fischer

# Catalogue
## Fixing Systems



# Foreword

## Dear partners,

We are fastening pioneers in the construction industry, and you, dear customers, are our most important source of inspiration. Your needs, concerns and projects are at the heart of our new developments and processes. Whether it is digitalisation, robotics or sustainability, we are always leading the way. Our joint success drives us to shape the future of construction with our solutions.

We have over 75 years of innovative power and technological expertise to draw on. Starting with a patented plastic expansion plug in 1958, our company continued to develop and now offers products, system solutions and services for the entire building supply chain. Our extensive portfolio includes plastic plugs, steel anchors, chemical systems and screws in addition to drills and smart tools for your fastening projects. Product ranges designed for specific applications complete our offer and include solar fastenings, anchor channels as well as facade, installation and fire protection systems.

In addition to providing the most suitable products and systems, our comprehensive range of services offers optimal and individual support, including the development of customised solutions. From planning and implementation to documentation and subsequent monitoring of structures and facilities, we offer a 360-degree service.

We are always at your side as a strong and reliable partner, from full engineering services through to installation support, successful project completion and structural health monitoring. Our engineers, application engineers and staff in the field provide individual and professional support. We're never far away thanks to our 52 subsidiaries around the globe. With a diverse range of online and in-person training sessions provided by our fischer Academy, you can always stay up to date with the latest products, applications and current regulations.

Our digital offer meanwhile comprises BIM (Building Information Modelling) services and digital inventory scanning tools. There's also a range of useful apps that offer advice on selecting and using our products in addition to our FiXperience design software for carrying out structural calculations with our fixing systems. Discover the world of automated construction with our BauBot construction robot and increase your maintenance efficiency with our Construction Monitoring sensor innovation for digitally monitoring and documenting your buildings.

We look forward to talking to you and continuing to work closely with you in future. We hope you enjoy discovering and using our products and services.

**Alexander Bässler**



*Speaker of the Board of Directors at the fischer Group of Companies*



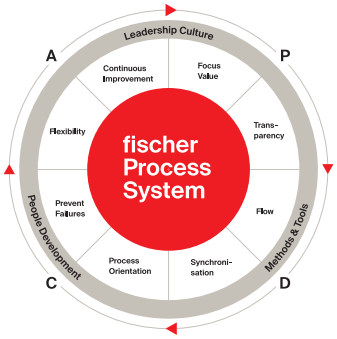
**“Whoever chooses fischer receives more than a range of safe products. The aim is to always develop the best solutions for our customers across the globe.”**

Besides the innovative products, this predominantly concerns support that is focused on the customer, and services designed to improve customer benefit.

# A brand and its promise to perform.

## Continuous improvement

With the fischer ProcessSystem (fPS) we ensure that we are adapting and optimising our processes in line with customer requirements in a flexible manner and on a continuous basis.




## Safety that connects. Decisive quality

We don’t make any compromises when it comes to the safety of our products. A whole host of our products are distinguished by comprehensive, up-to-date and international approvals. The fischer product range is well-positioned in all sectors of fixing technology – Steel, Nylon and Chemical fixings. In awardwinning quality which continues to impress both professional clients and private customers with equal measure.

ICC ES ESR-1990 See ICC-ES Evaluation Report at www.icc-es.org

ETA CE

**International approvals** characterise many of our products.





## Always on the pulse of time

At fischer, innovation is more than just the sum of the patents. We are open to new things and are prepared for change – always with the aim of offering our customers the greatest possible benefits. Over the years, our own development and production sites have been developing numerous fixing solutions for the most wide-ranging applications. Be it new production procedures or materials, such as renewable raw materials: We are carrying out the research for your safety and will continue to do so in the future. This gives us such great flexibility that we can even develop tailor-made customer solutions. This power to innovate has seen fischer become a market leader in anchor technology and the fixing industry.

## Our service to you

We are a reliable partner, one that will stand at your side and address your individual requirements with advice and action:

- Our products range from chemical systems to steel anchors through to plastic anchors.
- Competence and innovation through own research, development and production.
- Global presence and active sales service in over 100 countries.
- Qualified technical consulting for economical and compliant fastening solutions. Also on-site at the construction site requested.
- Training sessions, some with accreditation, at your premises or at the fischer academy.
- Design and construction software for demanding applications.

## We take responsibility

Our active environment management policy means that we are helping to maintain an intact environment for our generation and for those that follow. The environment management policy at the Tumlingen site has been certified in line with DIN EN ISO 14001.
It fills us with particular pride that in 2020 we have received the most important and largest award in Europe in the field of sustainability: the German Sustainability Award - category large companies.
This was in recognition of our holistic approach and the strategic anchoring of our sustainability management.
With our greenline products we have launched the first range of fixings on the market that is based on renewable raw materials to more than 50%.



German Sustainability Award

Plus X Award – Sustainability

Lean & Green Management Award

German Green Brand Award

GreenLine assortment based on 50% regrowing raw materials

Climate Protection Company

# **Innovations** to inspire professionals.




01 02 03 04 05 06

**01 DuoLine assortment**
Clever combinations for more power and intelligence.
**Page 512**
**Page 500**
**Page 434**
**Page 496**

**02 Injection mortar FIS V Plus**
The powerful universal mortar for concrete and masonry.
**Page 87**

**03 Injection mortar FIS V Zero**
Maximum flexibility and safety for various applications
**Page 112**

**04 Concrete screw UltraCut FBS II**
The high-performance concrete screw for absolute installation ease in external applications.
**Seite 292**

**05 Strong Undercut Anchor FSU**
The anchoring system for extreme safety and load requirements
**Page 277**

**06 Bolt anchor FAZ II Plus**
For highest demands. Powerful and flexible.
**Page 258**

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# 2 GreenLine


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# 3 Chemical fixings

## MORTARS AND CAPSULES FOR GENERAL APPLICATIONS


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## SPECIAL APPLICATIONS


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ACCESSORIES

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# 4 High performance steel anchors

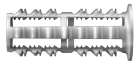
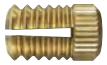

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| Window frame fixing F-S | 402 |  |
| Metal frame fixing F-M | 404 |  |
| Window frame screws FFS | 407 |  |
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# 6 General fixings


| | | |
|---|---|---|
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| Metal expansion anchor FMD | 464 |  |
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| EasyHook | 468 |  |
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| | | |
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| Plasterboard fixing GK | 515 |  |
| Plasterboard fixing GK Green | 518 |  |
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# 8 Electrical fixings


| | | |
|---|---|---|
| Locking clip SCN | 526 |  |
| Pipe clip RC | 528 |  |
| Pipe clip FC | 530 |  |
| Saddle clip SCH | 532 |  |
| Fastening tie FF | 534 |  |
| ClipFix plus LS/ES/ZS | 536 |  |
| ClipFix plus SD | 538 |  |
| Cable clasp KB | 540 |  |
| Cable harness SHA | 542 |  |
| Multi cable support metal SHA M | 544 |  |
| Wall slot clip FWSC | 546 |  |
| Nail disc NSB | 548 |  |
| Nail clip NS/MNS | 550 |  |
| Spacer pipe clip AM | 552 |  |
| Conduit clip BSM/BSMD/BSMZ | 554 |  |
| Textile web strapping GWB | 556 |  |
| Perforated steel banding LBV/LBK | 558 |  |
| Impact nail ED | 560 |  |
| Cable tie BN/UBN/GBN | 562 |  |
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# 9 Sanitary fixings


| | | |
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# 10
# Scaffold and eye screw fixings


| | | |
|---|---|---|
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| Scaffold eyebolt FI G 12 | 586 |  |
| Eye screw GS | 588 |  |
| Ring nut RI | 590 |  |


# 11
# Insulation fixings


| | | |
|---|---|---|
| Insulation support DHK | 594 |  |
| Insulation support DHM | 596 |  |
| Render fixing DIPK | 699 |  |
| Render fixing FIF-PN 8 | 601 |  |
| Render fixing FIF-CN II 8 | 604 |  |
| Render fixing FIF-CS | 607 |  |
| Insulation discs DT | 609 |  |
| Insulation discs | 610 |  |
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| Insulation plug FID II | 617 |  |
| Insulation plug FID II Plus | 619 |  |
| Insulation screw FID-Z | 622 |  |
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| Holding clamp DVN | 626 |  |


# 12
# Foams and sealants


| | | |
|---|---|---|
| Low monomer PU foam | 630 |  |
| Premium quick assembly & well foam | 631 |  |
| Fast bonding foam | 632 |  |
| Flexible gun foam | 633 |  |
| Premium gun foam | 635 |  |
| Gun foam | 636 |  |
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| Perimeter adhesive foam | 639 |  |
| ETICS adhesive foam | 640 |  |
| Rapid foam door frame & tray | 642 |  |
| PU foam dispenser PUP K2 Plus | 643 |  |
| PU foam dispenser PUP M3 | 644 |  |
| PU foam dispenser PUP M4 BLACK | 645 |  |
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SEALANTS

Sanitary Pro SI (DSSA) 652 
Sanitary SI (DSSI) 654 
Multi SI (DMS) 655 
High Temp SI (DHS) 656 
Flex MS 657 
Construction Pro SI (DBSA) 658 
Construction SI (DBSI) 660 
Natural Stone SI (DNS) 661 
Paint AC (DMA) 662 
Texture AC (DSA) 663 
Multi AC (DA) 664 
Repair AC (DEC) 665 
All-Weather AC (DDK) 666 
Roof BI (DD) 667 
Dispenser KPM 1 668 
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Dispenser KPM 2 Plus 670 
Foil bag dispenser KPM 600 671 

ZINC SPRAY

Zinc-alu spray FTC-ZA 672 
Zinc spray FTC-ZS 673 


# 13 Adhesives


Multi MS 676 
Crystal MS 677 
High Tack MS 678 
Express MS 679 
Express PU 680 
High Tack AC 681 


# 14 Drills and bits


CONCRETE DRILL BITS

Hammer drill bit Quattric II S / Quattric II 684 
Hammer drill bit SDS Plus II Pointer 687 
Hammer drill bit SDS Max IV 690 
Hollow drill bit FHD 692 

MASONRY DRILL BITS

Masonry drill bit Pointer U 694 

STONE DRILL BITS

Stone drill bit D-SDX 696 
Stone drill bit D-S 698 

METAL DRILL BITS

| | | |
|---|---|---|
| Metal drill bit D-HSS-Co | 700 |  |
| Metal drill bit D-HSS-G | 702 |  |
| Metal drill bit D-HSS-R | 704 |  |

UNIVERSAL DRILL BITS

| | | |
|---|---|---|
| Universal drill bit D-U Hex | 706 |  |

CHISEL

| | | |
|---|---|---|
| Premium chisel FCP | 708 |  |
| Standard chisel | 709 |  |
| ProfiBit FPB | 711 |  |
| Bit FMB II | 713 |  |
| BitHolder FBH | 714 |  |
| BitSets | 715 |  |
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# 15
# Power tools


| | | |
|---|---|---|
| Cordless impact wrench FSS 18V 600 | 720 |  |
| Gas actuated fastening tool FGC 100 | 723 |  |
| Battery actuated fastening tool FXC 85 | 728 |  |
| Perforated steel banding direct fastening LBV/LBK DF | 732 |  |
| Fastening tie FF DF direct fastening | 734 |  |
| Pipe clip RC DF direct fastening | 737 |  |
| Cable clasp direct fastening KB DF | 740 |  |
| Cable harness direct fastening SHA II | 742 |  |
| Gas actuated fastening tool FGW 90F | 745 |  |



Non-cracked concrete

| | | | Single fixings for non-cracked concrete<br>Chemical systems | | |
|---|---|---|---|---|---|
| Product | Type | | Epoxy system<br>FIS EM Plus | Superbond system<br>FSB | Injection mortar<br>FIS V PLUS |
| | Page | | **74** | **60** | **87** |
| | | |  |  |  |
| Connection thread or screw diameter | Anchor rod or anchor size | | M8 – M30 | M8 – M30 | M6 – M30 |
| | Internal thread | | M8 – M20 | M8 – M20 | M8 – M20 |
| | Reinforcing bar | | ø 8 – 40 mm | ø 8 – 32 mm | ø 8 – 28 mm |
| | Screw diameter | | – | – | – |
| Steel/material | gvz | | ● | ● | ● |
| | R | | ● | ● | ● |
| | HCR | | ● | ● | ● |
| | hdg/cp | | ● | ● | ● |
| | Nylon | | – | – | – |
| Usable length | Up to | | ∞ | ∞ | ∞ |
| Approvals/certificates | Approvals | ETA | ● | ● | ● |
| | | ICC | ● | ● | ● |
| | | DiBt | ● | ● | ● |
| | | Seismic | ● | ● | ● |
| | | Dynamic | ● | ● | – |
| | Certificates | Shock | – | – | – |
| | | Fire resistance reports | ● | ● | ● |
| Type of installation | Pre-positioned installation | | ● | ● | ● |
| | Push-through installation | | ● | ● | ● |
| | Stand-off installation | | ● | ● | ● |
| Drilling method | Hammer drilling | | ● | ● | ● |
| | Hollow drilling | | ● | ● | ● |
| | Diamond drilling | | ● | ● | – |
| Waiting time until loading at 20 °C | None | | – | – | – |
| | Short | ≤ 5 Minutes | – | ● | – |
| | Middle | ≤ 20 Minutes | – | ● | – |
| | Long | > 20 Minutes | ● | ● | ● |
| Substrate | | | -5 °C | -30 °C | -10 °C |
| Special features | Approved without drill hole cleaning | | – | – | – |
| | Installation in concrete < C20/25 acc. to certificate | | – | – | – |
| | Installation in concrete > C50/60 acc. to certificate | | – | – | – |
| | Approved in water-filled drill holes | | ● | ● | ● |
| | Installation in steel fibre concrete possible | | ● | ● | ● |
| | Installation possible in narrow members ≤ 120 mm | | ● | ● | ● |
| | Removable | Flush with the surface | ●* | ●* | ●* |
| | | Completely | – | – | – |

* With internal threaded anchor

| Single fixings for non-cracked concrete | | | | Redundant fixtures (multiple fixtures) | | |
|---|---|---|---|---|---|---|
| Steel anchors | | | | Steel anchor | | Frame fixing |
| Bolt anchor FAZ II Plus **256** | Bolt anchor FBN II **339** | UltraCut concrete screw FBS II **290** | High performance anchor FH II **266** | Nail anchor FNA II **325** | Hammerset anchor EA II **316** | DuoXpand **376** |
|  |  |  |  |  |  |  |
| M6 – M24 | M6 – M20 | ø 6 – 14 mm | ø 10 – 32 mm | ø 6 mm M6 – M8 | – | ø 8 – 10 mm |
| ● | – | – | M6 – M12 | – | M6 – M12 | – |
| – | – | – | – | – | – | – |
| – | – | – | – | – | – | ø 6 – 7 mm |
| ● | ● | ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● | ● | ● |
| ● | – | – | – | ● | – | – |
| – | ● | ● | – | – | – | – |
| – | – | – | – | – | – | ● |
| 320 mm | 315 mm | 225 mm | 125 mm | 120 mm | ∞ | 180 mm |
| ● | ● | ● | ● | ● | ● | ● |
| ● | – | ● | ● | – | – | – |
| ● | – | ● | – | – | – | – |
| ● | – | ● | ● | – | – | ● |
| ● | – | – | – | – | – | – |
| ● | – | – | ● | – | – | – |
| ● | ● | ● | ● | ● | ● | – |
| ● | ● | – | ●* | – | ● | – |
| ● | ● | ● | ● | ● | – | ● |
| ● | ● | – | ●* | – | ● | – |
| ● | ● | ● | ● | ● | ● | ● |
| ● | ● | ● | ● | – | – | – |
| ● | – | ● | – | – | – | – |
| ● | ● | ● | ● | ● | ● | ● |
| – | – | – | – | – | – | – |
| – | – | – | – | – | – | – |
| – | – | – | – | – | – | – |
| -40 °C | -40 °C | -40 °C | -40 °C | -40 °C | -40 °C | -40 °C |
| ● | – | ● | – | – | – | – |
| ● | – | – | – | ● | ● | ● |
| ● | – | – | – | – | – | – |
| ● | ● | ● | ● | ● | ● | – |
| ● | – | – | – | – | – | – |
| ● | ● | ● | ● | ● | ● | ● |
| – | – | ● | ●* | – | ● | ● |
| – | – | ● | – | – | – | ● |

* With internal threaded anchor



Cracked concrete

Single fixings for cracked concrete

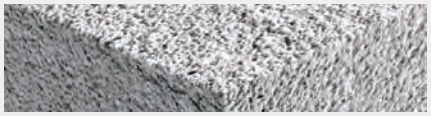
Chemical systems

| Product | Type | | Highbond system FHB II | Epoxy system FIS EM Plus | Superbond system FSB | Injection mortar FIS V PLUS |
|---|---|---|---|---|---|---|
| | Page | | 55 | 74 | 60 | 87 |
| | | |  |  |  |  |
| Connection thread or screw diameter | Anchor rod or anchor size | | M8 – M24 | M8 – M30 | M8 – M30 | M8 – M30 |
| | Internal thread | | – | M8 – M20 | M8 – M20 | – |
| | Reinforcing bar | | – | ø 8 – 40 mm | ø 8 – 32 mm | ø 10 – 28 mm |
| | Screw diameter | | – | – | – | – |
| Steel/material | gvz | | ● | ● | ● | ● |
| | R | | ● | ● | ● | ● |
| | HCR | | ● | ● | ● | ● |
| | hdg/cp | | – | ● | ● | ● |
| | Nylon | | – | – | – | – |
| Usable length | Up to | | 200 mm | ∞ | ∞ | ∞ |
| Approvals/certif-icates | Approvals | ETA | ● | ● | ● | ● |
| | | ICC | – | ● | ● | ● |
| | | DiBt | – | – | – | – |
| | | Seismic | – | ● | ● | ● |
| | | Dynamic | – | ● | ● | – |
| | Certificates | Shock | ● | – | – | – |
| | | Fire resist-ance reports | ● | ● | ● | ● |
| Type of installation | Pre-positioned installation | | ● | ● | ● | ● |
| | Push-through installation | | ● | ● | ● | ● |
| | Stand-off installation | | ● | ● | ● | ● |
| Drilling method | Hammer drilling | | ● | ● | ● | ● |
| | Hollow drilling | | ● | ● | ● | ● |
| | Diamond drilling | | – | ● | ● | – |
| Waiting time until loading at 20 °C | None | | – | – | – | – |
| | Short | ≤ 5 Minutes | ● | – | ● | – |
| | Middle | ≤ 20 Minutes | ● | – | ● | – |
| | Long | > 20 Minutes | ● | ● | ● | ● |
| Substrate | | | -5 °C | -5 °C | -30 °C | -10 °C |
| Special features | Approved without drill-hole cleaning | | ● | – | – | – |
| | Installation in concrete < C20/25 acc. to certificate | | – | – | – | – |
| | Installation in concrete > C50/60 acc. to certificate | | – | – | – | – |
| | Approved in water-filled drill holes | | ● | ● | – | ● |
| | Installation in steel fibre concrete possible | | – | ● | ● | – |
| | Installation possible in narrow members ≤ 120 mm | | ● | – | ● | ● |
| | Removable | Flush with the surface | – | ●* | ●* | – |
| | | Completely | – | – | – | – |

* With internal threaded anchor

| Single fixings for cracked concrete | | | | Redundant fixtures (multiple fixtures) | | |
|---|---|---|---|---|---|---|
| Steel anchors | | | Frame fixing | Steel anchor | | Frame fixing |
| Bolt anchor FAZ II Plus **198** | UltraCut concrete screw FBS II **224** | High performance anchor FH II **205** | SXRL 10 **304** | Nail anchor FNA II **254** | Hammerset anchor EAII EA II **316** | DuoXpand **376** |
|  |  |  |  |  |  |  |
| M6 – M24 | ø 6 – 14 mm | ø 10 – 32 mm | ø 10 mm | ø 6 mm M6 – M8 | – | ø 8 – 14 mm |
| – | – | M6 – M12 | – | – | M6 – M12 | – |
| – | – | – | – | – | – | – |
| – | – | – | 7 mm | – | – | ø 6 – 10 mm |
| ● | ● | ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● | ● | ● |
| ● | – | – | – | ● | – | – |
| – | ● | | | | | – |
| – | – | – | ● | – | – | ● |
| 320 mm | 225 mm | 100 mm | 240 mm | 125 mm | ∞ | 260 mm |
| ● | ● | ● | – | ● | ● | ● |
| ● | – | ● | – | – | – | – |
| – | – | – | ● | – | – | ● |
| ● | (●)* | ● | – | – | – | – |
| – | – | – | – | – | – | – |
| ● | – | ● | – | – | – | – |
| ● | ● | ● | – | ● | ● | ● |
| ● | – | ●* | – | ● | ● | – |
| ● | ● | ● | ● | ● | – | ● |
| ● | – | ●* | – | – | ● | – |
| ● | ● | ● | ● | ● | ● | ● |
| ● | ● | – | – | – | – | – |
| ● | ● | – | – | – | – | – |
| ● | ● | ● | ● | ● | ● | ● |
| – | – | – | – | – | – | – |
| – | – | – | – | – | – | – |
| – | – | – | – | – | – | – |
| -40 °C | -40 °C | -40 °C | -40 °C | -40 °C | -40 °C | -40 °C |
| – | ● | – | – | – | – | – |
| ● | ● | – | – | ● | ● | ● |
| ● | – | – | – | – | – | – |
| ● | ● | ● | ● | ● | ● | – |
| – | – | – | – | – | – | – |
| ● | – | – | – | ● | ● | ● |
| – | ● | ●* | ● | – | ● | ● |
| – | ● | – | ● | – | – | ● |

* With internal threaded anchor



Autoclaved aerated concrete AAC

| | | | Chemical systems | Steel-anchor | Frame fixings | General fixings | | |
|---|---|---|---|---|---|---|---|---|
| Product | Type | | Injection mortar FIS V PLUS | Aircrete anchor FPX-I | DuoXpand | Aircrete anchor GB | DuoPower | Turbo aircrete anchor FTP K/M |
| | Page | | 87 | 370 | 376 | 475 | 434 | 479 |
| | | |  |  |  |  |  |  |
| Connection thread or screw diameter | Anchor rod or anchor size | | M6 – M16 | – | ø 8 – 14 mm | GB 10 | ø 5 –14 mm | ø 4 – 10 mm |
| | Internal thread | | M6 – M12 | M6 – M12 | – | – | – | M6 – M10 |
| | Screw diameter | | – | – | ø 6 – 10 mm | ø 5 – 10 mm | ø 3 – 12 mm | ø 5 – 10 mm |
| Steel/material | gvz | | ● | ● | ● | ● | – | ● |
| | R | | ● | – | ● | ● | – | – |
| | Nylon | | – | – | ● | ● | ● | ● |
| Usable length | Up to | | ∞ | ∞ | 290 mm | 105 mm | ∞ | ∞ |
| Approvals/certif-icates | Approvals | ETA | ● | ● | ● | – | – | – |
| | | DiBt | – | – | ● | ● | – | – |
| | Certificates | Fire restance report | ● | ● | – | – | – | – |
| Type of installation | Pre-positioned installation | | ● | ● | – | ● | ● | ● |
| | Push-through installation | | ● | – | ● | – | ● | – |
| | Stand-off installation | | ● | ● | – | – | – | – |
| Drilling method | Hammer drilling | | ● | ● | ● | – | – | – |
| | Rotary drilling | | ● | ● | ● | ● | ● | ● |
| Waiting time until loading at 20 °C | None | | – | ● | ● | ● | ● | ● |
| | Short | < 5 Minutes | – | – | – | – | – | – |
| | Middle | ≤ 20 Minutes | ● | – | – | – | – | – |
| | Long | > 20 Minutes | ● | – | – | – | – | – |
| Minimum compo-nent temperature | | | -10 °C | -40 °C | -40 °C | -20 °C | -40 °C | -40 °C |
| Special features | Approved without drill hole cleaning | | – | – | – | – | – | – |
| | Applicable in autoclaved aerated concrete ceilings | | – | ● | – | – | – | – |
| | Removable | Flush with the surface | ●* | ● | ● | ● | ● | ● |
| | | Completely | – | – | ● | ● | ● | ● |




Solid & perforated brick

| | | | Chemical systems | Frame fixings | | | General fixings |
|---|---|---|---|---|---|---|---|
| Product | Type | | Injection mortar FIS V PLUS | DuoXpand | Frame fixing SXR/SXRL | Hammerfix N | DuoPower |
| | Page | | 87 | 376 | 380 | 392 | 434 |
| | | |  |  |  |  |  |
| Connection thread or screw diameter | Anchor rod or anchor size | | M6 - M16 | ø 8 – 14 mm | ø 8–14 mm | ø 5–10 mm | ø 5 –14 mm |
| | Internal thread | | M6 - M12 | – | – | – | – |
| | Screw diameter | | – | ø 6 – 10 mm | 6 – 10 mm | 3.5 – 7 mm | ø 3 – 12 mm |
| Steel/material | gvz | | ● | ● | ● | ● | – |
| | R | | ● | ● | ● | in A2 | – |
| | Nylon | | – | ● | ● | ● | ● |
| Usable length | Up to | | 290 mm | 290 mm | 180 mm | 180 mm | ∞ |
| Approvals/certif-icates | Approvals | ETA | – | ● | ● | – | – |
| | | DiBt | ● | ● | ● | – | – |
| | Certificates | Fire resistance reports | – | – | – | – | – |
| Type of installation | Pre-positioned installation | | ● | – | – | – | ● |
| | Push-through installation | | ● | ● | ● | ● | ● |
| | Stand-off installation | | ● | – | – | – | – |
| Drilling method | Hammer drilling | | ● | ● | ● | ● | ● |
| | Rotary drilling | | ● | ● | ● | ● | ● |
| Waiting time until loading at 20 °C | None | | – | ● | ● | ● | ● |
| | Short | ≤ 5 Minutes | – | – | – | – | – |
| | Middle | ≤ 20 Minutes | ● | – | – | – | – |
| | Long | > 20 Minutes | ● | – | – | – | – |
| Minimum compo-nent temperature | | | -10 °C | -40 °C | -40 °C | -40 °C | -40 °C |
| Special features | Approved without drill hole cleaning | | – | – | – | – | – |
| | Removable | Flush with the surface | ●* | ● | ● | ● | ● |
| | | Completely | – | ● | ● | ● | ● |

* With internal threaded anchor



Panel building materials

| | | | Cavity fixings | | | | | General fixings |
|---|---|---|---|---|---|---|---|---|
| Product | Type | | Metal cavity fixing HM | DuoHM | Gravity toggle/ spring toggle KD | fischer DuoTec | Plasterboard fixing DuoBlade | DuoPower |
| | Page | | 503 | 500 | 507 | 496 | 512 | 434 |
| | | |  |  |  |  |  |  |
| Connection thread or diameter of the screw | Anchor size | | M4 – M8 | M4 – M6 | M3 – M10 | ø 10 and ø 12 mm | – | ø 5,6,8 and 10 mm |
| | Screw diameter | | Metric screw M4 – M6; Hexagon-headed screw M8; Angle hook M4 and M5 | Metric thread M4 - M6 | Metric thread M3 – M10; Round hook M3 – M8 | Metric thread M5 – M6 chipboard screws 4.5 – 6 mm | Chipboard screw 4.0 – 5.0 mm | Chipboard screw 3.0 – 8.0 mm |
| Steel/material | gvz | | ● | ● | ● | – | – | – |
| | R | | – | – | – | – | – | – |
| | Nylon | | – | – | – | ● | ● | ● |
| Panel thickness | | | 3 – 50 mm | 9,5 – 30 mm | 9.5 – 90 mm | 9.5 – 55 mm | min. 9.5 mm | min. 9.5 mm |
| Usable length | Up to | | 34 mm | 8 mm | 63 mm | ∞ | ∞ | ∞ |
| Required cavity depth by 12.5 mm board thickness | | | min. 19 mm | min 42,5 mm | min. 27 mm | min. 40 mm | min. 35 mm | min. 18 mm |
| Type of installation | Pre-positioned installation | | ● | ● | ● | ● | ● | ● |
| | Push-through installation | | – | – | – | – | – | ● |
| | Stand-off installation | | – | – | ● | ● | – | – |
| Drilling method | Rotary drilling | | ● | ● | ● | ● | ● | ● |
| Waiting time until loading | None | | ● | ● | ● | ● | ● | ● |
| Special features | Removable | Flush with the surface | ● | ● | ● | ● | – | – |
| | | Completely | – | – | – | – | ● | ● |



Insulated building materials (e.g. ETICS)

| | | | Stand-off installation system | | Insulation plug |
|---|---|---|---|---|---|
| Product | Type | | TherMax 12 and 16 | TherMax 8 and 10 | FID II / FID II Plus |
| | Page | | 421 | 417 | 617 |
| | | |  |  |  |
| Connection thread or screw diameter | Anchor rod or anchor size | | M12 and M16 | M8 and M10 | – |
| | Screw diameter | | – | 4.5 – 6 mm, M6 – M10 | 4.5 – 6 mm |
| Steel/material | gvz | | ● | ● | ● |
| | R | | ● | – | – |
| | Nylon | | – | ● | – |
| Usable length | Up to | | 170 and 290 mm | 180 and 240 mm | ∞ |
| Approvals/certificates | Approvals | ETA | – | – | – |
| | | DiBt | ● | – | – |
| Type of installation | Pre-positioned installation | | ● | ● | ● |
| | Push-through installation | | – | – | – |
| | Stand-off installation | | ● | ● | – |
| Drilling method | Hammer drilling | | ● | ● | – |
| | Rotary drilling | | ● | – | – |
| Waiting time until loading at 20°C | None | | – | ● | ● |
| | Short | ≤ 5 Minutes | Depends on the injection mortar | – | – |
| | Middle | ≤ 20 Minutes | Depends on the injection mortar | – | – |
| | Long | > 20 Minutes | Depends on the injection mortar | – | – |
| Minimum component temperature | | | Depends on the injection mortar | -40 °C | -40 °C |
| Special features | Removable | Flush with the surface | ● | ● | ● |
| | | Completely | – | – | ● |


fischer
SX Plus Green
8x30

# 2
# GreenLine




| | | |
|---|---|---|
| Universal plug UX Green | 28 |  |
| Expansion plug SX Plus Green | 31 |  |
| Plasterboard fixing GK Green | 34 |  |
| Hammerfix N Green | 36 |  |
| Aircrete anchor GB Green | 38 |  |

# Environmentally friendly and secure.



## Sustainable building



With the introduction of its GreenLine products, fischer is the first manufacturer worldwide to offer a range of bio-based fixing systems.

We are adapting to the demands of processors and builders who greatly value sustainability when building and renovating, even when it comes to installation.

## Grown naturally

BIOBASED 50 - 85%
DIN
Geprüft

All GreenLine products are produced with at least 50 % renewable raw materials. These do not compete with food and feed products or with corresponding cultivation areas. The regenerative material percentage is always confirmed by independent testing and certification by the DIN CERTCO / TÜV Rheinland. All products are in the „BIOBASED 50 - 85 %“ class.

## Durably secure

★★★★★
Nylon
Quality

We do not make any compromises when it comes to the security of GreenLine products. They have the same features and load-bearing capacity as the grey coloured originals. Just 100% fischer nylon quality - made in Germany!

## We take responsibility

Umweltmanagement
ISO 14001

For decades fischer has been actively practising environmental protection and taking on responsibility so that the environment remains intact for future generations.
We have an environmental management system certified according to DIN ISO 14001 and are a member of the German Sustainable Building Council (DGNB).

# The first range of fixing products with renewable resources.



## General fixings

**Universal plug UX Green**
The nylon plug for all construction materials
28


## Special fixings

**Expansion plug SX Plus Green**
The powerful nylon plug with 4-way expansion
31


**Plasterboard fixing GK Green**
The fastest installation in gypsum plasterboard
34


**Hammerfix N Green**
The hammer-in plug for simple, fast and economic installation
36


**Aircrete anchor GB Green**
Secure in aerated concrete
38


## The fischer GreenLine product line has a green solution for every building material.

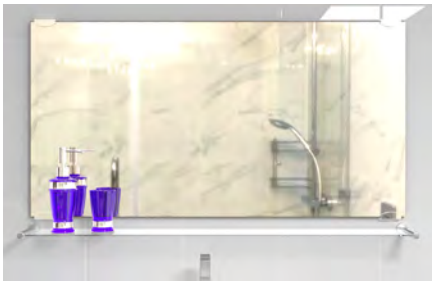
| GreenLine range |  Concrete |  Solid brick |  Perforated brick |  Autoclaved aerated concrete |  Natural stone |  Panel building materials |  Gypsum plasterboard |  Insulation panels |
|---|---|---|---|---|---|---|---|---|
|  UX Green | ● | ● | ● | ● | ● | ● | ● | – |
|  SX Green | ● | ● | ● | ● | ● | – | – | – |
|  GK Green | – | – | – | – | – | – | ● | – |
|  N Green | ● | ● | ● | ● | ● | – | – | – |
|  GB Green | – | – | – | ● | – | – | – | – |

# Universal plug UX Green

The first plug made from renewable resources.







Mirror



Pictures

## Applications

- Pictures
- Lighting
- Skirting
- Light cabinets
- Towel rails
- Mirror cabinets
- Curtain rails
- Wash basin fixings
- TV consoles
- Plumbing and heating fixings

## Advantages

- Produced with at least 50% renewable raw materials and therefore particularly environmentally friendly.
- Just as effective, secure and durable as regular UX plugs.
- The universal operating principle (knotting or expanding) allows for use in all solid, hollow and board building materials. Thus the UX Green is the correct choice for unknown base materials.
- Plug collar for anti-slip safety and saw tooth sides as turning lock ensure the highest installation safety.

## Certificates / Features

BIOBASED 50 - 85% DIN Geprüft 8C029

★★★★★ Nylon Quality

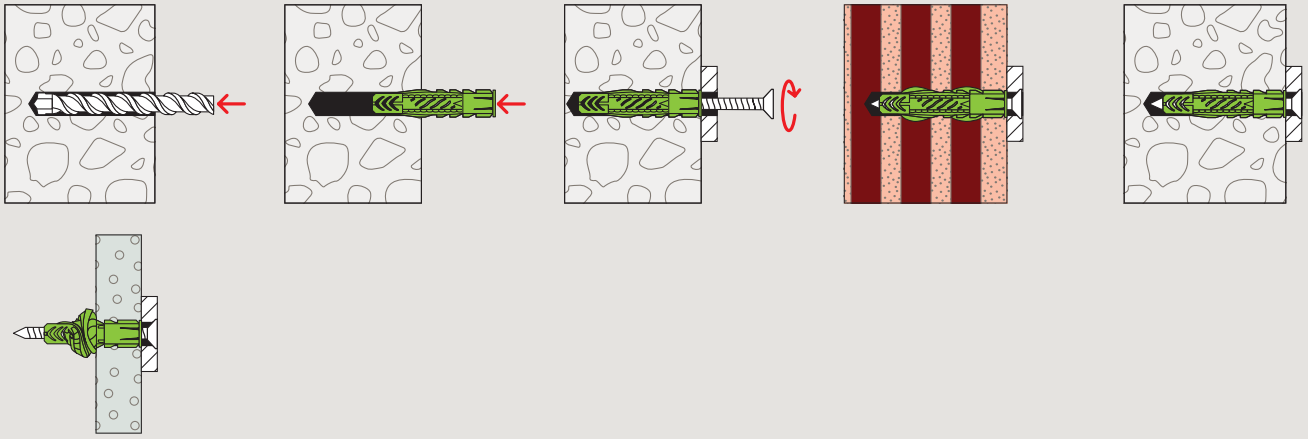
## Building materials

- Concrete
- Gypsum plasterboard and gypsum fibreboards
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Cavity floor slabs made from bricks and concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Natural stone
- Aerated concrete
- Chipboard
- Solid panel made from gypsum
- Solid brick made from lightweight concrete
- Solid brick

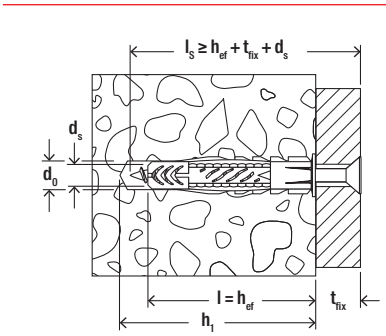
## Functioning

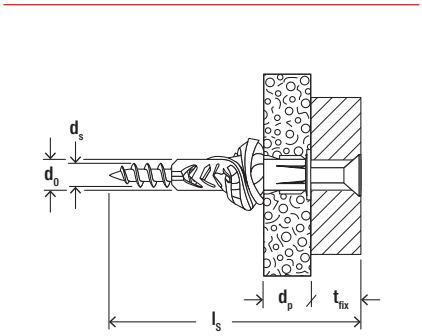
- The Universal plug UX with rim is suitable for pre-positioned installation; the UX without rim is suitable for push-through installation.
- When screwing in the screw, the UX Green expands in solid building materials and knots itself into cavities.
- Suitable for woodand chipboard screws, as well as stud screws.
- The required screw length is given by: the plug length + fixture thickness + 1x screw diameter.
- In the case of board building materials, the threadless part of the screw must not be longer than the fixture.
- The edge distance must be at least one plug length.

## Installation UX Green








## Technical data

**Universal plug UX Green**



UX Green R UX Green

| Item | With rim<br>Item no. | Without rim<br>Item no. | Drill diameter<br>$d_0$<br>[mm] | Min. drill hole depth<br>$h_1$<br>[mm] | Min. panel thickness<br>$d_p$<br>[mm] | Anchor length<br>l<br>[mm] | Wood and chipboard screws<br>$d_s$<br>[mm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|
| **UX Green 6 x 35 R** | **518885** | **–** | 6 | 45 | 9.5 | 35 | 4.0 - 5.0 | 40 |
| **UX Green 6 x 50 R** | **524855** | **–** | 6 | 60 | 9.5 | 50 | 4.0 - 5.0 | 40 |
| **UX Green 8 x 50 R** | **518886** | **–** | 8 | 60 | 9.5 | 50 | 4.5 - 6.0 | 40 |
| **UX Green 10 x 60 R** | **518887** | **–** | 10 | 75 | 12.5 | 60 | 6.0 - 8.0 | 20 |
| **UX Green 12 x 70** | **–** | **524858** | 12 | 85 | – | 70 | 8.0 - 10.0 | 18 |

# Loads

**Universal plug UX Green**

Recommended loads[1] for a single anchor.
The given loads are valid for wood screws with the specified diameter.

| Type | | | UX Green 6 x 35 | UX Green 6 x 50 | UX Green 8 x 50 | UX Green 10 x 60 | UX Green 12 x 70 |
|---|---|---|---|---|---|---|---|
| **Wood screw diameter** | | **[mm]** | **5** | **5** | **6** | **8** | **10** |
| **Recommended loads in the respective base material $F_{rec}$** [2] | | | | | | | |
| **Concrete** | ≥ C20/25 | **[kN]** | 0.40 | 0.60 | 0.60 | 1.00 | 1.50 |
| **Solid brick** | ≥ Mz 12 | **[kN]** | 0.20 | 0.30 | 0.30 | 0.50 | 0.70 |
| **Perforated sand-lime brick** | ≥ KSL 12 | **[kN]** | 0.40 | 0.40 | 0.50 | 0.60 | 0.80 |
| **Vertically perforated brick** | ≥ HLz 12 | **[kN]** | 0.20 | 0.20 | 0.20 | 0.20 | 0.30 |
| **Aerated concrete** | ≥ AAC 4 | **[kN]** | 0.20 | 0.20 | 0.30 | 0.40 | 0.60 |
| **Gypsum plasterboard** | 12.5 mm | **[kN]** | 0.10 | 0.10 | 0.10 | 0.10 | - |
| **Gypsum plasterboard** | 25 mm | **[kN]** | 0.15 | 0.15 | 0.15 | 0.15 | - |
| **Gypsum fibreboard** | (Fermacell) | **[kN]** | 0.20 | 0.20 | 0.20 | 0.25 | - |
| **Gypsum block** | $\rho \geq 0.9$ kg/dm$^3$ | **[kN]** | - | - | 0.15 | 0.35 | 0.45 |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tensile load, shear load and oblique load under any angle.

# Expansion plug SX Plus Green

The specialist for solid building materials with renewable raw materials.







Curtain rails



Mirrors

## Applications

- Lamps
- Wardrobes
- Motion detectors
- Skirting boards
- Light wall shelves
- Mirror cabinets
- Mailboxes
- TV consoles
- Trellis
- Folding shutters
- Fire detector

## Advantages

- The SX Plus Green is produced with at least 50% renewable raw materials and therefore particularly environmentally friendly.
- The 4-way expansion ensures optimum force transmission into the building material and guarantees high holding values in solid and perforated building materials.
- The special fixing wings ensure pre-fixation of the screw, leaving both of the user's hands free during the setting process.
- The expansion-free plug neck prevents the creation of expansion forces on the material surface whilst screwing in the screw. This helps to prevent damage to tiles and plaster.
- The special shape of the plug makes it easy to insert into the drill hole with just a few hammer blows.
- The pronounced edge of the plug prevents it from slipping deeper into the drill hole and enables secure installation.

## Certificates / Features

BIOBASED 50 - 85%
DIN Geprüft
8C029

★★★★★
Nylon
Quality

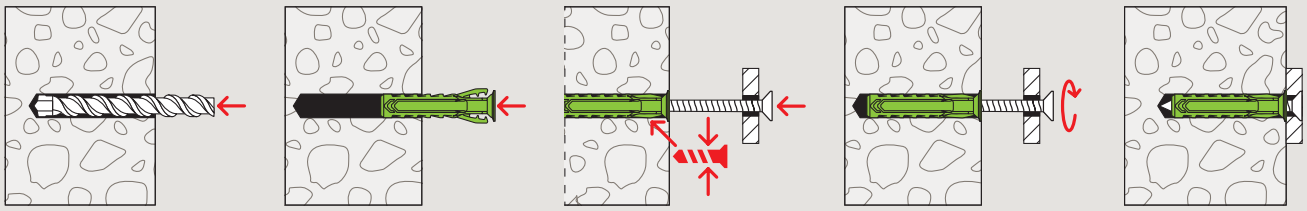
## Building materials

- Concrete
- Solid brick
- Solid sand-lime brick
- Aerated concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Solid stone of leightweight concrete
- Hollow block of leightweight concrete
- Natural stone
- Hollow brick & concrete ceilings
- Solid gypsum boards

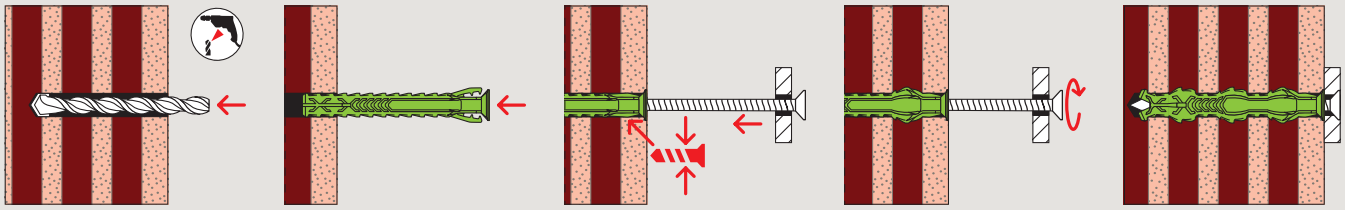
## Functioning

- The SX Plus Green is suitable for pre-positioned and push-through installation.
- When the plug is inserted, the fixing wings fold inwards. This locks the screw in place when it is inserted into the plug and prevents it from falling out, which is particularly helpful in overhead applications.
- When the screw is tightened, the SX Plus Green expands in four directions and thus anchors itself securely in the building material.
- The anti-rotation lock prevents the plug from twisting and allows for easy installation.
- Suitable for wood and chipboard screws, as well as stud screws.
- The required screw length is given by: the plug length + fixture thickness + the screw diameter.

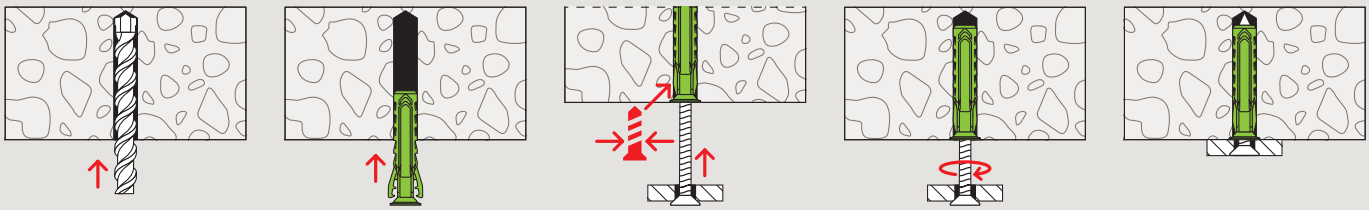
## SX Plus Green in concrete

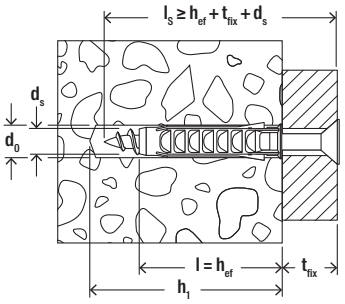


## SX Plus Green long version in vertically perforated brick



## SX Plus Green overhead use





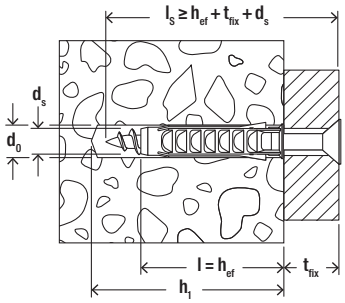

## Technical data

**Expansion plug SX Plus Green**



SX Plus Green | SX Plus Green long version | SX Plus Green S

| Item | With screw<br>Item no. | Without screw<br>Item no. | Drill diameter<br>$d_0$<br>[mm] | Min. drill hole depth<br>$h_1$<br>[mm] | Anchor length<br>l<br>[mm] | Wood and chipboard screws<br>$d_s$<br>[mm] | Screw dimension<br>$d_s \times l_s$<br>[mm] | Max. fixture thickness<br>$t_{fix}$<br>[mm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|
| SX Plus Green 5 x 25 | – | 567806 | 5 | 35 | 25 | 3.0 - 4.0 | – | – | 90 |
| SX Plus Green 6 x 30 | – | 567807 | 6 | 40 | 30 | 4.0 - 5.0 | – | – | 90 |
| SX Plus Green 6 x 30 S | 567813 | – | 6 | 45 | 30 | 4.5 x 40 | 4.5 x 40 | 5 | 45 |
| SX Plus Green 6 x 50 | – | 567808 | 6 | 60 | 50 | 4.0 - 5.0 | – | – | 90 |
| SX Plus Green 8 x 40 | – | 567809 | 8 | 50 | 40 | 4.5 - 6.0 | – | – | 90 |
| SX Plus Green 8 x 40 S | 567814 | – | 8 | 60 | 40 | – | 5.0 x 60 | 10 | 45 |
| SX Plus Green 8 x 65 | – | 567810 | 8 | 75 | 65 | 4.5 - 6.0 | – | – | 45 |






## Technical data

**Expansion plug SX Plus Green**



SX Plus Green | SX Plus Green long version | SX Plus Green S

| | With screw | Without screw | Drill diameter | Min. drill hole depth | Anchor length | Wood and chipboard screws | Screw dimension | Max. fixture thickness | Sales unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | $d_0$ | $h_1$ | l | $d_s$ | $d_s \times l_s$ | $t_{fix}$ | |
| | Item no. | Item no. | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [pcs] |
| **Item** | | | | | | | | | |
| **SX Plus Green 10 x 50** | – | **567811** | 10 | 60 | 50 | 6.0 - 8.0 | – | – | 45 |
| **SX Plus Green 12 x 60** | – | **567812** | 12 | 80 | 60 | 8.0 - 10.0 | – | – | 20 |

## Loads

**Expansion plug SX Plus Green**

Recommended loads[1] for a single anchor.
The given loads are valid for wood screws with the specified diameter.

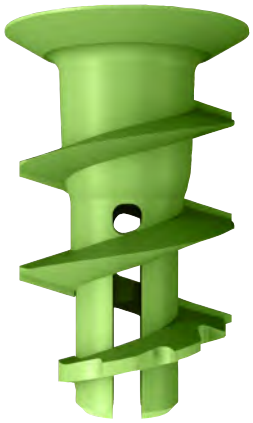
| Type | | | SX Plus Green 5x25 | SX Plus Green 6x30 | SX Plus Green 6x50 | SX Plus Green 8x40 | SX Plus Green 8x65 | SX Plus Green 10x50 | SX Plus Green 12x60 |
|---|---|---|---|---|---|---|---|---|---|
| **Wood screw diameter** | | [mm] | 4 | 5 | 5 | 6 | 6 | 8 | 10 |
| **Min. edge distance in concrete** | $c_{min}$ | [mm] | 25 | 35 | 35 | 40 | 50 | 50 | 65 |
| **Recommended loads in the respective base material $F_{rec}$[2]** | | | | | | | | | |
| **Concrete** | ≥ C20/25 | [kN] | 0.35 | 0.65 | 1.30 | 0.75 | 1.50 | 1.40 | 2.40 |
| **Solid brick** | ≥ Mz 12 | [kN] | 0.27 | 0.35 | 0.50 | 0.60 | 0.80 | 1.00 | 1.25 |
| **Solid sand-lime brick** | ≥ KS 12 | [kN] | 0.35 | 0.65 | 1.30 | 0.75 | 1.50 | 1.40 | 2.40 |
| **Aerated concrete** | ≥ AAC 2 | [kN] | 0.03 | 0.07 | 0.12 | 0.10 | 0.15 | 0.18 | 0.22 |
| **Aerated concrete** | ≥ AAC 4 | [kN] | 0.15 | 0.20 | 0.35 | 0.30 | 0.40 | 0.50 | 0.80 |
| **Perforated sand-lime brick** | ≥ KSL 12 | [kN] | 0.25 | 0.30 | 0.35 | 0.40 | 0.80 | 0.45 | 0.70 |
| **Vertically perforated brick** | ≥ HLz 12, Doppio UNI 19 | [kN] | 0.13 | 0.15 | 0.17 | 0.25 | 0.40 | 0.25 | 0.35 |
| **Vertically perforated brick** | Forato Type F8 | [kN] | 0.08[3] | 0.10[3] | - | 0.10[3] | - | 0.12[3] | - |
| **Light-weight concrete hollow block** | Sepa Parpaing | [kN] | 0.20 | 0.25 | 0.30[3] | 0.25 | 0.30[3] | 0.35 | 0.50[3] |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tension, shear and combined tension and shear load.
[3] Load determination on plastered wall.

# Plasterboard fixing GK Green

The fastest installation in gypsum plasterboard.







Wall lamps



Pictures

## Applications

- Pictures
- Lighting
- Electrical installations
- Fitting accessories
- Series installations

## Advantages

- Produced with at least 50% renewable raw materials and therefore particularly environmentally friendly.
- Just as effective, secure and durable as regular GK plugs.
- The included setting tool combine the functions of drilling and setting fixings for direct and easy installation.
- Sharp, self-tapping thread for a positive-fit connection with a high load-bearing capacity.
- The cross-drive recess in the head of the fixing means that the GK Green can also easily be screwed out like a screw.
- The GK Green can be used with various screws, hooks and eye screws, making it very versatile in its applications.

## Certificates / Features

BIOBASED 50 - 85%
DIN Geprüft
8C029

★★★★★
Nylon
Quality

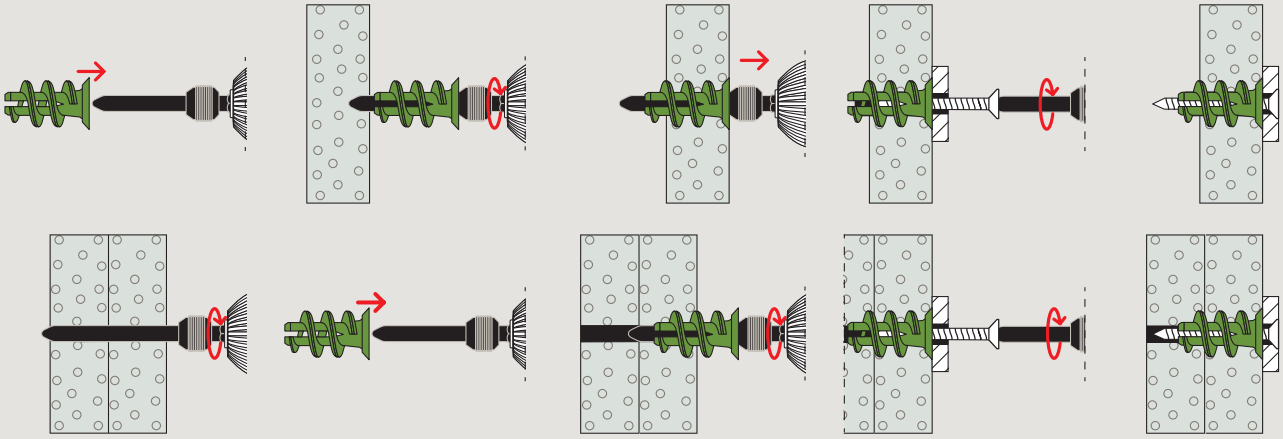
## Building materials

- Gypsum plasterboard, single and double-planked

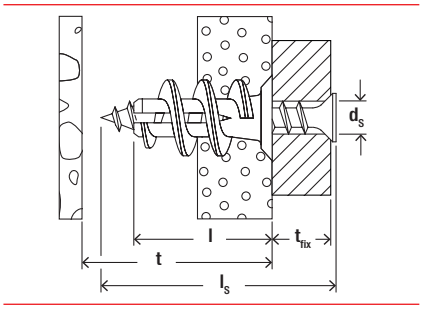
## Functioning

- The gypsum plasterboard fixing GK Green is suitable for pre-positioned installation.
- The gypsum plasterboard fixing GK Green is screwed flush into the gypsum plasterboard using the setting tool provided. Avoid manual and machine-aided overtightening.
- For board thicknesses greater than 15 mm, drill a hole first by using the setting tool.
- Not suitable for gypsum fibreboard and tiled gypsum plasterboard.
- Adapted for wood, sheet metal and chipboard screws with a diameter of 4.0 to 5.0 mm.

## Installation GK Green








## Technical data

**Plasterboard fixing GK Green**



GK Green GK Green S

| | Item no. | Anchor length l [mm] | Min. thickness to first supporting layer t [mm] | Max. fixture thickness $t_{fix}$ [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | |
| **GK Green** | **524868**[1)2)] | 22 | 25 | – | 4.0 - 5.0 x Ls | – | 90 |
| **GK Green S** | **524869**[1)3)] | 22 | 25 | 13 | 4.5 x 35 | PZ2 | 45 |

[1)] Including installation tool GKW.
[2)] Min. screw length = length of plug 22 mm + thickness of building component.
[3)] Supplied with plasterboard screw.

## Loads

**Plasterboard fixing GK Green**

Recommended loads[1)] for a single anchor.

| Type | | | GK |
|---|---|---|---|
| **Chipboard screw** | | **[mm]** | 4.0 - 5.0 |
| **Recommended loads in the respective base material $F_{rec}$**[2)] | | | |
| **Gypsum plasterboard** | 9.5 mm | **[kN]** | 0.07 |
| **Gypsum plasterboard** | 12.5 mm | **[kN]** | 0.08 |
| **Gypsum plasterboard** | 2 x 12.5 mm | **[kN]** | 0.11 |

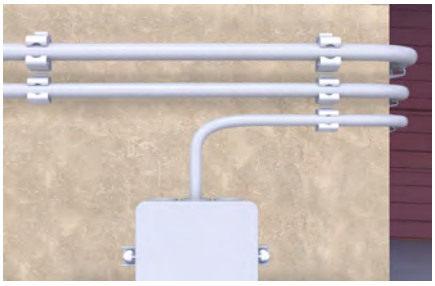
[1)] Required safety factors are considered. The given loads are valid for chipboard screws with the specified diameters. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2)] Valid for tensile load, shear load and oblique load under any angle.

# Hammerfix N Green

The hammer-in plug for a simple, fast and economical installation.







Cable fixing



Timber substructures

## Applications

- Substructures made of wood and metal
- Wall connection or plaster profiles
- Slides
- Sheets
- Cable and pipe clips
- Perforated tapes

## Advantages

- Produced with at least 50% renewable raw materials and therefore particularly environmentally friendly.
- Just as effective, secure and durable as regular hammerfix N plugs.
- The rapid push-through and hammer-set installation reduces the amount of work required and allows for economic series installation.
- The integrated hammer-in stop prevents the plug from expanding prematurely, thus enabling problem-free installation.
- Together with the cross-slot recess, the thread of the nail screw allows the screw to be removed, thus allowing for subsequent dismantling.

## Certificates / Features

BIOBASED 50 - 85%
DIN Geprüft
8C029

★★★★★
Nylon
Quality

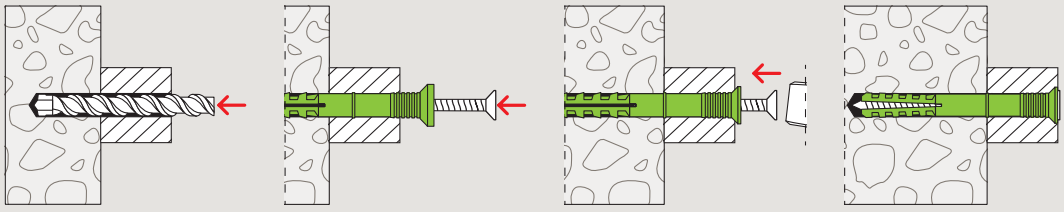
## Building materials

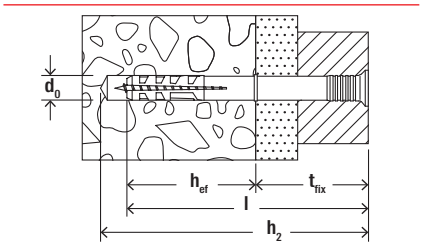
- Concrete
- Solid sand-lime brick
- Building brick
- Natural stone
- Solid brick made from lightweight concrete
- Aerated concrete
- Solid panel made from gypsum

## Functioning

- The hammerfix N Green is suitable for push-through installation.
- The easiest installation: drill, knock in and you're done.
- When being hammered in, the nail screw causes the plug to expand in two directions, thus providing a secure anchoring in the building material.

## Installation N Green








## Technical data

**Hammerfix N Green**



N Green S

| Item | Item no. | Drill diameter $d_0$ [mm] | Effect. anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Max. fixture thickness $t_{fix}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **N Green 6 x 40/10 S** | **524845** | 6 | 30 | 40 | 55 | 10 | PZ2 | 45 |
| **N Green 6 x 60/30 S** | **524847** | 6 | 30 | 60 | 75 | 30 | PZ2 | 45 |
| **N Green 6 x 80/50 S** | **524848** | 6 | 30 | 80 | 95 | 50 | PZ2 | 45 |
| **N Green 8 x 80/40 S** | **524849** | 8 | 40 | 80 | 95 | 40 | PZ3 | 45 |
| **N Green 8 x 100/60 S** | **524850** | 8 | 40 | 100 | 115 | 60 | PZ3 | 45 |

## Loads

**Hammerfix N Green**

Recommended loads[1] for a single anchor.
The given loads are valid for screw nails with the specified diameter.

| Type | | | N Green 6 | N Green 8 |
|---|---|---|---|---|
| **Screw nail diameter** | | [mm] | 4 | 5 |
| **Recommended loads in the respective base material $F_{rec}$** [2] | | | | |
| **Concrete** | ≥ C20/25 | [kN] | 0.25 | 0.27 |
| **Solid brick** | ≥ Mz 12 | [kN] | 0.18 | 0.24 |
| **Solid sand-lime brick** | ≥ KS 12 | [kN] | 0.22 | 0.24 |
| **Solid brick of lightweight aggregate concrete** | ≥ V 4 | [kN] | 0.12 | 0.15 |
| **Aerated concrete** | ≥ AAC 2 | [kN] | 0.04 | 0.05 |
| **Aerated concrete** | ≥ AAC 4 | [kN] | 0.10 | 0.13 |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tensile load, shear load and oblique load under any angle.

# Aircrete anchor GB Green

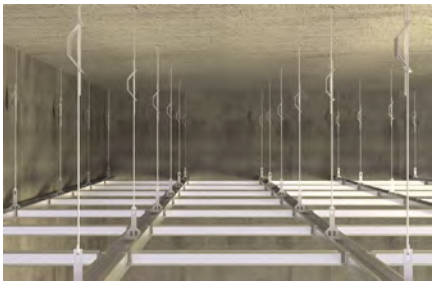
Secure in aerated concrete.







Radiators



Suspended ceilings

## Applications

- Pipelines
- Letter boxes
- Anopy brackets
- Handles
- Gratings
- Electrical installations

## Advantages

- Produced with at least 50% renewable raw materials and therefore particularly environmentally friendly.
- The spiral-shaped outer ribs cut a positive fit in the soft building material, thus ensuring best pressure distribution and load-bearing capacity.
- Can be applied with a hammer – there is no need for special tools, thus saving time and money for the installation.

## Certificates / Features

BIOBASED 50 - 85% DIN Geprüft 8C029

★★★★★ Nylon Quality

## Building materials

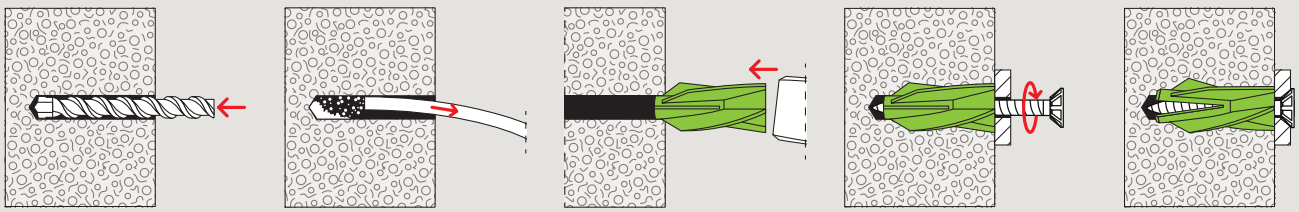
**Suitable for:**

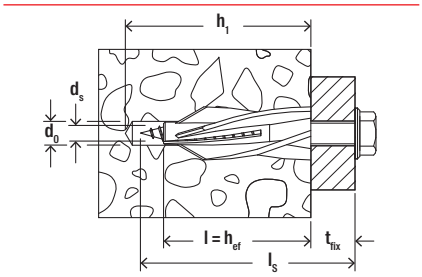
- Aerated concrete ≥ PB2, PP2
- Aerated concrete and ceiling panels of compressive strength ≥ 3.3

## Functioning

- The aircrete anchor GB Green is suitable for pre-positioned installation.
- The spiral-shaped outer ribs cut a positive fit into the soft building material when knocked in, thus ensuring optimal pressure distribution and load-bearing capacity.
- The required screw length is given by the plug length + fixture thickness + 1x screw diameter.
- Rotary drilling of the hole is required.
- Can be used in unplastered aerated concrete.

## Installation GB Green








## Technical data

**Aircrete anchor GB Green**



GB Green

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Plug length = min. anchorage depth $l = h_{ef}$ [mm] | fischer safety screw $d_s$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **GB Green 8** | **524870** | 8 | 60 | 50 | 5 | 20 |
| **GB Green 10** | **524871** | 10 | 65 | 55 | 7 | 18 |

## fischer Safety screw for GB Green

| Type | Usable length | | Screw dimension[1] | Zinc plated and passivated steel | |
|---|---|---|---|---|---|
| | | | | Countersunk head, TX star recess drive | Hexagonal head |
| | min. $t_{fix}$ [mm] | max. $t_{fix}$ [mm] | ø x $l_s$ | Item No. | Item No. |
| **GB 10** | 0 | 5 | 7 x 67 | | 80404 |
| | 5 | 25 | 7 x 87 | 89170 | 80405 |
| | 25 | 45 | 7 x 107 | 89172 | |
| | 85 | 105 | 7 x 167 | 89178 | |

[1] Further sizes on request.

## Loads

**Aircrete anchor GB Green**

Recommended loads[1] for a single anchor in aerated concrete.
Load values apply when using fischer safety screws[2] according to selection table.

| Type | | | GB Green 8 | GB Green 10 |
|---|---|---|---|---|
| **Diameter fischer safety screw** | | **[mm]** | **5** | **7** |
| **Minimum spacing[3]** | $s_{min}$ | **[mm]** | 150 (100)[5] | 100 |
| **Minimum edge distance[4]** | $c_{min}$ | **[mm]** | 100 (75)[5] | 100 |
| **Minimum member thickness** | $h_{min}$ | **[mm]** | 75 | 120 |
| **Anchorage depth** | $h_{nom}$ | **[mm]** | 50 | 55 |
| **Recommended load ($F_{rec}$) in the respective base material** | | | | |
| **AAC 2** | ρ ≥ 0.35 [kg/dm³] | **[kN]** | 0.18 | 0.21 |
| **AAC 4** | ρ ≥ 0.50 [kg/dm³] | **[kN]** | 0.40 | 0.54 (0.71)[6] |

[1] Required safety factors are considered. Valid for tensile load, shear load and oblique load under any angle. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Galvanised steel (gvz) and stainless steel (R).
[3] Minimum possible axial spacing while reducing the load.
[4] Minimum permissible edge distance.
[5] Values in brackets apply to AAC 2.
[6] The values in brackets are decisive for member thickness ≥ 150mm.



# 3
# Chemical fixings



## MORTARS AND CAPSULES FOR GENERAL APPLICATIONS


| | | |
|---|---|---|
| Highbond-System FHB II | 47 |  |
| Highbond-system FHB II Inject | 55 |  |
| Superbond-system FSB | 60 |  |
| Resin anchor RM II | 68 |  |
| Epoxy mortar FIS EM Plus | 74 |  |
| Epoxy mortar FIS EB II | 81 |  |
| Epoxy mortar FIS EP | 84 |  |
| Injection mortar FIS V Plus | 87 |  |
| Injection mortar FIS V | 98 |  |
| Injection mortar FIS VL | 106 |  |
| Injection mortar FIS V Zero | 112 |  |
| Injection mortar FIS P Plus | 119 |  |
| Injection mortar FIS P | 124 |  |
| Injection mortar FIS RC II | 127 |  |


## ANCHOR RODS


| | | |
|---|---|---|
| Anchor rod FIS A | 133 |  |
| Anchor rod RG M | 144 |  |
| Threaded rod G M | 148 |  |
| Internal threaded anchor RG M I | 151 |  |
| Internal threaded sockets FIS E | 154 |  |
| Internal threaded anchor FIS IG | 157 |  |
| Injections anchor sleeve FIS H K | 159 |  |
| Injection anchor sleeve | 161 |  |


## SPECIAL APPLICATIONS


| | | |
|---|---|---|
| WHG compliant anchoring | 165 |  |
| Highbond-anchor dynamic FHB dyn | 169 |  |
| Dynamic-anchor FDA | 174 |  |
| Superbond dynamic FSB dyn | 177 |  |
| Filling mortar FastFill | 186 |  |
| Post-installed rebar connections | 188 |  |
| Concrete-concrete shear connector FCC | 198 |  |

| | | |
|---|---|---|
| Bridge cap anchor FCC-B | 200 |  |
| Injection mortar FIS EM Plus for wood | 204 |  |
| Remedial wall tie VBS 8 | 224 |  |
| Weather facing reconstruction system FWS II | 227 |  |
| Fill&Fix injection fixing | 230 |  |


3

DISPENSER


| | | |
|---|---|---|
| Dispenser KPM 2 Plus | 234 |  |
| Dispenser FIS AM | 235 |  |
| Dispenser FIS DM S Pro | 236 |  |
| Dispenser FIS DM S-L | 237 |  |
| Dispenser FIS AM S-XL | 238 |  |
| Dispenser FIS AC | 239 |  |
| Dispenser FIS DM C Pro | 240 |  |
| Battery dispenser FIS DB S Pro | 241 |  |
| Battery dispenser FIS DB SL Pro | 244 |  |
| Dispenser FIS AP | 247 |  |
| Dispenser FIS DP S-L | 248 |  |
| Dispenser FIS DP S-XL | 249 |  |

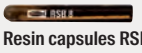

ACCESSORIES


| | | |
|---|---|---|
| Accessories | 250 |  |

## Mortar cartridges

| | | Approved substrates (ETA) | | | | | Approved features | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Cracked concrete | Non-cracked concrete | Solid masonry | Perforated masonry | Aerated concrete | Post- installed rebar connection | ICC | Fire resistance R120 | Seismic approval | Waterfilled drill hole | Diamond drilling | Hollow drilling | Dynamic loads | Steel fiber reinforced concrete | |
| | Positioning | | | | | | | | | | | | | | | Page |
|  Highbond-system FHB II | The best performance in cracked concrete | ● | ● | – | – | – | – | – | ● | – | – | – | ● | ● | – | 47 |
|  Superbond-system FSB | The concrete all-rounder | ● | ● | – | – | – | ● | ● | ● | C1, C2 | – | – | ● | ● | – | 60 |
|  Epoxy mortar FIS EM Plus | The powerful injection mortar for rebar connections and cracked concrete | ● | ● | – | – | – | ● | ● | ● | C1, C2 | ● | ● | ● | ● | ● | 74 |
|  Epoxy mortar FIS EB II | The basic epoxy mortar for applications in concrete | ● | ● | – | – | – | ● | ● | ● | C1, C2 | ● | ● | ● | – | – | 81 |
|  Epoxy mortar FIS EP | The cost-efficient epoxy mortar for applications in concrete | – | ● | – | – | – | – | – | – | – | – | – | – | – | – | 84 |
|  Injection mortar FIS V Plus | The powerful universal mortar for concrete and masonry | ● | ● | ● | ● | ● | ● | ● | ● | C1, C2 | ● | – | ● | – | – | 87 |
|  Injection mortar FIS V | The versatile injection mortar for anchorings in masonry und cracked concrete | ● | ● | ● | ● | ● | ● | ● | ● | C1, C2 | ● | – | ● | – | – | 98 |
|  Injection mortar FIS VL | The solid injection mortar for standard applications in cracked concrete and masonry | ● | ● | ● | ● | ● | ● | – | ● | – | ● | – | ● | – | – | 106 |
|  Injection mortar FIS V Zero | The universal mortar offers maximum safety for human and nature | ● | ● | ● | ● | – | ● | – | ● | | ● | – | ● | – | – | 112 |
|  Injection mortar FIS P Plus | The approved injection mortar for anchorings in masonry and non-cracked concrete | – | ● | ● | ● | ● | – | – | ● | – | ● | – | ● | – | – | 119 |
|  Injection mortar FIS P | The reliable injection mortar for anchorings in masonry | – | – | (●) | (●) | (●) | – | – | – | – | – | – | – | – | – | 124 |
|  Injection mortar FIS RC II | The cost-efficient injection mortar for post-installed rebar connections | – | – | – | – | – | ● | – | ● | – | – | – | ● | – | – | 127 |

## Capsules

| | | Approved substrates (ETA) | | | | | Approved features | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | |  | | | | | | | | | | | | | | |
| | | Cracked concrete | Non-cracked concrete | Solid masonry | Perforated masonry | Aeratedconcrete | Post- installed rebar connection | ICC | Fire resistance R120 | Seismic approval | Waterfilled drill hole | Diamond drilling | Hollow drilling | Dynamic loads | Steel fiber reinforced concrete | |
| | **Positioning** | | | | | | | | | | | | | | | **Page** |
|  **Resin capsules FHB II-P, FHB II-PF high speed** | The best performance in cracked concrete | ● | ● | – | – | – | – | – | ● | – | ● | – | ● | – | – | 49 |
|  **Resin capsules RSB** | The concrete all-rounder | ● | ● | – | – | – | – | ● | ● | C1 | ● | ● | ● | ● | – | 63 |
|  **Resin capsules RM II** | Bonded anchor for cracked concrete without drill hole cleaning | ● | ● | – | – | – | – | – | ● | – | ● | – | ● | – | – | 69 |

| Mortar cartridges |  FIS HB |  FIS SB |  FIS EM Plus |  FIS EB II |  FIS EP |  FIS V Plus |  FIS V |  FIS VL |  FIS V Zero |  FIS P Plus |  FIS P | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Positioning | Best performance in concrete | Concrete all-rounder | Powerful rebar connections + cracked concrete | Basic epoxy mortar for concrete | The cost-efficient epoxy mortar for applications in concrete | The powerful universal mortar for concrete and masonry | Versatile mortar for masonry und cracked concrete | Solid mortar for standard anchorings in masonry and cracked concrete | Universal mortar for maximum safety for people and nature. | Approved for masonry and non-cracked concrete | Reliable in masonry | |
| | | | | | | | | | | | | Page |
|  Threaded rod FIS A | – | ● | ● | ● | (●) | ● | ● | ● | ● | ● | (●) | 133 |
|  Threaded rod RG M | – | ● | ● | ● | (●) | ● | ● | ● | ● | ● | (●) | 144 |
|  Internal threaded anchor RG M I | – | ● | ● | – | – | ● | ● | ● | ● | – | – | 151 |
|  Internal threaded socket FIS E | – | – | – | – | – | ● | ● | ● | ● | ● | (●) | 154 |
|  Highbond anchor FHB II-A L/FHB II-AS | ● | – | – | – | – | – | – | – | – | – | – | 50 |
|  Highbond anchor FHB II-A L Inject/FHB II-A S Inject | ● | – | – | – | – | – | – | – | – | – | – | 57 |
|  FHB dyn | ● | – | – | – | – | – | – | – | – | – | – | 169 |
|  FDA | ● | – | – | – | – | – | – | – | – | – | – | 174 |

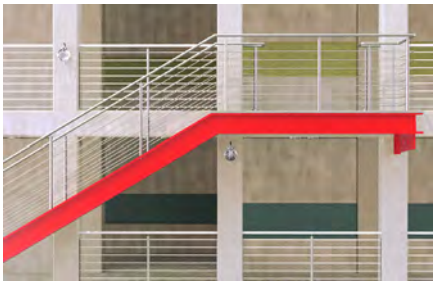
| Mortar capsules | | | | |
|---|---|---|---|---|
| |  FHB II-P, FHB II-PF high speed |  RSB |  RM II | |
| Positioning | Best performance in concrete | Concrete all-rounder | Bonded anchor for cracked concrete without drill hole cleaning | |
| | | | | Page |
|  Threaded rod RG M | – | ● | ● | 144 |
|  Internal threaded anchor RG M I | – | ● | ● | 151 |
|  Highbond anchor FHB II-A L/FHB II-AS | ● | – | – | 47 |

# Highbond system FHB II

The best performance in cracked concrete.





Steel constructions



Railings

## Applications

- Guard rails
- Façades
- Staircases
- Steel brackets
- Machines
- Silo installations
- Masts
- Rash protection
- Steelwork constructions
- Timber constructions

## Advantages

- The Highbond system FHB II achieves the highest load values in cracked concrete. Thus fewer fixing points and smaller anchor plates are required.
- The injection mortar FIS HB and the capsules FHB II-P/PF offer the same performance and can be used with the FHB II-A S (short version) or L (long version) anchor rods. Thus, you can select the most economical solution based on requirements.
- The resin capsule FHB II-P / PF HIGH SPEED is the economic solution for single applications. Cleaning the borehole during processing is not required.
- The special formulation used in the capsule FHB II-PF HIGH SPEED ensures especially fast curing and allows installation without waiting times.
- The FHB II-A S anchor is assessed for a service life of 100 years and in combination with the capsule system also assessed for diamond drilled holes. Thus, it offers maximium flexibility.

## Certificates / Features

ETA-21/0948, in concrete
ETA-05/0164, in concrete

## Building materials

**Approved for:**

- Concrete C20/25 to C50/60, cracked and non-cracked

**Also suitable for:**

- Concrete C12/15

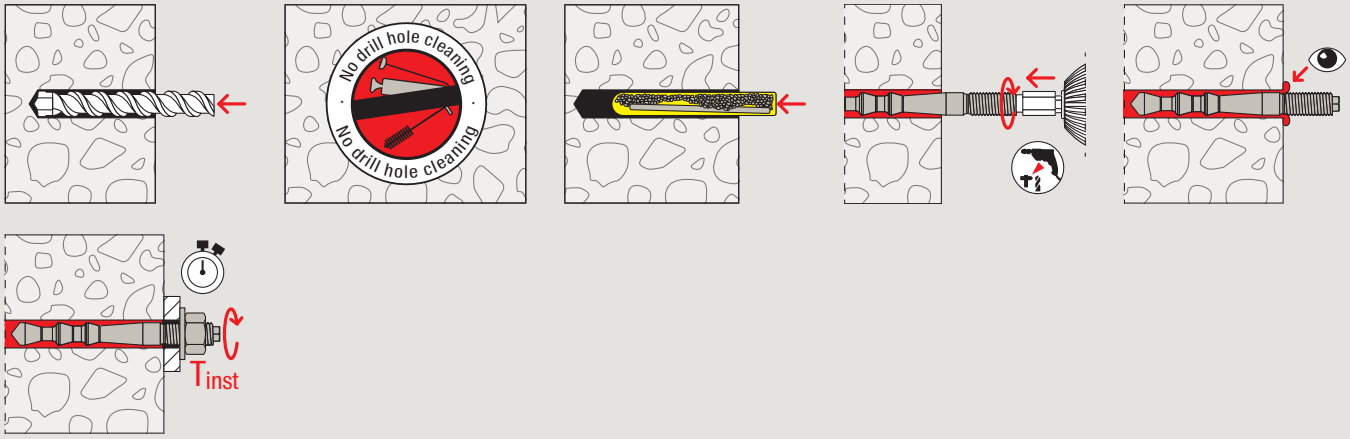
## Versions

- Galvanised steel
- Stainless steel
- Highly corrosion-resistant steel

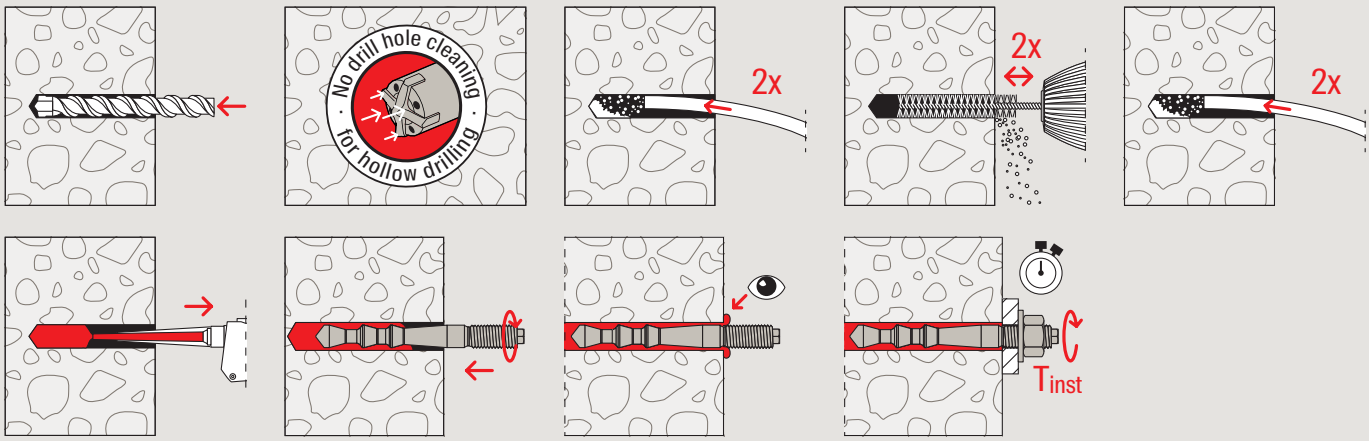
## Functioning

- The FHB II is a bonded anchor with torque-controlled expansion for pre-positioned and push-through installation.
- The anchor rod can be set either with injection mortar FIS HB or with the capsule FHB II-P / FHB II-PF HIGH SPEED, and is fully bonded in the drill hole.
- When tightening the hexagon nut, the anchor rod cones are pulled into the mortar shell, which expands against the drill hole wall.
- The styrene-free vinyl ester mortar fully seals the drill hole.
- When using the resin capsule, set the anchor rod through rotating and hitting motions with a hammer drill. The RA-SDS setting tool, item no. 62420 is used.

## Installation in concrete with capsule FHB II-P / -PF




## Pre-positioned installation in concrete with FIS HB




## Technical data

**Injection mortar FIS HB**


FIS HB 360 S


FIS HB 150 C


FIS MR Plus

| Item | Item no. | Approval ETA | Approval DIBt | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FIS HB 150 C** | **519665** | ● | ● | CS, DE, EN | 70 | 1 x Cartridge 150 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **562659** | ● | ● | DE, FR, IT, NL | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **519125** | ● | ● | DE | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **562658** | ● | ● | CN, EN | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **562660** | ● | ● | CS, EN, PL, RU, SK | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **562661** | ● | ● | EL, EN, ES, PT | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **569207** | ● | ● | EN, TR | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **568247** | ● | ● | DA, FI, NO, SV | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS MR Plus** | **545853** | – | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |
| **FIS MR Plus bulk pack** | **140033** | – | – | – | – | 500 x Static mixer FIS MR Plus for 100 ml, 150 ml, 300 ml, 360 ml, 390 ml and 380/410 ml cartridges | |

## Curing times

| FIS HB<br>System temperature FIS HB (Mortar min. +5 °C)<br>[°C] | Maximum processing time FIS HB<br>$t_{work}$<br>[min.] | Minimum curing time FIS HB [1]<br>$t_{cure}$<br>[min.] |
|---|---|---|
| -5 – -1 | – | 360 |
| 0 – +4 | – | 180 |
| > +5 – +9 | 15 | 90 |
| > +10 – +19 | 6 | 35 |
| > +20 – +29 | 4 | 20 |
| > +30 – +40 | 2 | 12 |

1) In wet concrete the curing times must be doubled.



## Technical data

**Resin capsule FHB II-P**



FHB II-P (standard)

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Match | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FHB II-P 8 x 60** | **096824** | ● | 10 | 75 | 60 | FHB II-A L M 8 x 60 | 10 |
| **FHB II-P 10 x 60** | **096847** | ● | 10 | 75 | 60 | FHB II-S M 10 x 60 | 10 |
| **FHB II-P 10 x 75** | **508016** | ● | 10 | 90 | 75 | FHB II-A S M 10 x 75 | 10 |
| **FHB II-P 10 x 95** | **096843** | ● | 12 | 110 | 95 | FHB II-A L M 10 x 95 | 10 |
| **FHB II-P 12 x 75** | **096848** | ● | 12 | 90 | 75 | FHB II-A S M 12 x 75 | 10 |
| **FHB II-P 12 x 100** | **507922** | ● | 14 | 115 | 100 | FHB II-A L M 12 x 100 | 10 |
| **FHB II-P 12 x 120** | **096844** | ● | 14 | 135 | 120 | FHB II-A L M 12 x 120 | 10 |
| **FHB II-P 16 x 95** | **096849** | ● | 16 | 110 | 95 | FHB II-A S M 16 x 95 | 10 |
| **FHB II-P 16 x 125** | **507923** | ● | 18 | 140 | 125 | FHB II-A L M 16 x 125 | 10 |
| **FHB II-P 16 x 145** | **507924** | ● | 18 | 160 | 145 | FHB II-A L M 16 x 145 | 10 |
| **FHB II-P 16 x 160** | **096845** | ● | 18 | 175 | 160 | FHB II-A L M 16 x 160 | 10 |
| **FHB II-P 20 x 170** | **507925** | ● | 25 | 190 | 170 | FHB II-A S M 20 x 170 | 4 |
| **FHB II-P 20 x 210** | **096846** | ● | 25 | 235 | 210 | FHB II-A L M 20 x 210 | 4 |
| **FHB II-P 24 x 170** | **096851** | ● | 25 | 190 | 170 | FHB II-A S M 24 x 170 | 4 |
| **FHB II-P 24 x 210** | **507926** | ● | 25 | 235 | 210 | FHB II-A L M 24 x 210 | 4 |

## Technical data

**Resin capsule FHB II-PF HIGH SPEED**



FHB II-PF High Speed

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Match | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FHB II-PF 8 x 60** | **500542** | ● | 10 | 75 | 60 | FHB II-A L M 8 x 60 | 10 |
| **FHB II-PF 10 x 60** | **500547** | ● | 10 | 75 | 60 | FHB II-S M 10 x 60 | 10 |
| **FHB II-PF 10 X 75** | **507999** | ● | 10 | 90 | 75 | FHB II-A S M 10 x 75 | 10 |
| **FHB II-PF 10 x 95** | **500543** | ● | 12 | 110 | 95 | FHB II-A L M 10 x 95 | 10 |
| **FHB II-PF 12 x 75** | **500548** | ● | 12 | 90 | 75 | FHB II-A S M 12 x 75 | 10 |
| **FHB II-PF 12 x 100** | **508000** | ● | 14 | 115 | 100 | FHB II-A L M 12 x 100 | 10 |
| **FHB II-PF 12 x 120** | **500544** | ● | 14 | 135 | 120 | FHB II-A L M 12 x 120 | 10 |
| **FHB II-PF 16 x 95** | **500549** | ● | 16 | 110 | 95 | FHB II-A S M 16 x 95 | 10 |
| **FHB II-PF 16 x 125** | **508001** | ● | 18 | 140 | 125 | FHB II-A L M 16 x 125 | 10 |
| **FHB II-PF 16 x 145** | **508002** | ● | 18 | 160 | 145 | FHB II-A L M 16 x 145 | 10 |
| **FHB II-PF 16 x 160** | **500545** | ● | 18 | 175 | 160 | FHB II-A L M 16 x 160 | 10 |
| **FHB II-PF 20 x 170** | **508003** | ● | 25 | 190 | 170 | FHB II-A S M 20 x 170 | 4 |

## Technical data

**Resin capsule FHB II-PF HIGH SPEED**



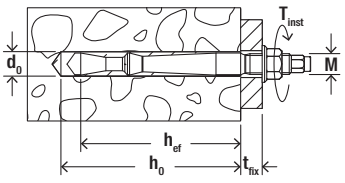
FHB II-PF High Speed

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Match | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FHB II-PF 20 x 210** | **500546** | ● | 25 | 235 | 210 | FHB II-A L M 20 x 210 | 4 |
| **FHB II-PF 24 x 170** | **500550** | ● | 25 | 190 | 170 | FHB II-A S M 24 x 170 | 4 |
| **FHB II-PF 24 x 210** | **508004** | ● | 25 | 235 | 210 | FHB II-A L M 24 x 210 | 4 |

## Curing times

| FHB II P/FHB II-PF HIGH SPEED<br>System temperature [°C] | Minimum curing time FHB II-P $t_{cure}$ [min.] | Minimum curing time FHB II-PF HIGH SPEED $t_{cure}$ [min.] |
|---|---|---|
| -5 – ±0 | 240 | 8 |
| > +1 – +10 | 45 | 6 |
| > +11 – +20 | 20 | 4 |
| > +20 | 10 | 2 |

In wet concrete or flooded holes the curing times must be doubled.




## Technical data

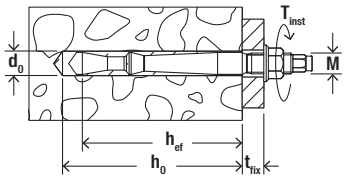
**Highbond anchor FHB II-A S**



FHB II-A S (Standard)

| Item | Galvanised steel Item no. gvz | Stainless steel Item no. R | Highly corrosion-resistant steel Item no. HCR | Approval ETA | Drill diameter $d_0$ [mm] | Drill hole depth $h_0$ [mm] | Anchorage depth $h_{ef}$ [mm] | Max. fixture thickness $t_{fix}$ [mm] | Thread M | Width across nut SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **FHB II-A S M10 x 60/10** | **097072** | **097630** | **097704**[1] | ● | 10 | 75 | 60 | 10 | M10 | 17 | 10 |
| **FHB II-A S M10 x 60/20** | **097073** | **097631** | **–** | ● | 10 | 75 | 60 | 20 | M10 | 17 | 10 |
| **FHB II-A S M10 x 60/30** | **–** | **050571** | **–** | ● | 10 | 75 | 60 | 30 | M10 | 17 | 10 |
| **FHB II-A S M10 x 60/40** | **–** | **097632** | **–** | ● | 10 | 75 | 60 | 40 | M10 | 17 | 10 |
| **FHB II-A S M10 x 60/60** | **097074** | **097633** | **–** | ● | 10 | 75 | 60 | 60 | M10 | 17 | 10 |
| **FHB II-A S M10 x 60/100** | **097206** | **097634** | **–** | ● | 10 | 75 | 60 | 100 | M10 | 17 | 10 |
| **FHB II-A S M10 x 75/10** | **506884** | **506888** | **–** | ● | 10 | 90 | 75 | 10 | M10 | 17 | 10 |
| **FHB II-A S M10 x 75/20** | **506885** | **506889** | **–** | ● | 10 | 90 | 75 | 20 | M10 | 17 | 10 |
| **FHB II-A S M10 x 75/40** | **–** | **506890** | **–** | ● | 10 | 90 | 75 | 40 | M10 | 17 | 10 |
| **FHB II-A S M10 x 75/60** | **506886** | **506891** | **–** | ● | 10 | 90 | 75 | 60 | M10 | 17 | 10 |
| **FHB II-A S M10 x 75/100** | **506887** | **506892** | **–** | ● | 10 | 90 | 75 | 100 | M10 | 17 | 10 |
| **FHB II-A S M12 x 75/10** | **097257** | **097635** | **–** | ● | 12 | 90 | 75 | 10 | M12 | 19 | 10 |
| **FHB II-A S M12 x 75/25** | **097268** | **097636** | **097706**[1] | ● | 12 | 90 | 75 | 25 | M12 | 19 | 10 |
| **FHB II-A S M12 x 75/40** | **–** | **097637** | **–** | ● | 12 | 90 | 75 | 40 | M12 | 19 | 10 |
| **FHB II-A S M12 x 75/60** | **097274** | **097638** | **–** | ● | 12 | 90 | 75 | 60 | M12 | 19 | 10 |
| **FHB II-A S M12 x 75/100** | **097275** | **097639** | **–** | ● | 12 | 90 | 75 | 100 | M12 | 19 | 10 |
| **FHB II-A S M12 x 75/165** | **097280** | **097640** | **–** | ● | 12 | 90 | 75 | 165 | M12 | 19 | 10 |

[1] Delivery time on request.




## Technical data

**Highbond anchor FHB II-A S**



FHB II-A S (Standard)

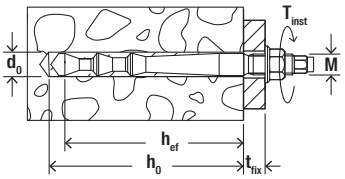
| | Galvanised steel | Stainless steel | Highly corrosion-resistant steel | Approval | Drill diameter | Drill hole depth | Anchorage depth | Max. fixture thickness | Thread | Width across nut | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | Item no. | ETA | $d_0$ [mm] | $h_0$ [mm] | $h_{ef}$ [mm] | $t_{fix}$ [mm] | M | SW [mm] | [pcs] |
| **Item** | **gvz** | **R** | **HCR** | | | | | | | | |
| **FHB II-A S M16 x 95/30** | **097281** | **097641** | **097708**[1)] | ● | 16 | 110 | 95 | 30 | M16 | 24 | 10 |
| **FHB II-A S M16 x 95/60** | **097286** | **097642** | – | ● | 16 | 110 | 95 | 60 | M16 | 24 | 10 |
| **FHB II-A S M16 x 95/100** | **097295** | **097643** | – | ● | 16 | 110 | 95 | 100 | M16 | 24 | 10 |
| **FHB II-A S M16 x 95/165** | **097296** | **097644** | – | ● | 16 | 110 | 95 | 165 | M16 | 24 | 10 |
| **FHB II-A S M20 x 170/50** | **506917** | **506919** | – | ● | 25 | 190 | 170 | 50 | M20 | 30 | 4 |
| **FHB II-A S M24 x 170/50** | **097297** | **097645** | – | ● | 25 | 190 | 170 | 50 | M24 | 36 | 4 |
| **FHB II-A S M24 x 170/70** | **552057** | – | – | ● | 25 | 190 | 170 | 70 | M24 | 36 | 4 |

[1)] Delivery time on request.

## Filling quantities

| FHB II-A S | Drill hole diameter | Drill hole depth | Mortar volume in scale units shown on the cartridge labels' corresponding scala | Anchor per cartridge FIS HB 360 S*) |
|---|---|---|---|---|
| Type | [mm] | [mm] | | |
| **FHB II-A S M10 x 60** | 10 | 75 | 3 | 56 |
| **FHB II-A S M10 x 75** | 10 | 90 | 4 | 42 |
| **FHB II-A S M12 x 75** | 12 | 90 | 4 | 42 |
| **FHB II-A S M16 x 95** | 16 | 110 | 8 | 21 |
| **FHB II-A S M20 x 170** | 25 | 190 | 26 | 6 |
| **FHB II-A S M24 x 170** | 25 | 190 | 26 | 6 |

*) Max. number with one static mixer.




## Technical data



**Highbond anchor FHB II-A L**



FHB II-A L (long version)

| Item | Galvanised steel<br>Item no.<br>gvz | Stainless steel<br>Item no.<br>R | Highly corrosion-resistant steel<br>Item no.<br>HCR | Approval<br>ETA | Drill diameter<br>$d_0$<br>[mm] | Drill hole depth<br>$h_0$<br>[mm] | Anchorage depth<br>$h_{ef}$<br>[mm] | Max. fixture thickness<br>$t_{fix}$<br>[mm] | Thread<br>M | Width across nut<br>SW<br>[mm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FHB II-A L M8 x 60/10 | 097032 | 097298 | 097696[1)] | ● | 10 | 75 | 60 | 10 | M8 | 13 | 10 |
| FHB II-A L M8 x 60/30 | 097033 | 097299 | – | ● | 10 | 75 | 60 | 30 | M8 | 13 | 10 |
| FHB II-A L M8 x 60/50 | 097034 | 097440 | – | ● | 10 | 75 | 60 | 50 | M8 | 13 | 10 |
| FHB II-A L M10 x 95/10 | 096907 | 097616 | – | ● | 12 | 110 | 95 | 10 | M10 | 17 | 10 |
| FHB II-A L M10 x 95/20 | 096940 | 097617 | 097699[1)] | ● | 12 | 110 | 95 | 20 | M10 | 17 | 10 |
| FHB II-A L M10 x 95/40 | – | 097618 | – | ● | 12 | 110 | 95 | 40 | M10 | 17 | 10 |
| FHB II-A L M10 x 95/60 | 096941 | 097619 | – | ● | 12 | 110 | 95 | 60 | M10 | 17 | 10 |
| FHB II-A L M10 x 95/100 | 096942 | 097620 | – | ● | 12 | 110 | 95 | 100 | M10 | 17 | 10 |
| FHB II-A L M12 x 100/10 | 506893 | 506897 | – | ● | 14 | 115 | 100 | 10 | M12 | 19 | 10 |
| FHB II-A L M12 x 100/25 | 506894 | 506898 | – | ● | 14 | 115 | 100 | 25 | M12 | 19 | 10 |
| FHB II-A L M12 x 100/50 GS | – | 537065 | – | ● | 14 | 115 | 100 | 50 | M12 | 19 | 10 |
| FHB II-A L M12 x 100/60 | 506895 | 506901 | – | ● | 14 | 115 | 100 | 60 | M12 | 19 | 10 |
| FHB II-A L M12 x 100/60 | – | 506899 | – | ● | 14 | 115 | 100 | 40 | M12 | 19 | 10 |
| FHB II-A L M12 x 100/100 | 506896 | 506902 | – | ● | 14 | 115 | 100 | 100 | M12 | 19 | 10 |
| FHB II-A L M12 x 120/10 | 096943 | 097621 | – | ● | 14 | 135 | 120 | 10 | M12 | 19 | 10 |
| FHB II-A L M12 x 120/25 | 096944 | 097622 | 097700[1)] | ● | 14 | 135 | 120 | 25 | M12 | 19 | 10 |
| FHB II-A L M12 x 120/40 | – | 097623 | – | ● | 14 | 135 | 120 | 40 | M12 | 19 | 10 |
| FHB II-A L M12 x 120/60 | 097014 | 097624 | – | ● | 14 | 135 | 120 | 60 | M12 | 19 | 10 |
| FHB II-A L M12 x 120/100 | 097031 | 097625 | – | ● | 14 | 135 | 120 | 100 | M12 | 19 | 10 |
| FHB II-A L M16 x 125/30 | 506903 | 506906 | – | ● | 18 | 140 | 125 | 30 | M16 | 24 | 10 |
| FHB II-A L M16 x 125/60 | 506904 | 506909 | – | ● | 18 | 140 | 125 | 60 | M16 | 24 | 10 |
| FHB II-A L M16 x 125/100 | 506905 | 506910 | – | ● | 18 | 140 | 125 | 100 | M16 | 24 | 10 |
| FHB II-A L M16 x 145/30 | 506911 | 506914 | – | ● | 18 | 160 | 145 | 30 | M16 | 24 | 10 |
| FHB II-A L M16 x 145/60 | 506912 | 506915 | – | ● | 18 | 160 | 145 | 60 | M16 | 24 | 10 |
| FHB II-A L M16 x 145/100 | 506913 | 506916 | – | ● | 18 | 160 | 145 | 100 | M16 | 24 | 10 |
| FHB II-A L M16 x 160/30 | 097035 | 097626 | 097702[1)] | ● | 18 | 175 | 160 | 30 | M16 | 24 | 10 |
| FHB II-A L M16 x 160/60 | 097038 | 097627 | – | ● | 18 | 175 | 160 | 60 | M16 | 24 | 10 |
| FHB II-A L M16 x 160/100 | 097070 | 097628 | – | ● | 18 | 175 | 160 | 100 | M16 | 24 | 10 |
| FHB II-A L M20 x 210/50 | 097071 | 097629 | 097703[1)] | ● | 25 | 235 | 210 | 50 | M20 | 30 | 4 |
| FHB II-A L M20 x 210/150 | 052370 | – | – | ● | 25 | 235 | 210 | 150 | M20 | 30 | 8 |
| FHB II-A L M20x 210/200 | 552056 | – | – | ● | 25 | 235 | 210 | 200 | M20 | 30 | 8 |
| FHB II-A L M24 x 210/50 | 506920 | 506921 | – | ● | 25 | 235 | 210 | 50 | M24 | 36 | 4 |

[1)] Delivery time on request.

## Filling quantities

| FHB II-A L<br>Type | Drill hole diameter<br>[mm] | Drill hole depth<br>[mm] | Mortar volume in scale units shown on the cartridge labels' corresponding scala | Anchor per cartridge FIS HB 360 S*) |
|---|---|---|---|---|
| **FHB II-A L M8 x 60** | 10 | 75 | 3 | 56 |
| **FHB II-A L M10 x 95** | 12 | 110 | 5 | 34 |
| **FHB II-A L M12 x 100** | 14 | 115 | 7 | 24 |
| **FHB II-A L M12 x 120** | 14 | 135 | 7 | 24 |
| **FHB II-A L M16 x 125** | 18 | 140 | 11 | 15 |
| **FHB II-A L M16 x 145** | 18 | 160 | 13 | 13 |
| **FHB II-A L M16 x 160** | 18 | 175 | 13 | 13 |
| **FHB II-A L M20 x 210** | 25 | 235 | 33 | 5 |
| **FHB II-A L M24 x 210** | 25 | 235 | 33 | 5 |

*) Max. number with one static mixer.

# Loads



## Highbond-Anchor FHB II

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-05/0164 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | Material / surface[3)] | Effective anchorage depth $h_{ef}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Instal-lation torque $T_{inst}$ [Nm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] |
| **FHB II-A L M8 x 60** | gvz | 60 | 100 | 15 | 7.6 | 7.8 | 40 | 40 | 10.9 | 7.8 | 40 | 40 |
| | R | 60 | 100 | 15 | 7.6 | 8.7 | 40 | 40 | 10.9 | 8.7 | 40 | 40 |
| | HCR | 60 | 100 | 15 | 7.6 | 8.7 | 40 | 40 | 10.9 | 8.7 | 40 | 40 |
| **FHB II-A S M10 x 60** | gvz | 60 | 100 | 15 | 7.6 | 11.3 | 40 | 40 | 10.9 | 11.3 | 40 | 40 |
| | R | 60 | 100 | 15 | 7.6 | 13.8 | 40 | 40 | 10.9 | 13.8 | 40 | 40 |
| | HCR | 60 | 100 | 15 | 7.6 | 13.8 | 40 | 40 | 10.9 | 13.8 | 40 | 40 |
| **FHB II-A S M10 x 75** | gvz | 75 | 120 | 15 | 10.7 | 11.3 | 40 | 40 | 12.0 | 11.3 | 40 | 40 |
| | R | 75 | 120 | 15 | 10.7 | 13.8 | 40 | 40 | 12.0 | 13.8 | 40 | 40 |
| **FHB II-A L M10 x 95** | gvz | 95 | 140 | 20 | 15.2 | 11.9 | 40 | 40 | 16.4 | 11.9 | 40 | 40 |
| | R | 95 | 140 | 20 | 15.2 | 13.3 | 40 | 40 | 16.4 | 13.3 | 40 | 40 |
| | HCR | 95 | 140 | 20 | 15.2 | 13.3 | 40 | 40 | 16.4 | 13.3 | 40 | 40 |
| **FHB II-A S M12 x 75** | gvz | 75 | 120 | 30 | 10.7 | 15.6 | 40 | 40 | 15.2 | 15.6 | 40 | 40 |
| | R | 75 | 120 | 30 | 10.7 | 19.3 | 40 | 40 | 15.2 | 19.3 | 40 | 40 |
| | HCR | 75 | 120 | 30 | 10.7 | 19.3 | 40 | 40 | 15.2 | 19.3 | 40 | 40 |
| **FHB II-A L M12 x 100** | gvz | 100 | 140 | 40 | 16.4 | 17.3 | 50 | 50 | 23.4 | 17.3 | 50 | 50 |
| | R | 100 | 140 | 40 | 16.4 | 19.3 | 50 | 50 | 23.4 | 19.3 | 50 | 50 |
| **FHB II-A L M12 x 120** | gvz | 120 | 170 | 40 | 21.6 | 17.3 | 50 | 50 | 23.7 | 17.3 | 50 | 50 |
| | R | 120 | 170 | 40 | 21.6 | 19.3 | 50 | 50 | 23.7 | 19.3 | 50 | 50 |
| | HCR | 120 | 170 | 40 | 21.6 | 19.3 | 50 | 50 | 23.7 | 19.3 | 50 | 50 |
| **FHB II-A S M16 x 95** | gvz | 95 | 150 | 50 | 15.2 | 29.0 | 50 | 50 | 21.7 | 29.0 | 50 | 50 |
| | R | 95 | 150 | 50 | 15.2 | 30.4 | 50 | 50 | 21.7 | 35.8 | 50 | 50 |
| | HCR | 95 | 150 | 50 | 15.2 | 30.4 | 50 | 50 | 21.7 | 35.8 | 50 | 50 |
| **FHB II-A L M16 x 125** | gvz | 125 | 170 | 60 | 22.9 | 32.2 | 55 | 55 | 32.7 | 32.2 | 55 | 55 |
| | R | 125 | 170 | 60 | 22.9 | 35.8 | 55 | 55 | 32.7 | 35.8 | 55 | 55 |
| **FHB II-A L M16 x 145** | gvz | 145 | 190 | 60 | 28.6 | 32.2 | 60 | 60 | 40.9 | 32.2 | 60 | 60 |
| | R | 145 | 190 | 60 | 28.6 | 35.8 | 60 | 60 | 40.9 | 35.8 | 60 | 60 |
| **FHB II-A L M16 x 160** | gvz | 160 | 220 | 60 | 33.2 | 32.2 | 70 | 70 | 46.0 | 32.2 | 70 | 70 |
| | R | 160 | 220 | 60 | 33.2 | 35.8 | 70 | 70 | 46.0 | 35.8 | 70 | 70 |
| | HCR | 160 | 220 | 60 | 33.2 | 35.8 | 70 | 70 | 46.0 | 35.8 | 70 | 70 |
| **FHB II-A S M20 x 170** | gvz | 170 | 240 | 100 | 36.3 | 45.9 | 80 | 80 | 51.9 | 45.9 | 80 | 80 |
| | R | 170 | 240 | 100 | 36.3 | 55.9 | 80 | 80 | 51.9 | 55.9 | 80 | 80 |
| **FHB II-A L M20 x 210** | gvz | 210 | 280 | 100 | 49.9 | 50.2 | 90 | 90 | 65.5 | 50.2 | 90 | 90 |
| | R | 210 | 280 | 100 | 49.9 | 55.9 | 90 | 90 | 65.5 | 55.9 | 90 | 90 |
| | HCR | 210 | 280 | 100 | 49.9 | 55.9 | 90 | 90 | 65.5 | 55.9 | 90 | 90 |
| **FHB II-A S M24 x 170** | gvz | 170 | 240 | 100 | 36.3 | 65.3 | 80 | 80 | 51.9 | 65.3 | 80 | 80 |
| | R | 170 | 240 | 100 | 36.3 | 71.1 | 80 | 80 | 51.9 | 71.1 | 80 | 80 |
| | HCR | 170 | 240 | 100 | 36.3 | 72.7 | 80 | 80 | 51.9 | 80.6 | 80 | 80 |
| **FHB II-A L M24 x 210** | gvz | 210 | 280 | 100 | 49.9 | 72.5 | 90 | 90 | 65.5 | 72.5 | 90 | 90 |
| | R | 210 | 280 | 100 | 49.9 | 80.6 | 90 | 90 | 65.5 | 80.6 | 90 | 90 |

1) Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.

2) The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 80 °C). Drill hole cleaning as per specification in the ETA.

3) Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).

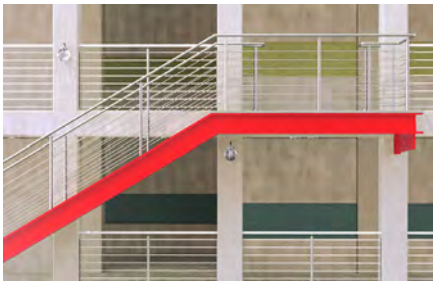
4) In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Highbond-system FHB II Inject

The economical solution in cracked concrete.





Steel constructions



Bridge railings

## Applications

- Bridge railings
- Façades
- Staircases
- Steel constructions
- Masts

## Advantages

- The Highbond system FHB II Inject achieves high load values in cracked concrete.
- The combination of injection mortar FIS HB and anchor rod FHB II-A S Inject R (short version) or FHB II-A L Inject R (long version) is ideally suited for serial installation outdoors.
- The low drill hole depth minimizes the drilling effort, which saves time and ensures economical installation.
- When using hollow drills with extraction, no drill hole cleaning is required.
- The FHB II-A S Inject anchor is assessed for a service life of 100 years.

## Certificates / Features

**ETA-16/0637, in concrete**
**ETA-06/0171, in concrete**
**ETA-21/0948, in concrete**
**ETA-05/0164, in concrete**

## Building materials

**Approved for:**
- Concrete C20/25 to C50/60, cracked and non-cracked

**Also suitable for:**
- Concrete C12/15

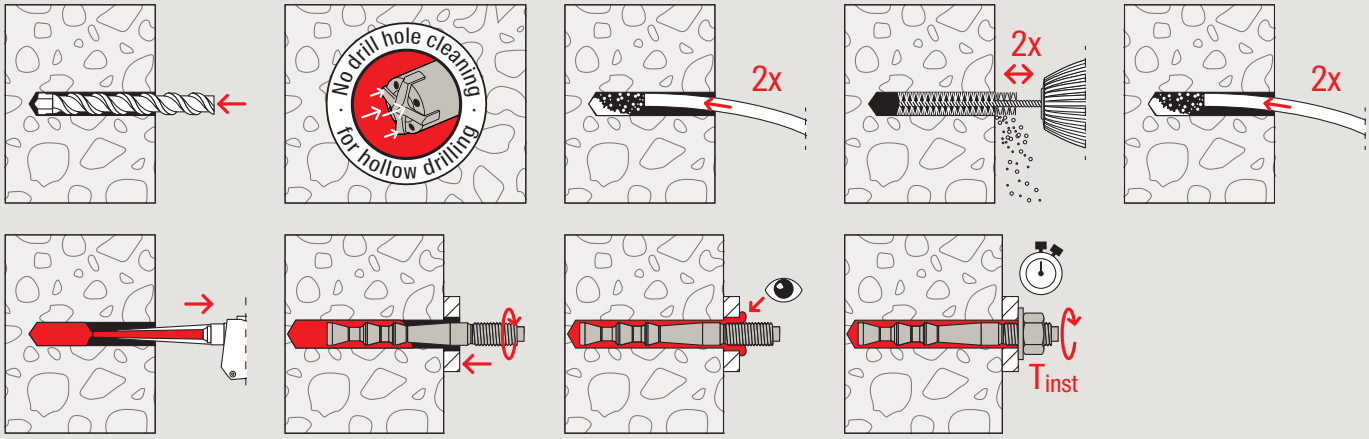
## Versions

- Stainless steel

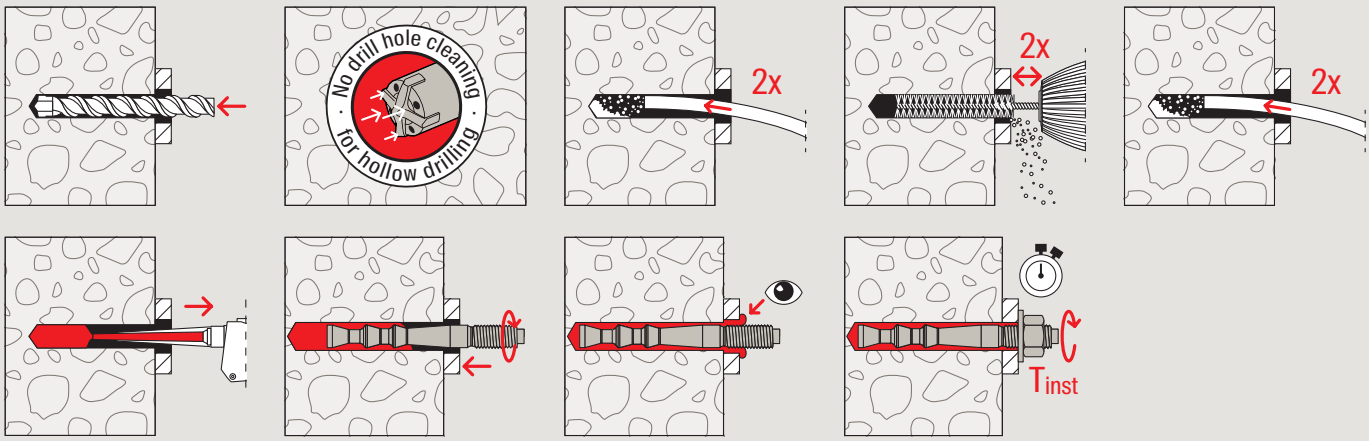
## Functioning

- The FHB II Inject is a bonded anchor with torque-controlled expansion for pre-positioned and push-trough installation.
- For FHB II-A L Inject, the annular gap must be filled with Highbond special mortar FIS HB in case of push-through installation.
- The anchor rod is set with the Highbond special mortar FIS HB and is fully bonded in the drill hole.
- When tightening the hexagon nut, the anchor rod cones are pulled in the mortar shell, which expands against the drill hole wall.

## Pre-positioned installation in concrete with FIS HB




## Push-through installation in concrete with FIS HB




## Technical data

**Injection mortar FIS HB**


FIS HB 360 S


FIS HB 150 C

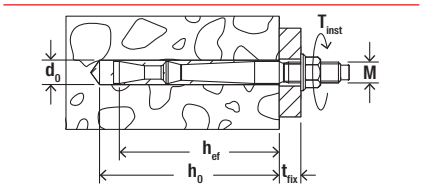

FIS MR Plus

| Item | Item no. | Approval ETA | Approval DIBt | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FIS HB 150 C** | **519665** | ● | ● | CS, DE, EN | 70 | 1 x Cartridge 150 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 345 S** | **033211** | ● | ● | CS, DE, EN, ES, FR, NL | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **562659** | ● | ● | DE, FR, IT, NL | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **519125** | ● | ● | DE | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **562658** | ● | ● | CN, EN | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **562660** | ● | ● | CS, EN, PL, RU, SK | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **562661** | ● | ● | EL, EN, ES, PT | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **569207** | ● | ● | EN, TR | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **568247** | ● | ● | DA, FI, NO, SV | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS MR Plus** | **545853** | – | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |
| **FIS MR Plus bulk pack** | **140033** | – | – | – | – | 500 x Static mixer FIS MR Plus for 100 ml, 150 ml, 300 ml, 360 ml, 390 ml and 380/410 ml cartridges | |

## Curing times

| FIS HB<br>System temperature FIS HB (Mortar min. +5 °C)<br>[°C] | Maximum processing time FIS HB<br>$t_{work}$<br>[min.] | Minimum curing time FIS HB 1)<br>$t_{cure}$<br>[min.] |
|---|---|---|
| -5 – -1 | – | 360 |
| 0 – +4 | – | 180 |
| > +5 – +9 | 15 | 90 |
| > +10 – +19 | 6 | 35 |
| > +20 – +29 | 4 | 20 |
| > +30 – +40 | 2 | 12 |

1) In wet concrete the curing times must be doubled.




## Technical data

**Highbond anchor FHB II-A S Inject**



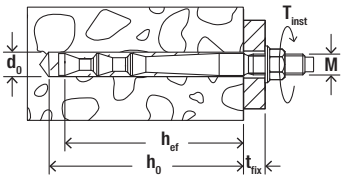
FHB II-A S Inject R (short version)

| Item | Stainless steel<br>Item no.<br>R | Ap-pro-val<br>ETA | Drill diameter<br>$d_0$<br>[mm] | Drill hole depth<br>$h_0$<br>[mm] | Anchorage depth<br>$h_{ef}$<br>[mm] | Length<br>l<br>[mm] | Max. fixture thickness<br>$t_{fix}$<br>[mm] | Width across nut<br>SW<br>[mm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **FHB II-A S Inject M10 x 60/10 R** | **539911** | ● | 10 | 66 | 60 | 96 | 10 | 17 | 10 |
| **FHB II-A S Inject M10 x 60/20 R** | **539912** | ● | 10 | 66 | 60 | 106 | 20 | 17 | 10 |
| **FHB II-A S Inject M10 x 60/30 R** | **539927** | ● | 10 | 66 | 60 | 116 | 30 | 17 | 10 |
| **FHB II-A S Inject M10 x 60/40 R** | **539913** | ● | 10 | 66 | 60 | 126 | 40 | 17 | 10 |
| **FHB II-A S Inject M10 x 60/60 R** | **554092** | ● | 10 | 66 | 60 | 146 | 60 | 17 | 10 |
| **FHB II-A S Inject M10 x 60/100 R** | **539914** | ● | 10 | 66 | 60 | 186 | 100 | 17 | 10 |
| **FHB II-A S Inject M12 x 75/25 R** | **539928** | ● | 12 | 81 | 75 | 132 | 25 | 19 | 10 |
| **FHB II-A S Inject M12 x 75/40 R** | **561037** | ● | 12 | 81 | 75 | 147 | 40 | 19 | 10 |
| **FHB II-A S Inject M12 x 75/50 R** | **539929** | ● | 12 | 81 | 75 | 157 | 50 | 19 | 10 |
| **FHB II-A S Inject M16 x 95/30 R** | **539920** | ● | 16 | 101 | 95 | 160 | 30 | 24 | 10 |
| **FHB II-A S Inject M16 x 95/60 R** | **539921** | ● | 16 | 101 | 95 | 190 | 60 | 24 | 10 |

## Filling quantities

| FHB II-A S Inject<br>Type | Drill hole diameter<br>[mm] | Drill hole depth<br>[mm] | Mortar volume in scale units shown on the cartridge labels' corresponding scala | Anchor per cartridge FIS HB 360 S*) |
|---|---|---|---|---|
| **FHB II-A S Inject M10 x 60** | 10 | 75 | 3 | 56 |
| **FHB II-A S Inject M12 x 75** | 12 | 90 | 4 | 42 |
| **FHB II-A S Inject M16 x 95** | 16 | 110 | 8 | 21 |

*) Max. number with one static mixer.




## Technical data

3

**Highbond anchor FHB II-A L Inject**



FHB II-A L Inject R (long version)

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Drill hole depth $h_0$ [mm] | Anchorage depth $h_{ef}$ [mm] | Length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Width across nut SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **FHB II-A L Inject M10 x 95/10 R** | **539916** | ● | 12 | 101 | 95 | 133 | 10 | 17 | 10 |
| **FHB II-A L Inject M10 x 95/20 R** | **539917** | ● | 12 | 101 | 95 | 143 | 20 | 17 | 10 |
| **FHB II-A L Inject M12 x 100/25 R** | **539918** | ● | 14 | 106 | 100 | 157 | 25 | 19 | 10 |
| **FHB II-A L Inject M12 x 120/25 R** | **539919** | ● | 14 | 126 | 120 | 177 | 25 | 19 | 10 |
| **FHB II-A L Inject M16 x 125/30 R** | **539922** | ● | 18 | 131 | 125 | 193 | 30 | 24 | 10 |
| **FHB II-A L Inject M16 x 125/60 R** | **539923** | ● | 18 | 131 | 125 | 223 | 60 | 24 | 10 |
| **FHB II-A L Inject M16 x 160/30 R** | **539925** | ● | 18 | 166 | 160 | 228 | 30 | 24 | 10 |
| **FHB II-A L Inject M16 x 160/60 R** | **539926** | ● | 18 | 166 | 160 | 258 | 60 | 24 | 10 |

## Filling quantities

| FHB II-A L Inject Type | Drill hole diameter [mm] | Drill hole depth [mm] | Mortar volume in scale units shown on the cartridge labels' corresponding scala | Anchor per cartridge FIS HB 360 S*) |
|---|---|---|---|---|
| **FHB II-A L Inject M10 x 95** | 12 | 101 | 5 | 34 |
| **FHB II-A L Inject M12 x 100** | 14 | 106 | 6 | 24 |
| **FHB II-A L Inject M12 x 120** | 14 | 126 | 7 | 24 |
| **FHB II-A L Inject M16 x 125** | 18 | 131 | 11 | 15 |
| **FHB II-A L Inject M16 x 160** | 18 | 166 | 13 | 13 |

*) Max. number with one static mixer.

# Loads



## Highbond-Anchor FHB II Inject

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-16/0637 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | Material / surface[3)] | Effective anchorage depth $h_{ef}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Installation torque $T_{inst}$ [Nm] | $N_{perm}$[4)] [kN] | $V_{perm}$[4)] [kN] | $s_{min}$[4)] [mm] | $c_{min}$[4)] [mm] | $N_{perm}$[4)] [kN] | $V_{perm}$[4)] [kN] | $s_{min}$[4)] [mm] | $c_{min}$[4)] [mm] |
| **FHB II-A S Inject M10 x 60** | R | 60 | 100 | 15 | 7.6 | 13.8 | 40 | 40 | 10.9 | 13.8 | 40 | 40 |
| **FHB II-A L Inject M10 x 95** | R | 95 | 140 | 20 | 15.2 | 13.3 | 40 | 40 | 16.4 | 13.3 | 40 | 40 |
| **FHB II-A S Inject M12 x 75** | R | 75 | 120 | 30 | 10.7 | 19.3 | 40 | 40 | 15.2 | 19.3 | 40 | 40 |
| **FHB II-A L Inject M12 x 100** | R | 100 | 140 | 40 | 16.4 | 19.3 | 50 | 50 | 23.4 | 19.3 | 50 | 50 |
| **FHB II-A L Inject M12 x 120** | R | 120 | 170 | 40 | 21.6 | 19.3 | 50 | 50 | 23.7 | 19.3 | 50 | 50 |
| **FHB II-A S Inject M16 x 95** | R | 95 | 150 | 50 | 15.2 | 30.4 | 50 | 50 | 21.7 | 35.8 | 50 | 50 |
| **FHB II-A L Inject M16 x 125** | R | 125 | 170 | 60 | 22.9 | 35.8 | 55 | 55 | 32.7 | 35.8 | 55 | 55 |
| **FHB II-A L Inject M16 x 160** | R | 160 | 220 | 60 | 33.2 | 35.8 | 70 | 70 | 46.0 | 35.8 | 70 | 70 |

[1)] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.
[2)] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 80 °C). Drill hole cleaning as per specification in the ETA.
[3)] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).
[4)] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Superbond-system FSB

The concrete all-rounder.








Steel girders



Bridges for traffic signs

## Applications

- Heavy steel constructions
- Silo installations
- Tall shelving
- Sound barriers
- Guard rails
- Staircases
- Reinforcing steel (only FIS SB)
- Overhead installations
- Water-filled drill holes (only RSB)
- Diamond drilled holes (only RSB)

## Advantages

- The Superbond system is a combined capsule and injection system for cracked and non-cracked concrete. The injection mortar FIS SB and resin capsule RSB perform the same as each other at the same anchorage depth. This gives the installer maximum flexibility.
- Variable anchorage depths from 4 x $d_s$ to 20 x $d_s$ enable ideal adaptation to the load to be applied, and thus ensure an optimised installation time and use of materials.
- Maximum application temperatures of up to +150 °C open up new areas of use for bonded anchors.
- Superbond is even approved for installation at frosty temperatures of -30 °C.
- The approval-compliant use for seismic applications (performance category C1, C2) as well as in waterfilled and diamond drill holes (only RSB capsule) ensures safety even in extreme conditions.

## Certificates / Features

ETA-12/0258, in concrete
ETA-13/0651, for post- installed rebar connections
ETA-19/0501, for post-installed fasteners in concrete

ESR-3572
See ICC-ES Evaluation Report at www.icc-es.org

R 120

Seismic C2

Dynamic

NSF
Certified to NSF/ANSI/CAN 61

## Building materials

**Approved for anchorings in:**

- Concrete C20/25 to C50/60, cracked and non-cracked

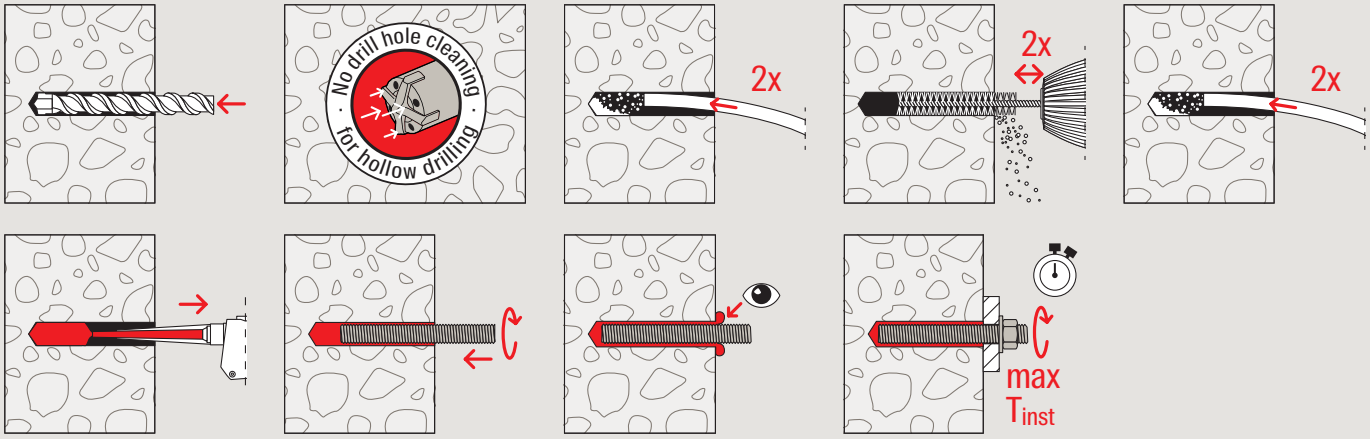
**Also suitable for:**

- Natural stone with dense structure

## Functioning

- Superbond is a bonded anchor system based on a vinylester hybrid with silane technology.
- The threaded rod FIS A can only be set with injection mortar FIS SB (Standard and HIGH SPEED); the threaded rod RGM with oblique edge can be optionally set with injection mortar FIS SB (Standard and HIGH SPEED) or resin capsule RSB.
- Resin and hardener are stored in two separate chambers and are not mixed and activated until extrusion through the static mixer or destruction of the capsule during the setting procedure.
- The mortar bonds the entire surface of the fastening element with the drill hole wall and seals the drill hole.

## Installation in concrete with FIS SB and FIS A / RG M






## Technical data

**Injection mortar FIS SB**



FIS SB 390 S | FIS SB High Speed 390 S | FIS SB 585 S | FIS MR Plus | FIS UMR

| Item | Item no. | Approval ETA | Approval ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| FIS SB 390 S | 519451 | ● | ● | DE, FR, NL | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS SB 390 S | 520555 | ● | ● | CS, RO, SK | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS SB 390 S | 520557 | ● | ● | BG, DE, SL, SR | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS SB 390 S | 520559 | ● | ● | DA, FI, NO, SV | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS SB 390 S | 518831 | ● | ● | EN, ES, PT | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS SB 390 S | 520595 | ● | ● | HU, PL, RU | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS SB 390 S | 519450 | ● | ● | DE, EN, IT | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS SB HIGH SPEED 390 S | 523300 | ● | ● | DE | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS SB 585 S | 562065 | ● | ● | DE, FR, NL | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| FIS SB 585 S | 520526 | ● | ● | DE, EN, IT | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| FIS SB 585 S | 519452 | ● | ● | EN, ES, PT | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| FIS SB 585 S | 540990 | ● | ● | ET, HU, LT, LV, PL, RU | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| FIS MR Plus | 545853 | – | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |
| FIS UMR | 520593 | – | – | – | – | 10 x static mixer FIS UMR for 585 & 1500 ml cartridges | 10 |
| FIS MR Plus bulk pack | 140033 | – | – | – | – | 500 x Static mixer FIS MR Plus for 100 ml, 150 ml, 300 ml, 360 ml, 390 ml and 380/410 ml cartridges | |

## Technical data

**Injection mortar FIS SB**




FIS SB 390 S HWK big




FIS SB 390 S in bucket

3

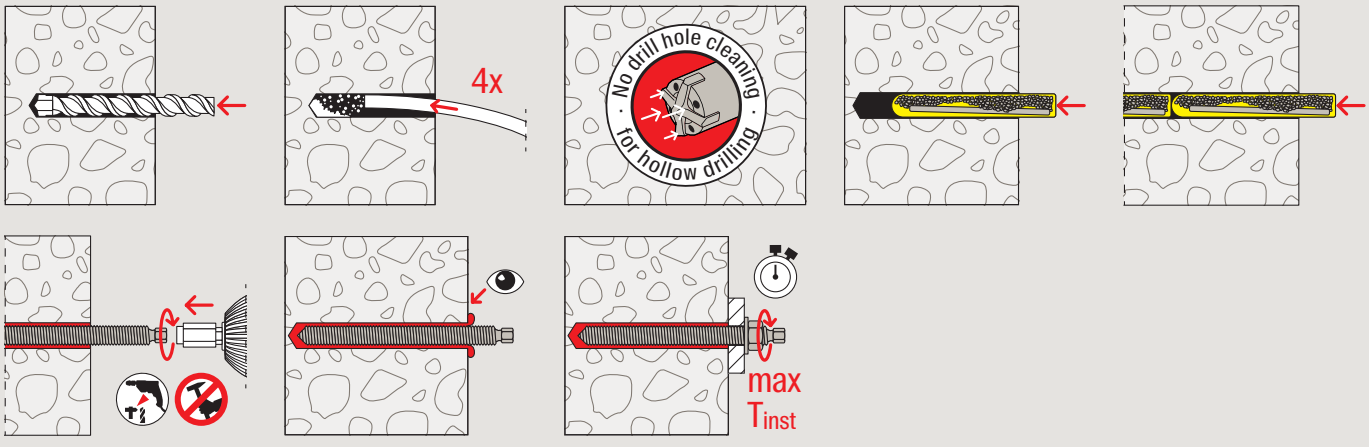
| Item | Item no. | Approval ETA | Approval ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FIS SB 390 S HWK big** | **520573** | ● | ● | DE, EN, IT | 180 | 20 x Cartridge 390 ml, 20 x static mixer FIS MR Plus | 1 |
| **FIS SB 390 S HWK big** | **540252** | ● | ● | EN, ES, PT | 180 | 20 x Cartridge 390 ml, 40 x static mixer FIS MR Plus | 1 |
| **FIS SB 390 S HWK big** | **547945** | ● | ● | HU, PL, RU | 180 | 20 x cartridge 390 ml, 20 x static mixer FIS MR Plus | 1 |
| **FIS SB 390 S in bucket** | **540750** | ● | ● | EN, ES, PT | 180 | 18 x Cartridge 390 ml, 36 x static mixer FIS MR Plus | 1 |

## Curing times

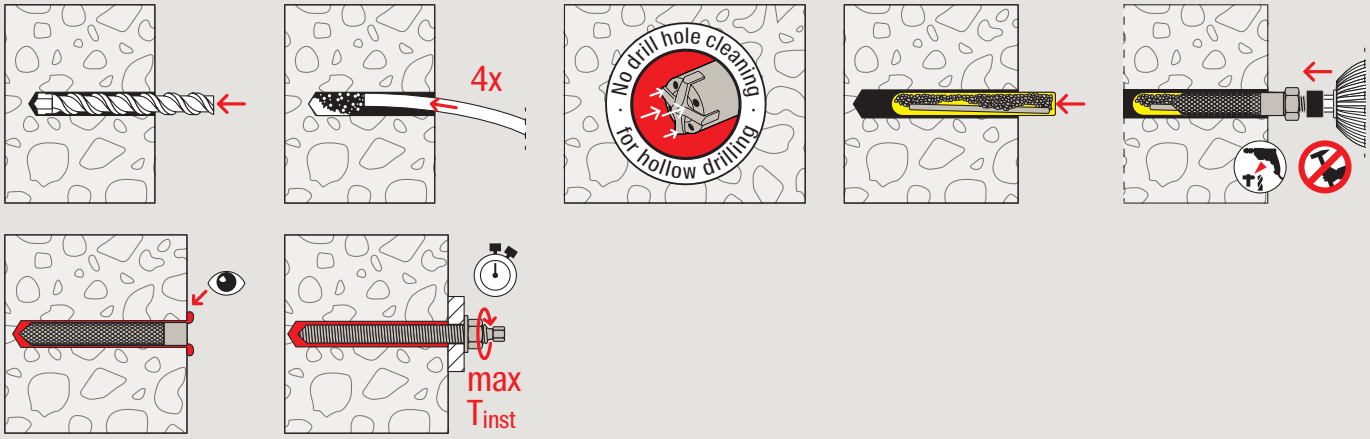
| FIS SB Temperature in anchoring base [°C] | Maximum processing time FIS SB $t_{work}$ [min.] | Maximum processing time FIS SB High Speed $t_{work}$ [min.] | Minimum curing time FIS SB $t_{cure}$ [hrs.] | [min.] | Minumum curing time FIS SB High Speed $t_{cure}$ [hrs.] | [min.] |
|---|---|---|---|---|---|---|
| > -20 – -15 | - | 60 | – | – | 24 | – |
| > -15 – -10 | 60 | 30 | 36 | – | 8 | – |
| > -10 – -5 | 30 | 15 | 24 | – | – | 180 |
| > -5 – 0 | 20 | 10 | 8 | – | – | 120 |
| > +0 – +5 | 13 | 5 | 4 | – | – | 60 |
| > +5 – +10 | 9 | 3 | – | 120 | – | 45 |
| > +10 – +20 | 5 | 2 | – | 60 | – | 30 |
| > +20 – +30 | 4 | 1 | – | 45 | – | 15 |
| > +30 – +40 | 2 | - | – | 30 | – | – |

1) Minimum cartridge temperature +5°C

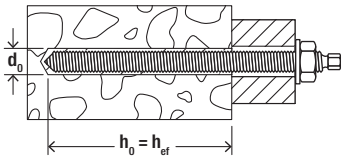
## Installation in concrete with capsule RSB and RG M



## Installation in concrete with capsule RSB and RG M I






## Technical data

**Resin capsule RSB**




RSB

| Item | Item no. | Approval ETA | Approval ICC | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Match | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **RSB 8** | 518807 | ● | ● | 10 | 80 | 80 | RG M 8 / RG M 5 I | 10 |
| **RSB 10** | 518821 | ● | ● | 12 | 90 | 90 | RG M 10 / RG M 8 I | 10 |
| **RSB 12 mini** | 518822 | ● | ● | 14 | 75 | 75 | RG M 12 | 10 |
| **RSB 12** | 518823 | ● | ● | 14 | 110 | 110 | RG M 12 / RG M 10 I | 10 |
| **RSB 16 mini** | 518824 | ● | ● | 18 | 95 | 95 | RG M 16 | 10 |
| **RSB 16** | 518825 | ● | ● | 18 | 125 | 125 | RG M 16 / RG M 12 I | 10 |
| **RSB 16 E** | 518826 | ● | ● | 24 | 160 | 160 | RG M16 I | 10 |
| **RSB 20** | 518827 | ● | ● | 25 | 170 | 170 | RG M 20 | 10 |
| **RSB 10 mini** | 518820 | ● | ● | 12 | 75 | 75 | RG M 10 / RG M 6 I | 10 |
| **RSB 20 E/24** | 518828 | ● | ● | 25 | 210 | 210 | RG M 20 / RG M 24 / RG M 20 I | 5 |
| **RSB 30** | 518829 | ● | ● | 35 | 280 | 280 | RG M 30 | 5 |

## Curing times

| RSB<br>Temperature at anchoring base | Minimum curing time RSB<br>$t_{cure}$ | |
|---|---|---|
| [°C] | [hrs.] | [min.] |
| -30 – -20 [1] | 120 | – |
| > -20 – -15 | 48 | – |
| > -15 – -10 | 30 | – |
| > -10 – -5 | 16 | – |
| > -5 – 0 | 10 | – |
| > +0 – +5 | – | 45 |
| > +5 – +10 | – | 30 |
| > +10 – +20 | – | 20 |
| > +20 – +30 | – | 5 |
| > +30 – +40 | – | 3 |

1) Minimum resin capsule temperature -15°C



## Loads

**Superbond-System: Injection mortar FIS SB with internal threaded anchor RG M I**

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-12/0258 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Screw material[3)] | Effective anchorage depth | Minimum member thickness | Maximum installation-torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,max}$ [Nm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] |
| **RG M8 I** | 5.8 | 90 | 120 | 10 | 8.1 | 5.3 | 55 | 55 | 9.0 | 5.3 | 55 | 55 |
| | 8.8 | 90 | 120 | 10 | 8.1 | 8.3 | 55 | 55 | 13.8 | 8.3 | 55 | 55 |
| | R-70 | 90 | 120 | 10 | 8.1 | 5.9 | 55 | 55 | 9.9 | 5.9 | 55 | 55 |
| **RG M10 I** | 5.8 | 90 | 130 | 20 | 10.8 | 8.3 | 65 | 65 | 13.8 | 8.3 | 65 | 65 |
| | 8.8 | 90 | 130 | 20 | 10.8 | 13.3 | 65 | 65 | 20.0 | 13.3 | 65 | 65 |
| | R-70 | 90 | 130 | 20 | 10.8 | 9.3 | 65 | 65 | 15.7 | 9.3 | 65 | 65 |
| **RG M12 I** | 5.8 | 125 | 170 | 40 | 16.8 | 12.1 | 75 | 75 | 20.5 | 12.1 | 75 | 75 |
| | 8.8 | 125 | 170 | 40 | 16.8 | 19.3 | 75 | 75 | 32.4 | 19.3 | 75 | 75 |
| | R-70 | 125 | 170 | 40 | 16.8 | 13.5 | 75 | 75 | 22.5 | 13.5 | 75 | 75 |
| **RG M16 I** | 5.8 | 160 | 210 | 80 | 26.3 | 22.4 | 95 | 95 | 37.6 | 22.4 | 95 | 95 |
| | 8.8 | 160 | 210 | 80 | 26.3 | 30.9 | 95 | 95 | 47.4 | 30.9 | 95 | 95 |
| | R-70 | 160 | 210 | 80 | 26.3 | 25.1 | 95 | 95 | 42.0 | 25.1 | 95 | 95 |
| **RG M20 I** | 5.8 | 200 | 260 | 120 | 41.9 | 35.4 | 125 | 125 | 58.6 | 35.4 | 125 | 125 |
| | 8.8 | 200 | 260 | 120 | 41.9 | 51.4 | 125 | 125 | 66.3 | 51.4 | 125 | 125 |
| | R-70 | 200 | 260 | 120 | 41.9 | 39.4 | 125 | 125 | 65.7 | 39.4 | 125 | 125 |

1) Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.

2) The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 80 °C). Drill hole cleaning as per specification in the ETA. The factor $\Psi_{sus}$ for sustained load was taken into account with 1.0.

3) Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).

4) In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Loads



**Superbond-System: Injection morter FIS SB with threaded rod FIS A or RG M**

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-12/0258 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material/ surface[3)] | Effective anchorage depth | Minimum member thickness | Maximum installation-torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,max}$ [Nm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] |
| **FIS A M 8** | 5.8 | 60 | 100 | 10 | 4.3 | 6.3 | 40 | 40 | 8.6 | 6.3 | 40 | 40 |
| | 5.8 | 80 | 110 | 10 | 5.7 | 6.3 | 40 | 40 | 9.0 | 6.3 | 40 | 40 |
| | 5.8 | 160 | 190 | 10 | 9.0 | 6.3 | 40 | 40 | 9.0 | 6.3 | 40 | 40 |
| | R-70 | 60 | 100 | 10 | 4.3 | 6.0 | 40 | 40 | 8.6 | 6.0 | 40 | 40 |
| | R-70 | 80 | 110 | 10 | 5.7 | 6.0 | 40 | 40 | 9.9 | 6.0 | 40 | 40 |
| | R-70 | 160 | 190 | 10 | 9.9 | 6.0 | 40 | 40 | 9.9 | 6.0 | 40 | 40 |
| **FIS A M 10** | 5.8 | 60 | 100 | 20 | 5.8 | 9.7 | 45 | 45 | 10.8 | 9.7 | 45 | 45 |
| | 5.8 | 90 | 120 | 20 | 8.8 | 9.7 | 45 | 45 | 13.8 | 9.7 | 45 | 45 |
| | 5.8 | 200 | 230 | 20 | 13.8 | 9.7 | 45 | 45 | 13.8 | 9.7 | 45 | 45 |
| | R-70 | 60 | 100 | 20 | 5.8 | 9.2 | 45 | 45 | 10.8 | 9.2 | 45 | 45 |
| | R-70 | 90 | 120 | 20 | 8.8 | 9.2 | 45 | 45 | 15.7 | 9.2 | 45 | 45 |
| | R-70 | 200 | 230 | 20 | 15.7 | 9.2 | 45 | 45 | 15.7 | 9.2 | 45 | 45 |
| **FIS A M 12** | 5.8 | 70 | 100 | 40 | 9.4 | 14.3 | 55 | 55 | 13.7 | 14.3 | 55 | 55 |
| | 5.8 | 110 | 140 | 40 | 14.8 | 14.3 | 55 | 55 | 20.5 | 14.3 | 55 | 55 |
| | 5.8 | 240 | 270 | 40 | 20.5 | 14.3 | 55 | 55 | 20.5 | 14.3 | 55 | 55 |
| | R-70 | 70 | 100 | 40 | 9.4 | 13.7 | 55 | 55 | 13.7 | 13.7 | 55 | 55 |
| | R-70 | 110 | 140 | 40 | 14.8 | 13.7 | 55 | 55 | 22.5 | 13.7 | 55 | 55 |
| | R-70 | 240 | 270 | 40 | 22.5 | 13.7 | 55 | 55 | 22.5 | 13.7 | 55 | 55 |
| **FIS A M 16** | 5.8 | 80 | 120 | 60 | 11.7 | 23.5 | 65 | 65 | 16.8 | 26.9 | 65 | 65 |
| | 5.8 | 125 | 170 | 60 | 22.4 | 26.9 | 65 | 65 | 32.7 | 26.9 | 65 | 65 |
| | 5.8 | 320 | 360 | 60 | 37.6 | 26.9 | 65 | 65 | 37.6 | 26.9 | 65 | 65 |
| | R-70 | 80 | 120 | 60 | 11.7 | 23.5 | 65 | 65 | 16.8 | 25.2 | 65 | 65 |
| | R-70 | 125 | 170 | 60 | 22.4 | 25.2 | 65 | 65 | 32.7 | 25.2 | 65 | 65 |
| | R-70 | 320 | 360 | 60 | 42.0 | 25.2 | 65 | 65 | 42.0 | 25.2 | 65 | 65 |
| **FIS A M 20** | 5.8 | 90 | 140 | 120 | 14.0 | 28.0 | 85 | 85 | 20.0 | 40.0 | 85 | 85 |
| | 5.8 | 170 | 220 | 120 | 36.3 | 42.3 | 85 | 85 | 51.9 | 42.3 | 85 | 85 |
| | 5.8 | 400 | 450 | 120 | 58.6 | 42.3 | 85 | 85 | 58.6 | 42.3 | 85 | 85 |
| | R-70 | 90 | 140 | 120 | 14.0 | 28.0 | 85 | 85 | 20.0 | 39.4 | 85 | 85 |
| | R-70 | 170 | 220 | 120 | 36.3 | 39.4 | 85 | 85 | 51.9 | 39.4 | 85 | 85 |
| | R-70 | 400 | 450 | 120 | 65.7 | 39.4 | 85 | 85 | 65.7 | 39.4 | 85 | 85 |
| **FIS A M 24** | 5.8 | 96 | 160 | 150 | 15.4 | 30.8 | 105 | 105 | 22.0 | 44.1 | 105 | 105 |
| | 5.8 | 210 | 270 | 150 | 49.9 | 60.6 | 105 | 105 | 71.3 | 60.6 | 105 | 105 |
| | 5.8 | 480 | 540 | 150 | 84.3 | 60.6 | 105 | 105 | 84.3 | 60.6 | 105 | 105 |
| | R-70 | 96 | 160 | 150 | 15.4 | 30.8 | 105 | 105 | 22.0 | 44.1 | 105 | 105 |
| | R-70 | 210 | 270 | 150 | 49.9 | 56.8 | 105 | 105 | 71.3 | 56.8 | 105 | 105 |
| | R-70 | 480 | 540 | 150 | 94.3 | 56.8 | 105 | 105 | 94.3 | 56.8 | 105 | 105 |
| **FIS A M 30** | 5.8 | 120 | 190 | 300 | 21.6 | 43.1 | 140 | 140 | 30.8 | 61.6 | 140 | 140 |
| | 5.8 | 280 | 350 | 300 | 76.8 | 96.0 | 140 | 140 | 109.8 | 96.0 | 140 | 140 |
| | 5.8 | 600 | 670 | 300 | 133.8 | 96.0 | 140 | 140 | 133.8 | 96.0 | 140 | 140 |
| | R-70 | 120 | 190 | 300 | 21.6 | 43.1 | 140 | 140 | 30.8 | 61.6 | 140 | 140 |
| | R-70 | 280 | 350 | 300 | 76.8 | 90.2 | 140 | 140 | 109.8 | 90.2 | 140 | 140 |
| | R-70 | 600 | 670 | 300 | 150.1 | 90.2 | 140 | 140 | 150.1 | 90.2 | 140 | 140 |

[1)] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.

[2)] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 80 °C). Drill hole cleaning as per specification in the ETA. The factor $\Psi_{sus}$ for sustained load was taken into account with 1.0.

[3)] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).

[4)] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Loads

**Superbond-System: Resin capsule RSB with threaded rod RG M**

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-12/0258 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material/ surface[3)] | Effective anchorage depth | Minimum member thickness | Maximum installation-torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,max}$ [Nm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] |
| **RG M 8** | 5.8 | 80 | 110 | 10 | 5.7 | 6.3 | 40 | 40 | 9.0 | 6.3 | 40 | 40 |
| | R-70 | 80 | 110 | 10 | 5.7 | 6.0 | 40 | 40 | 9.9 | 6.0 | 40 | 40 |
| **RG M 10** | 5.8 | 75 | 110 | 20 | 7.3 | 9.7 | 45 | 45 | 13.5 | 9.7 | 45 | 45 |
| | 5.8 | 90 | 120 | 20 | 8.8 | 9.7 | 45 | 45 | 13.8 | 9.7 | 45 | 45 |
| | 5.8 | 150 | 180 | 20 | 13.8 | 9.7 | 45 | 45 | 13.8 | 9.7 | 45 | 45 |
| | R-70 | 75 | 110 | 20 | 7.3 | 9.2 | 45 | 45 | 13.5 | 9.2 | 45 | 45 |
| | R-70 | 90 | 120 | 20 | 8.8 | 9.2 | 45 | 45 | 15.7 | 9.2 | 45 | 45 |
| | R-70 | 150 | 180 | 20 | 14.6 | 9.2 | 45 | 45 | 15.7 | 9.2 | 45 | 45 |
| **RG M 12** | 5.8 | 75 | 110 | 40 | 10.1 | 14.3 | 55 | 55 | 15.2 | 14.3 | 55 | 55 |
| | 5.8 | 110 | 140 | 40 | 14.8 | 14.3 | 55 | 55 | 20.5 | 14.3 | 55 | 55 |
| | 5.8 | 150 | 180 | 40 | 20.2 | 14.3 | 55 | 55 | 20.5 | 14.3 | 55 | 55 |
| | R-70 | 75 | 110 | 40 | 10.1 | 13.7 | 55 | 55 | 15.2 | 13.7 | 55 | 55 |
| | R-70 | 110 | 140 | 40 | 14.8 | 13.7 | 55 | 55 | 22.5 | 13.7 | 55 | 55 |
| | R-70 | 150 | 180 | 40 | 20.2 | 13.7 | 55 | 55 | 22.5 | 13.7 | 55 | 55 |
| **RG M 16** | 5.8 | 95 | 140 | 60 | 15.2 | 26.9 | 65 | 65 | 21.7 | 26.9 | 65 | 65 |
| | 5.8 | 125 | 170 | 60 | 22.4 | 26.9 | 65 | 65 | 32.7 | 26.9 | 65 | 65 |
| | 5.8 | 190 | 230 | 60 | 34.1 | 26.9 | 65 | 65 | 37.6 | 26.9 | 65 | 65 |
| | R-70 | 95 | 140 | 60 | 15.2 | 25.2 | 65 | 65 | 21.7 | 25.2 | 65 | 65 |
| | R-70 | 125 | 170 | 60 | 22.4 | 25.2 | 65 | 65 | 32.7 | 25.2 | 65 | 65 |
| | R-70 | 190 | 230 | 60 | 34.1 | 25.2 | 65 | 65 | 42.0 | 25.2 | 65 | 65 |
| **RG M 20** | 5.8 | 170 | 220 | 120 | 36.3 | 42.3 | 85 | 85 | 51.9 | 42.3 | 85 | 85 |
| | 5.8 | 210 | 260 | 120 | 47.1 | 42.3 | 85 | 85 | 58.6 | 42.3 | 85 | 85 |
| | R-70 | 170 | 220 | 120 | 36.3 | 39.4 | 85 | 85 | 51.9 | 39.4 | 85 | 85 |
| | R-70 | 210 | 260 | 120 | 47.1 | 39.4 | 85 | 85 | 65.7 | 39.4 | 85 | 85 |
| **RG M 24** | 5.8 | 210 | 270 | 150 | 49.9 | 60.6 | 105 | 105 | 71.3 | 60.6 | 105 | 105 |
| | R-70 | 210 | 270 | 150 | 49.9 | 56.8 | 105 | 105 | 71.3 | 56.8 | 105 | 105 |
| **RG M 30** | 5.8 | 280 | 350 | 300 | 76.8 | 96.0 | 140 | 140 | 109.8 | 96.0 | 140 | 140 |
| | R-70 | 280 | 350 | 300 | 76.8 | 90.2 | 140 | 140 | 109.8 | 90.2 | 140 | 140 |

1) Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.

2) The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 80 °C). Drill hole cleaning as per specification in the ETA. The factor $\Psi_{sus}$ for sustained load was taken into account with 1.0.

3) Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).

4) In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Loads

**Superbond-System: Resin capsule RSB with Internal threaded anchor RG M I**

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-12/0258 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Screw material[3)] | Effective anchorage depth | Minimum member thickness | Maximum installation-torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,max}$ [Nm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] |
| **RG M8 I** | 5.8 | 90 | 120 | 10 | 8.1 | 5.3 | 55 | 55 | 9.0 | 5.3 | 55 | 55 |
| | 8.8 | 90 | 120 | 10 | 8.1 | 8.3 | 55 | 55 | 13.8 | 8.3 | 55 | 55 |
| | R-70 | 90 | 120 | 10 | 8.1 | 5.9 | 55 | 55 | 9.9 | 5.9 | 55 | 55 |
| **RG M10 I** | 5.8 | 90 | 130 | 20 | 10.8 | 8.3 | 65 | 65 | 13.8 | 8.3 | 65 | 65 |
| | 8.8 | 90 | 130 | 20 | 10.8 | 13.3 | 65 | 65 | 20.0 | 13.3 | 65 | 65 |
| | R-70 | 90 | 130 | 20 | 10.8 | 9.3 | 65 | 65 | 15.7 | 9.3 | 65 | 65 |
| **RG M12 I** | 5.8 | 125 | 170 | 40 | 16.8 | 12.1 | 75 | 75 | 20.5 | 12.1 | 75 | 75 |
| | 8.8 | 125 | 170 | 40 | 16.8 | 19.3 | 75 | 75 | 32.4 | 19.3 | 75 | 75 |
| | R-70 | 125 | 170 | 40 | 16.8 | 13.5 | 75 | 75 | 22.5 | 13.5 | 75 | 75 |
| **RG M16 I** | 5.8 | 160 | 210 | 80 | 26.3 | 22.4 | 95 | 95 | 37.6 | 22.4 | 95 | 95 |
| | 8.8 | 160 | 210 | 80 | 26.3 | 30.9 | 95 | 95 | 47.4 | 30.9 | 95 | 95 |
| | R-70 | 160 | 210 | 80 | 26.3 | 25.1 | 95 | 95 | 42.0 | 25.1 | 95 | 95 |
| **RG M20 I** | 5.8 | 200 | 260 | 120 | 41.9 | 35.4 | 125 | 125 | 58.6 | 35.4 | 125 | 125 |
| | 8.8 | 200 | 260 | 120 | 41.9 | 51.4 | 125 | 125 | 66.3 | 51.4 | 125 | 125 |
| | R-70 | 200 | 260 | 120 | 41.9 | 39.4 | 125 | 125 | 65.7 | 39.4 | 125 | 125 |

[1)] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.

[2)] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 80 °C). Drill hole cleaning as per specification in the ETA. The factor $\Psi_{sus}$ for sustained load was taken into account with 1.0.

[3)] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).

[4)] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Resin anchor RM II

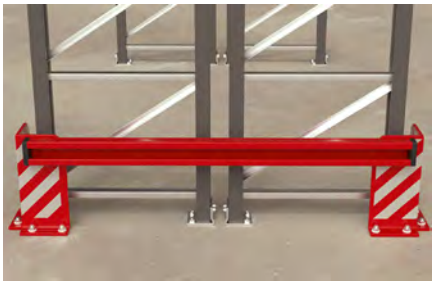
The bonded anchor for cracked concrete without drill hole cleaning.








Crash barriers



Collision protection

## Applications

**Suitable for:**
- Steel constructions
- Guard rails
- Staircases
- Column bases
- Machines
- Masts

**Ideal for:**
- Overhead installations
- Water-filled drill holes

## Advantages

- RM II is the first bonded anchor with threaded rod RG M for cracked and non-cracked concrete that does not require drill hole cleaning. This allows for a rapid working progress and an economic installation.
- Moreover, there is a reduced exposition to drill dust on the building site. This increases the safety for the user.
- The pre-portioned resin capsule is easy to install and especially suitable for individual applications and overhead installations.

## Certificates / Features

ETA-16/0340, in concrete

## Building materials

**Approved for:**
- Concrete C20/25 to C50/60, cracked and non-cracked

**Also suitable for:**
- Natural stone with dense structure

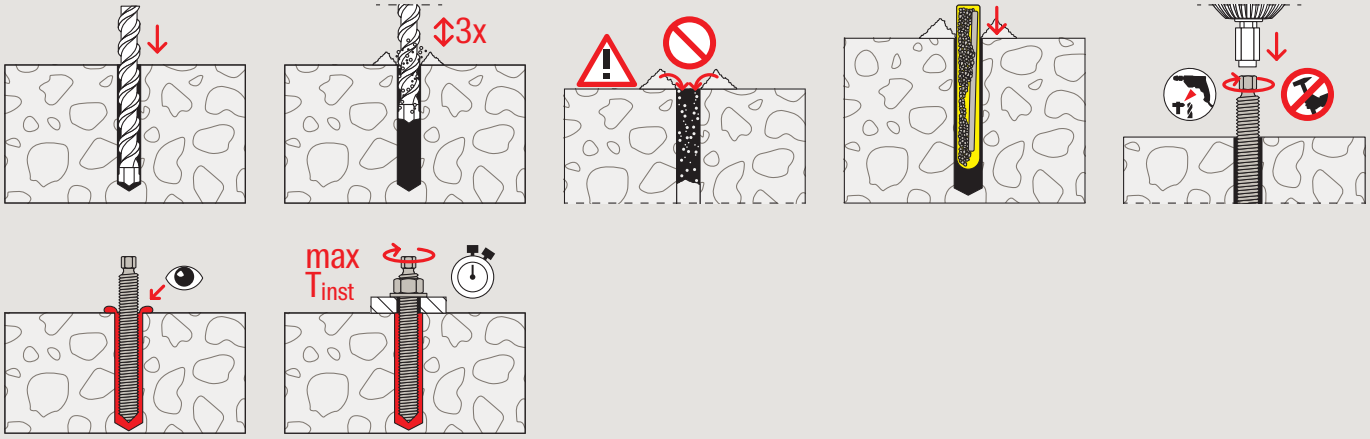
## Versions

- Galvanised steel
- Stainless steel
- Highly corrosion-resistant steel
- Hot-dip galvanised steel

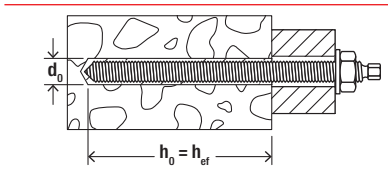
## Functioning

- The resin anchor RM II is suitable for pre-positioned installation.
- The 2-component resin capsule RM II contains styrene-free vinylester resin and hardener.
- The threaded rod RG M is set using a hammer drill and the accompanying setting tool in rotating and hitting motions.
- During setting, the oblique edge of the RG M destroys the capsule, and mixes and activates the mortar.
- The mortar bonds the entire surface of the threaded rod with the drill hole wall and seals the drill hole.

## Installation in concrete with capsule RM II and RG M






## Technical data

**Resin capsule RM II**



RM II

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Suitable for threaded rod | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| RM II 8 | 539796 | ● | 10 | 80 | 80 | RG M8 | 10 |
| RM II 10 | 539797 | ● | 12 | 90 | 90 | RG M8 | 10 |
| RM II 12 | 539798 | ● | 14 | 110 | 110 | RG M12 | 10 |
| RM II 14 | 539799 | – | 16 | 120 | 120 | RG M14 | 10 |
| RM II 16 | 539800 | ● | 18 | 125 | 125 | RG M16 | 10 |
| RM II 16 E | 539801 | ● | 18 | 190 | 190 | RG M24 | 10 |
| RM II 20/22 | 539802[1)] | ● | 25 | 170 | 170 | RG M20 / RG M22 | 10 |
| RM II 24 | 539803 | ● | 28 | 210 | 210 | RG M24 | 5 |

[1)] RM II 20/22 in combination with RG M 22 and effect. anchorage depth of 190 mm is not part of the assessment.

## Technical data

**Threaded rod RG M**



RG M

| Item | Galvanised steel, steel grade 5.8 Item no. | Galvanised steel, steel grade 8.8 Item no. | Stainless steel Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Anchorage depth (short/standard/large) $h_{ef}$ [mm] | Usable length (short/standard/large) $t_{fix}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| RG M8 x 110 | 050256 | – | 050263 | ● | 10 | - / 80 / - | - / 14 / - | 10 |
| RG M8 x 150 | 095698 | 519443 | 050293 | ● | 10 | - / 80 / - | - / 54 / - | 10 |
| RG M10 x 110 | 535007 | – | 535009 | ● | 12 | 75 / - / - | - / 144 / 104 | 10 |
| RG M10 x 130 | 050257 | – | 050264 | ● | 12 | 75 / 90 / - | 35 / 20 / - | 10 |

[1)] Straight cut, setting tool is enclosed.
[2)] Straight cut, additional setting tool required.

## Technical data

**Threaded rod RG M**



RG M

| Item | Galvanised steel, steel grade 5.8<br>Item no.<br>gvz 5.8 | Galvanised steel, steel grade 8.8<br>Item no.<br>gvz 8.8 | Stainless steel<br>Item no.<br>R | Approval<br>ETA | Drill diameter<br>$d_0$<br>[mm] | Anchorage depth (short/standard/large)<br>$h_{ef}$<br>[mm] | Usable length (short/standard/large)<br>$t_{fix}$<br>[mm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|
| RG M10 x 165 | 050280 | – | 050294 | ● | 12 | 75 / 90 / - | 70 / 55 / - | 10 |
| RG M10 x 190 | 050281 | – | 050296 | ● | 12 | 75 / 90 / 150 | 95 / 80 / 20 | 10 |
| RG M10 x 220 | – | 519444 | – | ● | 12 | 75 / 90 / 150 | 125 / 110 / 50 | 10 |
| RG M10 x 250 | 095703 | – | 095701 | ● | 12 | 75 / 90 / 150 | 201 / 166 / 126 | 10 |
| RG M10 x 350 | 095718 | – | 095709 | ● | 12 | 75 / 90 / 150 | 255 / 240 / 180 | 10 |
| RG M12 x 120 | 535010 | – | 535011 | ● | 14 | 75 / - / - | 21 / - / - | 10 |
| RG M12 x 160 | 050258 | – | 050265 | ● | 14 | 75 / 110 / - | 61 / 26 / - | 10 |
| RG M12 x 180 | 512248 | – | 512249 | ● | 14 | 75 / 110 / 150 | 81 / 46 / 6 | 10 |
| RG M12 x 200 | – | – | 050576 | ● | 14 | 75 / 110 / 150 | 101 / 66 / 26 | 10 |
| RG M12 x 220 | 050283 | 519445 | 050297 | ● | 14 | 75 / 110 / 150 | 121 / 86 / 46 | 10 |
| RG M12 x 250 | 050284 | – | 095702 | ● | 14 | 75 / 110 / 150 | 151 / 116 / 76 | 10 |
| RG M12 x 300 | 050285 | – | 095705 | ● | 14 | 75 / 110 / 150 | 225 / 190 / 150 | 10 |
| RG M12 x 380 | 095720[1] | – | 095710[2] | ● | 14 | 75 / 110 / 150 | 281 / 246 / 206 | 10 |
| RG M16 x 165 | 050287 | – | 095704 | ● | 18 | 95 / 125 / - | 38 / 8 / - | 10 |
| RG M16 x 190 | 050259 | – | 050266 | ● | 18 | 95 / 125 / - | 63 / 33 / - | 10 |
| RG M16 x 250 | 050288 | – | 050298 | ● | 18 | 95 / 125 / 190 | 123 / 93 / 28 | 10 |
| RG M16 x 270 | – | 519446 | – | ● | 18 | 95 / 125 / 190 | 143 / 113 / 48 | 10 |
| RG M16 x 300 | 050289 | – | 050299 | ● | 18 | 95 / 125 / 190 | 173 / 143 / 78 | 10 |
| RG M16 x 380 | 095722[1] | – | 095712[2] | ● | 18 | 95 / 125 / 190 | 253 / 223 / 158 | 10 |
| RG M16 x 500 | 095723[1] | – | 095713[2] | ● | 18 | 95 / 125 / 190 | 373 / 343 / 278 | 10 |
| RG M20 x 220 | 512251 | – | – | ● | 25 | - / 170 / - | - / 14 / - | 10 |
| RG M20 x 260 | 050260 | – | 050267 | ● | 25 | - / 170 / 210 | - / 54 / 14 | 10 |
| RG M20 x 290 | – | 519447 | – | ● | 25 | - / 170 / 210 | - / 84 / 44 | 10 |
| RG M20 x 350 | 095707 | – | 095706 | ● | 25 | - / 170 / 210 | 155 / 140 / 80 | 10 |
| RG M20 x 500 | 095725[2] | – | – | ● | 25 | - / 170 / 210 | - / 294 / 254 | 10 |
| RG M24 x 295 | – | 519448[2] | – | ● | 28 | - / 210 / - | - / 185 / - | 10 |
| RG M24 x 300 | 050261[2] | – | 050268[2] | ● | 28 | - / 210 / - | - / 61 / - | 10 |
| RG M24 x 400 | 095727[2] | – | 095715[2] | ● | 28 | - / 210 / - | - / 161 / - | 10 |
| RG M24 x 600 | 095728[2] | – | – | ● | 28 | - / 210 / - | - / 361 / - | 5 |
| RG M30 x 380 | 050262[2] | – | 090726 | ● | 35 | - / 280 / - | 15 / - / - | 5 |
| RG M30 x 500 | 095730[2] | – | – | ● | 35 | - / 280 / - | - / 56 / - | 5 |

[1] Straight cut, setting tool is enclosed.
[2] Straight cut, additional setting tool required.

## Technical data

**Threaded rod RG M hdg / HCR**



RG M



RG M

| Item | Hot-dip galvanised steel<br>Item no.<br>hdg | Highly corrosion-resistant steel<br>Item no.<br>HCR | Approval<br>ETA | Drill diameter<br>$d_0$<br>[mm] | Anchorage depth (short/standard/large)<br>$h_{ef}$<br>[mm] | Usable length (short/standard/large)<br>$t_{fix}$<br>[mm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|
| RG M10 x 130 | – | 096217 | ● | 12 | 75 / 90 / - | 35 / 20 / - | 10 |
| RG M12 x 160 | 512247 | 096218 | ● | 14 | 75 / 110 / - | 61 / 26 / - | 10 |
| RG M16 x 165 | 537062 | – | ● | 18 | 95 / 125 / - | 38 / 8 / - | 10 |
| RG M16 x 190 | 512250 | 096219 | ● | 18 | 95 / 125 / - | 63 / 33 / - | 10 |

# Loads

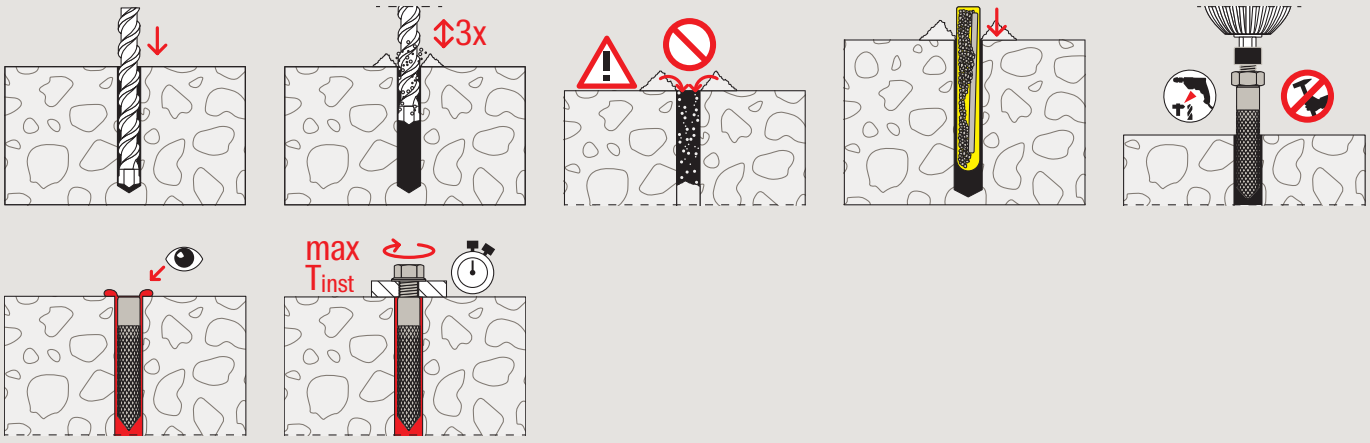
**Resin capsule RM II with threaded rod RG M**

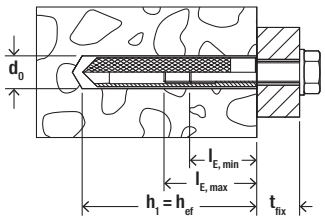
Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-16/0340 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material/ surface[3)] | Effective anchorage depth | Minimum member thickness | Maximum installation-torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,max}$ [Nm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] |
| **RG M 8** | 5.8 | 80 | 110 | 10 | - | - | - | - | 9.0 | 6.3 | 40 | 40 |
| | R-70 | 80 | 110 | 10 | - | - | - | - | 9.6 | 6.0 | 40 | 40 |
| **RG M 10** | 5.8 | 90 | 120 | 20 | 4.5 | 9.7 | 45 | 45 | 13.5 | 9.7 | 45 | 45 |
| | R-70 | 90 | 120 | 20 | 4.5 | 9.2 | 45 | 45 | 13.5 | 9.2 | 45 | 45 |
| **RG M 12** | 5.8 | 110 | 140 | 40 | 6.6 | 14.3 | 55 | 55 | 19.7 | 14.3 | 55 | 55 |
| | R-70 | 110 | 140 | 40 | 6.6 | 13.7 | 55 | 55 | 19.7 | 13.7 | 55 | 55 |
| **RG M 16** | 5.8 | 125 | 170 | 60 | 10.0 | 23.9 | 65 | 65 | 27.3 | 26.9 | 65 | 65 |
| | R-70 | 125 | 170 | 60 | 10.0 | 23.9 | 65 | 65 | 27.3 | 25.2 | 65 | 65 |
| **RG M 20** | 5.8 | 170 | 220 | 120 | 17.0 | 40.7 | 85 | 85 | 43.3 | 42.3 | 85 | 85 |
| | R-70 | 170 | 220 | 120 | 17.0 | 39.4 | 85 | 85 | 43.3 | 39.4 | 85 | 85 |
| **RG M 24** | 5.8 | 210 | 270 | 150 | 25.1 | 60.3 | 105 | 105 | 59.4 | 60.6 | 105 | 105 |
| | R-70 | 210 | 270 | 150 | 25.1 | 56.8 | 105 | 105 | 59.4 | 56.8 | 105 | 105 |

[1)] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.
[2)] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 80 °C). Drill hole cleaning as per specification in the ETA. The factor $\Psi'_{sus}$ for sustained load was taken into account with 1.0.
[3)] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).
[4)] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

## Installation in concrete with capsule RM II and RG M I






## Technical data

3

**Resin capsule RM II**




RM II

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Suitable for internal threaded anchor | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **RM II 10** | **539797** | ● | 12 | 90 | 90 | RG M8 I | 10 |
| **RM II 12** | **539798** | ● | 14 | 110 | 110 | RG M10 I | 10 |
| **RM II 16** | **539800** | ● | 18 | 125 | 125 | RG M 12 I | 10 |
| **RM II 16 E** | **539801** | ● | 18 | 190 | 190 | RG M16 I | 10 |
| **RM II 24** | **539803** | ● | 28 | 210 | 210 | RG M20 I | 5 |

## Technical data

**Internal threaded anchor RG M I**



RG M I

| Item | Galvanised steel Item no. gvz | Stainless steel Item no. R | Approval ETA | Drill diameter $d_0$ [mm] | Depth = embedment depth $h_0 = h_s$ [mm] | Min. bolt penetration $l_{E,min}$ [mm] | Max. bolt penetration $l_{E,max}$ [mm] | Match | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **RG 8 x 75 M5 I** | **048221**[1)] | – | – | 10 | 75 | 8 | 14 | 539796 RM II 8 | 10 |
| **RG 10 x 75 M6 I** | **048222**[1)] | – | – | 12 | 75 | 10 | 16 | 539796 RM II 8 | 10 |
| **RG 12 x 90 M8 I** | **050552**[1)] | **050565**[1)] | ● | 14 | 90 | 8 | 18 | 539797 RM II 10 | 10 |
| **RG 16 x 90 M10 I** | **050553**[1)] | **050566**[1)] | ● | 18 | 90 | 10 | 23 | 539798 RM II 12 | 10 |
| **RG 18 x 125 M12 I** | **050562**[1)] | **050567**[1)] | ● | 20 | 125 | 12 | 26 | 539800 RM II 16 | 10 |
| **RG 22 x 160 M16 I** | **050563**[1)] | **050568**[1)] | ● | 24 | 160 | 16 | 35 | 539801 RM II 16 E | 5 |
| **RG 28 x 200 M20 I** | **050564**[1)] | **050569**[1)] | ● | 32 | 200 | 20 | 45 | 539803 RM II 24 | 5 |

[1)] Setting tool is included in each package.

## Curing times

| RM II Concrete temperature [°C] | Minimum curing time $t_{cure}$ [hrs.] | [min.] |
|---|---|---|
| -15 – -10 | 30 | – |
| > -10 – -5 | 16 | – |
| > -5 – 0 | 10 | – |
| > 0 – +5 | – | 45 |
| > +5 – +10 | – | 30 |
| > +10 – +20 | – | 20 |
| > +20 – +30 | – | 5 |
| > +30 – +40 | – | 3 |

# Loads

**Resin capsule RM II with internal threaded anchor RG M I**

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-16/0340 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | Screw material[3)] | Effective anchorage depth $h_{ef}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Maximum installation-torque $T_{inst,max}$ [Nm] | $N_{perm}$[4)] [kN] | $V_{perm}$[4)] [kN] | $s_{min}$[4)] [mm] | $c_{min}$[4)] [mm] | $N_{perm}$[4)] [kN] | $V_{perm}$[4)] [kN] | $s_{min}$[4)] [mm] | $c_{min}$[4)] [mm] |
| **RG M8 I** | 5.8 | 90 | 120 | 10 | 5.4 | 5.3 | 55 | 55 | 9.0 | 5.3 | 55 | 55 |
| | 8.8 | 90 | 120 | 10 | 5.4 | 8.3 | 55 | 55 | 13.8 | 8.3 | 55 | 55 |
| | R-70 | 90 | 120 | 10 | 5.4 | 5.9 | 55 | 55 | 9.9 | 5.9 | 55 | 55 |
| **RG M10 I** | 5.8 | 90 | 130 | 20 | 7.2 | 8.3 | 65 | 65 | 13.8 | 8.3 | 65 | 65 |
| | 8.8 | 90 | 130 | 20 | 7.2 | 13.3 | 65 | 65 | 16.7 | 13.3 | 65 | 65 |
| | R-70 | 90 | 130 | 20 | 7.2 | 9.3 | 65 | 65 | 15.7 | 9.3 | 65 | 65 |
| **RG M12 I** | 5.8 | 125 | 170 | 40 | 11.2 | 12.1 | 75 | 75 | 20.5 | 12.1 | 75 | 75 |
| | 8.8 | 125 | 170 | 40 | 11.2 | 19.3 | 75 | 75 | 27.3 | 19.3 | 75 | 75 |
| | R-70 | 125 | 170 | 40 | 11.2 | 13.5 | 75 | 75 | 22.5 | 13.5 | 75 | 75 |
| **RG M16 I** | 5.8 | 160 | 210 | 80 | 17.6 | 22.4 | 95 | 95 | 37.6 | 22.4 | 95 | 95 |
| | 8.8 | 160 | 210 | 80 | 17.6 | 30.9 | 95 | 95 | 39.5 | 30.9 | 95 | 95 |
| | R-70 | 160 | 210 | 80 | 17.6 | 25.1 | 95 | 95 | 39.5 | 25.1 | 95 | 95 |
| **RG M20 I** | 5.8 | 200 | 260 | 120 | 27.9 | 35.4 | 125 | 125 | 55.2 | 35.4 | 125 | 125 |
| | 8.8 | 200 | 260 | 120 | 27.9 | 51.4 | 125 | 125 | 55.2 | 51.4 | 125 | 125 |
| | R-70 | 200 | 260 | 120 | 27.9 | 39.4 | 125 | 125 | 55.2 | 39.4 | 125 | 125 |

[1)] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.

[2)] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 80 °C). Drill hole cleaning as per specification in the ETA. The factor $\Psi_{sus}$ for sustained load was taken into account with 1.0.

[3)] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).

[4)] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Epoxy mortar FIS EM Plus

The powerful injection mortar for rebar connections and cracked concrete.








Rail fastenings



Rebar connections

## Applications

- Post-installed rebar connections
- Jointers for concrete layers
- Rim beam anchorings
- Seismic applications
- Anchorings in diamond-drilled or in waterfilled drill holes
- Heavy steel constructions
- Silo installations
- Tall shelving
- Sound barriers
- Temporary or removable fixings (with internal threaded anchor RG M I)
- Anchorings in sealing surfaces according to WRL (Water Ressources Law)

## Advantages

- The ETA assessment guarantees a service life of 100 years. The expert report of IEA Stuttgart even confirms a working life up to 120 years and thus underlines the reliability and durability of the FIS EM Plus.
- With the threaded rod FIS A, the loads to be applied can be designed variably by selecting the anchorage depth. The mortar is approved for diamond drilled and water-filled drillholes as well as seismic applications and thus offers safety under extreme conditions.
- In combination with the fischer anchor rods FIS A/RG M (8.8 gvz or stainless steel R) and the matching filling set, the system offers an approval-compliant solution for anchoring dynamic loads.
- In combination with the fischer anchor rods FIS A/RG M (8.8 gvz or stainless steel R) and the matching filling set, the system offers an approval-compliant solution for anchoring dynamic loads.
- For practical use on the building site, FIS EM Plus can be processed at low temperatures down to -5°C.

## Certificates / Features

CE

ETA-17/0979, in concrete
ETA-23/0842 post-installed fasteners in concrete under fatigue cyclic loading

ICC ES ESR-1990 See ICC-ES Evaluation Report at www.icc-es.org

ICC-ES for cracked and uncracked concrete, post-installed rebar connection

aBG
Z-74.8-199, Z-74.8-211
Z-9.1-914

Seismic C2

R 240

120 Years Service life

Dynamic

TR 069

## Building materials

**Approved for anchorings in:**

- Concrete C20/25 to C50/60, cracked and non-cracked
- Sealing surfaces according WRL (Water Ressouces Law)
- Glued laminated or glued solid timber of spruce (Picea abies), fir (Abies alba) or pine (Pinus sylvestris)

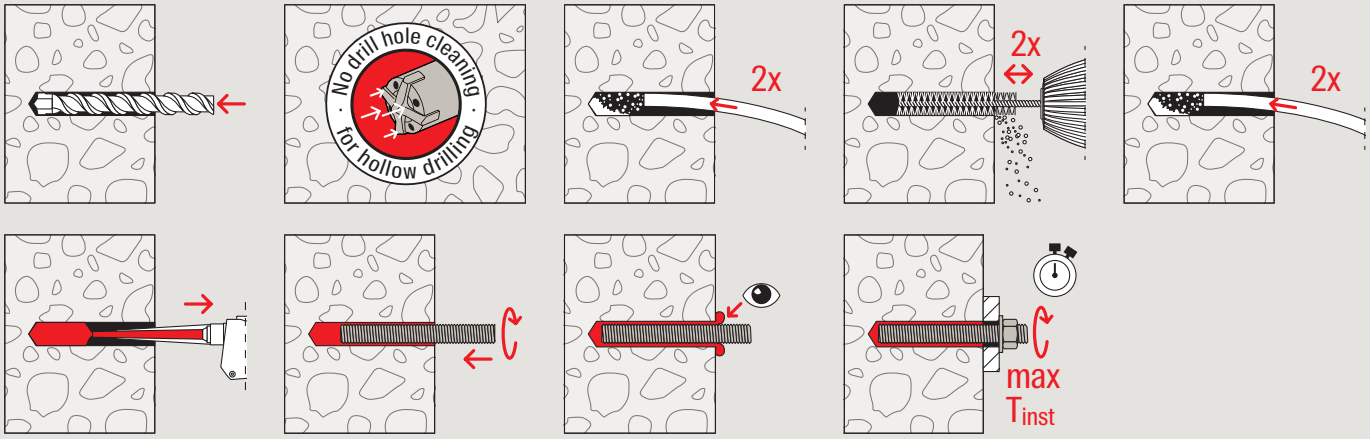
**Also suitable for:**

- Natural stone with dense structure

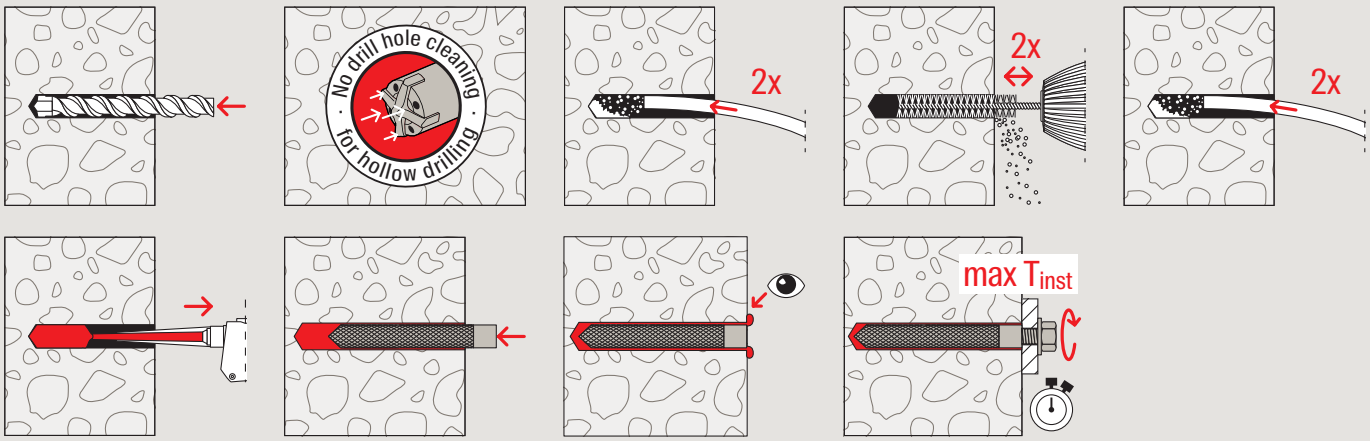
## Functioning

- The epoxy mortar FIS EM Plus combined with the FIS A anchor rod, is suitable for pre-positioned and push-through installation and with the internal threaded anchor RG M I for pre-positioned installation.
- Resin and hardener are stored in two separate chambers and are not mixed and activated until extrusion through the static mixer.
- The mortar is injected bubble-free from the drill hole base.
- The mortar bonds the entire surface of the anchor with the drill hole wall and seals off the drill hole.

## Installation in concrete with FIS EM Plus and FIS A / RG M




## Installation in concrete with FIS EM Plus and RG M I




## Technical data

**Epoxy mortar FIS EM Plus**



FIS EM Plus 300 T | FIS EM Plus 390 S | FIS EM Plus 585 S | FIS EM Plus 1500 S | FIS MR Plus | FIS UMR

| Item | Item no. | Approval ETA | DIBt | ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| FIS EM Plus 300 T | 575314 | ● | ● | ● | AR, EN, PT | 142 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS EM Plus 300 T | 575313 | ● | ● | ● | DE, IT | 142 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS EM Plus 300 T | 575312 | ● | ● | ● | EN, ES, FR | 142 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS EM Plus 390 S | 544154 | ● | ● | ● | EN, FR, NL | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS EM Plus 390 S | 544176 | ● | ● | ● | CS, RO, SK | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS EM Plus 390 S | 544155 | ● | ● | ● | AR, EN, ZH | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS EM Plus 390 S | 544159 | ● | ● | ● | KK, RU, UK | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS EM Plus 390 S | 567987 | ● | ● | ● | EL, HU, KO | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS EM Plus 585 S | 544166 | ● | ● | ● | EL, EN, ES, PT | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| FIS EM Plus 585 S | 544165 | ● | ● | ● | CS, KO, PL, SK | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| FIS EM Plus 585 S | 567989 | ● | ● | ● | DE, FR, NL | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| FIS EM Plus 585 S | 544175 | ● | ● | ● | EN, KO, ZH | 270 | 1 x Cartridge 585 ml 1 x static mixer FIS UMR<br>1 x Extension tube Ø 9 x 250 mm | 1 |
| FIS EM Plus 1500 S | 544167 | ● | ● | ● | DE, EN, ES, FR, IT | 670 | 1 x Cartridge 1500 ml, 2 x static mixer FIS UMR | 1 |

## Technical data

**Epoxy mortar FIS EM Plus**


FIS EM Plus 300 T


FIS EM Plus 390 S


FIS EM Plus 585 S


FIS EM Plus 1500 S


FIS MR Plus


FIS UMR

| Item | Item no. | Approval ETA | Approval DIBt | Approval ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS MR Plus** | **545853** | – | – | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |
| **FIS UMR** | **520593** | – | – | – | – | – | 10 x static mixer FIS UMR for 585 & 1500 ml cartridges | 10 |

## Technical data

**Epoxy mortar FIS EM Plus**



FIS EM Plus 390 S HWK big



FIS EM Plus in bucket

| Item | Item no. | Approval ETA | Approval DIBt | Approval ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS EM Plus 390 S in bucket** | **544172**[1)] | ● | ● | ● | AR, EN, ZH | 180 | 20 x Cartridge 390 ml, 20 x static mixer FIS MR Plus | 1 |
| **FIS EM Plus 390 S HWK big** | **544156**[1)] | ● | ● | ● | EN, FR, KO | 180 | 20 x Cartridge 390 ml, 20 x static mixer FIS MR Plus | 1 |

[1)] Dangerous goods - no express shipping possible.

## Curing times

| FIS EM Plus<br>Temperature in anchoring base [°C] | Maximum processing time $t_{work}$ [min.] | Minimum curing time [1)] $t_{cure}$ [hrs.] |
|---|---|---|
| -5 – 0 | 240 | 200 |
| > 0 – +5 | 150 | 90 |
| > +5 – +10 | 120 | 40 |
| > +10 – +20 | 30 | 18 |
| > +20 – +30 | 14 | 10 |
| > +30 – +40 | 7 | 5 |

1) In wet concrete or water filled holes the curing times must be doubled.

# Loads



**Injection system FIS EM Plus with threaded rod FIS A resp. RG M**

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-17/0979 of 22.04.2024 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material/ surface[3)] | Effective anchorage depth | Minimum member thickness | Maximum installation-torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,max}$ [Nm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] |
| **FIS A M 8** | 5.8 | 60 | 90 | 10 | 5.2 | 6.2 | 40 | 40 | 8.7 | 6.2 | 40 | 40 |
| | 5.8 | 80 | 110 | 10 | 6.9 | 6.2 | 40 | 40 | 8.7 | 6.2 | 40 | 40 |
| | 5.8 | 160 | 190 | 10 | 8.7 | 6.2 | 40 | 40 | 8.7 | 6.2 | 40 | 40 |
| | R-70 | 60 | 90 | 10 | 5.2 | 5.9 | 40 | 40 | 9.8 | 5.9 | 40 | 40 |
| | R-70 | 80 | 110 | 10 | 6.9 | 5.9 | 40 | 40 | 9.8 | 5.9 | 40 | 40 |
| | R-70 | 160 | 190 | 10 | 9.8 | 5.9 | 80 | 40 | 9.8 | 5.9 | 40 | 40 |
| **FIS A M 10** | 5.8 | 60 | 90 | 20 | 7.6 | 9.9 | 45 | 45 | 10.9 | 9.9 | 45 | 45 |
| | 5.8 | 90 | 120 | 20 | 11.4 | 9.9 | 45 | 45 | 13.8 | 9.9 | 45 | 45 |
| | 5.8 | 200 | 230 | 20 | 13.8 | 9.9 | 45 | 45 | 13.8 | 9.9 | 45 | 45 |
| | R-70 | 60 | 90 | 20 | 7.6 | 9.3 | 45 | 45 | 10.9 | 9.3 | 45 | 45 |
| | R-70 | 90 | 120 | 20 | 11.4 | 9.3 | 45 | 45 | 15.5 | 9.3 | 45 | 45 |
| | R-70 | 200 | 230 | 20 | 15.5 | 9.3 | 45 | 45 | 15.5 | 9.3 | 45 | 45 |
| **FIS A M 12** | 5.8 | 70 | 100 | 40 | 9.6 | 14.4 | 55 | 45 | 13.7 | 14.4 | 55 | 45 |
| | 5.8 | 110 | 140 | 40 | 18.8 | 14.4 | 55 | 45 | 20.0 | 14.4 | 55 | 45 |
| | 5.8 | 240 | 270 | 40 | 20.0 | 14.4 | 55 | 45 | 20.0 | 14.4 | 55 | 45 |
| | R-70 | 70 | 100 | 40 | 9.6 | 13.5 | 55 | 45 | 13.7 | 13.5 | 55 | 45 |
| | R-70 | 110 | 140 | 40 | 18.8 | 13.5 | 55 | 45 | 22.5 | 13.5 | 55 | 45 |
| | R-70 | 240 | 270 | 40 | 22.5 | 13.5 | 55 | 45 | 22.5 | 13.5 | 55 | 45 |
| **FIS A M 16** | 5.8 | 80 | 120 | 60 | 11.7 | 23.5 | 65 | 50 | 16.8 | 26.9 | 65 | 50 |
| | 5.8 | 125 | 170 | 60 | 22.9 | 26.9 | 65 | 50 | 32.7 | 26.9 | 65 | 50 |
| | 5.8 | 320 | 360 | 60 | 37.4 | 26.9 | 65 | 50 | 37.4 | 26.9 | 65 | 50 |
| | R-70 | 80 | 120 | 60 | 11.7 | 23.5 | 65 | 50 | 16.8 | 25.1 | 65 | 50 |
| | R-70 | 125 | 170 | 60 | 22.9 | 25.1 | 65 | 50 | 32.7 | 25.1 | 65 | 50 |
| | R-70 | 320 | 360 | 60 | 42.0 | 25.1 | 65 | 50 | 42.0 | 25.1 | 65 | 50 |
| **FIS A M 20** | 5.8 | 90 | 140 | 120 | 14.0 | 28.0 | 85 | 55 | 20.0 | 40.0 | 85 | 55 |
| | 5.8 | 170 | 220 | 120 | 36.3 | 42.0 | 85 | 55 | 51.9 | 42.0 | 85 | 55 |
| | 5.8 | 400 | 450 | 120 | 58.3 | 42.0 | 85 | 55 | 58.3 | 42.0 | 85 | 55 |
| | R-70 | 90 | 140 | 120 | 14.0 | 28.0 | 85 | 55 | 20.0 | 39.2 | 85 | 55 |
| | R-70 | 170 | 220 | 120 | 36.3 | 39.2 | 85 | 55 | 51.9 | 39.2 | 85 | 55 |
| | R-70 | 400 | 450 | 120 | 65.5 | 39.2 | 85 | 55 | 65.5 | 39.2 | 85 | 55 |
| **FIS A M 24** | 5.8 | 96 | 160 | 150 | 15.4 | 30.8 | 105 | 60 | 22.0 | 44.1 | 105 | 60 |
| | 5.8 | 210 | 270 | 150 | 49.9 | 60.5 | 105 | 60 | 71.3 | 60.5 | 105 | 60 |
| | 5.8 | 480 | 540 | 150 | 84.0 | 60.5 | 105 | 60 | 84.0 | 60.5 | 105 | 60 |
| | R-70 | 96 | 160 | 150 | 15.4 | 30.8 | 105 | 60 | 22.0 | 44.1 | 105 | 60 |
| | R-70 | 210 | 270 | 150 | 49.9 | 56.5 | 105 | 60 | 71.3 | 56.5 | 105 | 60 |
| | R-70 | 480 | 540 | 150 | 94.4 | 56.5 | 105 | 60 | 94.4 | 56.5 | 105 | 60 |
| **FIS A M 30** | 5.8 | 120 | 190 | 300 | 21.6 | 43.1 | 140 | 80 | 30.8 | 61.6 | 140 | 80 |
| | 5.8 | 280 | 350 | 300 | 76.8 | 96.2 | 140 | 80 | 109.8 | 96.2 | 140 | 80 |
| | 5.8 | 600 | 670 | 300 | 133.6 | 96.2 | 140 | 80 | 133.6 | 96.2 | 140 | 80 |
| | R-70 | 120 | 190 | 300 | 21.6 | 43.1 | 140 | 80 | 30.8 | 61.6 | 140 | 80 |
| | R-70 | 280 | 350 | 300 | 76.8 | 89.9 | 140 | 80 | 109.8 | 89.9 | 140 | 80 |
| | R-70 | 600 | 670 | 300 | 150.0 | 89.9 | 140 | 80 | 150.0 | 89.9 | 140 | 80 |

[1)] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.

[2)] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 72 °C). Higher loads are possible at lower temperatures. Drilling method and borehole cleaning according to ETA specifications. The factor $\Psi_{sus}$ for sustained load was taken into account with 1.0.

[3)] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).

[4)] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Loads



**Injection system FIS EM Plus with internal threaded anchor RG M I**

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-17/0979 of 22.04.2024 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Screw material[3] | Effective anchorage depth | Minimum member thickness | Maximum installation-torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst.max}$ [Nm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] |
| **RG M8 I** | 5.8 | 90 | 120 | 10 | 8.7 | 6.2 | 55 | 55 | 8.7 | 6.2 | 55 | 55 |
| | 8.8 | 90 | 120 | 10 | 11.3 | 8.3 | 55 | 55 | 13.9 | 8.3 | 55 | 55 |
| | R-70 | 90 | 120 | 10 | 9.8 | 5.9 | 55 | 55 | 9.8 | 5.9 | 55 | 55 |
| **RG M10 I** | 5.8 | 90 | 130 | 20 | 12.9 | 9.9 | 65 | 65 | 13.8 | 9.9 | 65 | 65 |
| | 8.8 | 90 | 130 | 20 | 12.9 | 13.3 | 65 | 65 | 20.0 | 13.3 | 65 | 65 |
| | R-70 | 90 | 130 | 20 | 12.9 | 9.3 | 65 | 65 | 15.5 | 9.3 | 65 | 65 |
| **RG M12 I** | 5.8 | 125 | 170 | 40 | 20.0 | 14.4 | 75 | 75 | 20.0 | 14.4 | 75 | 75 |
| | 8.8 | 125 | 170 | 40 | 20.2 | 19.3 | 75 | 75 | 32.1 | 19.3 | 75 | 75 |
| | R-70 | 125 | 170 | 40 | 20.2 | 13.5 | 75 | 75 | 22.5 | 13.5 | 75 | 75 |
| **RG M16 I** | 5.8 | 160 | 210 | 80 | 33.2 | 26.9 | 95 | 95 | 37.3 | 26.9 | 95 | 95 |
| | 8.8 | 160 | 210 | 80 | 33.2 | 35.9 | 95 | 95 | 47.4 | 35.9 | 95 | 95 |
| | R-70 | 160 | 210 | 80 | 33.2 | 25.1 | 95 | 95 | 41.9 | 25.1 | 95 | 95 |
| **RG M20 I** | 5.8 | 200 | 260 | 120 | 46.4 | 42.0 | 125 | 125 | 58.3 | 42.0 | 125 | 125 |
| | 8.8 | 200 | 260 | 120 | 46.4 | 56.0 | 125 | 125 | 66.3 | 56.0 | 125 | 125 |
| | R-70 | 200 | 260 | 120 | 46.4 | 39.2 | 125 | 125 | 65.4 | 39.2 | 125 | 125 |

[1)] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered. As a single anchor counts e.g. an anchor with a spacing s ≥ 3 x $h_{ef}$ and an edge distance c ≥ 1.5 x $h_{ef}$. Accurate data see ETA.

[2)] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 72 °C). Higher loads are possible at lower temperatures. Drilling method and borehole cleaning according to ETA specifications. The factor $\Psi_{sus}$ for sustained load was taken into account with 1.0.

[3)] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).

[4)] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Loads



**Injection system FIS EM Plus dynamic with threaded rod FIS A resp. RG M**

Design values for cyclic fatigue loading[1] of a single anchor in cracked or non-cracked normal concrete of strength class C20/25[2]
For the design the complete current assessment ETA-23/0842 of 11.06.2024 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material / surface | Effective anchorage depth | Minimum member thickness | Installation torque | Design values of tension ($\Delta N_{Ed,max}$) and shear loads ($\Delta V_{Ed,max}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Design values of tension ($\Delta N_{Ed,max}$) and shear loads ($\Delta V_{Ed,max}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst}$ [Nm] | $\Delta N_{Ed,max}$ [3] [kN] | $\Delta V_{Ed,max}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] | $\Delta N_{Ed,max}$ [3] [kN] | $\Delta V_{Ed,max}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] |
| **FIS A M 12** | 8.8 | 70 | 100 | 40 | 3.8 | 2.0 | 55 | 55 | 4.5 | 2.0 | 55 | 55 |
| | 8.8 | 110 | 140 | 40 | 4.5 | 2.0 | 55 | 55 | 4.5 | 2.0 | 55 | 55 |
| | 8.8 | 240 | 270 | 40 | 4.5 | 2.0 | 55 | 55 | 4.5 | 2.0 | 55 | 55 |
| | R-70 | 70 | 100 | 40 | 3.8 | 2.6 | 55 | 55 | 4.9 | 2.6 | 55 | 55 |
| | R-70 | 110 | 140 | 40 | 4.9 | 2.6 | 55 | 55 | 4.9 | 2.6 | 55 | 55 |
| | R-70 | 240 | 270 | 40 | 4.9 | 2.6 | 55 | 55 | 4.9 | 2.6 | 55 | 55 |
| **FIS A M 16** | 8.8 | 80 | 120 | 60 | 5.7 | 3.7 | 65 | 65 | 8.4 | 3.7 | 65 | 65 |
| | 8.8 | 125 | 170 | 60 | 8.4 | 3.7 | 65 | 65 | 8.4 | 3.7 | 65 | 65 |
| | 8.8 | 320 | 360 | 60 | 8.4 | 3.7 | 65 | 65 | 8.4 | 3.7 | 65 | 65 |
| | R-70 | 80 | 120 | 60 | 5.7 | 4.9 | 65 | 65 | 9.2 | 4.9 | 65 | 65 |
| | R-70 | 125 | 170 | 60 | 9.2 | 4.9 | 65 | 65 | 9.2 | 4.9 | 65 | 65 |
| | R-70 | 320 | 360 | 60 | 9.2 | 4.9 | 65 | 65 | 9.2 | 4.9 | 65 | 65 |
| **FIS A M 20** | R-70 | 90 | 140 | 120 | 8.1 | 7.6 | 85 | 85 | 14.0 | 7.6 | 85 | 85 |
| | R-70 | 170 | 220 | 120 | 14.3 | 7.6 | 85 | 85 | 14.3 | 7.6 | 85 | 85 |
| | R-70 | 400 | 450 | 120 | 14.3 | 7.6 | 85 | 85 | 14.3 | 7.6 | 85 | 85 |
| **FIS A M 24** | R-70 | 96 | 160 | 150 | 9.9 | 11.0 | 105 | 105 | 15.4 | 11.0 | 105 | 105 |
| | R-70 | 210 | 270 | 150 | 20.6 | 11.0 | 105 | 105 | 20.6 | 11.0 | 105 | 105 |
| | R-70 | 480 | 540 | 150 | 20.6 | 11.0 | 105 | 105 | 20.6 | 11.0 | 105 | 105 |

[1] The design values of the cyclic fatigue loading apply for load cycles > $10^8$ in accordance with design method I acc. to TR061 – for unknown static lower load. If the static lower load is known and / or for lower number of load cycles higher load values are possible. The partial safety factors as regulated in the design standard are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$. The given load values apply for anchorages in dry and wet concrete and temperatures in the base material up to 50 °C (resp. short-term up to 72 °C). Higher loads are possible at lower temperatures. Drilling method and borehole cleaning according to ETA specifications.

[2] For higher concrete strength classes up to C50/60 higher permissible loads may be possible, see assessment. The concrete is assumed to be standard-reinforced.

[3] In the case of combinations of tensile loads, shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups) the design must be carried out in accordance with the provisions of the complete ETA. We recommend using our anchor design software C-FIX.

# Loads



**Injection system FIS EM Plus dynamic with threaded rod FIS A resp. RG M**

Design values for cyclic fatigue loading[1] of a single anchor in cracked or non-cracked normal concrete of strength class C20/25[2]
For the design the complete current assessment ETA-23/0842 of 11.06.2024 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material / surface | Effective anchorage depth | Minimum member thickness | Installation torque | Design values of tension ($\Delta N_{Ed,max}$) and shear loads ($\Delta V_{Ed,max}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Design values of tension ($\Delta N_{Ed,max}$) and shear loads ($\Delta V_{Ed,max}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst}$ [Nm] | $\Delta N_{Ed,max}$ [3] [kN] | $\Delta V_{Ed,max}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] | $\Delta N_{Ed,max}$ [3] [kN] | $\Delta V_{Ed,max}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] |
| **FIS A M 12** | 8.8 | 70 | 100 | 40 | 3.8 | 2.0 | 55 | 55 | 4.5 | 2.0 | 55 | 55 |
| | 8.8 | 110 | 140 | 40 | 4.5 | 2.0 | 55 | 55 | 4.5 | 2.0 | 55 | 55 |
| | 8.8 | 240 | 270 | 40 | 4.5 | 2.0 | 55 | 55 | 4.5 | 2.0 | 55 | 55 |
| | R-70 | 70 | 100 | 40 | 3.8 | 2.6 | 55 | 55 | 4.9 | 2.6 | 55 | 55 |
| | R-70 | 110 | 140 | 40 | 4.9 | 2.6 | 55 | 55 | 4.9 | 2.6 | 55 | 55 |
| | R-70 | 240 | 270 | 40 | 4.9 | 2.6 | 55 | 55 | 4.9 | 2.6 | 55 | 55 |
| **FIS A M 16** | 8.8 | 80 | 120 | 60 | 5.7 | 3.7 | 65 | 65 | 8.4 | 3.7 | 65 | 65 |
| | 8.8 | 125 | 170 | 60 | 8.4 | 3.7 | 65 | 65 | 8.4 | 3.7 | 65 | 65 |
| | 8.8 | 320 | 360 | 60 | 8.4 | 3.7 | 65 | 65 | 8.4 | 3.7 | 65 | 65 |
| | R-70 | 80 | 120 | 60 | 5.7 | 4.9 | 65 | 65 | 9.2 | 4.9 | 65 | 65 |
| | R-70 | 125 | 170 | 60 | 9.2 | 4.9 | 65 | 65 | 9.2 | 4.9 | 65 | 65 |
| | R-70 | 320 | 360 | 60 | 9.2 | 4.9 | 65 | 65 | 9.2 | 4.9 | 65 | 65 |
| **FIS A M 20** | R-70 | 90 | 140 | 120 | 8.1 | 7.6 | 85 | 85 | 14.0 | 7.6 | 85 | 85 |
| | R-70 | 170 | 220 | 120 | 14.3 | 7.6 | 85 | 85 | 14.3 | 7.6 | 85 | 85 |
| | R-70 | 400 | 450 | 120 | 14.3 | 7.6 | 85 | 85 | 14.3 | 7.6 | 85 | 85 |
| **FIS A M 24** | R-70 | 96 | 160 | 150 | 9.9 | 11.0 | 105 | 105 | 15.4 | 11.0 | 105 | 105 |
| | R-70 | 210 | 270 | 150 | 20.6 | 11.0 | 105 | 105 | 20.6 | 11.0 | 105 | 105 |
| | R-70 | 480 | 540 | 150 | 20.6 | 11.0 | 105 | 105 | 20.6 | 11.0 | 105 | 105 |

[1] The design values of the cyclic fatigue loading apply for load cycles > $10^8$ in accordance with design method I acc. to TR061 – for unknown static lower load. If the static lower load is known and / or for lower number of load cycles higher load values are possible. The partial safety factors as regulated in the design standard are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$. The given load values apply for anchorages in dry and wet concrete and temperatures in the base material up to 50 °C (resp. short-term up to 72 °C). Higher loads are possible at lower temperatures. Drilling method and borehole cleaning according to ETA specifications.

[2] For higher concrete strength classes up to C50/60 higher permissible loads may be possible, see assessment. The concrete is assumed to be standard-reinforced.

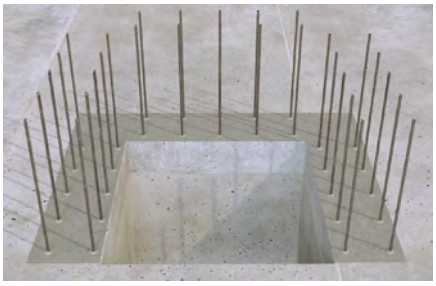
[3] In the case of combinations of tensile loads, shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups) the design must be carried out in accordance with the provisions of the complete ETA. We recommend using our anchor design software C-FIX.

# Epoxy mortar FIS EB II

The Epoxy mortar for standard applications in concrete.





Post-installed rebar connections



Tall shelving

## Applications

- Heavy steel constructions
- Consoles
- Silo installations
- Tall shelving
- Post-installed rebar connections

## Advantages

- The injection mortar FIS EB II has ETA assessments for anchorings in cracked concrete and for post-installed rebar connections.
- Due to the seismic approval for performance category C1 and C2, the FIS EB II can be safely used in earthquake regions.
- FIS EB II is the reliable system for fixing heavy loads indoors and outdoors.
- Due to the variable anchoring depths, the epoxy resin mortar is very versatile.
- The long processing time of FIS EB II is particularly suitable for applications in large and deep drillholes.

## Certificates / Features

CE

Seismic C2

**ETA-21/0469, for cracked concrete**
**ETA-21/0470, for post-installed rebar connections**

R 120

## Building materials

**Approved for anchorings in:**

- Concrete C20/25 to C50/60, cracked and non-cracked

## Functioning

- The epoxy mortar FIS EB II in combination with the anchor rod FIS A and RG M is suitable for pre-positioned and push-through installation.
- Resin and hardener are stored in two separate chambers and are not mixed and activated until extrusion through the static mixer.
- The mortar is injected bubble-free from the drill hole base.
- The mortar bonds the entire surface of the anchor rod with the drill hole wall and seals off the drill hole.
- The anchor rod is set manually by slightly rotating it until it reaches the drill hole base.
- During push-through installation, the annular gap between the anchor rod and the attachment is filled with FIS EB II.

**For use with:**

Threaded rod FIS A Page 133



**For use with:**

Battery dispenser FIS DB S Pro Page 241

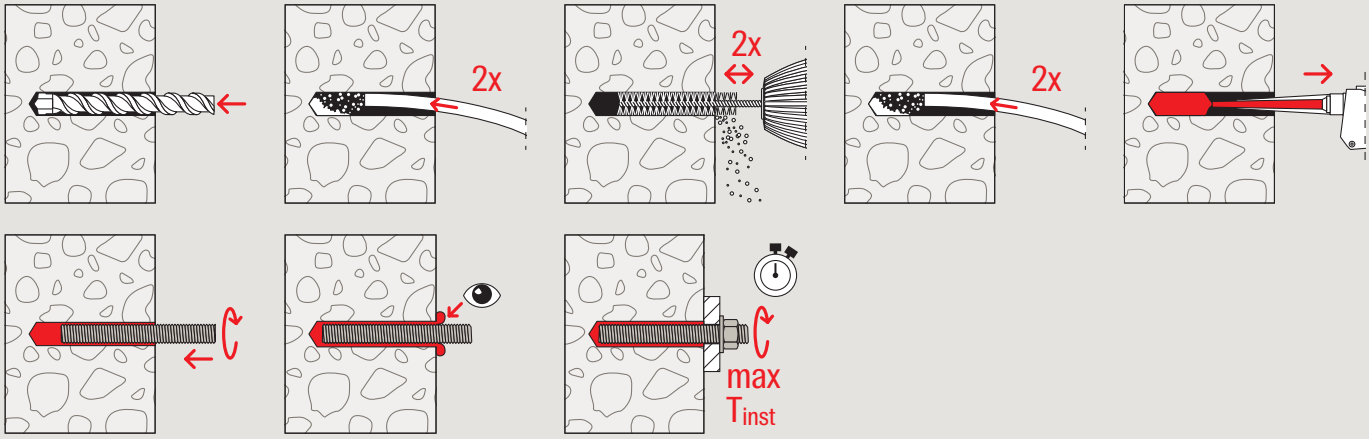


**For use with:**

Accessories Page 250



## Installation in concrete with FIS EB II and FIS A / RG M




3

## Technical data

**Epoxy mortar FIS EB II**


FIS EB II 390 S


FIS EB II 585 S



FIS EB II 390 S in bucket


FIS MR Plus


FIS UMR

| Item | Item no. | Approval ETA | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FIS EB II 390 S** | **562629** | ● | EN, ES, PT | 190 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS EB II 390 S** | **562630** | ● | EN, RU, TR | 190 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS EB II 390 S in bucket** | **563265** | ● | EN, ES, PT | 190 | 20 x Cartridge 390 ml, 20 x static mixer FIS MR Plus | 1 |
| **FIS EB II 585 S** | **562632** | ● | EN, ES, PT | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| **FIS UMR** | **520593** | – | – | – | 10 x static mixer FIS UMR for 585 & 1500 ml cartridges | 10 |
| **FIS MR Plus** | **545853** | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |

## Processing and curing times

| **FIS EB II** Temperatures at anchoring base [°C] | Maximum processing time $t_{work}$ [min.] | Minimum curing time $t_{cure}$ [hrs.] |
|---|---|---|
| +5 – +10 | 180 | 96 |
| > +10 – +15 | 90 | 60 |
| > +15 – +20 | 60 | 36 |
| > +20 – +30 | 30 | 24 |
| > +30 – +40 | 15 | 12 |

# Loads



**Injection system FIS EB II with threaded rod FIS A resp. RG M**

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-21/0469 of 25.07.2023 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material / surface[3)] | Effective anchorage depth | Minimum member thickness | Maximum installation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,max}$ [Nm] | $N_{perm}$ 4) [kN] | $V_{perm}$ 4) [kN] | $s_{min}$ 4) [mm] | $c_{min}$ 4) [mm] | $N_{perm}$ 4) [kN] | $V_{perm}$ 4) [kN] | $s_{min}$ 4) [mm] | $c_{min}$ 4) [mm] |
| **FIS A M 8** | 5.8 | 60 | 100 | 10 | 3.6 | 6.3 | 40 | 40 | 5.4 | 6.3 | 40 | 40 |
| | 5.8 | 80 | 110 | 10 | 4.8 | 6.3 | 40 | 40 | 7.2 | 6.3 | 40 | 40 |
| | 5.8 | 160 | 190 | 10 | 9.0 | 6.3 | 40 | 40 | 9.0 | 6.3 | 40 | 40 |
| | R-70 | 60 | 100 | 10 | 3.6 | 6.0 | 40 | 40 | 5.4 | 6.0 | 40 | 40 |
| | R-70 | 80 | 110 | 10 | 4.8 | 6.0 | 40 | 40 | 7.2 | 6.0 | 40 | 40 |
| | R-70 | 160 | 190 | 10 | 9.6 | 6.0 | 40 | 40 | 9.9 | 6.0 | 40 | 40 |
| **FIS A M 10** | 5.8 | 60 | 100 | 20 | 4.5 | 9.7 | 45 | 45 | 6.7 | 9.7 | 45 | 45 |
| | 5.8 | 90 | 120 | 20 | 6.7 | 9.7 | 45 | 45 | 10.1 | 9.7 | 45 | 45 |
| | 5.8 | 200 | 230 | 20 | 13.8 | 9.7 | 45 | 45 | 13.8 | 9.7 | 45 | 45 |
| | R-70 | 60 | 100 | 20 | 4.5 | 9.2 | 45 | 45 | 6.7 | 9.2 | 45 | 45 |
| | R-70 | 90 | 120 | 20 | 6.7 | 9.2 | 45 | 45 | 10.1 | 9.2 | 45 | 45 |
| | R-70 | 200 | 230 | 20 | 15.0 | 9.2 | 45 | 45 | 15.7 | 9.2 | 45 | 45 |
| **FIS A M 12** | 5.8 | 70 | 100 | 40 | 6.3 | 14.3 | 55 | 55 | 9.4 | 14.3 | 55 | 55 |
| | 5.8 | 110 | 140 | 40 | 9.9 | 14.3 | 55 | 55 | 14.8 | 14.3 | 55 | 55 |
| | 5.8 | 240 | 270 | 40 | 20.5 | 14.3 | 55 | 55 | 20.5 | 14.3 | 55 | 55 |
| | R-70 | 70 | 100 | 40 | 6.3 | 13.7 | 55 | 55 | 9.4 | 13.7 | 55 | 55 |
| | R-70 | 110 | 140 | 40 | 9.9 | 13.7 | 55 | 55 | 14.8 | 13.7 | 55 | 55 |
| | R-70 | 240 | 270 | 40 | 21.5 | 13.7 | 55 | 55 | 22.5 | 13.7 | 55 | 55 |
| **FIS A M 16** | 5.8 | 80 | 120 | 60 | 8.8 | 21.1 | 65 | 65 | 14.0 | 26.9 | 65 | 65 |
| | 5.8 | 125 | 170 | 60 | 13.7 | 26.9 | 65 | 65 | 22.4 | 26.9 | 65 | 65 |
| | 5.8 | 320 | 360 | 60 | 35.1 | 26.9 | 65 | 65 | 37.6 | 26.9 | 65 | 65 |
| | R-70 | 80 | 120 | 60 | 8.8 | 21.1 | 65 | 65 | 14.0 | 25.2 | 65 | 65 |
| | R-70 | 125 | 170 | 60 | 13.7 | 25.2 | 65 | 65 | 22.4 | 25.2 | 65 | 65 |
| | R-70 | 320 | 360 | 60 | 35.1 | 25.2 | 65 | 65 | 42.0 | 25.2 | 65 | 65 |
| **FIS A M 20** | 5.8 | 90 | 140 | 120 | 11.7 | 28.0 | 85 | 85 | 16.7 | 40.0 | 85 | 85 |
| | 5.8 | 170 | 220 | 120 | 23.3 | 42.3 | 85 | 85 | 38.1 | 42.3 | 85 | 85 |
| | 5.8 | 400 | 450 | 120 | 54.9 | 42.3 | 85 | 85 | 58.6 | 42.3 | 85 | 85 |
| | R-70 | 90 | 140 | 120 | 11.7 | 28.0 | 85 | 85 | 16.7 | 39.4 | 85 | 85 |
| | R-70 | 170 | 220 | 120 | 23.3 | 39.4 | 85 | 85 | 38.1 | 39.4 | 85 | 85 |
| | R-70 | 400 | 450 | 120 | 54.9 | 39.4 | 85 | 85 | 65.7 | 39.4 | 85 | 85 |
| **FIS A M 24** | 5.8 | 96 | 160 | 150 | 12.9 | 30.8 | 105 | 105 | 18.4 | 44.1 | 105 | 105 |
| | 5.8 | 210 | 270 | 150 | 34.6 | 60.6 | 105 | 105 | 53.4 | 60.6 | 105 | 105 |
| | 5.8 | 480 | 540 | 150 | 79.0 | 60.6 | 105 | 105 | 84.3 | 60.6 | 105 | 105 |
| | R-70 | 96 | 160 | 150 | 12.9 | 30.8 | 105 | 105 | 18.4 | 44.1 | 105 | 105 |
| | R-70 | 210 | 270 | 150 | 34.6 | 56.8 | 105 | 105 | 53.4 | 56.8 | 105 | 105 |
| | R-70 | 480 | 540 | 150 | 79.0 | 56.8 | 105 | 105 | 94.3 | 56.8 | 105 | 105 |
| **FIS A M 30** | 5.8 | 120 | 190 | 300 | 18.0 | 43.1 | 140 | 140 | 25.7 | 61.6 | 140 | 140 |
| | 5.8 | 280 | 350 | 300 | 52.4 | 96.0 | 140 | 140 | 78.5 | 96.0 | 140 | 140 |
| | 5.8 | 600 | 670 | 300 | 112.2 | 96.0 | 140 | 140 | 133.8 | 96.0 | 140 | 140 |
| | R-70 | 120 | 190 | 300 | 18.0 | 43.1 | 140 | 140 | 25.7 | 61.6 | 140 | 140 |
| | R-70 | 280 | 350 | 300 | 52.4 | 90.2 | 140 | 140 | 78.5 | 90.2 | 140 | 140 |
| | R-70 | 600 | 670 | 300 | 112.2 | 90.2 | 140 | 140 | 150.1 | 90.2 | 140 | 140 |

[1)] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.

[2)] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 72 °C). Higher loads are possible at lower temperatures. Drill hole cleaning as per specification in the ETA. The factor $\Psi_{sus}$ for sustained load was taken into account with 1.0.

[3)] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).

[4)] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Epoxy mortar FIS EP

The cost-efficient epoxy mortar for applications in concrete.








Steel girders



Column bases

## Applications

- Columns
- Beams
- Shear dowels
- Starter bars
- Polders

## Advantages

- FIS EP is the economical epoxy resin mortar for applications in concrete that do not require approval.
- The epoxy mortar FIS EP can also be used in cracked concrete for construction site convenient installation.
- With the anchor rod FIS A, the loads to be introduced can be selected variably by choosing the anchorage depth.
- FIS EP can be used for smooth installation with the standard fischer accessories.

## Building materials

**Suitable for:**

- Concrete C20/25 to C50/60, non-cracked and cracked

## Functioning

- The epoxy mortar FIS EP combined with the FIS A anchor rod is suitable for pre-positioned and push-through installation.
- Resin and hardener are stored in two separate chambers, thus are not mixed and activated until extrusion through the static mixer.
- The mortar bonds the entire surface of the anchor with the drill hole wall and seals off the drill hole.
- The anchor is set manually by slightly rotating it until the anchor reaches the drill hole base.
- During push-through installation, the annular gap is filled with FIS EP.

**For use with:**

Battery dispenser FIS DB S Pro
Page 241

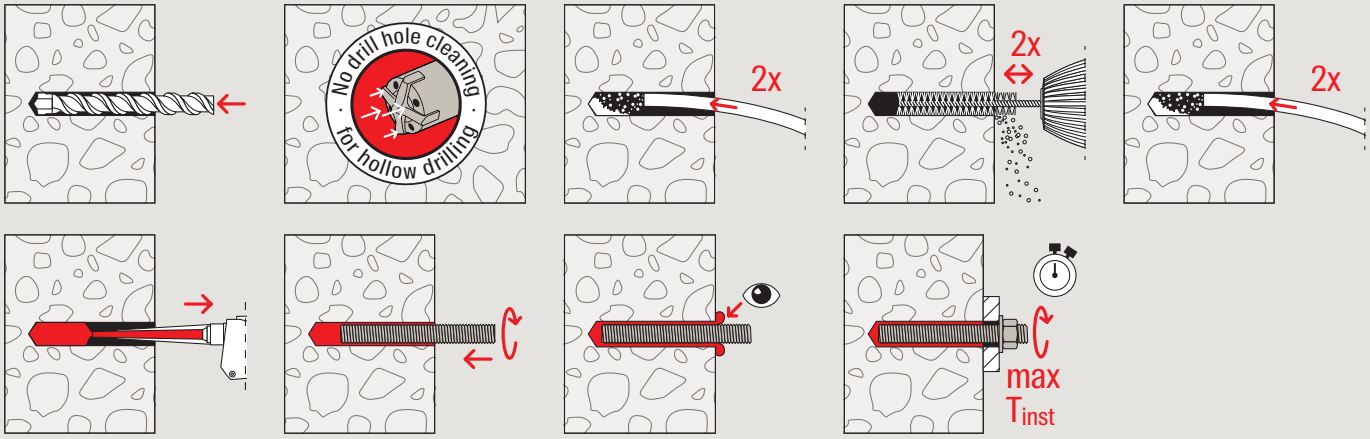


**For use with:**

Threaded rod FIS A
Page 133



## Installation in concrete with FIS EP and FIS A






## Technical data

**Epoxy mortar FIS EP**



FIS EP 390 S



FIS EP 585 S

| Item | Item no. | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|
| **FIS EP 390 S** | **553526** | AR, EN, ES, PT | 180 | 1 x Cartridge FIS EP 390 ml, 1 x static mixer FIS MR Plus | 1 |
| **FIS EP 585 S** | **553514** | EN, ES, PT | 270 | 1 x Cartridge FIS EP 585 ml, 1 x static mixer FIS MR Plus | 1 |
| **FIS MR Plus** | **545853** | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |
| **FIS UMR** | **520593** | – | – | 10 x static mixer FIS UMR for 585 & 1500 ml cartridges | 10 |

## Curing times

| FIS EP<br>Temperature at anchoring base<br>[°C] | Maximum processing time<br>$t_{work}$<br>[min.] | Minimum curing time [1]<br>$t_{cure}$<br>[hrs.] |
|---|---|---|
| +5 – +10 | 180 | 96 |
| >+10 – +15 | 90 | 48 |
| >+15 – +20 | 60 | 36 |
| >+20 – +30 | 30 | 24 |
| >+30 – +40 | 15 | 12 |

1) In wet concrete or water filled holes the curing times must be doubled.

# Loads



**Injection system FIS EP with threaded rod FIS A resp. RGM**

Recommended loads of a single anchor[1)2)] in normal concrete of strength class C20/25.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material / surface[3)] | Effective anchorage depth | Minimum member thickness | Maximum installation torque | Recommended tension- ($N_{rec}$) and shear loads ($V_{rec}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Recommended tension- ($N_{rec}$) and shear loads ($V_{rec}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,max}$ [Nm] | $N_{rec}$[4)] [kN] | $V_{rec}$[4)] [kN] | $s_{min}$[4)] [mm] | $c_{min}$[4)] [mm] | $N_{rec}$[4)] [kN] | $V_{rec}$[4)] [kN] | $s_{min}$[4)] [mm] | $c_{min}$[4)] [mm] |
| **FIS A M 8** | 5.8 | 60 | 100 | 10 | - | - | - | - | 5.4 | 5.1 | 40 | 40 |
| | 5.8 | 160 | 190 | 10 | - | - | - | - | 9.0 | 5.1 | 40 | 40 |
| | R-70 | 60 | 100 | 10 | - | - | - | - | 5.4 | 6.0 | 40 | 40 |
| | R-70 | 160 | 190 | 10 | - | - | - | - | 9.9 | 6.0 | 40 | 40 |
| **FIS A M 10** | 5.8 | 60 | 100 | 20 | - | - | - | - | 6.4 | 8.6 | 45 | 45 |
| | 5.8 | 200 | 230 | 20 | - | - | - | - | 13.8 | 8.6 | 45 | 45 |
| | R-70 | 60 | 100 | 20 | - | - | - | - | 6.4 | 9.2 | 45 | 45 |
| | R-70 | 200 | 230 | 20 | - | - | - | - | 15.7 | 9.2 | 45 | 45 |
| **FIS A M 12** | 5.8 | 70 | 100 | 40 | 4.2 | 10.1 | 55 | 55 | 8.4 | 12.0 | 55 | 55 |
| | 5.8 | 240 | 270 | 40 | 14.4 | 12.0 | 55 | 55 | 20.5 | 12.0 | 55 | 55 |
| | R-70 | 70 | 100 | 40 | 4.2 | 10.1 | 55 | 55 | 8.4 | 13.7 | 55 | 55 |
| | R-70 | 240 | 270 | 40 | 14.4 | 13.7 | 55 | 55 | 22.5 | 13.7 | 55 | 55 |
| **FIS A M 16** | 5.8 | 80 | 120 | 60 | 6.4 | 15.3 | 65 | 65 | 12.0 | 22.3 | 65 | 65 |
| | 5.8 | 320 | 360 | 60 | 25.5 | 22.3 | 65 | 65 | 37.6 | 22.3 | 65 | 65 |
| | R-70 | 80 | 120 | 60 | 6.4 | 15.3 | 65 | 65 | 12.0 | 25.2 | 65 | 65 |
| | R-70 | 320 | 360 | 60 | 25.5 | 25.2 | 65 | 65 | 42.0 | 25.2 | 65 | 65 |
| **FIS A M 20** | 5.8 | 90 | 140 | 120 | 9.0 | 21.5 | 85 | 85 | 15.7 | 34.9 | 85 | 85 |
| | 5.8 | 400 | 450 | 120 | 39.9 | 34.9 | 85 | 85 | 58.6 | 34.9 | 85 | 85 |
| | R-70 | 90 | 140 | 120 | 9.0 | 21.5 | 85 | 85 | 15.7 | 37.7 | 85 | 85 |
| | R-70 | 400 | 450 | 120 | 39.9 | 39.4 | 85 | 85 | 65.7 | 39.4 | 85 | 85 |
| **FIS A M 24** | 5.8 | 96 | 160 | 150 | - | - | - | - | 17.2 | 41.4 | 105 | 105 |
| | 5.8 | 480 | 540 | 150 | - | - | - | - | 84.3 | 50.9 | 105 | 105 |
| | R-70 | 96 | 160 | 150 | - | - | - | - | 17.2 | 41.4 | 105 | 105 |
| | R-70 | 480 | 540 | 150 | - | - | - | - | 86.2 | 56.8 | 105 | 105 |
| **FIS A M 30** | 5.8 | 120 | 190 | 300 | - | - | - | - | 24.7 | 59.2 | 140 | 140 |
| | 5.8 | 600 | 670 | 300 | - | - | - | - | 123.4 | 80.6 | 140 | 140 |
| | R-70 | 120 | 190 | 300 | - | - | - | - | 24.7 | 59.2 | 140 | 140 |
| | R-70 | 600 | 670 | 300 | - | - | - | - | 123.4 | 90.2 | 140 | 140 |

1) Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance and a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As an single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$.

2) The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 43 °C (resp. short term up to 55 °C). Drill hole cleaning according to installation instructions. The factor $\Psi_{sus}$ for sustained load was taken into account with 1.0.

3) For dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R). Further steel grades by request.

4) In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance the provisions of the EN 1992-4:2018.

# Injection mortar FIS V Plus

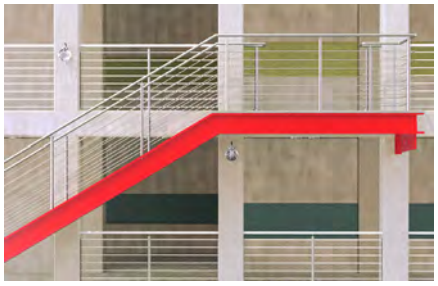
The powerful universal mortar for concrete and masonry.








Rescue ladders



Steel constructions

## Applications

- Steelwork constructions
- Timber constructions
- Guard rails
- Façades
- Staircases
- Steel brackets
- Machines
- Masts
- Awnings
- Canopies
- Gates
- Consoles
- Pipelines
- Gratings
- Satellite antennas

## Advantages

- The FIS V Plus injection mortar has numerous system approvals, such as in cracked and non-cracked concrete, masonry and for special applications.
- The ETA assessment for a service life of 100 years offers permanent safety for all applications.
- The approved use in water-filled drill holes enables a wide range of applications, even under harsh environmental conditions.
- FIS VW Plus High Speed has a significantly shorter curing time than FISV Plus, thus also ensuring swift work progress even at low temperatures.
- Due to the possible installation temperature of -10° to 40°C the universal mortar can be applied all year long.
- FIS VS Plus Low Speed with extended gelling time prevents premature curing of the mortar at higher temperatures and is ideally suited to large drill hole depths.
- The extensive range of accessories is ideally suited to the FIS V Plus injection mortar family, increases the great flexibility of the system and thus allows for a broad range of applications.

## Certificates / Features

CE

ESR-2786
See ICC-ES Evaluation Report at www.icc-es.org

**ETA-20/0729, in masonry**
**ETA-20/0603, in concrete**
**ETA-20/0728, for post-installed rebar connections**

aBG
Mit allgemeiner Bauartgenehmigung
Z-21.3-2110, Z-21.3-1737
Z-21.8-1837, Z-21.8-2029

Seismic C2

R 120

100 Years Service life

## Building materials

**Approved for anchorings in:**

- Concrete C20/25 to C50/60, cracked and non-cracked
- Hollow blocks made from lightweight concrete
- Hollow blocks made from concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Solid sand-lime brick
- Aerated concrete
- Solid brick

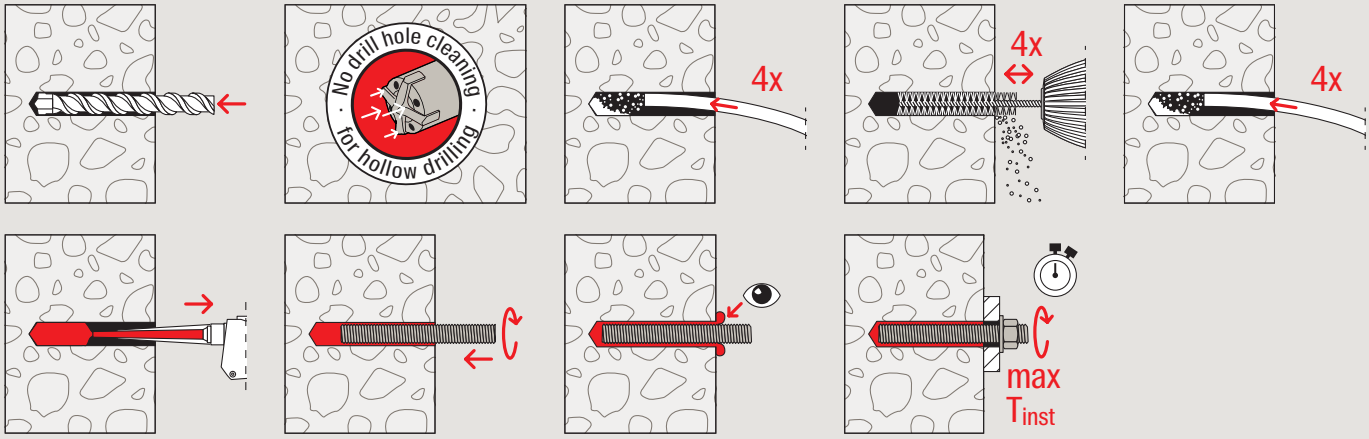
**Approved for:**

- Rebar connections
- Remedial wall tie VBS 8
- Weather facing reconstruction system FWS II
- Stand-off installation TherMax

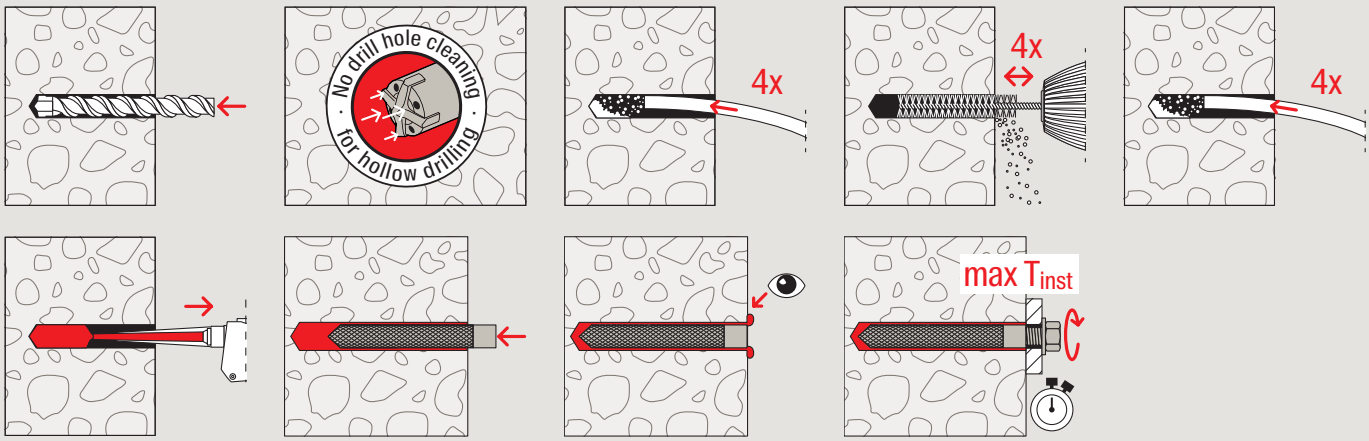
## Functioning

- FIS V Plus is a 2-component injection mortar based on a vinyl ester hybrid concept.
- Resin and hardener are stored in two separate chambers and are not mixed and activated until extrusion through the static mixer.
- The mortar is extruded bubble free from the drill hole base.
- The mortar bonds the entire surface of the anchor with the drill hole wall and seals the drill hole.
- The injection cartridges are quick and easy to use with the fischer dispensers.
- Partially used cartridges can be reused by changing the static mixer.

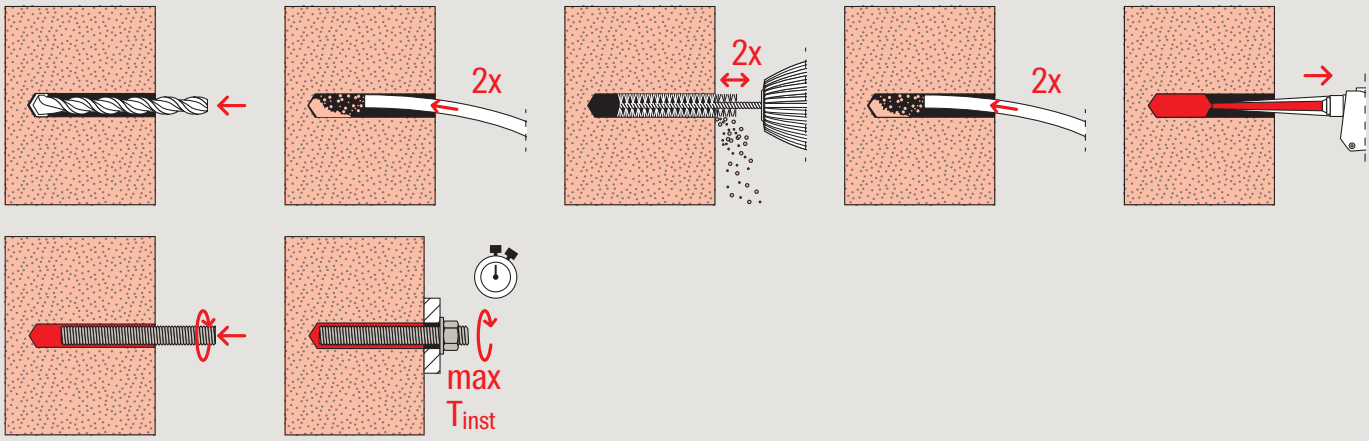
## Installation in concrete with FIS V Plus and FIS A / RG M



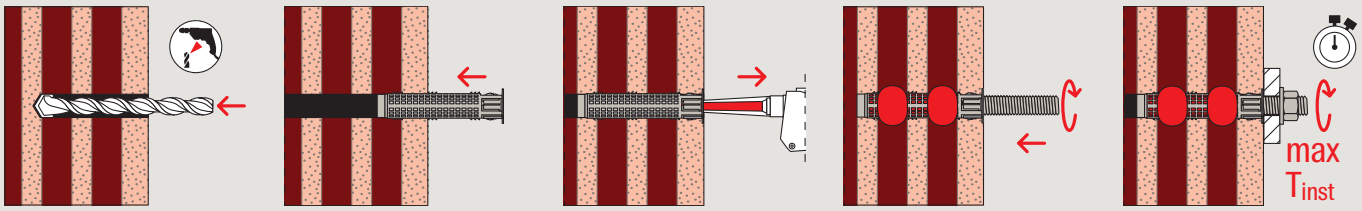

## Installation in concrete with FIS V Plus and RG M I




## Installation in solid brick with FIS V Plus and FIS A

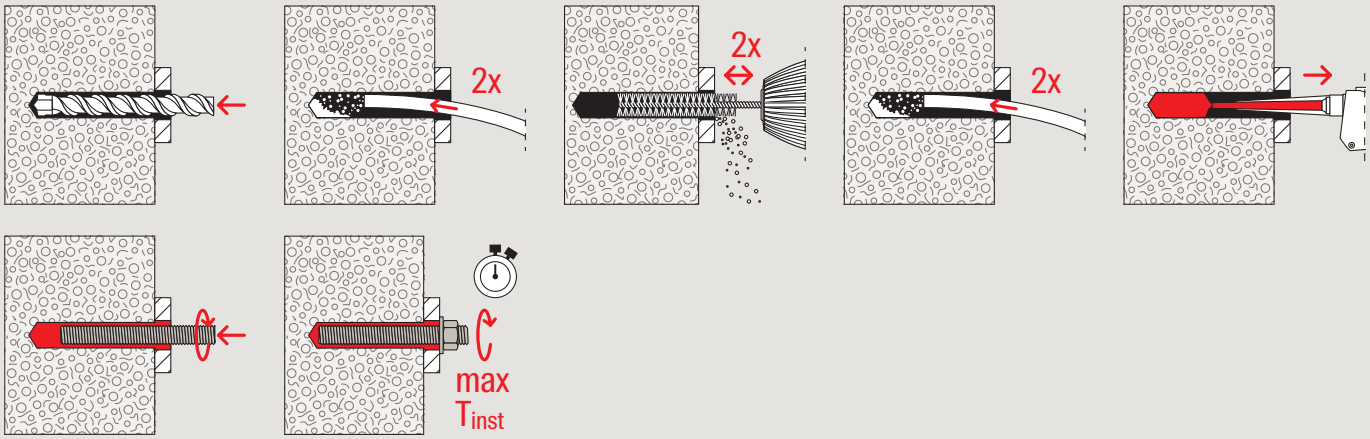


## Installation in hollow blocks with FIS V Plus and FIS HK + FIS A

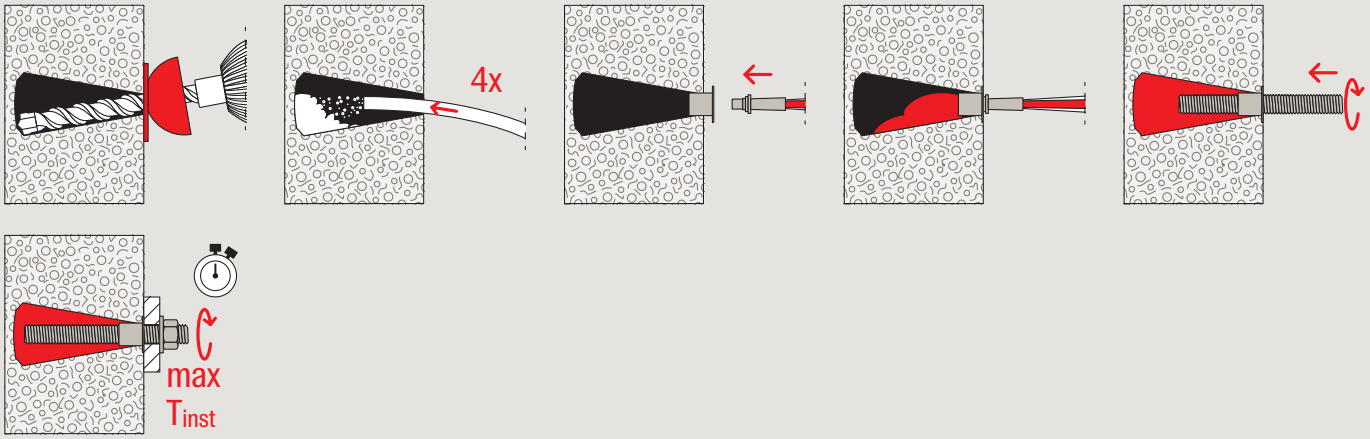





## Installation in aerated concrete with FIS V Plus and FIS A / RG M




## Installation in undercut drill hole in aerated concrete with FIS V Plus and FIS A / RG M



## Technical data

**Injection mortar FIS V Plus 300 T**



FIS V Plus 300 T



FIS MR Plus

| Item | Item no. | Approval ETA | DIBt | ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| FIS V Plus 300 T | 563281 | ● | ● | ● | DE | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS V Plus 300 T | 563282 | ● | ● | ● | DE, EN, IT | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS V Plus 300 T | 563292 | ● | ● | ● | EN, ES, PT | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS V Plus 300 T | 569074 | ● | ● | ● | DA, FI, NO, SV | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus with transparent clip | 1 |
| FIS V Plus 300 T | 569254 | ● | ● | ● | AR, EN, FR | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS V Plus 300 T | 563279 | ● | ● | ● | DE, FR, NL | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus with transparent clip | 1 |
| FIS VS Plus 300 T | 563278 | ● | ● | ● | ES, PT | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus with transparent clip | 1 |
| FIS VS Plus 300 T | 563290 | ● | ● | ● | EL, HU, PL, RO | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus with transparent clip | 1 |
| FIS VS Plus 300 T | 563291 | ● | ● | ● | FR | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus with transparent clip | 1 |
| FIS VS Plus 300 T | 563280 | ● | ● | ● | EN, ES, PT | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS VW Plus 300 T | 563286 | ● | ● | ● | DA, FI, NO, SV | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus with transparent clip | 1 |
| FIS VW Plus 300 T | 563287 | ● | ● | ● | CS, HU, PL, RU | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS VW Plus 300 T | 563293 | ● | ● | ● | DE, EN, HU, IT | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS MR Plus | 545853 | – | – | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |

## Technical data

**Injection mortar FIS V Plus**



FIS V Plus 360 S



FIS MR Plus

| Item | Item no. | Approval ETA | DIBt | ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| FIS V Plus 360 S | 558744 | ● | ● | ● | EN | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS V Plus 360 S | 558745 | ● | ● | ● | DE | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS V Plus 360 S | 558746 | ● | ● | ● | EN, ES, PT | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS V Plus 360 S | 558747 | ● | ● | ● | AR, EN, ZH | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS V Plus 360 S | 558753 | ● | ● | ● | IT, PL, RO | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS V Plus 360 S | 558752 | ● | ● | ● | DE, FR, NL | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS V Plus 360 S | 558754 | ● | ● | ● | AR, EL, TR | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS V Plus 360 S | 558755 | ● | ● | ● | DA, FI, NO, SV | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS V Plus 360 S | 558758 | ● | ● | ● | EN, ES, PT (Americas) | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS V Plus 360 S | 558760 | ● | ● | ● | KK, RU, UK | 180 | 1 x cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS V Plus 360 S | 558762 | ● | ● | ● | CS, HU, SK | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS V Plus 360 S | 560635 | ● | ● | ● | AR, EN, FR | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS V Plus 360 S | 561055 | ● | ● | ● | EN, PL, UK | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS MR Plus | 545853 | – | – | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |

## Technical data

**Injection mortar FIS VS Plus**



FIS VS Plus 360 S



FIS MR Plus

| Item | Item no. | Approval ETA | DIBt | ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS VS Plus 360 S** | **558750** | ● | ● | ● | EN, ES, PT | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VS Plus 360 S** | **558749** | ● | ● | ● | JA, KO, ZH | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VS Plus 360 S** | **561057** | ● | ● | ● | EN, PL, UK | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS MR Plus** | **545853** | – | – | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |

## Technical data

**Injection mortar FIS VW Plus**



FIS VW Plus 360 S



FIS MR Plus

| Item | Item no. | Approval ETA | DIBt | ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS VW Plus 360 S** | **569072** | ● | ● | ● | DA, FI, NO, SV | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VW Plus 360 S** | **558759** | ● | ● | ● | DE | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VW Plus 360 S** | **558764** | ● | ● | ● | EN, HU | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VW Plus 360 S** | **558765** | ● | ● | ● | DE, FR, NL | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VW Plus 360 S** | **558768** | ● | ● | ● | CS, HU, SK | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VW Plus 360 S** | **558767** | ● | ● | ● | KK, RU, UK | 180 | 1 x cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VW Plus 360 S** | **562602** | ● | ● | ● | EN, PL, UK | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS MR Plus** | **545853** | – | – | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |

## Technical data

**Injection mortar FIS V Plus HWK K**




FIS V Plus 360 S HWK K

| Item | Item no. | Approval ETA | DIBt | ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS V Plus 300 T HWK small** | **563283** | ● | ● | ● | DE, FR, NL | 150 | 10 x Cartridge 300 ml, 20 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S HWK small** | **558770** | ● | ● | ● | DE | 180 | 10 x Cartridge 360 ml, 20 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S HWK small** | **558769** | ● | ● | ● | DE, FR, NL | 180 | 10 x Cartridge 360 ml, 20 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S HWK small** | **558771** | ● | ● | ● | CS, HU, SK | 180 | 10 x Cartridge 360 ml, 20 x static mixer FIS MR Plus | 1 |

## Technical data

**Injection mortar FIS V Plus HWK G**




FIS V Plus 360 S HWK G



| Item | Item no. | Approval ETA | DIBt | ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS V Plus 300 T HWK big** | **563294** | ● | ● | ● | DE, FR, NL | 150 | 20 x Cartridge 300 ml, 40 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S HWK big** | **558748** | ● | ● | ● | AR, EN, ZH | 180 | 20 x Cartridge 360 ml, 40 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S HWK big** | **558756** | ● | ● | ● | DE | 180 | 20 x Cartridge 360 ml, 40 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S HWK big** | **558757** | ● | ● | ● | DE, FR, NL | 180 | 20 x Cartridge 360 ml, 40 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S HWK big** | **560637** | ● | ● | ● | AR, EN, FR | 180 | 20 x cartridge 360 ml, 40 x static mixer FIS MR Plus | 1 |

## Technical data

**Injection mortar FIS VW Plus HWK G**




FIS VW Plus 360 S (DE)
HWK G

| Item | Item no. | Approval ETA | DIBt | ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS VW Plus 360 S HWK big** | **558766** | ● | ● | ● | DE | 180 | 20 x Cartridge 360 ml, 40 x static mixer FIS MR Plus | 1 |

## Technical data

**Injection mortar FIS V Plus**




FIS V Plus 360 S

| Item | Item no. | Approval ETA | DIBt | ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS V Plus 360 S in bucket** | **558743** | ● | ● | ● | EN | 180 | 20 x Cartridge 360 ml, 40 x static mixer FIS MR Plus | 20 |
| **FIS V Plus 360 S in bucket** | **558751** | ● | ● | ● | AR, EN, ZH | 180 | 20 x Cartridge 360 ml, 20 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S in bucket** | **558763** | ● | ● | ● | DE, FR, NL | 180 | 20 x Cartridge 360 ml, 20 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S** | **558772** | ● | ● | ● | KK, RU, UK | 180 | 20 x cartridge 360 ml, 40 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S** | **560636** | ● | ● | ● | AR, EN, FR | 180 | 20 x cartridge 360 ml, 20 x static mixerFIS MR Plus | 1 |
| **FIS VS Plus 360 S in bucket** | **562601** | ● | ● | ● | IT, PL, RO | 180 | 20 x Cartridge 360 ml, 20 x static mixer FIS MR Plus | 1 |
| **FIS VS Plus 360 S in bucket** | **562603** | ● | ● | ● | EN, ES, PT | 180 | 20 x Cartridge 360 ml, 40 x static mixer FIS MR Plus | 1 |

## Technical data

**FIS V Plus 360 S HWK big + FIS DM S Pro**



FIS V Plus 360 S HWK big +
FIS DM S Pro

| Item | Item no. | Approval ETA | DIBt | ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS V Plus 360 S Set** | **558773** | ● | ● | ● | IT, PL, RO | 180 | 12 x cartridge 360 ml, 24 x static mixer FIS MR Plus<br>1 x dispenser FIS DM S Pro | 1 |
| **FIS V Plus 360 S Set** | **558775** | ● | ● | ● | EN, ES, PT | 180 | 12 x cartridge 360 ml, 24 x static mixer FIS MR Plus,<br>1 x dispenser FIS DM S Pro | 1 |
| **FIS V Plus 360 S Set** | **560032** | ● | ● | ● | DE, FR, NL | 180 | 12 x Cartridge 360 ml, 24 x static mixer FIS MR Plus<br>1 x Dispenser FIS DM S Pro | 1 |
| **FIS V Plus 360 S Set** | **560033** | ● | ● | ● | CS, HU, SK | 180 | 12 x Cartridge 360 ml, 24 x static mixer FIS MR Plus<br>1 x Dispenser FIS DM S Pro | 1 |

## Technical data

**Injection mortar FIS V Plus 380 + 410**



FIS VW Plus 380 C



FIS V Plus 410 C




FIS V Plus 410 C in bucket

| Item | Item no. | Approval ETA | DIBt | ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS VW Plus 380 C** | **558785** | ● | ● | ● | CS, PL, SK | 190 | 1 x cartridge 380 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VW Plus 410 C** | **569342** | ● | ● | ● | DE, FR, IT | 200 | 1 x Cartridge 410 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 410 C** | **558780** | ● | ● | ● | DE, EN, IT | 200 | 1 x Cartridge 410 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 410 C** | **558784** | ● | ● | ● | EN, ES, PT (Americas) | 200 | 1 x Cartridge 410 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 410 C in bucket** | **558782** | ● | ● | ● | DE, EN, IT | 200 | 16 x cartridge 410 ml, 32 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 410 C in bucket** | **558783** | ● | ● | ● | EN, RU, TR | 200 | 16 x Cartridge 410 ml, 32 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 410 C HWK big** | **558781** | ● | ● | ● | DE, EN, IT | 200 | 20 x Cartridge 410 ml, 40 x static mixer FIS MR Plus | 1 |

## Technical data

**Injection mortar FIS V Plus 825 S**



FIS V Plus 825 S

| Item | Item no. | Approval ETA | DIBt | ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS V Plus 825 S** | **567511** | ● | ● | ● | DE, EN, FR, IT, NL | 415 | 1 x Cartridge 825 ml, 2 x static mixer FIS JMR 825 | 1 |
| **FIS V Plus 825 S** | **567512** | ● | ● | ● | EN, ES, FR, PT, TR | 415 | 1 x Cartridge 825 ml, 2 x static mixer FIS JMR 825 | 1 |
| **FIS V Plus 825 S** | **567513** | ● | ● | ● | CS, EN, PL, RU, SK | 415 | 1 x Cartridge 825 ml, 2 x static mixer FIS JMR 825 | 1 |

## Technical data

**Injection mortar FIS V Plus**



Thermosafe case FIS V Plus



| | Item no. | Approval ETA | DIBt | ICC | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Item** | | | | | | |
| **FIS V Plus 360 S Thermosafe** | **558950** | ● | ● | ● | 6 x Cartridge 360 ml<br>12 x Static mixer FIS MR Plus<br>1 x Brush setBS ø12<br>1 x Blow-out pump AB G<br>1 x Dispenser FIS DM S Pro | 1 |

## Curing times

**FIS VW Plus High Speed**
**FIS V Plus**
**FIS VS Plus Low Speed**

| Temperature at anchoring base | Maximum processing time $t_{work}$ | | | Minimum curing time $t_{cure}$ [1] | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | FIS VW Plus High Speed | FIS V Plus | FIS VS Plus Low Speed | FIS VW Plus High Speed | | FIS V Plus | | FIS VS Plus Low Speed | |
| [°C] | [min.] | [min.] | [min.] | [hrs.] | [min.] | [hrs.] | [min.] | [hrs.] | [min.] |
| -10 – -5 [2] | – | – | – | 12 | – | – | – | – | – |
| > -5 – 0 [2] | 5 | – | – | 3 | – | 24 | – | – | – |
| > 0 – +5 [2] | 5 | 13 | – | 3 | – | 3 | – | 6 | – |
| > +5 – +10 | 3 | 9 | 20 | – | 50 | – | 90 | 3 | – |
| > +10 – +20 | 1 | 5 | 10 | – | 50 | – | 60 | 2 | – |
| > +20 – +30 | – | 4 | 6 | – | – | – | 45 | – | 60 |
| > +30 – +40 | – | 2 | 4 | – | – | – | 35 | – | 30 |

1) In wet concrete or water filled holes the curing times must be doubled.
2) Minimal cartridge temperature +5 °C

# Loads

**Injection system FIS V Plus with internal threaded anchor RG M I**

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-20/0603 has to be considered.

| | | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|
| | Screw Material[3)] | Effective anchorage depth | Minimum member thickness | Maximum installation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst, max}$ [Nm] | $N_{perm}$[4)] [kN] | $V_{perm}$[4)] [kN] | $s_{min}$[4)] [mm] | $c_{min}$[4)] [mm] |
| **RG M 8 I** | 5.8 | 90 | 120 | 10 | 9.0 | 5.3 | 55 | 55 |
| | 8.8 | 90 | 120 | 10 | 13.8 | 8.3 | 55 | 55 |
| | R-70 | 90 | 120 | 10 | 9.9 | 5.9 | 55 | 55 |
| **RG M 10 I** | 5.8 | 90 | 130 | 20 | 13.8 | 8.3 | 65 | 65 |
| | 8.8 | 90 | 130 | 20 | 20.0 | 13.3 | 65 | 65 |
| | R-70 | 90 | 130 | 20 | 15.7 | 9.3 | 65 | 65 |
| **RG M 12 I** | 5.8 | 125 | 170 | 40 | 20.5 | 12.1 | 75 | 75 |
| | 8.8 | 125 | 170 | 40 | 32.0 | 19.3 | 75 | 75 |
| | R-70 | 125 | 170 | 40 | 22.5 | 13.5 | 75 | 75 |
| **RG M 16 I** | 5.8 | 160 | 210 | 80 | 37.6 | 22.4 | 95 | 95 |
| | 8.8 | 160 | 210 | 80 | 47.4 | 30.9 | 95 | 95 |
| | R-70 | 160 | 210 | 80 | 42.0 | 25.1 | 95 | 95 |
| **RG M 20 I** | 5.8 | 200 | 260 | 120 | 58.6 | 35.4 | 125 | 125 |
| | 8.8 | 200 | 260 | 120 | 66.3 | 51.4 | 125 | 125 |
| | R-70 | 200 | 260 | 120 | 65.7 | 39.4 | 125 | 125 |

[1)] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.

[2)] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 80 °C). Drill hole cleaning as per specification in the ETA. The factor $\Psi_{sus}$ for sustained load was taken into account with 1.0.

[3)] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).

[4)] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Loads



**Injection system FIS V Plus with threaded rod FIS A resp. RG M**

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-20/0603 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material / surface[3)] | Effective anchorage depth | Minimum member thickness | Maximum installation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,max}$ [Nm] | $N_{perm}$[4)] [kN] | $V_{perm}$[4)] [kN] | $s_{min}$[4)] [mm] | $c_{min}$[4)] [mm] | $N_{perm}$[4)] [kN] | $V_{perm}$[4)] [kN] | $s_{min}$[4)] [mm] | $c_{min}$[4)] [mm] |
| **FIS A M 8** | 5.8 | 60 | 100 | 10 | 3.9 | 6.3 | 40 | 40 | 9.0 | 6.3 | 40 | 40 |
| | 5.8 | 80 | 110 | 10 | 5.3 | 6.3 | 40 | 40 | 9.0 | 6.3 | 40 | 40 |
| | 5.8 | 160 | 190 | 10 | 9.0 | 6.3 | 40 | 40 | 9.0 | 6.3 | 40 | 40 |
| | R-70 | 60 | 100 | 10 | 3.9 | 6.0 | 40 | 40 | 9.9 | 6.0 | 40 | 40 |
| | R-70 | 80 | 110 | 10 | 5.3 | 6.0 | 40 | 40 | 9.9 | 6.0 | 40 | 40 |
| | R-70 | 160 | 190 | 10 | 9.9 | 6.0 | 40 | 40 | 9.9 | 6.0 | 40 | 40 |
| **FIS A M 10** | 5.8 | 60 | 100 | 20 | 5.4 | 9.7 | 45 | 45 | 10.9 | 9.7 | 45 | 45 |
| | 5.8 | 90 | 120 | 20 | 8.1 | 9.7 | 45 | 45 | 13.8 | 9.7 | 45 | 45 |
| | 5.8 | 200 | 230 | 20 | 13.8 | 9.7 | 45 | 45 | 13.8 | 9.7 | 45 | 45 |
| | R-70 | 60 | 100 | 20 | 5.4 | 9.2 | 45 | 45 | 10.9 | 9.2 | 45 | 45 |
| | R-70 | 90 | 120 | 20 | 8.1 | 9.2 | 45 | 45 | 15.7 | 9.2 | 45 | 45 |
| | R-70 | 200 | 230 | 20 | 15.7 | 9.2 | 45 | 45 | 15.7 | 9.2 | 45 | 45 |
| **FIS A M 12** | 5.8 | 70 | 100 | 40 | 8.2 | 14.3 | 55 | 45 | 13.7 | 14.3 | 55 | 45 |
| | 5.8 | 110 | 140 | 40 | 12.8 | 14.3 | 55 | 45 | 20.5 | 14.3 | 55 | 45 |
| | 5.8 | 240 | 270 | 40 | 20.5 | 14.3 | 55 | 45 | 20.5 | 14.3 | 55 | 45 |
| | R-70 | 70 | 100 | 40 | 8.2 | 13.7 | 55 | 45 | 13.7 | 13.7 | 55 | 45 |
| | R-70 | 110 | 140 | 40 | 12.8 | 13.7 | 55 | 45 | 22.5 | 13.7 | 55 | 45 |
| | R-70 | 240 | 270 | 40 | 22.5 | 13.7 | 55 | 45 | 22.5 | 13.7 | 55 | 45 |
| **FIS A M 16** | 5.8 | 80 | 120 | 60 | 11.5 | 23.0 | 65 | 50 | 16.8 | 26.9 | 65 | 50 |
| | 5.8 | 125 | 170 | 60 | 18.0 | 26.9 | 65 | 50 | 32.7 | 26.9 | 65 | 50 |
| | 5.8 | 320 | 360 | 60 | 37.6 | 26.9 | 65 | 50 | 37.6 | 26.9 | 65 | 50 |
| | R-70 | 80 | 120 | 60 | 11.5 | 23.0 | 65 | 50 | 16.8 | 25.2 | 65 | 50 |
| | R-70 | 125 | 170 | 60 | 18.0 | 25.2 | 65 | 50 | 32.7 | 25.2 | 65 | 50 |
| | R-70 | 320 | 360 | 60 | 42.0 | 25.2 | 65 | 50 | 42.0 | 25.2 | 65 | 50 |
| **FIS A M 20** | 5.8 | 90 | 140 | 120 | 14.0 | 28.0 | 85 | 55 | 20.0 | 40.0 | 85 | 55 |
| | 5.8 | 170 | 220 | 120 | 28.0 | 42.3 | 85 | 55 | 51.9 | 42.3 | 85 | 55 |
| | 5.8 | 400 | 450 | 120 | 58.6 | 42.3 | 85 | 55 | 58.6 | 42.3 | 85 | 55 |
| | R-70 | 90 | 140 | 120 | 14.0 | 28.0 | 85 | 55 | 20.0 | 39.4 | 85 | 55 |
| | R-70 | 170 | 220 | 120 | 28.0 | 39.4 | 85 | 55 | 51.9 | 39.4 | 85 | 55 |
| | R-70 | 400 | 450 | 120 | 65.7 | 39.4 | 85 | 55 | 65.7 | 39.4 | 85 | 55 |
| **FIS A M 24** | 5.8 | 96 | 160 | 150 | 15.4 | 30.8 | 105 | 60 | 22.0 | 44.1 | 105 | 60 |
| | 5.8 | 210 | 270 | 150 | 37.7 | 60.6 | 105 | 60 | 71.3 | 60.6 | 105 | 60 |
| | 5.8 | 480 | 540 | 150 | 84.3 | 60.6 | 105 | 60 | 84.3 | 60.6 | 105 | 60 |
| | R-70 | 96 | 160 | 150 | 15.4 | 30.8 | 105 | 60 | 22.0 | 44.1 | 105 | 60 |
| | R-70 | 210 | 270 | 150 | 37.7 | 56.8 | 105 | 60 | 71.3 | 56.8 | 105 | 60 |
| | R-70 | 480 | 540 | 150 | 86.2 | 56.8 | 105 | 60 | 94.3 | 56.8 | 105 | 60 |
| **FIS A M 30** | 5.8 | 120 | 190 | 300 | 21.6 | 43.1 | 140 | 80 | 30.8 | 61.6 | 140 | 80 |
| | 5.8 | 280 | 350 | 300 | 56.5 | 96.0 | 140 | 80 | 109.8 | 96.0 | 140 | 80 |
| | 5.8 | 600 | 670 | 300 | 121.2 | 96.0 | 140 | 80 | 133.8 | 96.0 | 140 | 80 |
| | R-70 | 120 | 190 | 300 | 21.6 | 43.1 | 140 | 80 | 30.8 | 61.6 | 140 | 80 |
| | R-70 | 280 | 350 | 300 | 56.5 | 90.2 | 140 | 80 | 109.8 | 90.2 | 140 | 80 |
| | R-70 | 600 | 670 | 300 | 121.2 | 90.2 | 140 | 80 | 150.1 | 90.2 | 140 | 80 |

[1)] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.

[2)] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 80 °C). Drill hole cleaning as per specification in the ETA. The factor $\Psi_{sus}$ for sustained load was taken into account with 1.0.

[3)] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).

[4)] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Loads



**Injection system FIS V Plus with threaded rod FIS A in solid and perforated masonry**

Permissible loads[1)2)] for a single anchor in masonry for pre-positioned installation.
For the design the complete current assessment ETA-20/0729 has to be considered.

| Type | Compressive brick strength $f_b$ [N/mm²] | Brick raw density $\rho$ [kg/dm³] | Minimum brick dimensions[3)] (L x W x H) [mm] | Effective anchorage depth $h_{ef}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Maximum installation torque $T_{inst,max}$ [Nm] | Permissible tensile load[4)] $N_{perm}$ [kN] | Permissible shear load[4)] $V_{perm}$ [kN] | Minimum-spacing[5)] $s_{min\parallel}$ / $s_{min\perp}$ [mm] | Characteristic resp. minimum edge distance[5)] $c_{cr} = c_{min}$ [mm] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Solid brick Mz, NF, acc. to EN 771-1** | | | | | | | | | | |
| M6 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | ≥ 50 | 115 | 4 | 1.14 | 0.71 | 240 / 75 | 100 |
| M8 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | ≥ 50 | 115 | 10 | 1.14 | 0.71 | 240 / 75 | 100 |
| M10 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 80 | 115 | 10 | 1.42 | 1.14 | 240 / 75 | 100 |
| M10 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 200 | 240 | 10 | 3.43 | 2.43 | 240 / 75 | 100 |
| M12 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 80 | 115 | 10 | 1.57 | 1.14 | 240 / 75 | 100 |
| M12 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 200 | 240 | 10 | 2.29 | 3.28 | 240 / 75 | 100 |
| **Solid sand-lime brick KS, acc. to EN 771-2** | | | | | | | | | | |
| M6 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 50 | 115 | 3 | 1.14 | 0.42 | 80 / 150 | 60 |
| M6 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 100 | 115 | 3 | 1.57 | 0.89 | 80 / 300 | 60 |
| M8 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 50 | 115 | 5 | 1.14 | 0.42 | 80 / 150 | 60 |
| M8 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 100 | 115 | 5 | 2.29 | 0.89 | 80 / 300 | 60 |
| M10 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 100 | 115 | 15 | 1.57 | 0.57 | 80 / 300 | 60 |
| M10 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 200 | 240 | 15 | 3.42 | 0.57 | 80 / 600 | 60 |
| M12 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 100 | 115 | 15 | 1.28 | 0.57 | 80 / 300 | 60 |
| M12 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 200 | 240 | 15 | 3.42 | 0.57 | 80 / 600 | 60 |
| M16 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 100 | 115 | 25 | 1.57 | 0.57 | 80 / 300 | 60 |
| M16 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 200 | 240 | 25 | 3.42 | 0.57 | 80 / 600 | 60 |
| **Vertically perforated brick Hlz, acc. to EN 771-1[3)]** | | | | | | | | | | |
| M6 / M8 with FIS H 12 x 85 K | ≥ 12 | ≥ 1.0 | 370 x 240 x 237 | 85 | 240 | 2 | 0.34 | 0.43 | 100 / 100 | 100 |
| M8 / M10 with FIS H 16 x 130 K | ≥ 12 | ≥ 1.0 | 370 x 240 x 237 | 130 | 240 | 2 | 0.86 | 0.57 | 100 / 100 | 100 |
| M12 / M16 with FIS H 20 x 130 K | ≥ 12 | ≥ 1.0 | 370 x 240 x 237 | 130 | 240 | 2 | 1.14 | 0.57 | 100 / 100 | 100 |
| **Perforated sand-lime brick KSL, acc. to EN 771-2[3)]** | | | | | | | | | | |
| M6 / M8 with FIS H 12 x 85 K | ≥ 12 | ≥ 1.4 | 240 x 175 x 113 | 85 | 175 | 2 | 0.71 | 0.71 | 100 / 115 | 60 |
| M8 / M10 with FIS H 16 x 130 K | ≥ 12 | ≥ 1.4 | 240 x 175 x 113 | 130 | 175 | 2 | 1.00 | 1.29 | 100 / 115 | 80 |
| M12 / M16 with FIS H 20 x 85 K | ≥ 12 | ≥ 1.4 | 240 x 175 x 113 | 85 | 175 | 2 | 1.00 | 1.14 | 100 / 115 | 80 |
| **Lightweight concrete hollow block Hbl, acc. EN 771-3[3)]** | | | | | | | | | | |
| M6 / M8 with FIS H 12 x 85 K | ≥ 2 | ≥ 1.0 | 362 x 240 x 240 | 85 | 240 | 2 | 0.43 | 0.26 | 100 / 240 | 60 |
| M6 / M8 with FIS H 12 x 85 K | ≥ 4 | ≥ 1.0 | 362 x 240 x 240 | 85 | 240 | 2 | 0.86 | 0.57 | 100 / 240 | 60 |
| M8 / M10 with FIS H 16 x 85 K | ≥ 2 | ≥ 1.0 | 362 x 240 x 240 | 85 | 240 | 2 | 0.43 | 0.26 | 100 / 240 | 60 |
| M8 / M10 with FIS H 16 x 85 K | ≥ 4 | ≥ 1.0 | 362 x 240 x 240 | 85 | 240 | 2 | 0.86 | 0.57 | 100 / 240 | 60 |
| M12 / M16 with FIS H 20 x 200 K | ≥ 2 | ≥ 1.0 | 362 x 240 x 240 | 200 | 240 | 2 | 0.71 | 0.26 | 100 / 240 | 60 |
| M12 / M16 with FIS H 20 x 200 K | ≥ 4 | ≥ 1.0 | 362 x 240 x 240 | 200 | 240 | 2 | 1.57 | 0.57 | 100 / 240 | 60 |
| **Aerated concrete acc. to EN 771-4[6)]** | | | | | | | | | | |
| M8 | ≥ 2 | ≥ 0.35 | - | 100 | 130 | 1 | 0.54 | 0.43 | 250 / 250 | 100 |
| M8 | ≥ 4 | ≥ 0.50 | - | 200 | 230 | 8 | 1.07 | 0.71 | 80 / 80 | 100 |
| M10 | ≥ 2 | ≥ 0.35 | - | 100 | 130 | 2 | 0.54 | 0.43 | 250 / 250 | 100 |
| M10 | ≥ 4 | ≥ 0.50 | - | 200 | 230 | 12 | 1.79 | 0.71 | 80 / 80 | 100 |
| M12 | ≥ 2 | ≥ 0.35 | - | 100 | 130 | 2 | 0.71 | 0.54 | 250 / 250 | 100 |
| M12 | ≥ 4 | ≥ 0.50 | - | 200 | 230 | 16 | 1.79 | 0.71 | 80 / 80 | 100 |
| M16 | ≥ 2 | ≥ 0.35 | - | 100 | 130 | 2 | 0.71 | 0.43 | 250 / 250 | 100 |
| M16 | ≥ 4 | ≥ 0.50 | - | 200 | 230 | 20 | 1.79 | 0.71 | 80 / 80 | 100 |

[1)] The required partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered. Load values are valid for zinc-plated steel, stainless steel R and highly corrosion-resistant steel HCR. In perforated bricks and hollow blocks threaded rod FIS A in combination with anchor sleeve FIS H K.

[2)] The given loads are valid for installation and use of fixations in dry masonry - use category d/d - for temperatures in the substrate up to 50 °C (resp. short term up to 80 °C) and drill hole cleaning according to assessment. The given brick types in combination with the permissible loads are an extract of the assessment.

[3)] More information about, e.g. hole patterns, assortment of anchor sleeves FIS H K see assessment.

[4)] In the case of combinations of tensile and shear loads, bending moments and reduced edge and axial spacings (anchor groups), the design must be carried out in accordance with the provisions of the complete assessment.

[5)] Minimum feasible spacing resp. edge distance. Details as well as to the distances to joints see assessment.

[6)] Cylindrical drill hole.

# Injection mortar FIS V

The versatile injection mortar for anchorings in masonry and cracked concrete.








Rescue ladders



Column bases

## Applications

- Steelwork constructions
- Timber constructions
- Guard rails
- Façades
- Staircases
- Steel brackets
- Machines
- Masts
- Awnings
- Canopies
- Gates
- Consoles
- Pipelines
- Gratings
- Satellite antennas

## Advantages

- The injection mortar FIS V has a range of system approvals, for cracked and non-cracked concrete, masonry, and rebar connections, for example. FIS V is therefore the universal injection mortar family with guaranteed safety for almost every application.
- FIS VW HIGH SPEED has a significantly shorter hardening time than FIS V, which ensures swift work progress even at low temperatures.
- The FIS VS LOW SPEED has an extended processing time that prevents the premature hardening of the mortar at higher temperatures. It is ideally suited to large drill hole depths.
- The extensive range of accessories is perfectly tailored to the injection mortar family FIS V, increases the high flexibility of the system, and thus enables a broad range of applications.

## Certificates / Features

CE

ICC ES ESR-2786 See ICC-ES Evaluation Report at www.icc-es.org

**ETA-08/0266, for post-installed rebar connections**
**ETA-02/0024, in concrete**
**ETA-10/0383, in masonry**

Seismic C2

R 120

aBG
Mit allgemeiner Bauartgenehmigung
Z-21.3-2110, Z-21.3-1737
Z-21.8-1837, Z-21.8-2029

## Building materials

**Approved for anchorings in:**

- Concrete C20/25 to C50/60, cracked and non-cracked
- Hollow blocks made from lightweight concrete
- Hollow blocks made from concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Solid sand-lime brick
- Aerated concrete
- Solid brick

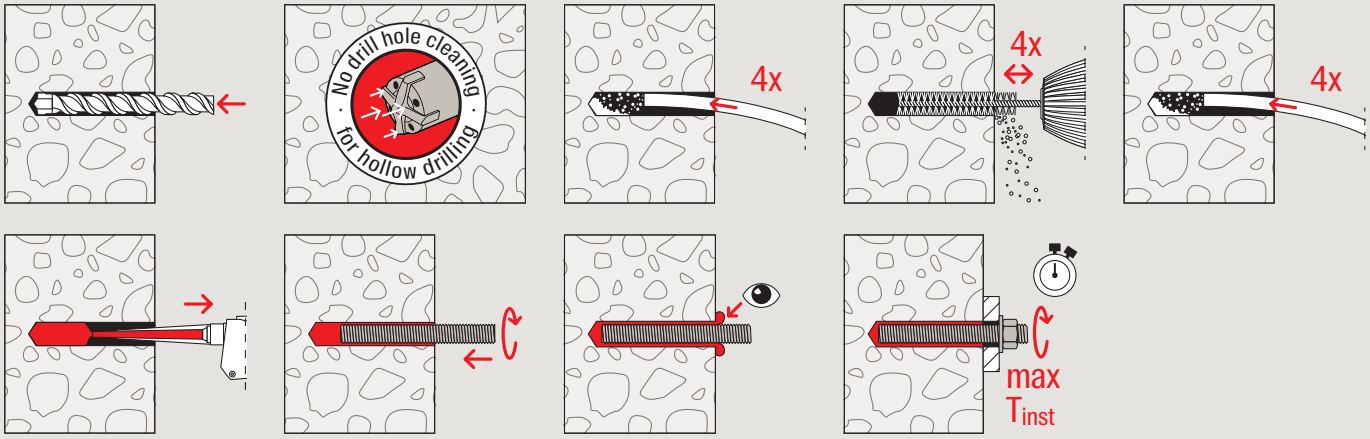
**Approved for:**

- Rebar connections
- Remedial wall tie VBS 8
- Weather facing reconstruction system FWS II
- Stand-off installation TherMax

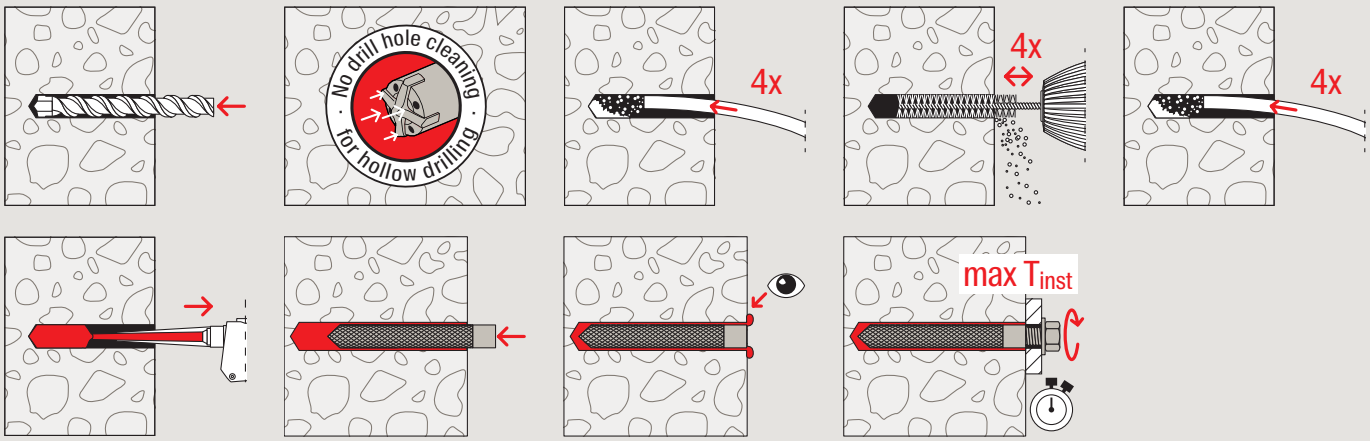
## Functioning

- FIS V is a 2-component injection mortar based on a vinyl ester hybrid concept.
- Resin and hardener are stored in two separate chambers and are not mixed and activated until extrusion through the static mixer.
- The mortar is extruded bubble free from the drill hole base.
- The mortar bonds the entire surface of the anchor with the drill hole wall and seals the drill hole.
- The injection cartridges are quick and easy to use with the fischer dispensers.
- Partially used cartridges can be reused by changing the static mixer.

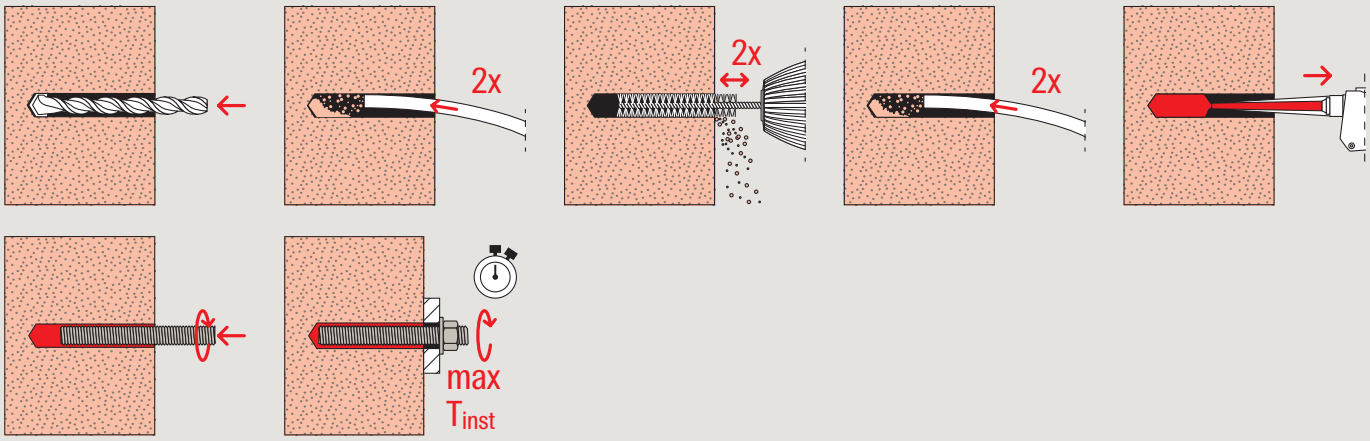
## Installation in concrete with FIS V and FIS A / RG M



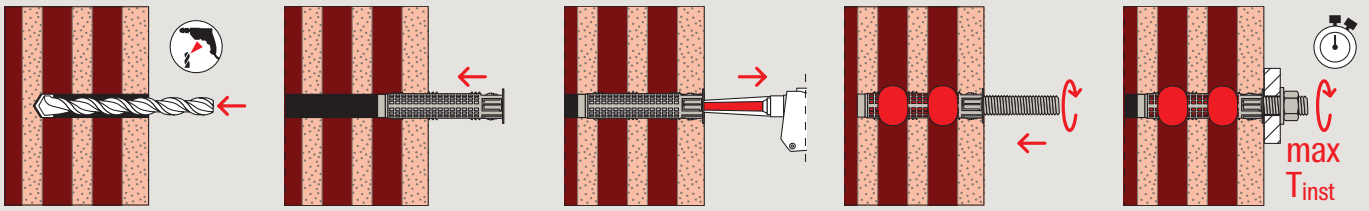

## Installation in concrete with FIS V and RG M I




## Installation in solid brick with FIS V and FIS A

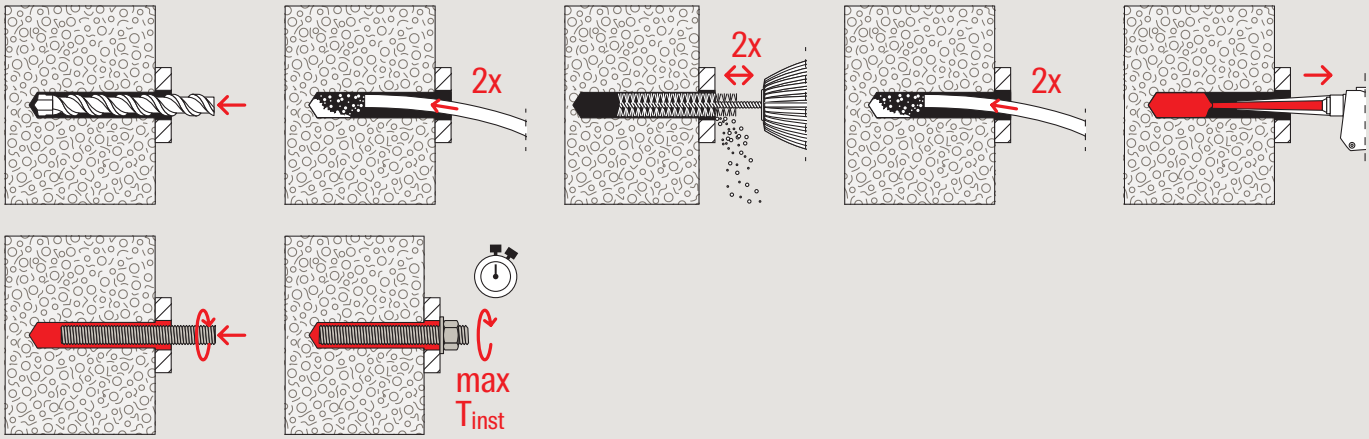


## Installation in hollow blocks with FIS V and FIS HK + FIS A

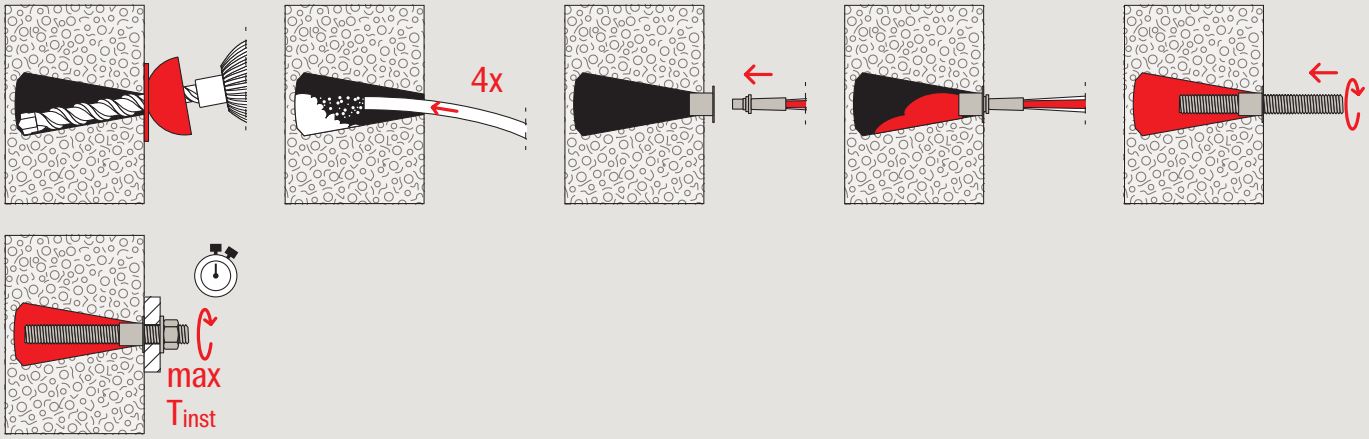



3

## Installation in aerated concrete with FIS V and FIS A / RG M




## Installation in undercut drill hole in aerated concrete with FIS V and FIS A / RG M



## Technical data

**Injection mortar FIS V**


FIS V 300 T


FIS V 360 S


FIS V 410 C


FIS MR Plus

| Item | Item no. | Approval ETA | Approval DIBt | Approval ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS V 300 T** | **531573** | ● | ● | ● | EN, ES, PT | 150 | 1 x cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V 360 S** | **559132** | ● | ● | ● | DA, FI, NO, SV | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V 360 S** | **559131** | ● | ● | ● | EN, ES, PT | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V 360 S** | **559429** | ● | ● | ● | DE, FR, NL | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V 360 S** | **559435** | ● | ● | ● | IT, PL, RO | 180 | 1 x cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V 360 S** | **561056** | ● | ● | ● | EN, PL, RU | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V 410 C** | **521431** | ● | ● | ● | DE, EN, IT | 200 | 1 x Cartridge 410 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V 410 C** | **538131** | ● | ● | ● | EN, ES, PT | 200 | 1 x Cartridge 410 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS MR Plus** | **545853** | – | – | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |

## Technical data

**Injection mortar FIS VW HIGH SPEED**


FIS VW 300 T


FIS VW 360 S


FIS VW 380 C


FIS MR Plus

| Item | Item no. | Approval ETA | Approval DIBt | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FIS VW 300 T** | **507793** | ● | ● | DE, EN, HR, IT, SL, SR | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VW 300 T** | **507795** | ● | ● | SV, DA, NO, CS, SK, PL, RU | 150 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VW 360 S** | **559134** | ● | – | EN, HU | 180 | 1 x cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VW 360 S** | **559437** | ● | – | DE, FR, NL | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VW 360 S** | **559436** | ● | – | CS, PL, RO | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VW 380 C** | **519328** | ● | – | CS, PL, SK | 190 | 1 x Cartridge 380 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS MR Plus** | **545853** | – | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |

## Technical data

**Injection mortar FIS VS LOW SPEED**


FIS VS 100 P


FIS VS 150 C


FIS VS 150 C Set


FIS VS 300 T


FIS MR Plus

| Item | Item no. | Approval ETA | Approval ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FIS VS 100 P** | **072525** | ● | ● | DE, EN, ES, FR, IT, NL | 50 | 1 x Cartridge 100 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VS 300 T** | **093180** | ● | ● | DE, EN, FR, NL, ES, PT | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VS 300 T** | **044102** | ● | ● | CS, SK, PL, HU, RO, EL | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VS 300 T** | **093226** | ● | ● | PL, IS, DA, NO, SV, FI | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VS 150 C** | **045302** | ● | ● | DE, EN, ES, FR, IT, NL | 70 | 1 x Cartridge 145 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VS 150 C Set** | **045303** | ● | ● | DE, EN, ES, FR, IT, NL | 70 | Set for hollow bricks:<br>1 x Cartridge 145 ml<br>2 x Static mixer FIS MR Plus<br>6 x FIS H 16 x 85 K | 1 |
| **FIS MR Plus** | **545853** | – | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |

## Technical data

**Injection mortar FIS V HWK**




FIS V 360 S HWK small




FIS VS 300 T HWK G



| Item | Item no. | Approval ETA | Approval DIBt | Approval ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS V 360 S** | **559431** | ● | ● | ● | DE, FR, NL | 180 | 10 x cartridge 360 ml, 20 x static mixer FIS MR Plus | 1 |
| **FIS V 360 S** | **559430** | ● | ● | ● | DE, FR, NL | 180 | 20 x cartridge 360 ml, 40 x static mixer FIS MR Plus | 1 |

## Technical data

**Injection mortar FIS V**




FIS V 360 S in bucket




FIS V 410 C in bucket

| Item | Item no. | Approval ETA | Approval DIBt | Approval ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS V 360 S in bucket** | **559434** | ● | ● | ● | DE, FR, NL | 180 | 20 x Cartridge 360 ml, 20 x static mixer FIS MR Plus | 1 |
| **FIS V 410 in bucket** | **531504** | ● | ● | ● | EN, RU, TR | 200 | 16 x Cartridge 410 ml, 32 x static mixer FIS MR Plus | 1 |

## Curing times

**FIS VW High Speed**
**FIS V**
**FIS VS Low Speed**

| Temperature at anchoring base [°C] | Maximum processing time $t_{work}$ FIS VW High Speed [min.] | FIS V [min.] | FIS VS Low Speed [min.] | Minimum curing time $t_{cure}$ [1] FIS VW High Speed [hrs.] | [min.] | FIS V [hrs.] | [min.] | FIS VS Low Speed [hrs.] | [min.] |
|---|---|---|---|---|---|---|---|---|---|
| -10 – -5 [2] | – | – | – | 12 | – | – | – | – | – |
| > -5 – 0 [2] | 5 | – | – | 3 | – | 24 | – | – | – |
| > 0 – +5 [2] | 5 | 13 | – | 3 | – | 3 | – | 6 | – |
| > +5 – +10 | 3 | 9 | 20 | – | 50 | – | 90 | 3 | – |
| > +10 – +20 | 1 | 5 | 10 | – | 50 | – | 60 | 2 | – |
| > +20 – +30 | – | 4 | 6 | – | – | – | 45 | – | 60 |
| > +30 – +40 | – | 2 | 4 | – | – | – | 35 | – | 30 |

1) In wet concrete or water filled holes the curing times must be doubled.
2) Minimal cartridge temperature +5 °C

# Loads



**Injection system FIS V with threaded rod FIS A in solid and perforated masonry**

Permissible loads[1)2)] for a single anchor in masonry for pre-positioned installation.
For the design the complete current assessment ETA-10/0383 has to be considered.

| Type | Compressive brick strength $f_b$ [N/mm²] | Brick raw density $\rho$ [kg/dm³] | Minimum brick dimensions[3)] (L x W x H) [mm] | Effective anchorage depth $h_{ef}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Maximum installation torque $T_{inst,max}$ [Nm] | Permissible tensile load[4)] $N_{perm}$ [kN] | Permissible shear load[4)] $V_{perm}$ [kN] | Minimum-spacing[5)] $s_{min\parallel}$ / $s_{min\perp}$ [mm] | Characteristic resp. minimum edge distance[5)] $c_{cr} = c_{min}$ [mm] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Solid brick Mz, NF, acc. to EN 771-1** | | | | | | | | | | |
| M6 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | ≥ 50 | 115 | 4 | 1.14 | 0.71 | 240 / 75 | 100 |
| M8 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | ≥ 50 | 115 | 10 | 1.14 | 0.71 | 240 / 75 | 100 |
| M10 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 80 | 115 | 10 | 1.42 | 1.14 | 240 / 75 | 100 |
| M10 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 200 | 240 | 10 | 3.43 | 2.43 | 240 / 75 | 100 |
| M12 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 80 | 115 | 10 | 1.57 | 1.14 | 240 / 75 | 100 |
| M12 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 200 | 240 | 10 | 2.29 | 3.28 | 240 / 75 | 100 |
| **Solid sand-lime brick KS, acc. to EN 771-2** | | | | | | | | | | |
| M6 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 50 | 115 | 3 | 1.14 | 0.42 | 80 / 150 | 60 |
| M6 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 100 | 115 | 3 | 1.57 | 0.89 | 80 / 300 | 60 |
| M8 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 50 | 115 | 5 | 1.14 | 0.42 | 80 / 150 | 60 |
| M8 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 100 | 115 | 5 | 2.29 | 0.89 | 80 / 300 | 60 |
| M10 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 100 | 115 | 15 | 1.57 | 0.57 | 80 / 300 | 60 |
| M10 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 200 | 240 | 15 | 3.42 | 0.57 | 80 / 600 | 60 |
| M12 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 100 | 115 | 15 | 1.28 | 0.57 | 80 / 300 | 60 |
| M12 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 200 | 240 | 15 | 3.42 | 0.57 | 80 / 600 | 60 |
| M16 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 100 | 115 | 25 | 1.57 | 0.57 | 80 / 300 | 60 |
| M16 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 200 | 240 | 25 | 3.42 | 0.57 | 80 / 600 | 60 |
| **Vertically perforated brick Hlz, acc. to EN 771-1[3)]** | | | | | | | | | | |
| M6 / M8 with FIS H 12 x 85 K | ≥ 12 | ≥ 1.0 | 370 x 240 x 237 | 85 | 240 | 2 | 0.34 | 0.43 | 100 / 100 | 100 |
| M8 / M10 with FIS H 16 x 130 K | ≥ 12 | ≥ 1.0 | 370 x 240 x 237 | 130 | 240 | 2 | 0.86 | 0.57 | 100 / 100 | 100 |
| M12 / M16 with FIS H 20 x 130 K | ≥ 12 | ≥ 1.0 | 370 x 240 x 237 | 130 | 240 | 2 | 1.14 | 0.57 | 100 / 100 | 100 |
| **Perforated sand-lime brick KSL, acc. to EN 771-2[3)]** | | | | | | | | | | |
| M6 / M8 with FIS H 12 x 85 K | ≥ 12 | ≥ 1.4 | 240 x 175 x 113 | 85 | 175 | 2 | 0.71 | 0.71 | 100 / 115 | 60 |
| M8 / M10 with FIS H 16 x 130 K | ≥ 12 | ≥ 1.4 | 240 x 175 x 113 | 130 | 175 | 2 | 1.00 | 1.29 | 100 / 115 | 80 |
| M12 / M16 with FIS H 20 x 85 K | ≥ 12 | ≥ 1.4 | 240 x 175 x 113 | 85 | 175 | 2 | 1.00 | 1.14 | 100 / 115 | 80 |
| **Lightweight concrete hollow block Hbl, acc. EN 771-3[3)]** | | | | | | | | | | |
| M6 / M8 with FIS H 12 x 85 K | ≥ 2 | ≥ 1.0 | 362 x 240 x 240 | 85 | 240 | 2 | 0.43 | 0.26 | 100 / 240 | 60 |
| M6 / M8 with FIS H 12 x 85 K | ≥ 4 | ≥ 1.0 | 362 x 240 x 240 | 85 | 240 | 2 | 0.86 | 0.57 | 100 / 240 | 60 |
| M8 / M10 with FIS H 16 x 85 K | ≥ 2 | ≥ 1.0 | 362 x 240 x 240 | 85 | 240 | 2 | 0.43 | 0.26 | 100 / 240 | 60 |
| M8 / M10 with FIS H 16 x 85 K | ≥ 4 | ≥ 1.0 | 362 x 240 x 240 | 85 | 240 | 2 | 0.86 | 0.57 | 100 / 240 | 60 |
| M12 / M16 with FIS H 20 x 200 K | ≥ 2 | ≥ 1.0 | 362 x 240 x 240 | 200 | 240 | 2 | 0.71 | 0.26 | 100 / 240 | 60 |
| M12 / M16 with FIS H 20 x 200 K | ≥ 4 | ≥ 1.0 | 362 x 240 x 240 | 200 | 240 | 2 | 1.57 | 0.57 | 100 / 240 | 60 |
| **Aerated concrete acc. to EN 771-4[6)]** | | | | | | | | | | |
| M8 | ≥ 2 | ≥ 0.35 | - | 100 | 130 | 1 | 0.54 | 0.43 | 250 / 250 | 100 |
| M8 | ≥ 4 | ≥ 0.50 | - | 200 | 230 | 8 | 1.07 | 0.71 | 80 / 80 | 100 |
| M10 | ≥ 2 | ≥ 0.35 | - | 100 | 130 | 2 | 0.54 | 0.43 | 250 / 250 | 100 |
| M10 | ≥ 4 | ≥ 0.50 | - | 200 | 230 | 12 | 1.79 | 0.71 | 80 / 80 | 100 |
| M12 | ≥ 2 | ≥ 0.35 | - | 100 | 130 | 2 | 0.71 | 0.54 | 250 / 250 | 100 |
| M12 | ≥ 4 | ≥ 0.50 | - | 200 | 230 | 16 | 1.79 | 0.71 | 80 / 80 | 100 |
| M16 | ≥ 2 | ≥ 0.35 | - | 100 | 130 | 2 | 0.71 | 0.43 | 250 / 250 | 100 |
| M16 | ≥ 4 | ≥ 0.50 | - | 200 | 230 | 20 | 1.79 | 0.71 | 80 / 80 | 100 |

[1)] The required partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered. Load values are valid for zinc-plated steel, stainless steel R and highly corrosion-resistant steel HCR. In perforated bricks and hollow blocks threaded rod FIS A in combination with anchor sleeve FIS H K.

[2)] The given loads are valid for installation and use of fixations in dry masonry - use category d/d - for temperatures in the substrate up to 50 °C (resp. short term up to 80 °C) and drill hole cleaning according to assessment. The given brick types in combination with the permissible loads are an extract of the assessment.

[3)] More information about, e.g. hole patterns, assortment of anchor sleeves FIS H K see assessment.

[4)] In the case of combinations of tensile and shear loads, bending moments and reduced edge and axial spacings (anchor groups), the design must be carried out in accordance with the provisions of the complete assessment.

[5)] Minimum feasible spacing resp. edge distance. Details as well as to the distances to joints see assessment.

[6)] Cylindrical drill hole.

# Loads



**Injection system FIS V with threaded rod FIS A**

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-02/0024 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material / surface[3)] | Effective anchorage depth | Minimum member thickness | Maximum installation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,max}$ [Nm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] |
| **FIS A M 8** | 5.8 | 60 | 100 | 10 | 3.9 | 6.3 | 40 | 40 | 7.9 | 6.3 | 40 | 40 |
| | 5.8 | 80 | 110 | 10 | 5.3 | 6.3 | 40 | 40 | 9.0 | 6.3 | 40 | 40 |
| | 5.8 | 160 | 190 | 10 | 9.0 | 6.3 | 40 | 40 | 9.0 | 6.3 | 40 | 40 |
| | R-70 | 60 | 100 | 10 | 3.9 | 6.0 | 40 | 40 | 7.9 | 6.0 | 40 | 40 |
| | R-70 | 80 | 110 | 10 | 5.3 | 6.0 | 40 | 40 | 9.9 | 6.0 | 40 | 40 |
| | R-70 | 160 | 190 | 10 | 9.9 | 6.0 | 40 | 40 | 9.9 | 6.0 | 40 | 40 |
| **FIS A M 10** | 5.8 | 60 | 100 | 20 | 5.4 | 9.7 | 45 | 45 | 9.9 | 9.7 | 45 | 45 |
| | 5.8 | 90 | 120 | 20 | 8.1 | 9.7 | 45 | 45 | 13.8 | 9.7 | 45 | 45 |
| | 5.8 | 200 | 230 | 20 | 13.8 | 9.7 | 45 | 45 | 13.8 | 9.7 | 45 | 45 |
| | R-70 | 60 | 100 | 20 | 5.4 | 9.2 | 45 | 45 | 9.9 | 9.2 | 45 | 45 |
| | R-70 | 90 | 120 | 20 | 8.1 | 9.2 | 45 | 45 | 14.8 | 9.2 | 45 | 45 |
| | R-70 | 200 | 230 | 20 | 15.7 | 9.2 | 45 | 45 | 15.7 | 9.2 | 45 | 45 |
| **FIS A M 12** | 5.8 | 70 | 100 | 40 | 7.5 | 14.3 | 55 | 55 | 13.7 | 14.3 | 55 | 55 |
| | 5.8 | 110 | 140 | 40 | 11.8 | 14.3 | 55 | 55 | 20.5 | 14.3 | 55 | 55 |
| | 5.8 | 240 | 270 | 40 | 20.5 | 14.3 | 55 | 55 | 20.5 | 14.3 | 55 | 55 |
| | R-70 | 70 | 100 | 40 | 7.5 | 13.7 | 55 | 55 | 13.7 | 13.7 | 55 | 55 |
| | R-70 | 110 | 140 | 40 | 11.8 | 13.7 | 55 | 55 | 21.7 | 13.7 | 55 | 55 |
| | R-70 | 240 | 270 | 40 | 22.5 | 13.7 | 55 | 55 | 22.5 | 13.7 | 55 | 55 |
| **FIS A M 16** | 5.8 | 80 | 120 | 60 | 11.5 | 23.0 | 65 | 65 | 16.8 | 26.9 | 65 | 65 |
| | 5.8 | 125 | 170 | 60 | 18.0 | 26.9 | 65 | 65 | 29.9 | 26.9 | 65 | 65 |
| | 5.8 | 320 | 360 | 60 | 37.6 | 26.9 | 65 | 65 | 37.6 | 26.9 | 65 | 65 |
| | R-70 | 80 | 120 | 60 | 11.5 | 23.0 | 65 | 65 | 16.8 | 25.2 | 65 | 65 |
| | R-70 | 125 | 170 | 60 | 18.0 | 25.2 | 65 | 65 | 29.9 | 25.2 | 65 | 65 |
| | R-70 | 320 | 360 | 60 | 42.0 | 25.2 | 65 | 65 | 42.0 | 25.2 | 65 | 65 |
| **FIS A M 20** | 5.8 | 90 | 140 | 120 | 14.0 | 28.0 | 85 | 85 | 20.0 | 40.0 | 85 | 85 |
| | 5.8 | 170 | 220 | 120 | 28.0 | 42.3 | 85 | 85 | 48.3 | 42.3 | 85 | 85 |
| | 5.8 | 400 | 450 | 120 | 58.6 | 42.3 | 85 | 85 | 58.6 | 42.3 | 85 | 85 |
| | R-70 | 90 | 140 | 120 | 14.0 | 28.0 | 85 | 85 | 20.0 | 39.4 | 85 | 85 |
| | R-70 | 170 | 220 | 120 | 28.0 | 39.4 | 85 | 85 | 48.3 | 39.4 | 85 | 85 |
| | R-70 | 400 | 450 | 120 | 65.7 | 39.4 | 85 | 85 | 65.7 | 39.4 | 85 | 85 |
| **FIS A M 24** | 5.8 | 96 | 160 | 150 | 15.4 | 30.8 | 105 | 105 | 22.0 | 44.1 | 105 | 105 |
| | 5.8 | 210 | 270 | 150 | 33.9 | 60.6 | 105 | 105 | 67.9 | 60.9 | 105 | 105 |
| | 5.8 | 480 | 540 | 150 | 77.6 | 60.6 | 105 | 105 | 84.3 | 60.9 | 105 | 105 |
| | R-70 | 96 | 160 | 150 | 15.4 | 30.8 | 105 | 105 | 22.0 | 44.1 | 105 | 105 |
| | R-70 | 210 | 270 | 150 | 33.9 | 56.8 | 105 | 105 | 67.9 | 56.8 | 105 | 105 |
| | R-70 | 480 | 540 | 150 | 77.6 | 56.8 | 105 | 105 | 94.3 | 56.8 | 105 | 105 |
| **FIS A M 30** | 5.8 | 120 | 190 | 300 | 21.5 | 43.1 | 140 | 140 | 30.8 | 61.6 | 140 | 140 |
| | 5.8 | 280 | 350 | 300 | 50.3 | 96.0 | 140 | 140 | 106.8 | 96.0 | 140 | 140 |
| | 5.8 | 600 | 670 | 300 | 107.7 | 96.0 | 140 | 140 | 133.8 | 96.0 | 140 | 140 |
| | R-70 | 120 | 190 | 300 | 21.5 | 43.1 | 140 | 140 | 30.8 | 61.6 | 140 | 140 |
| | R-70 | 280 | 350 | 300 | 50.3 | 90.2 | 140 | 140 | 106.8 | 90.2 | 140 | 140 |
| | R-70 | 600 | 670 | 300 | 107.7 | 90.2 | 140 | 140 | 150.1 | 90.2 | 140 | 140 |

[1)] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.

[2)] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 80 °C). Drill hole cleaning as per specification in the ETA. The factor $\Psi_{sus}$ for sustained load was taken into account with 1.0.

[3)] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).

[4)] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Loads

**Injection system FIS V with internal threaded anchor RG M I**

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-02/0024 has to be considered.

| | | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|
| | Screw Material[3)] | Effective anchorage depth | Minimum member thickness | Maximum Installation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,\,max}$ [Nm] | $N_{perm}$[4)] [kN] | $V_{perm}$[4)] [kN] | $s_{min}$[4)] [mm] | $c_{min}$[4)] [mm] |
| **RG M 8 I** | 5.8 | 90 | 120 | 10 | 9.0 | 5.3 | 55 | 55 |
| | 8.8 | 90 | 120 | 10 | 13.8 | 8.3 | 55 | 55 |
| | R-70 | 90 | 120 | 10 | 9.9 | 5.9 | 55 | 55 |
| **RG M 10 I** | 5.8 | 90 | 130 | 20 | 13.8 | 8.3 | 65 | 65 |
| | 8.8 | 90 | 130 | 20 | 19.0 | 13.3 | 65 | 65 |
| | R-70 | 90 | 130 | 20 | 15.7 | 9.3 | 65 | 65 |
| **RG M 12 I** | 5.8 | 125 | 170 | 40 | 20.5 | 12.1 | 75 | 75 |
| | 8.8 | 125 | 170 | 40 | 23.8 | 19.3 | 75 | 75 |
| | R-70 | 125 | 170 | 40 | 22.5 | 13.5 | 75 | 75 |
| **RG M 16 I** | 5.8 | 160 | 210 | 80 | 35.7 | 22.4 | 95 | 95 |
| | 8.8 | 160 | 210 | 80 | 35.7 | 35.8 | 95 | 95 |
| | R-70 | 160 | 210 | 80 | 35.7 | 25.1 | 95 | 95 |
| **RG M 20 I** | 5.8 | 200 | 260 | 120 | 54.8 | 35.4 | 125 | 125 |
| | 8.8 | 200 | 260 | 120 | 54.8 | 42.9 | 125 | 125 |
| | R-70 | 200 | 260 | 120 | 54.8 | 39.4 | 125 | 125 |

[1)] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.

[2)] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 80 °C). Drill hole cleaning as per specification in the ETA. The factor $\Psi_{sus}$ for sustained load was taken into account with 1.0.

[3)] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).

[4)] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Injection mortar FIS VL

The solid injection mortar for standard applications in cracked concrete and masonry.








High-bay warehouses

## Applications

- Steelwork constructions
- Timber constructions
- Guard rails
- Façades
- Staircases
- Steel brackets
- Machines
- Masts
- Awnings
- Canopies
- Gates
- Consoles
- Pipelines
- Gratings
- Satellite antennas

## Advantages

- The FIS VL is approved for use in cracked concrete and masonry, and achieves a high load-bearing capacity in these conditions.
- The temperature resistance of the FIS VL injection mortar of -40 °C to +120 °C allows for a solid load level even when subjected to high temperature demands, thus providing great flexibility.
- FIS VL HIGH SPEED has a significantly shorter curing time than FIS VL, thus also ensuring swift work progress even at low temperatures.

## Certificates / Features

ETA-10/0352, in concrete
ETA-15/0263, in masonry
ETA-15/0539, for post-installed rebar connections

## Building materials

**Approved for anchorings in:**

- Concrete C20/25 to C50/60, cracked
- Hollow blocks made from lightweight concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Solid sand-lime brick
- Solid brick
- Rebar connections
- Aerated concrete

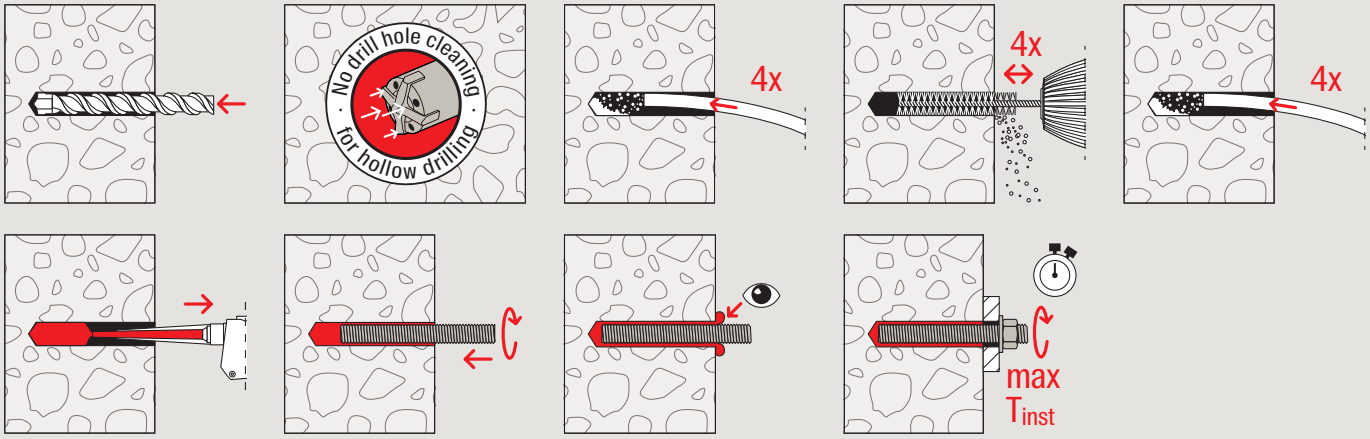
**Also suitable for:**

- Concrete C12/15
- Hollow blocks made from concrete

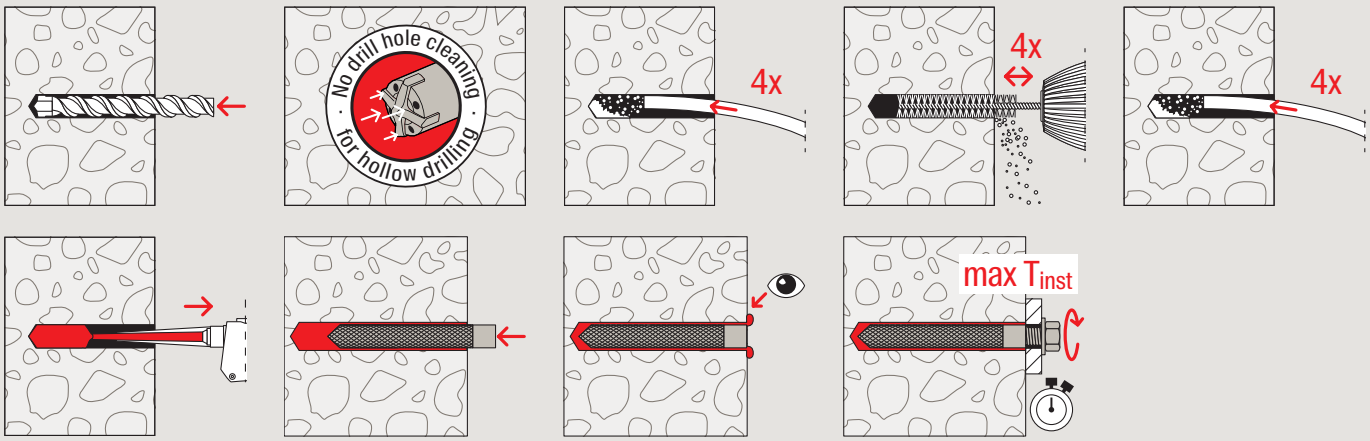
## Functioning

- The FIS VL is a 2-component injection mortar based on vinyl ester.
- Resin and hardener are stored in two separate chambers and are not mixed and activated until extrusion through the static mixer.
- The mortar is extruded bubble free from the drill hole base.
- The mortar bonds the entire surface of the anchor with the drill hole wall and seals the drill hole.
- The injection mortar FIS VL 150 C and 300 T can be applied without a special tool using a standard dispenser.
- Partially used cartridges can be reused by changing the static mixer.

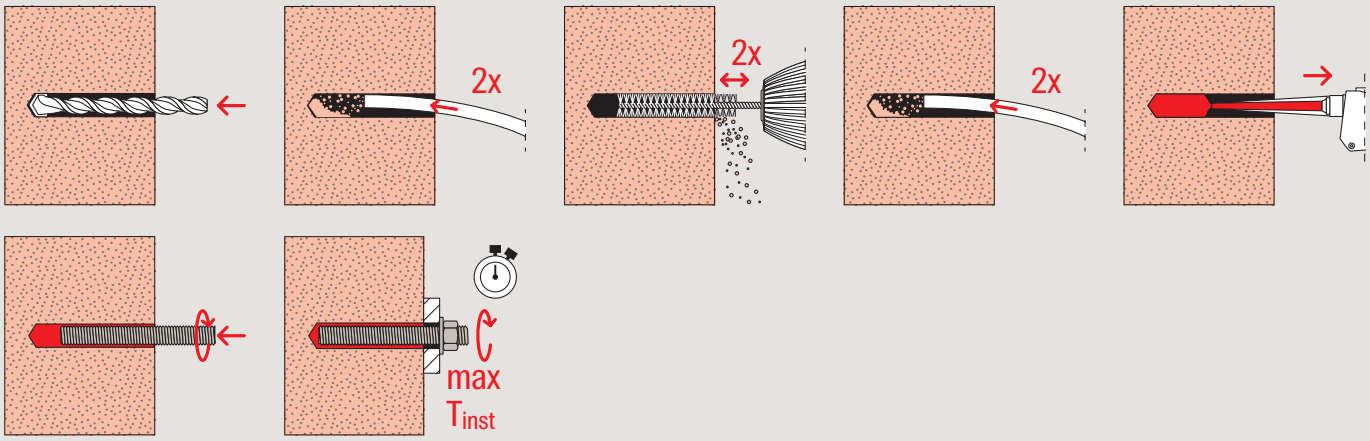
## Installation in concrete with FIS VL and FIS A / RG M



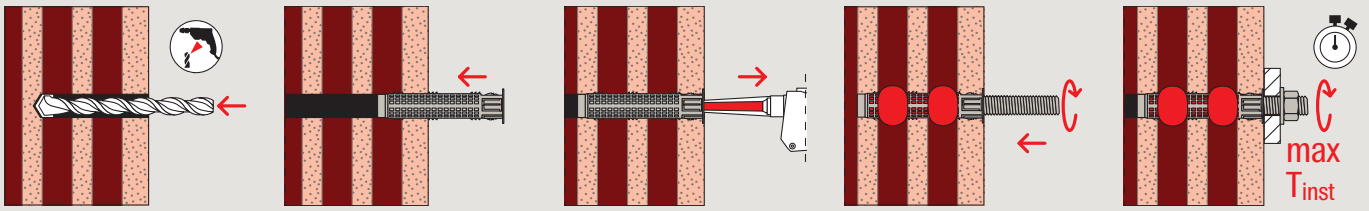

## Installation in concrete with FIS VL and RG M I




## Installation in solid brick with FIS VL and FIS A / RG M

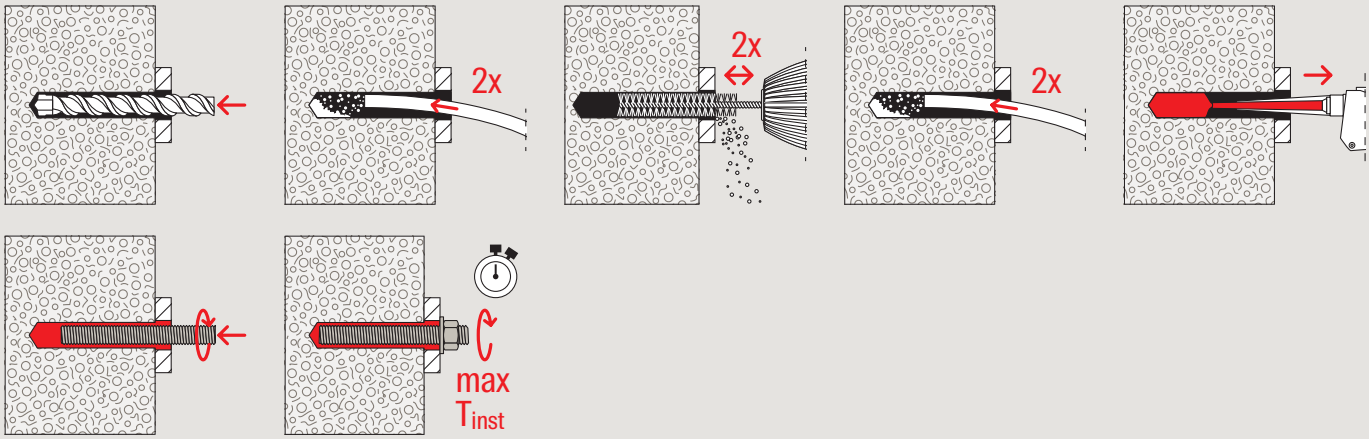


## Installation in hollow blocks with FIS VL and FIS HK + FIS A / RG M






## Installation in aerated concrete with FIS VL and FIS A / RG M




## Technical data

**Injection mortar FIS VL**



FIS VL 300 T | FIS VL 360 S | FIS VL 410 C | FIS MR Plus

| Item | Item no. | Approval ETA | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FIS VL 300 T** | **519557** | ● | DE | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VL 300 T electro** | **519558** | ● | DE | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VL 300 T** | **539461** | ● | EN, ES, PT | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VL 300 T** | **537149** | ● | EN, ES, PT | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VL 300 T with clip** | **538583** | ● | CS, HU, SK | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VL 300 T** | **540983** | ● | ET, LT, LV, PL | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VL 300 T in bucket** | **539462** | ● | EN, ES, PT | 150 | 20 x Cartridge 300 ml, 40 x static mixer FIS MR Plus | 1 |
| **FIS VL 300 T HIGH SPEED** | **571912** | ● | DE | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VL 300 T HIGH SPEED with clip** | **538585** | ● | CS, SK | 150 | 1 x Cartridge 380 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VL 360 S** | **519556** | ● | DE | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VL 360 S** | **558795** | ● | AR, EL, EN | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VL 410 C** | **539463** | ● | EL, EN, ES, PT | 200 | 1 x Cartridge 410 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VL 410 C** | **538584** | ● | CS, SK | 200 | 1 x Cartridge 410 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VL 410 C HIGH SPEED** | **538586** | ● | CS, SK | 200 | 1 x Cartridge 410 ml, 1 x static mixer FIS MR Plus | 1 |
| **FIS VL 410 C** | **540986** | ● | EN, PL, UK | 200 | 1 x Cartridge 410 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VL 410 C in bucket** | **538549** | ● | EN, TR | 200 | 16 x Cartridge 410 ml, 32 x static mixer FIS MR Plus | 1 |
| **FIS VL 410 C in bucket** | **539464** | ● | EL, EN, ES, PT | 200 | 16 x Cartridge 410 ml, 32 x static mixer FIS MR Plus | 1 |
| **FIS VL 300 T HWK big** | **538589** | ● | CS, SK | 150 | 20 x Cartridge 300 ml, 40 x static mixer FIS MR Plus | 1 |
| **FIS VL 410 C HWK big** | **538590** | ● | CS, SK | 200 | 16 x Cartridge 410 ml, 32 x static mixer FIS MR Plus | 1 |
| **FIS MR Plus** | **545853** | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |

## Curing times

| FIS VL High Speed<br>FIS VL | | | | | | |
|---|---|---|---|---|---|---|
| Temperature at anchoring base | Maximum processing time $t_{work}$ | | Minimum curing time $t_{cure}$ [1] | | | |
| | FIS VL High Speed | FIS VL | FIS VL High Speed | | FIS VL | |
| [°C] | [min.] | [min.] | [hrs.] | [min.] | [hrs.] | [min.] |
| -10 – -5 [2] | – | – | 12 | – | – | – |
| > -5 – 0 [2] | 5 | – | 3 | – | 24 | – |
| > 0 – +5 [2] | 5 | 13 | 3 | – | 3 | – |
| > +5 – +10 | 3 | 9 | – | 50 | – | 90 |
| > +10 – +20 | 1 | 5 | – | 30 | – | 60 |
| > +20 – +30 | – | 4 | – | – | – | 45 |
| > +30 – +40 | – | 2 | – | – | – | 35 |

1) In wet concrete or water filled holes the curing times must be doubled.
2) Minimal cartridge temperature +5 °C

## Loads

**Injection system FIS VL with threaded rod FIS A in solid and perforated masonry**

Permissible loads[1) 2)] for a single anchor in masonry for pre-positioned installation.
For the design the complete current assessment ETA-15/0263 has to be considered.

| Type | Compressive brick strength $f_b$ [N/mm²] | Brick raw density $\rho$ [kg/dm³] | Minimum brick dimensions[3)] (L x B x H) [mm] | Effective anchorage depth $h_{ef}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Maximum installation torque $T_{inst,max}$ [Nm] | Permissible tensile load[4)] $N_{perm}$ [kN] | Permissible shear load[4)] $V_{perm}$ [kN] | Minimum-spacing[5)] $s_{min\parallel}$ / $s_{min\perp}$ [mm] | Characteristic resp. minimum edge distance[5)] $c_{cr} = c_{min}$ [mm] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Solid sand-lime brick KS, acc. to EN 771-2** | | | | | | | | | | |
| M8 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | ≥ 50 | 115 | 5 | 1.14 | 0.43 | 80 / 150 | 60 |
| M8 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 100 | 240 | 5 | 2.29 | 0.86 | 80 / 300 | 60 |
| M10 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 100 | 240 | 15 | 1.57 | 0.57 | 80 / 300 | 60 |
| M10 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 200 | 240 | 15 | 3.43 | 0.57 | 80 / 600 | 60 |
| M12 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 100 | 240 | 15 | 1.29 | 0.57 | 80 / 300 | 60 |
| M12 | ≥ 12 | ≥ 1.8 | 240 x 115 x 71 | 200 | 240 | 15 | 3.43 | 0.57 | 80 / 300 | 60 |
| **Perforated sand-lime brick KSL, acc. to EN 771-2[3)]** | | | | | | | | | | |
| M8 with FIS H 12 x 85 K | ≥ 12 | ≥ 1.4 | 240 x 175 x 113 | 85 | 175 | 2 | 0.71 | 0.71 | 100 / 115 | 60 |
| M8 / M10 with FIS H 16 x 85 K | ≥ 12 | ≥ 1.4 | 240 x 175 x 113 | 85 | 175 | 2 | 0.86 | 1.29 | 100 / 115 | 80 |
| M12 with FIS H 20 x 85 K | ≥ 12 | ≥ 1.4 | 240 x 175 x 113 | 85 | 175 | 2 | 0.86 | 1.29 | 100 / 115 | 80 |
| M8 / M10 with FIS H 16 x 130 K | ≥ 12 | ≥ 1.4 | 240 x 175 x 113 | 130 | 175 | 2 | 0.86 | 1.29 | 100 / 115 | 80 |
| **Vertically perforated brick Hlz, acc. to EN 771-1[3)]** | | | | | | | | | | |
| M8 with FIS H 12 x 85 K | ≥ 10 | ≥ 0.9 | 240 x 175 x 113 | 85 | 175 | 2 | 1.14 | 1.14 | 240 / 115 | 100 |
| M8 / M10 with FIS H 16 x 85 K | ≥ 10 | ≥ 0.9 | 240 x 175 x 113 | 85 | 175 | 2 | 1.00 | 1.57 | 240 / 115 | 100 |
| M12 with FIS H 20 x 85 K | ≥ 10 | ≥ 0.9 | 240 x 175 x 113 | 85 | 175 | 2 | 1.43 | 1.71 | 240 / 115 | 100 |
| M8 / M10 with FIS H 16 x 130 K | ≥ 10 | ≥ 0.9 | 240 x 175 x 113 | 130 | 175 | 2 | 1.43 | 1.57 | 240 / 115 | 100 |
| M12 with FIS H 20 x 130 K | ≥ 10 | ≥ 0.9 | 240 x 175 x 113 | 130 | 175 | 2 | 1.43 | 1.71 | 240 / 115 | 100 |
| **Aerated concrete acc. to EN 771-4[6)]** | | | | | | | | | | |
| M8 | ≥ 2 | ≥ 0.35 | - | ≥ 100 | 130 | 1 | 0.54 | 0.43 | 250 / 250 | 100 |
| M8 | ≥ 4 | ≥ 0.50 | - | 200 | 230 | 8 | 1.07 | 0.71 | 80 / 80 | 100 |
| M10 | ≥ 2 | ≥ 0.35 | - | ≥ 100 | 130 | 2 | 0.54 | 0.43 | 250 / 250 | 100 |
| M10 | ≥ 4 | ≥ 0.50 | - | 200 | 230 | 12 | 1.79 | 0.71 | 80 / 80 | 100 |
| M12 | ≥ 2 | ≥ 0.35 | - | ≥ 100 | 130 | 2 | 0.71 | 0.54 | 250 / 250 | 100 |
| M12 | ≥ 4 | ≥ 0.50 | - | 200 | 230 | 16 | 1.79 | 0.71 | 80 / 80 | 100 |

[1)] The required partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered. Load values are valid for zinc-plated steel, stainless steel R and highly corrosion-resistant steel HCR. In perforated bricks and hollow blocks threaded rod FIS A in combination with anchor sleeve FIS H K.
[2)] The given loads are valid for installation and use of fixations in dry masonry - use category d/d - for temperatures in the substrate up to 50 °C (resp. short term up to 80 °C) and drill hole cleaning according to assessment. The given brick types in combination with the permissible loads are an extract of the assessment.
[3)] More information about, e.g. hole patterns, assortment of anchor sleeves FIS H K see assessment.
[4)] In the case of combinations of tensile and shear loads, bending moments and reduced edge and axial spacings (anchor groups), the design must be carried out in accordance with the provisions of the complete assessment.
[5)] Minimum feasible spacing resp. edge distance. Details as well as to the distances to joints see assessment.
[6)] Cylindrical drill hole.

# Loads



**Injection system FIS VL with threaded rod FIS A resp. RG M**

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-10/0352 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material / surface[3)] | Effective anchorage depth | Minimum member thickness | Maximum installation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,max}$ [Nm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] |
| **FIS A M 8** | 5.8 | 60 | 100 | 10 | - | - | - | - | 6.6 | 6.3 | 40 | 40 |
| | 5.8 | 80 | 110 | 10 | - | - | - | - | 8.8 | 6.3 | 40 | 40 |
| | 5.8 | 160 | 190 | 10 | - | - | - | - | 9.0 | 6.3 | 40 | 40 |
| | R-70 | 60 | 100 | 10 | - | - | - | - | 6.6 | 6.0 | 40 | 40 |
| | R-70 | 80 | 110 | 10 | - | - | - | - | 8.8 | 6.0 | 40 | 40 |
| | R-70 | 160 | 190 | 10 | - | - | - | - | 13.8 | 6.0 | 40 | 40 |
| **FIS A M 10** | 5.8 | 60 | 100 | 20 | 4.5 | 9.7 | 45 | 45 | 8.2 | 9.7 | 45 | 45 |
| | 5.8 | 90 | 120 | 20 | 6.7 | 9.7 | 45 | 45 | 12.3 | 9.7 | 45 | 45 |
| | 5.8 | 200 | 230 | 20 | 13.8 | 9.7 | 45 | 45 | 13.8 | 9.7 | 45 | 45 |
| | R-70 | 60 | 100 | 20 | 4.5 | 9.2 | 45 | 45 | 8.2 | 9.2 | 45 | 45 |
| | R-70 | 90 | 120 | 20 | 6.7 | 9.2 | 45 | 45 | 12.3 | 9.2 | 45 | 45 |
| | R-70 | 200 | 230 | 20 | 15.0 | 9.2 | 45 | 45 | 15.7 | 9.2 | 45 | 45 |
| **FIS A M 12** | 5.8 | 70 | 100 | 40 | 6.3 | 14.3 | 55 | 55 | 11.4 | 14.3 | 55 | 55 |
| | 5.8 | 110 | 140 | 40 | 9.9 | 14.3 | 55 | 55 | 18.1 | 14.3 | 55 | 55 |
| | 5.8 | 240 | 270 | 40 | 20.5 | 14.3 | 55 | 55 | 20.5 | 14.3 | 55 | 55 |
| | R-70 | 70 | 100 | 40 | 6.3 | 13.7 | 55 | 55 | 11.4 | 13.7 | 55 | 55 |
| | R-70 | 110 | 140 | 40 | 9.9 | 13.7 | 55 | 55 | 18.1 | 13.7 | 55 | 55 |
| | R-70 | 240 | 270 | 40 | 21.5 | 13.7 | 55 | 55 | 22.5 | 13.7 | 55 | 55 |
| **FIS A M 16** | 5.8 | 80 | 120 | 60 | 9.6 | 23.0 | 65 | 65 | 14.0 | 26.9 | 65 | 65 |
| | 5.8 | 125 | 170 | 60 | 15.0 | 26.9 | 65 | 65 | 24.9 | 26.9 | 65 | 65 |
| | 5.8 | 320 | 360 | 60 | 37.6 | 26.9 | 65 | 65 | 37.6 | 26.9 | 65 | 65 |
| | R-70 | 80 | 120 | 60 | 9.6 | 23.0 | 65 | 65 | 14.0 | 25.2 | 65 | 65 |
| | R-70 | 125 | 170 | 60 | 15.0 | 25.2 | 65 | 65 | 24.9 | 25.2 | 65 | 65 |
| | R-70 | 320 | 360 | 60 | 38.3 | 25.2 | 65 | 65 | 42.0 | 25.2 | 65 | 65 |
| **FIS A M 20** | 5.8 | 90 | 140 | 120 | 11.7 | 28.0 | 85 | 85 | 16.7 | 40.0 | 85 | 85 |
| | 5.8 | 170 | 220 | 120 | 23.3 | 42.3 | 85 | 85 | 40.3 | 42.3 | 85 | 85 |
| | 5.8 | 400 | 450 | 120 | 54.9 | 42.3 | 85 | 85 | 58.6 | 42.3 | 85 | 85 |
| | R-70 | 90 | 140 | 120 | 11.7 | 28.0 | 85 | 85 | 16.7 | 39.4 | 85 | 85 |
| | R-70 | 170 | 220 | 120 | 23.3 | 39.4 | 85 | 85 | 40.3 | 39.4 | 85 | 85 |
| | R-70 | 400 | 450 | 120 | 54.9 | 39.4 | 85 | 85 | 65.7 | 39.4 | 85 | 85 |
| **FIS A M 24** | 5.8 | 96 | 160 | 150 | - | - | - | - | 18.4 | 44.1 | 105 | 105 |
| | 5.8 | 210 | 270 | 150 | - | - | - | - | 56.5 | 60.6 | 105 | 105 |
| | 5.8 | 480 | 540 | 150 | - | - | - | - | 84.3 | 60.6 | 105 | 105 |
| | R-70 | 96 | 160 | 150 | - | - | - | - | 18.4 | 44.1 | 105 | 105 |
| | R-70 | 210 | 270 | 150 | - | - | - | - | 56.5 | 56.8 | 105 | 105 |
| | R-70 | 480 | 540 | 150 | - | - | - | - | 94.3 | 56.8 | 105 | 105 |
| **FIS A M 30** | 5.8 | 120 | 190 | 300 | - | - | - | - | 25.7 | 61.6 | 140 | 140 |
| | 5.8 | 280 | 350 | 300 | - | - | - | - | 89.0 | 96.0 | 140 | 140 |
| | 5.8 | 600 | 670 | 300 | - | - | - | - | 133.8 | 96.0 | 140 | 140 |
| | R-70 | 120 | 190 | 300 | - | - | - | - | 25.7 | 61.6 | 140 | 140 |
| | R-70 | 280 | 350 | 300 | - | - | - | - | 89.0 | 90.2 | 140 | 140 |
| | R-70 | 600 | 670 | 300 | - | - | - | - | 150.1 | 90.2 | 140 | 140 |

[1)] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.

[2)] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 80 °C). Drill hole cleaning as per specification in the ETA. The factor $\Psi_{sus}$ for sustained load was taken into account with 1.0.

[3)] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).

[4)] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Loads

**Injection system FIS VL with internal threaded anchor RG M I**

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-10/0352 has to be considered.

| | | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|
| | Screw Material[3)] | Effective anchorage depth | Minimum member thickness | Maximum Installation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,\,max}$ [Nm] | $N_{perm}$[4)] [kN] | $V_{perm}$[4)] [kN] | $s_{min}$[4)] [mm] | $c_{min}$[4)] [mm] |
| **RG M 8 I** | 5.8 | 90 | 120 | 10 | 9.0 | 5.3 | 55 | 55 |
| | 8.8 | 90 | 120 | 10 | 13.8 | 8.3 | 55 | 55 |
| | R-70 | 90 | 120 | 10 | 9.9 | 5.9 | 55 | 55 |
| **RG M 10 I** | 5.8 | 90 | 130 | 20 | 13.8 | 8.3 | 65 | 65 |
| | 8.8 | 90 | 130 | 20 | 16.7 | 13.3 | 65 | 65 |
| | R-70 | 90 | 130 | 20 | 15.7 | 9.3 | 65 | 65 |
| **RG M 12 I** | 5.8 | 125 | 170 | 40 | 20.5 | 12.1 | 75 | 75 |
| | 8.8 | 125 | 170 | 40 | 26.6 | 19.3 | 75 | 75 |
| | R-70 | 125 | 170 | 40 | 22.5 | 13.5 | 75 | 75 |
| **RG M 16 I** | 5.8 | 160 | 210 | 80 | 37.6 | 22.4 | 95 | 95 |
| | 8.8 | 160 | 210 | 80 | 39.5 | 30.9 | 95 | 95 |
| | R-70 | 160 | 210 | 80 | 39.5 | 25.1 | 95 | 95 |
| **RG M 20 I** | 5.8 | 200 | 260 | 120 | 55.2 | 35.4 | 125 | 125 |
| | 8.8 | 200 | 260 | 120 | 55.2 | 42.9 | 125 | 125 |
| | R-70 | 200 | 260 | 120 | 55.2 | 39.4 | 125 | 125 |

[1)] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.
[2)] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 80 °C). Drill hole cleaning as per specification in the ETA. The factor $\Psi_{sus}$ for sustained load was taken into account with 1.0.
[3)] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).
[4)] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Injection mortar FIS V Zero

Maximum safety for human and nature.








Outdoor fixings in sub-zero temperatures



Fixings in occupied rooms

## Applications

- Steelwork constructions
- Guard rails
- Handrails
- Cable trays
- Satellite antennas
- Canopies
- Consoles

## Advantages

- The universal mortar FIS V Zero is free from dibenzoyl peroxide, which is classified as environmentally hazardous, sensitising and eye-irritating, thus enabling its users safe application.
- Due to its novel formulation and innovative ingredients, the cartridge can be disposed of in the usual residual waste and thus avoids cost-intensive hazardous waste.
- Due to the non-labelled ingredients, FIS V Zero enables user-friendly and safe installation.
- The injection mortar is approved for anchoring in concrete and masonry, for post-installed rebar connections and for water-filled drill holes.
- The universal mortar FIS V Zero not only provides secure constructions in all building substrates, but also enables an environmental friendly application and disposal.
- The possible installation temperatures from -10 to 40°C allow the universal use of FIS V Zero over the entire year.

## Certificates / Features

CE ETA

NORDIC SWAN ECOLABEL 3097 0044

**ETA-21/0267, in masonry**
**ETA-20/0574, for post-installed rebar connections**
**ETA-20/0572, in concrete**

Made with recycled plastic

Zero hazard technology

## Building materials

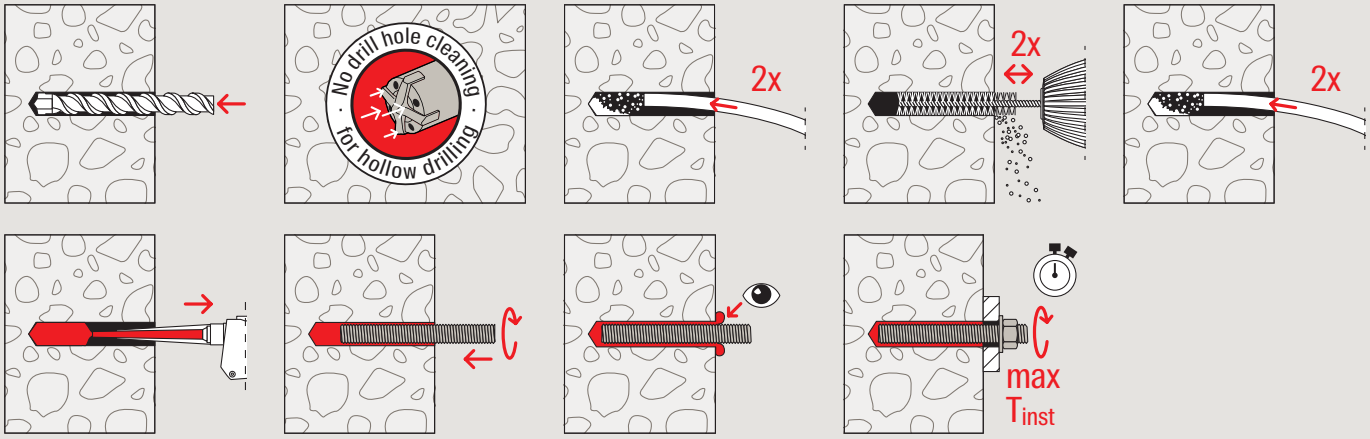
**Approved for:**

- Concrete C20/25 to C50/60, cracked and non-cracked
- Hollow blocks made from lightweight concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Solid sand-lime brick
- Solid brick
- Aerated concrete

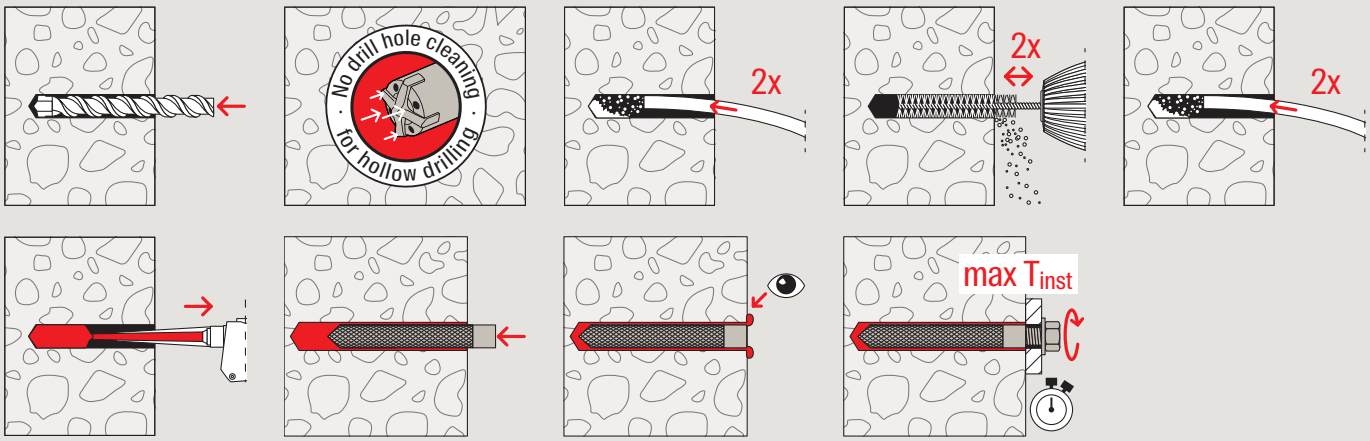
## Functioning

- Resin and hardener are stored in two separate chambers and are only mixed and activated in the static mixer when pressed out.
- The mortar needs to be injected bubble-free from the bottom of the borehole.
- The mortar bonds the fixing element to the borehole wall over the entire surface and also seals it.
- The injection cartridges are quick and easy to use with the fischer dispensers.
- Opened cartridges can be reused by changing the static mixer. Simply dispose empty cartridges in household waste.

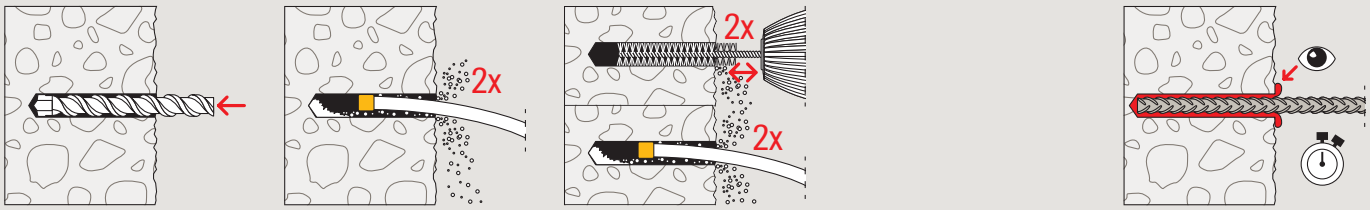
## Installation in concrete with FIS V Zero and FIS A / RG M



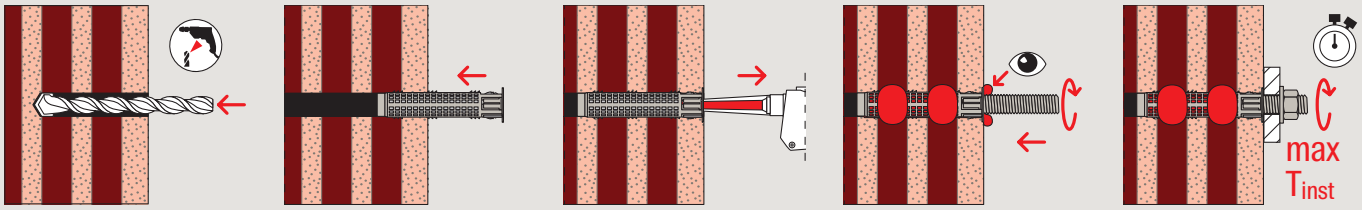

## Installation in concrete with FIS V Zero and RG M I



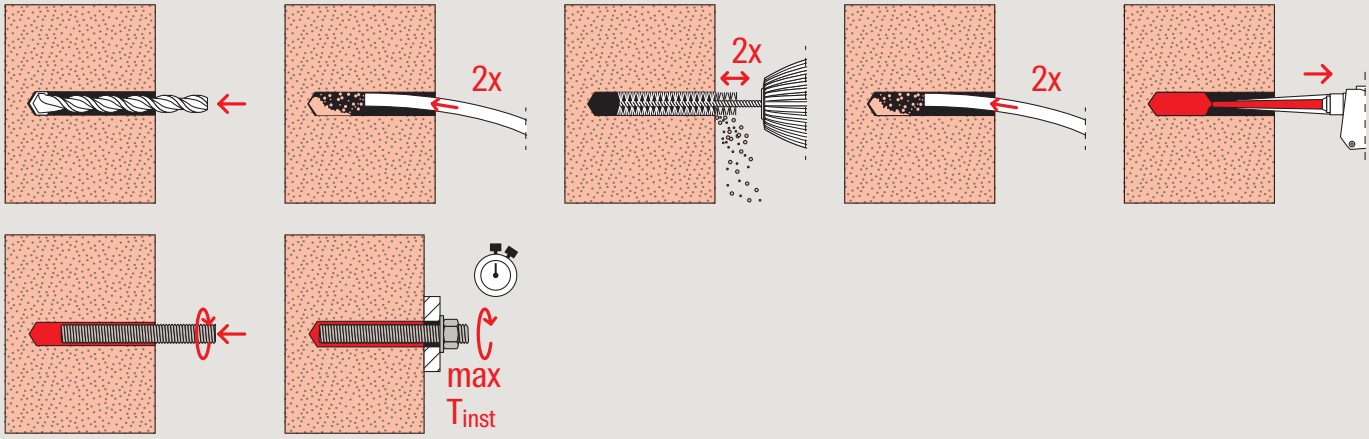

## Installation in concrete with FIS V Zero in hammerdrilled holes




## Installation in hollow blocks with FIS V Zero and FIS HK + FIS A



## Installation in solid brick with FIS V Zero and FIS A






## Technical data

**Injection mortar FIS V Zero**


FIS V Zero 150 C


FIS V Zero 300 T


FIS V Zero 360 S


FIS MR Plus

| Item | Item no. | Approval ETA | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FIS V Zero 150 C** | **575603** | ● | SV, DA, NO, CS, SK, PL, RU | 70 | 1 x Cartridge 150ml, 1 x static mixer FIS MR Plus | 1 |
| **FIS V Zero 150 C** | **574542** | ● | DE, EN, ES, FR, IT, NL, PT | 70 | 1 x Cartridge 150ml, 1x static mixer FIS MR Plus | 1 |
| **FIS V Zero 150 C Set M8** | **574543** | ● | DE, EN, ES, FR, IT, NL, PT | 70 | 1 x Cartridge 150ml, 4 x threaded rod M8 x 110 gvz, 4 x washer and nut, 4 x sieve sleeve FIS H 12 x 85 K, 1 x static mixer FIS MR Plus | 1 |
| **FIS V Zero 300 T** | **558953** | ● | DE, EN, ES, FR, IT, NL, PT | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus with transparent clip | 1 |
| **FIS V Zero 300 T** | **562064** | ● | CS, DA, EN, FI, HU, NO, PL, RO, RU, SE, SK | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus with transparent clip | 1 |
| **FIS V Zero 360 S** | **558954** | ● | DE, EN, ES, FR, HU, PL, PT | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS MR Plus** | **545853** | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |

## Technical data

**Injection mortar FIS V Zero HWK**



FIS V Zero 300 T HWK K

| Item | Item no. | Approval ETA | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FIS V Zero 300 T HWK K** | **569050** | ● | DE, EN, ES, FR, IT, NL, PT | 150 | 10 x Cartridges 300ml, 20 x static mixer FIS MR Plus | 1 |

## Technical data

| Injection mortar FIS V Zero | | | | | | |
|---|---|---|---|---|---|---|
| Item | Item no. | Approval ETA | Language on label | Scale unit | Contents | Sales unit [pcs] |
| FIS V Zero 300 T in bucket | 574540 | ● | DE, EN, ES, FR, IT, NL, PT | 150 | 20 x Cartridges 300ml, 40 x static mixer FIS MR Plus | 1 |
| FIS V Zero 300 T in bucket | 574814 | ● | CS, DA, EN, FI, HU, NO, PL, RO, RU, SE, SK | 150 | 20 x Cartridges 300ml, 40 x static mixer FIS MR Plus | 1 |




FIS V Zero 300 T in bucket

## Technical data

| Injection mortar FIS V Zero | | | | | | |
|---|---|---|---|---|---|---|
| Item | Item no. | Approval ETA | Language on label | Scale unit | Contents | Sales unit [pcs] |
| Cooling box FIS V Zero 300 T | 574541 | ● | DE, EN, ES, FR, IT, NL, PT | 150 | 12 x Cartridges 300ml, 24 x static mixer FIS MR Plus | 1 |
| Cooling box FIS V Zero 300 T | 574815 | ● | CS, DA, EN, FI, HU, NO, PL, RO, RU, SE, SK | 150 | 12 x Cartridges 300ml, 24 x static mixer FIS MR Plus | 1 |




Cooling box FIS V Zero 300 T

## Curing times

| FIS V Zero<br>Temperature at anchoring base [°C] | Maximum processing time $t_{work}$ [hrs.] | [min.] | Minimum curing time [1] $t_{cure}$ [hrs.] | [min.] |
|---|---|---|---|---|
| -10 – -5[2] | 6 | – | 72 | – |
| > -5– 0[2] | 2 | – | 24 | – |
| > 0 – +5[2] | – | 45 | 12 | – |
| > +5 – +10 | – | 20 | 6 | – |
| > +10 – +15 | – | 8 | 3 | – |
| > +15 – +20 | – | 5 | 2 | – |
| > +20 – +25 | – | 3 | 1 | – |
| > +25 – +30 | – | 2 | – | 45 |
| > +30 – +40 | – | 1 | – | 30 |

1) In wet concrete or water-filled holes the curing times must be doubled.

2) Minimum cartridge temperature +5 °C.

# Loads



**Injection system FIS V Zero with threaded rod FIS A**

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-20/0572 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material/ surface[3)] | Effective anchorage depth | Minimum member thickness | Maximum installation-torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,max}$ [Nm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] |
| **FIS A M 8** | 5.8 | 60 | 100 | 10 | 2.1 | 5.7 | 40 | 40 | 5.1 | 6.3 | 40 | 40 |
| | 5.8 | 80 | 110 | 10 | 2.7 | 6.3 | 40 | 40 | 6.8 | 6.3 | 40 | 40 |
| | 5.8 | 160 | 190 | 10 | 5.5 | 6.3 | 40 | 40 | 9.0 | 6.3 | 40 | 40 |
| | R-70 | 60 | 100 | 10 | 2.1 | 5.7 | 40 | 40 | 5.1 | 6.0 | 40 | 40 |
| | R-70 | 80 | 110 | 10 | 2.7 | 6.0 | 40 | 40 | 6.8 | 6.0 | 40 | 40 |
| | R-70 | 160 | 190 | 10 | 5.5 | 6.0 | 40 | 40 | 9.9 | 6.0 | 40 | 40 |
| **FIS A M 10** | 5.8 | 60 | 100 | 20 | 2.6 | 7.2 | 45 | 45 | 6.4 | 9.7 | 45 | 45 |
| | 5.8 | 90 | 120 | 20 | 3.8 | 9.7 | 45 | 45 | 9.6 | 9.7 | 45 | 45 |
| | 5.8 | 200 | 230 | 20 | 8.5 | 9.7 | 45 | 45 | 13.8 | 9.7 | 45 | 45 |
| | R-70 | 60 | 100 | 20 | 2.6 | 7.2 | 45 | 45 | 6.4 | 9.2 | 45 | 45 |
| | R-70 | 90 | 120 | 20 | 3.8 | 9.2 | 45 | 45 | 9.6 | 9.2 | 45 | 45 |
| | R-70 | 200 | 230 | 20 | 8.5 | 9.2 | 45 | 45 | 15.7 | 9.2 | 45 | 45 |
| **FIS A M 12** | 5.8 | 70 | 100 | 40 | 3.6 | 10.1 | 55 | 55 | 9.0 | 14.3 | 55 | 55 |
| | 5.8 | 110 | 140 | 40 | 5.6 | 14.3 | 55 | 55 | 14.1 | 14.3 | 55 | 55 |
| | 5.8 | 240 | 270 | 40 | 12.3 | 14.3 | 55 | 55 | 20.5 | 14.3 | 55 | 55 |
| | R-70 | 70 | 100 | 40 | 3.6 | 10.1 | 55 | 55 | 9.0 | 13.7 | 55 | 55 |
| | R-70 | 110 | 140 | 40 | 5.6 | 13.7 | 55 | 55 | 14.1 | 13.7 | 55 | 55 |
| | R-70 | 240 | 270 | 40 | 12.3 | 13.7 | 55 | 55 | 22.5 | 13.7 | 55 | 55 |
| **FIS A M 16** | 5.8 | 80 | 120 | 60 | 5.5 | 15.3 | 65 | 65 | 12.0 | 26.9 | 65 | 65 |
| | 5.8 | 125 | 170 | 60 | 8.5 | 23.9 | 65 | 65 | 21.4 | 26.9 | 65 | 65 |
| | 5.8 | 320 | 360 | 60 | 21.9 | 26.9 | 65 | 65 | 37.6 | 26.9 | 65 | 65 |
| | R-70 | 80 | 120 | 60 | 5.5 | 15.3 | 65 | 65 | 12.0 | 25.2 | 65 | 65 |
| | R-70 | 125 | 170 | 60 | 8.5 | 23.9 | 65 | 65 | 21.4 | 25.2 | 65 | 65 |
| | R-70 | 320 | 360 | 60 | 21.9 | 25.2 | 65 | 65 | 42.0 | 25.2 | 65 | 65 |
| **FIS A M 20** | 5.8 | 90 | 140 | 120 | 7.7 | 21.5 | 85 | 85 | 14.3 | 40.0 | 85 | 85 |
| | 5.8 | 170 | 220 | 120 | 14.5 | 40.7 | 85 | 85 | 34.5 | 42.3 | 85 | 85 |
| | 5.8 | 400 | 450 | 120 | 34.2 | 42.3 | 85 | 85 | 58.6 | 42.3 | 85 | 85 |
| | R-70 | 90 | 140 | 120 | 7.7 | 21.5 | 85 | 85 | 14.3 | 39.4 | 85 | 85 |
| | R-70 | 170 | 220 | 120 | 14.5 | 39.4 | 85 | 85 | 34.5 | 39.4 | 85 | 85 |
| | R-70 | 400 | 450 | 120 | 34.2 | 39.4 | 85 | 85 | 65.7 | 39.4 | 85 | 85 |
| **FIS A M 24** | 5.8 | 96 | 160 | 150 | 9.8 | 27.6 | 105 | 105 | 15.7 | 44.1 | 105 | 105 |
| | 5.8 | 210 | 270 | 150 | 21.5 | 60.3 | 105 | 105 | 45.8 | 60.6 | 105 | 105 |
| | 5.8 | 480 | 540 | 150 | 49.2 | 60.6 | 105 | 105 | 84.3 | 60.6 | 105 | 105 |
| | R-70 | 96 | 160 | 150 | 9.8 | 27.6 | 105 | 105 | 15.7 | 44.1 | 105 | 105 |
| | R-70 | 210 | 270 | 150 | 21.5 | 56.8 | 105 | 105 | 45.8 | 56.8 | 105 | 105 |
| | R-70 | 480 | 540 | 150 | 49.2 | 56.8 | 105 | 105 | 94.3 | 56.8 | 105 | 105 |

[1)] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.

[2)] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 80 °C). Drill hole cleaning as per specification in the ETA. The factor $\Psi_{sus}$ for sustained load was taken into account with 1.0.

[3)] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).

[4)] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Loads

**Injection system FIS V Zero with internal threaded anchor RG M I**

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-20/0572 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Screw material[3)] | Effective anchorage depth | Minimum member thickness | Maximum installation-torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,max}$ [Nm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] | $N_{perm}$ [4)] [kN] | $V_{perm}$ [4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] |
| **RG M8 I** | 5.8 | 90 | 120 | 10 | 5.2 | 5.3 | 40 | 40 | 8.7 | 5.3 | 40 | 40 |
| | 8.8 | 90 | 120 | 10 | 5.2 | 8.3 | 40 | 40 | 8.7 | 8.3 | 40 | 40 |
| | R-70 | 90 | 120 | 10 | 5.2 | 5.9 | 40 | 40 | 8.7 | 5.9 | 40 | 40 |
| **RG M10 I** | 5.8 | 90 | 130 | 20 | 6.2 | 8.3 | 45 | 45 | 11.5 | 8.3 | 45 | 45 |
| | 8.8 | 90 | 130 | 20 | 6.2 | 13.3 | 45 | 45 | 11.5 | 13.3 | 45 | 45 |
| | R-70 | 90 | 130 | 20 | 6.2 | 9.3 | 45 | 45 | 11.5 | 9.3 | 45 | 45 |
| **RG M12 I** | 5.8 | 125 | 170 | 40 | 9.6 | 12.1 | 55 | 55 | 18.0 | 12.1 | 55 | 55 |
| | 8.8 | 125 | 170 | 40 | 9.6 | 19.3 | 55 | 55 | 18.0 | 19.3 | 55 | 55 |
| | R-70 | 125 | 170 | 40 | 9.6 | 13.5 | 55 | 55 | 18.0 | 13.5 | 55 | 55 |
| **RG M16 I** | 5.8 | 160 | 210 | 80 | 13.2 | 22.4 | 65 | 65 | 26.3 | 22.4 | 65 | 65 |
| | 8.8 | 160 | 210 | 80 | 13.2 | 30.9 | 65 | 65 | 26.3 | 30.9 | 65 | 65 |
| | R-70 | 160 | 210 | 80 | 13.2 | 25.1 | 65 | 65 | 26.3 | 25.1 | 65 | 65 |

[1)] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.

[2)] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 80 °C). Drill hole cleaning as per specification in the ETA. The factor $\Psi'_{sus}$ for sustained load was taken into account with 1.0.

[3)] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).

[4)] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Loads



**Injection system FIS V Zero with threaded rod FIS A in solid and perforated masonry**

Permissible loads[1) 2)] for a single anchor in masonry for pre-positioned installation.
For the design the complete valid European Technical Assessment ETA-21/0267 has to be considered.

| Type | Compressive brick strength $f_b$ [N/mm²] | Brick raw density $\rho$ [kg/dm³] | Minimum brick dimensions[3)] (L x W x H) [mm] | Effective anchorage depth $h_{ef}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Maximum installation torque $T_{inst,max}$ [Nm] | Permissible tensile load[4)] $N_{perm}$ [kN] | Permissible shear load[4)] $V_{perm}$ [kN] | Minimum spacing[5)] $s_{min\parallel}$ / $s_{min\perp}$ [mm] | Characteristic resp. minimum edge distance[5)] $c_{cr} = c_{min}$ [mm] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Solid brick Mz, acc. to EN 771-1** | | | | | | | | | | |
| **M8** | ≥ 36 | ≥ 2.0 | 230 x 108 x 55 | 50 | 108 | 10 | 0.43 | 0.71 | 100 / 100 | 100 |
| **M10** | ≥ 36 | ≥ 2.0 | 230 x 108 x 55 | 80 | 110 | 10 | 0.57 | 1.29 | 100 / 100 | 100 |
| **M12** | ≥ 48 | ≥ 2.0 | 230 x 108 x 55 | 80 | 110 | 10 | 0.71 | 1.43 | 100 / 100 | 100 |
| **M16** | ≥ 36 | ≥ 2.0 | 230 x 108 x 55 | 80 | 110 | 10 | 1.00 | 1.29 | 100 / 100 | 100 |
| **M16** | ≥ 48 | ≥ 2.0 | 230 x 108 x 55 | 80 | 110 | 10 | 1.14 | 1.43 | 100 / 100 | 100 |
| **Solid sand-lime brick KS, acc. to EN 771-2** | | | | | | | | | | |
| **M8** | ≥ 12 | ≥ 2.0 | 240 x 115 x 71 | 80 | 115 | 8 | 0.43 | 1.00 | 100 /100 | 100 |
| **M10** | ≥ 12 | ≥ 2.0 | 240 x 115 x 71 | 80 | 115 | 10 | 0.86 | 1.29 | 100 /100 | 100 |
| **M12** | ≥ 12 | ≥ 2.0 | 240 x 115 x 71 | 80 | 115 | 10 | 0.86 | 1.14 | 100 /100 | 100 |
| **M16** | ≥ 12 | ≥ 2.0 | 240 x 115 x 71 | 80 | 115 | 10 | 0.43 | 1.14 | 100 /100 | 100 |
| **Vertically perforated brick Hlz, acc. to EN 771-1[3)]** | | | | | | | | | | |
| **M8 with FIS H 12 x 85 K** | ≥ 16 | ≥ 1.6 | 230 x 108 x 55 | 85 | 115 | 5 | 0.43 | 1.43 | 100 / 60 | 100 |
| **M8 / M10 with FIS H 16 x 130 K** | ≥ 16 | ≥ 1.6 | 230 x 108 x 55 | 130 | 160 | 5 | 0.71 | 1.43 | 100 / 60 | 100 |
| **M12 / M16 with FIS H 20 x 130 K** | ≥ 16 | ≥ 1.6 | 230 x 108 x 55 | 130 | 160 | 5 | 0.71 | 1.43 | 100 / 60 | 100 |
| **Perforated sand-lime brick KSL, acc. to EN 771-2[3)]** | | | | | | | | | | |
| **M8 with FIS H 12 x 85 K** | ≥ 16 | ≥ 1.6 | 240 x 175 x 113 | 85 | 175 | 8 | 0.34 | 1.00 | 100 / 100 | 100 |
| **M8 / M10 with FIS H 16 x 130 K** | ≥ 16 | ≥ 1.6 | 240 x 175 x 113 | 130 | 175 | 8 / 10 | 1.00 | 1.14 | 100 / 100 | 100 |
| **M12 / M16 with FIS H 20 x 85 K** | ≥ 16 | ≥ 1.6 | 240 x 175 x 113 | 85 | 175 | 10 | 0.43 | 1.86 | 100 / 100 | 100 |
| **Lightweight concrete hollow block Hbl, acc. EN 771-3[3)]** | | | | | | | | | | |
| **M8 / M10 with FIS H 16 x 85 K** | ≥ 2 | ≥ 1.0 | 500 x 200 x 200 | 85 | 200 | 2 | 0.09 | 0.43 | 100 / 100 | 100 |
| **M12 / M16 with FIS H 20 x 130 K** | ≥ 4 | ≥ 1.0 | 500 x 200 x 200 | 130 | 200 | 2 | 0.17 | 0.57 | 100 / 100 | 100 |

1) The required partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered. Load values are valid for zinc-plated steel gvz, stainless steel R and highly corrosion-resistant steel HCR. In perforated bricks and hollow blocks threaded rod FIS A in combination with anchor sleeve FIS H K.

2) The given loads are valid for installation and use of fixations in dry masonry - use category d/d - for temperatures in the substrate up to 50 °C (resp. short term up to 80 °C) and drill hole cleaning according to assessment. The given brick types in combination with the permissible loads are an extract of the assessment.

3) More information about, e.g. hole patterns, assortment of anchor sleeves FIS H K see assessment.

4) In the case of combinations of tensile and shear loads, bending moments and reduced edge and axial spacings (anchor groups), the design must be carried out in accordance with the provisions of the complete assessment.

5) Minimum feasible spacing resp. edge distance. Details as well as to the distances to joints see assessment.

# Injection mortar FIS P Plus

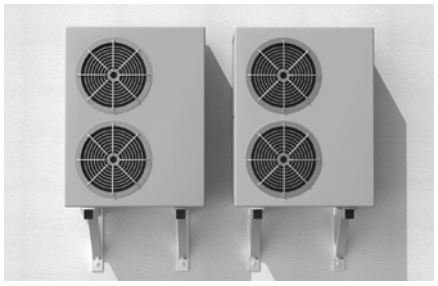
The approved injection mortar for anchorings in masonry and non-cracked concrete.








Cable duct



Air conditioning units

## Applications

- Awnings
- Canopies
- Fireplaces
- French balconies
- Fire escapes
- Gratings
- Gates
- Handrails

## Advantages

- With FIS P Plus, anchorings in masonry and non-cracked concrete for which approval is relevant can be realised in a particularly economical manner.
- FIS P Plus 300 T can be used with stable, standard silicone injection dispensers. No special equipment is required. As a result, procurement costs can be reduced on the basis of polyester resin.

## Certificates / Features

**ETA-18/0383, in concrete**
**ETA-11/0419, in masonry**

## Building materials

**Approved for anchorings in:**

- Concrete C20/25 to C50/60, non-cracked
- Vertically perforated brick
- Perforated sand-lime brick
- Solid sand-lime brick
- Perforated blocks made from lightweight concrete
- Solid brick
- Aerated concrete

**Also suitable for:**

- Solid brick made from lightweight concrete

## Functioning

- FIS P Plus is a 2-component injection mortar based on polyester resin.
- Resin and hardener are stored in two separate chambers and are not mixed and activated until extrusion through the static mixer.
- The mortar is extruded bubble free from the drill hole base.
- The mortar bonds the entire surface of the anchor with the drill hole wall and seals the drill hole.
- Partially used cartridges can be reused by changing the static mixer.

**See also:**
Battery dispenser FIS DB S Pro Page 241



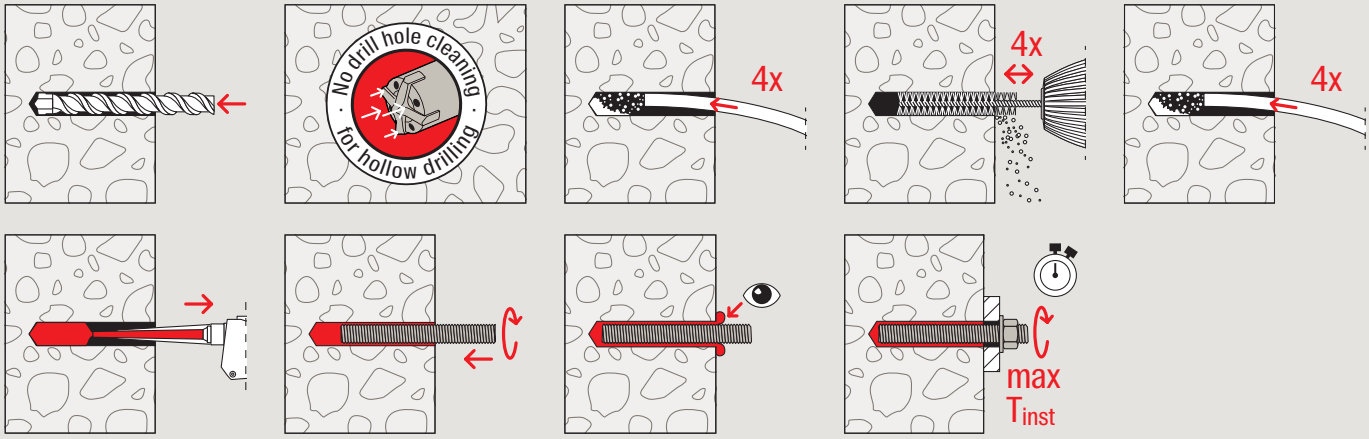
**See also:**
Accessories Page 250



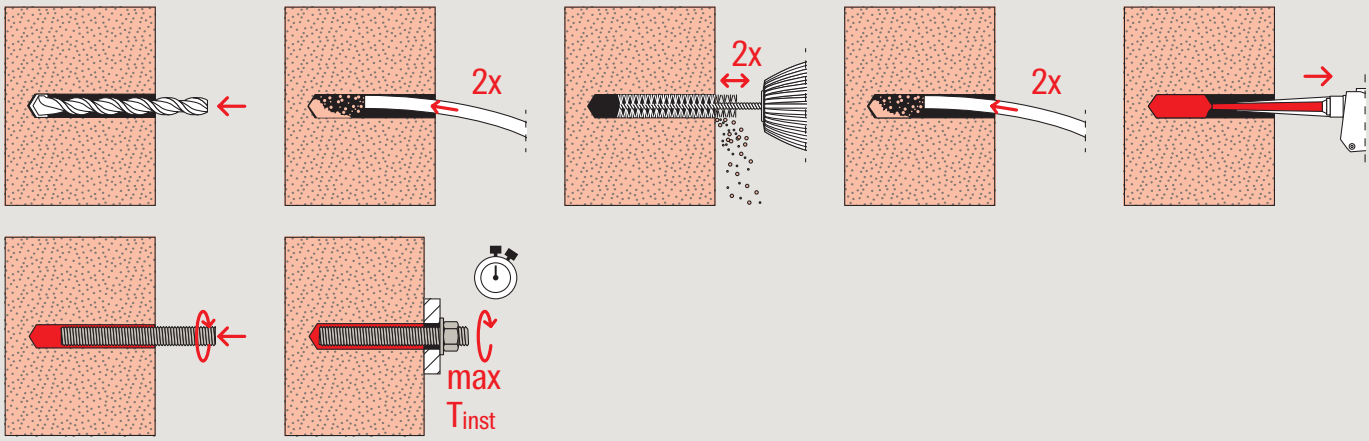
**See also:**
Threaded rod FIS A Page 133



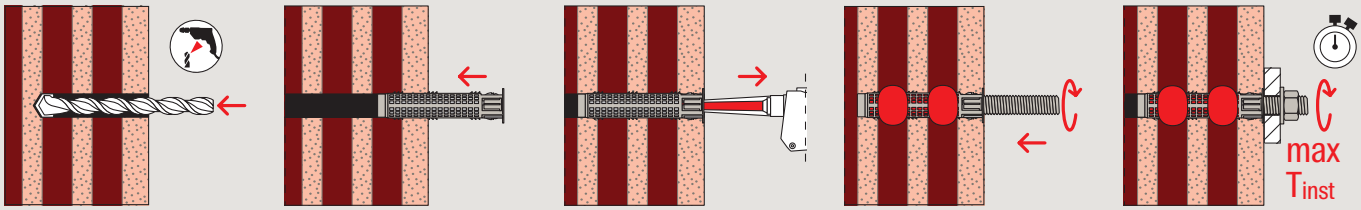
## Installation in concrete with FIS P Plus and FIS A / RG M



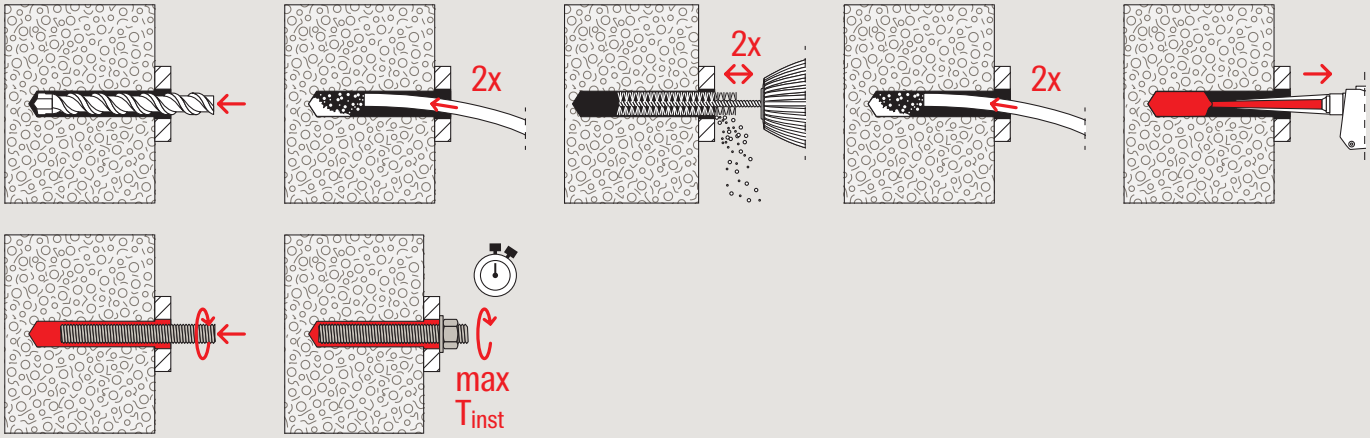

## Installation in solid brick with FIS P Plus and FIS A / RG M




## Installation in hollow blocks with FIS P Plus and FIS HK + FIS A / RG M



## Installation in aerated concrete with FIS P Plus and FIS A / RG M






## Technical data

**Injection mortar FIS P Plus**



FIS P Plus 300 T | FIS P Plus 380 C | FIS MR Plus

| Item | Item no. | Approval ETA | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FIS P Plus 300 T** | **522430** | ● | DE, FR, NL | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS P Plus 300 T** | **537551** | ● | CS, EL, SK | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS P Plus 300 T** | **523226** | ● | EN, ES, PT | 150 | 1 x Cartridge 300 ml, 1 x static mixer FIS MR Plus | 1 |
| **FIS P Plus 380 C** | **522178** | ● | EN, ES, PT | 190 | 1 x Cartridge 380 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS MR Plus** | **545853** | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |

## Technical data

**Injection mortar FIS P Plus**




FIS P PLUS 300 T HWK | FIS P Plus 300T in bucket

| Item | Item no. | Approval ETA | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FIS P PLUS 300 T HWK** | **551940** | ● | DE, FR, NL | 150 | 12 x Cartridge 300 ml, 24 x static mixer FIS MR Plus | 1 |
| **FIS P PLUS 300 T in bucket** | **567192** | ● | EN, HU, RO | 150 | 20 x Cartridge 300 ml, 40 x static mixer FIS MR Plus | 1 |

## Curing times

| FIS P Plus<br>Temperature at anchoring base<br>[°C] | Maximum processing time<br>$t_{work}$<br>[min.] | Minimum curing time [1]<br>$t_{cure}$<br>[hrs.] | [min.] |
|---|---|---|---|
| > 0 – +5 | 13 | 3 | – |
| > +5 – +10 | 9 | – | 90 |
| > -10 – +20 | 5 | – | 60 |
| > +20 – +30 | 4 | – | 45 |
| > +30 – +40 | 2 | – | 35 |

1) In wet concrete or water filled holes the curing times must be doubled.

# Loads

**Injection system FIS P Plus with threaded rod FIS A resp. RG M**

Permissible loads of a single anchor[1) 2)] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-18/0383 has to be considered.

| | | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|
| | Material / surface[3)] | Effective anchorage depth | Minimum member thickness | Maximum installation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,max}$ [Nm] | $N_{perm}$[4)] [kN] | $V_{perm}$[4)] [kN] | $s_{min}$[4)] [mm] | $c_{min}$[4)] [mm] |
| **FIS A M 8** | 5.8 | 60 | 100 | 10 | 3.9 | 5.1 | 40 | 40 |
| | 5.8 | 80 | 110 | 10 | 5.2 | 5.1 | 40 | 40 |
| | 5.8 | 160 | 190 | 10 | 9.0 | 5.1 | 40 | 40 |
| | R-70 | 60 | 100 | 10 | 3.9 | 6 | 40 | 40 |
| | R-70 | 80 | 110 | 10 | 5.2 | 6 | 40 | 40 |
| | R-70 | 160 | 190 | 10 | 9.9 | 6 | 40 | 40 |
| **FIS A M 10** | 5.8 | 60 | 100 | 20 | 4.9 | 8.6 | 45 | 45 |
| | 5.8 | 90 | 120 | 20 | 7.3 | 8.6 | 45 | 45 |
| | 5.8 | 200 | 230 | 20 | 13.8 | 8.6 | 45 | 45 |
| | R-70 | 60 | 100 | 20 | 4.9 | 9.2 | 45 | 45 |
| | R-70 | 90 | 120 | 20 | 7.3 | 9.2 | 45 | 45 |
| | R-70 | 200 | 230 | 20 | 15.7 | 9.2 | 45 | 45 |
| **FIS A M 12** | 5.8 | 70 | 100 | 40 | 6.8 | 12.0 | 55 | 55 |
| | 5.8 | 110 | 140 | 40 | 10.7 | 12.0 | 55 | 55 |
| | 5.8 | 240 | 270 | 40 | 20.5 | 12.0 | 55 | 55 |
| | R-70 | 70 | 100 | 40 | 6.8 | 13.7 | 55 | 55 |
| | R-70 | 110 | 140 | 40 | 10.7 | 13.7 | 55 | 55 |
| | R-70 | 240 | 270 | 40 | 22.5 | 13.7 | 55 | 55 |
| **FIS A M 16** | 5.8 | 80 | 120 | 60 | 10.4 | 22.3 | 65 | 65 |
| | 5.8 | 125 | 170 | 60 | 16.2 | 22.3 | 65 | 65 |
| | 5.8 | 320 | 360 | 60 | 37.6 | 22.3 | 65 | 65 |
| | R-70 | 80 | 120 | 60 | 10.4 | 24.9 | 65 | 65 |
| | R-70 | 125 | 170 | 60 | 16.2 | 25.2 | 65 | 65 |
| | R-70 | 320 | 360 | 60 | 41.5 | 25.2 | 65 | 65 |
| **FIS A M 20** | 5.8 | 90 | 140 | 120 | 13.5 | 32.3 | 85 | 85 |
| | 5.8 | 170 | 220 | 120 | 25.4 | 34.9 | 85 | 85 |
| | 5.8 | 400 | 450 | 120 | 58.6 | 34.9 | 85 | 85 |
| | R-70 | 90 | 140 | 120 | 13.5 | 32.3 | 85 | 85 |
| | R-70 | 170 | 220 | 120 | 25.4 | 39.4 | 85 | 85 |
| | R-70 | 400 | 450 | 120 | 59.8 | 39.4 | 85 | 85 |
| **FIS A M 24** | 5.8 | 96 | 160 | 150 | 17.2 | 41.4 | 105 | 105 |
| | 5.8 | 210 | 270 | 150 | 37.7 | 50.9 | 105 | 105 |
| | 5.8 | 480 | 540 | 150 | 84.3 | 50.9 | 105 | 105 |
| | R-70 | 96 | 160 | 150 | 17.2 | 41.4 | 105 | 105 |
| | R-70 | 210 | 270 | 150 | 37.7 | 56.8 | 105 | 105 |
| | R-70 | 480 | 540 | 150 | 86.2 | 56.8 | 105 | 105 |

[1)] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.
[2)] The specified loads are valid for anchorages in dry and damp concrete. For temperatures in the anchoring substrate up to 50 °C (resp. short term up to 80 °C). Drill hole cleaning as per specification in the ETA. The factor $\Psi_{sus}$ for sustained load was taken into account with 1.0.
[3)] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).
[4)] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Injection mortar FIS P

The reliable injection mortar for anchorings in masonry.








Wall consoles



Gates

## Applications

- Gratings
- Gates
- Handrails
- Consoles
- Pipelines

## Advantages

- The FIS P is the economical solution for anchorings in masonry that do not require approvals.
- The FIS P 300 T can be used with stable, standard silicone injection dispensers. No special equipment is required. This helps to reduce procurement costs.

## Building materials

- Vertically perforated brick
- Hollow block
- Perforated sand-lime brick
- Solid sand-lime brick
- Aerated concrete
- Solid brick made from lightweight concrete
- Solid brick

## Functioning

- The FIS P is a 2-component injection mortar based on polyester resin.
- Resin and hardener are stored in two separate chambers and are not mixed and activated until extrusion through the static mixer.
- The mortar is extruded bubble free from the drill hole base.
- The mortar bonds the entire surface of the anchor with the drill hole wall and seals the drill hole.
- Partially used cartridges can be reused by changing the static mixer.

**See also:**
Dispenser FIS DM S Pro Page 236



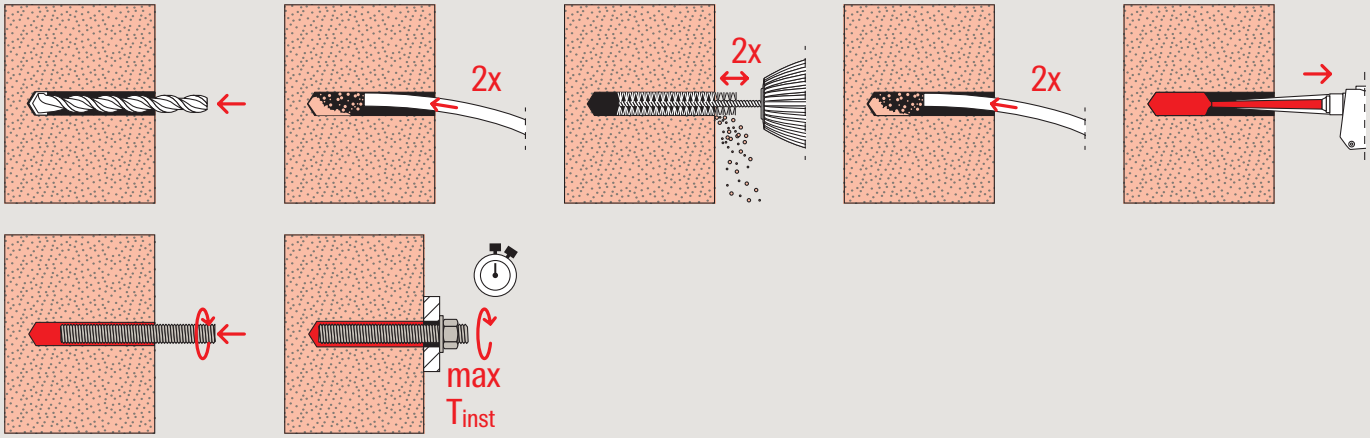
**See also:**
Accessories Page 250



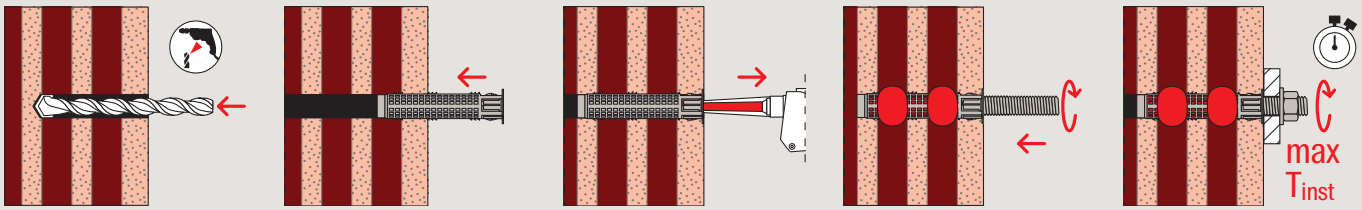
**See also:**
Threaded rod FIS A Page 133



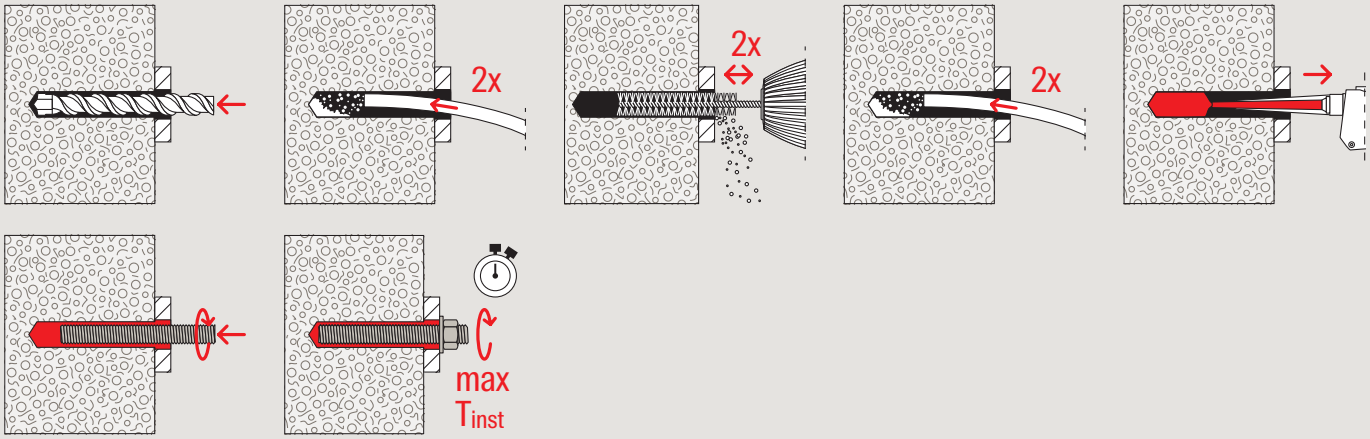
## Installation in solid brick with FIS P and FIS A / RG M




## Installation in hollow blocks with FIS P and FIS HK + FIS A / RG M




## Installation in aerated concrete with FIS P and FIS A / RG M



## Technical data

**Injection mortar FIS P**


FIS P 300 T


FIS P 360 S


FIS P 380 / 410 C


FIS MR Plus

| Item | Item no. | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|
| **FIS P 300 T** | **093175** | EN, FR, KO, ZH | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS P 300 T** | **093178** | HR, HU, PL, RO | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS P 300 T** | **535861** | EN, ES, PT (Americas) | 150 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS P 360 S** | **558803** | ES, KO, PT | 180 | 1 x cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS P 360 S** | **558804** | EN, ES, PT (Americas) | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS P 380 C** | **059234** | AR, EN, RU | 190 | 1 x Cartridge 380 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS P 410 C** | **538134** | EN, ES, PT, TR | 200 | 1 x Cartridge 410 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS MR Plus** | **545853** | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |

## Curing times

| **FIS P 300 T** Cartridge temperature (mortar) [°C] | Maximum processing time $t_{work}$ [min.] | Temperature at anchoring base [°C] | Minimum curing time $t_{cure}$ [hrs.] | [min.] |
|---|---|---|---|---|
| | | 0 – +5 | 6 | – |
| +5 – +10 | 15 | +5 – +10 | 3 | – |
| +10 – +20 | 8 | +10 – +20 | 2 | – |
| +20 – +30 | 5 | +20 – +30 | – | 60 |
| +30 – +40 | 3 | +30 – +40 | – | 30 |

The above times apply from the moment of contact between resin and hardener in the static mixer.
For installation, the cartridge temperature must be at least +5 °C. For longer installation times, i.e. when interruptions occur in work, the mixer should be replaced.

## Curing times

| **FIS P 360 S** Cartridge temperature (mortar) [°C] | Maximum processing time $t_{work}$ [min.] | Temperature at anchoring base [°C] | Minimum curing time $t_{cure}$ [hrs.] | [min.] |
|---|---|---|---|---|
| | | -5 | 8 | – |
| | | 0 | 4 | – |
| +5 | 14 | +5 | 2 | – |
| +20 | 5 | +20 | – | 60 |
| +30 | 3 | +30 | – | 30 |
| +40 | 2 | +40 | – | 20 |

Please note: The curing times apply for dry anchoring basees, in damp anchoring bases they should be doubled.

## Curing times

| **FIS P 380 C** Cartridge temperature (mortar) [°C] | Maximum processing time $t_{work}$ [min.] | Temperature at anchoring base [°C] | Minimum curing time $t_{cure}$ [hrs.] | [min.] |
|---|---|---|---|---|
| | | -5 – 0 | 6 | – |
| | | 0 – +5 | 3 | – |
| +5 – +20 | 5 | +5 – +20 | – | 90 |
| +20 – +30 | 4 | +20 – +30 | – | 45 |
| +30 – +40 | 2 | +30 – +40 | – | 30 |

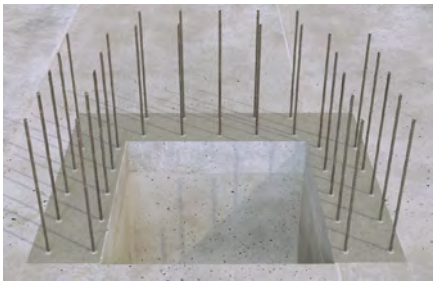
The above times apply from the moment of contact between resin and hardener in the static mixer.
For installation, the cartridge temperature must be at least +5 °C. For longer installation times, i.e. when interruptions occur in work, the mixer should be replaced.

# Injection mortar FIS RC II

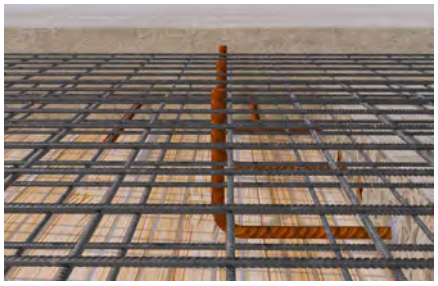
The cost-efficient injection mortar for post-installed rebar connections.





Post-installed rebar connections



Post-installed rebar connections

## Applications

- Post-installed rebar connections

## Advantages

- The European Technical Assessment (ETA) permits post-installed rebar connection with rebars from Ø 8-40 mm and embedment depths up to 2 m including seismic applications.
- The short processing and curing times ensure fast working progress.
- Processing in different substrate temperatures from -10°C to +40°C allows universal use.
- The injection mortar Rebar Connect FIS RC II allows flexible application with hollow or hammer drills.
- In addition, the FIS RC II is approved for post-installed rebar connections with a service life of 100 years.

## Certificates / Features

CE 100 Years Service life

**ETA-22/0501, for use in concrete**
**ETA-22/0502, for post-installed rebar connections**

## Building materials

- Concrete C12/15 to C50/60, cracked and non-cracked

## Functioning

- Resin and hardener are stored in two separate chambers and are only mixed and activated in the static mixer when the injection cartridge is ejected.
- In combination with the suitable hollow drill, there is no need for drill hole cleaning.
- The injection cartridges can be applied quickly and with minimum effort using the fischer dispenser.
- The reinforcement bar is set by hand with a slight rotating movement down to the bottom of the drill hole.
- The mortar fully bonds the reinforcement bar to the drill hole wall and seals the borehole.
- Opened cartridges can be reused by changing static mixers.

**See also:**

Accessories Page 250

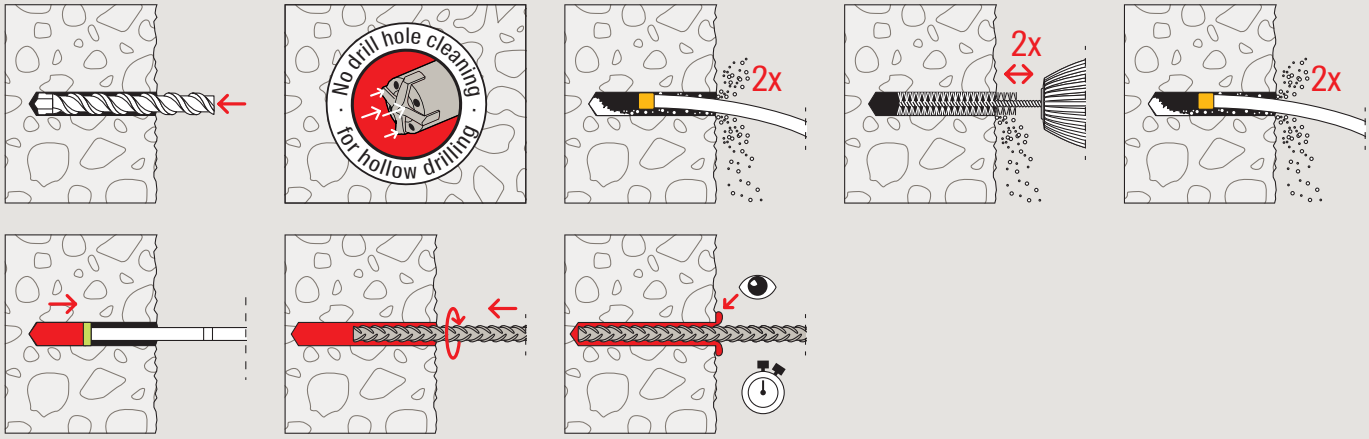


**See also:**

Battery dispenser FIS DB S Pro Page 241



## Installation in concrete with FIS RC II in hammer drilled holes






## Technical data

**Injection mortar FIS RC II**



FIS RC II 360 S | FIS RC II 825 S | FIS MR Plus | FIS JMR 825

| Item | Item no. | Approval ETA | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FIS RC II 360 S** | **567517** | ● | DE, EN, IT | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS RC II 360 S** | **567518** | ● | EN, ES, PT | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS RC II 360 S** | **567519** | ● | EN, PL, RU | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS RC II 360 S** | **567520** | ● | DE, FR, NL | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS RC II 360 S** | **567521** | ● | DA, FI, NO, SV | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS RC II 360 S** | **567524** | ● | CS, GR, HU, SK | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS RC II 825 S** | **567514** | ● | DE, EN, FR, IT, NL | 415 | 1 x Cartridge 825 ml, 2 x static mixer FIS JMR 825 | 1 |
| **FIS RC II 825 S** | **567515** | ● | EN, ES, FR, PT, TR | 415 | 1 x Cartridge 825 ml, 2 x static mixer FIS JMR 825 | 1 |
| **FIS RC II 825 S** | **567516** | ● | CS, EN, PL, RU, SK | 415 | 1 x Cartridge 825 ml, 2 x static mixer FIS JMR 825 | 1 |
| **FIS RC II 825 S** | **567523** | ● | DA, FI, NO, SV | 415 | 1 x Cartridge 825 ml, 2 x static mixer FIS JMR 825 | 1 |
| **FIS MR Plus** | **545853** | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |
| **FIS JMR 825** | **567522** | – | – | – | 12 x Static mixer FIS JMR 825 for 825 ml cartridges | 12 |

## Curing times

**FIS RC II**

| Temperature at anchoring base [°C] | Maximum processing time $t_{work}$ [1] [min.] | Minimum curing time $t_{cure}$ [2] [Std.] | [Min.] |
|---|---|---|---|
| -10 – 0 | 20[3] | 12 | – |
| > 0 – 5 | 13[3] | 3 | – |
| > 5 – 10 | 9[3] | – | 90 |
| > 10 – 20 | 5 | – | 60 |
| > 20 – 30 | 4 | – | 45 |
| > 30 – 40 | 2[4] | – | 35 |

1) Maximum time from the beginning of the injection to rebar / fischer rebar anchor FRA setting and positioning.
2) For wet concrete the curing time must be doubled.
3) If the temperature in the concrete falls below 10 °C the cartridge must be warmed up to +15 °C.
4) If the temperature in the concrete exceeds 30 °C the cartridge must be cooled down to +15 °C up to 20 °C.

## Loads

**Rebar anchor FRA with injection systems FIS EM Plus, FIS SB, FIS V Plus, FIS VS Plus LOW SPEED and FIS RC II in accordance with rebar theory**

Design resistances and permissible loads[1) 2)] of single, post-installed Rebar anchor in cracked or non-cracked normal concrete of the strength class C20/25[3)].

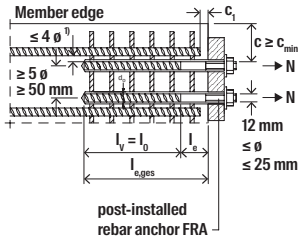
| Type | Basic value for anchorage length $l_{b,rqd}$[4)] [mm] | Maximum anchorage depth $l_{v,max}$ [mm] | Maximum embedment depth $l_{e,ges,max}$ [mm] | Maximum Installation torque $T_{inst}$ [Nm] | Maximum design resistance for axial tension load $N_{Rd,s}$[5)] [kN] | Maximum permissible tension load $N_{perm,s}$[5)] [kN] |
|---|---|---|---|---|---|---|
| **FRA 12/900 M12** | 567 | 800 | 900 | ≤ 50 | 49.2 | 35.1 |
| **FRA 16/1100 M16** | 756 | 1000 | 1100 | ≤ 100 | 87.4 | 62.4 |
| **FRA 20/1400 M20** | 945 | 1300 | 1400 | ≤ 150 | 136.6 | 97.6 |

For planning and design the complete European Technical Assessments ETA-17/1056 (FIS EM Plus), ETA-13/0651 (FIS SB), ETA-20/0728 (FIS V Plus resp. FIS VS Plus LOW SPEED) or ETA-22/0502 (FIS RC II) have to be considered. For determination of the installation parameters (minimum concrete cover distances, etc.) as well as required transverse reinforcement see EN 1992-1-1 and general installation rules of the assessments.

1) The partial safety factors for resistance taken from the European standard EN 1992-1-1 as well as a partial safety factor for action of $\gamma_L$ = 1.4 are considered.
2) With FIS EM Plus, FIS SB, FIS V Plus, FIS V Plus LOW SPEED and FIS RC II post-installed Rebar anchors are approved in dry or wet concrete with temperatures up to +50 °C (resp. short term up to +80 °C) and drill hole cleaning in accordance with ETA.
3) The ETAs for FIS EM Plus, FIS SB, FIS V Plus, FIS V Plus LOW SPEED and FIS RC II permit post-installed rebar connections in concrete C12/15 up to C50/60. The above mentioned basic value for anchorage length changes depending on the relevant concrete strength class.
4) Basic value of the anchorage length in accordance with EN 1992-1-1, section 8.4.3 for concrete strength class C20/25 and good bond conditions.
5) For utilisation of the full steel capacity.

**General rules of construction**

- The Rebar anchor FRA is permitted to transfer tension loads in direction of the axis of the rebar only.
- $l_v$ and $l_0$ is according to approval.
- According to approval it has to be proved that sufficient transverse reinforcement is available.




1) If the clear distance of the lapped bars is larger than 4 x ø, EC2 must be applied.

| | |
|---|---|
| c | Concrete cover of the post-installed rebar anchor |
| $c_1$ | Concrete cover of the front side of the existing rebar |
| $l_e$ | Concrete cover above the welding |
| $c_{min}$ | Minimum concrete cover acc. to approval |
| ø | Diameter of the post-installed rebar anchor |
| $l_0$ | Lap length |
| $l_v$ | Effective anchorage depth of the rebar anchor |
| $l_{e,ges}$ | Embedment depth of the rebar anchor |
| $d_0$ | Nominal drill diameter |

## Loads

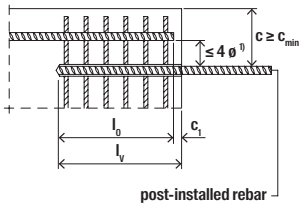
**Injection systems FIS EM Plus, FIS SB, FIS V Plus, FIS VS Plus LOW SPEED or FIS RC II with reinforcing steel B500B[5] in accordance with rebar theory**

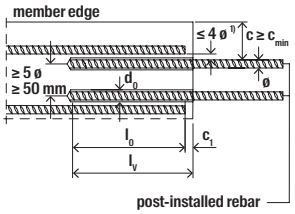
Design resistances and permissible loads[1] [6] of single, post-installed rebars in cracked or non-cracked normal concrete of the strength class C20/25[2].

| Reinforcing steel B500B<br>fyk / fuk<br>500 / 540 N/mm² | Basic value for the anchorage length for FIS EM Plus | Basic value for the anchorage length for FIS SB | Basic value for the anchorage length for FIS V Plus FIS VS Plus LOW SPEED | Basic value for the anchorage length for FIS RC II | Maximum anchorage depth | Maximum design resistance for acial tensile load | Maximum permissible tensile load |
|---|---|---|---|---|---|---|---|
| Type | $l_{b,rqd}$ [4] [mm] | $l_{b,rqd}$ [4] [mm] | $l_{b,rqd}$ [4] [mm] | | $l_{V,max}$ [mm] | $N_{Rd,s}$ [3] [kN] | $N_{zul,s}$ [3] [kN] |
| **Ø 8 mm** | 378 | 378 | 378 | 378 | 1800 (3000)[8] | 21.9 | 15.6 |
| **Ø 10 mm** | 473 | 473 | 473 | 473 | 1800 (3000)[8] | 34.1 | 24.4 |
| **Ø 12 mm** | 567 | 567 | 567 | 567 | 1800 (3000)[8] | 49.2 | 35.1 |
| **Ø 14 mm** | 662 | 662 | 662 | 662 | 1800 (3000)[8] | 66.9 | 47.8 |
| **Ø 16 mm** | 756 | 756 | 756 | 756 | 1800 (3000)[8] | 87.4 | 62.4 |
| **Ø 20 mm** | 945 | 945 | 945 | 945 | 1800 (3000)[8] | 136.6 | 97.6 |
| **Ø 22 mm** | 1040 | – | – | 1040 | 2000 (1800)[7] | 165.3 | 118.1 |
| **Ø 24 mm** | 1134 | – | – | 1134 | 2000 (1800)[7] | 196.7 | 140.5 |
| **Ø 25 mm** | 1181 | 1181 | 1181 | 1181 | 2000 (3000)[8] | 213.4 | 152.4 |
| **Ø 26 mm** | 1229 | – | – | – | 2000 | 230.8 | 164.9 |
| **Ø 28 mm** | 1323 | 1323 | 1323 | 1323 | 2000 (3000)[8] | 267.7 | 191.2 |
| **Ø 30 mm** | 1418 | – | – | 1418 | 2000 | 307.3 | 219.5 |
| **Ø 32 mm** | 1512 | 1512 | – | 1512 | 2000 (3000)[8] (1500)[9] | 349.7 | 249.8 |
| **Ø 34 mm** | 1607 | – | – | – | 2000 | 394.7 | 282.0 |
| **Ø 36 mm** | 1701 | – | – | – | 2000 | 442.6 | 316.1 |
| **Ø 40 mm** | 1890 | – | – | – | 2000 | 546.4 | 390.3 |

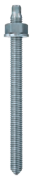
For planning and design the complete European Technical Assessments ETA-17/1056 (FIS EM Plus), ETA-13/0651 (FIS SB), ETA-20/0728 (FIS V Plus and FIS VS Plus LOW SPEED) or ETA-22/0502 (FIS RC II) have to be considered. For determination of the installation parameters (minimum concrete cover distances, etc.) as well as required transverse reinforcement see EN 1992-1-1 and general installation rules of the assessments.

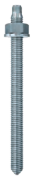
[1] The partial safety factors for resistance taken from the European standard EN 1992-1-1 as well as a partial safety factor for action of $\gamma_L$ = 1.4 are considered.
[2] The ETAs for FIS EM Plus, FIS SB, FIS V Plus, FIS V Plus LOW SPEED and FIS RC II permit post-installed rebar connections in concrete C12/15 up to C50/60. The above mentioned basic value for anchorage length changes depending on the relevant concrete strength class.
[3] When utilising the full steel load capacity.
[4] Basic value of the anchorage length in accordance with EN 1992-1-1, section 8.4.3 for concrete strength class C20/25 and good bond conditions.
[5] All reinforcing steels with characteristic yield strength $f_{yk}$ = 400 - 600 N/mm² in accordance with EN 1992-1-1 Annex C, Table C.1 and C.2N. The above-mentioned basic value for the anchorage length as well as maximum steel resistance (see footnote 3) will change accordingly.
[6] With FIS EM Plus, FIS SB, FIS V Plus, FIS VS Plus LOW SPEED or FIS RC II post-installed rebars are approved in dry or wet concrete with temperatures up to +50 °C (resp. short term up to +80 °C) and drill hole cleaning in accordance with ETA.
[7] Only FIS RC II.
[8] Values in brackets apply for FIS SB.
[9] FIS RC II at installation temperature $T_I$ > 0°C.




1) If the clear distance of the lapped bars is larger than 4 x ø, EC2 must be applied.

| Anchor and mortars | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | |  Threaded rod FIS A |  Threaded rod RG M |  Internal threaded anchor RG M I |  Internal threaded socket FIS E |  Highbond anchor FHB II-A L /FHB II-AS |  High-bond anchor FHB II-A L inject/ FHB II-A S inject |  FHB dyn |  FDA |  Rebar | |
| **Mortar cartridges** | **Positioning** | | | | | | | | | | **Page** |
|  **Highbond-System FHB II** | The best performance in cracked concrete | – | – | – | – | ● | ● | ● | ● | – | **47** |
|  **Superbond-System FSB** | The concrete all-rounder | ● | ● | ● | – | – | – | – | – | ● | **60** |
|  **Epoxy mortar FIS EM Plus** | The powerful injection mortar for rebar connections and cracked concrete | ● | ● | ● | – | – | – | – | – | ● | **74** |
|  **Epoxy mortar FIS EB II** | The basic epoxy mortar for applications in concrete | ● | ● | – | – | – | – | – | – | ● | **81** |
|  **Epoxy mortar FIS EP** | The cost-efficient epoxy mortar for applications in concrete | ● | ● | – | – | – | – | – | – | – | **84** |
|  **Injection mortar FIS V Plus** | The powerful universal mortar for concrete and masonry | ● | ● | ● | ● | – | – | – | – | ● | **87** |
|  **Injection mortar FIS V** | The versatile injection mortar for anchorings in masonry und cracked concrete | ● | ● | ● | ● | – | – | – | – | ● | **98** |
|  **Injection mortar FIS VL** | The solid injection mortar for standard applications in cracked concrete and masonry | ● | ● | ● | ● | – | – | – | – | ● | **106** |
|  **Injection mortar FIS V Zero** | The universal mortar offers maximum safety for human and nature | ● | ● | ● | ● | – | – | – | – | – | **112** |
|  **Injection mortar FIS P Plus** | The approved injection mortar for anchorings in masonry and non-cracked concrete | ● | ● | – | ● | – | – | – | – | – | **119** |
|  **Injection mortar FIS P** | The reliable injection mortar for anchorings in masonry | (●) | (●) | – | (●) | – | – | – | – | – | **124** |
|  **Injection mortar FIS RC II** | The cost-efficient injection mortar for post-installed rebar connections | ● | ● | – | – | – | – | – | – | ● | **127** |

| Anchor and mortars | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | |  Threaded rod FIS A |  Threaded rod RG M |  Internal threaded anchor RG M I |  Internal threaded socket FIS E |  High-bond anchor FHB II-A L/ FHB II-AS |  High-bond anchor FHB II-A L inject/ FHB II-A S inject |  FHB dyn |  FDA |  Rebar | |
| **Mortar cartridges** | **Positioning** | | | | | | | | | | **Page** |
|  **Resin capsules FHB II-P, FHB II-PF high speed** | The best performance in cracked concrete | – | – | – | – | ● | – | – | – | – | 55 |
|  **Resin capsules RSB** | The concrete all-rounder | – | ● | ● | – | – | – | – | – | – | 63 |
|  **Resin capsules RM II** | Bonded anchor for cracked concrete without drill hole cleaning | – | ● | ● | – | – | – | – | – | – | 69 |

# Anchor rod FIS A

The flexible anchor rod FIS A.





Bridges for traffic signs



Steel constructions



## Applications

- Anchorings with each of the fischer injection mortars such as FIS V Plus, FIS V Zero, FIS SB, FIS EM Plus, FIS EB II, FIS V, FIS VL, FIS P Plus, FIS P and FIS EP

## Advantages

- The anchor rod FIS A can be used with almost every fischer injection mortar (except Highbond special mortar FIS HB). It can be individually selected based on requirements, thus allowing for a wide range of applications.
- The wide range of approved anchor rods FIS A from M6 to M30 allows for various applications.
- Please refer to the approvals of the injection mortar used.

## Building materials

- In connection with several fischer injection mortars the anchor rod FIS A is approved or suitable for different building materials.

## Versions

- Galvanised steel
- Stainless steel R
- Hot-dip galvanised steel
- Highly corrosion-resistant steel HCR

## Functioning

- The anchor rod FIS A is suitable for pre-positioned and push-through installation.
- FIS A is set manually into the drill hole, by lightly rotating it until it reaches the drill hole base.

**Threaded rod FIS A**





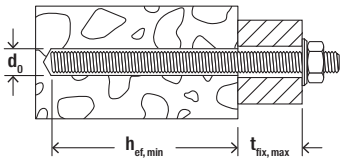









| | Zinc plated, steel grade 5.8 | Zinc plated, steel grade 8.8 | Stainless steel | FIS SB | FIS EM Plus | FIS EB II | FIS EP | FIS V Plus | | FIS V | | FIS VL | | FIS V Zero | | FIS P Plus | | FIS P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | Item no. | Con-crete | Con-crete | Con-crete | Con-crete | Con-crete | Ma-sonry | Con-crete | Ma-sonry | Con-crete | Ma-sonry | Con-crete | Ma-sonry | Con-crete | Ma-sonry | Ma-sonry |
| Item | gvz 5.8 | gvz 8.8 | R | | | | | | | | | | | | | | | |
| FIS A M 6 x 70 | 046204 | – | – | – | – | – | (●) | ● | ● | ● | ● | ● | – | – | – | – | – | (●) |
| FIS A M 6 x 75 | 090243 | – | 090437 | – | – | – | (●) | ● | ● | ● | ● | ● | – | – | – | – | – | (●) |
| FIS A M 6 x 85 | 090272 | – | – | – | – | – | (●) | ● | ● | ● | ● | ● | – | – | – | – | – | (●) |
| FIS A M 6 x 110 | 090273 | – | 090439 | – | – | – | (●) | ● | ● | ● | ● | ● | – | – | – | – | – | (●) |
| FIS A M 8 x 90 | 090274 | 519390 | 090440 | ● | ● | ● | (●) | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 8 x 110 | 090275 | 519391 | 090441 | ● | ● | ● | (●) | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 8 x 130 | 090276 | 519392 | 090442 | ● | ● | ● | (●) | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 8 x 175 | 090277 | 519393 | 090443 | ● | ● | ● | (●) | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 8 x 1000 | 509214 [1] | – | 509230 [1] | ● | ● | ● | (●) | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 10 x 110 | 090278 | – | 090444 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 10 x 130 | 090279 | – | 090447 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 10 x 130 | – | 524170 | – | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 10 x 150 | 090281 | 517935 | 090448 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 10 x 170 | 044969 | 519395 | 044973 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 10 x 190 | – | 517936 | – | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 10 x 200 | 090282 | 519396 | 090449 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 10 x 1000 | 509215 [1] | 509223 [1] | 509231 [1] | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 12 x 120 | 044971 | 519397 | 044974 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 12 x 140 | 090283 | 519398 | 090450 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 12 x 160 | 090284 | 517937 | 090451 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 12 x 180 | 090285 | 519399 | 090452 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 12 x 200 | – | 517938 | 519421 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 12 x 210 | 090286 | – | 090453 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 12 x 260 | 090287 | – | 090454 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 12 x 280 | – | – | 547703 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 12 x 1000 | 509216 [1] | 509224 [1] | 509232 [1] | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | (●) |
| FIS A M 16 x 130 | 044972 | 519400 | 044975 | ● | ● | ● | ● | ● | ● | ● | ● | ● | – | ● | ● | ● | – | – |
| FIS A M 16 x 175 | 090288 | 519401 | 090455 | ● | ● | ● | ● | ● | ● | ● | ● | ● | – | ● | ● | ● | – | – |
| FIS A M 16 x 200 | 090289 | 517939 | 090456 | ● | ● | ● | ● | ● | ● | ● | ● | ● | – | ● | ● | ● | – | – |
| FIS A M 16 x 250 | 090290 | 517940 | 090457 | ● | ● | ● | ● | ● | ● | ● | ● | ● | – | ● | ● | ● | – | – |
| FIS A M 16 x 300 | 090291 | 519402 | 090458 | ● | ● | ● | ● | ● | ● | ● | ● | ● | – | ● | ● | ● | – | – |
| FIS A M 16 x 1000 | 509217 [1] | 509225 [1] | 509233 [1] | ● | ● | ● | ● | ● | ● | ● | ● | ● | – | ● | ● | ● | – | – |
| FIS A M 20 x 245 | 090292 | 519404 | 090459 | ● | ● | ● | ● | ● | – | ● | – | ● | – | ● | – | ● | – | – |
| FIS A M 20 x 290 | 090293 | 519406 | 090460 | ● | ● | ● | ● | ● | – | ● | – | ● | – | ● | – | ● | – | – |
| FIS A M 20 x 1000 | – | 519410 [1] | 519427 [1] | ● | ● | ● | ● | ● | – | ● | – | ● | – | ● | – | ● | – | – |
| FIS A M 24 x 290 | 090294 | – | 090461 | ● | ● | ● | – | ● | – | ● | – | ● | – | ● | – | ● | – | – |
| FIS A M 24 x 380 | 090295 | – | 090462 | ● | ● | ● | – | ● | – | ● | – | ● | – | ● | – | ● | – | – |
| FIS A M 24 x 1000 | 533881 | 551771 | – | ● | ● | ● | – | ● | – | ● | – | ● | – | ● | – | ● | – | – |
| FIS A M 30 x 430 | 090297 | – | 090464 | ● | ● | ● | – | ● | – | ● | – | ● | – | – | – | – | – | – |
| FIS A M 30 x 1000 | – | 552728 | – | ● | ● | ● | – | ● | – | ● | – | ● | – | – | – | ● | – | – |




## Technical data in concrete

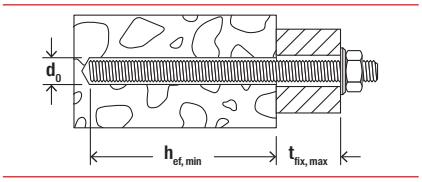
**Threaded rod FIS A**



FIS A

| Item | Galvanised steel, steel grade 5.8<br>Item no.<br>gvz 5.8 | Galvanised steel, steel grade 8.8<br>Item no.<br>gvz 8.8 | Stainless steel<br>Item no.<br>R | Highly corrosion-resistant steel<br>Item no.<br>HCR | Approval<br>ETA | Drill diameter<br>$d_0$<br>[mm] | Min. / max. anchorage depth<br>$h_{ef,min / max}$<br>[mm] | Min. / max. usable length<br>[mm] | Min. / max. filling quantity<br>[scale units] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| FIS A M6 x 70 | 046204 | – | – | – | ● | 8 | 50 / 62 | 0 / 12 | 2 / 3 | 10 |
| FIS A M6 x 75 | 090243 | – | 090437 | – | ● | 8 | 50 / 67 | 0 / 17 | 2 / 3 | 20 |
| FIS A M6 x 85 | 090272 | – | – | – | ● | 8 | 50 / 72 | 5 / 27 | 2 / 3 | 20 |
| FIS A M6 x 110 | 090273 | – | 090439 | – | ● | 8 | 50 / 72 | 30 / 52 | 2 / 3 | 20 |
| FIS A M8 x 90 | 090274 | 519390 | 090440 | – | ● | 10 | 60 / 80 | 0 / 20 | 2 / 3 | 10 |
| FIS A M8 x 110 | 090275 | 519391 | 090441 | – | ● | 10 | 60 / 100 | 0 / 40 | 2 / 3 | 10 |
| FIS A M8 x 130 | 090276 | 519392 | 090442 | – | ● | 10 | 60 / 120 | 0 / 60 | 2 / 4 | 10 |
| FIS A M8 x 140 | – | 553763 | – | – | ● | 10 | 60 / 130 | 0 / 70 | 2 / 4 | 10 |
| FIS A M8 x 150 | – | 553627 | – | – | ● | 10 | 60 / 140 | 0 / 80 | 2 / 4 | 10 |
| FIS A M8 x 175 | 090277 | 519393 | 090443 | – | ● | 10 | 60 / 160 | 5 / 105 | 2 / 5 | 10 |
| FIS A M8 x 1,000 | 509214[1)] | 509222[1)] | 509230[1)] | – | ● | 10 | 60 / 160 | 830 / 930 | 2 / 5 | 10 |
| FIS A M10 x 110 | 090278 | – | 090444 | – | ● | 12 | 60 / 96 | 0 / 36 | 3 / 4 | 10 |
| FIS A M10 x 130 | 090279 | 524170 | 090447 | – | ● | 12 | 60 / 116 | 0 / 56 | 3 / 5 | 10 |
| FIS A M10 x 135 | – | – | 562856 | – | ● | 12 | 60 / 121 | 0 / 61 | 3 / 5 | 10 |
| FIS A M10 x 150 | 090281 | 517935 | 090448 | – | ● | 12 | 60 / 136 | 0 / 76 | 3 / 5 | 10 |
| FIS A M10 x 160 | – | – | 562855 | – | ● | 12 | 60 / 146 | 0 / 86 | 3 / 6 | 10 |
| FIS A M10 x 170 | 044969 | 519395 | 044973 | – | ● | 12 | 60 / 156 | 0 / 96 | 3 / 6 | 10 |
| FIS A M10 x 190 | – | 517936 | – | – | ● | 12 | 60 / 176 | 0 / 116 | 3 / 7 | 10 |
| FIS A M10 x 200 | 090282 | 519396 | 090449 | – | ● | 12 | 60 / 186 | 0 / 126 | 3 / 7 | 10 |
| FIS A M10 x 1,000 | 509215[1)] | 509223[1)] | 509231[1)] | – | ● | 12 | 60 / 200 | 786 / 926 | 3 / 7 | 10 |
| FIS A M12 x 120 | 044971 | 519397 | 044974 | – | ● | 14 | 70 / 104 | 0 / 34 | 3 / 5 | 10 |
| FIS A M12 x 140 | 090283 | 519398 | 090450 | – | ● | 14 | 70 / 124 | 0 / 54 | 3 / 6 | 10 |
| FIS A M12 x 160 | 090284 | 517937 | 090451 | – | ● | 14 | 70 / 144 | 0 / 74 | 3 / 6 | 10 |
| FIS A M12 x 180 | 090285 | 519399 | 090452 | – | ● | 14 | 70 / 164 | 0 / 94 | 3 / 7 | 10 |
| FIS A M12 x 200 | – | 517938 | 519421 | – | ● | 14 | 70 / 184 | 0 / 114 | 3 / 8 | 10 |
| FIS A M12 x 210 | 090286 | – | 090453 | – | ● | 14 | 70 / 194 | 0 / 124 | 3 / 9 | 10 |
| FIS A M12 x 260 | 090287 | – | 090454 | – | ● | 14 | 70 / 240 | 4 / 174 | 3 / 10 | 10 |
| FIS A M12 x 280 | – | – | 547703 | – | ● | 14 | 70 / 240 | 24 / 194 | 3 / 10 | 10 |
| FIS A M12 x 1,000 | 509216[1)] | 509224[1)] | 509232[1)] | 571885[1)] | ● | 14 | 70 / 240 | 744 / 914 | 3 / 10 | 10 |
| FIS A M16 x 130 | 044972 | 519400 | 044975 | – | ● | 18 | 80 / 110 | 0 / 30 | 5 / 7 | 10 |
| FIS A M16 x 175 | 090288 | 519401 | 090455 | – | ● | 18 | 80 / 155 | 0 / 75 | 5 / 9 | 10 |
| FIS A M16 x 200 | 090289 | 517939 | 090456 | – | ● | 18 | 80 / 180 | 0 / 100 | 5 / 11 | 10 |
| FIS A M16 x 250 | 090290 | 517940 | 090457 | – | ● | 18 | 80 / 230 | 0 / 150 | 5 / 14 | 10 |
| FIS A M16 x 300 | 090291 | 519402 | 090458 | – | ● | 18 | 80 / 280 | 0 / 200 | 5 / 16 | 10 |
| FIS A M16 x 350 | – | 558865 | – | – | ● | 18 | 80 / 320 | 10 / 250 | 5 / 19 | 10 |
| FIS A M16 x 1,000 | 509217[1)] | 509225[1)] | 509233[1)] | 571886[1)] | ● | 18 | 80 / 320 | 660 / 900 | 5 / 19 | 10 |
| FIS A M20 x 245 | 090292 | 519404 | 090459 | – | ● | 24 | 90 / 221 | 0 / 131 | 11 / 27 | 10 |
| FIS A M20 x 290 | 090293 | 519406 | 090460 | – | ● | 24 | 90 / 266 | 0 / 176 | 11 / 32 | 10 |
| FIS A M20 x 350 | – | 559627 | – | – | ● | 24 | 90 / 326 | 0 / 236 | 11 / 40 | 10 |
| FIS A M20 x 400 | – | 558866 | – | – | ● | 24 | 90 / 376 | 0 / 286 | 11 / 46 | 10 |
| FIS A M20 x 1,000 | – | 519410[1)] | 519427[1)] | – | ● | 24 | 90 / 400 | 576 / 886 | 11 / 48 | 10 |
| FIS A M20 x 1,000 | – | – | – | 571887[1)] | ● | 24 | 90 / 400 | 576 / 886 | 11 / 48 | 3 |
| FIS A M24 x 175 | – | – | 570632 | – | ● | 28 | 96 / 146 | 0 / 50 | 14 / 21 | 5 |
| FIS A M24 x 200 | – | – | 570633 | – | ● | 28 | 96 / 171 | 0 / 75 | 14 / 25 | 5 |
| FIS A M24 x 290 | 090294 | – | 090461 | – | ● | 28 | 96 / 261 | 0 / 165 | 14 / 38 | 5 |

[1)] Order washer and nut separately.




## Technical data in concrete

**Threaded rod FIS A**

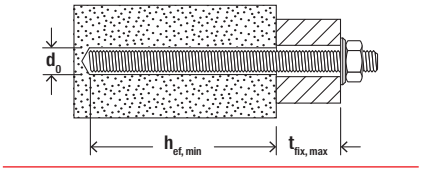




FIS A

| Item | Galvanised steel, steel grade 5.8<br>Item no.<br>gvz 5.8 | Galvanised steel, steel grade 8.8<br>Item no.<br>gvz 8.8 | Stainless steel<br>Item no.<br>R | Highly corrosion-resistant steel<br>Item no.<br>HCR | Approval<br>ETA | Drill diameter<br>$d_0$<br>[mm] | Min. / max. anchorage depth<br>$h_{ef,min / max}$<br>[mm] | Min. / max. usable length<br>[mm] | Min. / max. filling quantity<br>[scale units] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| FIS A M24 x 380 | 090295 | – | 090462 | – | ● | 28 | 96 / 351 | 0 / 255 | 14 / 51 | 5 |
| FIS A M24 x 450 | – | 558867 | – | – | ● | 28 | 96 / 421 | 0 / 325 | 14 / 61 | 5 |
| FIS A M24 x 650 | – | 558868 | – | – | ● | 28 | 96 / 480 | 141 / 525 | 14 / 69 | 5 |
| FIS A M24 x 1,000 | – | 551771[1] | – | – | ● | 28 | 96 / 480 | 491 / 875 | 14 / 69 | 5 |
| FIS A M24 x 1,000 | – | – | 568801[1] | 571888[1] | ● | 28 | 96 / 480 | 491 / 875 | 14 / 69 | 3 |
| FIS A M30 x 430 | 090297 | – | 090464 | – | ● | 35 | 120 / 396 | 0 / 276 | 27 / 87 | 5 |
| FIS A M30 x 550 | – | 558869 | – | – | ● | 35 | 120 / 516 | 0 / 396 | 27 / 113 | 5 |
| FIS A M30 x 650 | – | 566677 | – | – | ● | 35 | 120 / 600 | 16 / 496 | 27 / 132 | 4 |
| FIS A M30 x 750 | – | 566676 | – | – | ● | 35 | 120 / 600 | 116 / 596 | 27 / 132 | 4 |
| FIS A M30 x 1,000 | – | 568800[1] | 568802[1] | 571889[1] | ● | 35 | 120 / 600 | 366 / 846 | 27 / 132 | 3 |

[1] Order washer and nut separately.




## Technical data in solid brick masonry

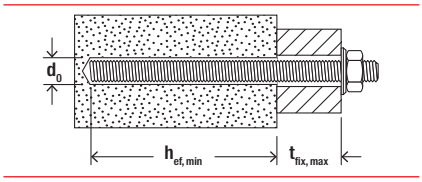
**Threaded rod FIS A**



FIS A

| Item | Galvanised steel, steel grade 5.8<br>Item no.<br>gvz 5.8 | Galvanised steel, steel grade 8.8<br>Item no.<br>gvz 8.8 | Stainless steel<br>Item no.<br>R | Highly corrosion-resistant steel<br>Item no.<br>HCR | Approval<br>ETA | Drill hole diameter in solid brick masonry<br>$d_0$<br>[mm] | Min. effective anchorage depth acc. ETA<br>$h_{ef}$<br>[mm] | Max. effective length acc. ETA<br>$t_{fix, max}$<br>[mm] | Fill quantity for effect. anchorage depth in solid brick masonry<br>[scale units] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| FIS A M6 x 70 | 046204 | – | – | – | ● | 8 | 50 | 12 | 2 | 10 |
| FIS A M6 x 75 | 090243 | – | 090437 | – | ● | 8 | 50 | 17 | 2 | 20 |
| FIS A M6 x 85 | 090272 | – | – | – | ● | 8 | 50 | 27 | 2 | 20 |
| FIS A M6 x 110 | 090273 | – | 090439 | – | ● | 8 | 50 | 52 | 2 | 20 |
| FIS A M8 x 90 | 090274 | 519390 | 090440 | – | ● | 10 | 50 | 30 | 2 | 10 |
| FIS A M8 x 110 | 090275 | 519391 | 090441 | – | ● | 10 | 50 | 50 | 2 | 10 |
| FIS A M8 x 130 | 090276 | 519392 | 090442 | – | ● | 10 | 50 | 70 | 2 | 10 |
| FIS A M8 x 140 | – | 553763 | – | – | ● | 10 | 50 | 80 | 2 | 10 |
| FIS A M8 x 150 | – | 553627 | – | – | ● | 10 | 50 | 90 | 2 | 10 |
| FIS A M8 x 175 | 090277 | 519393 | 090443 | – | ● | 10 | 50 | 115 | 2 | 10 |
| FIS A M8 x 1,000 | 509214[1] | 509222[1] | 509230[1] | – | ● | 10 | 50 | – | – | 10 |
| FIS A M10 x 110 | 090278 | – | 090444 | – | ● | 12 | 50 | 46 | 3 | 10 |
| FIS A M10 x 130 | 090279 | 524170 | 090447 | – | ● | 12 | 50 | 66 | 3 | 10 |
| FIS A M10 x 135 | – | – | 562856 | – | ● | 12 | 50 | 71 | 3 | 10 |

[1] Order washer and nut separately.




## Technical data in solid brick masonry

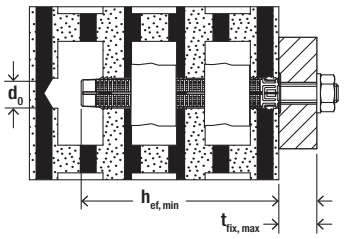
**Threaded rod FIS A**



FIS A

| Item | Galvanised steel, steel grade 5.8<br>Item no.<br>gvz 5.8 | Galvanised steel, steel grade 8.8<br>Item no.<br>gvz 8.8 | Stainless steel<br>Item no.<br>R | Highly corrosion-resistant steel<br>Item no.<br>HCR | Approval<br>ETA | Drill hole diameter in solid brick masonry<br>$d_0$<br>[mm] | Min. effective anchorage depth acc. ETA<br>$h_{ef}$<br>[mm] | Max. effective length acc. ETA<br>$t_{fix,max}$<br>[mm] | Fill quantity for effect. anchorage depth in solid brick masonry<br>[scale units] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| FIS A M10 x 150 | 090281 | 517935 | 090448 | – | ● | 12 | 50 | 86 | 3 | 10 |
| FIS A M10 x 160 | – | – | 562855 | – | ● | 12 | 50 | 96 | 3 | 10 |
| FIS A M10 x 170 | 044969 | 519395 | 044973 | – | ● | 12 | 50 | 106 | 3 | 10 |
| FIS A M10 x 190 | – | 517936 | – | – | ● | 12 | 50 | 126 | 3 | 10 |
| FIS A M10 x 200 | 090282 | 519396 | 090449 | – | ● | 12 | 50 | 136 | 3 | 10 |
| FIS A M10 x 1,000 | 509215[1)] | 509223[1)] | 509231[1)] | – | ● | 12 | 50 | – | – | 10 |
| FIS A M12 x 120 | 044971 | 519397 | 044974 | – | ● | 14 | 50 | 54 | 3 | 10 |
| FIS A M12 x 140 | 090283 | 519398 | 090450 | – | ● | 14 | 50 | 74 | 3 | 10 |
| FIS A M12 x 160 | 090284 | 517937 | 090451 | – | ● | 14 | 50 | 94 | 3 | 10 |
| FIS A M12 x 180 | 090285 | 519399 | 090452 | – | ● | 14 | 50 | 114 | 3 | 10 |
| FIS A M12 x 200 | – | 517938 | 519421 | – | ● | 14 | 50 | 134 | 3 | 10 |
| FIS A M12 x 210 | 090286 | – | 090453 | – | ● | 14 | 50 | 144 | 3 | 10 |
| FIS A M12 x 260 | 090287 | – | 090454 | – | ● | 14 | 50 | 194 | 3 | 10 |
| FIS A M12 x 280 | – | – | 547703 | – | ● | 14 | 50 | 214 | 3 | 10 |
| FIS A M12 x 1,000 | 509216[1)] | 509224[1)] | 509232[1)] | 571885[1)] | ● | 14 | 50 | – | – | 10 |
| FIS A M16 x 130 | 044972 | 519400 | 044975 | – | ● | 18 | 50 | 60 | 5 | 10 |
| FIS A M16 x 175 | 090288 | 519401 | 090455 | – | ● | 18 | 50 | 105 | 5 | 10 |
| FIS A M16 x 200 | 090289 | 517939 | 090456 | – | ● | 18 | 50 | 130 | 5 | 10 |
| FIS A M16 x 250 | 090290 | 517940 | 090457 | – | ● | 18 | 50 | 180 | 5 | 10 |
| FIS A M16 x 300 | 090291 | 519402 | 090458 | – | ● | 18 | 50 | 230 | 5 | 10 |
| FIS A M16 x 350 | – | 558865 | – | – | ● | 18 | 50 | 280 | 5 | 10 |
| FIS A M16 x 1,000 | 509217[1)] | 509225[1)] | 509233[1)] | 571886[1)] | ● | 18 | 50 | – | – | 10 |

[1)] Order washer and nut separately.




## Technical data in perforated brick masonry

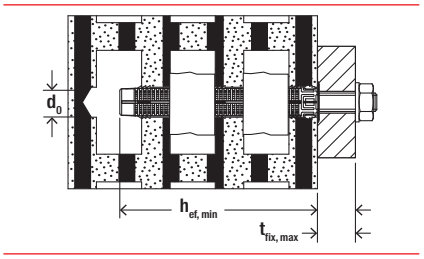
3

**Threaded rod FIS A**



FIS A

| | Galvanised steel, steel grade 5.8<br>Item no. | Galvanised steel, steel grade 8.8<br>Item no. | Stainless steel<br>Item no. | Approval<br>ETA | Drill hole diameter in perforated brick masonry<br>$d_0$<br>[mm] | Min. anchorage depth in perforated brick masonry<br>$h_{ef,min}$<br>[mm] | Max. useful length in perforated brick masonry<br>$t_{fix,max}$<br>[mm] | Suitable injection anchor sleeve | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **Item** | **gvz 5.8** | **gvz 8.8** | **R** | | | | | | |
| **FIS A M6 x 70** | **046204** | **–** | **–** | ● | 12 | 50 | 12 | FIS H 12 x 50 K | 10 |
| **FIS A M6 x 75** | **090243** | **–** | **090437** | ● | 12 | 50 | 17 | FIS H 12 x 50 K | 20 |
| **FIS A M6 x 85** | **090272** | **–** | **–** | ● | 12 | 50 | 27 | FIS H 12 x 50 K | 20 |
| **FIS A M6 x 110** | **090273** | **–** | **090439** | ● | 12<br>12 | 50<br>85 | 52<br>17 | FIS H 12 x 50 K<br>FIS H 12 x 85 K | 20 |
| **FIS A M8 x 90** | **090274** | **519390** | **090440** | ● | 12 | 50 | 30 | FIS H 12 x 50 K | 10 |
| **FIS A M8 x 110** | **090275** | **519391** | **090441** | ● | 12<br>12<br>16 | 50<br>85<br>85 | 50<br>15<br>15 | FIS H 12 x 50 K<br>FIS H 12 x 85 K<br>FIS H 16 x 85 K | 10 |
| **FIS A M8 x 130** | **090276** | **519392** | **090442** | ● | 12<br>12<br>16 | 50<br>85<br>85 | 70<br>35<br>35 | FIS H 12 x 50 K<br>FIS H 12 x 85 K<br>FIS H 16 x 85 K | 10 |
| **FIS A M8 x 140** | **–** | **553763** | **–** | ● | 12<br>12<br>16 | 50<br>85<br>85 | 80<br>45<br>45 | FIS H 12 x 50 K<br>FIS H 12 x 85 K<br>FIS H 16 x 85 K | 10 |
| **FIS A M8 x 150** | **–** | **553627** | **–** | ● | 12<br>12<br>16<br>16 | 50<br>85<br>85<br>130 | 90<br>55<br>55<br>10 | FIS H 12 x 50 K<br>FIS H 12 x 85 K<br>FIS H 16 x 85 K<br>FIS H 16 x 130 K | 10 |
| **FIS A M8 x 175** | **090277** | **519393** | **090443** | ● | 12<br>12<br>16<br>16 | 50<br>85<br>85<br>130 | 115<br>80<br>80<br>35 | FIS H 12 x 50 K<br>FIS H 12 x 85 K<br>FIS H 16 x 85 K<br>FIS H 16 x 130 K | 10 |
| **FIS A M10 x 110** | **090278** | **–** | **090444** | ● | 16 | 85 | 11 | FIS H 16 x 85 K | 10 |
| **FIS A M10 x 130** | **090279** | **524170** | **090447** | ● | 16 | 85 | 31 | FIS H 16 x 85 K | 10 |
| **FIS A M10 x 135** | **–** | **–** | **562856** | ● | 16 | 85 | 36 | FIS H 16 x 85 K | 10 |
| **FIS A M10 x 150** | **090281** | **517935** | **090448** | ● | 16<br>16 | 85<br>130 | 51<br>6 | FIS H 16 x 85 K<br>FIS H 16 x 130 K | 10 |
| **FIS A M10 x 160** | **–** | **–** | **562855** | ● | 16<br>16 | 85<br>130 | 61<br>16 | FIS H 16 x 85 K<br>FIS H 16 x 130 K | 10 |
| **FIS A M10 x 170** | **044969** | **519395** | **044973** | ● | 16<br>16 | 85<br>130 | 71<br>26 | FIS H 16 x 85 K<br>FIS H 16 x 130 K | 10 |
| **FIS A M10 x 190** | **–** | **517936** | **–** | ● | 16<br>16 | 85<br>130 | 91<br>46 | FIS H 16 x 85 K<br>FIS H 16 x 130 K | 10 |
| **FIS A M10 x 200** | **090282** | **519396** | **090449** | ● | 16<br>16 | 85<br>130 | 101<br>56 | FIS H 16 x 85 K<br>FIS H 16 x 130 K | 10 |
| **FIS A M12 x 120** | **044971** | **519397** | **044974** | ● | 20 | 85 | 19 | FIS H 20 x 85 K | 10 |
| **FIS A M12 x 140** | **090283** | **519398** | **090450** | ● | 20 | 85 | 39 | FIS H 20 x 85 K | 10 |
| **FIS A M12 x 160** | **090284** | **517937** | **090451** | ● | 20<br>20 | 85<br>130 | 59<br>14 | FIS H 20 x 85 K<br>FIS H 20 x 130 K | 10 |
| **FIS A M12 x 180** | **090285** | **519399** | **090452** | ● | 20<br>20 | 85<br>130 | 79<br>34 | FIS H 20 x 85 K<br>FIS H 20 x 130 K | 10 |
| **FIS A M12 x 200** | **–** | **517938** | **519421** | ● | 20<br>20 | 85<br>130 | 99<br>54 | FIS H 20 x 85 K<br>FIS H 20 x 130 K | 10 |
| **FIS A M12 x 210** | **090286** | **–** | **090453** | ● | 20<br>20 | 85<br>130 | 109<br>64 | FIS H 20 x 85 K<br>FIS H 20 x 130 K | 10 |
| **FIS A M12 x 260** | **090287** | **–** | **090454** | ● | 20<br>20<br>20 | 85<br>130<br>200 | 159<br>114<br>44 | FIS H 20 x 85 K<br>FIS H 20 x 130 K<br>FIS H 20 x 200 K | 10 |





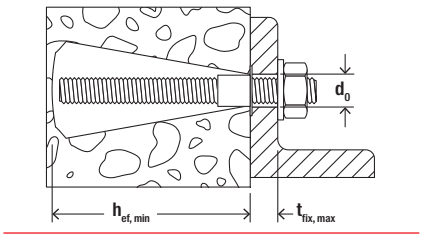

## Technical data in perforated brick masonry

**Threaded rod FIS A**



FIS A

| | Galvanised steel, steel grade 5.8 | Galvanised steel, steel grade 8.8 | Stainless steel | Approval | Drill hole diameter in perforated brick masonry | Min. anchorage depth in perforated brick masonry | Max. useful length in perforated brick masonry | Suitable injection anchor sleeve | Sales unit |
|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | Item no. | ETA | $d_0$ [mm] | $h_{ef,\,min}$ [mm] | $t_{fix,\,max}$ [mm] | | [pcs] |
| **Item** | **gvz 5.8** | **gvz 8.8** | **R** | | | | | | |
| **FIS A M12 x 280** | – | – | 547703 | ● | 20 | 85 | 189<br>134<br>64 | FIS H 20 x 85 K<br>FIS H 20 x 130 K<br>FIS H 20 x 200 K | 10 |
| **FIS A M16 x 130** | 044972 | 519400 | 044975 | ● | 20 | 85 | 25 | FIS H 20 x 85 K | 10 |
| **FIS A M16 x 175** | 090288 | 519401 | 090455 | ● | 20<br>20 | 85<br>130 | 70<br>25 | FIS H 20 x 85 K<br>FIS H 20 x 130 K | 10 |
| **FIS A M16 x 200** | 090289 | 517939 | 090456 | ● | 20<br>20 | 85<br>130 | 95<br>50 | FIS H 20 x 85 K<br>FIS H 20 x 130 K | 10 |
| **FIS A M16 x 250** | 090290 | 517940 | 090457 | ● | 20<br>20<br>20 | 85<br>130<br>200 | 145<br>100<br>30 | FIS H 20 x 85 K<br>FIS H 20 x 130 K<br>FIS H 20 x 200 K | 10 |
| **FIS A M16 x 300** | 090291 | 519402 | 090458 | ● | 20<br>20<br>20 | 85<br>130<br>200 | 195<br>150<br>80 | FIS H 20 x 85 K<br>FIS H 20 x 130 K<br>FIS H 20 x 200 K | 10 |
| **FIS A M16 x 350** | – | 558865 | – | ● | 20<br>20<br>20<br>22 | 85<br>130<br>200<br>130 | 245<br>200<br>130<br>200 | FIS H 20 x 85 K<br>FIS H 20 x 130 K<br>FIS H 20 x 200 K<br>FIS H 22x130/200K | 10 |



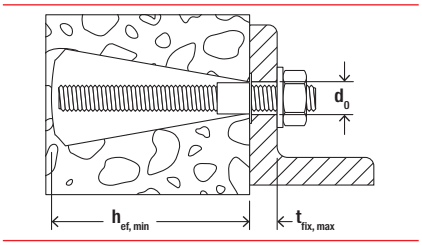

## Technical data in undercut drill hole in aerated concrete

**Threaded rod FIS A**



FIS A

| | Galvanised steel, steel grade 5.8 | Galvanised steel, steel grade 8.8 | Stainless steel | Approval | Drill hole diameter in aerated concrete in undercut drill hole | Min. / max. anchorage depth in aerated concrete in undercut drill hole | Min. / max. usable length in aerated concrete | Filling quantity for min. / max. anchorage depth in aerated concrete | Sales unit |
|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | Item no. | ETA | $d_0$ [mm] | $h_{ef}$ [mm] | $t_{fix}$ [mm] | [scale units] | [pcs] |
| **Item** | **gvz 5.8** | **gvz 8.8** | **R** | | | | | | |
| **FIS A M8 x 90** | 090274 | 519390 | 090440 | ● | 14 | 75 / 95 | - / 5 | 15 / - | 10 |
| **FIS A M8 x 110** | 090275 | 519391 | 090441 | ● | 14 | 75 / 95 | 5 / 25 | 15 / 20 | 10 |
| **FIS A M8 x 130** | 090276 | 519392 | 090442 | ● | 14 | 75 / 95 | 25 / 45 | 15 / 20 | 10 |
| **FIS A M8 x 140** | – | 553763 | – | ● | 14 | 75 / 95 | 35 / 55 | 15 / 20 | 10 |
| **FIS A M8 x 150** | – | 553627 | – | ● | 14 | 75 / 95 | 45 / 65 | 15 / 20 | 10 |
| **FIS A M8 x 175** | 090277 | 519393 | 090443 | ● | 14 | 75 / 95 | 70 / 90 | 15 / 20 | 10 |




## Technical data in undercut drill hole in aerated concrete

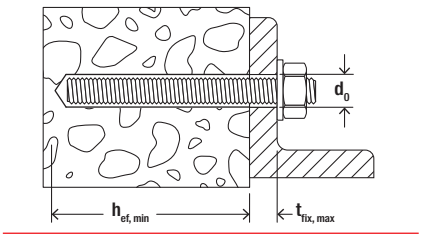
3

**Threaded rod FIS A**



FIS A

| | Galvanised steel, steel grade 5.8 | Galvanised steel, steel grade 8.8 | Stainless steel | Approval | Drill hole diameter in aerated concrete in undercut drill hole | Min. / max. anchorage depth in aerated concrete in undercut drill hole | Min. / max. usable length in aerated concrete | Filling quantity for min. / max. anchorage depth in aerated concrete | Sales unit |
|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | Item no. | ETA | $d_0$ [mm] | $h_{ef}$ [mm] | $t_{fix}$ [mm] | [scale units] | [pcs] |
| **Item** | **gvz 5.8** | **gvz 8.8** | **R** | | | | | | |
| **FIS A M10 x 110** | **090278** | **–** | **090444** | ● | 14 | 75 / 95 | - / 21 | 15 / - | 10 |
| **FIS A M10 x 130** | **090279** | **524170** | **090447** | ● | 14 | 75 / 95 | 21 / 41 | 15 / 20 | 10 |
| **FIS A M10 x 135** | **–** | **–** | **562856** | ● | 14 | 75 / 95 | 46 / 26 | 15 / 20 | 10 |
| **FIS A M10 x 150** | **090281** | **517935** | **090448** | ● | 14 | 75 / 95 | 41 / 61 | 15 / 20 | 10 |
| **FIS A M10 x 160** | **–** | **–** | **562855** | ● | 14 | 75 / 95 | 71 / 51 | 15 / 20 | 10 |
| **FIS A M10 x 170** | **044969** | **519395** | **044973** | ● | 14 | 75 / 95 | 61 / 81 | 15 / 20 | 10 |
| **FIS A M10 x 190** | **–** | **517936** | **–** | ● | 14 | 75 / 95 | 81 / 101 | 15 / 20 | 10 |
| **FIS A M10 x 200** | **090282** | **519396** | **090449** | ● | 14 | 75 / 95 | 91 / 111 | 15 / 20 | 10 |
| **FIS A M12 x 120** | **044971** | **519397** | **044974** | ● | 14 | 75 / 95 | 9 / 29 | 15 / 20 | 10 |
| **FIS A M12 x 140** | **090283** | **519398** | **090450** | ● | 14 | 75 / 95 | 29 / 49 | 15 / 20 | 10 |
| **FIS A M12 x 160** | **090284** | **517937** | **090451** | ● | 14 | 75 / 95 | 49 / 69 | 15 / 20 | 10 |
| **FIS A M12 x 180** | **090285** | **519399** | **090452** | ● | 14 | 75 / 95 | 69 / 89 | 15 / 20 | 10 |
| **FIS A M12 x 200** | **–** | **517938** | **519421** | ● | 14 | 75 / 95 | 89 / 109 | 15 / 20 | 10 |
| **FIS A M12 x 210** | **090286** | **–** | **090453** | ● | 14 | 75 / 95 | 99 / 119 | 15 / 20 | 10 |
| **FIS A M12 x 260** | **090287** | **–** | **090454** | ● | 14 | 75 / 95 | 149 / 169 | 15 / 20 | 10 |
| **FIS A M12 x 280** | **–** | **–** | **547703** | ● | 14 | 75 / 95 | 189 / 169 | 15 / 20 | 10 |



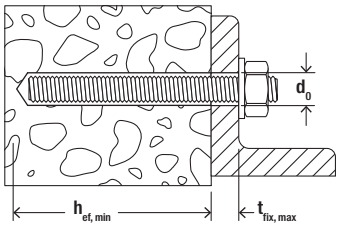

## Technical data in cylindrical drill hole in aerated concrete

**Threaded rod FIS A**



FIS A

| | Galvanised steel, steel grade 5.8 | Galvanised steel, steel grade 8.8 | Stainless steel | Approval | Drill hole diameter in aerated concrete in cylindrical drill hole | Anchorage depth in aerated concrete in cylindrical drill hole | Usable length | Fill quantity for effect. anchorage depth in aerated concrete | Sales unit |
|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | Item no. | ETA | $d_0$ [mm] | $h_{ef}$ [mm] | $t_{fix}$ [mm] | [scale units] | [pcs] |
| **Item** | **gvz 5.8** | **gvz 8.8** | **R** | | | | | | |
| **FIS A M8 x 130** | **090276** | **519392** | **090442** | ● | 10 | 100 | 20 | 3 | 10 |
| **FIS A M8 x 140** | **–** | **553763** | **–** | ● | 10 | 100 | 30 | 3 | 10 |




## Technical data in cylindrical drill hole in aerated concrete

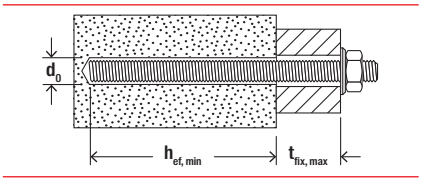


**Threaded rod FIS A**



FIS A

| | Galvanised steel, steel grade 5.8 | Galvanised steel, steel grade 8.8 | Stainless steel | Approval | Drill hole diameter in aerated concrete in cylindrical drill hole | Anchorage depth in aerated concrete in cylindrical drill hole | Usable length | Fill quantity for effect. anchorage depth in aerated concrete | Sales unit |
|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | Item no. | ETA | $d_0$ [mm] | $h_{ef}$ [mm] | $t_{fix}$ [mm] | [scale units] | [pcs] |
| **Item** | **gvz 5.8** | **gvz 8.8** | **R** | | | | | | |
| **FIS A M8 x 150** | – | 553627 | – | ● | 10 | 100 | 40 | 3 | 10 |
| **FIS A M8 x 175** | 090277 | 519393 | 090443 | ● | 10 | 100 | 65 | 3 | 10 |
| **FIS A M10 x 130** | 090279 | 524170 | 090447 | ● | 12 | 100 | 16 | 4 | 10 |
| **FIS A M10 x 135** | – | – | 562856 | ● | 12 | 100 | 21 | 4 | 10 |
| **FIS A M10 x 150** | 090281 | 517935 | 090448 | ● | 12 | 100 | 36 | 4 | 10 |
| **FIS A M10 x 160** | – | – | 562855 | ● | 12 | 100 | 46 | 4 | 10 |
| **FIS A M10 x 170** | 044969 | 519395 | 044973 | ● | 12 | 100 | 56 | 4 | 10 |
| **FIS A M10 x 190** | – | 517936 | – | ● | 12 | 100 | 76 | 4 | 10 |
| **FIS A M10 x 200** | 090282 | 519396 | 090449 | ● | 12 | 100 | 86 | 4 | 10 |
| **FIS A M12 x 120** | 044971 | 519397 | 044974 | ● | 14 | 100 | 4 | 5 | 10 |
| **FIS A M12 x 140** | 090283 | 519398 | 090450 | ● | 14 | 100 | 24 | 5 | 10 |
| **FIS A M12 x 160** | 090284 | 517937 | 090451 | ● | 14 | 100 | 44 | 5 | 10 |
| **FIS A M12 x 180** | 090285 | 519399 | 090452 | ● | 14 | 100 | 64 | 5 | 10 |
| **FIS A M12 x 200** | – | 517938 | 519421 | ● | 14 | 100 | 84 | 5 | 10 |
| **FIS A M12 x 210** | 090286 | – | 090453 | ● | 14 | 100 | 94 | 5 | 10 |
| **FIS A M12 x 260** | 090287 | – | 090454 | ● | 14 | 100 | 144 | 5 | 10 |
| **FIS A M12 x 280** | – | – | 547703 | ● | 14 | 100 | 164 | 5 | 10 |
| **FIS A M16 x 130** | 044972 | 519400 | 044975 | ● | 18 | 100 | 10 | 6 | 10 |
| **FIS A M16 x 175** | 090288 | 519401 | 090455 | ● | 18 | 100 | 55 | 6 | 10 |
| **FIS A M16 x 200** | 090289 | 517939 | 090456 | ● | 18 | 100 | 80 | 6 | 10 |
| **FIS A M16 x 250** | 090290 | 517940 | 090457 | ● | 18 | 100 | 130 | 6 | 10 |
| **FIS A M16 x 300** | 090291 | 519402 | 090458 | ● | 18 | 100 | 180 | 6 | 10 |
| **FIS A M16 x 350** | – | 558865 | – | ● | 18 | 100 | 230 | 6 | 10 |




## Technical data

**Threaded rod FIS A - By the meter**





FIS A

| | Galvanised steel, steel grade 5.8 | Galvanised steel, steel grade 8.8 | Stainless steel | Highly corrosion-resistant steel | Approval | Drill diameter | Min. / max. anchorage depth | Max. usable length at min. / max. anchorage depth | Min. / max. filling quantity | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | Item no. | Item no. | | $d_0$ | $h_{ef,min / max}$ | $t_{fix, min / max}$ | | |
| Item | gvz 5.8 | gvz 8.8 | R | HCR | ETA | [mm] | [mm] | [mm] | [scale units] | [pcs] |
| FIS A M8 x 1,000 | 509214[1)] | 509222[1)] | 509230[1)] | – | ● | 10 | 60 / 160 | 930 / 830 | 2 / 5 | 10 |
| FIS A M10 x 1,000 | 509215[1)] | 509223[1)] | 509231[1)] | – | ● | 12 | 60 / 200 | 926 / 786 | 3 / 7 | 10 |
| FIS A M12 x 1,000 | 509216[1)] | 509224[1)] | 509232[1)] | 571885[1)] | ● | 14 | 70 / 240 | 914 / 744 | 3 / 10 | 10 |
| FIS A M16 x 1,000 | 509217[1)] | 509225[1)] | 509233[1)] | 571886[1)] | ● | 18 | 80 / 320 | 900 / 660 | 5 / 19 | 10 |
| FIS A M20 x 1,000 | – | 519410[1)] | 519427[1)] | – | ● | 24 | 90 / 400 | 886 / 576 | 11 / 48 | 10 |
| FIS A M20 x 1,000 | – | – | – | 571887[1)] | ● | 24 | 90 / 400 | 886 / 576 | 11 / 48 | 3 |
| FIS A M24 x 1,000 | – | 551771[1)] | – | – | ● | 28 | 96 / 480 | 875 / 431 | 14 / 69 | 5 |
| FIS A M24 x 1,000 | – | – | 568801[1)] | 571888[1)] | ● | 28 | 96 / 480 | 875 / 431 | 14 / 69 | 3 |
| FIS A M30 x 1,000 | – | 568800[1)] | 568802[1)] | 571889[1)] | ● | 35 | 120 / 600 | 846 / 366 | 27 / 132 | 3 |

[1)] Order washer and nut separately.

## Hexagonal nut and washer

**Hexagonal nut and washer**



Nut and washers

| | Galvanised steel, steel grade 8.8 | Stainless steel | Highly corrosion-resistant steel | Approval | Thread | Washer (outer diameter x thickness) | Match | Width across nut | Sales unit |
|---|---|---|---|---|---|---|---|---|---|
| | Item-no. | Item-no. | Item-no. | | M | | | SW | |
| Item | gvz 8.8 | R | HCR | ETA | | [mm] | | [mm] | [pcs] |
| Nut & washer M8 | 510509 | 510513 | – | ● | M8 | 16 x 1,6 | FIS A M8 gvz / R | 13 | 50 |
| Nut & washer M10 | 510510 | 510514 | – | ● | M10 | 20 x 2 | FIS A M10 gvz / R | 17 | 50 |
| Nut & washer M12 | 510511 | 510515 | 573788 | ● | M12 | 24 x 2,5 | FIS A M12 gvz / R / HCR | 19 | 25 |
| Nut & washer M16 | 510512 | 510516 | 573789 | ● | M16 | 30 x 3,0 | FIS A M16 gvz / R / HCR | 24 | 20 |
| Nut & washer M20 | 519737 | 519738 | 573790 | ● | M20 | 37 x 3 | FIS A M20 gvz / R / HCR | 30 | 10 |
| Nut & washer M24 | 552110 | 552111 | – | ● | M24 | 44 x 4 | FIS A M24 gvz / R | 36 | 5 |
| Nut & washer M24 | – | – | 573791 | ● | M24 | 44 x 4 | FIS A M24 HCR | 36 | 3 |
| Nut & washer M30 | 559124 | 573787 | – | ● | M30 | 56 x 4 | FIS A M30 gvz / R | 46 | 5 |

# Filling set

**Filling set**



Filling sets

| Item | Item no. | For use with injection mortar | Match | Sales unit [pcs] |
|---|---|---|---|---|
| **Filling set M12** | **537218** | FIS SB, FIS EM Plus, FIS V Plus and further fischer injection mortars | FIS A / RG M12 | 10 |
| **Filling set M16** | **537219** | FIS SB, FIS EM Plus, FIS V Plus and further fischer injection mortars | FIS A / RG M16 | 10 |
| **Filling set M20** | **537220** | FIS SB, FIS EM Plus, FIS V Plus and further fischer injection mortars | FIS A / RG M20 | 10 |

# Anchor rod RG M

The fischer threaded rod with chamfer.







Underwater applications



Crash barriers

## Applications

- Anchorings with resin capsule RSB and RSB mini
- Anchorings with resin capsule RM II
- Anchorings with each of the fischer injection mortars such as FIS SB, FIS EM Plus, FIS EB II, FIS V, FIS VL, FIS V Zero, FIS P Plus, FIS P, FIS EP and FIS Green

## Advantages

- The wide range of the RG M from M8 to M30 opens up a wide range of applications and therefore offers great flexibility.
- The wide range of approved steel types for RG M allows for use in all corrosion resistance classes and offers the best possible application safety.
- Please refer to the approvals for the resin capsules and mortar used.

## Building materials

Approved for anchorings in:
- Concrete C20/25 to C50/60, cracked and non-cracked

Also suitable for:
- Natural stone with dense structure

## Versions

- Galvanised steel
- Stainless steel R
- Hot-dip galvanised steel
- Highly corrosion-resistant steel HCR

## Functioning

- Due to its oblique edge, the anchor rod RG M is particularly suitable for use in conjunction with resin capsules.
- The anchor rod RG M is set using a hammer drill and the accompanying setting tool in rotating and hitting motions.
- During setting, the oblique edge of the RG M destroys the capsule, and mixes and activates the mortar.
- Use with injection mortar is also possible. Here, the anchor rod is manually inserted into the drill hole with a light rotating movement until it reaches the base of the hole.

**Threaded rod RG M**







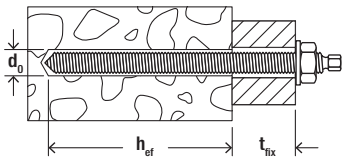









| Item | Zinc plated, steel grade 5.8<br>Item no<br>gvz | Zinc plated, steel grade 8.8<br>Item no<br>gvz | Stainless steel<br>Item no<br>R | Hot-dip galva-nised steel<br>Item no<br>hdg | highly corro-sion resistant steel<br>Item no<br>HCR | FIS SB<br>Concrete | FIS EM Plus<br>Concrete | FIS EB II<br>Concrete | FIS EP<br>Concrete | FIS V Plus<br>Concrete | FIS V Plus<br>Masonry | FIS V<br>Concrete | FIS V<br>Masonry | FIS VL<br>Concrete | FIS VL<br>Masonry | FIS V Zero<br>Concrete | FIS V Zero<br>Masonry | FIS P Plus<br>Concrete | FIS P Plus<br>Masonry | FIS P<br>Masonry | RSB<br>Concrete | RM<br>Concrete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RG M 8 x 110 | 050256 | – | 050263 | – | – | • | • | • | (•) | • | • | • | • | • | • | • | • | • | • | (•) | • | • |
| RG M 8 x 150 | 095698 | 519443 | 050293 | – | – | • | • | • | (•) | • | • | • | • | • | • | • | • | • | • | (•) | • | • |
| RG M 10 x 110 | 535007 | – | 535009 | – | – | • | • | • | • | • | • | • | • | • | • | • | • | • | • | (•) | • | • |
| RG M 10 x 130 | 050257 | – | 050264 | – | 096217[1] | • | • | • | • | • | • | • | • | • | • | • | • | • | • | (•) | • | • |
| RG M 10 x 165 | 050280 | – | 050294 | – | – | • | • | • | • | • | • | • | • | • | • | • | • | • | • | (•) | • | • |
| RG M 10 x 190 | 050281 | – | 050296 | – | – | • | • | • | • | • | • | • | • | • | • | • | • | • | • | (•) | • | • |
| RG M 10 x 220 | – | 519444 | – | – | – | • | • | • | • | • | • | • | • | • | • | • | • | • | • | (•) | • | • |
| RG M 10 x 250 | 095703 | – | 095701 | – | – | • | • | • | • | • | • | • | • | • | • | • | • | • | • | (•) | • | • |
| RG M 10 x 350 | 095718 | – | 095709 | – | – | • | • | • | • | • | • | • | • | • | • | • | • | • | • | (•) | • | • |
| RG M 12 x 120 | 535010 | – | 535011 | – | – | • | • | • | • | • | • | • | • | • | • | • | • | • | • | (•) | • | • |
| RG M 12 x 160 | 050258 | – | 050265 | 512247 | 096218[1] | • | • | • | • | • | • | • | • | • | • | • | • | • | • | (•) | • | • |
| RG M 12 x 180 | 512248 | – | 512249 | – | – | • | • | • | • | • | • | • | • | • | • | • | • | • | • | (•) | • | • |
| RG M 12 x 200 | – | – | 050576 | – | – | • | • | • | • | • | • | • | • | • | • | • | • | • | • | (•) | • | • |
| RG M 12 x 220 | 050283 | 519445 | 050297 | – | – | • | • | • | • | • | • | • | • | • | • | • | • | • | • | (•) | • | • |
| RG M 12 x 250 | 050284 | – | 095702 | – | – | • | • | • | • | • | • | • | • | • | • | • | • | • | • | (•) | • | • |
| RG M 12 x 300 | 050285 | – | 095705 | – | – | • | • | • | • | • | • | • | • | • | • | • | • | • | • | (•) | • | • |
| RG M 12 x 380 | 095720[2] | – | 095710[1] | – | – | • | • | • | • | • | • | • | • | • | • | • | • | • | • | (•) | • | • |
| RG M 16 x 165 | 050287 | – | 095704 | 537062 | – | • | • | • | • | • | • | • | • | • | – | • | • | • | – | – | • | • |
| RG M 16 x 140 | 542407 | – | – | – | – | • | • | • | • | • | • | • | • | • | – | • | • | • | – | – | • | • |
| RG M 16 x 190 | 050259 | – | 050266 | 512250 | 096219[1] | • | • | • | • | • | • | • | • | • | – | • | • | • | – | – | • | • |
| RG M 16 x 250 | 050288 | – | 050298 | – | – | • | • | • | • | • | • | • | • | • | – | • | • | • | – | – | • | • |
| RG M 16 x 270 | – | 519446 | – | – | – | • | • | • | • | • | • | • | • | • | – | • | • | • | – | – | • | • |
| RG M 16 x 300 | 050289 | – | 050299 | – | – | • | • | • | • | • | • | • | • | • | – | • | • | • | – | – | • | • |
| RG M 16 x 380 | 095722[2] | – | 095712[1] | – | – | • | • | • | • | • | • | • | • | • | – | • | • | • | – | – | • | • |
| RG M 16 x 500 | 095723[2] | – | 095713[1] | – | – | • | • | • | • | • | • | • | • | • | – | • | • | • | – | – | • | • |
| RG M 20 x 220 | 512251 | – | – | – | – | • | • | • | • | • | – | • | – | • | – | • | – | • | – | – | • | • |
| RG M 20 x 260 | 050260 | – | 050267 | – | – | • | • | • | • | • | – | • | – | • | – | • | – | • | – | – | • | • |
| RG M 20 x 290 | – | 519447 | – | – | – | • | • | • | • | • | – | • | – | • | – | • | – | • | – | – | • | • |
| RG M 20 x 350 | 095707 | – | 095706 | – | – | • | • | • | • | • | – | • | – | • | – | • | – | • | – | – | • | • |
| RG M 20 x 500 | 095725[1] | – | – | – | – | • | • | • | • | • | – | • | – | • | – | • | – | • | – | – | • | • |
| RG M 24 x 295 | – | 519448[1] | – | – | – | • | • | • | – | • | – | • | – | • | – | – | – | • | – | – | • | • |
| RG M 24 x 300 | 050261[1] | – | 050268[1] | – | – | • | • | • | – | • | – | • | – | • | – | – | – | • | – | – | • | • |
| RG M 24 x 400 | 095727[1] | – | 095715[1] | – | – | • | • | • | – | • | – | • | – | • | – | – | – | • | – | – | • | • |
| RG M 24 x 600 | 095728 | – | – | – | – | • | • | • | – | • | – | • | – | • | – | – | – | • | – | – | • | • |
| RG M 30 x 380 | 050262[1] | – | 090726[1] | – | – | • | • | • | – | • | – | • | – | • | – | – | – | – | – | – | • | – |
| RG M 30 x 500 | 095730[1] | – | – | – | – | • | • | • | – | • | – | • | – | • | – | – | – | – | – | – | • | – |




## Technical data in concrete



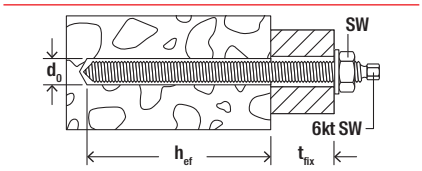
**Threaded rod RG M**



RG M RG M R

| Item | Galvanised steel, steel grade 5.8<br>Item no.<br>gvz 5.8 | Galvanised steel, steel grade 8.8<br>Item no.<br>gvz 8.8 | Stainless steel<br>Item no.<br>R | Approval<br>ETA | Drill diameter<br>$d_0$<br>[mm] | Anchorage depth (short/standard/large)<br>$h_{ef}$<br>[mm] | Usable length (short/standard/large)<br>$t_{fix}$<br>[mm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|
| RG M8 x 110 | 050256 | – | 050263 | ● | 10 | - / 80 / - | - / 14 / - | 10 |
| RG M8 x 150 | 095698 | 519443 | 050293 | ● | 10 | - / 80 / - | - / 54 / - | 10 |
| RG M10 x 110 | 535007 | – | 535009 | ● | 12 | 75 / - / - | - / 144 / 104 | 10 |
| RG M10 x 130 | 050257 | – | 050264 | ● | 12 | 75 / 90 / - | 35 / 20 / - | 10 |
| RG M10 x 165 | 050280 | – | 050294 | ● | 12 | 75 / 90 / - | 70 / 55 / - | 10 |
| RG M10 x 190 | 050281 | – | 050296 | ● | 12 | 75 / 90 / 150 | 95 / 80 / 20 | 10 |
| RG M10 x 220 | – | 519444 | – | ● | 12 | 75 / 90 / 150 | 125 / 110 / 50 | 10 |
| RG M10 x 250 | 095703 | – | 095701 | ● | 12 | 75 / 90 / 150 | 201 / 166 / 126 | 10 |
| RG M10 x 350 | 095718 | – | 095709 | ● | 12 | 75 / 90 / 150 | 255 / 240 / 180 | 10 |
| RG M12 x 120 | 535010 | – | 535011 | ● | 14 | 75 / - / - | 21 / - / - | 10 |
| RG M12 x 160 | 050258 | – | 050265 | ● | 14 | 75 / 110 / - | 61 / 26 / - | 10 |
| RG M12 x 180 | 512248 | – | 512249 | ● | 14 | 75 / 110 / 150 | 81 / 46 / 6 | 10 |
| RG M12 x 200 | – | – | 050576 | ● | 14 | 75 / 110 / 150 | 101 / 66 / 26 | 10 |
| RG M12 x 220 | 050283 | 519445 | 050297 | ● | 14 | 75 / 110 / 150 | 121 / 86 / 46 | 10 |
| RG M12 x 250 | 050284 | – | 095702 | ● | 14 | 75 / 110 / 150 | 151 / 116 / 76 | 10 |
| RG M12 x 300 | 050285 | – | 095705 | ● | 14 | 75 / 110 / 150 | 225 / 190 / 150 | 10 |
| RG M12 x 380 | 095720[1] | – | 095710[2] | ● | 14 | 75 / 110 / 150 | 281 / 246 / 206 | 10 |
| RG M16 x 140 | 542407 | – | – | ● | 18 | 95 / - / - | 13 / - / - | 10 |
| RG M16 x 165 | 050287 | – | 095704 | ● | 18 | 95 / 125 / - | 38 / 8 / - | 10 |
| RG M16 x 190 | 050259 | – | 050266 | ● | 18 | 95 / 125 / - | 63 / 33 / - | 10 |
| RG M16 x 250 | 050288 | – | 050298 | ● | 18 | 95 / 125 / 190 | 123 / 93 / 28 | 10 |
| RG M16 x 270 | – | 519446 | – | ● | 18 | 95 / 125 / 190 | 143 / 113 / 48 | 10 |
| RG M16 x 300 | 050289 | – | 050299 | ● | 18 | 95 / 125 / 190 | 173 / 143 / 78 | 10 |
| RG M16 x 380 | 095722[1] | – | 095712[2] | ● | 18 | 95 / 125 / 190 | 253 / 223 / 158 | 10 |
| RG M16 x 500 | 095723[1] | – | 095713[2] | ● | 18 | 95 / 125 / 190 | 373 / 343 / 278 | 10 |
| RG M20 x 220 | 512251 | – | – | ● | 25 | - / 170 / - | - / 14 / - | 10 |
| RG M20 x 260 | 050260 | – | 050267 | ● | 25 | - / 170 / 210 | - / 54 / 14 | 10 |
| RG M20 x 290 | – | 519447 | – | ● | 25 | - / 170 / 210 | - / 84 / 44 | 10 |
| RG M20 x 350 | 095707 | – | 095706 | ● | 25 | - / 170 / 210 | 155 / 140 / 80 | 10 |
| RG M20 x 500 | 095725[2] | – | – | ● | 25 | - / 170 / 210 | - / 294 / 254 | 10 |
| RG M24 x 295 | – | 519448[2] | – | ● | 28 | - / 210 / - | - / 185 / - | 10 |
| RG M24 x 300 | 050261[2] | – | 050268[2] | ● | 28 | - / 210 / - | - / 61 / - | 10 |
| RG M24 x 400 | 095727[2] | – | 095715[2] | ● | 28 | - / 210 / - | - / 161 / - | 10 |
| RG M24 x 600 | 095728[2] | – | – | ● | 28 | - / 210 / - | - / 361 / - | 5 |
| RG M30 x 380 | 050262[2] | – | 090726 | ● | 35 | - / 280 / - | 15 / - / - | 5 |
| RG M30 x 500 | 095730[2] | – | – | ● | 35 | - / 280 / - | - / 56 / - | 5 |

[1] Straight cut, setting tool is enclosed.
[2] Straight cut, additional setting tool required.




## Technical data in concrete

**Threaded rod RG M**



RG M

| | Hot-dip galvanised steel | Highly corrosion-resistant steel | Ap-pro-val | Drill diameter | Min. effect. an-chorage depth | Max. fixture thickness | Fits capsule RSB | Hexagon drive | Width across nut | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | ETA | $d_0$ [mm] | $h_{ef}$ [mm] | $t_{fix}$ [mm] | | SW [mm] | SW [mm] | [pcs] |
| **Item** | **hdg** | **HCR** | | | | | | | | |
| **RG M10 x 130** | – | **096217** | ● | 12 | 60 | 56 | 1 x RSB 10 mini<br>1 x RSB 10 | 7 | 17 | 10 |
| **RG M12 x 160** | **512247** | **096218** | ● | 14 | 70 | 74 | 1 x RSB 12 mini<br>1 x RSB 12 | 8 | 19 | 10 |
| **RG M16 x 165** | **537062** | – | ● | 18 | 80 | 65 | 1 x RSB 16 mini<br>1 x RSB 16 | 12 | 24 | 10 |
| **RG M16 x 190** | **512250** | **096219** | ● | 18 | 80 | 90 | 1 x RSB 16 mini<br>1 x RSB 16 | 12 | 24 | 10 |

## Filling Set

**Filling Set**



Filling sets for subsequent filling of the annular gap

| | Item no. | For use with injection mortar | Match | Sales unit |
|---|---|---|---|---|
| **Item** | | | | [pcs] |
| **Filling set M12** | **537218** | FIS SB, FIS EM Plus, FIS V Plus and further fischer injection mortars | FIS A / RG M12 | 10 |
| **Filling set M16** | **537219** | FIS SB, FIS EM Plus, FIS V Plus and further fischer injection mortars | FIS A / RG M16 | 10 |
| **Filling set M20** | **537220** | FIS SB, FIS EM Plus, FIS V Plus and further fischer injection mortars | FIS A / RG M20 | 10 |

# Threaded rod G M

The economic threaded rod for standard applications.







Railings



Cable duct

## Applications

- Steel structures
- Railing
- Staircases
- Wood structures
- Gates

## Advantages

- The large packaging unit with up to 50 pieces facilitates handling for series applications.
- A wide selection of standard dimensions up to yard goods in various steel grades and galvanised types cover a wide range of applications.
- The mechanical properties according to standard EN ISO 898-1 guarantee a safe application.
- Variable anchorage depths allow efficient installation with fischer injection systems.

## Building materials

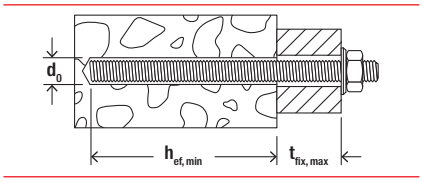
- The threaded rods G M are suitable for the fischer injection mortars in different building materials.
- The approved building materials can be found in the fischer injection mortar documents.

## Versions

- 4.8 Galvanised steel
- 5.8 Galvanised steel
- 8.8 Galvanised steel
- 8.8 Hot dip galvanised steel

## Functioning

- The threaded rod G M is suitable for pre-positioned and push-through installation.
- The threaded rod G M is set manually by lightly rotating it until it reaches the drill hole base.
- The mortar bonds the entire surface of the anchor rod with the drill holw wall and seals the drill hole.



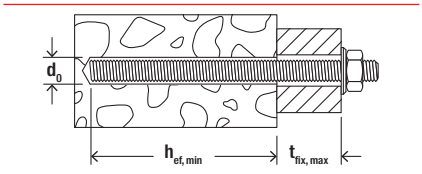

## Technical data

**Threaded rod G M**



G M

| Item | Galvanised steel, steel grade 5.8<br>Item no.<br>gvz 5.8 | Galvanised steel, steel grade 8.8<br>Item no.<br>gvz 8.8 | Hot-dip galvanised steel grade 8.8<br>Item no.<br>hdg 8.8 | Drill diameter<br>$d_0$<br>[mm] | Min. / max. anchorage depth<br>$h_{ef,min / max}$<br>[mm] | Max. usable length at min. / max. anchorage depth<br>$t_{fix,min / max}$<br>[mm] | Min. / max. filling quantity<br>[scale units] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|
| G M8 x 110 | 561506 | 561514 | – | 10 | 60 / 100 | 40 / - | 2 / 3 | 50 |
| G M10 x 130 | 561508 | 561516 | – | 12 | 60 / 116 | 56 / - | 3 / 5 | 50 |
| G M12 x 140 | 561510 | – | – | 14 | 70 / 124 | 54 / - | 3 / 6 | 40 |
| G M12 x 160 | – | 561518 | 562138 | 14 | 70 / 144 | 74 / - | 3 / 7 | 40 |
| G M12 x 190 | – | – | 562139 | 14 | 70 / 174 | 104 / - | 3 / 8 | 40 |
| G M16 x 175 | – | 561520 | – | 18 | 80 / 155 | 75 / - | 5 / 10 | 20 |
| G M16 x 190 | 567693 | – | 561528 | 18 | 80 / 170 | 90 / - | 5 / 11 | 20 |
| G M16 x 250 | – | 561521 | – | 18 | 80 / 230 | 150 / - | 5 / 14 | 20 |
| G M20 x 190 | – | – | 561529 | 24 | 90 / 166 | 76 / - | 11 / 19 | 20 |
| G M20 x 220 | – | – | 561530 | 24 | 90 / 196 | 106 / - | 11 / 24 | 20 |
| G M20 x 240 | – | – | 561531 | 24 | 90 / 216 | 126 / - | 11 / 26 | 20 |
| G M20 x 260 | – | – | 561532 | 24 | 90 / 236 | 146 / - | 11 / 29 | 15 |
| G M20 x 350 | – | 561523 | – | 24 | 90 / 236 | 236 / - | 11 / 39 | 15 |
| G M24 x 300 | 567695 | – | – | 24 | 96 / 271 | 175 / - | 13 / 36 | 10 |




## Technical data

**Threaded rod G M - By the meter**



G M

| Item | Galvanised steel, steel grade 4.8<br>Item no.<br>gvz 4.8 | Galvanised steel, steel grade 5.8<br>Item no.<br>gvz 5.8 | Galvanised steel, steel grade 8.8<br>Item no.<br>gvz 8.8 | Hot-dip galvanised steel grade 8.8<br>Item no.<br>hdg 8.8 | Drill diameter<br>$d_0$<br>[mm] | Min. / max. anchorage depth<br>$h_{ef,min / max}$<br>[mm] | Max. usable length at min. / max. anchorage depth<br>$t_{fix,min / max}$<br>[mm] | Min. / max. filling quantity<br>[scale units] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|
| G M8 x 1000 | 561502 | 561507 | 561515 | – | 10 | 60 / 990 | 930 / - | 2 / 5 | 20 |
| G M10 x 1000 | 561503 | 561509 | 561517 | 561533 | 12 | 60 / 986 | 926 / - | 3 / 7 | 20 |
| G M12 x 1000 | 561504 | 561511 | 561519 | 561534 | 14 | 70 / 984 | 914 / - | 3 / 10 | 15 |
| G M16 x 1000 | 561505 | 561512 | 561522 | 561535 | 18 | 80 / 980 | 900 / - | 5 / 19 | 10 |
| G M20 x 1000 | – | 561513 | 561524 | 561536 | 24 | 90 / 976 | 886 / - | 11 / 48 | 5 |
| G M24 x 1000 | – | – | 561525 | – | 28 | 96 / 971 | 875 / - | 13 / 69 | 3 |
| G M27 x 1000 | – | – | 561526 | – | 30 | 108 / 968 | 860 / - | 15 / 73 | 3 |
| G M30 x 1000 | – | – | 561527 | – | 35 | 120 / 966 | 846 / - | 24 / 120 | 3 |

## Hexagonal nut and washer

**Hexagonal nut and washer**



Nut and washers

| | Galvanised steel, steel grade 8.8 | Stainless steel | Highly corrosion-resistant steel | Approval | Thread | Washer (outer diameter x thickness) | Width across nut | Sales unit |
|---|---|---|---|---|---|---|---|---|
| | Item-no. | Item-no. | Item-no. | ETA | M | [mm] | SW [mm] | [pcs] |
| **Item** | **gvz 8.8** | **R** | **HCR** | | | | | |
| **Nut & washer M8** | **510509** | **510513** | **–** | ● | M8 | 16 x 1,6 | 13 | 50 |
| **Nut & washer M10** | **510510** | **510514** | **–** | ● | M10 | 20 x 2 | 17 | 50 |
| **Nut & washer M12** | **510511** | **510515** | **573788** | ● | M12 | 24 x 2,5 | 19 | 25 |
| **Nut & washer M16** | **510512** | **510516** | **573789** | ● | M16 | 30 x 3,0 | 24 | 20 |
| **Nut & washer M20** | **519737** | **519738** | **573790** | ● | M20 | 37 x 3 | 30 | 10 |
| **Nut & washer M24** | **552110** | **552111** | **–** | ● | M24 | 44 x 4 | 36 | 5 |
| **Nut & washer M24** | **–** | **–** | **573791** | ● | M24 | 44 x 4 | 36 | 3 |
| **Nut & washer M30** | **559124** | **573787** | **–** | ● | M30 | 56 x 4 | 46 | 5 |

## Filling set

**Filling set**



Filling sets for subsequent filling of the annular gap

| | Item no. | For use with injection mortar | Match | Sales unit |
|---|---|---|---|---|
| | | | | [pcs] |
| **Item** | | | | |
| **Filling set M12** | **537218** | FIS SB, FIS EM Plus, FIS V Plus and further fischer injection mortars | FIS A / RG M12 | 10 |
| **Filling set M16** | **537219** | FIS SB, FIS EM Plus, FIS V Plus and further fischer injection mortars | FIS A / RG M16 | 10 |
| **Filling set M20** | **537220** | FIS SB, FIS EM Plus, FIS V Plus and further fischer injection mortars | FIS A / RG M20 | 10 |

# Internal threaded anchor RG M I

The internal threaded anchor for detachable fixations in concrete.





Column bases



Pumps



## Applications

- Removable and temporary fixings
- Anchorings with resin capsules RSB and RM II
- Anchorings with various injection mortars such as FIS SB, FIS EM Plus, FIS V Plus in concrete

## Advantages

- The system internal threaded anchor RG M I and an injection mortar for concrete can be individually selected based on requirements, thus allowing for a wide range of applications.
- The internal threaded anchor RG M I allows for surface flush removal and reuse of the fixing point, and therefore offers the best possible flexibility.
- The metric internal thread allows for the use of standard screws or threaded rods for the ideal adaptation to suit the intended use.

## Building materials

**Approved for:**

- Concrete C20/25 to C50/60, cracked and non-cracked

**Also suitable for:**

- Concrete C12/15, non-cracked

## Functioning

For use in conjunction with resin capsules:

- The internal threaded anchor RG M I is set using a hammer drill and the accompanying setting tool in rotating and hitting motions.
- During setting, the oblique edge of the internal threaded anchor destroys the capsule, and mixes and activates the mortar.

For use in conjunction with injection mortars:

- The RG M I is set manually by lightly rotating it until it reaches the drill hole base.
- The mortar bonds the entire surface of the internal threaded anchor with the drill hole wall and seals the drill hole.

## Technical data

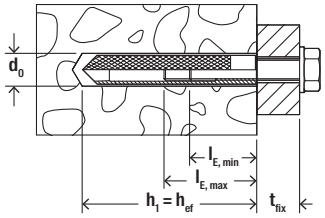
**Internal threaded anchor RG M I**



RG M I

| | Galvanised steel | Stainless steel | Approval | Suitable for use with | Sales unit |
|---|---|---|---|---|---|
| | Item no. | Item no. | ETA | | [pcs] |
| Item | gvz | R | | | |
| RG 8 x 75 M5 I | 048221[1)] | – | – | FIS SB, FIS EM Plus, FIS V Plus, FIS VL, RSB, RM II | 10 |
| RG 10 x 75 M6 I | 048222[1)] | – | – | FIS SB, FIS EM Plus, FIS V Plus, FIS VL, RSB, RM II | 10 |
| RG 12 x 90 M8 I | 050552[1)] | 050565[1)] | ● | FIS SB, FIS EM Plus, FIS V Plus, FIS VL, FIS V Zero, RSB, RM II | 10 |
| RG 16 x 90 M10 I | 050553[1)] | 050566[1)] | ● | FIS SB, FIS EM Plus, FIS V Plus, FIS VL, FIS V Zero, RSB, RM II | 10 |
| RG 18 x 125 M12 I | 050562[1)] | 050567[1)] | ● | FIS SB, FIS EM Plus, FIS V Plus, FIS VL, FIS V Zero, RSB, RM II | 10 |
| RG 22 x 160 M16 I | 050563[1)] | 050568[1)] | ● | FIS SB, FIS EM Plus, FIS V Plus, FIS VL, FIS V Zero, RSB, RM II | 5 |
| RG 28 x 200 M20 I | 050564[1)] | 050569[1)] | ● | FIS SB, FIS EM Plus, FIS V Plus, FIS VL, RSB, RM II | 5 |

[1)] Setting tool is included in each package.




## Technical data

**Internal threaded anchor RG M I**



RG M I

| | Galvanised steel | Stainless steel | Approval | Drill diameter | Depth = embedment depth | Min. bolt penetration | Max. bolt penetration | Match | Sales unit |
|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | ETA | $d_0$ [mm] | $h_0 = h_s$ [mm] | $l_{E,min}$ [mm] | $l_{E,max}$ [mm] | | [pcs] |
| Item | gvz | R | | | | | | | |
| RG 8 x 75 M5 I | 048221[1)] | – | – | 10 | 75 | 8 | 14 | 539796 RM II 8 | 10 |
| RG 10 x 75 M6 I | 048222[1)] | – | – | 12 | 75 | 10 | 16 | 539796 RM II 8 | 10 |
| RG 12 x 90 M8 I | 050552[1)] | 050565[1)] | ● | 14 | 90 | 8 | 18 | 539797 RM II 10 | 10 |
| RG 16 x 90 M10 I | 050553[1)] | 050566[1)] | ● | 18 | 90 | 10 | 23 | 539798 RM II 12 | 10 |
| RG 18 x 125 M12 I | 050562[1)] | 050567[1)] | ● | 20 | 125 | 12 | 26 | 539800 RM II 16 | 10 |
| RG 22 x 160 M16 I | 050563[1)] | 050568[1)] | ● | 24 | 160 | 16 | 35 | 539801 RM II 16 E | 5 |
| RG 28 x 200 M20 I | 050564[1)] | 050569[1)] | ● | 32 | 200 | 20 | 45 | 539803 RM II 24 | 5 |

[1)] Setting tool is included in each package.

Approval Seismic C1/C2 only with maximum embedment depth

| Threaded rod RG M I | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
|  | | |  |  |  |  |  |  |  |  |
| | Zinc plated, steel grade 5.8<br>gvz<br>Art.-No. | Stainless steel<br>R<br>Art.-No. | FIS SB<br>Concrete | FIS EM Plus<br>Concrete | FIS V Plus<br>Concrete | FIS V<br>Concrete | FIS VL<br>Concrete | FIS V Zero<br>Concrete | RSB<br>Concrete | RM II<br>Concrete |
| RG 8 x 75 M 5 I | 48221 | – | – | – | – | – | – | – | – | – |
| RG 10 x 75 M 6 I | 48222 | – | – | – | – | – | – | – | – | – |
| RG 12 x 90 M8 I | 50552 | 50565 | • | • | • | • | • | • | • | • |
| RG 16 x 90 M10 I | 50553 | 50566 | • | • | • | • | • | • | • | • |
| RG 18 x 125 M12 I | 50562 | 50567 | • | • | • | • | • | • | • | • |
| RG 22 x 160 M16 I | 50563 | 50568 | • | • | • | • | • | • | • | • |
| RG 28 x 200 M20 I | 50564 | 50569 | • | • | • | • | | • | • | • |

# Internal threaded sockets FIS E

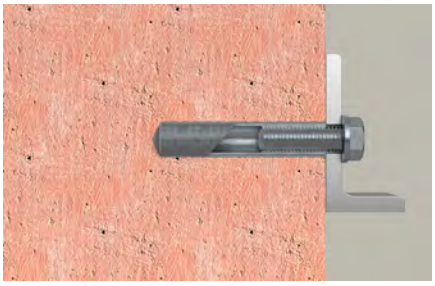
The internal threaded anchor for masonry and aerated concrete.







Cable duct



Steel console

## Applications

- The internal threaded anchor FIS E allows for surface flush removal and reuse of the fixing point, and therefore offers the best possible flexibility
- Anchorings with various injection mortars such as FIS V Plus, FIS V, FIS VL, FIS P Plus, FIS Green, FIS V Zero in concrete

## Advantages

- The internal threaded anchor FIS E is suitable for use with injection mortar in masonry or aerated concrete.
- The internal threaded anchor FIS E allows for surface-flush removal and the reuse of the fixing point, and therefore offers the best possible flexibility.
- The metric internal thread allows for the use of standard metric screws or threaded rods, which enables ideal adaptation in line with the intended use.
- Please refer to the approvals for the mortar used.

## Building materials

**Approved for:**
- Solid sand-lime brick
- Solid brick

**Also suitable for:**
- Solid and lightweight concrete blocks
- Solid pumice and other solid building materials

## Functioning

- FIS E is suitable for pre-positioned installation.
- The mortar bonds the entire surface of the anchor with the drill hole wall and seals the drill hole.
- The anchor is set manually, by lightly rotating it until it reaches the drill hole base.

## Versions

- Galvanised steel
- Stainless steel

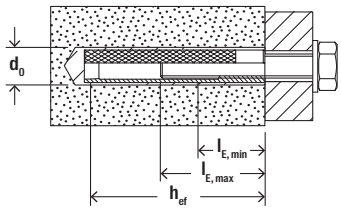
## For use with injection mortar

**Internal threaded sockets FIS E**



FIS E

| | Galvanised steel | Stainless steel | Approval | For use with injection mortar | Sales unit |
|---|---|---|---|---|---|
| | Item no. | Item no. | ETA | | [pcs] |
| Item | gvz | R | | | |
| FIS E 11 x 85 M 6 | 043631 | – | ● | FIS V Plus, FIS V, FIS VL, FIS P Plus | 10 |
| FIS E 11 x 85 M 8 | 043632 | 562060 | ● | FIS V Plus, FIS V, FIS VL, FIS P Plus, FIS V Zero | 10 |
| FIS E 15 x 85 M 10 | 043633 | 562061 | ● | FIS V Plus, FIS V, FIS VL, FIS P Plus, FIS V Zero | 10 |
| FIS E 15 x 85 M 12 | 043634 | – | ● | FIS V Plus, FIS V, FIS VL, FIS P Plus, FIS V Zero | 10 |



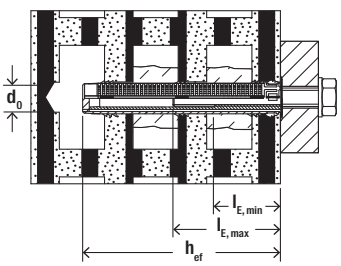

## Technical data in solid brick masonry

**Internal threaded sockets FIS E**



FIS E

| | Galvanised steel | Stainless steel | Approval | Drill hole diameter in solid brick masonry | Min. effect. anchorage depth | Min. bolt penetration | Max. bolt penetration | Suitable injection anchor sleeve | Sales unit |
|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | ETA | $d_0$ [mm] | $h_{ef}$ [mm] | $l_{E,min}$ [mm] | $l_{E,max}$ [mm] | | [pcs] |
| Item | gvz | R | | | | | | | |
| FIS E 11 x 85 M 8 | 043632 | 562060 | ● | 14 | 85 | 8 | 60 | FIS H 16 x 85 K | 10 |
| FIS E 15 x 85 M 10 | 043633 | 562061 | ● | 18 | 85 | 10 | 60 | FIS H 20 x 85 K | 10 |
| FIS E 15 x 85 M 12 | 043634 | – | ● | 18 | 85 | 12 | 60 | FIS H 20 x 85 K | 10 |



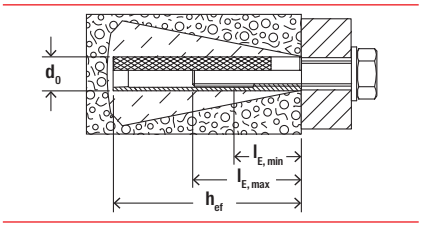

## Technical data in perforated brick masonry

**Internal threaded sockets FIS E**



FIS E

| | Galvanised steel | Stainless steel | Approval | Drill hole diameter in perforated brick masonry | Min. effect. anchorage depth | Min. bolt penetration | Max. bolt penetration | Suitable injection anchor sleeve | Sales unit |
|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | ETA | $d_0$ [mm] | $h_{ef}$ [mm] | $l_{E,min}$ [mm] | $l_{E,max}$ [mm] | | [pcs] |
| Item | gvz | R | | | | | | | |
| FIS E 11 x 85 M 6 | 043631 | – | ● | 16 | 85 | 6 | 60 | FIS H 16 x 85 K | 10 |
| FIS E 11 x 85 M 8 | 043632 | 562060 | ● | 16 | 85 | 8 | 60 | FIS H 16 x 85 K | 10 |
| FIS E 15 x 85 M 10 | 043633 | 562061 | ● | 20 | 85 | 10 | 60 | FIS H 20 x 85 K | 10 |
| FIS E 15 x 85 M 12 | 043634 | – | ● | 20 | 85 | 12 | 60 | FIS H 20 x 85 K | 10 |




## Technical data in undercut drill hole in aerated concrete

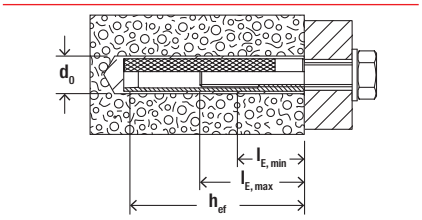
3

**Internal threaded sockets FIS E**



FIS E

| | Galvanised steel | Stainless steel | Approval | Drill diameter | Min. effect. anchorage depth | Min. drill hole depth | Min. bolt penetration | Fill quantity for effect. anchorage depth in solid brick masonry | Sales unit |
|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | ETA | $d_0$ [mm] | $h_{ef}$ [mm] | $h_1$ [mm] | $l_{E,min}$ [mm] | [scale units] | [pcs] |
| Item | gvz | R | | | | | | | |
| FIS E 11 x 85 M 6 | 043631 | – | ● | 14 | 85 | 90 | 6 | 4 | 10 |
| FIS E 11 x 85 M 8 | 043632 | 562060 | ● | 14 | 85 | 90 | 8 | 4 | 10 |




## Technical data cylindrical drill hole in aerated concrete

**Internal threaded sockets FIS E**



FIS E

| | Galvanised steel | Stainless steel | Approval | Drill diameter | Min. effect. anchorage depth | Min. bolt penetration | Max. bolt penetration | Fill quantity for effect. anchorage depth in solid brick masonry | Sales unit |
|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | ETA | $d_0$ [mm] | $h_{ef}$ [mm] | $l_{E,min}$ [mm] | $l_{E,max}$ [mm] | [scale units] | [pcs] |
| Item | gvz | R | | | | | | | |
| FIS E 11 x 85 M 6 | 043631 | – | ● | 14 | 85 | 6 | 60 | 4 | 10 |
| FIS E 11 x 85 M 8 | 043632 | 562060 | ● | 14 | 85 | 8 | 60 | 4 | 10 |
| FIS E 15 x 85 M 10 | 043633 | 562061 | ● | 18 | 85 | 10 | 60 | 5 | 10 |
| FIS E 15 x 85 M 12 | 043634 | – | ● | 18 | 85 | 12 | 60 | 5 | 10 |

**Internal threaded sockets FIS E**









| | Zinc plated, steel grade 5.8 | Stainless steel | FIS V Plus | FIS V | FIS VL | FIS P Plus | FIS V Zero |
|---|---|---|---|---|---|---|---|
| | gvz | R | | | | | |
| | Art.-No. | Art.-No. | | | | | |
| FIS E 11 x 85 M6 | 43631 | – | • | • | • | • | • |
| FIS E 11 x 85 M8 | 43632 | 562060 | • | • | • | • | • |
| FIS E 15 x 85 M10 | 43633 | 562061 | • | • | • | • | • |
| FIS E 15 x 85 M12 | 43634 | – | • | • | • | • | • |

# Internal threaded anchor FIS IG

The internal threaded anchor for anchoring in wood.







Connection with internal thread anchor FIS IG and hexagonal screw

## Applications

- The internal threaded anchor FIS E allows for surface flush removal and reuse of the fixing point, and therefore offers the best possible flexibility
- Anchorings with various injection mortars such as FIS V Plus, FIS V, FIS VL, FIS P Plus, FIS Green, FIS V Zero in concrete

## Advantages

- In combination with the FIS EM Plus injection mortar, the internally threaded anchor is approved for anchoring in wood in accordance with abG and ETA.
- Available in galvanised and stainless steel versions in internal thread sizes M8 - M20 (external diameter M12 - M30), it can be used flexibly both indoors and outdoors.
- The flush finish of the internal thread solution enables safe component transport to the construction site without bending protruding anchor rods.
- The recommended fischer centring clips DD-E and DD-S allow ideal centring of the internally threaded anchors in the drill hole.
- The internally threaded anchor FIS IG allows the fixing point in timber to be removed and reused flush with the surface.

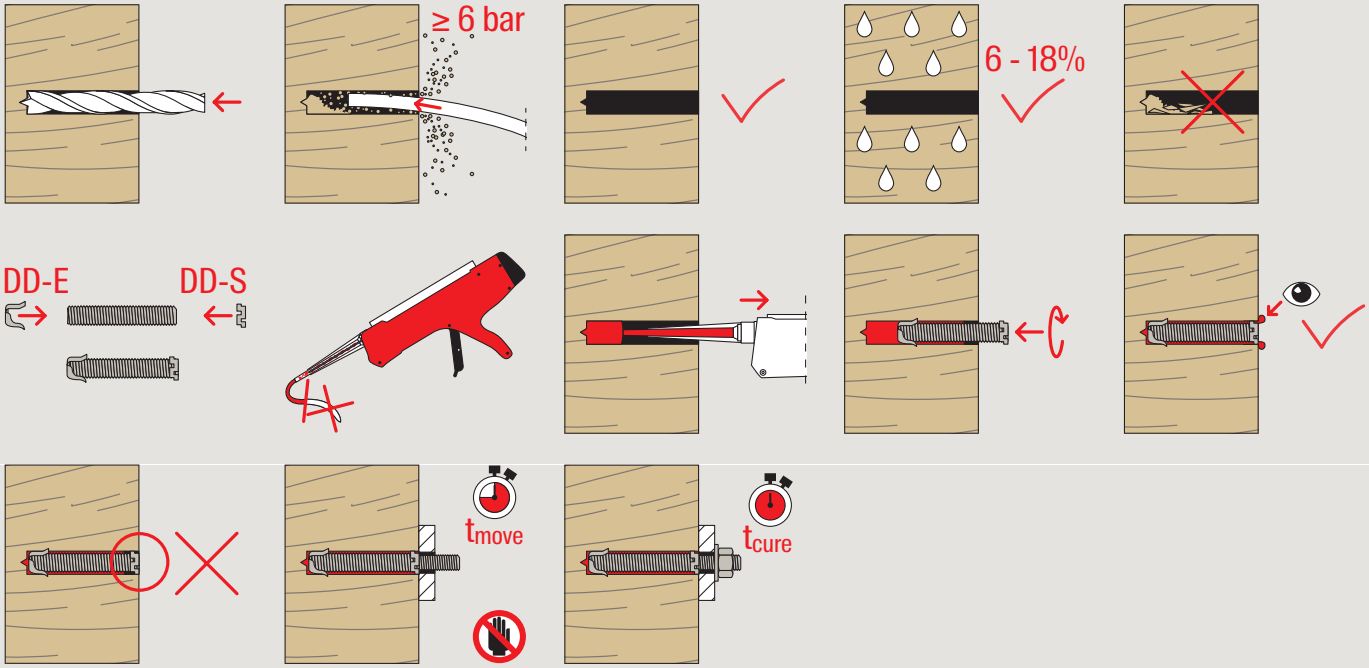
## Building materials

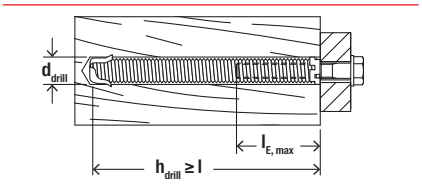
- Glulam and laminated beams made of spruce (Picea abies), fir (Abies alba) or pine (Pinus sylvestris)

## Functioning

- The internally threaded anchor FIS IG is suitable for pre-positioned installation in timber.
- The anchor is centred in the drill hole by attaching centring aids such as the fischer centring clips DD-E and DD-S.
- The fixing element is set by hand by slightly screwing it in until the anchor is countersunk flush with the surface.

## Gluing in wood with FIS EM Plus and internally threaded anchor FIS IG




## Technical data

**Internal threaded anchor FIS IG**



FIS IG gvz FIS IG R

| Item | Galvanised steel Item no. gvz | Stainless steel Item no. R | Approval DIBt | Internal thread | External thread | Drill hole diameter in wood $d_{drill}$ [mm] | Min. drill hole depth $h_{drill}$ [mm] | Anchor length l [mm] | Max. bolt penetration $l_{E,max}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| FIS IG 8 | 572992 | 572997 | ● | M8 | M12 | 14 / 16 | 120 | 120 | 20 | 10 |
| FIS IG 10 | 572993 | 572998 | ● | M10 | M16 | 18 / 20 | 160 | 160 | 25 | 10 |
| FIS IG 12 | 572994 | 572999 | ● | M12 | M20 | 22 / 24 | 200 | 200 | 30 | 10 |
| FIS IG 16 | 572995 | 573000 | ● | M16 | M24 | 26 / 28 | 240 | 240 | 40 | 5 |
| FIS IG 20 | 572996 | 573001 | ● | M20 | M30 | 32 / 34 | 300 | 300 | 50 | 5 |

# Injections anchor sleeve FIS H K

Simple push-through installation in masonry.







Car ports



Wood constructions in push-through installation

## Applications

- Timber constructions
- Awnings
- Canopies
- Car ports
- Gates

## Advantages

- The direct installation through the fixture reduces preliminary work wherever there are several fixing points for each fixture, and guarantees a significantly simpler installation process.
- The design of the push-through anchor sleeve FIS H K allows for a range of usable lengths with just one product, thus providing maximum flexibility and cost-effectiveness.
- The movable edge, in combination with the scale, makes it easier to adapt the anchor sleeve to suit the desired usable length.
- The grating structure of the push-through anchor sleeve is adapted for the injection mortars FIS V Plus, FIS V or FIS V Zero and ensures sparing mortar use with the best interlock.

## Building materials

**Approved for:**

- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Hollow blocks made from concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Solid brick

**Also suitable for:**

- Hollow pumice slabs
- Slabs made of hollow brick and other perforated brick
- Solid pumice and other solid building materials

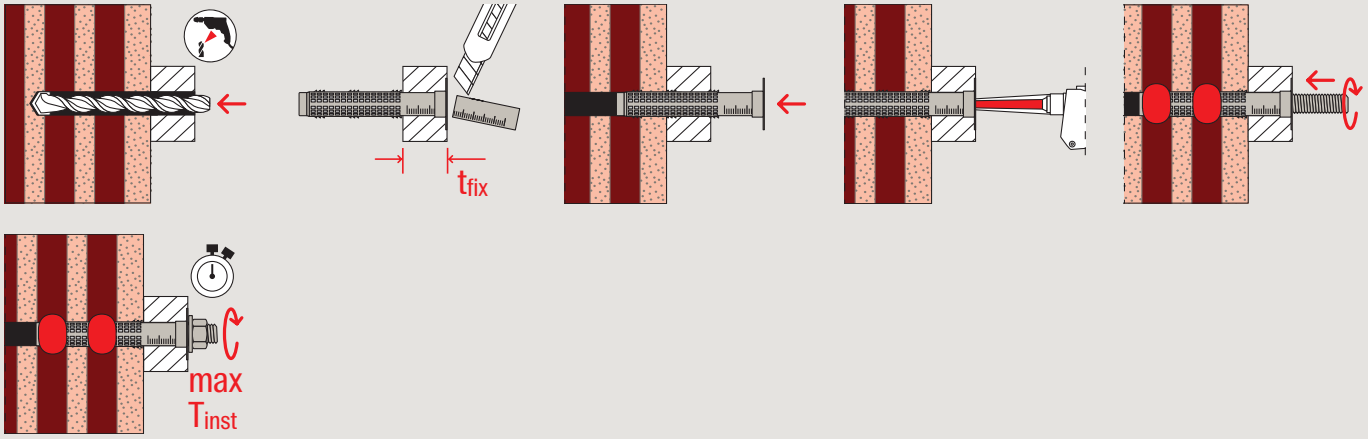
## Versions

- Galvanised steel
- Stainless steel

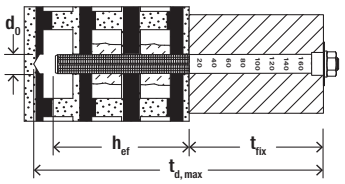
## Functioning

- The system can be used with any of the following injection mortars: FIS V Plus, FIS V, FIS V Zero and FIS P Plus can be used but does not have approvals.
- The injection system is suitable for push-through installation when combined with the push-through anchor sleeve FIS H K.
- The push-through anchor sleeve is adapted to suit the fixture thickness using the scale and the movable edge, and cut as required.
- The anchor sleeve is placed in the drill hole, and filled with injection mortar from the anchor sleeve base. It should be ensured that the anchor sleeve is completely filled, including in the fixture region.
- Turning in the anchor causes the mortar to be pushed through the anchor sleeve's grating structure, so that it fits the base material perfectly. The load is borne by the interlock.

## Installation with FIS V Plus and FIS H K





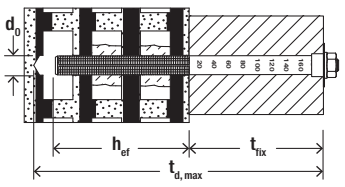

## Technical data

**Injection anchor sleeve**



FIS HK

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Max. drill hole depth [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Max. fixture thickness $t_{fix}$ [mm] | Match | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| FIS H 18 x 130/200 K | 045707 | ● | 18 | 340 | 130 | 200 | M10 - M12 | 10 |
| FIS H 22 x 130/200 K | 045708 | ● | 22 | 340 | 130 | 200 | M16 | 10 |




## Technical data

**FIS Set**



FIS Set

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Max. drill hole depth [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Max. usable length $t_{fix}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| FIS Set 18 x 130/200 M12/200 | 047443 | ● | 18 | 340 | 130 | 200 | 5 |
| FIS Set 18 x 130/200 M12/200 R | 047452 | ● | 18 | 340 | 130 | 200 | 5 |

# Injection anchor sleeves

## FIS H K



### Advantages

- The grating structure of the FIS H K anchor sleeve is adapted for the injection mortars FIS V Plus, FIS V, FIS VL, FIS GREEN, FIS P Plus and FIS P, and ensures sparing mortar use with the best interlock.
- The centring blades perfectly align the anchor in the anchor sleeve, and allow for use with various threaded rod diameters.
- The barbed hooks secure the anchor sleeve in the drill hole and allow for a trouble-free overhead installation.
- The geometry of the anchor sleeves allows for the bridging of non-bearing layers for a simple and convenient installation.

### Functioning

- The system can be used with any of the following injection mortars: FIS V Plus, FIS VW Plus High Speed, FIS VS Plus Low Speed, FIS VL, FIS GREEN or FIS P Plus. FIS P can be used but does not have approvals.
- The system is suitable for pre-positioned installation when combined with injection anchor sleeves and threaded rods FIS A or internal threaded anchors FIS E.
- The anchor sleeve is placed in the drill hole, and filled with injection mortar from the anchor sleeve base.
- Turning in the anchor causes the mortar to be pushed through the anchor sleeve's grating structure, so that it fits the base material perfectly. The load is borne by the interlock.

## FIS H L



### Advantages

- The metal anchor sleeve can be cut to the required length and thus allows for a range of usable lengths with just one produce, providing flexibility and cost-effectiveness.
- The grating structure of the anchor sleeve allows for uniform distribution of mortar in the drill hole and thus for secure hold.

### Functioning

- The anchor sleeve is at first cut to the required length.
- The anchor sleeve is placed in the drill hole, and filled with injection mortar from the anchor sleeve base.
- Turning in the anchor causes the mortar to be pushed through the anchor sleeve's grating structure, so that it fits the base material perfectly.
- The load is borne by the interlock.

## FIS H N

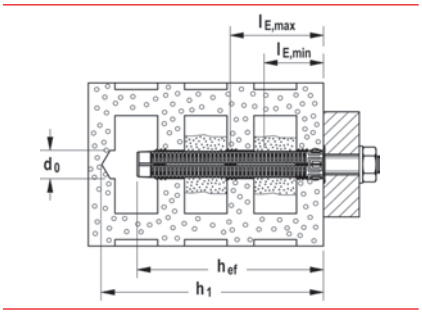


### Advantage

- The net structure of the anchor sleeve allows for uniform distribution of mortar in the drill hole and thus for secure hold.

### Functioning

- The anchor sleeve is placed in the drill hole, and filled with injection mortar from the anchor sleeve base.
- Turning in the anchor causes the mortar to be pushed through the anchor sleeve's grating structure, so that it fits the base material perfectly.
- The load is borne by the interlock.






## Technical data

**Injection anchor sleeves FIS H K**



FIS H K

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| FIS H 12 x 50 K | 041900 | ● | 12 | 60 | 50 | 50 |
| FIS H 12 x 85 K | 041901 | ● | 12 | 95 | 85 | 50 |
| FIS H 16 x 85 K | 041902 | – | 16 | 95 | 85 | 50 |
| FIS H 16 x 130 K | 041903 | ● | 16 | 140 | 110 | 20 |
| FIS H 20 x 85 K | 041904 | ● | 20 | 95 | 85 | 20 |
| FIS H 20 x 130 K | 046703 | – | 20 | 140 | 110 | 20 |
| FIS H 20 x 200 K | 046704 | – | 20 | 210 | 180 | 20 |

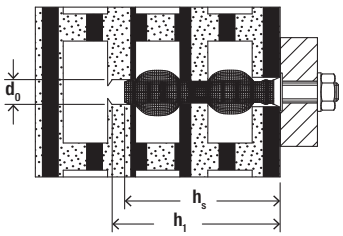
## Technical data

**Injection anchor sleeve FIS H L**



FIS H L

| Item | Item no. | Drill diameter $d_0$ [mm] | Total length l [mm] | Match | Sales unit [pcs] |
|---|---|---|---|---|---|
| FIS H 12 x 1000 L | 050598 | 12 | 1,000 | Ø6/M6 - Ø8/M8 | 10 |
| FIS H 16 x 1000 L | 050599 | 16 | 1,000 | Ø8/M8 - Ø10/M10 | 10 |
| FIS H 22 x 1000 L | 045301 | 22 | 1,000 | Ø12/M12 - Ø16/M16 | 6 |
| FIS H 30 x 1000 L | 000645 | 30 | 1,000 | Ø16/M16 - Ø22/M22 | 4 |




## Technical data



**Injection anchor sleeve FIS H N**



FIS H N

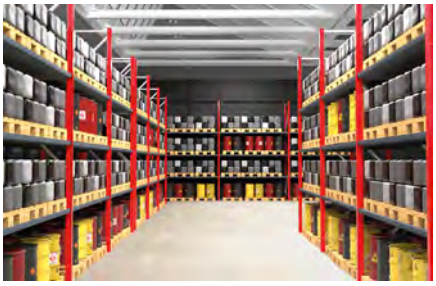
| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Match | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FIS H 16 x 85 N** | **050470** | 16 | 95 | 85 | Ø8/M8 | 20 |
| **FIS H 18 x 85 N** | **050472** | 18 | 95 | 85 | Ø10/M10 | 20 |
| **FIS H 20 x 85 N** | **050474** | 20 | 95 | 85 | Ø12/M12 | 20 |

| Special applications | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | |  FIS HB |  FIS SB |  FIS EM Plus |  FIS EB II |  FIS V Plus |  FIS V |  FIS VL |  RSB | |
| **Item** | **Positioning** | | | | | | | | | **Page** |
|  **Highbond anchor dynamic FHB dyn** | Performance class amongst dynamic anchors | ● | – | – | – | – | – | – | – | 169 |
|  **Dynamic-anchor FDA** | Dynamic push-through anchor for an economical serial installation at medium load level | ● | – | – | – | – | – | – | – | 174 |
|  **FIS A** | Dynamic fixation with Superbond-System FSB and FIS EM Plus | – | ● | ● | – | – | – | – | – | 135 |
|  **RG M** | Dynamic fixation with Superbond-System FSB and FIS EM Plus | – | ● | ● | – | – | – | – | ● | 144 |
|  **Post-installed rebar connections** | Professional rebar connections | – | ● | ● | ● | ● | ● | ● | – | 188 |
|  **Concrete-concrete shear connector FCC** | Approved system for building renovation | – | ● | ● | – | ● | ● | – | – | 198 |
|  **Remedial wall tie VBS 8** | Facade repair for two-leaf cavity walls | – | – | – | – | ● | ● | – | – | 224 |
|  **Weather facing reconstruction system FWS II** | Economical repair of triple-skin outer wall panels | – | – | – | – | ● | ● | – | – | 227 |

# WRL compliant anchorings

FIS EM Plus - the system with general construction technique permit for anchoring in sealing surfaces according to the WRL (Water Resources Law).



Pallet storage



Chemical production with silos and pipelines



## Applications

- The internal threaded anchor FIS E allows for surface flush removal and reuse of the fixing point, and therefore offers the best possible flexibility
- Anchorings with various injection mortars such as FIS V Plus, FIS V, FIS VL, FIS P Plus, FIS Green, FIS V Zero in concrete

## Advantages

- FIS EM Plus is the first anchorage system with general construction technique permit (aBG) for sealing surfaces according to the WRL, consisting of liquid impermeable concrete (LI / LIP concrete) or coated concrete with the epoxy resin coating StoCretec WHG System 2. For anchorages in surfaces made of coated concrete, an additional expert opinion is available. This offers planning reliability and clear installation procedures.
- The WRL marking disc enables the anchorage point to be clearly marked. This enables the anchorage to be controlled during the prescribed inspections.

## Certificates / Features

CE
aBG
Z-74.8-199
Z-74.8-211

**ETA-17/0979, in concrete**

WRL

R240

Seismic C2

## Building materials

- WRL sealing surfaces made of liquid impermeable concrete (LI / LIP concrete)
- WRL sealing surfaces made of epoxy resin coated concrete

## Versions

- Galvanised steel
- Stainless steel R
- Highly corrosion resistant steel HCR

## Functioning

- The system consists of the injection mortar FIS EM Plus, anchor rod FIS A / RG M or internal threaded anchor RG M I and the WRL marking disc.
- In LI / LIP concrete and coated concrete, the mortar bonds the anchor rod to the drill hole wall throughout and seals the drill hole.
- Optionally, the WRL set can additionally be used for anchorings in coated concrete. Using the filling disc and mortar, the annular gap between the attachment and the threaded rod is filled, for even more secure sealing.
- The marking disc acts as proof that a WRL-compliant anchorage has been executed.

**See also:**
Product family Epoxy mortar FIS EM Plus Page 29



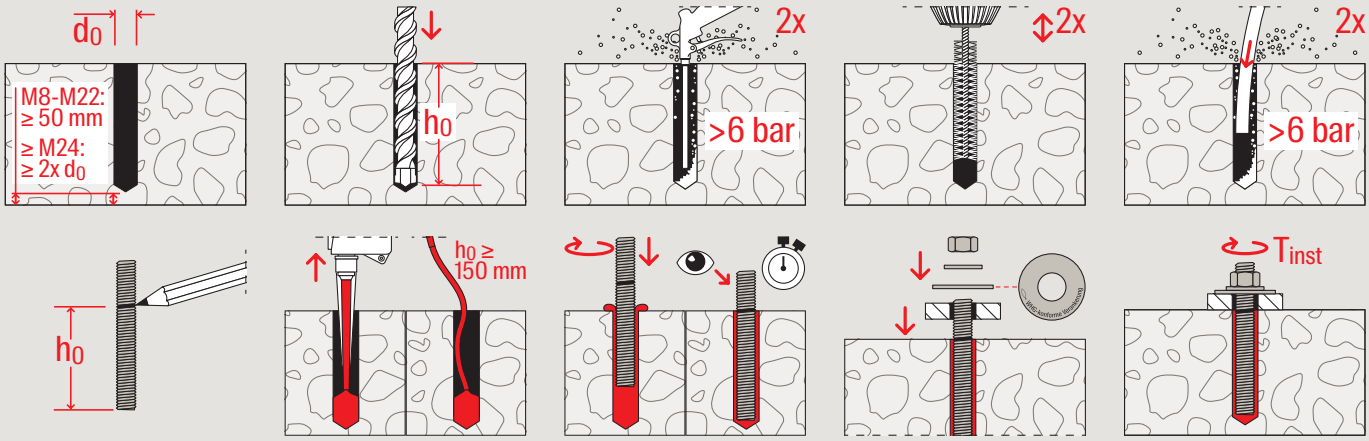
**See also:**
Threaded rod FIS A Page 133



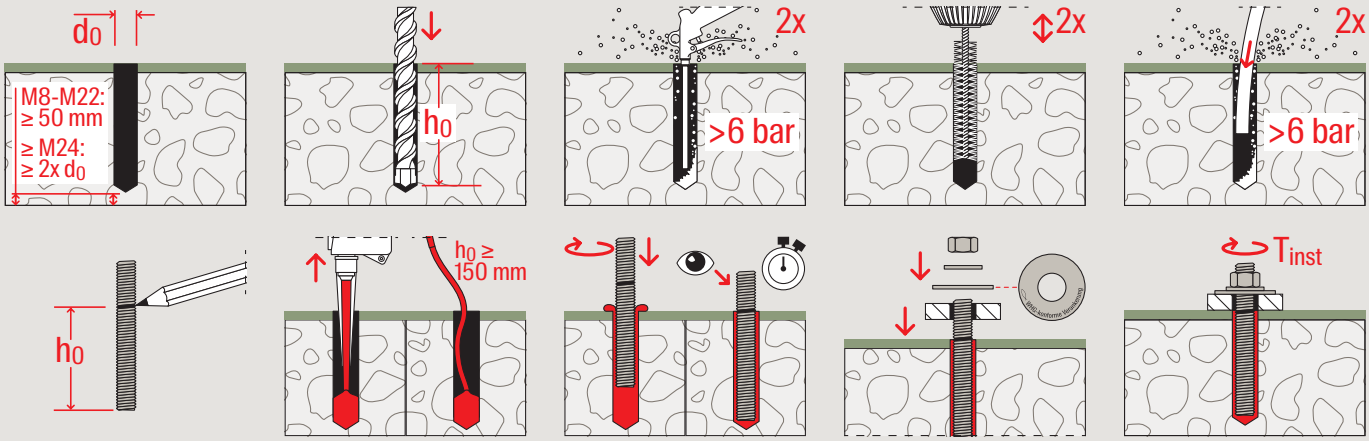
**See also:**
Internal-threaded anchor RG M I Page 151



## Installation in LI / LIP concrete




## Installation in coated concrete




## Technical data

**Epoxy mortar FIS EM Plus**



FIS EM Plus 300 T | FIS EM Plus 390 S | FIS EM Plus 585 S | FIS EM Plus 1500 S

| Item | Item no. | Approval ETA | DIBt | ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| FIS EM Plus 300 T | 575312 | ● | ● | ● | EN, ES, FR | 142 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS EM Plus 300 T | 575313 | ● | ● | ● | DE, IT | 142 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS EM Plus 300 T | 575314 | ● | ● | ● | AR, EN, PT | 142 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS EM Plus 390 S | 544154 | ● | ● | ● | EN, FR, NL | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS EM Plus 390 S | 544176 | ● | ● | ● | CS, RO, SK | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS EM Plus 390 S | 544155 | ● | ● | ● | AR, EN, ZH | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS EM Plus 390 S | 544159 | ● | ● | ● | KK, RU, UK | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS EM Plus 390 S | 567987 | ● | ● | ● | EL, HU, KO | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS EM Plus 585 S | 544165 | ● | ● | ● | CS, KO, PL, SK | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| FIS EM Plus 585 S | 544166 | ● | ● | ● | EL, EN, ES, PT | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| FIS EM Plus 585 S | 567989 | ● | ● | ● | DE, FR, NL | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| FIS EM Plus 585 S | 544175 | ● | ● | ● | EN, KO, ZH | 270 | 1 x Cartridge 585 ml 1 x static mixer FIS UMR 1 x Extension tube Ø 9 x 250 mm | 1 |
| FIS EM Plus 1500 S | 544167 | ● | ● | ● | DE, EN, ES, FR, IT | 670 | 1 x Cartridge 1500 ml, 2 x static mixer FIS UMR | 1 |

## Technical data

**Static mixer**



FIS MR Plus FIS UMR

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **FIS MR Plus** | **545853** | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |
| **FIS UMR** | **520593** | 10 x static mixer FIS UMR for 585 & 1500 ml cartridges | 10 |



## Technical data

**WRL marking**




WRL marking

| Item | Item no. | Ap-pro-val DIBt | Match | External-ø d [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|
| **WRL marking M8** | **558307** | ● | FIS A M8, RG M8, RG M8 I gvz + R | 35 | 10 |
| **WRL marking M10** | **558308** | ● | FIS A M10, RG M10, RG M10 I gvz + R | 35 | 10 |
| **WRL marking M12** | **558309** | ● | FIS A M12, RG M12, RG M12 I gvz + R | 40 | 10 |
| **WRL marking M16** | **558310** | ● | FIS A M16, RG M16, RG M16 I gvz + R | 50 | 10 |
| **WRL marking M20** | **558311** | ● | FIS A M20, RG M20, RG M20 I gvz + R | 60 | 10 |
| **WRL marking M24** | **558312** | ● | FIS A M24, RG M24 gvz + R | 65 | 10 |

## Technical data

**WRL set for coated concrete**




WRL set coated concrete

| Item | Item no. | Height H [mm] | Match | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|
| **WRL set coated concrete M8** | **558313** | 6 | FIS A M8, RG M8, RG M8 I | Each 10 x marking disc, filling disc, sperical disc<br>3 x Injection adapter | 10 |
| **WRL set coated concrete M10** | **558314** | 6 | FIS A M10, RG M10, RG M10 I | Each 10 x marking disc, filling disc, sperical disc<br>3 x Injection adapter | 10 |
| **WRL set coated concrete M12** | **558315** | 6 | FIS A M12, RG M12, RG M12 I | Each 10 x marking disc, filling disc, sperical disc<br>3 x Injection adapter | 10 |
| **WRL set coated concrete M16** | **558316** | 7 | FIS A M16, RG M16, RG M16 I | Each 10 x marking disc, filling disc, sperical disc<br>3 x Injection adapter | 10 |
| **WRL set coated concrete M20** | **558317** | 8 | FIS A M20, RG M20, RG M20 I | Each 10 x marking disc, filling disc, sperical disc<br>3 x Injection adapter | 10 |
| **WRL set coated concrete M24** | **558318** | 10 | FIS A M24, RG M24 | Each 10 x marking disc, filling disc, sperical disc<br>3 x Injection adapter | 10 |

Optionally, the WRL set can additionally be used for an even more secure sealing.
When used with WRL set, the effective length must be reduced by the height of the filling disc.

## Technical data

**WRL set for coated concrete**




WRL set coated concrete



| Item | Item no. | Height H [mm] | Match | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|
| **WRL set coated concrete M8 R** | **558319** | 6 | FIS A M8 R, RG M8 R, RG M8 I R | Each 10 x marking disc, filling disc, sperical disc<br>3 x Injection adapter | 10 |
| **WRL set coated concrete M10 R** | **558320** | 6 | FIS A M10 R, RG M10 R, RG M10 I R | Each 10 x marking disc, filling disc, sperical disc<br>3 x Injection adapter | 10 |
| **WRL set coated concrete M12 R** | **558321** | 6 | FIS A M12 R, RG M12 R, RG M12 I R | Each 10 x marking disc, filling disc, sperical disc<br>3 x Injection adapter | 10 |
| **WRL set coated concrete M16 R** | **558322** | 7 | FIS A M16 R, RG M16 R, RG M16 I R | Each 10 x marking disc, filling disc, sperical disc<br>3 x Injection adapter | 10 |
| **WRL set coated concrete M20 R** | **558323** | 8 | FIS A M20 R, RG M20 R, RG M20 I R | Each 10 x marking disc, filling disc, sperical disc<br>3 x Injection adapter | 10 |
| **WRL set coated concrete M24 R** | **558324** | 10 | FIS A M24 R, RG M24 R | Each 10 x marking disc, filling disc, sperical disc<br>3 x Injection adapter | 10 |

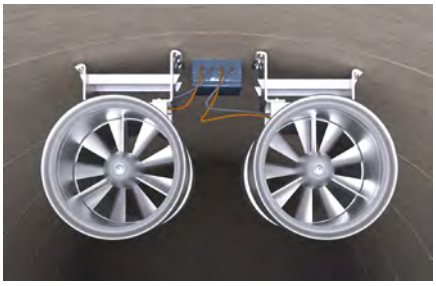
Optionally, the WRL set can additionally be used for an even more secure sealing.
When used with WRL set, the effective length must be reduced by the height of the filling disc.

# Highbond-anchor dynamic FHB dyn

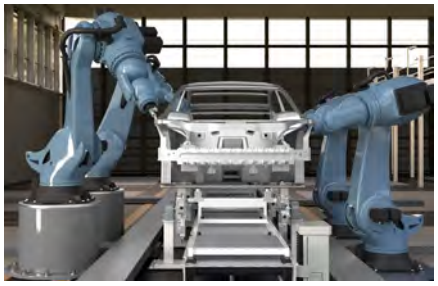
The highest performance in class amongst dynamic anchors.





Tunnel ventilators



Production robots

## Applications

- Jib cranes
- Gantry and overhead cranes
- Guide rails for elevators
- Tunnel ventilators (jet fans)
- Gantries in road construction
- Antennas and transmitter masts
- Industrial robots

## Advantages

- The Highbond-anchor dynamic FHB-A dyn must be applied in combination with the Highbond-mortar FIS HB.
- During the setting process, the injection mortar FIS HB fills the annular gap in the fixture, and ensures optimum load distribution. This allows for the absorption of dynamic alternating loads.
- The cone shape of the FHB-A dyn anchor rod ensures a controlled expansion under dynamic stress, thus allowing for use in cracked concrete.
- The anchor rod FHB-A dyn is also available made from high corrosion-resistant steel. This makes it suitable for use in aggressive atmospheres, for example in tunnels.
- The Highbond anchor dynamic system can achieve even greater shear loads thanks to the additional sleeve of the anchor rod FHB-A dyn V, and therefore provides an increased level of safety.
- The ETA for static and quasi-static loads allows the use of sizes M12 and M16 also for the anchoring base steel fiber concrete.

## Certificates / Features

CE aBG Z-21.3-1748

**ETA-06/0171, in concrete**

Dynamic

R 120

## Building materials

**Approved for:**

- Concrete C20/25 to C50/60, cracked and non-cracked
- Steel fiber reinforced concrete (M12 / M16)

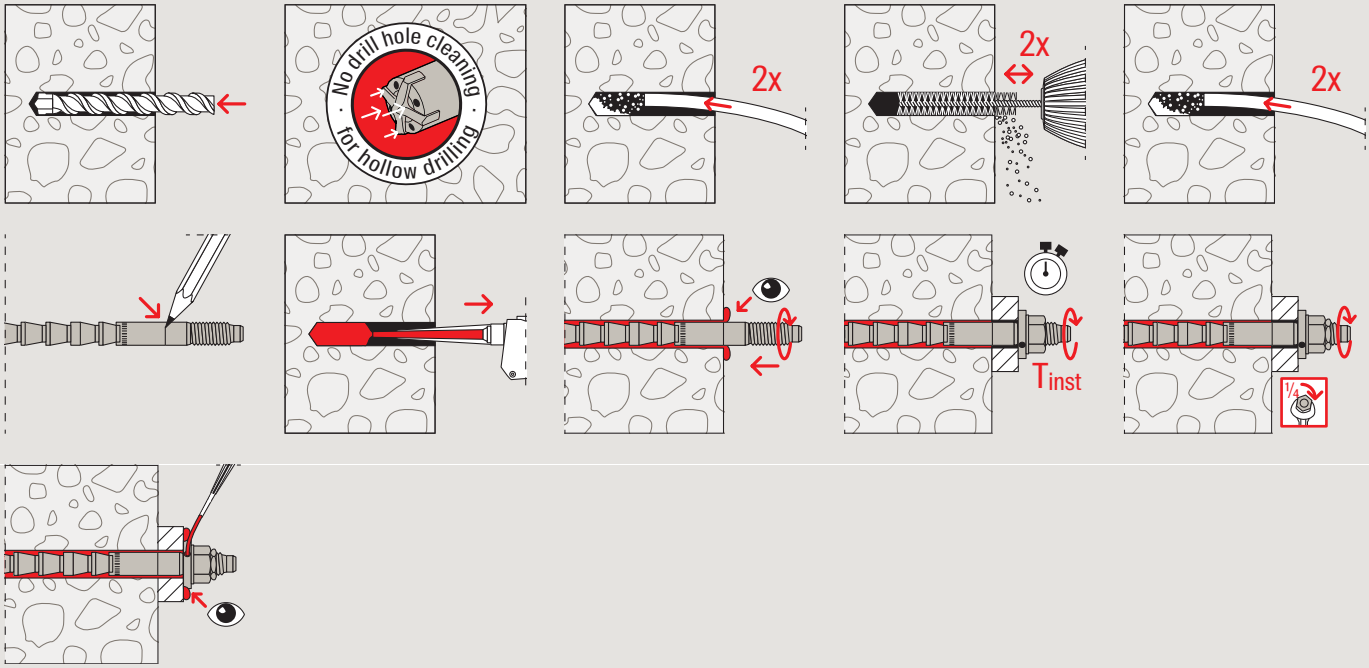
## Versions

- Galvanised steel
- Highly corrosion-resistant steel

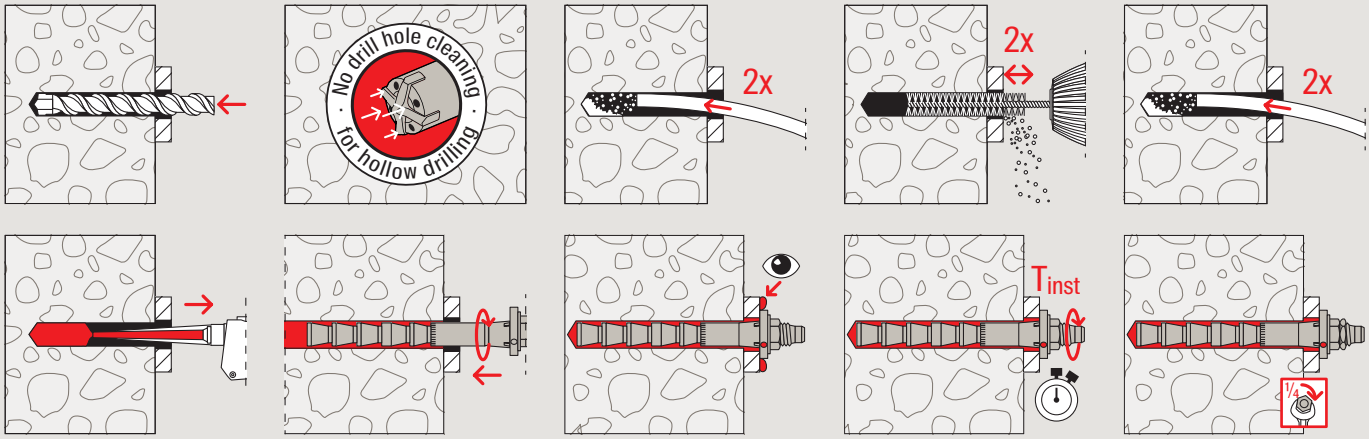
## Functioning

- The injection system suitable for tensile zones consists of the Highbond dynamic anchor rod FHB-A dyn and the injection mortar FIS HB.
- FHB dyn is approved for pre-positioned and push-through installation.
- Extruding the mortar causes the two components to be mixed and activated in the static mixer.
- The mortar bonds the entire surface of the anchor rod with the drill hole wall and seals the drill hole.
- The centring sleeve centres the anchor in the fixture, thus ensuring a safe load application.
- The lock nut prevents the nut from becoming loose.

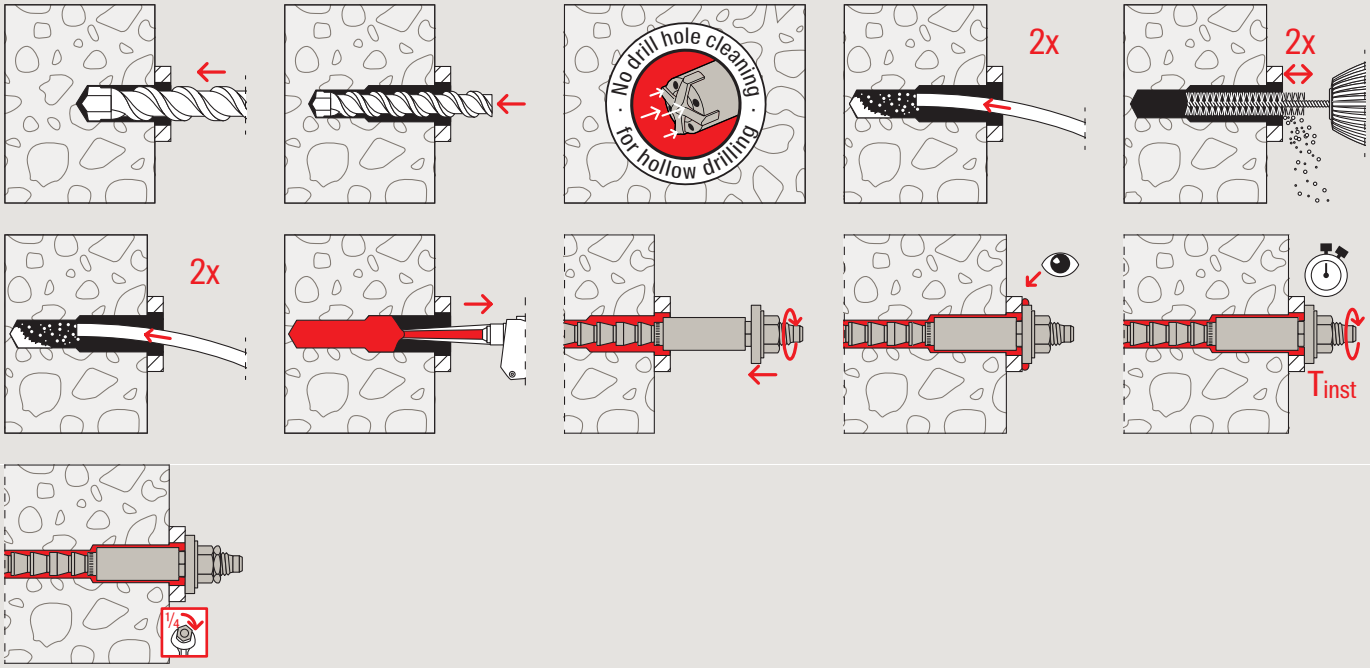
## Pre-positioned installation in concrete with FIS HB and FHB DYN



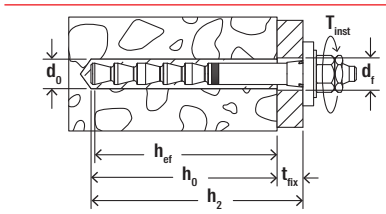

## Push-through installation in concrete with FIS HB and FHB DYN



## Push-through installation in concrete with FIS HB and FHB DYN V






## Technical data

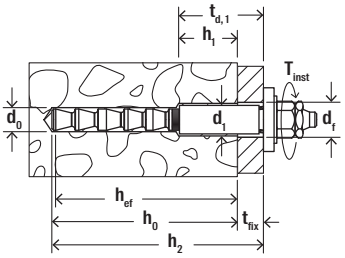
**Highbond anchor dynamic FHB-A dyn**



FHB-A dyn

| Item | Item no. | Approval ETA | Approval DIBt | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Anchorage depth $h_{ef}$ [mm] | Min. / max. usable length $t_{fix}$ [mm] | Width across nut SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **FHB-A dyn 12 x 100/25** | **092018** | ● | ● | 14 | 130 | 100 | 8 - 25 | 19 | 10 |
| **FHB-A dyn 12 x 100/25** | **531384**[1] | ● | ● | 14 | 130 | 100 | 8 - 25 | 19 | 10 |
| **FHB-A dyn 12 x 100/25** | **561726** | ● | ● | 14 | 130 | 100 | 8 - 25 | 19 | 4 |
| **FHB-A dyn 12 x 100/50** | **092019** | ● | ● | 14 | 155 | 100 | 11 - 50 | 19 | 10 |
| **FHB-A dyn 16 x 125/25** | **092020** | ● | ● | 18 | 155 | 125 | 10 - 25 | 24 | 10 |
| **FHB-A dyn 16 x 125/50** | **092036** | ● | ● | 18 | 180 | 125 | 10 - 50 | 24 | 10 |
| **FHB-A dyn 16 x 125/50** | **093445**[1] | ● | ● | 18 | 180 | 125 | 10 - 50 | 24 | 10 |
| **FHB-A dyn 16 x 125/50** | **561727**[1] | ● | ● | 18 | 180 | 125 | 10 - 50 | 24 | 4 |
| **FHB-A dyn 16 x 125/75** | **562302** | ● | ● | 18 | 205 | 125 | 10 - 75 | 24 | 10 |
| **FHB-A dyn 16 x 125/80** | **541874** | ● | ● | 18 | 210 | 125 | 10 - 80 | 24 | 10 |
| **FHB-A dyn 16 x 125/100** | **541875** | ● | ● | 18 | 230 | 125 | 10 - 100 | 24 | 10 |
| **FHB-A dyn 16 x 125/125** | **541873** | ● | ● | 18 | 255 | 125 | 10 - 125 | 24 | 10 |
| **FHB-A dyn 16 x 125/150** | **543657** | ● | ● | 18 | 280 | 125 | 10 - 150 | 24 | 10 |
| **FHB-A dyn 20 x 170/50** | **092037** | ● | ● | 24 | 225 | 170 | 12 - 50 | 30 | 10 |
| **FHB-A dyn 24 x 220/50** | **092038** | ● | ● | 28 | 275 | 220 | 14 - 50 | 36 | 5 |

[1] Prices and delivery time on requst.






## Technical data

**Highbond anchor dynamic FHB dyn V**



FHB-A dyn V

| Item | Item no. | Approval ETA | Approval DIBt | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Anchorage depth $h_{ef}$ [mm] | Min. / max. usable length $t_{fix}$ [mm] | Drill hole diameter in fixture $d_f$ [mm] | Width across nut SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| **FHB-A dyn 12 x 100/50 V** | **092039**[1] | ● | ● | 14 | 160 | 105 | 8 - 50 | 21 | 19 | 10 |
| **FHB-A dyn 16 x 125/50 V** | **092040**[2] | ● | ● | 18 | 185 | 130 | 10 - 50 | 29 | 24 | 10 |

[1] Stepped hole: 1st drill hole with Ø 20 mm and depth 85 mm. 2nd drill hole with Ø 14 mm and depth 160 mm.
[2] Stepped hole: 1st drill hole with Ø 28 mm and depth 100 mm. 2nd drill hole with Ø 18 mm and depth 185 mm.

## Technical data

**Injection mortar FIS HB**





FIS HB 150 C FIS HB 360 S FIS MR Plus

| Item | Item no. | Approval ETA | Approval DIBt | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FIS HB 150 C** | **519665** | ● | ● | CS, DE, EN | 70 | 1 x Cartridge 150 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **562659** | ● | ● | DE, FR, IT, NL | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **519125** | ● | ● | DE | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **562658** | ● | ● | CN, EN | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **562660** | ● | ● | CS, EN, PL, RU, SK | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **562661** | ● | ● | EL, EN, ES, PT | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS HB 360 S** | **569207** | ● | ● | EN, TR | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS MR Plus** | **545853** | – | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |

## Curing times

| FIS HB System temperature FIS HB (Mortar min. +5 °C) [°C] | Maximum processing time FIS HB $t_{work}$ [min.] | Minimum curing time FIS HB [1] $t_{cure}$ [min.] |
|---|---|---|
| -5 – -1 | – | 360 |
| 0 – +4 | – | 180 |
| > +5 – +9 | 15 | 90 |
| > +10 – +19 | 6 | 35 |
| > +20 – +29 | 4 | 20 |
| > +30 – +40 | 2 | 12 |

1) In wet concrete the curing times must be doubled.

## Filling quantities

| FHB dyn<br>Type | Mortar volume in scale units shown on the cartridge labels' corresponding scala | Anchor per cartridge FIS HB 360 S*) |
|---|---|---|
| FHB-A dyn 12 x 100 / 25 | 7 | 24 |
| FHB-A dyn 12 x 100 / 50 | 8 | 21 |
| FHB-A dyn 16 x 125 / 25 | 9 | 18 |
| FHB-A dyn 16 x 125 / 50 | 10 | 17 |
| FHB-A dyn 16 x 125 / 75 | 11 | 15 |
| FHB-A dyn 16 x 125 / 80 | 11 | 15 |
| FHB-A dyn 16 x 125 / 100 | 12 | 14 |
| FHB-A dyn 16 x 125 / 125 | 13 | 12 |
| FHB-A dyn 16 x 125 / 150 | 14 | 12 |
| FHB-A dyn 20 x 170 / 50 | 23 | 7 |
| FHB-A dyn 24 x 220 / 50 | 38 | 4 |
| FHB-A dyn 12 x 100 / 50 V | 12 | 14 |
| FHB-A dyn 16 x 125 / 50 V | 20 | 8 |

*) Max. number with one static mixer.

## Loads

**Highbond anchor dynamic FHB dyn**

Design values for cyclic fatigue loading[1] of a single anchor normal concrete of strength class C20/25[2].
For the design the complete current approval Z-21.3-1748 has to be considered.

| | | | | | Cracked and non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|
| | Material/surface | Effective anchorage depth | Minimum member thickness | Installation torque | Design values of tension ($\Delta N_{Ed,max}$) and shear loads ($\Delta V_{Ed,max}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst}$ [Nm] | $\Delta N_{Ed,max}$ [3)] [kN] | $\Delta V_{Ed,max}$ [3)4)] [kN] | $s_{min}$ [4)] [mm] | $c_{min}$ [4)] [mm] |
| FHB dyn 12 x 100 | gvz | 100 | 130 | 40 | 14.1 | 6.7 | 100 | 200[5)] |
| | gvz | 100 | 200 | 40 | 14.1 | 6.7 | 100 | 100[5)] |
| | HCR / 1.4529 | 100 | 130 | 40 | 11.3 | 4.4 | 100 | 200[5)] |
| | HCR / 1.4529 | 100 | 200 | 40 | 11.3 | 4.4 | 100 | 100[5)] |
| FHB dyn 12 x 100 V | gvz | 105 | 130 | 40 | 14.1 | 9.6 | 100 | 200[5)] |
| | gvz | 105 | 200 | 40 | 14.1 | 9.6 | 100 | 100 |
| FHB dyn 16 x 125 | gvz | 125 | 160 | 60 | 23.0 | 11.9 | 100 | 200[5)] |
| | gvz | 125 | 250 | 60 | 23.0 | 11.9 | 100 | 100 |
| | HCR / 1.4529 | 125 | 160 | 60 | 15.6 | 11.9 | 100 | 200[5)] |
| | HCR / 1.4529 | 125 | 250 | 60 | 15.6 | 11.9 | 100 | 100[5)] |
| FHB dyn 16 x 125 V | gvz | 130 | 160 | 60 | 23.0 | 17.0 | 100 | 200[5)] |
| | gvz | 130 | 250 | 60 | 23.0 | 17.0 | 100 | 100 |
| FHB dyn 20 x 170 | gvz | 170 | 220 | 100 | 28.4 | 17.0 | 80 | 80 |
| FHB dyn 24 x 220 | gvz | 220 | 440 | 120 | 28.9 | 22.2 | 180 | 180[5)] |

[1] The design values of the cyclic fatigue loading apply for load cycles ≥ 5 x $10^6$ in accordance with design method I - for unknown static lower load. If the static lower load is known and / or for lower number of load cycles higher load values are possible. The partial safety factors as regulated in the design standard are considered. As a single anchor counts e.g. an anchor with a spacing s ≥ 3 x $h_{ef}$ . The given load values apply for anchorages in dry and wet concrete and temperatures in the base material up to 50 °C (resp. short-term up to 80 °C) and drill hole cleaning acc. to approval.
[2] For higher concrete strength classes up to C50/60 higher permissible loads may be possible, see approval. The concrete is assumed to be standard-reinforced.
[3] In the case of combinations of tensile loads, shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups) the design must be carried out in accordance with the provisions of the complete approval.
[4] Valid for pulsating loads. For alternating loads see approval.
[5] Without reduction of the tension and shear load. For details see approval.

# Dynamic-anchor FDA

The dynamic push-through anchor for an economical serial installation at medium load level.








Platform lifts

## Applications

- Hydraulic ramps
- Conveyor belts
- Industrial robots
- Cooperation robots and -parts
- Guide rails for elevators

## Advantages

- Medium load level for a variety of applications.
- Pre-assembled anchor rod for fast installation.
- Assessed safety acc. to ETA.
- Easy push-through installation leads to cost effectiveness – especially for serial installations.
- Tight assortment with the size.
- Less spacings and edge distances.
- Drill holes are sealed.
- The ETA for static and quasi-static loads allows the use also for the anchoring base steel fiber concrete.

## Certificates / Features

ETA-06/0171, in concrete
ETA-20/0206, for post-installed fasteners in concrete under fatigue cyclic loading

R 120

## Building materials

- Concrete C20/25 to C50/60, cracked and non-cracked
- Steel fiber reinforced concrete

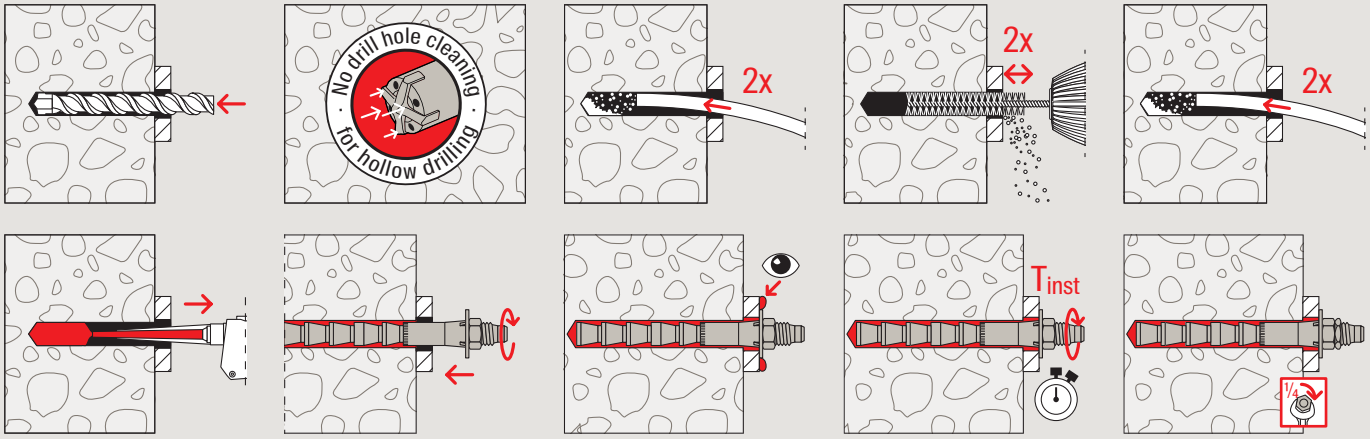
## Versions

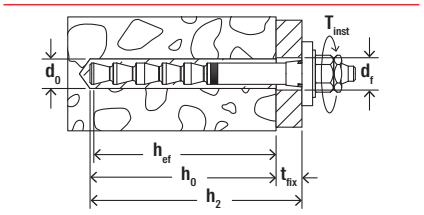
- Galvanised steel

## Functioning

- The injection system suitable for tensile zones consists of the fischer dynamic anchor rod FDA-A dyn and the injection mortar FIS HB.
- FDA is approved for push-through installation.
- Extruding the mortar causes the two components to be mixed and activated in the static mixer.
- The mortar bonds the entire surface of the anchor rod with the drill hole wall and seals the drill hole.
- The centring sleeve centres the anchor in the fixture, thus ensuring a safe load application.
- During the setting process, the injection mortar FIS HB fills the annular gap in the fixture, and ensures optimum load distribution. This allows for the absorption of dynamic alternating loads.

## Installation in concrete with FIS HB and FDA




## Technical data

**Dynamic anchor FDA**



FDA-A

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Drill hole diameter in fixture $d_f$ [mm] | Anchorage depth $h_{ef}$ [mm] | Min. / max. usable length $t_{fix}$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Width across nut SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **FDA-A 12 x 100/25 gvz** | **536943** | ● | 14 | 15 | 100 | 12 - 25 | 130 | 19 | 10 |
| **FDA-A 12 x 100/50 gvz** | **536944** | ● | 14 | 15 | 100 | 12 - 50 | 155 | 19 | 10 |
| **FDA-A 16 x 125/25 gvz** | **536945** | ● | 18 | 19 | 125 | 16 - 25 | 155 | 24 | 10 |
| **FDA-A 16 x 125/50 gvz** | **536946** | ● | 18 | 19 | 125 | 16 - 50 | 180 | 24 | 10 |
| **FDA-A 16 x 125/80 gvz** | **558966** | ● | 18 | 19 | 125 | 16 - 80 | 210 | 24 | 10 |

# Loads

**Dynamic-Anchor FDA**

Design values for cyclic fatigue loading[1] of a single anchor normal concrete of strength class C20/25[2].
For the design the complete current assessment ETA-20/0206 has to be considered.

| | | | | | Cracked and non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|
| | Material fixing element | Effective anchorage depth | Minimum member thickness | Installation torque | Design values of tension ($\Delta N_{Ed,max}$) and shear loads ($\Delta V_{Ed,max}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst}$ [Nm] | $\Delta N_{Ed,max}$[3] [kN] | $\Delta V_{Ed,max}$[3][4] [kN] | $s_{min}$[4] [mm] | $c_{min}$[4] [mm] |
| **FDA 12 x 100** | gvz | 100 | 130 | 40 | 10.8 | 5.0 | 100 | 200[5] |
| | gvz | 100 | 200 | 40 | 10.8 | 5.0 | 100 | 100[5] |
| **FDA 16 x 125** | gvz | 125 | 160 | 60 | 18.5 | 9.1 | 100 | 200[5] |
| | gvz | 125 | 250 | 60 | 18.5 | 9.1 | 100 | 100 |

[1] The design values of the cyclic fatigue loading apply for load cycles ≥ 5 x $10^6$ in accordance with design method I acc. to TR061 - for unknown static lower load. If the static lower load is known and / or for lower number of load cycles higher load values are possible. The partial safety factors as regulated in the design standard are considered. As a single anchor counts e.g. an anchor with a spacing s ≥ 3 x $h_{ef}$ . The given load values apply for anchorages in dry and wet concrete and temperatures in the base material up to 50 °C (resp. short-term up to 80 °C) and drill hole cleaning acc. to assessment.
[2] For higher concrete strength classes up to C50/60 higher permissible loads may be possible, see assessment. The concrete is assumed to be standard-reinforced.
[3] In the case of combinations of tension loads, shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups) the design must be carried out in accordance with the provisions of the complete assessment.
[4] Valid for pulsating loads. For alternating loads see assessment.
[5] Without reduction of the tension and shear load. Details see assessment.

# Superbond dynamic FSB dyn

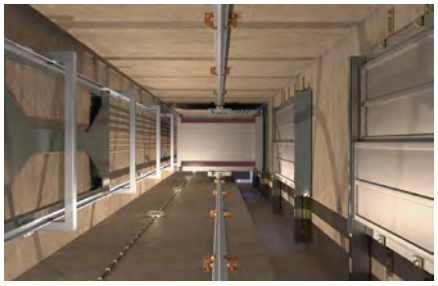
Dynamic fixation for FIS A and RG M with Superbond-System FSB.








Pumps



Guide rails for elevators

## Applications

- Small road sign
- Promotional sign
- Guide rails for elevators
- Pumps
- Conveyor belts
- Gates and doors
- Machines, components exposed to vibration

## Advantages

- The system is the first to offer lightweight, dynamic load specifications in an ETA for fischer FIS A 8.8 and RG M threaded rods using the filling set. The ETA covers zinc-plated steel in sizes M12 and M16, and stainless steel R in sizes M12 to M24.
- FIS A threaded rods must be mounted with FIS SB injection mortar and RG M threaded rods must be mounted with RSB mortar capsules or FIS SB injection mortar.
- Variable anchoring depth enables ideal adaption to the load and ensures optimised installation and material use.
- The version with RG M threaded rods and RSB capsules is ideal for accessories kits or applications with diamond drill holes.
- Approved threaded rods in stainless steel R can be used outdoors.

## Certificates / Features

CE ETA Dynamic

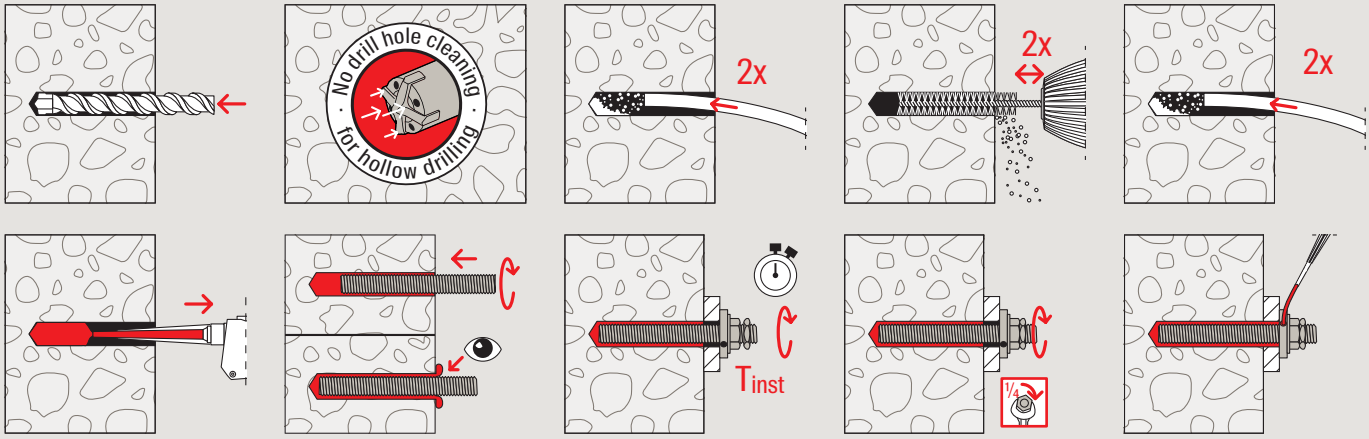
**ETA-12/0258, in concrete**
**ETA-19/0501, for post-installed fasteners in concrete**

R 120

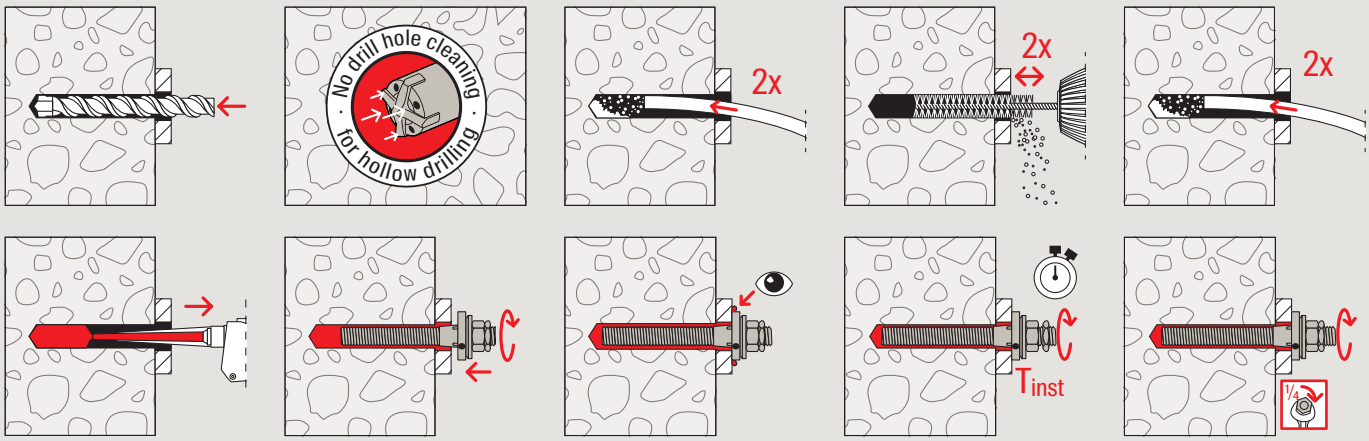
## Functioning

- Threaded rod FIS A in combination with injection mortar FIS SB is approved for pre-positioned and push-through installation.
- Threaded rod RG M in combination with the resin capsule RSB is approved for pre-positioned and push-through installation.
- The injection system ensures a full-surface bonding between the fixing element and wall of the drill hole and seals the drill hole.
- The filling disc ensures that the annular gap is filled seamlessly in pre-positioned installation, thereby ensuring reliable load transmission.
- The centering sleeve centres the threaded rod in the fixture, thus ensuring a safe load application.
- The lock nut prevents the hexagonal nut from becoming loose.

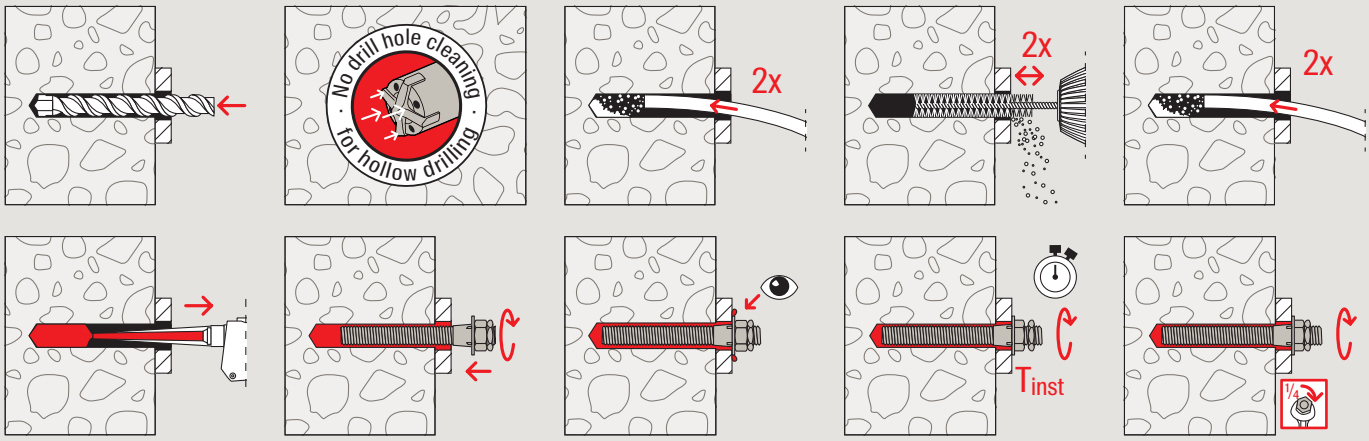
## Pre-positioned installation FIS A with filling disc



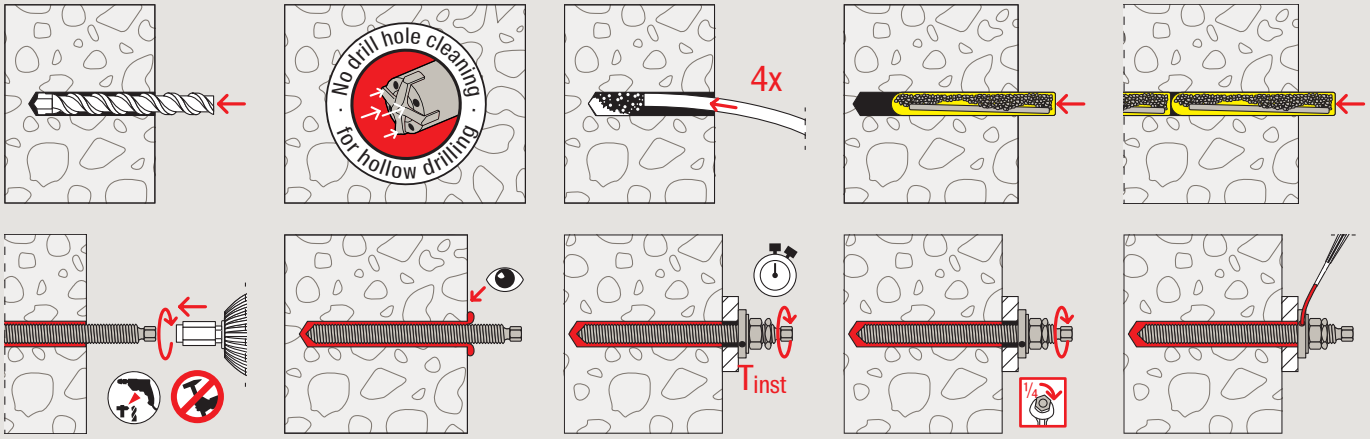

## Push-through installation FIS A with filling disc



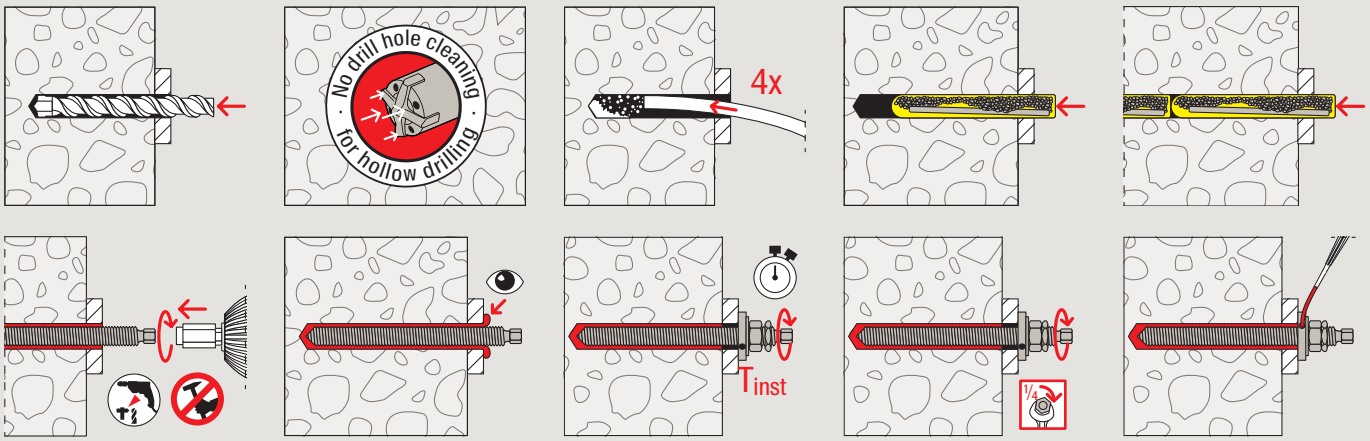

## Push-through installation without filling disc only for M20 / M24



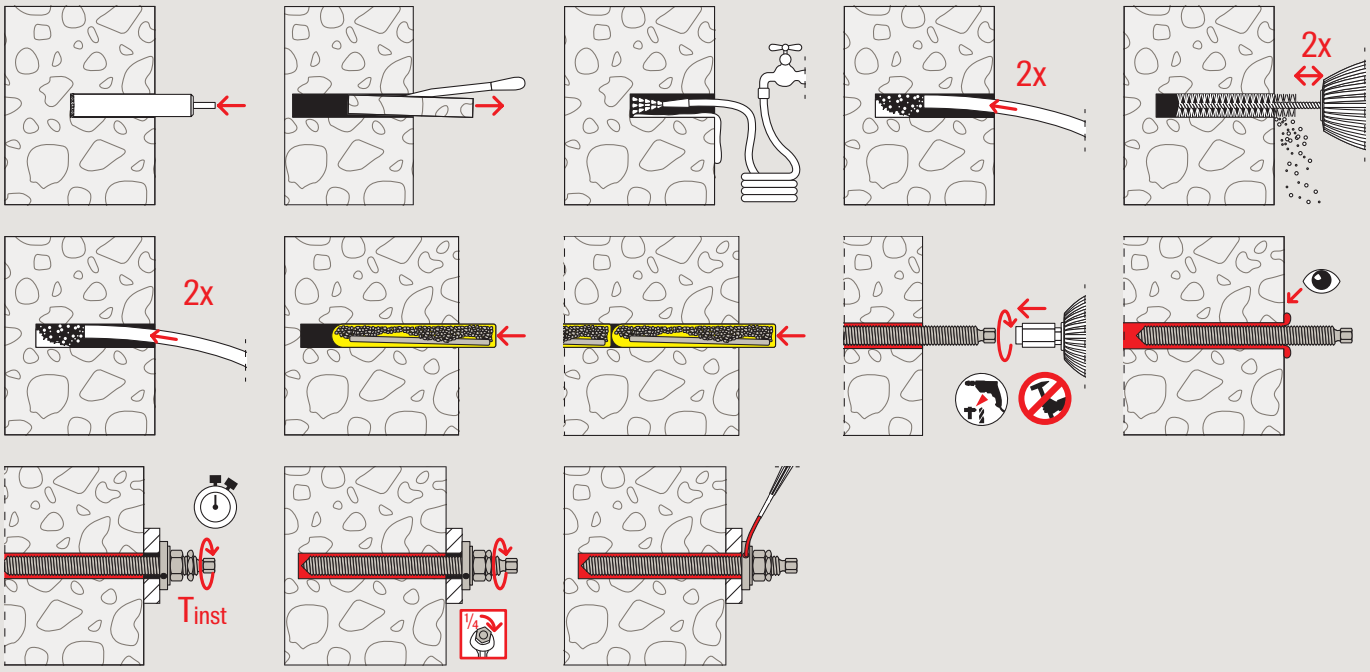
## Pre-positioned installation RG M with capsule RSB (hammer drilling)



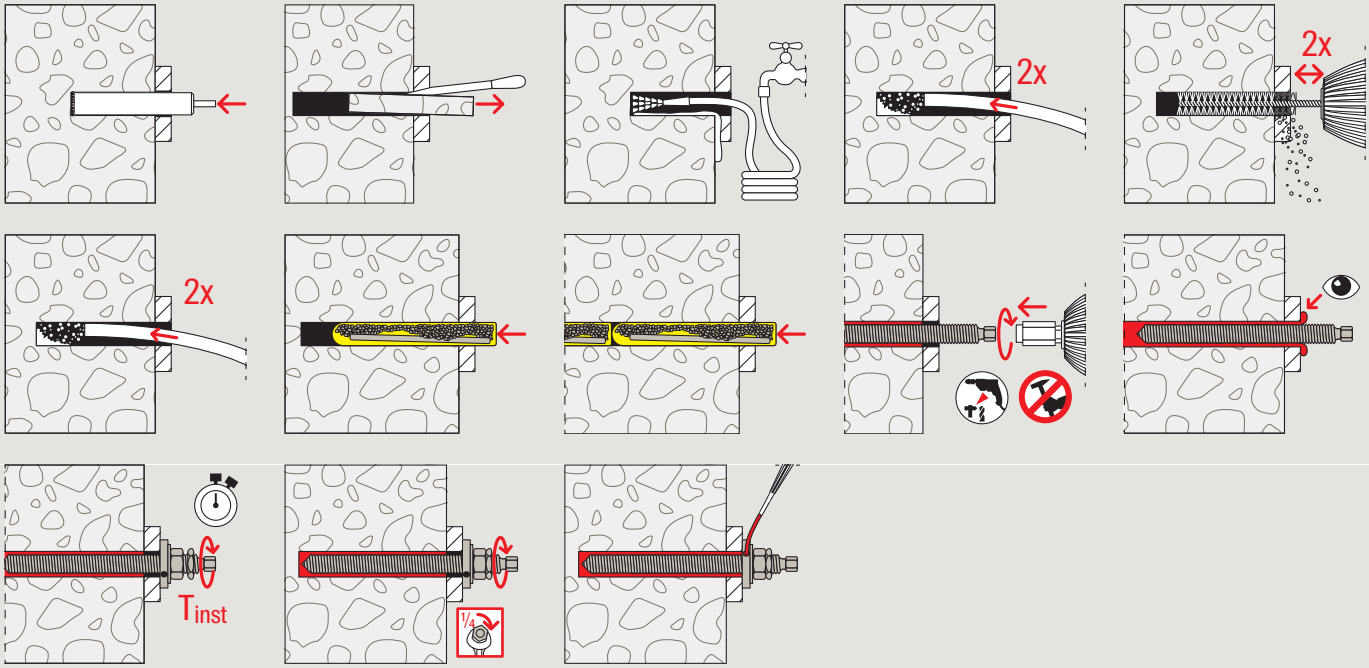

## Push-through installation RG M with capsule RSB (hammer drilling)




## Pre-positioned installation RG M with capsule RSB (diamond drilling)



## Push-through installation RG M with capsule RSB (diamond drilling)




## Technical data

**Superbond dynamic FSB dyn**

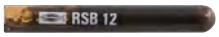


FIS SB 390 S | FIS SB 585 S | FIS MR Plus | FIS UMR

| Item | Item no. | Approval ETA | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| FIS SB 390 S | 519451 | ● | DE, FR, NL | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS SB 390 S | 520555 | ● | CS, RO, SK | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS SB 390 S | 520557 | ● | BG, DE, SL, SR | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS SB 390 S | 520559 | ● | DA, FI, NO, SV | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS SB 390 S | 518831 | ● | EN, ES, PT | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS SB 390 S | 520595 | ● | HU, PL, RU | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS SB 390 S | 519450 | ● | DE, EN, IT | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS SB 585 S | 562065 | ● | DE, FR, NL | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| FIS SB 585 S | 519452 | ● | EN, ES, PT | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| FIS SB 585 S | 520526 | ● | DE, EN, IT | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| FIS SB 585 S | 540990 | ● | ET, HU, LT, LV, PL, RU | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| FIS SB HIGH SPEED 390 S | 523300 | ● | DE | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| FIS MR Plus | 545853 | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |
| FIS UMR | 520593 | – | – | – | 10 x static mixer FIS UMR for 585 & 1500 ml cartridges | 10 |

## Technical data

**Resin capsule RSB**




RSB

| Item | Item no. | Approval ETA | Drill hole diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Match | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **RSB 12 mini** | **518822** | ● | 14 | 75 | 75 | RG M 12 | 10 |
| **RSB 12** | **518823** | ● | 14 | 110 | 110 | RG M 12 / RG M 10 I | 10 |
| **RSB 16 mini** | **518824** | ● | 18 | 95 | 95 | RG M 16 | 10 |
| **RSB 16** | **518825** | ● | 18 | 125 | 125 | RG M 16 / RG M 12 I | 10 |
| **RSB 20** | **518827** | ● | 25 | 170 | 170 | RG M 20 | 10 |
| **RSB 20 E/24** | **518828** | ● | 25 / 28 | 210 | 210 | RG M 20 / RG M 24 / RG M 20 I | 5 |

## Curing times

| FSB dyn<br>Temperature in anchoring base [°C] | Maximum processing time FIS SB $t_{work}$ [Min.] | Maximum processing time FIS SB High Speed $t_{work}$ [Min.] | Minimum curing time FIS SB $t_{cure}$ [hrs.] | [min.] | Minimum curing time FIS SB High Speed $t_{cure}$ [hrs.] | [min.] | Minimum curing time RSB $t_{cure}$ [hrs.] | [min.] |
|---|---|---|---|---|---|---|---|---|
| -30 – -20 | – | – | – | – | – | – | 120 | – |
| >-20 – -15 | – | 60 | – | – | 24 | – | 48 | |
| >-15 – -10 | 60 | 30 | 36 | – | 8 | – | 30 | – |
| >-10 – -5 | 30 | 15 | 24 | – | 3 | – | 16 | – |
| >-5 – 0 | 20 | 10 | 8 | – | 2 | – | 10 | – |
| >0 – +5 | 13 | 5 | 4 | – | 1 | – | – | 45 |
| >+5 – +10 | 9 | 3 | 2 | – | – | 45 | – | 30 |
| >+10 – +20 | 5 | 2 | 1 | – | – | 30 | – | 20 |
| >+20 – +30 | 4 | 1 | – | 45 | – | 15 | – | 5 |
| > +30 – +40 | 2 | – | – | 30 | – | – | – | 3 |

## Technical data

**Anchor rod FIS A**



FIS A gvz

| Item | Galvanised steel, steel grade 8.8 Item no. gvz 8.8 | Stainless steel Item no. R | Approval ETA | Drill diameter $d_0$ [mm] | Min. / max. anchorage depth $h_{ef,min / max}$ [mm] | Min. / max. usable length [mm] | Min. / max. filling quantity [scale units] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS A M12 x 120** | **519397** | **044974** | ● | 14 | 70 / 104 | 12 / 25 | 3 / 5 | 10 |
| **FIS A M12 x 140** | **519398** | **090450** | ● | 14 | 70 / 124 | 12 / 45 | 3 / 5 | 10 |
| **FIS A M12 x 160** | **517937** | **090451** | ● | 14 | 70 / 144 | 12 / 65 | 3 / 7 | 10 |
| **FIS A M12 x 180** | **519399** | **090452** | ● | 14 | 70 / 164 | 12 / 85 | 3 / 7 | 10 |
| **FIS A M12 x 200** | **517938** | **–** | ● | 14 | 70 / 184 | 12 / 105 | 3 / 7 | 10 |
| **FIS A M12 x 210** | **–** | **090453** | ● | 14 | 70 / 194 | 12 / 115 | 3 / 8 | 10 |
| **FIS A M12 x 260** | **–** | **090454** | ● | 14 | 70 / 240 | 12 / 165 | 3 / 9 | 10 |
| **FIS A M12 x 280** | **–** | **547703** | ● | 14 | 70 / 240 | 12 / 85 | 3 / 9 | 10 |
| **FIS A M16 x 130** | **519400** | **044975** | ● | 18 | 80 / 110 | 16 / 20 | 5 / 12 | 10 |
| **FIS A M16 x 175** | **519401** | **090455** | ● | 18 | 80 / 155 | 16 / 90 | 5 / 10 | 10 |
| **FIS A M16 x 200** | **517939** | **090456** | ● | 18 | 80 / 180 | 16 / 90 | 5 / 11 | 10 |
| **FIS A M16 x 250** | **517940** | **090457** | ● | 18 | 80 / 230 | 16 / 140 | 5 / 12 | 10 |
| **FIS A M16 x 300** | **–** | **090458** | ● | 18 | 80 / 280 | 16 / 190 | 5 / 17 | 10 |
| **FIS A M20 x 245** | **–** | **090459** | ● | 24 | 90 / 221 | 20 / 119 | 11 / 32 | 10 |
| **FIS A M20 x 290** | **–** | **090460** | ● | 24 | 90 / 266 | 20 / 164 | 11 / 29 | 10 |
| **FIS A M24 x 290** | **–** | **090461** | ● | 28 | 96 / 261 | 24 / 151 | 14 / 34 | 5 |

## Technical data

**Anchor rod FIS A**



FIS A gvz

| | Galvanised steel, steel grade 8.8<br>Item no. | Stainless steel<br>Item no. | Approval<br>ETA | Drill diameter<br>$d_0$<br>[mm] | Min. / max. anchorage depth<br>$h_{ef,min / max}$<br>[mm] | Min. / max. usable length<br>[mm] | Min. / max. filling quantity<br>[scale units] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|
| **Item** | **gvz 8.8** | **R** | | | | | | |
| **FIS A M24 x 380** | – | 090462 | ● | 28 | 96 / 351 | 24 / 200 | 14 / 46 | 5 |

## Technical data

**Threaded rod RG M**



RG M R

| | Stainless steel<br>Item no. | Approval<br>ETA | Drill diameter<br>$d_0$<br>[mm] | Anchorage depth (short/ standard/large)<br>$h_{ef}$<br>[mm] | Usable length<br>$t_{fix,min}$ - $t_{fix,max}$<br>[mm] | Fits capsule RSB | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|
| **Item** | **R** | | | | | | |
| **RG M12 x 120** | 535011 | ● | 14 | 75 / - / - | 12 - 13 | 1 x RSB 12 mini | 10 |
| **RG M12 x 160** | 050265 | ● | 14 | 75 / 110 / - | 12 - 53 / 12 - 18 | 1 x RSB 12 mini<br>1 x RSB 12 | 10 |
| **RG M12 x 180** | 512249 | ● | 14 | 75 / 110 / 150 | 12-73 / 12-38 | 1 x RSB 12 mini<br>1 x RSB 12<br>2 x RSB 12 mini | 10 |
| **RG M12 x 200** | 050576 | ● | 14 | 75 / 110 / 150 | 12-93 / 12-58 | 1 x RSB 12 mini<br>1 x RSB 12<br>2 x RSB 12 mini | 10 |
| **RG M12 x 220** | 050297 | ● | 14 | 75 / 110 / 150 | 12-113 / 12-78 / 12-38 | 1 x RSB 12 mini<br>1 x RSB 12<br>2 x RSB 12 mini | 10 |
| **RG M12 x 250** | 095702 | ● | 14 | 75 / 110 / 150 | 12-143 / 12-108 / 12-68 | 1 x RSB 12 mini<br>1 x RSB 12<br>2 x RSB 12 mini | 10 |
| **RG M12 x 300** | 095705 | ● | 14 | 75 / 110 / 150 | 12-193 / 12-158 / 12-118 | 1 x RSB 12 mini<br>1 x RSB 12<br>2 x RSB 12 mini | 10 |
| **RG M12 x 380** | 095710[1)] | ● | 14 | 75 / 110 / 150 | 12-200 / 12-200 / 12-198 | 1 x RSB 12 mini<br>1 x RSB 12<br>2 x RSB 12 mini | 10 |
| **RG M16 x 165** | 095704 | ● | 18 | 95 / 125 / - | 16-32 | 1 x RSB 16 mini<br>1 x RSB 16 | 10 |
| **RG M16 x 190** | 050266 | ● | 18 | 95 / 125 / - | 16-57 /16-27 | 1 x RSB 16 mini<br>1 x RSB 16 | 10 |
| **RG M16 x 250** | 050298 | ● | 18 | 95 / 125 / 190 | 16-117 / 16-87 / 16-22 | 1 x RSB 16 mini<br>1 x RSB 16<br>2 x RSB 16 mini | 10 |
| **RG M16 x 300** | 050299 | ● | 18 | 95 / 125 / 190 | 16-167 / 16-137 / 16-72 | 1 x RSB 16 mini<br>1 x RSB 16<br>2 x RSB 16 mini | 10 |
| **RG M16 x 380** | 095712[1)] | ● | 18 | 95 / 125 / 190 | 16-200 / 16-2007 / 16-152 | 1 x RSB 16 mini<br>1 x RSB 16<br>2 x RSB 16 mini | 10 |
| **RG M16 x 500** | 095713[1)] | ● | 18 | 95 / 125 / 190 | 16-200 / 16-200 / 16-200 | 1 x RSB 16 mini<br>1 x RSB 16<br>2 x RSB 16 mini | 10 |
| **RG M20 x 260** | 050267 | ● | 25 | - / 170 / 210 | 20-47 | 1 x RSB 20 mini<br>1 x RSB 20 E / 24 | 10 |
| **RG M20 x 350** | 095706 | ● | 25 | - / 170 / 210 | 20-137 / 20-97 | 1 x RSB 20<br>1 x RSB 20 E / 24 | 10 |
| **RG M24 x 300** | 050268[1)] | ● | 28 | - / 210 / - | 24-47 | 1 x RSB 20<br>1 x RSB 20 E / 24 | 10 |
| **RG M24 x 400** | 095715[1)] | ● | 28 | - / 210 / - | 24-147 | 1 x RSB 20 E / 24 | 10 |

[1)] Straight cut, additional setting tool required.

# Technical data

**Filling set**



Filling sets for subsequent filling of the annular gap



| | Item no. | External-ø d [mm] | Internal diameter D [mm] | Height H [mm] | Min. fixture thickness $t_{fix}$ [mm] | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | |
| **Filling set M12** | **537218** | 30 | 14 | 6 | 12 | 1 x Locking nut<br>1 x Centring bush<br>1 x Rounded washer<br>1 x Fillable bevel washer<br>1 x Injection nozzle | 10 |
| **Filling set M12 R** | **557875** | 30 | 14.2 | 9 | 12 | 1 x Locking nut<br>1 x Centring bush<br>1 x Rounded washer<br>1 x Fillable bevel washer<br>1 x Injection nozzle | 10 |
| **Filling set M16** | **537219** | 38 | 19 | 7 | 16 | 1 x Locking nut<br>1 x Centring bush<br>1 x Rounded washer<br>1 x Fillable bevel washer<br>1 x Injection nozzle | 10 |
| **Filling set M16 R** | **557876** | 40 | 19.2 | 11 | 16 | 1 x Locking nut<br>1 x Centring bush<br>1 x Rounded washer<br>1 x Fillable bevel washer<br>1 x Injection nozzle | 10 |
| **Filling set M20** | **537220** | 46 | 23 | 8 | 20 | 1 x Locking nut<br>1 x Centring bush<br>1 x Rounded washer<br>1 x Fillable bevel washer<br>1 x Injection nozzle<br>1 x Hexagon nut | 10 |
| **Filling set M20 R** | **557877** | 50 | 23.3 | 13 | 20 | 1 x Locking nut<br>1 x Centring bush<br>1 x Rounded washer<br>1 x Fillable bevel washer<br>1 x Injection nozzle | 10 |
| **Filling set M24 R** | **557878** | 55 | 28 | 17 | 24 | 1 x Locking nut<br>1 x Centring bush<br>1 x Rounded washer<br>1 x Fillable bevel washer<br>1 x Injection nozzle | 10 |
| **Filling set M20 R Push-through installation** | **557879** | 37 | 21 | – | 20 | 1 x Locking nut, 1 x centring bush | 10 |
| **Filling set M24 R Push-through installation** | **557880** | 44 | 25 | – | 24 | 1 x Locking nut, 1 x centring bush | 10 |

# Loads



**Superbond dynamic with Superbond mortar FIS SB and threaded rod FIS A resp. RG M**

Design values for cyclic fatigue loading[1] of a single anchor normal concrete of strength class C20/25[2].
For the design the complete current assessment ETA-19/0501 of 11.06.2024 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material/ surface | Effective anchorage depth | Minimum member thickness | Installation torque | Design values of tension ($\Delta N_{Ed,max}$) and shear loads ($\Delta V_{Ed,max}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Design values of tension ($\Delta N_{Ed,max}$) and shear loads ($\Delta V_{Ed,max}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst}$ [Nm] | $\Delta N_{Ed,max}$ [3] [kN] | $\Delta V_{Ed,max}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] | $\Delta N_{Ed,max}$ [3] [kN] | $\Delta V_{Ed,max}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] |
| **FIS A M12 / RG M12** | 8.8 | 70 | 100 | 40 | 3.0 | 2.0 | 55 | 55 | 4.5 | 2.0 | 55 | 55 |
| | 8.8 | 110 | 140 | 40 | 4.5 | 2.0 | 55 | 55 | 4.5 | 2.0 | 55 | 55 |
| | 8.8 | 240 | 270 | 40 | 4.5 | 2.0 | 55 | 55 | 4.5 | 2.0 | 55 | 55 |
| | R-70 | 70 | 100 | 40 | 3.0 | 2.7 | 55 | 55 | 4.8 | 2.7 | 55 | 55 |
| | R-70 | 110 | 140 | 40 | 4.9 | 2.7 | 55 | 55 | 4.9 | 2.7 | 55 | 55 |
| | R-70 | 240 | 270 | 40 | 4.9 | 2.7 | 55 | 55 | 4.9 | 2.7 | 55 | 55 |
| **FIS A M16 / RG M16** | 8.8 | 80 | 120 | 60 | 4.8 | 3.7 | 65 | 65 | 8.4 | 3.7 | 65 | 65 |
| | 8.8 | 125 | 170 | 60 | 8.4 | 3.7 | 65 | 65 | 8.4 | 3.7 | 65 | 65 |
| | 8.8 | 320 | 360 | 60 | 8.4 | 3.7 | 65 | 65 | 8.4 | 3.7 | 65 | 65 |
| | R-70 | 80 | 120 | 60 | 4.8 | 4.9 | 65 | 65 | 8.4 | 4.9 | 65 | 65 |
| | R-70 | 125 | 170 | 60 | 8.8 | 4.9 | 65 | 65 | 9.2 | 4.9 | 65 | 65 |
| | R-70 | 320 | 360 | 60 | 9.2 | 4.9 | 65 | 65 | 9.2 | 4.9 | 65 | 65 |
| **FIS A M20/ RG M20** | R-70 | 90 | 140 | 120 | 7.1 | 7.6 | 85 | 85 | 12.4 | 7.6 | 85 | 85 |
| | R-70 | 170 | 220 | 120 | 14.3 | 7.6 | 85 | 85 | 14.3 | 7.6 | 85 | 85 |
| | R-70 | 400 | 450 | 120 | 14.3 | 7.6 | 85 | 85 | 14.3 | 7.6 | 85 | 85 |
| **FIS A M24/ RG M24** | R-70 | 96 | 160 | 150 | 8.7 | 11.0 | 105 | 105 | 13.9 | 11.0 | 105 | 105 |
| | R-70 | 210 | 270 | 150 | 20.6 | 11.0 | 105 | 105 | 20.6 | 11.0 | 105 | 105 |
| | R-70 | 480 | 540 | 150 | 20.6 | 11.0 | 105 | 105 | 20.6 | 11.0 | 105 | 105 |

[1] The design values of the cyclic fatigue loading apply for load cycles > $10^8$ in accordance with design method I acc. to TR061 - for unknown static lower load. If the static lower load is known and / or for lower number of load cycles higher load values are possible. The partial safety factors as regulated in the design standard are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$. The given load values apply for anchorages in dry and wet concrete and temperatures in the base material up to 50 °C (resp. short-term up to 80 °C). Higher loads are possible at lower temperatures. Drilling method and borehole cleaning according to ETA specifications.

[2] For higher concrete strength classes up to C50/60 higher permissible loads may be possible, see ETA. The concrete is assumed to be standard-reinforced.

[3] In the case of combinations of tension loads, shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups) the design must be carried out in accordance with the provisions of the complete ETA. We recommend using our anchor design software C-FIX.

## Loads

**Superbond dynamic with Superbond capsule RSB and threaded rod RG M**

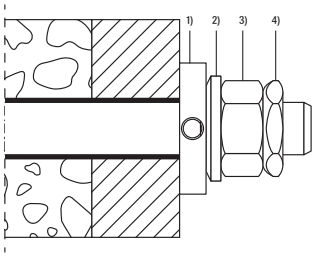
Design values for cyclic fatigue loading[1] of a single anchor normal concrete of strength class C20/25[2].
For the design the complete current assessment E ETA-19/0501 of 11.06.2024 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material/ surface | Effective anchorage depth | Minimum member thickness | Installation torque | Design values of tension ($\Delta N_{Ed,max}$) and shear loads ($\Delta V_{Ed,max}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Design values of tension ($\Delta N_{Ed,max}$) and shear loads ($\Delta V_{Ed,max}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst}$ [Nm] | $\Delta N_{Ed,max}$ [3] [kN] | $\Delta V_{Ed,max}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] | $\Delta N_{Ed,max}$ [3] [kN] | $\Delta V_{Ed,max}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] |
| **RG M 12** | 8.8 | 75 | 110 | 40 | 3.3 | 2.0 | 55 | 55 | 4.5 | 2.0 | 55 | 55 |
| | 8.8 | 110 | 140 | 40 | 4.5 | 2.0 | 55 | 55 | 4.5 | 2.0 | 55 | 55 |
| | 8.8 | 150 | 180 | 40 | 4.5 | 2.0 | 55 | 55 | 4.5 | 2.0 | 55 | 55 |
| | R-70 | 75 | 110 | 40 | 3.3 | 2.7 | 55 | 55 | 4.9 | 2.7 | 55 | 55 |
| | R-70 | 110 | 140 | 40 | 4.9 | 2.7 | 55 | 55 | 4.9 | 2.7 | 55 | 55 |
| | R-70 | 150 | 180 | 40 | 4.9 | 2.7 | 55 | 55 | 4.9 | 2.7 | 55 | 55 |
| **RG M 16** | 8.8 | 95 | 140 | 60 | 6.2 | 3.7 | 65 | 65 | 8.4 | 3.7 | 65 | 65 |
| | 8.8 | 125 | 170 | 60 | 8.4 | 3.7 | 65 | 65 | 8.4 | 3.7 | 65 | 65 |
| | 8.8 | 190 | 230 | 60 | 8.4 | 3.7 | 65 | 65 | 8.4 | 3.7 | 65 | 65 |
| | R-70 | 95 | 140 | 60 | 6.2 | 4.9 | 65 | 65 | 9.2 | 4.9 | 65 | 65 |
| | R-70 | 125 | 170 | 60 | 8.8 | 4.9 | 65 | 65 | 9.2 | 4.9 | 65 | 65 |
| | R-70 | 190 | 230 | 60 | 9.2 | 4.9 | 65 | 65 | 9.2 | 4.9 | 65 | 65 |
| **RG M 20** | R-70 | 170 | 220 | 120 | 14.3 | 7.6 | 85 | 85 | 14.3 | 7.6 | 85 | 85 |
| | R-70 | 210 | 260 | 120 | 14.3 | 7.6 | 85 | 85 | 14.3 | 7.6 | 85 | 85 |
| **RG M 24** | R-70 | 210 | 270 | 150 | 20.6 | 11.0 | 105 | 105 | 20.6 | 11.0 | 105 | 105 |

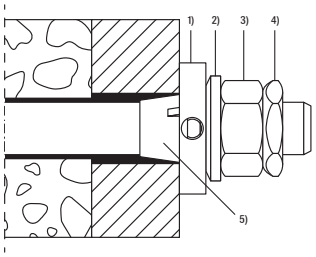
[1] The design values of the cyclic fatigue loading apply for load cycles > $10^8$ in accordance with design method I acc. to TR061 - for unknown static lower load. If the static lower load is known and / or for lower number of load cycles higher load values are possible. The partial safety factors as regulated in the design standard are considered. As a single anchor counts e.g. an anchor with a spacing s ≥ 3 x $h_{ef}$ . The given load values apply for anchorages in dry and wet concrete and temperatures in the base material up to 50 °C (resp. short-term up to 80 °C). Higher loads are possible at lower temperatures. Drill hole cleaning as per specification in the ETA. Drilling method and borehole cleaning according to ETA specifications.
[2] For higher concrete strength classes up to C50/60 higher permissible loads may be possible, see ETA. The concrete is assumed to be standard-reinforced.
[3] In the case of combinations of tension loads, shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups) the design must be carried out in accordance with the provisions of the complete ETA. We recommend using our anchor design software C-FIX.

## Installation drawings dynamic

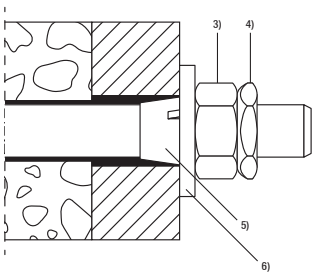
Pre-assembly with FIS A and injection system
Sizes: M12, M16, M20, M24



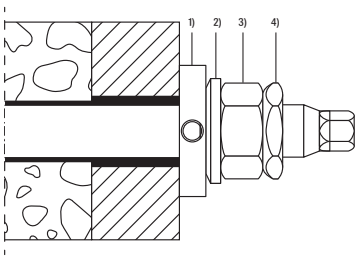

Push-through installation with FIS A and injection system
Sizes: M12, M16, M20, M24




Push-through installation with FIS A and injection system
Sizes: M12, M16, M20, M24




Pre-assembly / Push-through installation with RG M and cartridge system RSB
Sizes: M12, M16, M20, M24




[1] filling disc for subsequent backfilling of the annular gap
[2] cone ladle
[3] hex nut
(Included in the delivery of the anchor rod)
[4] locking nut
[5] centring sleeve
[6] washer
(Included in the delivery of the anchor rod)

# Filling mortar FastFill

The pre-portioned cartridge solution to backfill anchor plates.








Anchor plate railing



Anchor plate steel construction

## Applications

- For backfilling of small to medium-sized anchor plates and wooden columns.

## Advantages

- The fischer filling mortar FastFill is the quick and easy solution to backfill small to medium-sized anchor plates and wooden columns.
- Thanks to the cartridge as a pre-portioned package unit, no mixing of components is necessary as with conventional backfilling mortar solutions in sacks or buckets.
- With the included static mixer, the mortar can be injected directly under the anchor plate that needs to be backfilled.
- Due to the viscosity of the mortar, a formwork is not required.

## Building materials

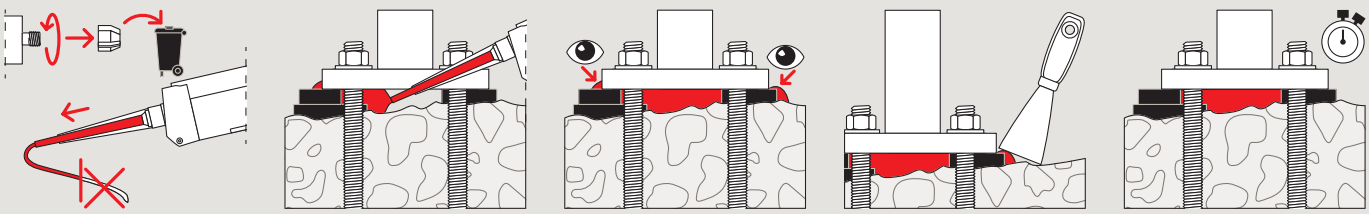
- Concrete
- Masonry
- Wood

## Versions

300 ml

## Functioning

- FastFill is a 2-component mortar system based on polyester resin.
- Resin and hardener are stored in two separate chambers and are not mixed and activated until extrusion through the static mixer.
- Partially used cartridges can be reused by changing the static mixer.
- The excess mortar can be smoothed out with a trowel after filling. For this purpose, take into account the specified curing times.



## Technical data

**Filling mortar FastFill**



FastFill 300 T

| Item | Item no. | Language on label | Scale unit | Compressive strength [N/mm²] | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FastFill 300 T** | **571947** | NL | 140 | > 70 N/mm2 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |



## Curing times

**FastFill**

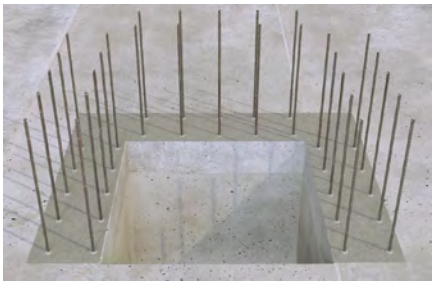
| Temperature [°C] | Processing time [min.] | Curing time [hrs.] | [min.] |
|---|---|---|---|
| -5 – 0 | – | 8 | – |
| > 0 – 5 | – | 4 | – |
| > 5 – 10 | 14 | 2 | – |
| > 10 – 20 | 5 | – | 60 |
| > 20 – 30 | 3 | – | 30 |
| > 30 – 40 | 2 | – | 20 |

# Post-installed rebar connections

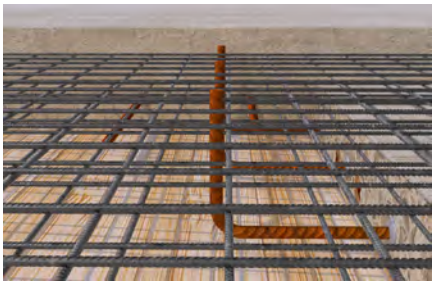
Professional rebar connections.







Rebar connections



Post-installed rebar connections

## Applications

- Post-installed concrete steel bars, e.g. for overlap connections, end anchorings, starter bars, crack stitching etc.
- Rebar anchor FRA
- Concrete-Concrete Shear Connector FCC

## Advantages

- The injection mortars FIS V Plus and FIS VS LOW SPEED allow for rebar connections from Ø 8 to 28mm, whilst injection mortar FIS EM Plus and FIS RC II allows for rebar connections up to Ø 40mm to be carried out. This offers maximum flexibility.
- The injection mortar FIS SB allows the user for realizing rebar connections from Ø 8 to 32 mm in combination with a simple and thus user-friendly cleaning of the drill hole.
- FIS EM Plus also allows for the execution of rebar connections in diamond-drilled holes without additional roughening of the drillhole.
- The fischer rebar anchor FRA with connecting thread in stainless steel R fully utilises the load-bearing capacity of the concrete. This means that extremely high tensile loads can be introduced into the base material.
- Accessories in line with building site requirements, such as injection adapters and extension tubes, ensure rapid progress.
- The FIS rebar case contains all of the individual components required, thus ensuring a convenient installation.
- The injeciton mortar FIS RC II allows the rebar connction from diameter 8 mm to 40 mm with a max. depth of 2 meters.

## Certificates / Features

**ETA-13/0651, for post-installed rebar connections**
**ETA-17/1056, for post-installed rebar connection**
**ETA-22/0001, for post-installed rebar connection with improved bonding and splitting behaviour**
**ETA-21/0470, for post-installed rebar connections**
**ETA-22/0502, for post-installed rebar connections**

## Building materials

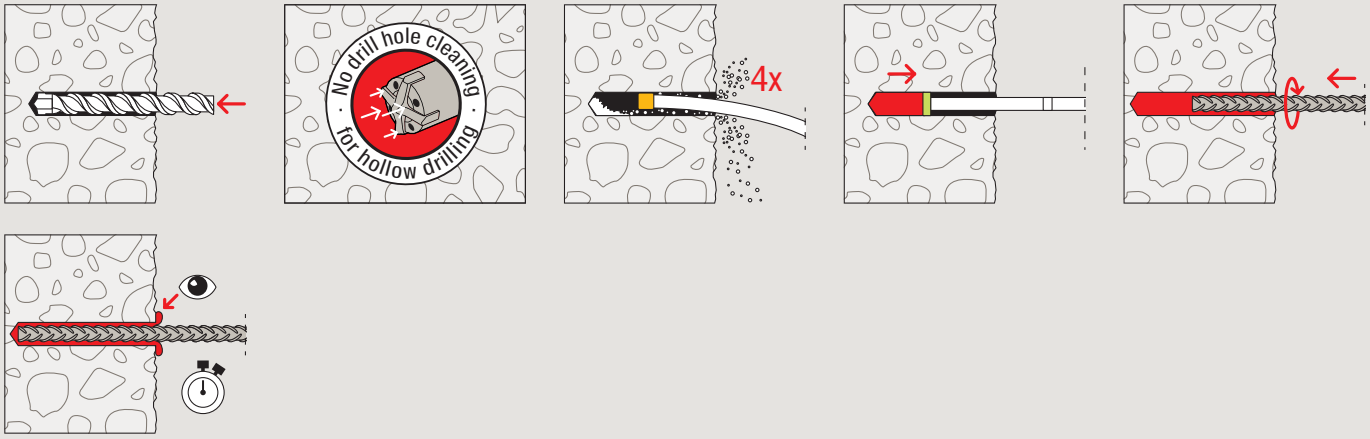
**Approved for:**

- Concrete C12/15 to C50/60, cracked and non-cracked

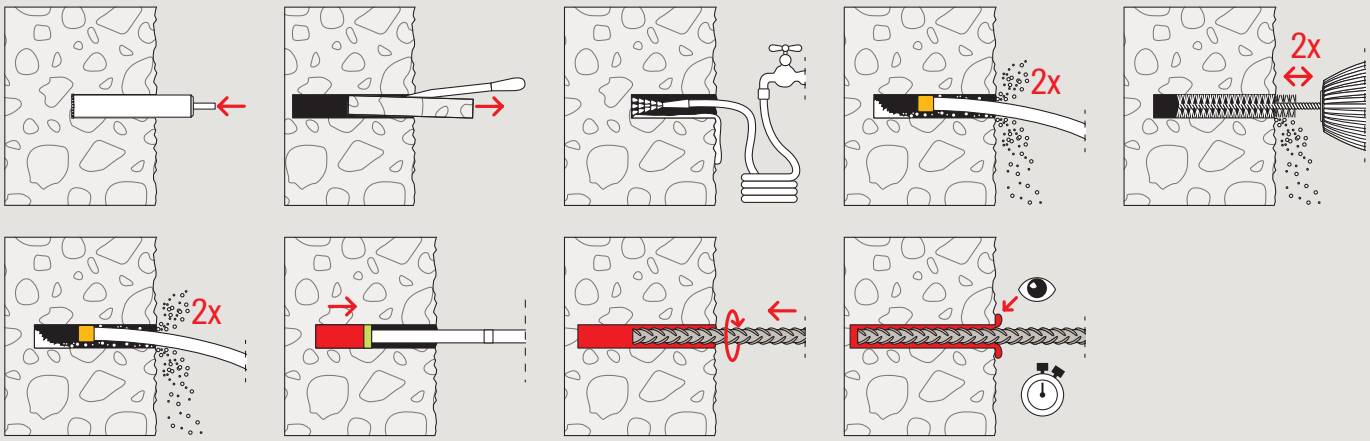
## Functioning

- Anchoring as with cast-in reinforcement bars in line with Eurocode 2 and DIN 1045-1.
- The mortar is extruded bubble free into the drill hole using the injection adapter. The geometry causes a build-up of pressure in the drill hole, which pushes the injection adapter and extension tube automatically out of the drill hole.
- The mortar bonds the entire surface of the reinforcement bar with the drill hole wall.
- A special certification is necessary for installation according to approval in Germany. The fischer Academy offers the relevant training courses.

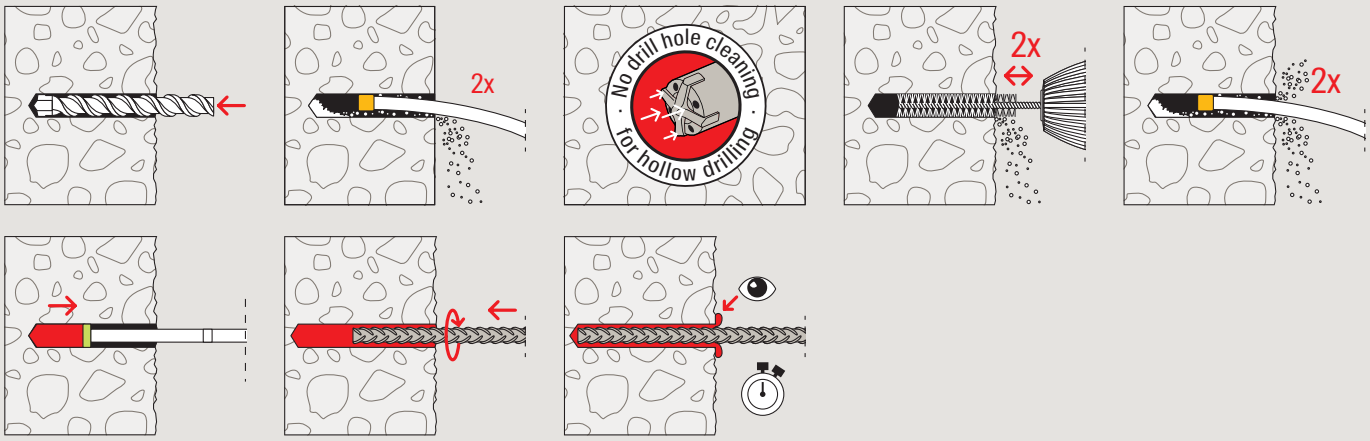
## Installation in concrete with FIS EM Plus in hammer drilled holes




## Installation in concrete with FIS EM Plus in diamond drilled holes




## Installation in concrete with FIS RC II in hammer drilled holes



## Installation in concrete with FIS V Plus in hammer drilled holes






## Technical data

**Epoxy mortar FIS EM Plus**



FIS EM Plus 300 T | FIS EM Plus 390 S | FIS EM Plus 585 S | FIS EM Plus 1500 S | FIS MR Plus | FIS UMR

| Item | Item no. | Approval ETA | Approval DIBt | Approval ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS EM Plus 300 T** | **575314** | ● | ● | ● | AR, EN, PT | 142 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS EM Plus 390 S** | **544155** | ● | ● | ● | AR, EN, ZH | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS EM Plus 585 S** | **544166** | ● | ● | ● | EL, EN, ES, PT | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| **FIS EM Plus 1500 S** | **544167** | ● | ● | ● | DE, EN, ES, FR, IT | 670 | 1 x Cartridge 1500 ml, 2 x static mixer FIS UMR | 1 |
| **FIS MR Plus** | **545853** | – | – | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |
| **FIS UMR** | **520593** | – | – | – | – | – | 10 x static mixer FIS UMR for 585 & 1500 ml cartridges | 10 |

## Technical data

**Injection mortar FIS RC II**



FIS RC II 360 S | FIS RC II 825 S | FIS MR Plus | FIS UMR

| Item | Item no. | Approval ETA | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FIS RC II 360 S** | **567517** | ● | DE, EN, IT | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS RC II 825 S** | **567514** | ● | DE, EN, FR, IT, NL | 415 | 1 x Cartridge 825 ml, 2 x static mixer FIS JMR 825 | 1 |
| **FIS MR Plus** | **545853** | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |
| **FIS UMR** | **520593** | – | – | – | 10 x static mixer FIS UMR for 585 & 1500 ml cartridges | 10 |

## Technical data

**Epoxy mortar FIS EB II**



FIS EB II 390 S | FIS EB II 585 S | FIS MR Plus

| Item | Item no. | Approval ETA | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FIS EB II 390 S** | **562629** | ● | EN, ES, PT | 190 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS EB II 390 S** | **562630** | ● | EN, RU, TR | 190 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS EB II 585 S** | **562632** | ● | EN, ES, PT | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |

## Technical data

**Epoxy mortar FIS EB II**


FIS EB II 390 S


FIS EB II 585 S


FIS MR Plus

| Item | Item no. | Approval ETA | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FIS MR Plus** | **545853** | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |
| **FIS UMR** | **520593** | – | – | – | 10 x static mixer FIS UMR for 585 & 1500 ml cartridges | 10 |

## Technical data

**Injection mortar FIS V Plus**


FIS V Plus 360 S


FIS MR Plus

| Item | Item no. | Approval ETA | Approval DIBt | Approval ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS V Plus 360 S** | **558744** | ● | ● | ● | EN | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S** | **558745** | ● | ● | ● | DE | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S** | **558746** | ● | ● | ● | EN, ES, PT | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S** | **558747** | ● | ● | ● | AR, EN, ZH | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S** | **558753** | ● | ● | ● | IT, PL, RO | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S** | **558752** | ● | ● | ● | DE, FR, NL | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S** | **558754** | ● | ● | ● | AR, EL, TR | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S** | **558755** | ● | ● | ● | DA, FI, NO, SV | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S** | **558758** | ● | ● | ● | EN, ES, PT (Americas) | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S** | **558760** | ● | ● | ● | KK, RU, UK | 180 | 1 x cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S** | **558762** | ● | ● | ● | CS, HU, SK | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S** | **560635** | ● | ● | ● | AR, EN, FR | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S** | **561055** | ● | ● | ● | EN, PL, UK | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS MR Plus** | **545853** | – | – | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |

## Technical data

**Injection mortar FIS SB**


FIS SB 390 S


FIS SB High Speed 390 S


FIS SB 585 S


FIS MR Plus


FIS UMR

| Item | Item no. | Approval ETA | Approval ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FIS SB 390 S** | **519451** | ● | ● | DE, FR, NL | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS SB 390 S** | **520555** | ● | ● | CS, RO, SK | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS SB 390 S** | **520557** | ● | ● | BG, DE, SL, SR | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS SB 390 S** | **520559** | ● | ● | DA, FI, NO, SV | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS SB 390 S** | **518831** | ● | ● | EN, ES, PT | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS SB 390 S** | **520595** | ● | ● | HU, PL, RU | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS SB 390 S** | **519450** | ● | ● | DE, EN, IT | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS SB HIGH SPEED 390 S** | **523300** | ● | ● | DE | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS SB 585 S** | **562065** | ● | ● | DE, FR, NL | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| **FIS SB 585 S** | **520526** | ● | ● | DE, EN, IT | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| **FIS SB 585 S** | **519452** | ● | ● | EN, ES, PT | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| **FIS SB 585 S** | **540990** | ● | ● | ET, HU, LT, LV, PL, RU | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |

## Technical data

**Injection mortar FIS SB**


FIS SB 390 S

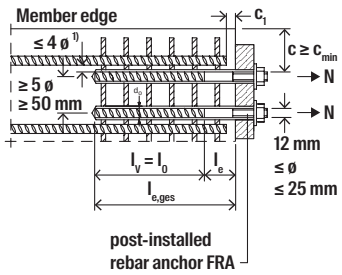

FIS SB High Speed 390 S


FIS SB 585 S


FIS MR Plus


FIS UMR

| Item | Item no. | Approval ETA | Approval ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FIS MR Plus** | **545853** | – | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |
| **FIS UMR** | **520593** | – | – | – | – | 10 x static mixer FIS UMR for 585 & 1500 ml cartridges | 10 |




[1)] If the clear distance of the lapped bars is larger than 4 x ø, EC2 must be applied.

## Technical data

**Rebar anchor FRA**


FRA

| Item | Item no. | Approval ETA | Fill quantity [scale units] | Sales unit [pcs] |
|---|---|---|---|---|
| **FRA 12/900 M12-60** | **505529**[1)] | ● | 50 | 8 |
| **FRA 16/1100 M16-60** | **505533**[1)] | ● | 81 | 8 |
| **FRA 20/1400 M20-60** | **505534**[1)] | ● | 160 | 4 |

[1)] Further dimensions up to max. 1800 mm total length on re quest.

## Technical data

**FIS-Rebar case**



FIS-Rebar case

| Item | Item no. | Approval ETA | Contents | Sales unit [pcs] |
|---|---|---|---|---|
| **FIS-Rebar case D** | **505941** | ● | 8 x Cleaning brush BSB, 4 x Extensions for Cleaning brushes à 40 cm, 1 x SDS Chuck with internal thread M 8<br>24 x Injection adapter, 1 x Cleaning hose complete, 1 x Brush control template, 8 x Cleaning nozzle<br>1 x Marker tape, 1x Marker pen, 1 x Digital thermometer, 1 x Installation instructions (german)<br>10 x Installation report, 2 x Flat spanner SW 7 and the relevant approvals | 1 |
| **FIS-Rebar case Int** | **505942** | ● | 8 x Cleaning brush BSB, 4 x Extensions for cleaning brushes à 40 cm, 1 x SDS Chuck with internal thread M 8, 24 x Injection adapter, 1 x Cleaning hose complete, 1 x Brush control template, 8 x Cleaning nozzle, 1 x Marker tape, 1 x Marker pen, 1 x Digital thermometer, 1 x Installation instructions (german, english, french, italian, spanish), 10 x Installation report, 2 x Flat spanner SW 7 and the relevant approvals | 1 |

## Technical data

**Cleaning brushes**



BSB

| Item | Item no. | Colour | Length l [mm] | Sales unit [pcs] |
|---|---|---|---|---|
| **BSB for drill-Ø 12 mm** | **001490** | white | 180 | 1 |
| **BSB for drill-Ø 14 mm** | **001491** | yellow | 180 | 1 |
| **BSB for drill-Ø 16 mm** | **001492** | red | 180 | 1 |
| **BSB for drill-Ø 18 mm** | **001493** | yellow | 180 | 1 |
| **BSB for drill-Ø 20 mm** | **001494** | green | 180 | 1 |
| **BSB for drill-Ø 25 mm** | **001495** | black | 180 | 1 |
| **BSB for drill-Ø 30 mm** | **090063** | grey | 180 | 1 |
| **BSB for drill-Ø 35 mm** | **090071** | brown | 180 | 1 |
| **BSB for drill-Ø 40 mm** | **505061** | – | 180 | 1 |
| **BSB for drill-Ø 45 mm** | **506254** | – | 180 | 1 |
| **BSB for drill-Ø 55 mm** | **505062** | – | 180 | 1 |
| **SDS Chuck** | **530332** | – | – | 1 |
| **FIS brush extension** | **508791** | – | 420 | 1 |

## Technical data

**Injection adapter**



Injection adapter for drill Ø 12 - 25 mm



Injection adapter for drill Ø 30 - 55 mm



Extension tube

| Item | Item no. | Colour | Length l [mm] | Sales unit [pcs] |
|---|---|---|---|---|
| **Injection-adapter (Ø 9) for drill-Ø 12 mm** | **001497** | ecru | – | 10 |
| **Injection-adapter (Ø 9 for drill-Ø 14 mm** | **001498** | blue | – | 10 |
| **Injection-adapter (Ø 9) for drill-Ø 16 mm** | **001499** | red | – | 10 |
| **Injection-adapter (Ø 9) for drill-Ø 18 mm** | **001483** | yellow | – | 10 |
| **Injection-adapter (Ø 9 for drill-Ø 20 mm** | **001506** | green | – | 10 |

## Technical data

**Injection adapter**



Injection adapter for drill Ø 12 - 25 mm



Injection adapter for drill Ø 30 - 55 mm



Extension tube

| Item | Item no. | Colour | Length l [mm] | Sales unit [pcs] |
|---|---|---|---|---|
| **Injection-adapter (Ø 9) for drill-Ø 25 mm** | **001507** | black | – | 10 |
| **Injection-adapter (Ø 9) for drill-Ø 30 mm** | **090689** | grey | – | 10 |
| **Injection-adapter (Ø 9) for drill-Ø 35 mm** | **090699** | brown | – | 10 |
| **Injection-adapter (Ø 9) for drill-Ø 40 mm** | **505077** | red | – | 10 |
| **Injection-adapter (Ø 9) for drill-Ø 45 mm** | **508909** | yellow | – | 10 |
| **Injection-adapter (Ø 9) for drill-Ø 55 mm** | **505078** | ecru | – | 10 |
| **Injection-adapter (Ø 15) for drill-Ø 20 mm** | **001508** | green | – | 10 |
| **Injection-adapter (Ø 15) for drill-Ø 25 mm** | **001509** | black | – | 10 |
| **Injection-adapter (Ø 15) for drill-Ø 30 mm** | **090700** | grey | – | 10 |
| **Injection-adapter (Ø 15) for drill-Ø 35 mm** | **090701** | brown | – | 10 |
| **Injection-adapter (Ø 15) for drill-Ø 40 mm** | **505079** | red | – | 10 |
| **Injection-adapter (Ø 15) for drill-Ø 45 mm** | **508910** | yellow | – | 10 |
| **Injection-adapter (Ø 15) for drill-Ø 55 mm** | **505080** | ecru | – | 10 |
| **FIS EXT Ø15** | **530800** | transparent | 10,000 | 1 |
| **FIS Extension tube Ø9** | **048983** | – | 1,000 | 10 |

## Technical data

**Compressed air nozzles**



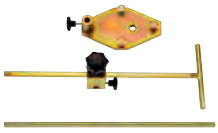
Compressed air nozzle

| Item | Item no. | Match | Sales unit [pcs] |
|---|---|---|---|
| **Compressed air nozzle D12-D15** | **511956** | Drill diameter Ø 12 - 15 mm | 2 |
| **Compressed air nozzle D16-D19** | **511957** | Drill diameter Ø 16 - 19 mm | 2 |
| **Compressed air nozzle D20-D25** | **511958** | Drill diameter Ø 20 - 25 mm | 2 |
| **Compressed air nozzle D30-D35** | **511959** | Drill diameter Ø 30 - 35 mm | 2 |
| **Compressed air nozzle D40-D55** | **511960**[1)] | Drill diameter Ø 40 - 45 mm | 2 |

[1)] Delivery time on request.

# Technical data

**Drilling aid/crabbeling tool**



Drilling aid



SDS-max Stocker

| Item | Item no. | Match | Dimensions [mm] | Sales unit [pcs] |
|---|---|---|---|---|
| **Drilling aid 3pcs.** | **090819**[1] | – | – | 1 |
| **SDS Max Stocker 45/240** | **001253** | Chuck type SDS max | 45 x 240 | 1 |

[1] Delivery on request.

## Loads

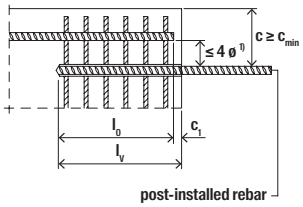
**Injection systems FIS EM Plus, FIS SB, FIS V Plus, FIS VS Plus LOW SPEED or FIS RC II with reinforcing steel B500B[5] in accordance with rebar theory**

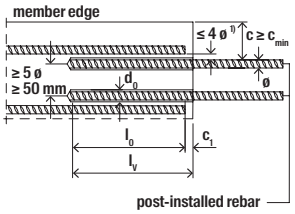
Design resistances and permissible loads[1] [6] of single, post-installed rebars in cracked or non-cracked normal concrete of the strength class C20/25[2].

| Reinforcing steel B500B<br>fyk / fuk<br>500 / 540 N/mm² | Basic value for the anchorage length for FIS EM Plus | Basic value for the anchorage length for FIS SB | Basic value for the anchorage length for FIS V Plus FIS VS Plus LOW SPEED | Basic value for the anchorage length for FIS RC II | Maximum anchorage depth | Maximum design resistance for acial tensile load | Maximum permissible tensile load |
|---|---|---|---|---|---|---|---|
| Type | $l_{b,rqd}$ [4]<br>[mm] | $l_{b,rqd}$ [4]<br>[mm] | $l_{b,rqd}$ [4]<br>[mm] | | $l_{V,max}$<br>[mm] | $N_{Rd,s}$ [3]<br>[kN] | $N_{zul,s}$ [3]<br>[kN] |
| **Ø 8 mm** | 378 | 378 | 378 | 378 | 1800 (3000)[8] | 21.9 | 15.6 |
| **Ø 10 mm** | 473 | 473 | 473 | 473 | 1800 (3000)[8] | 34.1 | 24.4 |
| **Ø 12 mm** | 567 | 567 | 567 | 567 | 1800 (3000)[8] | 49.2 | 35.1 |
| **Ø 14 mm** | 662 | 662 | 662 | 662 | 1800 (3000)[8] | 66.9 | 47.8 |
| **Ø 16 mm** | 756 | 756 | 756 | 756 | 1800 (3000)[8] | 87.4 | 62.4 |
| **Ø 20 mm** | 945 | 945 | 945 | 945 | 1800 (3000)[8] | 136.6 | 97.6 |
| **Ø 22 mm** | 1040 | – | – | 1040 | 2000 (1800)[7] | 165.3 | 118.1 |
| **Ø 24 mm** | 1134 | – | – | 1134 | 2000 (1800)[7] | 196.7 | 140.5 |
| **Ø 25 mm** | 1181 | 1181 | 1181 | 1181 | 2000 (3000)[8] | 213.4 | 152.4 |
| **Ø 26 mm** | 1229 | – | – | – | 2000 | 230.8 | 164.9 |
| **Ø 28 mm** | 1323 | 1323 | 1323 | 1323 | 2000 (3000)[8] | 267.7 | 191.2 |
| **Ø 30 mm** | 1418 | – | – | 1418 | 2000 | 307.3 | 219.5 |
| **Ø 32 mm** | 1512 | 1512 | – | 1512 | 2000 (3000)[8] (1500)[9] | 349.7 | 249.8 |
| **Ø 34 mm** | 1607 | – | – | – | 2000 | 394.7 | 282.0 |
| **Ø 36 mm** | 1701 | – | – | – | 2000 | 442.6 | 316.1 |
| **Ø 40 mm** | 1890 | – | – | – | 2000 | 546.4 | 390.3 |

For planning and design the complete European Technical Assessments ETA-17/1056 (FIS EM Plus), ETA-13/0651 (FIS SB), ETA-20/0728 (FIS V Plus and FIS VS Plus LOW SPEED) or ETA-22/0502 (FIS RC II) have to be considered. For determination of the installation parameters (minimum concrete cover distances, etc.) as well as required transverse reinforcement see EN 1992-1-1 and general installation rules of the assessments.

[1] The partial safety factors for resistance taken from the European standard EN 1992-1-1 as well as a partial safety factor for action of $\gamma_L$ = 1.4 are considered.
[2] The ETAs for FIS EM Plus, FIS SB, FIS V Plus, FIS V Plus LOW SPEED and FIS RC II permit post-installed rebar connections in concrete C12/15 up to C50/60. The above mentioned basic value for anchorage length changes depending on the relevant concrete strength class.
[3] When utilising the full steel load capacity.
[4] Basic value of the anchorage length in accordance with EN 1992-1-1, section 8.4.3 for concrete strength class C20/25 and good bond conditions.
[5] All reinforcing steels with characteristic yield strength $f_{yk}$ = 400 - 600 N/mm² in accordance with EN 1992-1-1 Annex C, Table C.1 and C.2N. The above-mentioned basic value for the anchorage length as well as maximum steel resistance (see footnote 3) will change accordingly.
[6] With FIS EM Plus, FIS SB, FIS V Plus, FIS VS Plus LOW SPEED or FIS RC II post-installed rebars are approved in dry or wet concrete with temperatures up to +50 °C (resp. short term up to +80 °C) and drill hole cleaning in accordance with ETA.
[7] Only FIS RC II.
[8] Values in brackets apply for FIS SB.
[9] FIS RC II at installation temperature $T_I$ > 0°C.




[1] If the clear distance of the lapped bars is larger than 4 x ø, EC2 must be applied.

## Loads

**Rebar anchor FRA with injection systems FIS EM Plus, FIS SB, FIS V Plus, FIS VS Plus LOW SPEED and FIS RC II in accordance with rebar theory**

Design resistances and permissible loads[1) 2)] of single, post-installed Rebar anchor in cracked or non-cracked normal concrete of the strength class C20/25[3)].

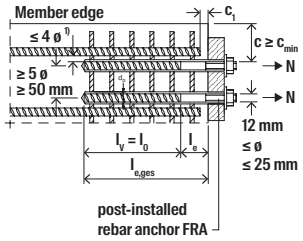
| Type | Basic value for anchorage length $l_{b,rqd}$[4)] [mm] | Maximum anchorage depth $l_{v,max}$ [mm] | Maximum embedment depth $l_{e,ges,max}$ [mm] | Maximum Installation torque $T_{inst}$ [Nm] | Maximum design resistance for axial tension load $N_{Rd,s}$[5)] [kN] | Maximum permissible tension load $N_{perm,s}$[5)] [kN] |
|---|---|---|---|---|---|---|
| **FRA 12/900 M12** | 567 | 800 | 900 | ≤ 50 | 49.2 | 35.1 |
| **FRA 16/1100 M16** | 756 | 1000 | 1100 | ≤ 100 | 87.4 | 62.4 |
| **FRA 20/1400 M20** | 945 | 1300 | 1400 | ≤ 150 | 136.6 | 97.6 |

For planning and design the complete European Technical Assessments ETA-17/1056 (FIS EM Plus), ETA-13/0651 (FIS SB), ETA-20/0728 (FIS V Plus resp. FIS VS Plus LOW SPEED) or ETA-22/0502 (FIS RC II) have to be considered. For determination of the installation parameters (minimum concrete cover distances, etc.) as well as required transverse reinforcement see EN 1992-1-1 and general installation rules of the assessments.

1) The partial safety factors for resistance taken from the European standard EN 1992-1-1 as well as a partial safety factor for action of $\gamma_L$ = 1.4 are considered.
2) With FIS EM Plus, FIS SB, FIS V Plus, FIS V Plus LOW SPEED and FIS RC II post-installed Rebar anchors are approved in dry or wet concrete with temperatures up to +50 °C (resp. short term up to +80 °C) and drill hole cleaning in accordance with ETA.
3) The ETAs for FIS EM Plus, FIS SB, FIS V Plus, FIS V Plus LOW SPEED and FIS RC II permit post-installed rebar connections in concrete C12/15 up to C50/60. The above mentioned basic value for anchorage length changes depending on the relevant concrete strength class.
4) Basic value of the anchorage length in accordance with EN 1992-1-1, section 8.4.3 for concrete strength class C20/25 and good bond conditions.
5) For utilisation of the full steel capacity.

**General rules of construction**

- The Rebar anchor FRA is permitted to transfer tension loads in direction of the axis of the rebar only.
- $l_v$ and $l_0$ is according to approval.
- According to approval it has to be proved that sufficient transverse reinforcement is available.




1) If the clear distance of the lapped bars is larger than 4 x ø, EC2 must be applied.

| | |
|---|---|
| c | Concrete cover of the post-installed rebar anchor |
| $c_1$ | Concrete cover of the front side of the existing rebar |
| $l_e$ | Concrete cover above the welding |
| $c_{min}$ | Minimum concrete cover acc. to approval |
| ø | Diameter of the post-installed rebar anchor |
| $l_0$ | Lap length |
| $l_v$ | Effective anchorage depth of the rebar anchor |
| $l_{e,ges}$ | Embedment depth of the rebar anchor |
| $d_0$ | Nominal drill diameter |

# Concrete-concrete shear connector FCC

The installation-friendly and approved system for structural strengthening.







Structural strengthening of bridges




Increasing load capacity of ceilings

## Applications

- Increasing load capacity of bridges and other concrete structures
- Increasing structural safety of ceilings during functional changes
- Structural strengthening of foundations, piers, columns and walls
- Structural retrofitting of car park ceilings following corrosion of rebars

## Advantages

- Due to its geometry and ease of installation, FCC is the rapid and economic alternative compared to the conventional installation method with bent iron.
- Dimensioning of the anchorage is possible thanks to the building approval. Thus, the system offers maximum security.
- Variable anchoring depths allow for ideal adaptation to the load to be applied, and ensure an optimised installation time and use of materials.
- Depending on site conditions, the FCC can be anchored, in compliance with the approval, with the injection mortars FIS SB, FIS EM Plus, FIS V Plus or FIS RC II.
- In conjunction with FIS EM Plus, FCC is also approved for use in diamond-drilled drill holes.

## Certificates / Features

aBG
Z-21.8-1954

## Building materials

**Approved for:**

- Concrete C20/25 to C50/60, cracked and non-cracked

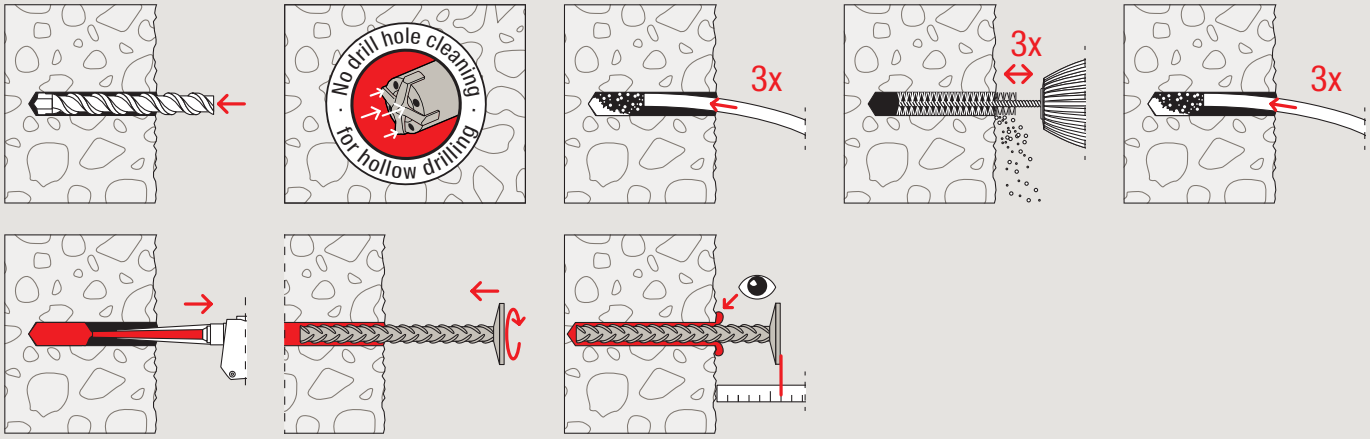
## Versions

Galvanised concrete steel bar B500B

## Functioning

- The system consists of injection mortar (e.g.: FIS SB or FIS EM Plus) and the concrete-concrete shear connector FCC.
- The mortar is injected bubble-free from the drill hole base.
- The mortar adheres the drill hole wall to the shear connector FCC.
- The shear connector is set manually, by lightly rotating it until it reaches the drill hole base.
- The tensile and shear forces arising in the joints between the old and new concrete are absorbed by the FCC-H and safely redirected.

## Installation in concrete with FIS SB or FIS EM Plus and FCC-H






## Technical data

**Concrete-concrete shear connector FCC**



FCC

| Item | Item no. | Approval DIBt | Drill diameter $d_0$ [mm] | Rebar diameter [mm] | Min. / standard anchorage depth [mm] | Min. / max. filling quantity FIS SB [scale units] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FCC-H 10 x 180** | **520081** | ● | 12 | 10 | 60 / 120 | 2 / 4 | 100 |
| **FCC-H 12 x 230** | **520082**[1)] | ● | 14 | 12 | 70 / 155 | 3 / 7 | 50 |
| **FCC-H 14 x 290** | **520083**[1)] | ● | 18 | 14 | 75 / 195 | 6 / 14 | 50 |
| **FCC-H 16 x 360** | **520085**[1)] | ● | 20 | 16 | 80 / 240 | 7 / 20 | 25 |

[1)] Delivery time on request.

# Bridge cap anchor FCC-B

Approved system for post-installed bridge edge beam fixings.







Bridge cap anchor with nut



Bridge cap anchor with head plate

## Applications

- Anchoring of bridge caps

## Advantages

- The fischer bridge cap anchor FCC-B is approved for anchoring in reinforced and unreinforced concrete of strength class from C20/25 and maximum C50/60 according to DIN EN 206-1.
- The FCC-B can be used with the fischer injection mortars FIS EM Plus, FIS SB, FIS V Plus or FIS RC II with maximum flexibility in the installation.
- The approved sealing washer ensures secure sealing of the penetrated sealing membrane.
- Safe design of the anchoring and fast documentation directly on site is supported by the design tool and the fischer PRO App.
- With the wide range of anchors in diameters M16 to M24, the system offers the right solution for every project.

## Certificates / Features

aBG
Z-21.8-1954

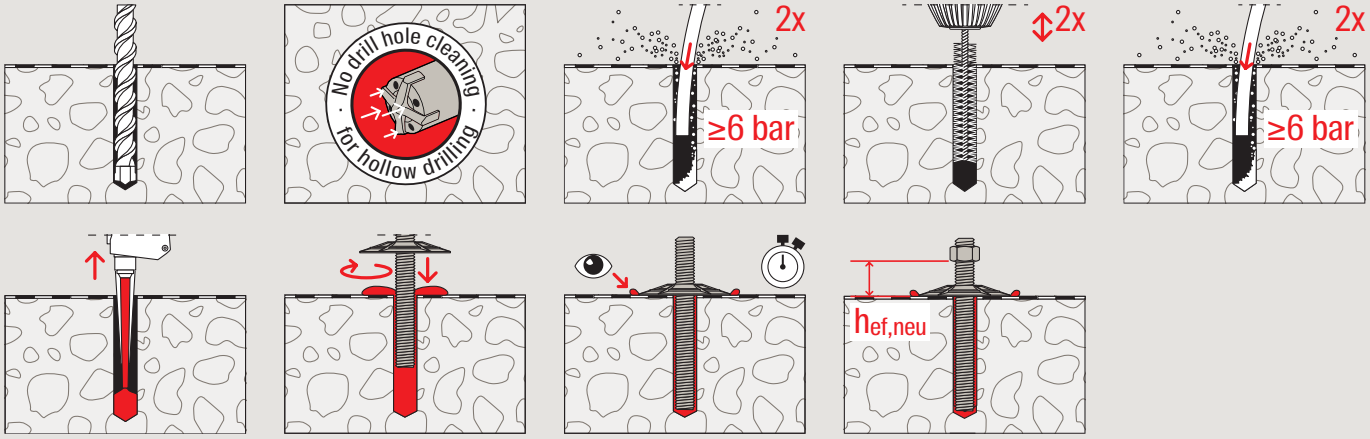
## Building materials

- Concrete C20/25 to C50/60, cracked and non-cracked

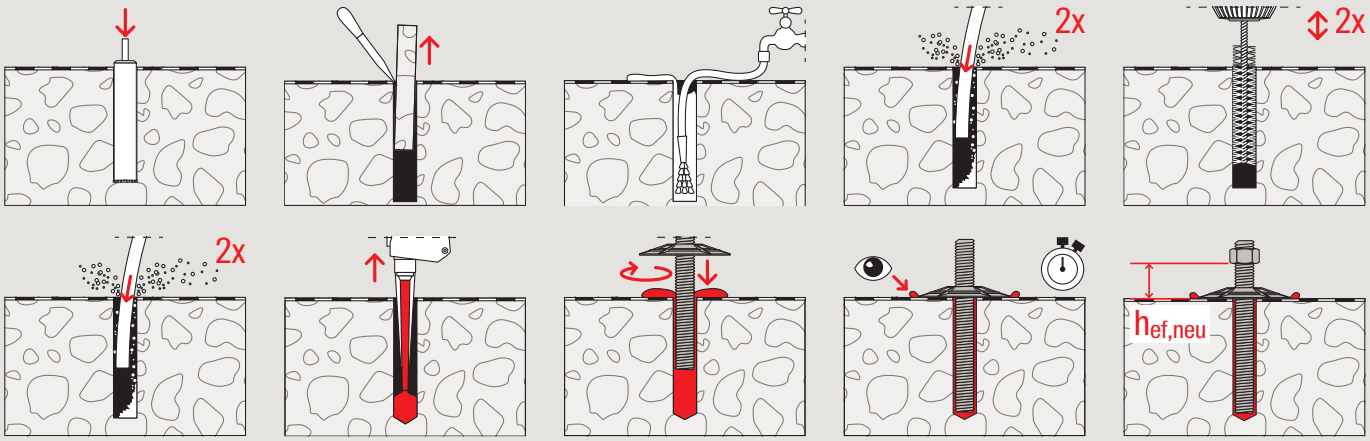
## Functioning

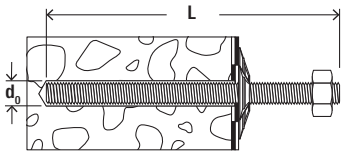
- The system consists of the fischer injection mortars FIS EM Plus or FIS SB and the FCC-B bridge cap anchor.
- The bridge cap anchor is installed by hand with a slight rotating movement down to the bottom of the drill hole.
- The injection mortar connects the threaded rod to the concrete via bond stress.
- The enclosed sealing washer is bonded with the injection mortar, therefore seals the penetration in the sealing membrane.
- The connection between the exisiting and new concrete is realized by the headed bolt and the corresponding nut or head plate.

## Installation with hammer drill with FIS EM Plus and FIS SB




## Installation with diamond drill with FIS EM Plus






## Technical data

**Bridge cap anchor FCC-B**





FCC-B

| Item | Item no. | Approval DIBt | Drill diameter $d_0$ [mm] | Length l [mm] | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FCC-B M16 x 250 R** | **569827** | ● | 18 | 250 | 10 x FIS A M16 x 250 R<br>10 x FCC-SD 12/16<br>10 x nut M16 | 10 |
| **FCC-B M16 x 300 R** | **569828** | ● | 18 | 300 | 10 x FIS A M16 x 300 R<br>10 x FCC-SD 12/16<br>10 x nut M16 | 10 |
| **FCC-B M20 x 245 R** | **569829** | ● | 22 | 245 | 10 x FIS A M20 x 245 R<br>10 x FCC-SD 20/24<br>10 x nut M20 | 10 |
| **FCC-B M20 x 290 R** | **569830** | ● | 22 | 290 | 10 x FIS A M20 x 290 R<br>10 x FCC-SD 20/24<br>10 x nut M20 | 10 |
| **FCC-B M24 x 290 R** | **569831** | ● | 28 | 290 | 5 x FIS A M24 x 290 R<br>5 x FCC-SD 20/24<br>5 x nut M24 | 5 |
| **FCC-B M24 x 380 R** | **569832** | ● | 28 | 380 | 5 x FIS A M24 x 380 R<br>5 x FCC-SD 20/24<br>5 x nut M24 | 5 |

Further sizes on request.

## Technical data

**Head plate FCC-HP**



FCC-HP

| Item | Item no. | Diameter d [mm] | Height H [mm] | Sales unit [pcs] |
|---|---|---|---|---|
| **FCC-HP M16 R** | **569764** | 48 | 14.8 | 10 |
| **FCC-HP M20 R** | **569765** | 50 | 18 | 10 |
| **FCC-HP M24 R** | **569766** | 70 | 21.5 | 5 |

## Technical data

**Sealing washer FCC-SD**



FCC-SD

| Item | Item no. | External-ø d [mm] | Height H [mm] | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|
| **FCC-SD 12/16** | **569495** | 74 | 9.1 | 50 x Sealing washer FCC-SD 12/16 | 50 |
| **FCC-SD 20/24** | **569496** | 102 | 9.8 | 50 x Sealing washer FCC-SD 20/24 | 50 |

## Filling quantities

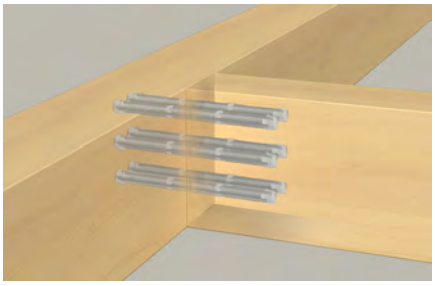
| FCC-B Anchor size | Drill hole diameter [mm] | Drill hole depth [mm] | Mortar volume anchor rod [scale unit] | [ml] | Mortar volume sealing washer [scale unit] | [ml] |
|---|---|---|---|---|---|---|
| **16** | 18 | 100 | 5 | 10 | 8 | 16 |
| **20** | 22 | 100 | 8 | 16 | 14 | 28 |
| **20** | 24 | 100 | 11 | 22 | 14 | 28 |
| **24** | 28 | 100 | 14 | 28 | 14 | 28 |

# Injection mortar FIS EM Plus in wood

For powerful glued anchoring solutions in wood.





Wood-wood connection with threaded rod FIS A



Connection with internal thread anchor FIS IG and hexagonal screw

## Applications

- Wood-wood connections
- Wood-concrete connections
- Wood-steel connections
- Prefabricated timber components for final assembly on the construction site
- Demountable and temporary fixings
- Glued anchorages in wood, see approval for gluing in wood

## Advantages

- The approval of the FIS EM Plus injection mortar for use in glued laminated or glued solid timber of spruce (Picea abies), fir (Abies alba) or pine (Pinus sylvestris) allows the realisation of high-performance and appealing wood-wood, wood-concrete and wood-steel connections.
- The range of galvanized and stainless steel versions of the anchor rods M6 - M30 and internal threaded anchors sizes M8 - M20 (external diameter M12 - M30) allows flexible use indoors and outdoors.
- The surface-flush finish of the internal threaded solution allows secure component transportation without bending protruding anchor rods.
- The option of invisibly connecting two timber components allows the realization of architecturally appealing connection solutions.
- The recommended fischer DD-E and DD-S centring clips allow ideal centring of the anchor rods in the drill hole.

## Certificates / Features

ETA-19/0657 Glued-in rods for timber connections

Gluing of steel anchors in wood

## Building materials

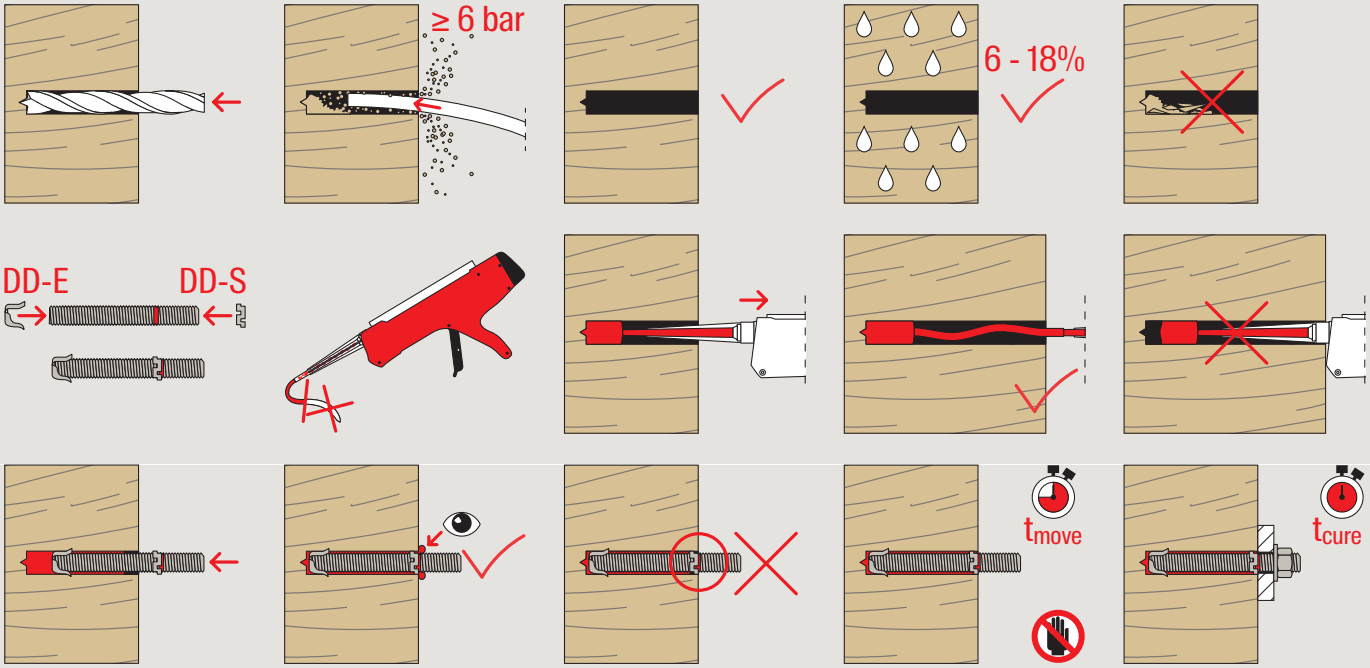
**Approved for glued anchorings in:**

- Glued laminated or glued solid timber of spruce (Picea abies), fir (Abies alba) or pine (Pinus sylvestris)

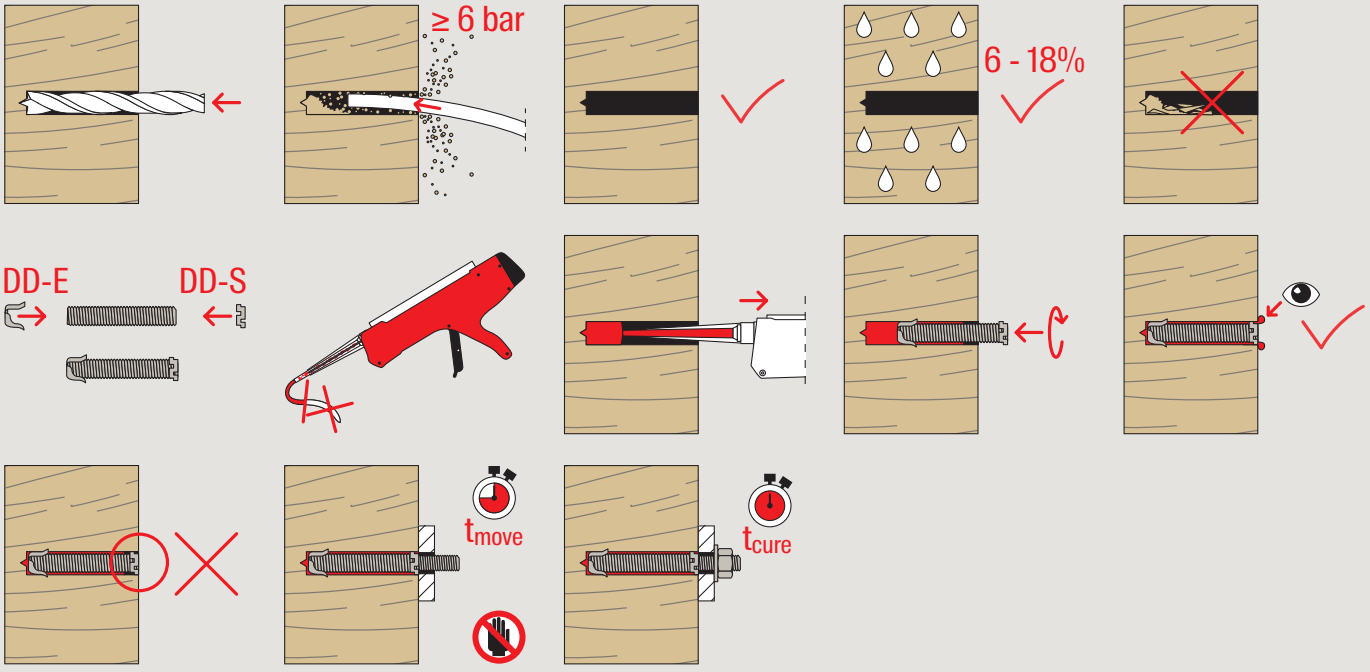
## Functioning

- The epoxy resin mortar FIS EM Plus is approved for pre-positioned and push-through installation with the anchor rod FIS A and for pre-positioned installation with the internally threaded anchor FIS IG.
- To center the fixing elements in the drill hole, the anchor rods should be centered with centering clips, such as the fischer DD-E and DD-S.
- The various processing methods with and without side-injection holes are explained in detail on the following pages.

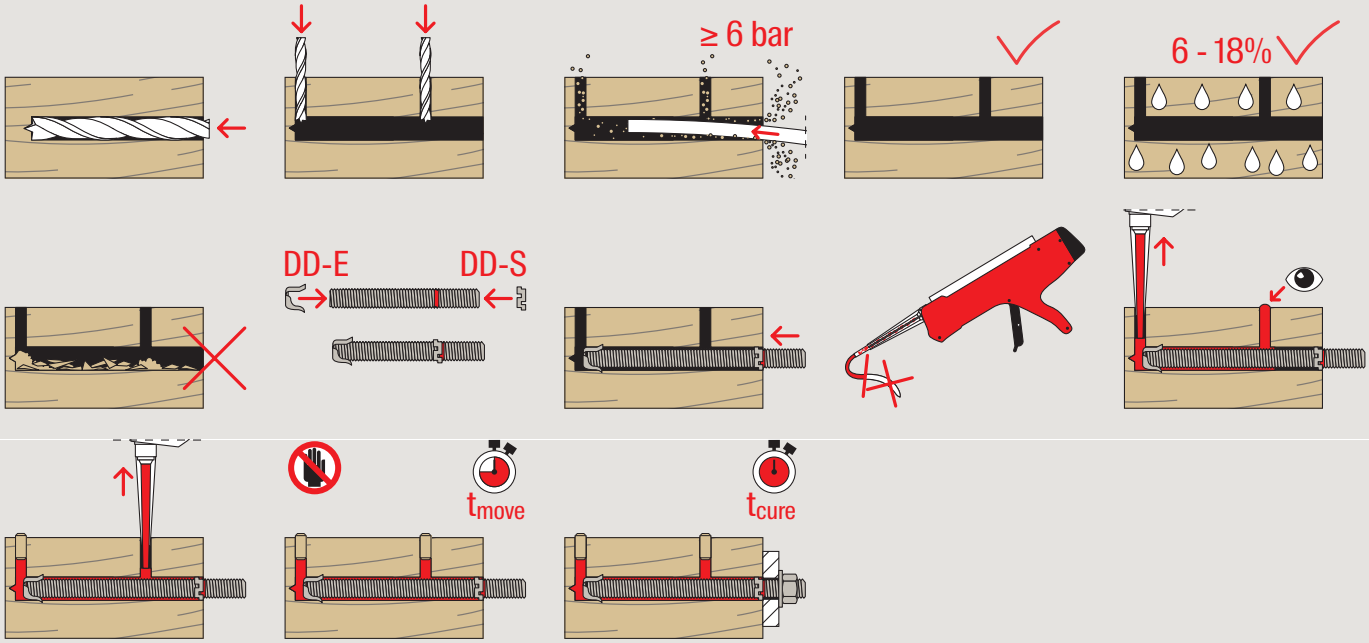
## Gluing in wood with FIS EM Plus and anchor rod FIS A as pre-positioned installation



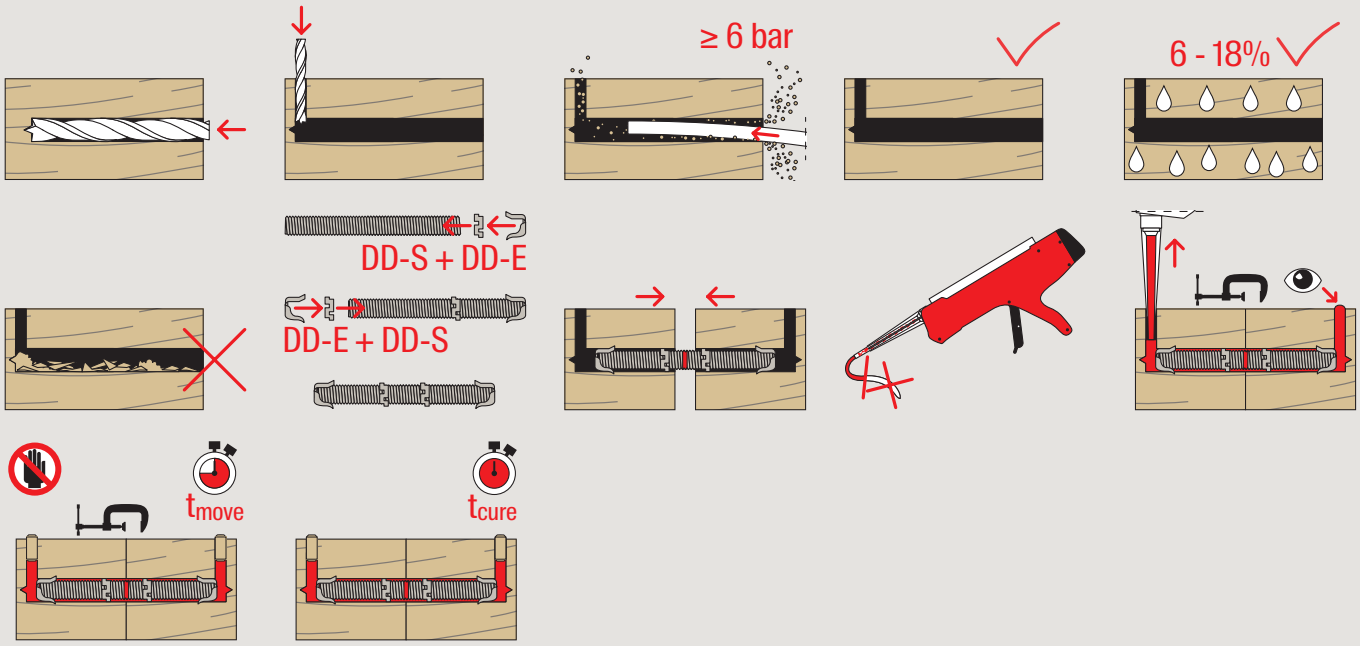

## Gluing in wood with FIS EM Plus and internally threaded anchor FIS IG



## Gluing in wood with FIS EM Plus and anchor rod FIS A as injection bypass method




## Gluing in wood with FIS EM Plus and anchor rod FIS A as wood-wood-connection



## Technical data

**Epoxy mortar FIS EM Plus**


FIS EM Plus 390 S

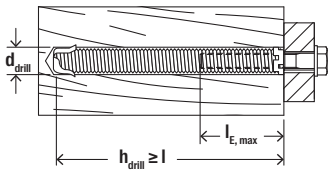

FIS EM Plus 585 S


FIS EM Plus 1500 S


FIS MR Plus


FIS UMR

| Item | Item no. | Approval ETA | Approval DIBt | Approval ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS EM Plus 300 T** | **575312** | ● | ● | ● | EN, ES, FR | 142 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS EM Plus 300 T** | **575313** | ● | ● | ● | DE, IT | 142 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS EM Plus 300 T** | **575314** | ● | ● | ● | AR, EN, PT | 142 | 1 x Cartridge 300 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS EM Plus 390 S** | **544154** | ● | ● | ● | EN, FR, NL | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS EM Plus 390 S** | **544176** | ● | ● | ● | CS, RO, SK | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS EM Plus 390 S** | **544155** | ● | ● | ● | AR, EN, ZH | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS EM Plus 390 S** | **544159** | ● | ● | ● | KK, RU, UK | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS EM Plus 390 S** | **567987** | ● | ● | ● | EL, HU, KO | 180 | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS EM Plus 585 S** | **544165** | ● | ● | ● | CS, KO, PL, SK | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| **FIS EM Plus 585 S** | **544166** | ● | ● | ● | EL, EN, ES, PT | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| **FIS EM Plus 585 S** | **567989** | ● | ● | ● | DE, FR, NL | 270 | 1 x Cartridge 585 ml, 2 x static mixer FIS UMR | 1 |
| **FIS EM Plus 585 S** | **544175** | ● | ● | ● | EN, KO, ZH | 270 | 1 x Cartridge 585 ml 1 x static mixer FIS UMR<br>1 x Extension tube Ø 9 x 250 mm | 1 |
| **FIS EM Plus 1500 S** | **544167** | ● | ● | ● | DE, EN, ES, FR, IT | 670 | 1 x Cartridge 1500 ml, 2 x static mixer FIS UMR | 1 |
| **FIS MR Plus** | **545853** | – | – | – | – | – | 10 x Static mixer FIS MR Plus for all cartridge sizes from 100 ml to 410 ml | 10 |
| **FIS UMR** | **520593** | – | – | – | – | – | 10 x static mixer FIS UMR for 585 & 1500 ml cartridges | 10 |




## Technical data

**Internal threaded anchor FIS IG**

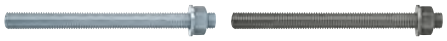

FIS IG gvz


FIS IG R

| Item | Galvanised steel Item no. gvz | Stainless steel Item no. R | Approval DIBt | Internal thread | External thread | Drill hole diameter in wood $d_{drill}$ [mm] | Min. drill hole depth $h_{drill}$ [mm] | Anchor length l [mm] | Max. bolt penetration $l_{E,max}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| **FIS IG 8** | **572992** | **572997** | ● | M8 | M12 | 14 / 16 | 120 | 120 | 20 | 10 |
| **FIS IG 10** | **572993** | **572998** | ● | M10 | M16 | 18 / 20 | 160 | 160 | 25 | 10 |
| **FIS IG 12** | **572994** | **572999** | ● | M12 | M20 | 22 / 24 | 200 | 200 | 30 | 10 |
| **FIS IG 16** | **572995** | **573000** | ● | M16 | M24 | 26 / 28 | 240 | 240 | 40 | 5 |
| **FIS IG 20** | **572996** | **573001** | ● | M20 | M30 | 32 / 34 | 300 | 300 | 50 | 5 |

## Technical data

**Threaded rod FIS A**



FIS A gvz FIS A R

| Item | Galvanised steel, steel grade 5.8<br>Item no.<br>gvz 5.8 | Galvanised steel, steel grade 8.8<br>Item no.<br>gvz 8.8 | Stainless steel<br>Item no.<br>R | Approval<br>ETA | Drill hole diameter in wood<br>$d_{drill}$<br>[mm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|
| FIS A M8 x 90 | 090274 | 519390 | 090440 | ● | 10 / 12 | 10 |
| FIS A M8 x 110 | 090275 | 519391 | 090441 | ● | 10 / 12 | 10 |
| FIS A M8 x 130 | 090276 | 519392 | 090442 | ● | 10 / 12 | 10 |
| FIS A M8 x 140 | – | 553763 | – | ● | 10 / 12 | 10 |
| FIS A M8 x 150 | – | 553627 | – | ● | 10 / 12 | 10 |
| FIS A M8 x 175 | 090277 | 519393 | 090443 | ● | 10 / 12 | 10 |
| FIS A M10 x 110 | 090278 | – | – | ● | 12 / 14 | 10 |
| FIS A M10 x 130 | 090279 | 524170 | 090447 | ● | 12 / 14 | 10 |
| FIS A M10 x 135 | – | – | 562856 | ● | 12 / 14 | 10 |
| FIS A M10 x 150 | 090281 | 517935 | 090448 | ● | 12 / 14 | 10 |
| FIS A M10 x 160 | – | – | 562855 | ● | 12 / 14 | 10 |
| FIS A M10 x 170 | 044969 | 519395 | 044973 | ● | 12 / 14 | 10 |
| FIS A M10 x 190 | – | 517936 | – | ● | 12 / 14 | 10 |
| FIS A M10 x 200 | 090282 | 519396 | 090449 | ● | 12 / 14 | 10 |
| FIS A M12 x 120 | 044971 | 519397 | 044974 | ● | 14 / 16 | 10 |
| FIS A M12 x 140 | 090283 | 519398 | 090450 | ● | 14 / 16 | 10 |
| FIS A M12 x 160 | 090284 | 517937 | 090451 | ● | 14 / 16 | 10 |
| FIS A M12 x 180 | 090285 | 519399 | 090452 | ● | 14 / 16 | 10 |
| FIS A M12 x 200 | – | 517938 | 519421 | ● | 14 / 16 | 10 |
| FIS A M12 x 210 | 090286 | – | 090453 | ● | 14 / 16 | 10 |
| FIS A M12 x 260 | 090287 | – | 090454 | ● | 14 / 16 | 10 |
| FIS A M12 x 280 | – | – | 547703 | ● | 14 / 16 | 10 |
| FIS A M16 x 130 | 044972 | 519400 | 044975 | ● | 18 / 20 | 10 |
| FIS A M16 x 175 | 090288 | 519401 | 090455 | ● | 18 / 20 | 10 |
| FIS A M16 x 200 | 090289 | 517939 | 090456 | ● | 18 / 20 | 10 |
| FIS A M16 x 250 | 090290 | 517940 | 090457 | ● | 18 / 20 | 10 |
| FIS A M16 x 300 | 090291 | 519402 | 090458 | ● | 18 / 20 | 10 |
| FIS A M16 x 350 | – | 558865 | – | ● | 18 / 20 | 10 |
| FIS A M20 x 245 | 090292 | 519404 | 090459 | ● | 22 / 24 | 10 |
| FIS A M20 x 290 | 090293 | 519406 | 090460 | ● | 22 / 24 | 10 |
| FIS A M20 x 350 | – | 559627 | – | ● | 22 / 24 | 10 |
| FIS A M20 x 400 | – | 558866 | – | ● | 22 / 24 | 10 |
| FIS A M24 x 175 | – | – | 570632 | ● | 26 / 28 | 5 |
| FIS A M24 x 200 | – | – | 570633 | ● | 26 / 28 | 5 |
| FIS A M24 x 290 | 090294 | – | 090461 | ● | 26 / 28 | 5 |
| FIS A M24 x 380 | 090295 | – | 090462 | ● | 26 / 28 | 5 |
| FIS A M24 x 450 | – | 558867 | – | ● | 26 / 28 | 5 |
| FIS A M24 x 650 | – | 558868 | – | ● | 26 / 28 | 5 |
| FIS A M30 x 430 | 090297 | – | 090464 | ● | 32 / 34 | 5 |
| FIS A M30 x 550 | – | 558869 | – | ● | 32 / 34 | 5 |
| FIS A M30 x 650 | – | 566677 | – | ● | 32 / 34 | 4 |
| FIS A M30 x 750 | – | 566676 | – | ● | 32 / 34 | 4 |

## Technical data

**Centring clip DD-E**



DD-E

| Item | Item no. | Thread M | Sales unit [pcs] |
|---|---|---|---|
| **DD-E M12** | **563722** | M12 | 100 |
| **DD-E M16** | **563724** | M16 | 100 |
| **DD-E M20** | **563726** | M20 | 100 |
| **DD-E M24** | **563728** | M24 | 100 |
| **DD-E M27** | **563730** | M27 | 100 |
| **DD-E M30** | **563732** | M30 | 100 |

Used for overhead mounting or in combination with the DD-S centring clip for centring in the drill hole.

## Technical data

**Centring clip DD-S**



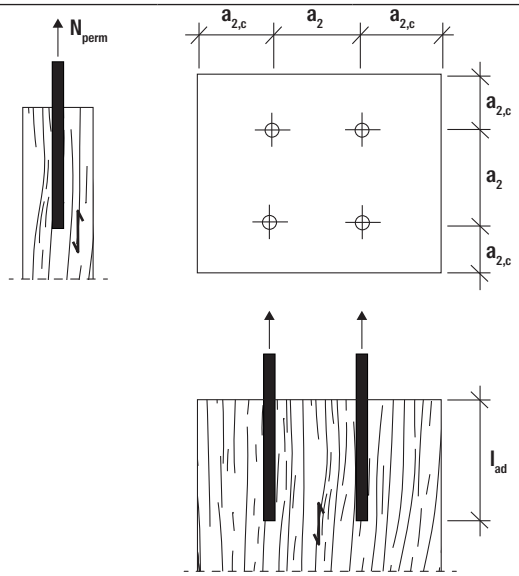
DD-S

| Item | Item no. | Thread M | Sales unit [pcs] |
|---|---|---|---|
| **DD-S M12** | **563721** | M12 | 100 |
| **DD-S M16** | **563723** | M16 | 100 |
| **DD-S M20** | **563725** | M20 | 100 |
| **DD-S M24** | **563727** | M24 | 100 |
| **DD-S M27** | **563729** | M27 | 100 |
| **DD-S M30** | **563731** | M30 | 100 |

Used in combination with the DD-E centring clip for centring in the drill hole.

# Loads FIS EM Plus with FIS A under tensile stress






**Injection system FIS EM Plus with anchor rod FIS A**

**Permissible tensile loads of a single anchor rod in glued laminated timber components ≥ GL24h**
**Anchor rods glued in parallel to the grain direction of the timber component**
For the design, the entire approval Z-9.1-914 and DIN EN 1995-1-1:2010-12 / NA must be observed.

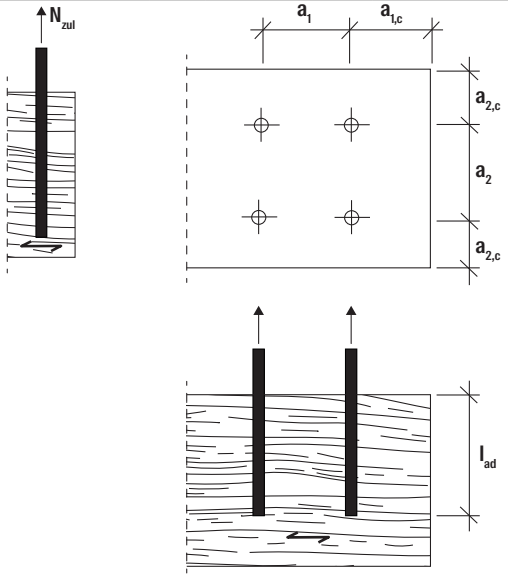
| Type | Material/surface [-] | Gluing length in timber component $l_{ad}$ [mm] | Permissible tensile load $N_{perm}$ [kN] | Minimum spacing $a_2$ [mm] | Minimum edge distance $a_{2,c}$ [mm] | Minimum component dimensions b = d [mm] |
|---|---|---|---|---|---|---|
| **FIS A M 6** | 5.8 | 100 | 3.7 | 30 | 15 | 30 |
| | 5.8 | 240 | 4.8 | 30 | 15 | 30 |
| | 8.8 | 100 | 3.7 | 30 | 15 | 30 |
| | 8.8 | 240 | 7.4 | 30 | 15 | 30 |
| | R-70 | 100 | 3.7 | 30 | 15 | 30 |
| | R-70 | 240 | 5.2 | 30 | 15 | 30 |
| **FIS A M 8** | 5.8 | 100 | 5.0 | 40 | 20 | 40 |
| | 5.8 | 320 | 8.8 | 40 | 20 | 40 |
| | 8.8 | 100 | 5.0 | 40 | 20 | 40 |
| | 8.8 | 320 | 13.4 | 40 | 20 | 40 |
| | R-70 | 100 | 5.0 | 40 | 20 | 40 |
| | R-70 | 320 | 9.4 | 40 | 20 | 40 |
| **FIS A M 10** | 5.8 | 100 | 6.2 | 50 | 25 | 50 |
| | 5.8 | 400 | 13.9 | 50 | 25 | 50 |
| | 8.8 | 100 | 6.2 | 50 | 25 | 50 |
| | 8.8 | 400 | 20.2 | 50 | 25 | 50 |
| | R-70 | 100 | 6.2 | 50 | 25 | 50 |
| | R-70 | 400 | 14.9 | 50 | 25 | 50 |
| **FIS A M 12** | 5.8 | 120 | 8.9 | 60 | 30 | 60 |
| | 5.8 | 480 | 20.2 | 60 | 30 | 60 |
| | 8.8 | 120 | 8.9 | 60 | 30 | 60 |
| | 8.8 | 480 | 25.5 | 60 | 30 | 60 |
| | R-70 | 120 | 8.9 | 60 | 30 | 60 |
| | R-70 | 480 | 21.7 | 60 | 30 | 60 |

| Type | Material/surface [-] | Gluing length in timber component $l_{ad}$ [mm] | Permissible tensile load $N_{perm}$ [kN] | Minimum spacing $a_2$ [mm] | Minimum edge distance $a_{2,c}$ [mm] | Minimum component dimensions b = d [mm] |
|---|---|---|---|---|---|---|
| **FIS A M 16** | 5.8 | 160 | 15.9 | 80 | 40 | 80 |
| | 5.8 | 640 | 37.7 | 80 | 40 | 80 |
| | 8.8 | 160 | 15.9 | 80 | 40 | 80 |
| | 8.8 | 640 | 40.4 | 80 | 40 | 80 |
| | R-70 | 160 | 15.9 | 80 | 40 | 80 |
| | R-70 | 640 | 40.4 | 80 | 40 | 80 |
| **FIS A M 20** | 5.8 | 200 | 24.9 | 100 | 50 | 100 |
| | 5.8 | 800 | 57.2 | 100 | 50 | 100 |
| | 8.8 | 200 | 24.9 | 100 | 50 | 100 |
| | 8.8 | 800 | 57.2 | 100 | 50 | 100 |
| | R-70 | 200 | 24.9 | 100 | 50 | 100 |
| | R-70 | 800 | 57.2 | 100 | 50 | 100 |
| **FIS A M 24** | 5.8 | 240 | 35.8 | 120 | 60 | 120 |
| | 5.8 | 960 | 73.7 | 120 | 60 | 120 |
| | 8.8 | 240 | 35.8 | 120 | 60 | 120 |
| | 8.8 | 960 | 73.7 | 120 | 60 | 120 |
| | R-70 | 240 | 35.8 | 120 | 60 | 120 |
| | R-70 | 960 | 73.7 | 120 | 60 | 120 |
| **FIS A M 30** | 5.8 | 300 | 52.4 | 150 | 75 | 150 |
| | 5.8 | 1000 | 93.2 | 150 | 75 | 150 |
| | 8.8 | 300 | 52.4 | 150 | 75 | 150 |
| | 8.8 | 1000 | 93.2 | 150 | 75 | 150 |
| | R-70 | 300 | 52.4 | 150 | 75 | 150 |
| | R-70 | 1000 | 93.2 | 150 | 75 | 150 |

Notes:
Drill diameter in the wood 4 mm larger than the outer diameter of the steel rods.
Steel failure in the stress cross-section against the yield strength, composite failure in the lateral surface and tensile failure of the net timber cross-section are taken into account.
Partial safety factors $\gamma_{M,H}$ = 1.3; $\gamma_{M,S}$ = 1.25; $\gamma_{F,global}$ = 1.4 and $k_{mod}$ = 0.9 from KLED short and NKL 1+2 taken into account.
Values valid for glued laminated timber ≥ GL24h. Higher load-bearing capacities may be possible for higher strength classes. For groups of steel bars, as well as for combined loading from tensile and shear loads, as well as for bending stress, see Z-9.1-914 and DIN EN 1995-1-1 / NA.
For groups of steel bars glued in parallel to the grain of the timber components, which are subjected to tensile stress in the grain direction, a verification of the connection for block shear failure according to EOTA Technical Report TR 070, Section 4.1.7., is required.
All mechanical values given must be considered in relation to the assumptions made and are examples of dimensioning.
This is a planning aid. Projects must be dimensioned exclusively by structural engineers!
All values are subject to typesetting and printing errors.

# Loads FIS EM Plus with FIS A under tensile stress






**Injection system FIS EM Plus with anchor rod FIS A**

**Permissible tensile loads of a single anchor rod in glued laminated timber components ≥ GL24h**
**Anchor rods glued in perpendicular to the grain direction of the timber component**
For the design, the entire approval Z-9.1-914 and DIN EN 1995-1-1:2010-12 / NA must be observed.

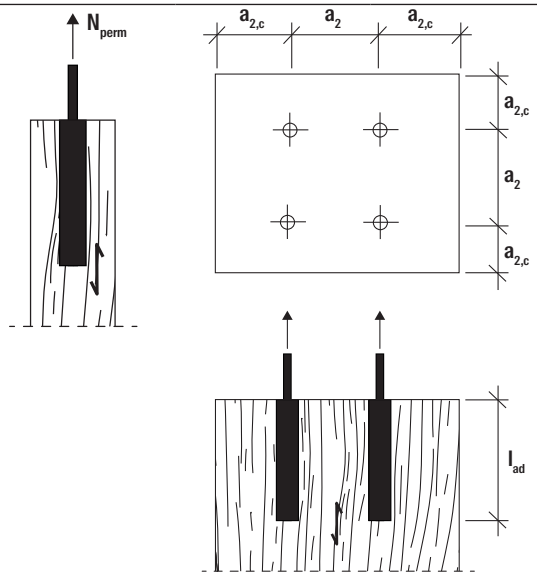
| Type | Material/surface [-] | Gluing length in timber component $l_{ad}$ [mm] | Permissible tensile load $N_{perm}$ [kN] | Minimum spacing $a_1 = a_2$ [mm] | Minimum edge distance $a_{1,c} = a_{2,c}$ [mm] | Minimum component width b [mm] | Minimum component height h [mm] |
|---|---|---|---|---|---|---|---|
| **FIS A M 6** | 5.8 | 100 | 3.7 | 24 | 15 | 30 | 120 |
| | 5.8 | 240 | 4.8 | 24 | 15 | 30 | 260 |
| | 8.8 | 100 | 3.7 | 24 | 15 | 30 | 120 |
| | 8.8 | 240 | 7.4 | 24 | 15 | 30 | 260 |
| | R-70 | 100 | 3.7 | 24 | 15 | 30 | 120 |
| | R-70 | 240 | 5.2 | 24 | 15 | 30 | 260 |
| **FIS A M 8** | 5.8 | 100 | 5.0 | 32 | 20 | 40 | 120 |
| | 5.8 | 320 | 8.8 | 32 | 20 | 40 | 340 |
| | 8.8 | 100 | 5.0 | 32 | 20 | 40 | 120 |
| | 8.8 | 320 | 13.4 | 32 | 20 | 40 | 340 |
| | R-70 | 100 | 5.0 | 32 | 20 | 40 | 120 |
| | R-70 | 320 | 9.4 | 32 | 20 | 40 | 340 |
| **FIS A M 10** | 5.8 | 100 | 6.2 | 40 | 25 | 50 | 120 |
| | 5.8 | 400 | 13.9 | 40 | 25 | 50 | 420 |
| | 8.8 | 100 | 6.2 | 40 | 25 | 50 | 120 |
| | 8.8 | 400 | 20.2 | 40 | 25 | 50 | 420 |
| | R-70 | 100 | 6.2 | 40 | 25 | 50 | 120 |
| | R-70 | 400 | 14.9 | 40 | 25 | 50 | 420 |
| **FIS A M 12** | 5.8 | 120 | 8.9 | 48 | 30 | 60 | 140 |
| | 5.8 | 480 | 20.2 | 48 | 30 | 60 | 500 |
| | 8.8 | 120 | 8.9 | 48 | 30 | 60 | 140 |
| | 8.8 | 480 | 25.5 | 48 | 30 | 60 | 500 |
| | R-70 | 120 | 8.9 | 48 | 30 | 60 | 140 |
| | R-70 | 480 | 21.7 | 48 | 30 | 60 | 500 |
| **FIS A M 16** | 5.8 | 160 | 15.9 | 64 | 40 | 80 | 180 |
| | 5.8 | 640 | 37.7 | 64 | 40 | 80 | 660 |
| | 8.8 | 160 | 15.9 | 64 | 40 | 80 | 180 |
| | 8.8 | 640 | 40.4 | 64 | 40 | 80 | 660 |
| | R-70 | 160 | 15.9 | 64 | 40 | 80 | 180 |
| | R-70 | 640 | 40.4 | 64 | 40 | 80 | 660 |

| Type | Material/surface [-] | Gluing length in timber component $l_{ad}$ [mm] | Permissible tensile load $N_{perm}$ [kN] | Minimum spacing $a_1 = a_2$ [mm] | Minimum edge distance $a_{1,c} = a_{2,c}$ [mm] | Minimum component width b [mm] | Minimum component height h [mm] |
|---|---|---|---|---|---|---|---|
| **FIS A M 20** | 5.8 | 200 | 24.9 | 80 | 50 | 100 | 220 |
| | 5.8 | 800 | 57.2 | 80 | 50 | 100 | 820 |
| | 8.8 | 200 | 24.9 | 80 | 50 | 100 | 220 |
| | 8.8 | 800 | 57.2 | 80 | 50 | 100 | 820 |
| | R-70 | 200 | 24.9 | 80 | 50 | 100 | 220 |
| | R-70 | 800 | 57.2 | 80 | 50 | 100 | 820 |
| **FIS A M 24** | 5.8 | 240 | 35.8 | 96 | 60 | 120 | 260 |
| | 5.8 | 960 | 73.7 | 96 | 60 | 120 | 980 |
| | 8.8 | 240 | 35.8 | 96 | 60 | 120 | 260 |
| | 8.8 | 960 | 73.7 | 96 | 60 | 120 | 980 |
| | R-70 | 240 | 35.8 | 96 | 60 | 120 | 260 |
| | R-70 | 960 | 73.7 | 96 | 60 | 120 | 980 |
| **FIS A M 30** | 5.8 | 300 | 52.4 | 120 | 75 | 150 | 320 |
| | 5.8 | 1000 | 93.2 | 120 | 75 | 150 | 1020 |
| | 8.8 | 300 | 52.4 | 120 | 75 | 150 | 320 |
| | 8.8 | 1000 | 93.2 | 120 | 75 | 150 | 1020 |
| | R-70 | 300 | 52.4 | 120 | 75 | 150 | 320 |
| | R-70 | 1000 | 93.2 | 120 | 75 | 150 | 1020 |

Notes:
Drill diameter in the wood 4 mm larger than the outer diameter of the steel rods.
Steel failure in the stress cross-section against the yield point and composite failure in the lateral surface are taken into account.
Any failure of the timber cross-section such as transverse tensile failure and block shear failure must be checked separately!
Partial safety factors $\gamma_{M,H} = 1.3$; $\gamma_{M,S} = 1.25$; $\gamma_{F,global} = 1.4$ and $k_{mod} = 0.9$ from KLED short and NKL 1+2 taken into account.
Values valid for glued laminated timber ≥ GL24h. Higher load-bearing capacities may be possible for higher strength classes.
For groups of steel bars, as well as for combined loading from tensile and shear loads, as well as for bending stress, see Z-9.1-914 and DIN EN 1995-1-1 / NA.
All mechanical values given must be considered in relation to the assumptions made and are examples of dimensioning.
This is a planning aid. Projects must be dimensioned exclusively by structural engineers!
All values are subject to typesetting and printing errors.

# Loads FIS EM Plus with FIS IG under tensile stress






**Injection system FIS EM Plus with internal threaded anchor FIS IG**

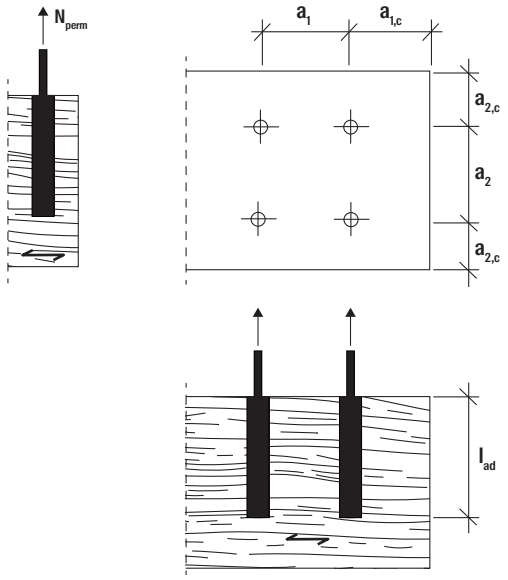
**Permissible tensile loads of a single internally threaded anchor in glued laminated timber components ≥ GL24h**
**Internally threaded anchor glued in parallel to the grain direction of the timber component**
For the design, the entire approval Z-9.1-914 and DIN EN 1995-1-1:2010-12 / NA must be observed.

| Type | Steel grade of the screw [-] | Gluing length in timber component $l_{ad}$ [mm] | Permissible tensile load $N_{perm}$ [kN] | Minimum spacing $a_2$ [mm] | Minimum edge distance $a_{2,c}$ [mm] | Minimum component dimensions b = d [mm] |
|---|---|---|---|---|---|---|
| **FIS IG M 8** | 5.8 | 120 | 8.8 | 60 | 30 | 60 |
| | 8.8 | 120 | 8.9 | 60 | 30 | 60 |
| | R-70 | 120 | 8.9 | 60 | 30 | 60 |
| **FIS IG M 10** | 5.8 | 160 | 13.9 | 80 | 40 | 80 |
| | 8.8 | 160 | 15.9 | 80 | 40 | 80 |
| | R-70 | 160 | 14.9 | 80 | 40 | 80 |
| **FIS IG M 12** | 5.8 | 200 | 20.2 | 100 | 50 | 100 |
| | 8.8 | 200 | 24.9 | 100 | 50 | 100 |
| | R-70 | 200 | 21.7 | 100 | 50 | 100 |
| **FIS IG M 16** | 5.8 | 240 | 35.8 | 120 | 60 | 120 |
| | 8.8 | 240 | 35.8 | 120 | 60 | 120 |
| | R-70 | 240 | 35.8 | 120 | 60 | 120 |
| **FIS IG M 20** | 5.8 | 300 | 52.4 | 150 | 75 | 150 |
| | 8.8 | 300 | 52.4 | 150 | 75 | 150 |
| | R-70 | 300 | 52.4 | 150 | 75 | 150 |

Notes:
Drill diameter in the wood 4 mm larger than the outer diameter of the internal threaded anchor FIS IG.
Steel failure in the stress cross-section of the FIS IG and the bolt against the yield strength, composite failure in the lateral surface and tensile failure of the net timber cross-section are taken into account.
Only use non-corroding FIS IG with non-corroding screws and FIS IG made of gvz. with screws made of gvz..
Minimum screw-in depth of the screws in the FIS IG in accordance with Z-9.1-914.
Partial safety factors $\gamma_{M,H}$ = 1.3; $\gamma_{M,S}$ = 1.25; $\gamma_{F,global}$ = 1.4 and $k_{mod}$ = 0.9 from KLED short and NKL 1+2 taken into account.
Values valid for glued laminated timber ≥ GL24h. Higher load-bearing capacities may be possible for higher strength classes.
For groups of steel bars, as well as for combined loading from tensile and shear loads, as well as for bending stress, see Z-9.1-914 and DIN EN 1995-1-1 / NA.
For groups of FIS IG glued in parallel to the grain of the timber components, which are subjected to tensile stress in the direction of the grain, the connection must be verified for block shear failure in accordance with EOTA Technical Report TR 070, Section 4.1.7.
All mechanical values given must be considered in relation to the assumptions made and are examples of dimensioning.
This is a planning aid. Projects must be dimensioned exclusively by structural engineers!
All values are subject to typesetting and printing errors.

# Load table FIS EM Plus with FIS IG under tensile stress






**Injection system FIS EM Plus with internally threaded anchors FIS IG**

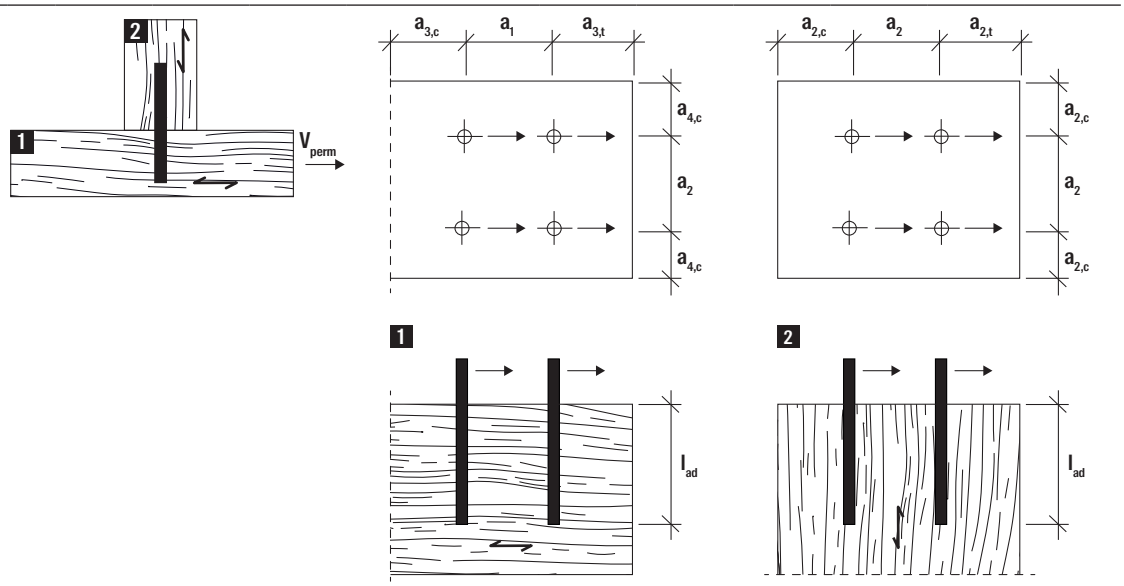
**Permissible tensile loads of a single internally threaded anchor in glued laminated timber components ≥ GL24h**
**Internally threaded anchor glued in perpendicular to the grain direction of the timber component**
For the design, the entire approval Z-9.1-914 and DIN EN 1995-1-1:2010-12 / NA must be observed.

| Type | Steel grade of the screw [-] | Gluing length in timber component $l_{ad}$ [mm] | Permissible tensile load $N_{perm}$ [kN] | Minimum spacing $a_1 = a_2$ [mm] | Minimum edge distance $a_{1,c} = a_{2,c}$ [mm] | Minimum component width b [mm] | Minimum component height h [mm] |
|---|---|---|---|---|---|---|---|
| **FIS IG M 8** | 5.8 | 120 | 8.8 | 48 | 30 | 60 | 140 |
| | 8.8 | 120 | 8.9 | 48 | 30 | 60 | 140 |
| | R-70 | 120 | 8.9 | 48 | 30 | 60 | 140 |
| **FIS IG M 10** | 5.8 | 160 | 13.9 | 64 | 40 | 80 | 180 |
| | 8.8 | 160 | 15.9 | 64 | 40 | 80 | 180 |
| | R-70 | 160 | 14.9 | 64 | 40 | 80 | 180 |
| **FIS IG M 12** | 5.8 | 200 | 20.2 | 80 | 50 | 100 | 220 |
| | 8.8 | 200 | 24.9 | 80 | 50 | 100 | 220 |
| | R-70 | 200 | 21.7 | 80 | 50 | 100 | 220 |
| **FIS IG M 16** | 5.8 | 240 | 35.8 | 96 | 60 | 120 | 260 |
| | 8.8 | 240 | 35.8 | 96 | 60 | 120 | 260 |
| | R-70 | 240 | 35.8 | 96 | 60 | 120 | 260 |
| **FIS IG M 20** | 5.8 | 300 | 52.4 | 120 | 75 | 150 | 320 |
| | 8.8 | 300 | 52.4 | 120 | 75 | 150 | 320 |
| | R-70 | 300 | 52.4 | 120 | 75 | 150 | 320 |

Notes:
Drill diameter in the wood 4 mm larger than the outer diameter of the internal threaded anchor FIS IG.
Steel failure in the stress cross-section of the FIS IG and the bolt against the yield point and composite failure in the lateral surface are taken into account.
Any failure of the timber cross-section, e.g. transverse tensile failure, must be checked separately.
Only use non-corroding FIS IG with non-corroding screws and FIS IG made of gvz. with screws made of gvz.
Minimum screw-in depth of the screws in the FIS IG in accordance with Z-9.1-914.
Partial safety factors $\gamma_{M,H} = 1.3$; $\gamma_{M,S} = 1.25$; $\gamma_{F,global} = 1.4$ and $k_{mod} = 0.9$ from KLED short and NKL 1+2 taken into account.
Values valid for glued laminated timber ≥ GL24h. Higher load-bearing capacities may be possible for higher strength classes.
For groups of steel bars, as well as for combined loading from tensile and shear loads, as well as for bending stress, see Z-9.1-914 and DIN EN 1995-1-1 / NA.
All mechanical values given must be considered in relation to the assumptions made and are examples of dimensioning.
This is a planning aid. Projects must be dimensioned exclusively by structural engineers!
All values are subject to typesetting and printing errors.

# Loads FIS EM Plus with FIS A under shear load





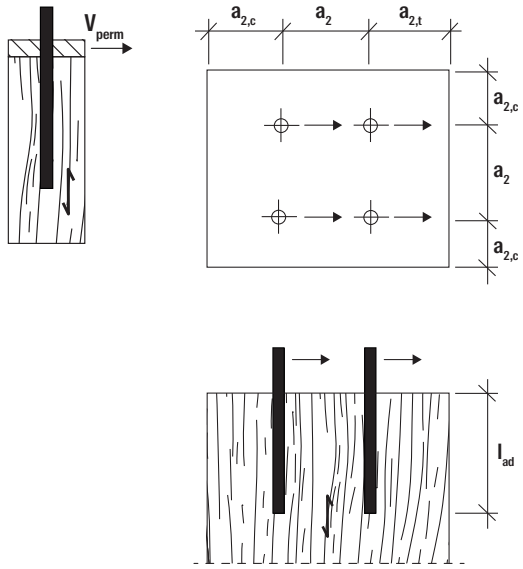

Injection system FIS EM Plus with anchor rod FIS A

**Permissible shear loads of a single anchor rod in glued laminated timber components ≥ GL24h in a wood-/wood-connection**
**Anchor rods glued in parallel on one side (component 2) and perpendicular to the grain direction of the timber component (component 1) on the other side**
For the design, the entire approval Z-9.1-914 and DIN EN 1995-1-1:2010-12 / NA must be observed.

| Type | Material/ surface [-] | Gluing length in component 1 (perpendicular to the fiber) $l_{ad,1}$ [mm] | Gluing length in component 2 (parallel to the fiber) $l_{ad,2}$ [mm] | Permissible shear load $V_{perm}$ [kN] | Minimum spacing $a_1 = a_2$ [mm] | Minimum edge distance (unloaded) Component 2 $a_{2,c}$ [mm] | Minimum edge distance (loaded) Component 2 $a_{2,t}$ [mm] | Minimum lateral edge distance (unloaded) Component 1 $a_{4,c}$ [mm] | Minimum endgrain edge distance (unloaded) Component 1 $a_{3,c}$ [mm] | Minimum endgrain edge distance (loaded) Component 1 $a_{3,t}$ [mm] | Minimum component dimensions Component 1 $b_1 / d_1$ [mm] | Minimum component dimensions Component 2 $b_2 / d_2$ [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **FIS A M 6** | 5.8 | 100 | 240 | 0.7 | 30 | 15 | 24 | 18 | 40 | 80 | 36 / 120 | 30 / 39 |
| | 8.8 | 100 | 240 | 0.9 | 30 | 15 | 24 | 18 | 40 | 80 | 36 / 120 | 30 / 39 |
| | R-70 | 100 | 240 | 0.8 | 30 | 15 | 24 | 18 | 40 | 80 | 36 / 120 | 30 / 39 |
| **FIS A M 8** | 5.8 | 100 | 320 | 1.1 | 40 | 20 | 32 | 24 | 40 | 80 | 40 / 120 | 40 / 52 |
| | 8.8 | 100 | 320 | 1.4 | 40 | 20 | 32 | 24 | 40 | 80 | 40 / 120 | 40 / 52 |
| | R-70 | 100 | 320 | 1.3 | 40 | 20 | 32 | 24 | 40 | 80 | 40 / 120 | 40 / 52 |
| **FIS A M 10** | 5.8 | 100 | 400 | 1.7 | 50 | 25 | 40 | 30 | 40 | 80 | 50 / 120 | 50 / 65 |
| | 8.8 | 100 | 400 | 2.1 | 50 | 25 | 40 | 30 | 40 | 80 | 50 / 120 | 50 / 65 |
| | R-70 | 100 | 400 | 1.9 | 50 | 25 | 40 | 30 | 40 | 80 | 50 / 120 | 50 / 65 |
| **FIS A M 12** | 5.8 | 120 | 480 | 2.3 | 60 | 30 | 48 | 36 | 42 | 84 | 60 / 140 | 60 / 78 |
| | 8.8 | 120 | 480 | 2.8 | 60 | 30 | 48 | 36 | 42 | 84 | 60 / 140 | 60 / 78 |
| | R-70 | 120 | 480 | 2.6 | 60 | 30 | 48 | 36 | 42 | 84 | 60 / 140 | 60 / 78 |
| **FIS A M 16** | 5.8 | 160 | 640 | 3.7 | 80 | 40 | 64 | 48 | 56 | 112 | 80 / 180 | 80 / 104 |
| | 8.8 | 160 | 640 | 4.5 | 80 | 40 | 64 | 48 | 56 | 112 | 80 / 180 | 80 / 104 |
| | R-70 | 160 | 640 | 4.2 | 80 | 40 | 64 | 48 | 56 | 112 | 80 / 180 | 80 / 104 |
| **FIS A M 20** | 5.8 | 200 | 800 | 5.2 | 100 | 50 | 80 | 60 | 70 | 140 | 100 / 220 | 100 / 130 |
| | 8.8 | 200 | 800 | 6.5 | 100 | 50 | 80 | 60 | 70 | 140 | 100 / 220 | 100 / 130 |
| | R-70 | 200 | 800 | 6.1 | 100 | 50 | 80 | 60 | 70 | 140 | 100 / 220 | 100 / 130 |
| **FIS A M 24** | 5.8 | 240 | 960 | 7.0 | 120 | 60 | 96 | 72 | 84 | 168 | 120 / 260 | 120 / 156 |
| | 8.8 | 240 | 960 | 8.6 | 120 | 60 | 96 | 72 | 84 | 168 | 120 / 260 | 120 / 156 |
| | R-70 | 240 | 960 | 8.1 | 120 | 60 | 96 | 72 | 84 | 168 | 120 / 260 | 120 / 156 |
| **FIS A M 30** | 5.8 | 300 | 1000 | 9.8 | 150 | 75 | 120 | 90 | 105 | 210 | 150 / 320 | 150 / 195 |
| | 8.8 | 300 | 1000 | 12.1 | 150 | 75 | 120 | 90 | 105 | 210 | 150 / 320 | 150 / 195 |
| | R-70 | 300 | 1000 | 11.3 | 150 | 75 | 120 | 90 | 105 | 210 | 150 / 320 | 150 / 195 |

Notes:
Drill diameter in the wood 4 mm larger than the outer diameter of the steel rods.
Partial safety factors $\gamma_{M,H}$ = 1.3; $\gamma_{M,S}$ = 1.25; $\gamma_{F,global}$ = 1.4 and $k_{mod}$ = 0.9 from KLED short and NKL 1+2 taken into account.
Values valid for glued laminated timber ≥ GL24h. Higher load-bearing capacities may be possible for higher strength classes.
Possible failure of the timber cross-section such as transverse tensile failure and block shear failure must be checked separately!
For groups of steel bars, as well as for combined loading from tensile and shear loads, as well as for bending loads, see Z-9.1-914 and DIN EN 1995-1-1 / NA.
All specified mechanical values must be considered depending on the assumptions made and represent design examples.
This is a planning aid. Projects must be dimensioned exclusively by structural engineers!
All values are subject to typesetting and printing errors.

# Loads FIS EM Plus with FIS A under shear load




**Injection system FIS EM Plus with anchor rod FIS A**

**Permissible shear loads of a single anchor rod in glued laminated timber components ≥ GL24h in a steel / timber connection**
**Anchor rods glued in parallel to the grain direction of the timber component**
For the design, the entire approval Z-9.1-914 and DIN EN 1995-1-1:2010-12 / NA must be observed.

| Type | Material/surface [-] | Gluing length $l_{ad}$ [mm] | Permissible shear load (thin steel attachment part) $t \le 0,5 \cdot d$ $V_{perm}$ [kN] | Permissible shear load (thick steel attachment part) $t \ge d$ [1] $V_{perm}$ [kN] | Minimum spacing $a_2$ [mm] | Minimum edge distance (unloaded) $a_{2,c}$ [mm] | Minimum edge distance (loaded) $a_{2,t}$ [mm] | Minimum component dimensions b / d [mm] |
|---|---|---|---|---|---|---|---|---|
| **FIS A M 6** | 5.8 | 100 | 0.4 | 0.7 | 30 | 15 | 24 | 30 / 39 |
| | 5.8 | 240 | 0.6 | 0.9 | 30 | 15 | 24 | 30 / 39 |
| | 8.8 | 100 | 0.4 | 0.8 | 30 | 15 | 24 | 30 / 39 |
| | 8.8 | 240 | 0.8 | 1.1 | 30 | 15 | 24 | 30 / 39 |
| | R-70 | 100 | 0.4 | 0.8 | 30 | 15 | 24 | 30 / 39 |
| | R-70 | 240 | 0.7 | 1.0 | 30 | 15 | 24 | 30 / 39 |
| **FIS A M 8** | 5.8 | 100 | 0.6 | 1.0 | 40 | 20 | 32 | 40 / 52 |
| | 5.8 | 320 | 1.0 | 1.4 | 40 | 20 | 32 | 40 / 52 |
| | 8.8 | 100 | 0.6 | 1.2 | 40 | 20 | 32 | 40 / 52 |
| | 8.8 | 320 | 1.3 | 1.8 | 40 | 20 | 32 | 40 / 52 |
| | R-70 | 100 | 0.6 | 1.1 | 40 | 20 | 32 | 40 / 52 |
| | R-70 | 320 | 1.2 | 1.7 | 40 | 20 | 32 | 40 / 52 |
| **FIS A M 10** | 5.8 | 100 | 0.7 | 1.4 | 50 | 25 | 40 | 50 / 65 |
| | 5.8 | 400 | 1.5 | 2.1 | 50 | 25 | 40 | 50 / 65 |
| | 8.8 | 100 | 0.7 | 1.7 | 50 | 25 | 40 | 50 / 65 |
| | 8.8 | 400 | 1.9 | 2.7 | 50 | 25 | 40 | 50 / 65 |
| | R-70 | 100 | 0.7 | 1.6 | 50 | 25 | 40 | 50 / 65 |
| | R-70 | 400 | 1.8 | 2.5 | 50 | 25 | 40 | 50 / 65 |
| **FIS A M 12** | 5.8 | 120 | 1.0 | 2.0 | 60 | 30 | 48 | 60 / 78 |
| | 5.8 | 480 | 2.1 | 3.0 | 60 | 30 | 48 | 60 / 78 |
| | 8.8 | 120 | 1.0 | 2.4 | 60 | 30 | 48 | 60 / 78 |
| | 8.8 | 480 | 2.6 | 3.7 | 60 | 30 | 48 | 60 / 78 |
| | R-70 | 120 | 1.0 | 2.2 | 60 | 30 | 48 | 60 / 78 |
| | R-70 | 480 | 2.4 | 3.5 | 60 | 30 | 48 | 60 / 78 |

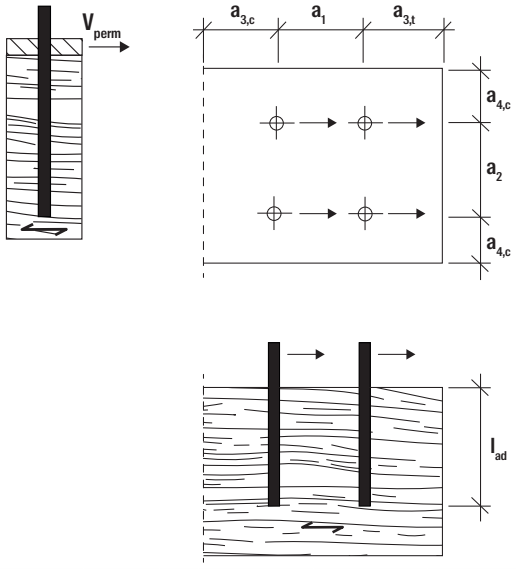
| Type | Material/surface [-] | Gluing length $l_{ad}$ [mm] | Permissible shear load (thin steel attachment part) t ≤ 0,5 · d $V_{perm}$ [kN] | Permissible shear load (thick steel attachment part) t ≥ d[1] $V_{perm}$ [kN] | Minimum spacing $a_2$ [mm] | Minimum edge distance (unloaded) $a_{2,c}$ [mm] | Minimum edge distance (loaded) $a_{2,t}$ [mm] | Minimum component dimensions b / d [mm] |
|---|---|---|---|---|---|---|---|---|
| **FIS A M 16** | 5.8 | 160 | 1.8 | 3.4 | 80 | 40 | 64 | 80 / 104 |
| | 5.8 | 640 | 3.5 | 4.9 | 80 | 40 | 64 | 80 / 104 |
| | 8.8 | 160 | 1.8 | 3.9 | 80 | 40 | 64 | 80 / 104 |
| | 8.8 | 640 | 4.3 | 6.1 | 80 | 40 | 64 | 80 / 104 |
| | R-70 | 160 | 1.8 | 3.8 | 80 | 40 | 64 | 80 / 104 |
| | R-70 | 640 | 4.0 | 5.7 | 80 | 40 | 64 | 80 / 104 |
| **FIS A M 20** | 5.8 | 200 | 2.7 | 5.0 | 100 | 50 | 80 | 100 / 130 |
| | 5.8 | 800 | 5.1 | 7.2 | 100 | 50 | 80 | 100 / 130 |
| | 8.8 | 200 | 2.7 | 5.8 | 100 | 50 | 80 | 100 / 130 |
| | 8.8 | 800 | 6.3 | 9.0 | 100 | 50 | 80 | 100 / 130 |
| | R-70 | 200 | 2.7 | 5.6 | 100 | 50 | 80 | 100 / 130 |
| | R-70 | 800 | 5.9 | 8.4 | 100 | 50 | 80 | 100 / 130 |
| **FIS A M 24** | 5.8 | 240 | 3.7 | 6.9 | 120 | 60 | 96 | 120 / 156 |
| | 5.8 | 960 | 6.9 | 9.8 | 120 | 60 | 96 | 120 / 156 |
| | 8.8 | 240 | 3.8 | 8.0 | 120 | 60 | 96 | 120 / 156 |
| | 8.8 | 960 | 8.6 | 12.2 | 120 | 60 | 96 | 120 / 156 |
| | R-70 | 240 | 3.8 | 7.6 | 120 | 60 | 96 | 120 / 156 |
| | R-70 | 960 | 8.1 | 11.4 | 120 | 60 | 96 | 120 / 156 |
| **FIS A M 30** | 5.8 | 300 | 5.5 | 10.0 | 150 | 75 | 120 | 150 / 195 |
| | 5.8 | 1000 | 10.0 | 14.2 | 150 | 75 | 120 | 150 / 195 |
| | 8.8 | 300 | 5.5 | 11.5 | 150 | 75 | 120 | 150 / 195 |
| | 8.8 | 1000 | 12.5 | 17.6 | 150 | 75 | 120 | 150 / 195 |
| | R-70 | 300 | 5.5 | 11.0 | 150 | 75 | 120 | 150 / 195 |
| | R-70 | 1000 | 11.7 | 16.5 | 150 | 75 | 120 | 150 / 195 |

[1] Tolerance of the hole diameter in the steel part must be ≤ 0.1 · d in accordance with DIN EN 1995-1-1

Notes:
Drill diameter in the wood 4 mm larger than the outer diameter of the steel rods.
Partial safety factors $\gamma_{M,H}$ = 1.3; $\gamma_{M,S}$ = 1.25; $\gamma_{F,global}$ = 1.4 and $k_{mod}$ = 0.9 from KLED short and NKL 1+2 taken into account.
Values valid for glued laminated timber ≥ GL24h. Higher load-bearing capacities may be possible for higher strength classes.
Possible failure of the timber cross-section such as transverse tensile failure and block shear failure must be checked separately!
For groups of steel bars, as well as for combined loading from tensile and shear loads, as well as for bending loads, see Z-9.1-914 and DIN EN 1995-1-1 / NA.
All specified mechanical values must be considered depending on the assumptions made and represent design examples.
This is a planning aid. Projects must be dimensioned exclusively by structural engineers!
All values are subject to typesetting and printing errors.

# Load table FIS EM Plus with FIS A under shear load






**Injection system FIS EM Plus with anchor rod FIS A**

**Permissible shear loads of a single anchor rod in glued laminated timber components ≥ GL24h in a steel / timber connection**
**Anchor rods bonded perpendicular to the grain direction of the timber component**
For the design, the entire approval Z-9.1-914 and DIN EN 1995-1-1:2010-12 / NA must be observed.

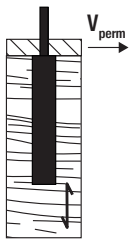
| Type | Material/ surface [-] | Gluing length $l_{ad}$ [mm] | Permissible shear load (thin steel attachment part) $t \le 0,5 \cdot d$ $V_{perm}$ [kN] | Permissible shear load (thick steel attachment) $t \ge d$ [1] $V_{perm}$ [kN] | Minimum spacing in fiber direction $a_1$ [mm] | Minimum spacing perpendicular to the fiber $a_2$ [mm] | Minimum lateral edge distance (unloaded) $a_{4,c}$ [mm] | Minimum edge distance end grain (loaded) $a_{3,t}$ [mm] | Minimum edge distance end grain (unloaded) $a_{3,ct}$ [mm] | Minimum component dimensions b / d [mm] |
|---|---|---|---|---|---|---|---|---|---|---|
| **FIS A M 6** | 5.8 | 100 | 1.9 | 2.7 | 30 | 30 | 18 | 80 | 40 | 36 / 120 |
| | 5.8 | 240 | 1.9 | 2.7 | 30 | 30 | 18 | 80 | 40 | 36 / 260 |
| | 8.8 | 100 | 2.4 | 3.4 | 30 | 30 | 18 | 80 | 40 | 36 / 120 |
| | 8.8 | 240 | 2.4 | 3.4 | 30 | 30 | 18 | 80 | 40 | 36 / 260 |
| | R-70 | 100 | 2.2 | 3.2 | 30 | 30 | 18 | 80 | 40 | 36 / 120 |
| | R-70 | 240 | 2.2 | 3.2 | 30 | 30 | 18 | 80 | 40 | 36 / 260 |
| **FIS A M 8** | 5.8 | 100 | 3.2 | 4.6 | 40 | 36 | 24 | 80 | 40 | 48 / 120 |
| | 5.8 | 320 | 3.2 | 4.6 | 40 | 36 | 24 | 80 | 40 | 48 / 340 |
| | 8.8 | 100 | 4.0 | 5.7 | 40 | 36 | 24 | 80 | 40 | 48 / 120 |
| | 8.8 | 320 | 4.0 | 5.7 | 40 | 36 | 24 | 80 | 40 | 48 / 340 |
| | R-70 | 100 | 3.8 | 5.3 | 40 | 36 | 24 | 80 | 40 | 48 / 120 |
| | R-70 | 320 | 3.8 | 5.3 | 40 | 36 | 24 | 80 | 40 | 48 / 340 |
| **FIS A M 10** | 5.8 | 100 | 4.8 | 6.8 | 50 | 42 | 30 | 80 | 40 | 60 / 120 |
| | 5.8 | 400 | 4.8 | 6.8 | 50 | 42 | 30 | 80 | 40 | 60 / 420 |
| | 8.8 | 100 | 6.0 | 8.3 | 50 | 42 | 30 | 80 | 40 | 60 / 120 |
| | 8.8 | 400 | 6.0 | 8.4 | 50 | 42 | 30 | 80 | 40 | 60 / 420 |
| | R-70 | 100 | 5.6 | 7.9 | 50 | 42 | 30 | 80 | 40 | 60 / 120 |
| | R-70 | 400 | 5.6 | 7.9 | 50 | 42 | 30 | 80 | 40 | 60 / 420 |
| **FIS A M 12** | 5.8 | 120 | 6.6 | 9.4 | 60 | 48 | 36 | 84 | 42 | 72 / 140 |
| | 5.8 | 480 | 6.6 | 9.4 | 60 | 48 | 36 | 84 | 42 | 72 / 500 |
| | 8.8 | 120 | 8.2 | 11.6 | 60 | 48 | 36 | 84 | 42 | 72 / 140 |
| | 8.8 | 480 | 8.3 | 11.7 | 60 | 48 | 36 | 84 | 42 | 72 / 500 |
| | R-70 | 120 | 7.7 | 10.9 | 60 | 48 | 36 | 84 | 42 | 72 / 140 |
| | R-70 | 480 | 7.7 | 10.9 | 60 | 48 | 36 | 84 | 42 | 72 / 500 |

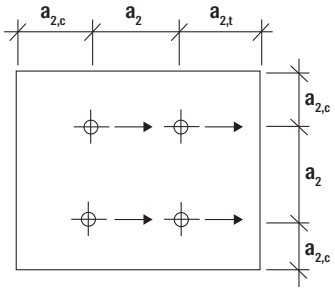
| Type | Material/ surface [-] | Gluing length $l_{ad}$ [mm] | Permissible shear load (thin steel attachment part) t ≤ 0,5 · d $V_{perm}$ [kN] | Permissible shear load (thick steel attachment) t ≥ d[1] $V_{perm}$ [kN] | Minimum spacing in fiber direction $a_1$ [mm] | Minimum center distance perpendicular to the fiber $a_2$ [mm] | Minimum lateral edge distance (unloaded) $a_{4,c}$ [mm] | Minimum edge distance end grain (loaded) $a_{3,t}$ [mm] | Minimum edge distance end grain (unloaded) $a_{3,ct}$ [mm] | Minimum component dimensions b / d [mm] |
|---|---|---|---|---|---|---|---|---|---|---|
| **FIS A M 16** | 5.8 | 160 | 11.0 | 15.5 | 80 | 60 | 48 | 112 | 56 | 96 / 180 |
| | 5.8 | 640 | 11.0 | 15.5 | 80 | 60 | 48 | 112 | 56 | 96 / 660 |
| | 8.8 | 160 | 13.6 | 19.3 | 80 | 60 | 48 | 112 | 56 | 96 / 180 |
| | 8.8 | 640 | 13.6 | 19.3 | 80 | 60 | 48 | 112 | 56 | 96 / 660 |
| | R-70 | 160 | 12.8 | 18.1 | 80 | 60 | 48 | 112 | 56 | 96 / 180 |
| | R-70 | 640 | 12.8 | 18.1 | 80 | 60 | 48 | 112 | 56 | 96 / 660 |
| **FIS A M 20** | 5.8 | 200 | 16.1 | 22.8 | 100 | 72 | 60 | 140 | 70 | 120 / 220 |
| | 5.8 | 800 | 16.1 | 22.8 | 100 | 72 | 60 | 140 | 70 | 120 / 820 |
| | 8.8 | 200 | 20.0 | 28.3 | 100 | 72 | 60 | 140 | 70 | 120 / 220 |
| | 8.8 | 800 | 20.0 | 28.3 | 100 | 72 | 60 | 140 | 70 | 120 / 820 |
| | R-70 | 200 | 18.8 | 26.5 | 100 | 72 | 60 | 140 | 70 | 120 / 220 |
| | R-70 | 800 | 18.8 | 26.6 | 100 | 72 | 60 | 140 | 70 | 120 / 820 |
| **FIS A M 24** | 5.8 | 240 | 21.9 | 31.0 | 120 | 84 | 72 | 168 | 84 | 144 / 260 |
| | 5.8 | 960 | 22.0 | 31.1 | 120 | 84 | 72 | 168 | 84 | 144 / 980 |
| | 8.8 | 240 | 27.3 | 38.6 | 120 | 84 | 72 | 168 | 84 | 144 / 260 |
| | 8.8 | 960 | 27.3 | 38.6 | 120 | 84 | 72 | 168 | 84 | 144 / 980 |
| | R-70 | 240 | 25.6 | 36.2 | 120 | 84 | 72 | 168 | 84 | 144 / 260 |
| | R-70 | 960 | 25.6 | 36.2 | 120 | 84 | 72 | 168 | 84 | 144 / 980 |
| **FIS A M 30** | 5.8 | 300 | 31.7 | 44.8 | 150 | 102 | 90 | 210 | 105 | 180 / 320 |
| | 5.8 | 1000 | 31.7 | 44.9 | 150 | 102 | 90 | 210 | 105 | 180 / 1020 |
| | 8.8 | 300 | 39.4 | 55.7 | 150 | 102 | 90 | 210 | 105 | 180 / 320 |
| | 8.8 | 1000 | 39.4 | 55.8 | 150 | 102 | 90 | 210 | 105 | 180 / 1020 |
| | R-70 | 300 | 36.9 | 52.2 | 150 | 102 | 90 | 210 | 105 | 180 / 320 |
| | R-70 | 1000 | 37.0 | 52.3 | 150 | 102 | 90 | 210 | 105 | 180 / 1020 |

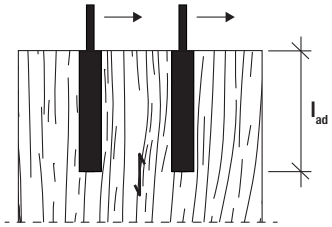
[1] Tolerance of the hole diameter in the steel part must be ≤ 0.1 · d in accordance with DIN EN 1995-1-1

Notes:
Drill diameter in the wood 4 mm larger than the outer diameter of the steel rods.
Partial safety factors $\gamma_{M,H}$ = 1.3; $\gamma_{M,S}$ = 1.25; $\gamma_{F,global}$ = 1.4 and $k_{mod}$ = 0.9 from KLED short and NKL 1+2 taken into account.
Values valid for glued laminated timber ≥ GL24h. Higher load-bearing capacities may be possible for higher strength classes.
Possible failure of the timber cross-section such as transverse tensile failure and block shear failure must be checked separately!
For groups of steel bars, as well as for combined loading from tensile and shear loads, as well as for bending loads, see Z-9.1-914 and DIN EN 1995-1-1 / NA.
All specified mechanical values must be considered depending on the assumptions made and represent design examples.
This is a planning aid. Projects must be dimensioned exclusively by structural engineers!
All values are subject to typesetting and printing errors.

# Loads FIS EM Plus with FIS IG under shear load




**Injection system FIS EM Plus with internally threaded anchors FIS IG**

**Permissible shear loads of a single internally threaded anchor in glued laminated timber components ≥ GL24h in a wood-/wood-connection**
**Internally threaded anchor glued in parallel to the grain direction of the timber component**
For the design, the entire approval Z-9.1-914 and DIN EN 1995-1-1:2010-12 / NA must be observed.
Specialities for internally threaded anchors according to the design proposal of FITT gGmbH, Prof. Dr.-Ing. Enders-Comberg

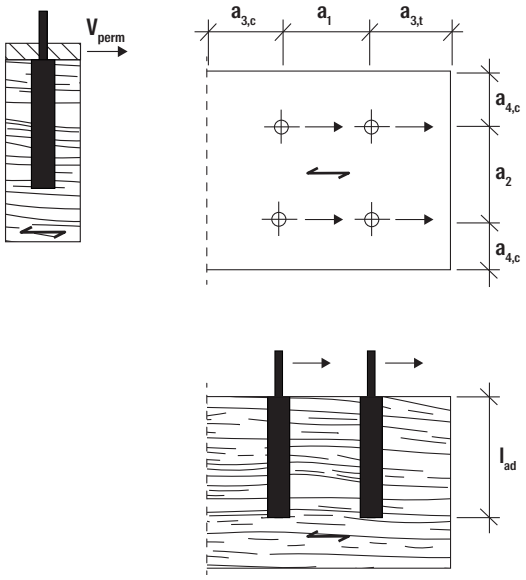
| Type | Steel grade of the screw [-] | Gluing length $l_{ad}$ [mm] | Permissible shear load (thin steel attachment part) $t \le 0{,}5 \cdot d$ $V_{perm}$ [kN] | Permissible shear load (thick steel attachment part) $t \ge d$[1] $V_{perm}$ [kN] | Minimum spacing $a_2$ [mm] | Minimum edge distance (unloaded) $a_{2,c}$ [mm] | Minimum edge distance (loaded) $a_{2,t}$ [mm] | Minimum component dimensions b / d [mm] |
|---|---|---|---|---|---|---|---|---|
| **FIS IG M8** | 5.8 | 120 | 0.6 | 1.1 | 60 | 30 | 48 | 60 / 78 |
| | 8.8 | 120 | 0.6 | 1.2 | 60 | 30 | 48 | 60 / 78 |
| | R-70 | 120 | 0.6 | 1.2 | 60 | 30 | 48 | 60 / 78 |
| **FIS IG M10** | 5.8 | 160 | 1.1 | 1.7 | 80 | 40 | 64 | 80 / 104 |
| | 8.8 | 160 | 1.1 | 1.9 | 80 | 40 | 64 | 80 / 104 |
| | R-70 | 160 | 1.1 | 1.8 | 80 | 40 | 64 | 80 / 104 |
| **FIS IG M12** | 5.8 | 200 | 1.5 | 2.4 | 100 | 50 | 80 | 100 / 130 |
| | 8.8 | 200 | 1.5 | 2.6 | 100 | 50 | 80 | 100 / 130 |
| | R-70 | 200 | 1.5 | 2.5 | 100 | 50 | 80 | 100 / 130 |
| **FIS IG M16** | 5.8 | 240 | 2.0 | 3.3 | 120 | 60 | 96 | 120 / 156 |
| | 8.8 | 240 | 2.0 | 3.7 | 120 | 60 | 96 | 120 / 156 |
| | R-70 | 240 | 2.0 | 3.6 | 120 | 60 | 96 | 120 / 156 |
| **FIS IG M20** | 5.8 | 300 | 2.7 | 4.6 | 150 | 75 | 120 | 150 / 195 |
| | 8.8 | 300 | 2.7 | 5.1 | 150 | 75 | 120 | 150 / 195 |
| | R-70 | 300 | 2.7 | 4.9 | 150 | 75 | 120 | 150 / 195 |

[1] Tolerance of the hole diameter in the steel part must be ≤ 0.1 · d in accordance with DIN EN 1995-1-1

Notes:
Drill diameter in the wood 4 mm larger than the outer diameter of the steel rods.
Partial safety factors $\gamma_{M,H} = 1{,}3$; $\gamma_{M,S} = 1{,}25$; $\gamma_{F,global} = 1{,}4$ and $k_{mod} = 0{,}9$ from KLED short and NKL 1+2 taken into account.
Values valid for glued laminated timber ≥ GL24h. Higher load-bearing capacities may be possible for higher strength classes.
For groups of steel bars, as well as for combined loading from tensile and shear loads, as well as for bending loads, see Z-9.1-914 and DIN EN 1995-1-1 / NA.
All specified mechanical values must be considered depending on the assumptions made and are examples of dimensioning.
This is a planning aid. Projects must be dimensioned exclusively by structural engineers!
All values are subject to typesetting and printing errors.

# Loads FIS EM Plus with FIS IG under shear load






**Injection system FIS EM Plus with internally threaded anchors FIS IG**

**Permissible shear loads of a single internally threaded anchor in glued laminated timber components ≥ GL24h in a wood-/wood-connection**
**Internally threaded anchor glued in perpendicular to the grain direction of the timber component**
For the design, the entire approval Z-9.1-914 and DIN EN 1995-1-1:2010-12 / NA must be observed.
Specialities for internally threaded anchors according to the design proposal of FITT gGmbH, Prof. Dr.-Ing. Enders-Comberg

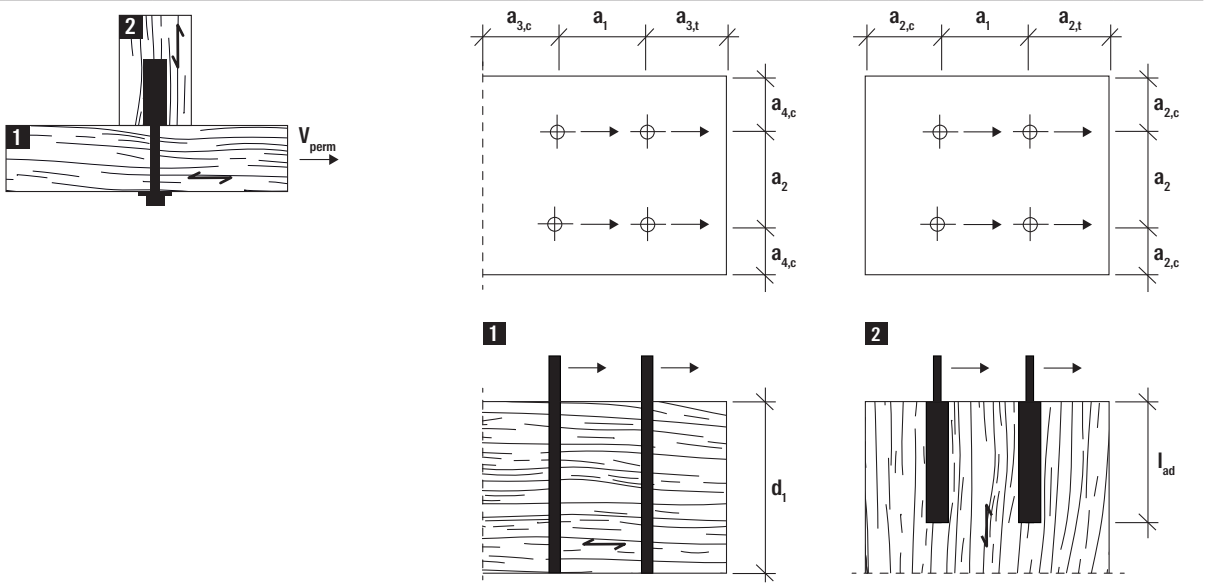
| Type | Steel grade of the screw [-] | Gluing length in timber component $l_{ad}$ [mm] | Permissible shear load (thin steel attachment part) t ≤ 0,5 · d $V_{perm}$ [kN] | Permissible shear load (thick steel attachment part) t ≥ d[1] $V_{perm}$ [kN] | Minimum spacing $a_1$ [mm] | Minimum spacing $a_2$ [mm] | Minimum edge distance end grain (unloaded) $a_{3,c}$ [mm] | Minimum endgrain edge distance end grain (loaded) $a_{3,t}$ [mm] | Minimum endgrain edge distance lateral (unloaded) $a_{4,c}$ [mm] | Minimum component dimensions b / d [mm] |
|---|---|---|---|---|---|---|---|---|---|---|
| **FIS IG M8** | 5.8 | 120 | 5.3 | 6.5 | 60 | 36 | 42 | 84 | 36 | 72 / 140 |
| | 8.8 | 120 | 5.3 | 7.1 | 60 | 36 | 42 | 84 | 36 | 72 / 140 |
| | R-70 | 120 | 5.5 | 7.1 | 60 | 36 | 42 | 84 | 36 | 72 / 140 |
| **FIS IG M10** | 5.8 | 160 | 9.7 | 11.3 | 80 | 48 | 56 | 112 | 48 | 96 / 180 |
| | 8.8 | 160 | 9.7 | 12.0 | 80 | 48 | 56 | 112 | 48 | 96 / 180 |
| | R-70 | 160 | 10.0 | 12.0 | 80 | 48 | 56 | 112 | 48 | 96 / 180 |
| **FIS IG M12** | 5.8 | 200 | 14.7 | 16.8 | 100 | 60 | 70 | 140 | 60 | 120 / 220 |
| | 8.8 | 200 | 14.7 | 17.8 | 100 | 60 | 70 | 140 | 60 | 120 / 220 |
| | R-70 | 200 | 15.3 | 17.8 | 100 | 60 | 70 | 140 | 60 | 120 / 220 |
| **FIS IG M16** | 5.8 | 240 | 20.7 | 24.1 | 120 | 72 | 84 | 168 | 72 | 144 / 260 |
| | 8.8 | 240 | 20.7 | 25.8 | 120 | 72 | 84 | 168 | 72 | 144 / 260 |
| | R-70 | 240 | 21.4 | 25.8 | 120 | 72 | 84 | 168 | 72 | 144 / 260 |
| **FIS IG M20** | 5.8 | 300 | 31.6 | 36.2 | 150 | 90 | 105 | 210 | 90 | 180 / 320 |
| | 8.8 | 300 | 31.6 | 38.5 | 150 | 90 | 105 | 210 | 90 | 180 / 320 |
| | R-70 | 300 | 32.7 | 38.6 | 150 | 90 | 105 | 210 | 90 | 180 / 320 |

[1] Tolerance of the hole diameter in the steel part must be ≤ 0.1 · d in accordance with DIN EN 1995-1-1

Notes:
Drill diameter in the wood 4 mm larger than the outer diameter of the steel rods.
Partial safety factors $\gamma_{M,H}$ = 1,3; $\gamma_{M,S}$ = 1,25; $\gamma_{F,global}$ = 1,4 and $k_{mod}$ = 0,9 from KLED short and NKL 1+2 taken into account.
Values valid for glued laminated timber ≥ GL24h. Higher load-bearing capacities may be possible for higher strength classes.
For groups of steel bars, as well as for combined loading from tensile and shear loads, as well as for bending loads, see Z-9.1-914 and DIN EN 1995-1-1 / NA.
All specified mechanical values must be considered depending on the assumptions made and are examples of dimensioning.
This is a planning aid. Projects must be dimensioned exclusively by structural engineers!
All values are subject to typesetting and printing errors.

# Loads FIS EM Plus with FIS IG under shear load






**Injection system FIS EM Plus with internally threaded anchors FIS IG**

**Permissible shear loads of a single internally threaded anchor in glued laminated timber components ≥ GL24h in a wood-/wood-connection**
**Internally threaded anchor glued in parallel on one side (component 2) and perpendicular to the grain direction of the timber component (component 1) screwed through as a threaded bolt on the other side**
For the design, the entire approval Z-9.1-914 and DIN EN 1995-1-1:2010-12 / NA must be observed.
Specialities for internally threaded anchors according to the design proposal of FITT gGmbH, Prof. Dr.-Ing. Enders-Comberg

| Type | Steel grade of the screw [-] | Gluing length in component 1 (perpendicluar to the fiber) $d_1$ [mm] | Gluing length in component 2 (parallel to the fiber) $l_{ad,2}$ [mm] | Permissible shear load $V_{perm}$ [kN] | Washers diameter on component 1 $d_u$ [mm] | Minimum spacing $a_1 = a_2$ [mm] | Minimum edge distance (unloaded) Component 2 $a_{2,c}$ [mm] | Minimum edge distance (loaded) Component 2 $a_{2,t}$ [mm] | Minimum edge distance lateral (unloaded) Component 1 $a_{4,c}$ [mm] | Minimum edge distance end grain (unloaded) Component 1 $a_{3,c}$ [mm] | Minimum edge distance end grain (loaded) Component 1 $a_{3,t}$ [mm] | Minimum component dimensions Component 1 $b_1 / d_1$ [mm] | Minimum component dimensions Component 2 $b_2 / d_2$ [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **FIS IG M8** | 5.8 | 60 | 120 | 1.1 | 28 | 60 | 30 | 48 | 24 | 32 | 80 | 48 / 60 | 60 / 78 |
| | 8.8 | 60 | 120 | 1.2 | 28 | 60 | 30 | 48 | 24 | 32 | 80 | 48 / 60 | 60 / 78 |
| | R-70 | 60 | 120 | 1.2 | 28 | 60 | 30 | 48 | 24 | 32 | 80 | 48 / 60 | 60 / 78 |
| **FIS IG M10** | 5.8 | 60 | 160 | 1.7 | 34 | 80 | 40 | 64 | 30 | 40 | 80 | 60 / 60 | 80 / 104 |
| | 8.8 | 60 | 160 | 1.9 | 34 | 80 | 40 | 64 | 30 | 40 | 80 | 60 / 60 | 80 / 104 |
| | R-70 | 60 | 160 | 1.8 | 34 | 80 | 40 | 64 | 30 | 40 | 80 | 60 / 60 | 80 / 104 |
| **FIS IG M12** | 5.8 | 60 | 200 | 2.4 | 58 | 100 | 50 | 80 | 36 | 48 | 84 | 72 / 60 | 100 / 130 |
| | 8.8 | 60 | 200 | 2.6 | 58 | 100 | 50 | 80 | 36 | 48 | 84 | 72 / 60 | 100 / 130 |
| | R-70 | 60 | 200 | 2.6 | 58 | 100 | 50 | 80 | 36 | 48 | 84 | 72 / 60 | 100 / 130 |
| **FIS IG M16** | 5.8 | 60 | 240 | 3.3 | 68 | 120 | 60 | 96 | 48 | 64 | 112 | 96 / 60 | 120 / 156 |
| | 8.8 | 60 | 240 | 3.3 | 68 | 120 | 60 | 96 | 48 | 64 | 112 | 96 / 60 | 120 / 156 |
| | R-70 | 60 | 240 | 3.3 | 68 | 120 | 60 | 96 | 48 | 64 | 112 | 96 / 60 | 120 / 156 |
| **FIS IG M20** | 5.8 | 100 | 300 | 4.7 | 80 | 150 | 75 | 120 | 60 | 80 | 140 | 120 / 100 | 150 / 195 |
| | 8.8 | 100 | 300 | 5.2 | 80 | 150 | 75 | 120 | 60 | 80 | 140 | 120 / 100 | 150 / 195 |
| | R-70 | 100 | 300 | 5.0 | 80 | 150 | 75 | 120 | 60 | 80 | 140 | 120 / 100 | 150 / 195 |

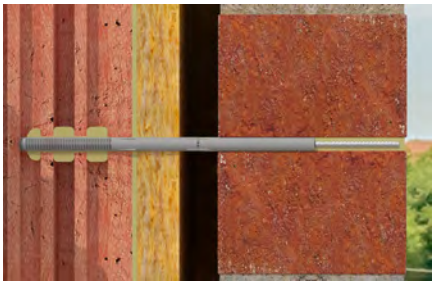
Notes:
Drill diameter in timber component 1: 1 mm larger than the outer diameter of the bolts.
Drill diameter in timber component 2: 4 mm larger than the outer diameter of the internally threaded anchor.
Partial safety factors $\gamma_{M,H} = 1,3$; $\gamma_{M,S} = 1,25$; $\gamma_{F,global} = 1,4$ and $k_{mod} = 0,9$ from KLED short and NKL 1+2 taken into account.
Values valid for glued laminated timber ≥ GL24h. Higher load-bearing capacities may be possible for higher strength classes.
For groups of steel bars, as well as for combined loading from tensile and shear loads, as well as for bending loads, see Z-9.1-914 and DIN EN 1995-1-1 / NA.
All specified mechanical values must be considered depending on the assumptions made and are examples of dimensioning.
This is a planning aid. Projects must be dimensioned exclusively by structural engineers!
All values are subject to typesetting and printing errors.

# Remedial wall tie VBS 8

The professional façade repair for two-leaf cavity walls.





Detail: Repairing outer leafs



Repairing outer leafs

## Applications

- Post-installation needling of two-skin cavity walls

## Advantages

- The expansion-force-free fixing prevents splitting and cracks. This means that VBS 8 can be used even in old and sensitive masonry.
- The drill bit diameter of just 8 mm means that a minimal amount of mortar is required for each fixing point. Thus VBS 8 is particularly economical.
- The installation is approved anywhere along the entire bed joint, thus ensuring a high level of installation safety.
- The grey colour of the injection mortar is similar to the colour of the bed joint. This means that the fixing is almost invisible to the eye.

## Certificates / Features

aBG
Z-21.3-1737

## Building materials

- Facing masonry with and without an air layer

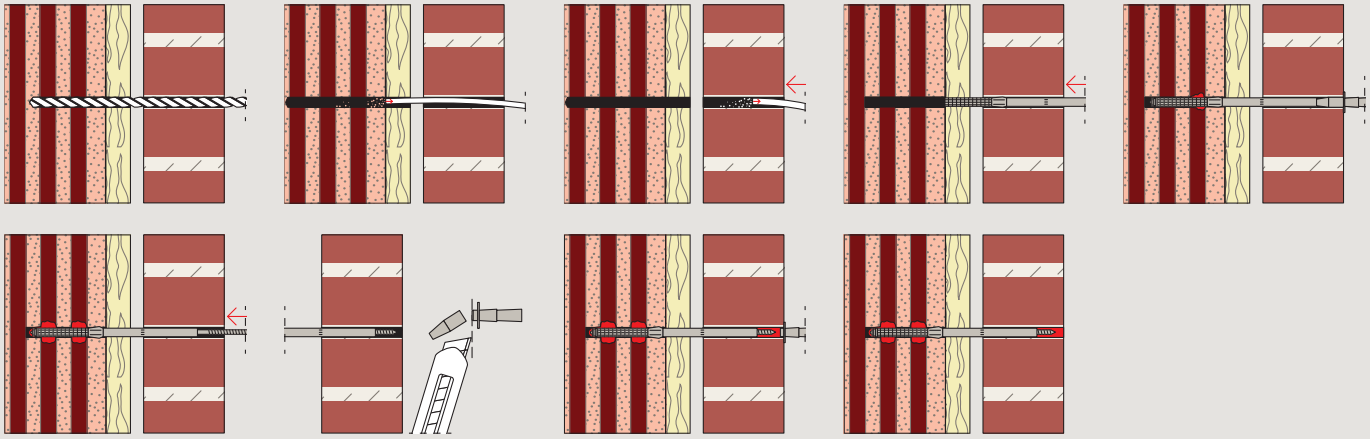
## Versions

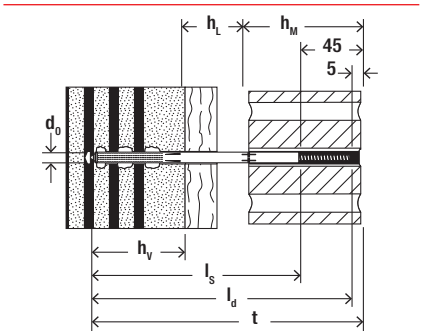
Stainless steel

## Functioning

- The remedial wall tie VBS 8 comprises a perforated plastic sleeve and a profiled stainless steel tie Ø 4 mm.
- VBS 8 is used together with the injection mortar FIS V and FIS V Plus.
- The anchor is inserted in the bed joint of the outer leaf using push-through installation.

## Installation in facing masonry with FIS V and VBS 8






## Technical data

**Remedial wall tie VBS 8**

VBS 8

| Item | Item no. | Approval DIBt | Cavity or insulation [mm] | Drill diameter $d_0$ [mm] | Depth = embedment depth $h_0 = h_s$ [mm] | Anchor length l [mm] | Anchorage depth $h_{ef}$ [mm] | Fill quantity FIS V bearing wall [scale units] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **VBS 8/20** | **078763**[1)2)] | ● | 0 - 20 | 8 | 195 | 188 | >60 | 4 | 100 |
| **VBS 8/50** | **078799**[1)2)] | ● | 20 - 50 | 8 | 225 | 218 | >60 | 4 | 100 |
| **VBS 8/80** | **078800**[1)2)] | ● | 50 - 80 | 8 | 255 | 248 | >60 | 4 | 100 |
| **VBS 8/120** | **078801**[1)2)] | ● | 80 - 120 | 8 | 295 | 288 | >60 | 6 | 100 |
| **VBS 8/150** | **078802**[1)2)] | ● | 120 - 150 | 8 | 325 | 318 | >60 | 6 | 100 |

[1)] Product consisting of perforated plastic sleeve, profiled wire R and injection nozzle.
[2)] For the closing of the curtain walling about 2-3 additional scale units of mortar are required.

## Accessories

**Accessories (Remedial wall tie VBS 8)**



ABP



SDS Plus II Pointer

| Item | Item no. | Match | Contents | Sales unit [pcs] |
|---|---|---|---|---|
| **VBS 8 cleaning set** | **090241** | – | Cleaning brush and extension tube for blow-out pump | 1 |
| **Compressed-air cleaning tool** | **093286** | Drill diameter Ø 12 - 15 mm | For professional cleaning of the drill hole | 1 |
| **SDS Plus IV 8/100/400** | **517689** | – | fischer Quattric drill bit with SDS-plus shank and short flute for drilling in concrete | 1 |

# Weather facing reconstruction system FWS II

The economical solution for the repair of triple-skin outer wall panels.








Repairing weather shells



Detail: Repairing weather shells

## Applications

- For post-installation securing of triple-skin outer wall panels
- Strengthening outer wall panels for additional exterior insulation

## Advantages

- The FWS II achieves a high shear load-bearing capacity due to its large anchor diameter. This reduces the number of reconstruction anchors needed for each plate to a minimum, thus saving costs.
- The drill hole can be drilled in one step using standard diamond drill bits. This ensures quick progress is made.
- Installation is already approved from a sub-base thickness ≥ 80 mm.
- Approval with a new measuring strategy allows a safer and economically static calculation while making it possible to document loads from temperature changes.

## Certificates / Features

aBG
Z-21.8-2029

## Building materials

- Triple-skin outer wall panels made of concrete ≥ C12/15

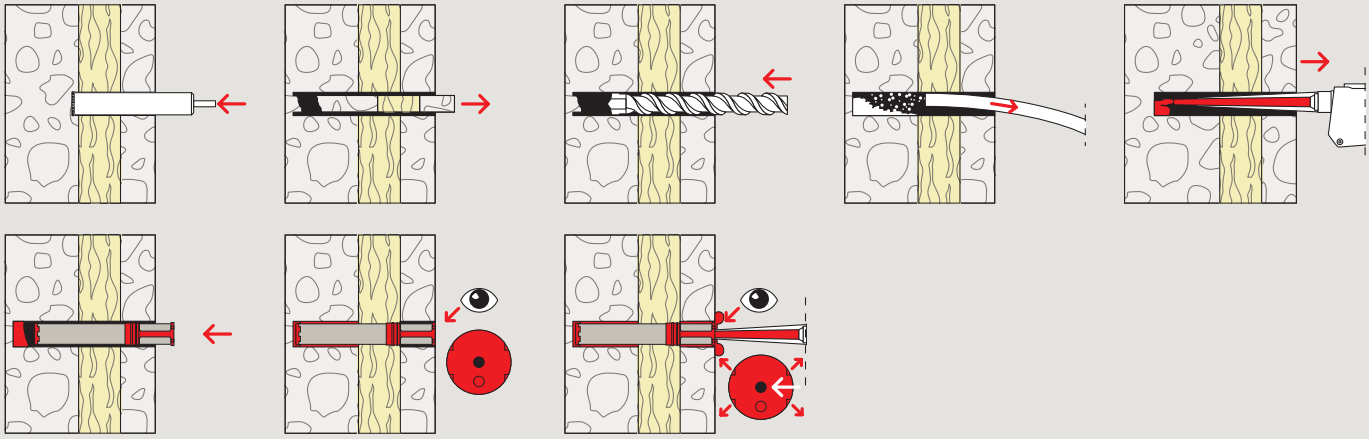
## Versions

Stainless steel

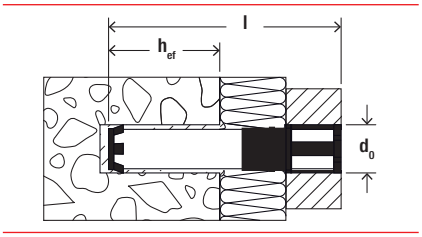
## Functioning

- The FWS II weather facing reconstruction anchors can be bedded in mortar into the load-bearing skin and weather shell with the FIS V Plus, FIS VW Plus or FIS VS Plus / FIS V, FIS VW or FIS VS injection mortar.
- The red plastic coating protects the insulation from being penetrated with mortar.
- You can see the correct anchor filling with the weather shell through the inspection openings on the head of the anchor.

## Installation in triple skin outer wall panels with FIS V Plus and FWS II-A








## Technical data

**Weather facing reconstruction system FWS II**



FWS II

| Item | Item no. | Approval DIBt | Total length l [mm] | Nom. drill diameter $d_B$ [mm] | Effect. anchorage depth in the load-bearing skin $h_v$ [mm] | Anchor per 360 ml-cartridge | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FWS II - A 180** | **532883** | ● | 180 | 40 - 41 | 70 | 5 | 5 |
| **FWS II - A 205** | **532884** | ● | 205 | 40 - 41 | 70 | 5 | 5 |
| **FWS II - A 230** | **532885** | ● | 230 | 40 - 41 | 70 | 5 | 5 |

## Technical data

**Injection mortar FIS V Plus**



FIS V Plus 360 S



FIS VW Plus 360 S

| Item | Item no. | Approval ETA | Approval DIBt | Approval ICC | Language on label | Scale unit | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FIS V Plus 360 S** | **558745** | ● | ● | ● | DE | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS VW Plus 360 S** | **558759** | ● | ● | ● | DE | 180 | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |

For further injection mortars see page FIS V Plus / FIS V

# Loads

**Weather facing reconstruction system FWS II**

Permissible shear loads[1) 2)] for a single anchor in a load-bearing skin made of concrete ≥ C12/15.
For the design the complete approval Z-21.8-2029 has to be considered.

| | | | | | | Cracked and non-cracked concrete | |
|---|---|---|---|---|---|---|---|
| Type | Effective anchorage depth in the load-bearing skin $h_{ef} \geq$ [mm] | Thickness of load-bearing layer $h_T \geq$ [mm] | Thickness of - thermal insulation[3)] $h_D \leq$ [mm] | Thickness of- outer leaf $h_w \geq$ [mm] | Permissible bending moment $M_{zul}$ [Nm] | Permissible shear load[4)] $V_{zul}$ [kN] | Mindestrand-abstand[5)] $c_{min}$ ($c_W$, $c_T$) [mm] |
| **FWS II - A 180** | 70 | 80 | 70 | 40 | 1310 | 11.5 | 150 |
| **FWS II - A 205** | 70 | 80 | 95 | 40 | 1310 | 9.5 | 150 |
| **FWS II - A 230** | 70 | 80 | 120 | 40 | 1310 | 8.1 | 150 |

[1)] Required safety factors are considered. The given loads are valid under the pre-condition that an additional thermal insulation will be applied on the weather facing.
[2)] The given loads are valid for fixations in dry and humid concrete for temperatures in the substrate up to +50 °C (resp. short term up to 80 °C) and drillhole cleaning according to approval.
[3)] For bigger insulation thicknesses special lengths are possible.
[4)] The determination of the permissible shear load for special lengths is done according Annex 3 and 4 of the approval.
[5)] For exact arrangement of the bolts as well as for eventually needed additional proofs see approval.

# Fill&Fix injection fixing

Liquid plugs and repair compounds for serious cases.







Repairing damaged drill holes



Repairing damaged hinges

## Applications

- Repairing cracked or over-sized drill holes
- Repairing broken furniture hinges etc.
- Fixing lightweight objects in difficult or damaged building materials (old buildings)
- Fixing lightweight objects in internal and UV-protected external areas

## Advantages

- The Fill&Fix injection fixing works for every drill hole size and building material. As a result, a number of applications can be completed with just one product.
- Wood screws can be screwed directly into the hardened injection fixing. This allows a fast and simple installation.
- The special formulation allows to reuse a screwhole after removing a screw. Thus, components can be reattached to the same point.
- Fill&Fix can be sanded and painted, and is suitable for filling drill holes that are no longer needed prior to painting.

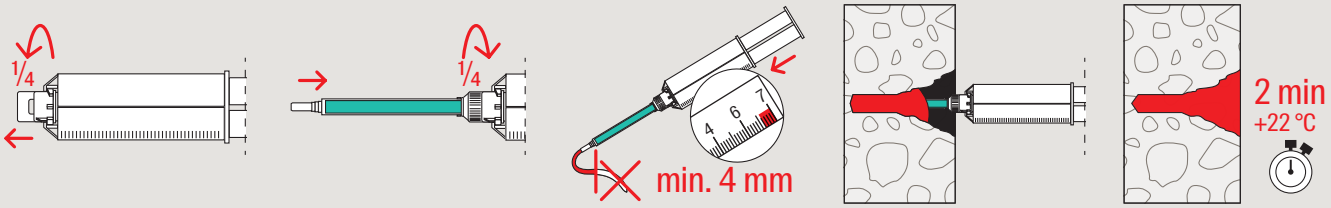
## Building materials

- Concrete
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Cavity floor slabs made from bricks and concrete
- Wooden materials
- Perforated sand-lime brick
- Solid sand-lime brick
- Natural stone with dense structure
- Panel building materials
- Aerated concrete
- Solid panel made from gypsum
- Solid brick made from lightweight concrete
- Solid brick

## Functioning

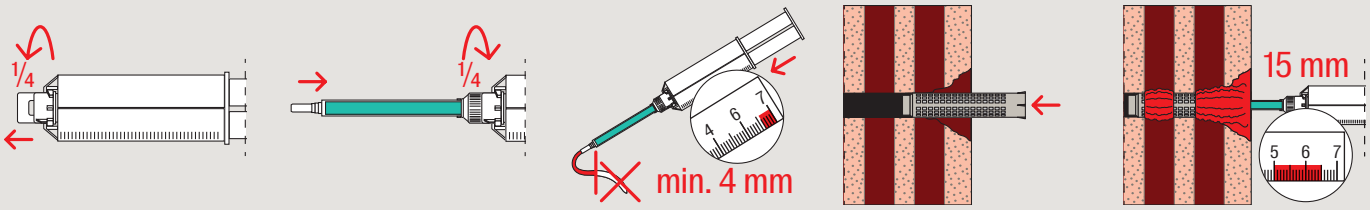
- Fill&Fix is a 2-component, solvent-free injection compound based on polyurethane. It is applied into the drill hole, where it foams lightly and sets quickly.
- The increase in volume during the setting process guarantees a secure hold, even in dilapidated or difficult building materials.
- After approx. 2 minutes, screws, hooks, eye screws etc. with a diameter of up to 6 mm that are normally used in wood can be screwed into and removed from the set material without pre-drilling.
- Use the perforated sleeves (included) for hollow and board building materials.

## Installation in solid building materials






## Installation in hollow and panel building material




## Technical data

**Fill&Fix injection fixing**



Fill&Fix

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **Fill & Fix K (D)** | **051097** | 1 x Cartridge 25 ml, 2 x static mixer, 4 x anchor sleeves, 2 x extension tubes | 1 |
| **Fill & Fix K (D/F)** | **503227** | 1 x Cartridge 25 ml, 2 x static mixer, 4 x anchor sleeves, 2 x extension tubes | 1 |
| **Fill & Fix K (F)** | **513500** | 1 x Cartridge 25 ml, 2 x static mixer, 4 x anchor sleeves, 2 x extension tubes | 1 |
| **Fill & Fix K (I)** | **051098** | 1 x cartridge 25 ml, 2 static mixer, 4 anchor sleeves, 2 extension tubes | 1 |
| **Fill & Fix K (S/DK)** | **505083** | 1 x Cartridge 25 ml, 2 x static mixer, 4 x anchor sleeves, 2 x extension tubes | 1 |
| **Fill & Fix K (GR)** | **505084** | 1 x Cartridge 25 ml, 2 static mixer, 4 anchor sleeves, 2 extension tubes | 1 |
| **Fill & Fix Static mixer** | **542940** | 6 x Static mixer | 1 |

Dangerous goods - no express shipping possible.

# Loads

**Fill&Fix**

Recommended loads[1) 2)] for a single anchor.
The given loads are valid for chipboard screws with the specified diameters.

| Type | | | Fill & Fix | | |
|---|---|---|---|---|---|
| **Diameter of chipboard screw** | Ø | **[mm]** | 4.0 | 5.0 | 6.0 |
| **Nominal drill diameter** | $d_0$ | **[mm]** | 10 | 10 | 10 |
| **Anchorage depth** | $h_{ef} \geq$ | **[mm]** | 45 | 45 | 45 |
| **Drill hole depth** | $h_1 \geq$ | **[mm]** | 50 | 50 | 50 |
| **Anchorage in solid substrates** | | | | | |
| Recommended load in concrete | ≥ C12/15 | **[kN]** | 0.50 | 0.60 | 0.70 |
| Recommended load in sand-lime bricks | ≥ KS 20, ≥ NF | **[kN]** | 0.50 | 0.60 | 0.70 |
| **Anchorage in perforated bricks/hollow blocks using the perforated sleeve** | | | | | |
| Recommended load in vertically perforated bricks | ≥ HLz 12, ρ ≥ 0.9 kg/dm³, ≥ 16DF | **[kN]** | 0.20 | 0.25 | 0.30 |
| Recommended load in perforated sand-lime bricks | ≥ KSL 12, ρ ≥ 1.4 kg/dm³, ≥ 5DF | **[kN]** | 0.20 | 0.25 | 0.30 |
| Recommended load in lightweight concrete hollow blocks | ≥ Hbl 4, 2K, ≥ 8DF | **[kN]** | 0.20 | 0.25 | 0.30 |
| **Anchorage in aerated concrete** | | | | | |
| Recommended load in aerated concrete | ≥ PB2, PP2 | **[kN]** | 0.10 | 0.15 | 0.20 |
| **Anchorage in board materials using the perforated sleeve** | | | | | |
| Recommended load in gypsum plasterboard | 12.5 mm | **[kN]** | 0.12 | 0.12 | 0.12 |
| Recommended load in gypsum plasterboard | 25 mm (= 2 × 12.5 mm) | **[kN]** | 0.20 | 0.20 | 0.20 |
| Recommended load in gypsum fibreboard | 12.5 mm | **[kN]** | 0.21 | 0.21 | 0.21 |

[1)] Required safety factors are considered.
[2)] Valid for tensile load, shear load and oblique load under any angle.

| Mortar Cartridges |  FIS ... 150 T |  FIS ... 300 T |  FIS ... 360 S |  FIS ... 390 S |  FIS ... 410 T |  FIS ... 585 S |  FIS ... 825 S |  FIS ... 1500 S | Page |
|---|---|---|---|---|---|---|---|---|---|
|  KPM 2 Plus (53117) | ● | ● | – | – | – | – | – | – | 234 |
|  FIS AM (58000) | ● | ● | ● | ● | – | – | – | – | 235 |
|  FIS DM C Pro (573575) | – | – | – | – | ● | – | – | – | 240 |
|  FIS DMS-L (567768) | – | – | – | – | – | ● | – | – | 237 |
|  FIS AM S-XL (563241) | – | – | – | – | – | – | ● | – | 238 |
|  FIS AC (96497) | – | – | – | – | ● | – | – | – | 239 |
|  FIS DM S Pro (563337) | ● | ● | ● | ● | – | – | – | – | 236 |
|  FIS DB S Pro (558955) | ● | ● | ● | ● | – | – | – | – | 241 |
|  FIS DB SL Pro (562004) | – | – | – | – | – | ● | ● | – | 244 |
|  FIS AP (58027) | ● | ● | ● | ● | – | – | – | – | 247 |
|  FIS DP S-L (511125) | – | – | – | – | – | ● | – | – | 248 |
|  FIS DP S-XL (512401) | – | – | – | – | – | – | – | ● | 249 |

# Dispenser KPM 2 Plus

The robust dispenser for cartridges with up to 310 ml volume.





## Applications

- For squeezing out 1-component sealant and adhesive cartridges up to 310 ml content
- For squeezing out fischer injection mortars up to 300 ml content

## Advantages

- The dispenser can be used for all common 1-component sealant and adhesive cartridges up to 310 ml as well as fischer injection mortars up to 300 ml content.
- The 18:1 transmission ratio enables rapid and gentle squeezing of even highly viscous compounds for maximum application comfort.
- The robust housing with specially hardened push block guarantees reliable and long-lasting processing under demanding construction site conditions.
- The freely accessible and rotatable cartridge insert allows the cartridge to be optimally aligned and reaches even hard-to-reach places.
- The adjustable overrun stop prevents dripping, especially of low-viscosity compounds.
- The push rod that is rounded at the back makes it easy to pull back and also convenient to hang the device.

## Functioning

- Metal housing with robust paint finish and corrosion-resistant sliding elements.
- Front groove width for inserting the cartridge approx. 26 mm.
- Diameter of the slide plate of 41.5 mm ± 0.1 mm.
- Compressive strength of 6,000 N.
- Weight approx. 770 g.

## Technical data

**Dispenser KPM 2 Plus**



KPM 2 Plus

| | Item no. | Adapted for | Sales unit [pcs] |
|---|---|---|---|
| **Item** | | | |
| **KPM 2 Plus** | **053117** | Cartridges with 150 ml, 300 ml, 360 ml and 390 ml content | 1 |

# Dispenser FIS AM

Dispenser for 2-chamber cartridges - solid, load-bearing design.






## Applications

- Shuttle cartridges with 360 and 390 ml content
- Cartridges with 150 ml content
- Multibond cartridges with 300 ml content
- Standard silicone cartridges

## Advantages

- The robust design can withstand the high requirements of the job site and thus offers a long life.
- The infinitely variable feed allows the exact dosing and thus ensures easy handling.

## Functioning

- The cartridges are placed into the dispenser and are dispensed by operating the handle.

## Technical data

**Dispenser FIS AM**



FIS AM

| | Item no. | Adapted for | Sales unit [pcs] |
|---|---|---|---|
| **Item** | | | |
| **FIS AM** | **058000** | Cartridges with 150 ml, 300 ml, 360 ml and 390 ml content | 1 |

# Dispenser FIS DM S Pro

The manual dispenser for ergonomic and easy work.







Outdoor concrete base



Indoor railing fixing

## Applications

- Extrusion of cartridges with 150ml, 300ml, 360ml and 390ml content

## Advantages

- The ergonomic design enables fast and effortless installation.
- The optimized geometry of the manual dispenser ensures the quick inserting and removing of the cartridges.
- The fiberglass-reinforced plastic housing gives the manual dispenser maximum stability and increases its service life.
- The manual dispenser FIS DM S Pro can be used with the cartridge sizes 150 ml, 300 ml, 360 ml and 390 ml.

## Functioning

- The cartridges are being placed in the manual dispenser and squeezed out by operating the handle.

## Dispensers

**Dispenser FIS DM S Pro**



FIS DM S Pro

| Item | Item no. | Adapted for | Sales unit [pcs] |
|---|---|---|---|
| **FIS DM S Pro** | **563337** | Cartridges with 150 ml, 300 ml, 360 ml and 390 ml content | 1 |

# Dispenser FIS DM S-L

High-quality dispenser for 2-chamber cartridges for quick, fatigue-free work.






## Applications

- Cartridges with 585 ml content

## Advantages

- The FIS DM S-L allows a large and even force transmission and ensures fatigue-free working.
- The dropout protection on the cartridge holder provides a secure hold of the cartridge in the dispenser.

## Functioning

- The cartridges are placed into the dispenser and are dispensed by operating the handle.

## Technical data

**Dispenser FIS DM S-L**




FIS DM S-L

| | Item no. | Adapted for | Sales unit [pcs] |
|---|---|---|---|
| **Item** | | | |
| **FIS DM S-L** | **567768** | For cartridges with 585 ml content | 1 |

# Dispenser FIS AM S-XL

The manual dispenser for 825 ml injection cartridge.






## Applications

- Extrusion of cartridges with 825ml content

## Advantages

- The manual dispeser FIS AM S-XL ensures a good balance and enables a fast installation with low fatigue.
- The easy handling of the manual dispenser ensures the quick inserting and removing of the cartridge.
- The robust metal housing gives the FIS AM S-XL high stability and long service life.
- The FIS AM S-XL manual dispenser can be used with cartridge size 825ml.

## Functioning

- The cartridges are being placed in the manual dispenser and squeezed out by operating the handle.

## Technical data

**Dispenser FIS AM S-XL**



FIS AM S-XL

| Item | Item no. | Adapted for | Sales unit [pcs] |
|---|---|---|---|
| **FIS AM S-XL** | **563241** | Cartridges with 825 ml content | 1 |

# Dispenser FIS AC

Suitable for catridge size 410 ml.





## Applications

- Coaxial cartridges with 380 and 410 ml content

## Advantages

- The dispensers allow for easy manual dispensing of injection cartridges.
- The robust design meets the hard requirements on the building site stand and thus offers a long service life.

## Functioning

- The cartridges are placed into the dispenser and are dispensed by operating the handle.

## Technical data

**Dispenser FIS AC**



FIS AC

| Item | Item no. | Adapted for | Sales unit [pcs] |
|---|---|---|---|
| **FIS AC** | **096497** | Cartridges with 380 ml and 410 ml content | 1 |

# Dispenser FIS DM C Pro

The manual dispenser for ergonomic and easy work.






## Applications

- Extrusion of cartridges with 380 ml and 410 ml content

## Advantages

- The ergonomic design enables fast and effortless installation.
- The optimized geometry of the manual dispenser ensures the quick inserting and removing of the cartridges.
- The fiberglass-reinforced plastic housing gives the manual dispenser maximum stability and increases its service life.
- The manual dispenser FIS DM C Pro can be used with the cartridge sizes 380 ml and 410 ml.

## Functioning

- Die Kartuschen werden in das Handauspressgerät eingelegt und durch Bewegung des Handgriffs ausgepresst.

## Technical data

**Dispenser FIS DMC Pro**



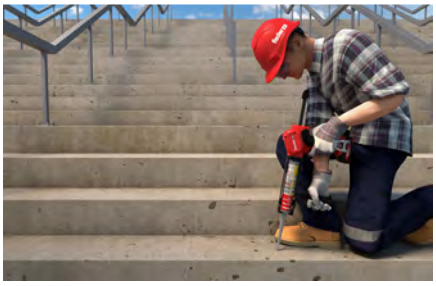

FIS DM C Pro

| | Item no. | Adapted for | Sales unit [pcs] |
|---|---|---|---|
| **Item** | | | |
| **FIS DM C Pro** | **573575** | Cartridges with 380 ml and 410 ml content | 1 |

# Battery dispenser FIS DB S Pro

The battery dispenser for professionals.





Serial installation



Post-installed rebar connection



## Applications

- Serial installations
- Post-installed rebar connections
- Railings

## Advantages

- The dosing function enables the efficient adjustment of the mortar quantity to match the drill hole size.
- The dispensing speed can be adjusted to the application via a controller.
- The detachable handle and belt hook ensure particularly ergonomic use.
- The sturdy design of the device guarantees reliable, long-lasting processing under demanding building site conditions.
- The FIS DB S Pro and FIS DB SL Pro battery dispensers can be used flexibly for several cartridge sizes.
- The 18V technology provides for the necessary dispensing power. Furthermore, the battery is compatible with all Cordless Alliance System (CAS) power tools and chargers worldwide.

## Functioning

- The cartridges are placed into the device and are dispensed through the actuation of the trigger button.
- By pressing the release button, the feed rod can be retracted and the cartridge removed.
- The dosing wheel can be used to dose the application rate according to the scale table. The last stage activates the permanent function.
- By placing the speed controller on the handle, the dispensing speed can be adjusted during installation.
- The illuminated LEDs indicate the current charge status of the batteries.

## Technical data

**Battery dispenser FIS DB S Pro**



FIS DB S Pro



FIS DB SL Pro



FIS DB S Pro Set

| Item | Item no. | Battery voltage [V] | Weight without battery [kg] | Extrusion force [N] | Adapted for | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FIS DB S Pro** | **558955** | 18 | 3 | 4,000 | Cartridges with 150ml, 300ml, 360ml and 390ml content | 1 x fischer battery dispenser FIS DB S Pro<br>1 x Charger FSS-BC 12-36V EU<br>1 x Battery FSS-B 18V Li-Ion 2.0Ah<br>1 x Hard case<br>1 x Screw off handle DB S Pro - H<br>1 x Belt hook DB S Pro - BH | 1 |
| **FIS DB S Pro UK** | **564960** | 18 | 3 | 4,000 | Cartridges with 150ml, 300ml, 360ml and 390ml content | 1 x fischer battery dispenser FIS DB S Pro<br>1 x Charger FSS-BC 12-36V UK<br>1 x Battery FSS-B 18V Li-Ion 2.0Ah<br>1 x Hard case<br>1 x Screw off handle DB S Pro - H<br>1 x Belt hook DB S Pro - BH | 1 |
| **FIS DB S Pro Solo** | **567189** | 18 | 3 | 4,000 | Cartridges with 150ml, 300ml, 360ml and 390ml content | 1 x fischer battery dispenser FIS DB S Pro<br>1 x Hard case<br>1 x Screw off handle DB S Pro - H<br>1 x Belt hook DB S Pro - BH | 1 |
| **FIS DB SL Pro** | **562004** | 18 | 3.2 | 4,000 | Cartridges with 585 ml and 825 ml content | 1 x fischer battery dispenser FIS DB SL Pro<br>1 x Charger FSS-BC 12-36V EU<br>1 x Battery FSS-B 18V Li-Ion 2.0Ah<br>1 x Hard case<br>1 x Screw off handle DB S Pro - H<br>1 x Belt hook DB S Pro - BH | 1 |
| **FIS DB SL Pro UK** | **564961** | 18 | 3.2 | 4,000 | Cartridges with 585 ml and 825 ml content | 1 x fischer battery dispenser FIS DB SL Pro<br>1 x Charger FSS-BC 12-36V UK<br>1 x Battery FSS-B 18V Li-Ion 2.0Ah<br>1 x Hard case<br>1 x Screw off handle DB S Pro - H<br>1 x Belt hook DB S Pro - BH | 1 |
| **FIS DB SL Pro Solo** | **567295** | 18 | 3.2 | 4,000 | Cartridges with 585 ml and 825 ml content | 1 x fischer battery dispenser FIS DB SL Pro<br>1 x Hard case<br>1 x Screw off handle DB S Pro - H<br>1 x Belt hook DB S Pro - BH | 1 |

## Accessories

**DB S Pro-H and DB S Pro-BH**



DB S Pro - H



DB S Pro - BH

| Item | Item no. | Match | Contents | Sales unit [pcs] |
|---|---|---|---|---|
| **DB S Pro - H** | **563975** | FIS DB S Pro / FIS DB SL Pro | 1 x Handle | 1 |
| **DB S Pro - BH** | **563976** | FIS DB S Pro / FIS DB SL Pro | 1 x Belt hook, 1 x allen screw | 1 |

## Batteries and chargers

**FSS-B and FSS-BC**



FSS-B 18V 2.0 Ah



FSS-BC

| | Item no. | CAS compatible | Type of battery pack | Battery capacity [Ah] | Voltage [V] | Mains frequency [Hz] | Max. charge amperage [A] | Weight [g] | Suitable for battery voltage [V] | Storage and processing [°C] | Air humidity [%] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | | | | | | |
| **FSS-B 18V 2.0Ah** | **563787**[1] | Yes | Li-Ion | 2.0 | – | – | – | 429 | – | -20 - +80 | < 90 | 1 |
| **FSS-BC 12-36V EU** | **552931** | Yes | – | – | 220 - 240 | 50 - 60 | 3 | – | 12 - 36 | – | – | 1 |
| **FSS-BC 12-36V UK** | **552932** | Yes | – | – | 220 - 240 | 50 - 60 | 3 | – | 12 - 36 | – | – | 1 |

[1] Battery may only be charged with fischer or CAS chargers.

# Battery dispenser FIS DB SL Pro

The battery dispenser for professionals.






## Applications

- Energy-saving injection cartridge dispensing

## Advantages

- The dosing function enables the efficient adjustment of the mortar quantity to match the drill hole size.
- The dispensing speed can be adjusted to the application via a controller.
- The detachable handle and belt hook ensure particularly ergonomic use.
- The sturdy design of the device guarantees reliable and long-lasting processing under demanding building site conditions.
- The FIS DB SL Pro battery dispenser can be universally used with the cartridge sizes 585 ml and 825 ml.
- The 18V technology provides for the necessary dispensing power. Furthermore, the battery is compatible with all Cordless Alliance System (CAS) power tools and chargers worldwide.

## Functioning

- The cartridges are placed into the device and are dispensed through the actuation of the trigger button.
- By pressing the release button, the feed rod can be retracted and the cartridge removed.
- The wheel can be used to dose the application rate according to the scale table. The last stage activates the permanent function.
- By placing the speed controller on the handle, the dispensing speed can be adjusted during installation.
- The illuminated LEDs indicate the current charge status of the batteries.

## Technical data

**Battery dispenser FIS DB SL Pro**



FIS DB SL Pro

| Item | Item no. | Battery voltage [V] | Weight without battery [kg] | Adapted for | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FIS DB SL Pro** | **562004** | 18 | 3.2 | Cartridges with 585 ml and 825 ml content | 1 x fischer battery dispenser FIS DB SL Pro<br>1 x Charger FSS-BC 12-36V EU<br>1 x Battery FSS-B 18V Li-Ion 2.0Ah<br>1 x Hard case<br>1 x Screw off handle DB S Pro - H<br>1 x Belt hook DB S Pro - BH | 1 |
| **FIS DB SL Pro UK** | **564961** | 18 | 3.2 | Cartridges with 585 ml and 825 ml content | 1 x fischer battery dispenser FIS DB SL Pro<br>1 x Charger FSS-BC 12-36V UK<br>1 x Battery FSS-B 18V Li-Ion 2.0Ah<br>1 x Hard case<br>1 x Screw off handle DB S Pro - H<br>1 x Belt hook DB S Pro - BH | 1 |
| **FIS DB SL Pro Solo** | **567295** | 18 | 3.2 | Cartridges with 585 ml and 825 ml content | 1 x fischer battery dispenser FIS DB SL Pro<br>1 x Hard case<br>1 x Screw off handle DB S Pro - H<br>1 x Belt hook DB S Pro - BH | 1 |

## Accessories

**DB S Pro-H and DB S Pro-BH**



DB S Pro - H



DB S Pro - BH

| Item | Item no. | Match | Contents | Sales unit [pcs] |
|---|---|---|---|---|
| **DB S Pro - H** | **563975** | FIS DB S Pro / FIS DB SL Pro | 1 x Handle | 1 |
| **DB S Pro - BH** | **563976** | FIS DB S Pro / FIS DB SL Pro | 1 x Belt hook, 1 x allen screw | 1 |

## Batteries and chargers

**FSS-B and FSS-BC**



FSS-B 18V 2.0 Ah



FSS-BC



| | Item no. | CAS compatible | Type of battery pack | Battery capacity [Ah] | Voltage [V] | Mains frequency [Hz] | Max. charge amperage [A] | Weight [g] | Suitable for battery voltage [V] | Storage and processing [°C] | Air humidity [%] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | | | | | | |
| **FSS-B 18V 2.0Ah** | **563787**[1)] | Yes | Li-Ion | 2.0 | – | – | – | 429 | – | -20 - +80 | < 90 | 1 |
| **FSS-BC 12-36V EU** | **552931** | Yes | – | – | 220 - 240 | 50 - 60 | 3 | – | 12 - 36 | – | – | 1 |
| **FSS-BC 12-36V UK** | **552932** | Yes | – | – | 220 - 240 | 50 - 60 | 3 | – | 12 - 36 | – | – | 1 |

[1)] Battery may only be charged with fischer or CAS chargers.

# Dispenser FIS AP

High-quality dispenser for 2-chamber cartridges with compressed air technology.





## Applications

- Shuttle cartridges with 345, 360 and 390 ml content
- Cartridges with 150 ml content
- Multibond cartridges with 300 ml content
- Standard silicone cartridges

## Advantages

- The fast venting minimises cartridge after-run, which facilitates clean work at the site.
- The reducing valve in the handle enables the optimum adjustment of the volume flow in line with the processing conditions.
- Due to the ergonomically formed handle, the dispensers fit nicely in your hand and make work less tiring.

## Functioning

- The cartridges are placed into the dispenser that is connected to the air compressor and are dispensed through the actuation of the handle.

## Technical data

**Dispenser FIS AP with compressed air drive**



FIS AP

| Item | Item no. | Adapted for | Sales unit [pcs] |
|---|---|---|---|
| **FIS AP** | **058027** | Cartridges with 150 ml, 300 ml, 360 ml and 390 ml content | 1 |

# Dispenser FIS DP S-L

High-quality dispenser for 2-chamber cartridges with compressed air technology.





## Applications

- Cartridges with 585 ml content

## Advantages

- The fast venting minimises cartridge after-run, which facilitates clean work at the site.
- The reducing valve in the handle enables the optimum adjustment of the volume flow in line with the processing conditions.
- Due to the ergonomically formed handle, the dispensers fit nicely in your hand and make work less tiring.

## Functioning

- The cartridges are placed into the dispenser that is connected to the air compressor and are dispensed through the actuation of the handle.

## Technical data

**Dispenser FIS DP S-L with compressed air drive**



FIS DP S-L

| | Item no. | Adapted for | Sales unit [pcs] |
|---|---|---|---|
| **Item** | | | |
| **FIS DP S-L** | **511125** | For cartridges with 585 ml content | 1 |

# Dispenser FIS DP S-XL

High-quality dispenser for 2-chamber cartridges with compressed air technology.





## Applications

- Cartridges with 1500 ml content

## Advantages

- The fast venting minimises cartridge after-run, which facilitates clean work at the site.
- The reducing valve in the handle enables the optimum adjustment of the volume flow in line with the processing conditions.
- Due to the ergonomically formed handle, the dispensers fit nicely in your hand.
- In addition the dispencer has a carrying strap around which make work less tiring.

## Functioning

- The cartridges are placed into the dispenser that is connected to the air compressor and are dispensed through the actuation of the handle.

## Technical data

**Dispenser FIS DP S-XL with compressed air drive**



FIS DP S-XL

| Item | Item no. | Adapted for | Sales unit [pcs] |
|---|---|---|---|
| **FIS DP S-XL** | **512401** | Cartridges with 1500 ml content | 1 |

# Centring clips

Centring clips for simplified overhead installation.





## Applications

- Overhead installations
- Gluing in wood

## Advantages

- The centring clips allow for an optimal alignment of the anchor in the drill hole and prevent it from dropping out when being installed overhead.

## Building materials

- Application in solid building materials

## Functioning

- The centring clips are used for overhead installation in concrete or to centre anchor rods in wood.
- The clips are clipped onto the anchor rod before the anchor is installed.
- This ensures that the anchor is optimally aligned and prevents it from falling out or slipping.

## Technical data

**Centring clip DD-E**



DD-E

| Item | Item no. | Thread M | Sales unit [pcs] |
|---|---|---|---|
| **DD-E M12** | **563722** | M12 | 100 |
| **DD-E M16** | **563724** | M16 | 100 |
| **DD-E M20** | **563726** | M20 | 100 |
| **DD-E M24** | **563728** | M24 | 100 |
| **DD-E M27** | **563730** | M27 | 100 |
| **DD-E M30** | **563732** | M30 | 100 |

Used for overhead mounting or in combination with the DD-S centring clip for centring in the drill hole.

## Accessories

**Centring clip DD-S**



DD-S

| Item | Item no. | Thread M | Sales unit [pcs] |
|---|---|---|---|
| **DD-S M12** | **563721** | M12 | 100 |
| **DD-S M16** | **563723** | M16 | 100 |
| **DD-S M20** | **563725** | M20 | 100 |
| **DD-S M24** | **563727** | M24 | 100 |
| **DD-S M27** | **563729** | M27 | 100 |
| **DD-S M30** | **563731** | M30 | 100 |

Used in combination with the DD-E centering clip for centring in the drill hole.

## Accessories

**Borehole cleaning**



BS



FIS-brush extension



Brush set

| Item | Item no. | Length $L_1$ [mm] | Length $L_2$ [mm] | Brush diameter [mm] | For drill diameter [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **BS Ø8** | **078177** | 120 | 50 | 9 | 8 | 1 |
| **BS Ø10** | **078178** | 120 | 50 | 11 | 10 | 1 |
| **BS Ø12** | **078179** | 150 | 80 | 13 | 12 | 1 |
| **BS Ø14** | **078180** | 250 | 80 | 16 | 14 | 1 |
| **BS Ø16/18** | **078181** | 250 | 80 | 20 | 16 / 18 | 1 |
| **BS Ø20/22** | **052277** | 300 | 80 | 25 | 20 / 22 | 1 |
| **BS Ø24** | **078182** | 300 | 100 | 26 | 24 | 1 |
| **BS Ø25** | **097806** | 300 | 100 | 27 | 25 | 1 |
| **BS Ø28** | **078183** | 350 | 100 | 30 | 28 | 1 |
| **BS Ø35** | **078184** | 400 | 100 | 40 | 30 / 32 / 35 | 1 |
| **FIS brush extension** | **508791** | 410 | – | – | – | 1 |
| **Brush set Ø14/20** | **048980** | 230 | 80 | – | 8 - 16 | 1 |
| **Brush set Ø20/30** | **048981** | 250 | 80 | – | 16 - 28 | 1 |

## Accessories

**Borehole cleaning (air)**



ABP



Compressed air nozzle




AB G



Centring wedge

| Item | Item no. | Match | Sales unit [pcs] |
|---|---|---|---|
| **Compressed-air cleaning tool** | **093286** | Drill diameter Ø 12 - 15 mm | 1 |
| **Compressed air nozzle D12-D15** | **511956** | Drill diameter Ø 12 - 15 mm | 2 |
| **Compressed air nozzle D16-D19** | **511957** | Drill diameter Ø 16 - 19 mm | 2 |
| **Compressed air nozzle D20-D25** | **511958** | Drill diameter Ø 20 - 25 mm | 2 |

[1] Delivery time on request.

# Accessories

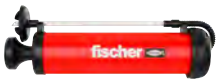
**Borehole cleaning (air)**



ABP



Compressed air nozzle




AB G



Centring wedge

| Item | Item no. | Match | Sales unit [pcs] |
|---|---|---|---|
| **Compressed air nozzle D30-D35** | **511959** | Drill diameter Ø 30 - 35 mm | 2 |
| **Compressed air nozzle D40-D55** | **511960**[1)] | Drill diameter Ø 40 - 45 mm | 2 |
| **Blow-out pump AB G** | **567792** | – | 1 |
| **Centring wedge** | **093076** | – | 10 |

[1)] Delivery time on request.

## Accessories

**Injection devices**



Extension tube



FIS Extension tube

| Item | Item no. | Length l [mm] | Sales unit [pcs] |
|---|---|---|---|
| FIS Extension tube Ø9 | 048983 | 1,000 | 10 |
| FIS EXT Ø15 | 530800 | 10,000 | 1 |

## Accessories

**Conical drill**



PBB

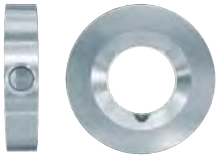


PBZ

| Item | Item no. | Approval ETA | Match | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|
| Cone drill PBB | 090634 | ● | M8 - M12, FIS E | 1 x Cone drill PBB | 1 |
| Centring sleeve PBZ | 090671 | ● | M8 - M12, FIS E | 10 x Centring sleeve PBZ, 5 x Injection adapter | 10 |

## Accessories

**Filling disc FFD**



FFD

| Item | Item no. | Suitable for anchor bolts / anchor rods | Contents | Sales unit [pcs] |
|---|---|---|---|---|
| FFD 22 x 9 x 6 | 547515 | M6 | | 4 |
| FFD 26 x 12 x 6 | 538458 | M8 + M10 | | 4 |
| FFD 30 x 14 x 6 | 538459 | M12 | | 4 |
| FFD 38 x 19 x 7 | 538460 | M16 | | 4 |
| FFD 46 x 23 x 8 | 538461 | M20 | | 4 |
| FFD 54 x 28 x 10 | 538462 | M24 | | 4 |
| FFD 26 x 12 x 6 R | 541986 | M8 + M10 | | 4 |
| FFD 30 x 14 x 6 R | 541987 | M12 | | 4 |
| FFD 40 x 19 x 7 R | 541988 | M16 | | 4 |
| FFD 50 x 23 x 8 R | 541989 | M20 | | 4 |
| FFD 55 x 28 x 10 R | 541990 | M24 | | 4 |

# Accessories

**Adapter and setting tools**


RA-SDS


SK SW 8 1/2“ VK


SDS plus 1/2“ VK


SDS-max 1/2“ VK


SDS-max 3/4“ VK


SDS-Adapter M8

| Item | Item no. | Match | Sales unit [pcs] |
|---|---|---|---|
| **RA-SDS** | **062420** | Adapter suitable fits set screw | 1 |
| **SK SW 8 1/2** | **001536** | Adapter suitable fits threaded rods M8 - M22 | 1 |
| **SDS plus 1/2** | **001537** | Adapter suitable fits threaded rods M8 - M16 | 1 |
| **SDS max 1/2** | **001538** | Adapter suitable fits threaded rods M16 - M20 | 1 |
| **SDS max 3/4** | **001539** | Adapter suitable fits threaded rods M20 - M30 | 1 |
| **SDS Chuck** | **530332** | – | 1 |



# 4

# High performance steel anchors




| | | |
|---|---|---|
| Bolt anchor FAZ II Plus | 258 |  |
| High performance anchor FH II | 268 |  |
| High performance anchor FH II-I | 274 |  |
| Strong undercut anchor FSU | 277 |  |
| ZYKON undercut anchor FZA | 282 |  |
| ZYKON hammerset anchor FZEA II | 289 |  |
| Concrete screw UltraCut FBS II 8-14 | 292 |  |
| Concrete screw UltraCut FBS II 6 | 305 |  |
| Concrete screw FBS IN | 313 |  |
| Hammerset anchor EA II | 318 |  |
| Hammerset anchor EA-N | 323 |  |
| Nail anchor FNA II | 327 |  |
| Nail anchor FNA II RB | 333 |  |

| | | |
|---|---|---|
| Ceiling nail FDN II | 336 |  |
| Ceiling nail FDZ | 339 |  |
| Bolt anchor FBN II | 341 |  |
| Boltanchor FWA Plus | 347 |  |
| Bolt anchor FWA (metric) | 350 |  |
| Heavy-duty anchor TA M | 352 |  |
| Heavy-duty anchor TA M-T | 358 |  |
| Sleeve anchor FSA | 361 |  |
| Fixing set for diamond drills FDBB | 364 |  |
| Wall screw MR | 366 |  |
| Hollow-ceiling anchor FHY | 368 |  |
| Aircrete anchor FPX-I | 372 |  |

# Bolt anchor FAZ II Plus

For highest demands. Powerful and flexible.







Balcony railings



Conveyor belt

## Applications

- Steel constructions
- Guard rails
- Consoles
- Lifts
- Lifting platforms
- Conveyor belts
- Pumps
- Cable trays
- Façades
- Timber constructions

## Advantages

- Quick and easier assembly without the need for drill hole cleaning (M8-M24).
- With the new assessment (ETA), the tensile strengths increase decisively. As a result, fewer fixing points and anchors are required.
- The new ETA confirms the use of the FAZ II Plus for dynamic loads for diameters M16-M24.
- An external independent assessment confirms the service life of anchorages up to 120 years. Thus, the FAZ II Plus outlasts a whole century and is perfectly suited for large, long-lasting construction projects (M10-M16).
- The FAZ II Plus allows the absorption of high seismic loads of performance category C1 from M8 and C2 for diameters M10-M24.
- The first bolt anchor M6 with ETA evaluation option 1 ensures a safe and approved anchorage.

## Certificates / Features

ETA-19/0520, in concrete
ETA-20/0897, for dynamic load in concrete

Z-21.1-2152

APPROVED

from M10

RWS

R 120

ZTV

BZS D 24-601

## Building materials

**Approved for:**

- Concrete C20/25 to C50/60, cracked and non-cracked

**Also suitable for:**

- Concrete C12/15 - C80/95 (classification available)
- Steel fiber concrete (classification available)
- Solid sand-lime brick (classification available)

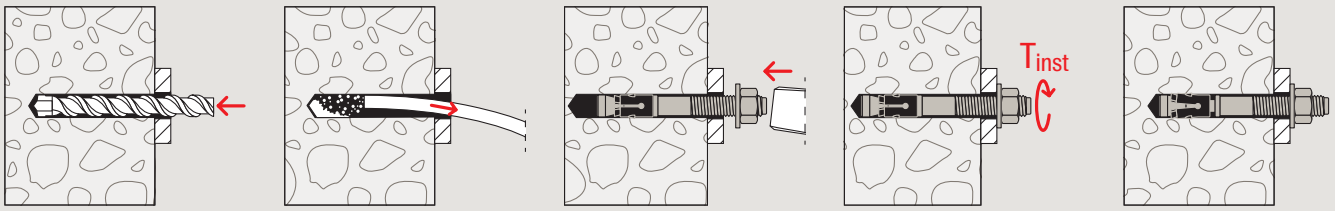
## Versions

- Galvanised steel
- Stainless steel R
- Highly corrosion-resistant steel HCR

## Functioning

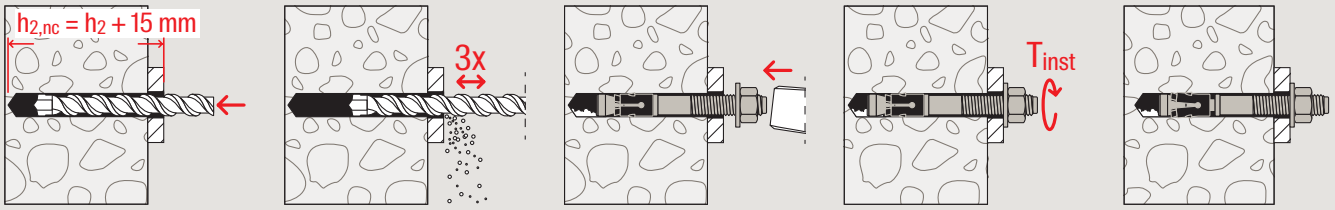
- The FAZ II Plus is suitable for pre-positioned and push-through installation and is also ideal for stand-off installation thanks to the long thread.
- The anchor is set in line with the approval once the preset installation torque is achieved.
- In the case of series installation, we recommend using the FABS or FA-ST II anchor bolt setting tools.
- In case of seismic demands or to minimise the hole clearance, the annular gap can be filled using the filling disc FFD.
- For dynamic loads, an additional „dynamic set“ is used, which is filled with injection mortar (compressive strength ≥ 50 N/mm² e.g.: FIS V Plus, FIS EM Plus, FIS HB or FIS SB) after installation.

## Push-through installation with hexagon nut

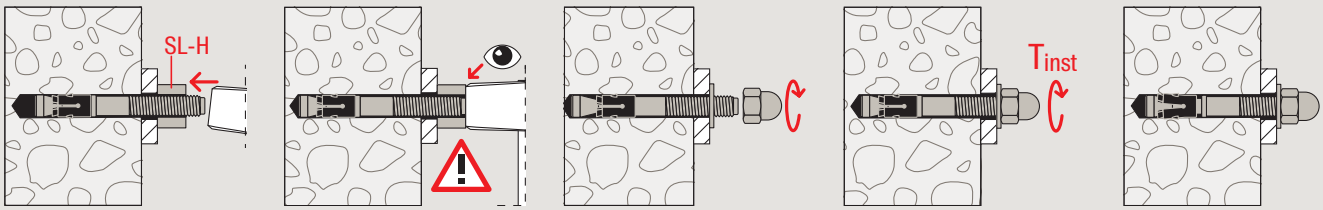




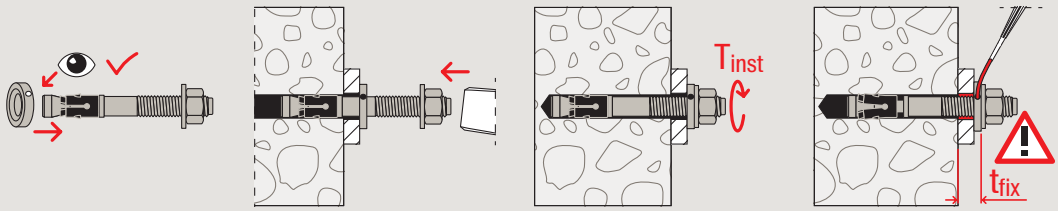

## Without borehole cleaning



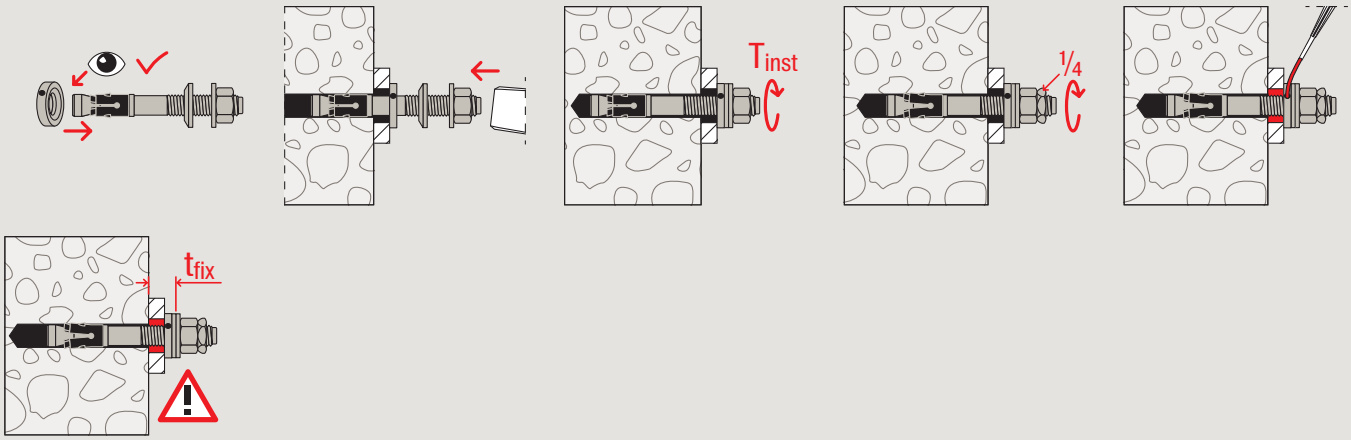

## Push-through installation of the cup nut version with setting gauge



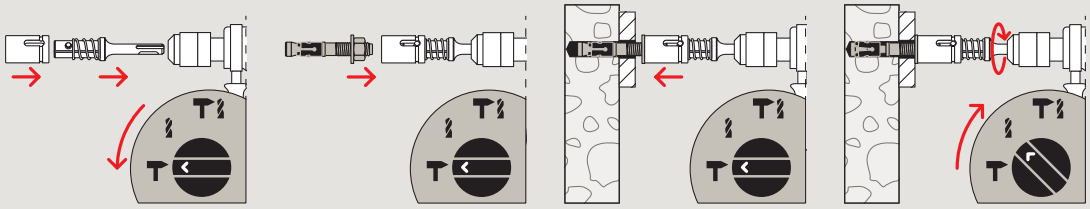

## With backfill disc for seismic application



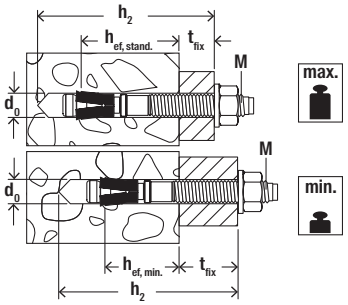

## Installation with dynamic set



## Installation with setting tool








## Technical data

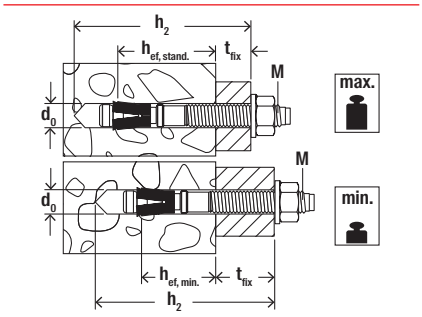
**Bolt anchor FAZ II Plus**



FAZ II Plus | FAZ II Plus R | FAZ II Plus HCR

| Item | Galvanised steel<br>Item no.<br>gvz | Stainless steel<br>Item no.<br>R | Highly corrosion-resistant steel<br>Item no.<br>HCR | Approval<br>ETA | <br>DIBt | <br>ICC | Seismic-Approval | Drill diameter<br>$d_0$<br>[mm] | Min. drill hole depth for through fixings<br>$h_2$<br>[mm] | Max. usable length hef,stand./ hef,min.<br>$t_{fix}$<br>[mm] | Anchor length<br>l<br>[mm] | Thread<br>ø x length<br>[mm] | Width across nut<br>SW<br>[mm] | Installation torque<br>$T_{inst}$<br>[Nm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FAZ II Plus 6/10 | 564572 | 564607 | – | ● | ● | – | – | 6 | 60 | 10 / - | 65 | M6 x 25 | 10 | 8 | 50 |
| FAZ II Plus 6/20 | 564573 | 564608 | – | ● | ● | – | – | 6 | 70 | 20 / - | 75 | M6 x 35 | 10 | 8 | 50 |
| FAZ II Plus 8/10 | 564574[1)] | 564609[1)] | – | ● | ● | ● | C1 | 8 | 65 | 10 / 20 | 75 | M8 x 38 | 13 | 20 | 50 |
| FAZ II Plus 8/10 | – | – | 564635[1)] | ● | ● | ● | C1 | 8 | 65 | 10 / 20 | 75 | M8 x 38 | 13 | 20 | 10 |
| FAZ II Plus 8/30 | 564575[1)] | 564610[1)] | – | ● | ● | ● | C1 | 8 | 85 | 30 / 40 | 95 | M8 x 58 | 13 | 20 | 50 |
| FAZ II Plus 8/30 | – | – | 564636[1)] | ● | ● | ● | C1 | 8 | 85 | 30 / 40 | 95 | M8 x 58 | 13 | 20 | 10 |
| FAZ II Plus 8/50 | 564576[1)] | 564611[1)] | – | ● | ● | ● | C1 | 8 | 105 | 50 / 60 | 115 | M8 x 78 | 13 | 20 | 50 |
| FAZ II Plus 8/50 | – | – | 564637[1)] | ● | ● | ● | C1 | 8 | 105 | 50 / 60 | 115 | M8 x 78 | 13 | 20 | 10 |
| FAZ II Plus 8/100 | 564577[1)] | – | – | ● | ● | ● | C1 | 8 | 155 | 100 / 110 | 165 | M8 x 128 | 13 | 20 | 25 |
| FAZ II Plus 8/160 | 564578[1)] | – | – | ● | ● | ● | C1 | 8 | 215 | 160 / 170 | 225 | M8 x 100 | 13 | 20 | 20 |
| FAZ II Plus 10/10 | 564579 | 564612 | – | ● | ● | ● | C1 / C2 | 10 | 85 | 10 / 30 | 95 | M10 x 53 | 17 | 45 | 50 |
| FAZ II Plus 10/10 | – | – | 564638 | ● | ● | ● | C1 / C2 | 10 | 85 | 10 / 30 | 95 | M10 x 53 | 17 | 45 | 10 |
| FAZ II Plus 10/20 | 564580 | – | – | ● | ● | ● | C1 / C2 | 10 | 95 | 20 / 40 | 105 | M10 x 63 | 17 | 45 | 25 |
| FAZ II Plus 10/20 | – | 564613 | – | ● | ● | ● | C1 / C2 | 10 | 95 | 20 / 40 | 105 | M10 x 63 | 17 | 45 | 50 |
| FAZ II Plus 10/30 | 564581 | – | – | ● | ● | ● | C1 / C2 | 10 | 105 | 30 / 50 | 115 | M10 x 73 | 17 | 45 | 25 |
| FAZ II Plus 10/30 | – | 564614 | – | ● | ● | ● | C1 / C2 | 10 | 105 | 30 / 50 | 115 | M10 x 73 | 17 | 45 | 50 |
| FAZ II Plus 10/30 | – | – | 564639 | ● | ● | ● | C1 / C2 | 10 | 105 | 30 / 50 | 115 | M10 x 73 | 17 | 45 | 10 |
| FAZ II Plus 10/50 | 564582 | 564615 | – | ● | ● | ● | C1 / C2 | 10 | 125 | 50 / 70 | 135 | M10 x 93 | 17 | 45 | 20 |
| FAZ II Plus 10/70 | – | 564616 | – | ● | ● | ● | C1 / C2 | 10 | 145 | 70 / 90 | 155 | M10 x 113 | 17 | 45 | 20 |
| FAZ II Plus 10/80 | 564583 | – | – | ● | ● | ● | C1 / C2 | 10 | 155 | 80 / 100 | 165 | M10 x 123 | 17 | 45 | 20 |
| FAZ II Plus 10/100 | 564584 | 564617 | – | ● | ● | ● | C1 / C2 | 10 | 175 | 100 / 120 | 185 | M10 x 143 | 17 | 45 | 20 |
| FAZ II Plus 10/160 | 564585 | 564618 | – | ● | ● | ● | C1 / C2 | 10 | 235 | 160 / 180 | 245 | M10 x 193 | 17 | 45 | 20 |
| FAZ II Plus 12/10 | 564586 | 564619 | – | ● | ● | ● | C1 / C2 | 12 | 100 | 10 / 30 | 110 | M12 x 61 | 19 | 60 | 20 |
| FAZ II Plus 12/10 | – | – | 564640 | ● | ● | ● | C1 / C2 | 12 | 100 | 10 / 30 | 110 | M12 x 61 | 19 | 60 | 10 |
| FAZ II Plus 12/20 | 564587 | 564620 | – | ● | ● | ● | C1 / C2 | 12 | 110 | 20 / 40 | 120 | M12 x 71 | 19 | 60 | 20 |
| FAZ II Plus 12/30 | 564588 | 564621 | – | ● | ● | ● | C1 / C2 | 12 | 120 | 30 / 50 | 130 | M12 x 81 | 19 | 60 | 20 |

[1)] With minimum embedment depth only for statically interderminate systems.




## Technical data



**Bolt anchor FAZ II Plus**

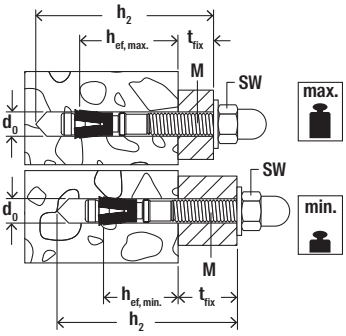


FAZ II Plus FAZ II Plus R FAZ II Plus HCR

| | Galvanised steel | Stainless steel | Highly corrosion-resistant steel | Approval | | | Seismic-Approval | Drill diameter | Min. drill hole depth for through fixings | Max. usable length hef,stand./ hef,min. | Anchor length | Thread | Width across nut | Installation torque | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | $d_0$ | $h_2$ | $t_{fix}$ | l | ø x length | SW | $T_{inst}$ | |
| | Item no. | Item no. | Item no. | ETA | DIBt | ICC | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [Nm] | [pcs] |
| **Item** | **gvz** | **R** | **HCR** | | | | | | | | | | | | |
| **FAZ II Plus 12/30** | – | – | 564641 | ● | ● | ● | C1 / C2 | 12 | 120 | 30 / 50 | 130 | M12 x 81 | 19 | 60 | 10 |
| **FAZ II Plus 12/50** | 564589 | 564622 | – | ● | ● | ● | C1 / C2 | 12 | 140 | 50 / 70 | 150 | M12 x 101 | 19 | 60 | 20 |
| **FAZ II Plus 12/60** | – | 564623 | – | ● | ● | ● | C1 / C2 | 12 | 150 | 60 / 80 | 160 | M12 x 111 | 19 | 60 | 20 |
| **FAZ II Plus 12/80** | 564590 | – | – | ● | ● | ● | C1 / C2 | 12 | 170 | 80 / 100 | 180 | M12 x 131 | 19 | 60 | 20 |
| **FAZ II Plus 12/100** | 564591 | 564624 | – | ● | ● | ● | C1 / C2 | 12 | 190 | 100 / 120 | 200 | M12 x 151 | 19 | 60 | 20 |
| **FAZ II Plus 12/160** | 564592 | – | – | ● | ● | ● | C1 / C2 | 12 | 250 | 160 / 180 | 260 | M12 x 186 | 19 | 60 | 10 |
| **FAZ II Plus 12/160** | – | 564625 | – | ● | ● | ● | C1 / C2 | 12 | 250 | 160 / 180 | 260 | M12 x 186 | 19 | 60 | 20 |
| **FAZ II Plus 12/200** | 564593 | – | – | ● | ● | ● | C1 / C2 | 12 | 290 | 200 / 220 | 300 | M12 x 186 | 19 | 60 | 10 |
| **FAZ II Plus 16/5** | 564594 | – | – | ● | ● | ● | C1 / C2 | 16 | 115 | 5 / 25 | 128 | M16 x 64 | 24 | 110 | 10 |
| **FAZ II Plus 16/5** | – | 564626 | – | ● | ● | ● | C1 / C2 | 16 | 115 | 5 / 25 | 128 | M16 x 64 | 24 | 110 | 20 |
| **FAZ II Plus 16/25** | 564595 | – | 564642 | ● | ● | ● | C1 / C2 | 16 | 135 | 25 / 45 | 148 | M16 x 84 | 24 | 110 | 10 |
| **FAZ II Plus 16/25** | – | 564627 | – | ● | ● | ● | C1 / C2 | 16 | 135 | 25 / 45 | 148 | M16 x 84 | 24 | 110 | 20 |
| **FAZ II Plus 16/50** | 564596 | – | 564643 | ● | ● | ● | C1 / C2 | 16 | 160 | 50 / 70 | 173 | M16 x 109 | 24 | 110 | 10 |
| **FAZ II Plus 16/50** | – | 564628 | – | ● | ● | ● | C1 / C2 | 16 | 160 | 50 / 70 | 173 | M16 x 109 | 24 | 110 | 20 |
| **FAZ II Plus 16/60** | – | 564629 | – | ● | ● | ● | C1 / C2 | 16 | 170 | 60 / 80 | 183 | M16 x 119 | 24 | 110 | 20 |
| **FAZ II Plus 16/100** | 564597 | 564630 | – | ● | ● | ● | C1 / C2 | 16 | 210 | 100 / 120 | 223 | M16 x 159 | 24 | 110 | 10 |
| **FAZ II Plus 16/160** | 564598 | – | – | ● | ● | ● | C1 / C2 | 16 | 270 | 160 / 180 | 283 | M16 x 189 | 24 | 110 | 10 |
| **FAZ II Plus 16/200** | 564599 | – | – | ● | ● | ● | C1 / C2 | 16 | 310 | 200 / 220 | 323 | M16 x 189 | 24 | 110 | 10 |
| **FAZ II Plus 16/250** | 564600 | – | – | ● | ● | ● | C1 / C2 | 16 | 360 | 250 / 270 | 373 | M16 x 100 | 24 | 110 | 10 |
| **FAZ II Plus 16/300** | 564601 | – | – | ● | ● | ● | C1 / C2 | 16 | 410 | 300 / 320 | 423 | M16 x 100 | 24 | 110 | 10 |
| **FAZ II Plus 20/30** | 564602 | – | – | ● | ● | ● | C1 / C2 | 20 | 155 | 30 / - | 172 | M20 x 54 | 30 | 200 | 5 |
| **FAZ II Plus 20/30** | – | 564631 | – | ● | ● | ● | C1 / C2 | 20 | 155 | 30 / - | 172 | M20 x 54 | 30 | 200 | 4 |
| **FAZ II Plus 20/60** | 564603 | – | – | ● | ● | ● | C1 / C2 | 20 | 185 | 60 / - | 202 | M20 x 84 | 30 | 200 | 5 |
| **FAZ II Plus 20/60** | – | 564632 | – | ● | ● | ● | C1 / C2 | 20 | 185 | 60 / - | 202 | M20 x 84 | 30 | 200 | 4 |
| **FAZ II Plus 20/160** | 564604 | – | – | ● | ● | ● | C1 / C2 | 20 | 285 | 160 / - | 302 | M20 x 100 | 30 | 200 | 5 |
| **FAZ II Plus 24/30** | 564605 | – | – | ● | ● | ● | C1 / C2 | 24 | 185 | 30 / - | 205 | M24 x 58 | 36 | 270 | 5 |
| **FAZ II Plus 24/30** | – | 564633 | – | ● | ● | ● | C1 / C2 | 24 | 185 | 30 / - | 205 | M24 x 58 | 36 | 270 | 4 |
| **FAZ II Plus 24/60** | 564606 | – | – | ● | ● | ● | C1 / C2 | 24 | 215 | 60 / - | 235 | M24 x 88 | 36 | 270 | 5 |
| **FAZ II Plus 24/60** | – | 564634 | – | ● | ● | ● | C1 / C2 | 24 | 215 | 60 / - | 235 | M24 x 88 | 36 | 270 | 4 |

[1] With minimum embedment depth only for statically interderminate systems.

C1/C2: Only with maximum embedment depth.




4

## Technical data

**Bolt anchor FAZ II Plus H (version with cap nut)**



FAZ II Plus H



FAZ II Plus H R



Cap nut FAZ II Plus gvz

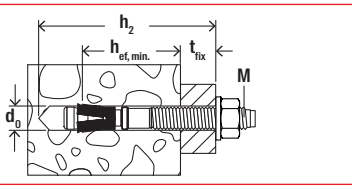


Cap nut FAZ II Plus R

| | Galvanised steel | Stainless steel | Approval | | Seismic-Approval | Drill diameter | Min. drill hole depth for through fixings | Max. usable length hef,stand./ hef,min. | Anchor length | Thread | Width across nut | Installation torque | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $d_0$ | $h_2$ | $t_{fix}$ | l | ø x length | SW | $T_{inst}$ | |
| | Item no. | Item no. | ETA | DIBt | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [Nm] | [pcs] |
| Item | gvz | R | | | | | | | | | | | |
| FAZ II Plus 10/10 H | 564687 | 564691 | ● | ● | C1 / C2 | 10 | 87 | 10 / 30 | 95 | M10 x 53 | 17 | 45 | 20 |
| FAZ II Plus 10/20 H | 564688 | 564692 | ● | ● | C1 / C2 | 10 | 97 | 20 / 40 | 105 | M10 x 63 | 17 | 45 | 20 |
| FAZ II Plus 12/10 H | 564689 | 564693 | ● | ● | C1 / C2 | 12 | 99 | 10 / 30 | 109 | M12 x 61 | 19 | 60 | 20 |
| FAZ II Plus 12/20 H | 564690 | 564694 | ● | ● | C1 / C2 | 12 | 109 | 20 / 40 | 119 | M12 x 71 | 19 | 60 | 20 |
| Cap nut FAZ II Plus M10 | 569126[1)] | 569127[1)] | ● | ● | – | – | – | – | – | M10 | 17 | – | 20 |
| Cap nut FAZ II Plus M12 | 569128[1)] | 569129[1)] | ● | ● | – | – | – | – | – | M12 | 19 | – | 20 |

[1)] Can be combined wit h all bolt anchors FAZ II M10 and M12 in accor dance with approval.

C1/C2: Only with maximum embedment depth.




## Technical data

**Bolt anchor FAZ II Plus K / Bolt anchor FAZ II Plus K GS (short version)**



FAZ II Plus K

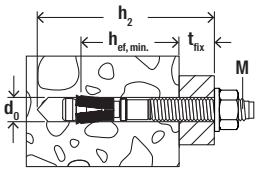


FAZ II Plus K GS



FAZ II Plus K R

| | Galvanised steel | Stainless steel | Approval | | Seismic-Approval | Drill diameter | Min. drill hole depth for through fixings | Anchor length | Max. fixture thickness | Thread | Washer (outer diameter x thickness) | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $d_0$ | $h_2$ | l | $t_{fix}$ | ø x length | | |
| | Item no. | Item no. | ETA | DIBt | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [pcs] |
| Item | gvz | R | | | | | | | | | | |
| FAZ II Plus 8/5 K | 564671 | 564676 | ● | ● | C1 | 8 | 45 | 60 | 5 | M8 x 23 | 16 x 1.6 | 50 |
| FAZ II Plus 10/10 K | 564672 | 564677 | ● | ● | C1 / C2 | 10 | 65 | 75 | 10 | M10 x 33 | 20 x 2 | 50 |
| FAZ II Plus 10/20 K | 564673 | – | ● | ● | C1 / C2 | 10 | 75 | 85 | 20 | M10 x 43 | 20 x 2 | 25 |
| FAZ II Plus 10/20 K | – | 564678 | ● | ● | C1 / C2 | 10 | 75 | 85 | 20 | M10 x 43 | 20 x 2 | 50 |
| FAZ II Plus 12/10 K | 564674 | 564679 | ● | ● | C1 / C2 | 12 | 80 | 90 | 10 | M12 x 41 | 18 x 2 | 20 |



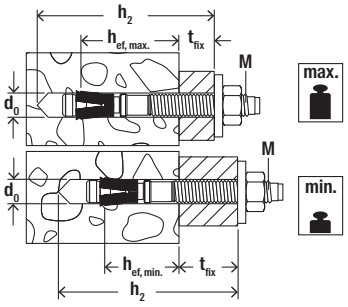

## Technical data

**Bolt anchor FAZ II Plus K / Bolt anchor FAZ II Plus K GS (short version)**



FAZ II Plus K FAZ II Plus K GS FAZ II Plus K R

| | Galvanised steel | Stainless steel | Approval | | Seismic-Approval | Drill diameter | Min. drill hole depth for through fixings | Anchor length | Max. fixture thickness | Thread | Washer (outer diameter x thickness) | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $d_0$ | $h_2$ | l | $t_{fix}$ | ø x length | | |
| | Item no. | Item no. | ETA | DIBt | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [pcs] |
| Item | gvz | R | | | | | | | | | | |
| FAZ II Plus 12/20 K | 564675 | 564680 | ● | ● | C1 / C2 | 12 | 90 | 100 | 20 | M12 x 51 | 18 x 2 | 20 |
| FAZ II Plus 10/10 K GS | 564681 | – | ● | ● | C1 / C2 | 10 | 65 | 75 | 10 | M10 x 33 | 25 x 3 | 50 |
| FAZ II Plus 12/10 K GS | 564682 | – | ● | ● | C1 / C2 | 12 | 80 | 90 | 10 | M12 x 41 | 30 x 3 | 20 |



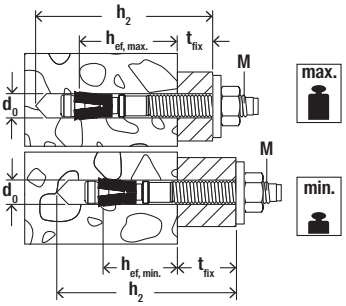

## Technical data

**Bolt anchor FAZ II Plus GS (with large washer) / Bolt anchor FAZ II Plus HBS (washer compliant to timber construction standard DIN 1052)**



FAZ II Plus GS FAZ II Plus GS R FAZ II Plus HBS

| | Galvanised steel | Stainless steel | Approval | | Seismic-Approval | Drill diameter | Min. drill hole depth for through fixings | Max. usable length hef,stand./ hef,min. | Anchor length | Thread | Width across nut | Washer (outer diameter x thickness) | Installation torque | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $d_0$ | $h_2$ | $t_{fix}$ | l | ø x length | SW | | $T_{inst}$ | |
| | Item no. | Item no. | ETA | DIBt | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [Nm] | [pcs] |
| Item | gvz | R | | | | | | | | | | | | |
| FAZ II Plus 8/10 GS | 564644 | – | ● | ● | C1 | 8 | 65 | 10 / 20 | 75 | M8 x 38 | 13 | 44 x 4 | 20 | 50 |
| FAZ II Plus 8/10 GS | – | 564663 | ● | ● | C1 | 8 | 65 | 10 / 20 | 75 | M8 x 38 | 13 | 22 x 2.5 | 20 | 50 |
| FAZ II Plus 8/30 GS | 564645 | 564664 | ● | ● | C1 | 8 | 85 | 30 / 40 | 95 | M8 x 58 | 13 | 22 x 2.5 | 20 | 50 |
| FAZ II Plus 10/10 GS | 564646 | 564665 | ● | ● | C1 / C2 | 10 | 85 | 10 / 30 | 95 | M10 x 53 | 17 | 25 x 3 | 45 | 50 |
| FAZ II Plus 10/30 GS | 564647 | – | ● | ● | C1 / C2 | 10 | 105 | 30 / 50 | 115 | M10 x 73 | 17 | 25 x 3 | 45 | 25 |
| FAZ II Plus 10/30 GS | – | 564666 | ● | ● | C1 / C2 | 10 | 105 | 30 / 50 | 115 | M10 x 73 | 17 | 25 x 3 | 45 | 50 |
| FAZ II Plus 12/10 GS | 564648 | 564667 | ● | ● | C1 / C2 | 12 | 100 | 10 / 30 | 110 | M12 x 61 | 19 | 30 x 3 | 60 | 20 |
| FAZ II Plus 12/20 GS | 564649 | – | ● | ● | C1 / C2 | 12 | 110 | 20 / 40 | 120 | M12 x 71 | 19 | 30 x 3 | 60 | 20 |
| FAZ II Plus 12/30 GS | 564650 | 564668 | ● | ● | C1 / C2 | 12 | 120 | 30 / 50 | 130 | M12 x 81 | 19 | 30 x 3 | 60 | 20 |
| FAZ II Plus 12/50 GS | 564651 | – | ● | ● | C1 / C2 | 12 | 140 | 50 / 70 | 150 | M12 x 101 | 19 | 30 x 3 | 60 | 20 |
| FAZ II Plus 12/80 GS | 564652 | – | ● | ● | C1 / C2 | 12 | 170 | 80 / 100 | 180 | M12 x 131 | 19 | 44 x 4 | 60 | 20 |
| FAZ II Plus 12/100 GS | 564653 | – | ● | ● | C1 / C2 | 12 | 190 | 100 / 120 | 200 | M12 x 151 | 19 | 30 x 3 | 60 | 20 |
| FAZ II Plus 12/100 GS | 564654 | – | ● | ● | C1 / C2 | 12 | 190 | 100 / 120 | 200 | M12 x 151 | 19 | 44 x 4 | 60 | 20 |
| FAZ II Plus 12/120 GS | 564656 | – | ● | ● | C1 / C2 | 12 | 210 | 120 / 140 | 220 | M12 x 171 | 19 | 44 x 4 | 60 | 20 |
| FAZ II Plus 12/120 GS | 564655 | – | ● | ● | C1 / C2 | 12 | 210 | 120 / 140 | 220 | M12 x 171 | 19 | 30 x 3 | 60 | 20 |
| FAZ II Plus 12/140 GS | 564657 | – | ● | ● | C1 / C2 | 12 | 230 | 140 / 160 | 240 | M12 x 186 | 19 | 44 x 4 | 60 | 20 |




4

## Technical data

**Bolt anchor FAZ II Plus GS (with large washer) / Bolt anchor FAZ II Plus HBS (washer compliant to timber construction standard DIN 1052)**



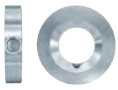
FAZ II Plus GS | FAZ II Plus GS R | FAZ II Plus HBS

| | Galvanised steel | Stainless steel | Approval | | Seismic-Approval | Drill diameter | Min. drill hole depth for through fixings | Max. usable length hef,stand./hef,min. | Anchor length | Thread | Width across nut | Washer (outer diameter x thickness) | Installation torque | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $d_0$ | $h_2$ | $t_{fix}$ | l | ø x length | SW | | $T_{inst}$ | |
| | Item no. | Item no. | ETA | DIBt | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [Nm] | [pcs] |
| **Item** | **gvz** | **R** | | | | | | | | | | | | |
| **FAZ II Plus 12/160 GS** | **564658** | **564669** | ● | ● | C1 / C2 | 12 | 250 | 160 / 180 | 260 | M12 x 186 | 19 | 44 x 4 | 60 | 20 |
| **FAZ II Plus 12/180 GS** | **564659** | **–** | ● | ● | C1 / C2 | 12 | 270 | 180 / 200 | 280 | M12 x 186 | 19 | 44 x 4 | 60 | 20 |
| **FAZ II Plus 12/200 GS** | **564660** | **–** | ● | ● | C1 / C2 | 12 | 290 | 200 / 220 | 300 | M12 x 186 | 19 | 44 x 4 | 60 | 20 |
| **FAZ II Plus 16/160 GS** | **–** | **564670** | ● | ● | C1 / C2 | 16 | 270 | 160 / 180 | 283 | M16 x 189 | 24 | 56 x 5 | 110 | 4 |
| **FAZ II Plus 16/160 GS** | **564661** | **–** | ● | ● | C1 / C2 | 16 | 270 | 160 / 180 | 283 | M16 x 189 | 24 | 56 x 5 | 110 | 10 |
| **FAZ II Plus 16/200 GS** | **564662** | **–** | ● | ● | C1 / C2 | 16 | 310 | 200 / 220 | 323 | M16 x 189 | 24 | 56 x 5 | 60 | 10 |
| **FAZ II Plus 12/100 HBS** | **564683** | **–** | ● | ● | C1 / C2 | 12 | 190 | 100 / 120 | 205 | M12 x 151 | 19 | 58 x 6 | 60 | 20 |
| **FAZ II Plus 12/120 HBS** | **564684** | **–** | ● | ● | C1 / C2 | 12 | 210 | 120 / 140 | 225 | M12 x 171 | 19 | 58 x 6 | 60 | 20 |
| **FAZ II Plus 16/160 HBS** | **564685** | **–** | ● | ● | C1 / C2 | 16 | 270 | 160 / 180 | 278 | M16 x 189 | 24 | 68 x 6 | 110 | 10 |
| **FAZ II Plus 16/200 HBS** | **564686** | **–** | ● | ● | C1 / C2 | 16 | 310 | 200 / 220 | 328 | M16 x 189 | 24 | 68 x 6 | 110 | 10 |

C1/C2: Only with maximum embedment depth.

## Accessories

**Accessories**



Filling disc FFD



FABS



FA-ST II




FA-ST II Set

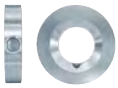


Replacement spring

| | | Internal diameter | External-ø | Match | Contents | Sales unit |
|---|---|---|---|---|---|---|
| | | D | d | | | |
| | Item no. | [mm] | [mm] | | | [pcs] |
| **Item** | | | | | | |
| **FFD 26 x 12 x 6** | **538458** | 12 | 26 | FAZ II Plus | | 4 |
| **FFD 26 x 12 x 6 R** | **541986** | 12 | 26 | FAZ II Plus | | 4 |
| **FFD 30 x 14 x 6** | **538459** | 14 | 30 | FAZ II Plus | | 4 |
| **FFD 30 x 14 x 6 R** | **541987** | 14 | 30 | FAZ II Plus | | 4 |
| **FFD 38 x 19 x 7** | **538460** | 19 | 38 | FAZ II Plus | | 4 |
| **FFD 40 x 19 x 7 R** | **541988** | 19 | 40 | FAZ II Plus | | 4 |
| **FFD 46 x 23 x 8** | **538461** | 23 | 46 | FAZ II Plus | | 4 |
| **FFD 50 x 23 x 8 R** | **541989** | 23 | 50 | FAZ II Plus | | 4 |
| **FFD 54 x 28 x 10** | **538462** | 28 | 54 | FAZ II Plus | | 4 |
| **FFD 55 x 28 x 10 R** | **541990** | 28 | 55 | FAZ II Plus | | 4 |
| **FABS** | **077937** | – | – | Bolt anchor M6 - M12 | | 1 |
| **FA-ST II M10** | **558790** | – | – | Bolt anchor M10 | 1 x SDS Adapter, 1 x Socket SW17 | 1 |
| **FA-ST II M12** | **558791** | – | – | Bolt anchor M12 | 1 x SDS Adapter, 1 x Socket SW19 | 1 |

## Accessories

**Accessories**



Filling disc FFD



FABS



FA-ST II




FA-ST II Set



Replacement spring

| | Item no. | Internal diameter D [mm] | External-ø d [mm] | Match | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Item** | | | | | | |
| **FA-ST II M16** | **558792** | – | – | Bolt anchor M16 | 1 x SDS Adapter, 1 x Socket SW24 | 1 |
| **FA-ST II Set** | **558789** | – | – | Bolt anchor M10 - M16 | 1 x SDS Adapter<br>1 x Socket SW17, SW19, SW24 | 1 |
| **FA-ST II Spring** | **558793** | – | – | FA-ST II M10/M12/M16 | 5 x Replacement spring | 1 |

## Accessories Dynamic set

**Accessories Dynamic set**



Dynamic set

| | Item no. | Ap-pro-val DIBt | External-ø d [mm] | Thickness [mm] | Min. fixture thickness $t_{fix}$ [mm] | Match | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | |
| **Dynamic set M16** | **568785** | ● | 38 | 11 | 15 | FAZ II Plus | 10 |
| **Dynamic set M20** | **568786** | ● | 46 | 13 | 20 | FAZ II Plus | 10 |
| **Dynamic set M24** | **568787** | ● | 54 | 17 | 24 | FAZ II Plus | 10 |
| **Dynamic set M16 R** | **568788** | ● | 40 | 11 | 15 | FAZ II Plus | 10 |
| **Dynamic set M20 R** | **568789** | ● | 50 | 13 | 20 | FAZ II Plus | 10 |
| **Dynamic set M24 R** | **568790** | ● | 55 | 17 | 24 | FAZ II Plus | 10 |

# Loads

**Bolt anchor FAZ II Plus**

Permissible loads of a single anchor[1] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-19/0520 of 24.05.2023 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | Material/ surface[2] | Effective anchorage depth $h_{ef}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Instal-lation torque $T_{inst}$ [Nm] | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] |
| **FAZ II Plus 6** | gvz | 40 | 80 | 8 | 0.7 | 4.3 | 35 | 40 | 5.0 | 4.3 | 35 | 40 |
| | gvz | 80 | 120 | 8 | 0.7 | 4.3 | 35 | 40 | 5.0 | 4.3 | 35 | 40 |
| | R | 40 | 80 | 8 | 0.7 | 5.0 | 35 | 40 | 5.0 | 5.0 | 35 | 40 |
| | R | 80 | 120 | 8 | 0.7 | 5.0 | 35 | 40 | 5.0 | 5.0 | 35 | 40 |
| **FAZ II Plus 8** | gvz | 35 | 80 | 20 | 2.6 | 8.5 | 35 | 40 | 4.8 | 9.3 | 40 | 40 |
| | gvz | 90 | 140 | 20 | 3.8 | 9.3 | 35 | 40 | 6.7 | 9.3 | 40 | 40 |
| | R | 35 | 80 | 20 | 2.6 | 8.5 | 35 | 40 | 4.8 | 10.1 | 40 | 40 |
| | R | 90 | 140 | 20 | 3.8 | 10.1 | 35 | 40 | 6.7 | 10.1 | 40 | 40 |
| **FAZ II Plus 10** | gvz | 40 | 80 | 45 | 4.1 | 10.8 | 40 | 45 | 5.9 | 15.0 | 40 | 45 |
| | gvz | 100 | 150 | 45 | 6.2 | 15.0 | 40 | 45 | 9.5 | 15.0 | 40 | 45 |
| | R | 40 | 80 | 45 | 4.1 | 10.8 | 40 | 45 | 5.9 | 15.1 | 40 | 45 |
| | R | 100 | 150 | 45 | 6.2 | 15.1 | 40 | 45 | 9.5 | 15.1 | 40 | 45 |
| **FAZ II Plus 12** | gvz | 50 | 100 | 60 | 5.8 | 18.0 | 50 | 55 | 8.3 | 21.1 | 50 | 55 |
| | gvz | 125 | 190 | 60 | 9.5 | 21.1 | 50 | 55 | 10.5 | 21.1 | 50 | 55 |
| | R | 50 | 100 | 60 | 5.8 | 18.0 | 50 | 55 | 8.3 | 24.1 | 50 | 55 |
| | R | 125 | 190 | 60 | 9.5 | 24.1 | 50 | 55 | 10.5 | 24.1 | 50 | 55 |
| **FAZ II Plus 16** | gvz | 65 | 140 | 110 | 8.6 | 27.5 | 65 | 65 | 12.3 | 39.1 | 65 | 65 |
| | gvz | 160 | 240 | 110 | 12.9 | 39.1 | 65 | 65 | 18.4 | 39.1 | 65 | 65 |
| | R | 65 | 140 | 110 | 8.6 | 27.5 | 65 | 65 | 12.3 | 39.3 | 65 | 65 |
| | R | 160 | 240 | 110 | 12.9 | 40.6 | 65 | 65 | 18.4 | 40.6 | 65 | 65 |
| **FAZ II Plus 20** | gvz | 100 | 160 | 200 | 16.4 | 47.4 | 95 | 85 | 23.4 | 47.4 | 95 | 95 |
| | gvz | 180 | 270 | 200 | 16.4 | 47.4 | 95 | 85 | 23.4 | 47.4 | 95 | 95 |
| | R | 100 | 160 | 200 | 16.4 | 52.5 | 95 | 85 | 23.4 | 61.7 | 95 | 95 |
| | R | 180 | 270 | 200 | 16.4 | 61.7 | 95 | 85 | 23.4 | 61.7 | 95 | 95 |
| **FAZ II Plus 24** | gvz | 125 | 200 | 270 | 22.9 | 73.3 | 100 | 100 | 32.7 | 73.3 | 100 | 135 |
| | R | 125 | 200 | 270 | 22.9 | 73.3 | 100 | 100 | 32.7 | 90.3 | 100 | 135 |

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.
[2] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).
[3] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Loads

## Bolt anchor FAZ II Plus dynamic

Design values for cyclic fatigue loading[1] of a single anchor in cracked or non-cracked normal concrete of strength class C20/25[2].
For the design the complete current assessment ETA-20/0897 of 22.05.2023 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material/ surface | Effective anchorage depth | Minimum member thickness | Installation torque | Design values of tension ($\Delta N_{Ed,max}$) and shear loads ($\Delta V_{Ed,max}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Design values of tension ($\Delta N_{Ed,max}$) and shear loads ($\Delta V_{Ed,max}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst}$ [Nm] | $\Delta N_{Ed,max}$ [3] [kN] | $\Delta V_{Ed,max}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] | $\Delta N_{Ed,max}$ [3] [kN] | $\Delta V_{Ed,max}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] |
| **FAZ II Plus 16** | gvz | 65 | 140 | 110 | 6.0 | 4.7 | 65 | 65 | 6.4 | 4.7 | 65 | 65 |
| | gvz | 85 | 140 | 110 | 6.4 | 4.7 | 65 | 65 | 6.4 | 4.7 | 65 | 65 |
| | gvz | 160 | 240 | 110 | 6.4 | 4.7 | 65 | 65 | 6.4 | 4.7 | 65 | 65 |
| | R | 65 | 140 | 110 | 3.1 | 6.0 | 65 | 65 | 3.1 | 6.0 | 65 | 65 |
| | R | 85 | 140 | 110 | 3.1 | 6.0 | 65 | 65 | 3.1 | 6.0 | 65 | 65 |
| | R | 160 | 240 | 110 | 3.1 | 6.0 | 65 | 65 | 3.1 | 6.0 | 65 | 65 |
| **FAZ II Plus 20** | gvz | 100 | 160 | 200 | 8.8 | 6.1 | 95 | 85 | 8.8 | 6.1 | 95 | 95 |
| | gvz | 180 | 270 | 200 | 8.8 | 6.1 | 95 | 85 | 8.8 | 6.1 | 95 | 95 |
| | R | 100 | 160 | 200 | 4.7 | 9.4 | 95 | 85 | 4.7 | 9.4 | 95 | 95 |
| | R | 180 | 270 | 200 | 4.7 | 9.4 | 95 | 85 | 4.7 | 9.4 | 95 | 95 |
| **FAZ II Plus 24** | gvz | 125 | 200 | 270 | 14.7 | 9.5 | 100 | 100 | 14.7 | 9.5 | 100 | 135 |
| | R | 125 | 200 | 270 | 6.9 | 13.6 | 100 | 100 | 6.9 | 13.6 | 100 | 135 |

[1] The design values of the cyclic fatigue loading apply for load cycles > $10^8$ in accordance with design method I acc. to TR061 – for unknown static lower load. If the static lower load is known and / or for lower number of load cycles higher load values are possible. The partial safety factors as regulated in the design standard are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$. Drill hole cleaning acc. to assessment.
[2] For higher concrete strength classes up to C50/60 higher permissible loads may be possible. - see assessment. The concrete is assumed to be standard-reinforced.
[3] In the case of combinations of tensile loads and shear loads, with reduced or minimum spacing and edge distances (anchor groups) the design must be carried out in accordance with the provisions of the complete assessment.

# High performance anchor FH II

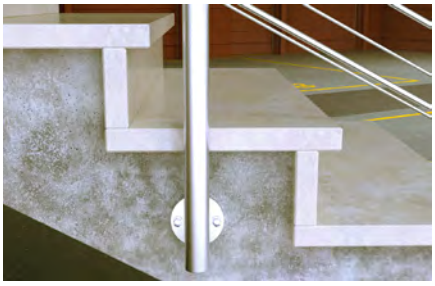
Strong, secure and aesthetic anchoring.







Steel girders



Banisters

## Applications

- Guard rails
- Staircases
- Consoles
- Steel constructions
- Ladders
- Cable trays
- Machines
- Gates
- Façades
- Gratings

## Advantages

- The international approvals guarantee maximum safety and the best performance. These approvals even cover use in earthquake zones (seismic C1 and C2).
- The anchor is designed with different head styles for fixing points with aesthetic design.
- The design between the bolt and the sleeve ensures high shear load-bearing capacity. Thus, fewer fixing points are required.
- The optimised geometry minimises the energy required for installation and thus allows for fast installation.
- The use of hollow drills is included in the approval.

## Certificates / Features

ETA-07/0025, in cracked concrete

M8-M20

## Building materials

**Approved for:**

- Concrete C20/25, cracked and non-cracked

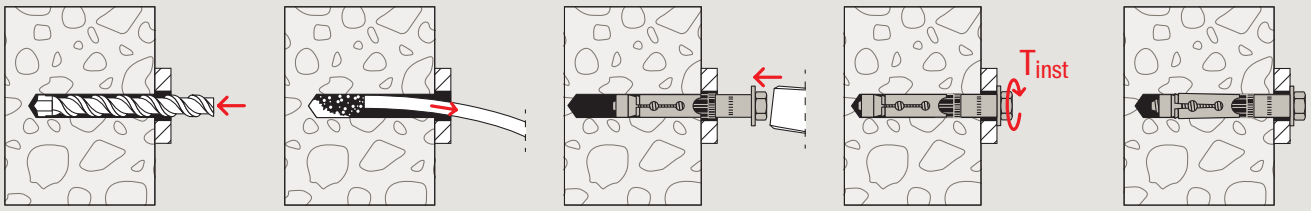
## Versions

- Galvanised steel
- Stainless steel R

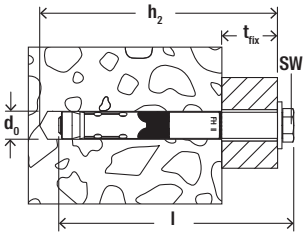
## Functioning

- The FH II is suitable for push-through installation.
- When the torque is applied, the cone is pulled into the expansion sleeve which is forced against the drill hole wall.
- The black plastic ring prevents rotation when tightening the anchor and acts as a crumple zone to take the torque slippage, so that the fixture of pulled onto the substrate.
- Alternative head designs for flexible design solutions: Hexagon head (type S), countersunk head (type SK), bolt version with nut and washer (type B) and cap nut (type H).

## Installation FH II





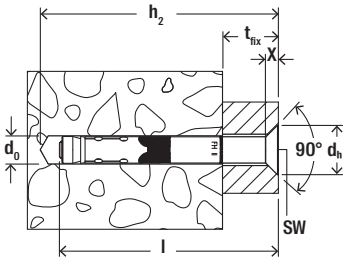

## Technical data

**High performance anchor FH II-S with hexagon head**



FH II-S FH II-S R

| Item | Galvanised steel Item no. gvz | Stainless steel Item no. R | Approval ETA | Approval ICC | Seismic-Approval | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Thread M | Width across nut SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FH II 10/10 S | 503133 | 510923 | ● | – | – | 10 | 65 | 70 | 10 | M6 | 10 | 50 |
| FH II 10/25 S | 503134 | 510924 | ● | – | – | 10 | 80 | 85 | 25 | M6 | 10 | 50 |
| FH II 10/50 S | 503135 | – | ● | – | – | 10 | 105 | 110 | 50 | M6 | 10 | 50 |
| FH II 12/10 S | 044884 | 510925 | ● | ● | C1 / C2 | 12 | 90 | 90 | 10 | M8 | 13 | 50 |
| FH II 12/25 S | 044885 | – | ● | ● | C1 / C2 | 12 | 105 | 105 | 25 | M8 | 13 | 50 |
| FH II 12/25 S | – | 510926 | ● | ● | C1 / C2 | 12 | 105 | 105 | 25 | M8 | 13 | 20 |
| FH II 12/50 S | 044886 | – | ● | ● | C1 / C2 | 12 | 130 | 130 | 50 | M8 | 13 | 25 |
| FH II 15/10 S | 044887 | – | ● | ● | C1 / C2 | 15 | 100 | 106 | 10 | M10 | 17 | 25 |
| FH II 15/10 S | – | 510927 | ● | ● | C1 / C2 | 15 | 100 | 106 | 10 | M10 | 17 | 50 |
| FH II 15/25 S | 044888 | – | ● | ● | C1 / C2 | 15 | 115 | 121 | 25 | M10 | 17 | 25 |
| FH II 15/25 S | – | 510928 | ● | ● | C1 / C2 | 15 | 115 | 121 | 25 | M10 | 17 | 20 |
| FH II 15/50 S | 044889 | – | ● | ● | C1 / C2 | 15 | 140 | 146 | 50 | M10 | 17 | 25 |
| FH II 18/10 S | 046847 | – | ● | ● | C1 / C2 | 18 | 115 | 118 | 10 | M12 | 19 | 20 |
| FH II 18/25 S | 044894 | – | ● | ● | C1 / C2 | 18 | 130 | 132 | 25 | M12 | 19 | 20 |
| FH II 18/25 S | – | 510929 | ● | ● | C1 / C2 | 18 | 130 | 132 | 25 | M12 | 19 | 10 |
| FH II 18/50 S | 044896 | – | ● | ● | C1 / C2 | 18 | 155 | 157 | 50 | M12 | 19 | 20 |
| FH II 24/25 S | 044898 | – | ● | ● | C1 / C2 | 24 | 150 | 160 | 25 | M16 | 24 | 10 |
| FH II 24/25 S | – | 502711 | ● | ● | C1 / C2 | 24 | 150 | 160 | 25 | M16 | 24 | 8 |
| FH II 24/50 S | 044900 | – | ● | ● | C1 / C2 | 24 | 175 | 185 | 50 | M16 | 24 | 10 |
| FH II 28/30 S | 044901 | – | ● | ● | C1 / C2 | 28 | 185 | 192 | 30 | M20 | 30 | 4 |
| FH II 28/60 S | 044902 | – | ● | ● | C1 / C2 | 28 | 215 | 222 | 60 | M20 | 30 | 4 |
| FH II 32/30 S | 044903 | – | ● | ● | C1 / C2 | 32 | 210 | 215 | 30 | M24 | 36 | 4 |
| FH II 32/60 S | 044904 | – | ● | ● | C1 / C2 | 32 | 240 | 245 | 60 | M24 | 36 | 4 |




| | X [mm] | Ø $d_h$ [mm] |
|---|---|---|
| FH II 10/... SK | 5,0 | 18 |
| FH II 12/... SK | 5,8 | 22 |
| FH II 15/... SK | 5,8 | 25 |
| FH II 18/... SK | 8,0 | 32 |

4

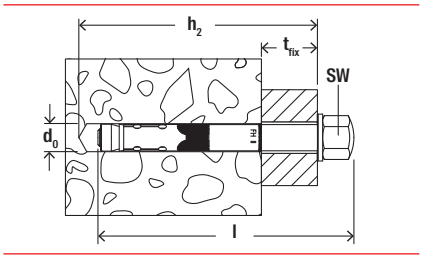
## Technical data

**High performance anchor FH II-SK with countersunk head**



FH II-SK FH II-SK R

| Item | Galvanised steel Item no. gvz | Stainless steel Item no. R | Approval ETA | Approval ICC | Seismic-Approval | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Thread M | Width across nut (hexagon socket) SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FH II 10/15 SK | 503136 | – | ● | – | – | 10 | 70 | 65 | 15 | M6 | 4 | 50 |
| FH II 10/25 SK | 503137 | – | ● | – | – | 10 | 80 | 75 | 25 | M6 | 4 | 50 |
| FH II 10/50 SK | 503138 | – | ● | – | – | 10 | 105 | 100 | 50 | M6 | 4 | 50 |
| FH II 12/15 SK | 044917 | 510931 | ● | – | C1 / C2 | 12 | 95 | 90 | 15 | M8 | 5 | 25 |
| FH II 12/25 SK | 044918 | – | ● | – | C1 / C2 | 12 | 105 | 100 | 25 | M8 | 5 | 25 |
| FH II 12/30 SK | – | 510932 | ● | – | C1 / C2 | 12 | 110 | 105 | 30 | M8 | 5 | 25 |
| FH II 12/50 SK | 044919 | 510933 | ● | – | C1 / C2 | 12 | 130 | 125 | 50 | M8 | 5 | 25 |
| FH II 15/15 SK | 044920 | 510934 | ● | ● | C1 / C2 | 15 | 105 | 100 | 15 | M10 | 6 | 25 |
| FH II 15/25 SK | 044921 | – | ● | ● | C1 / C2 | 15 | 115 | 110 | 25 | M10 | 6 | 25 |
| FH II 15/50 SK | 044922 | – | ● | ● | C1 / C2 | 15 | 140 | 135 | 50 | M10 | 6 | 25 |
| FH II 18/15 SK | 044923 | – | ● | ● | C1 / C2 | 18 | 120 | 115 | 15 | M12 | 8 | 20 |
| FH II 18/25 SK | 044924 | – | ● | ● | C1 / C2 | 18 | 130 | 125 | 25 | M12 | 8 | 20 |
| FH II 18/30 SK | – | 510935 | ● | ● | C1 / C2 | 18 | 135 | 130 | 30 | M12 | 8 | 20 |
| FH II 18/50 SK | 044925 | – | ● | ● | C1 / C2 | 18 | 155 | 150 | 50 | M12 | 8 | 20 |



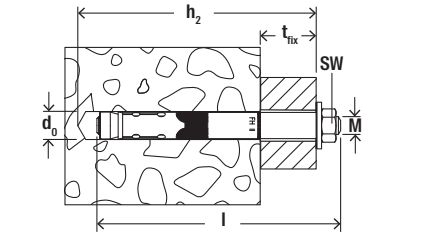

## Technical data

**High performance anchor FH II-H with cap nut**



FH II-H

| | Galvanised steel | Approval | | Seismic-Approval | Drill diameter | Min. drill hole depth for through fixings | Anchor length | Max. fixture thickness | Thread | Width across nut | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Item no. | ETA | ICC | | $d_0$ [mm] | $h_2$ [mm] | l [mm] | $t_{fix}$ [mm] | M | SW [mm] | [pcs] |
| Item | gvz | | | | | | | | | | |
| FH II 10/10 H | 503139 | ● | – | – | 10 | 65 | 75 | 10 | M6 | 13 | 50 |
| FH II 10/25 H | 503140 | ● | – | – | 10 | 80 | 90 | 25 | M6 | 13 | 50 |
| FH II 10/50 H | 503141 | ● | – | – | 10 | 105 | 115 | 50 | M6 | 13 | 50 |
| FH II 12/10 H | 044905 | ● | – | C1 / C2 | 12 | 90 | 100 | 10 | M8 | 17 | 50 |
| FH II 12/25 H | 044906 | ● | – | C1 / C2 | 12 | 105 | 115 | 25 | M8 | 17 | 50 |
| FH II 12/50 H | 044907 | ● | – | C1 / C2 | 12 | 130 | 140 | 50 | M8 | 17 | 25 |
| FH II 15/10 H | 044908 | ● | ● | C1 / C2 | 15 | 100 | 115 | 10 | M10 | 17 | 25 |
| FH II 15/25 H | 044909 | ● | ● | C1 / C2 | 15 | 115 | 130 | 25 | M10 | 17 | 25 |
| FH II 15/50 H | 044910 | ● | ● | C1 / C2 | 15 | 140 | 155 | 50 | M10 | 17 | 25 |
| FH II 18/25 H | 044915 | ● | ● | C1 / C2 | 18 | 130 | 145 | 25 | M12 | 19 | 20 |
| FH II 18/50 H | 044916 | ● | ● | C1 / C2 | 18 | 155 | 170 | 50 | M12 | 19 | 20 |



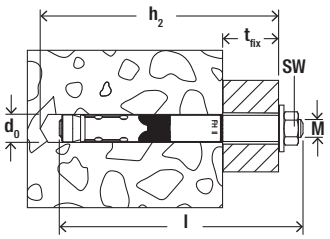

## Technical data

**High performance anchor FH II-B bolt version with nut and washer**



FH II-B

| | Galvanised steel | Approval | | Seismic-Approval | Drill diameter | Min. drill hole depth for through fixings | Anchor length | Max. fixture thickness | Thread | Width across nut | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Item no. | ETA | ICC | | $d_0$ [mm] | $h_2$ [mm] | l [mm] | $t_{fix}$ [mm] | M | SW [mm] | [pcs] |
| Item | gvz | | | | | | | | | | |
| FH II 10/10 B | 503142 | ● | – | – | 10 | 65 | 70 | 10 | M6 | 10 | 50 |
| FH II 10/25 B | 503143 | ● | – | – | 10 | 80 | 75 | 25 | M6 | 10 | 50 |
| FH II 10/50 B | 503144 | ● | – | – | 10 | 105 | 110 | 50 | M6 | 10 | 50 |
| FH II 12/10 B | 048773 | ● | ● | C1 / C2 | 12 | 90 | 95 | 10 | M8 | 13 | 50 |
| FH II 12/25 B | 048774 | ● | ● | C1 / C2 | 12 | 105 | 110 | 25 | M8 | 13 | 50 |
| FH II 12/50 B | 048775 | ● | ● | C1 / C2 | 12 | 130 | 135 | 50 | M8 | 13 | 25 |
| FH II 12/100 B | 046832 | ● | ● | C1 / C2 | 12 | 180 | 185 | 100 | M8 | 13 | 25 |
| FH II 15/10 B | 048776 | ● | ● | C1 / C2 | 15 | 100 | 110 | 10 | M10 | 17 | 25 |
| FH II 15/25 B | 048777 | ● | ● | C1 / C2 | 15 | 115 | 125 | 25 | M10 | 17 | 25 |
| FH II 15/50 B | 048778 | ● | ● | C1 / C2 | 15 | 140 | 150 | 50 | M10 | 17 | 25 |
| FH II 15/100 B | 046835 | ● | ● | C1 / C2 | 15 | 190 | 200 | 100 | M10 | 17 | 20 |
| FH II 18/25 B | 048779 | ● | ● | C1 / C2 | 18 | 130 | 140 | 25 | M12 | 19 | 20 |




## Technical data

4

**High performance anchor FH II-B bolt version with nut and washer**



FH II-B

| | Galvanised steel | Approval | | Seismic-Approval | Drill diameter | Min. drill hole depth for through fixings | Anchor length | Max. fixture thickness | Thread | Width across nut | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Item no. | ETA | ICC | | $d_0$ [mm] | $h_2$ [mm] | l [mm] | $t_{fix}$ [mm] | M | SW [mm] | [pcs] |
| **Item** | **gvz** | | | | | | | | | | |
| **FH II 18/50 B** | **048780** | ● | ● | C1 / C2 | 18 | 155 | 165 | 50 | M12 | 19 | 20 |
| **FH II 18/100 B** | **046841** | ● | ● | C1 / C2 | 18 | 205 | 215 | 100 | M12 | 19 | 10 |
| **FH II 24/25 B** | **048886** | ● | ● | C1 / C2 | 24 | 150 | 167 | 25 | M16 | 24 | 10 |
| **FH II 24/50 B** | **048887** | ● | ● | C1 / C2 | 24 | 175 | 192 | 50 | M16 | 24 | 10 |
| **FH II 24/100 B** | **046842** | ● | ● | C1 / C2 | 24 | 225 | 242 | 100 | M16 | 24 | 5 |
| **FH II 24X235 B GS** | **044938** | – | – | – | 24 | – | – | – | – | – | 10 |
| **FH II 28/30 B** | **047547** | ● | ● | C1 / C2 | 28 | 185 | 199 | 30 | M20 | 30 | 4 |
| **FH II 28/60 B** | **047548** | ● | ● | C1 / C2 | 28 | 215 | 229 | 60 | M20 | 30 | 4 |
| **FH II 28/100 B** | **506630** | ● | ● | C1 / C2 | 28 | 255 | 271 | 100 | M20 | 30 | 4 |
| **FH II 32/30 B** | **047549** | ● | ● | C1 / C2 | 32 | 210 | 231 | – | M24 | 36 | 4 |
| **FH II 32/60 B** | **047550** | ● | ● | C1 / C2 | 32 | 240 | 261 | 60 | M24 | 36 | 4 |

# Loads

**High performance anchor FH II**

Permissible loads of a single anchor[1] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-07/0025 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material/ surface[2] | Effective anchorage depth | Minimum member thickness | Instal-lation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst}$ [Nm] | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] |
| **FH II 10 S** | gvz | 40 | 80 | 10 | 3.6 | 4.1 | 40 | 40 | 5.9 | 5.9 | 40 | 40 |
| | R | 40 | 80 | 15 | 3.6 | 4.1 | 40 | 40 | 5.9 | 5.9 | 40 | 40 |
| **FH II 12 S** | gvz | 60 | 120 | 22.5 | 5.7 | 15.2 | 50 | 50 | 10.9 | 18.9 | 60 | 60 |
| | R | 60 | 120 | 25 | 5.7 | 15.2 | 50 | 50 | 9.5 | 17.7 | 60 | 60 |
| **FH II 15 S** | gvz | 70 | 140 | 40 | 7.6 | 19.2 | 60 | 60 | 13.7 | 27.4 | 70 | 70 |
| | R | 70 | 140 | 40 | 7.6 | 19.2 | 60 | 60 | 13.7 | 27.4 | 70 | 70 |
| **FH II 18 S** | gvz | 80 | 160 | 80 | 11.7 | 23.5 | 70 | 70 | 16.8 | 33.5 | 80 | 80 |
| | R | 80 | 160 | 100 | 11.7 | 23.5 | 70 | 70 | 16.8 | 33.5 | 80 | 80 |
| **FH II 24 S** | gvz | 100 | 200 | 160 | 16.4 | 32.8 | 80 | 80 | 23.4 | 46.9 | 100 | 100 |
| | R | 100 | 200 | 160 | 16.4 | 32.8 | 80 | 80 | 23.4 | 46.9 | 100 | 100 |
| **FH II 28 S** | gvz | 125 | 250 | 180 | 22.9 | 45.8 | 100 | 100 | 32.8 | 65.9 | 120 | 120 |
| **FH II 32 S** | gvz | 150 | 300 | 200 | 30.1 | 60.2 | 120 | 120 | 43.0 | 86.1 | 160 | 180 |
| **FH II 10 SK** | gvz | 40 | 80 | 10 | 3.6 | 4.1 | 40 | 40 | 5.9 | 5.9 | 40 | 40 |
| **FH II 12 SK** | gvz | 60 | 120 | 22.5 | 5.7 | 15.2 | 50 | 50 | 10.9 | 18.9 | 60 | 60 |
| | R | 60 | 120 | 25 | 5.7 | 15.2 | 50 | 50 | 10.9 | 18.9 | 60 | 60 |
| **FH II 15 SK** | gvz | 70 | 140 | 40 | 7.6 | 19.2 | 60 | 60 | 13.7 | 27.4 | 70 | 70 |
| | R | 70 | 140 | 40 | 7.6 | 19.2 | 60 | 60 | 13.7 | 27.4 | 70 | 70 |
| **FH II 18 SK** | gvz | 80 | 160 | 80 | 11.7 | 23.5 | 70 | 70 | 16.8 | 33.5 | 80 | 80 |
| | R | 80 | 160 | 100 | 11.7 | 23.5 | 70 | 70 | 16.8 | 33.5 | 80 | 80 |
| **FH II 10 H** | gvz | 40 | 80 | 10 | 3.6 | 4.1 | 40 | 40 | 5.9 | 5.9 | 40 | 40 |
| **FH II 12 H** | gvz | 60 | 120 | 22.5 | 5.7 | 15.2 | 50 | 50 | 10.9 | 15.5 | 60 | 60 |
| **FH II 15 H** | gvz | 70 | 140 | 40 | 7.6 | 19.2 | 60 | 60 | 13.7 | 24.5 | 70 | 70 |
| **FH II 18 H** | gvz | 80 | 160 | 80 | 11.7 | 23.5 | 70 | 70 | 16.8 | 33.5 | 80 | 80 |
| **FH II 10 B** | gvz | 40 | 80 | 10 | 3.6 | 4.1 | 40 | 40 | 5.9 | 5.9 | 40 | 40 |
| **FH II 12 B** | gvz | 60 | 120 | 17.5 | 5.7 | 15.2 | 50 | 50 | 10.9 | 15.5 | 60 | 60 |
| **FH II 15 B** | gvz | 70 | 140 | 38 | 7.6 | 19.2 | 60 | 60 | 13.7 | 24.5 | 70 | 70 |
| **FH II 18 B** | gvz | 80 | 160 | 80 | 11.7 | 23.5 | 70 | 70 | 16.8 | 33.5 | 80 | 80 |
| **FH II 24 B** | gvz | 100 | 200 | 120 | 16.4 | 32.8 | 80 | 80 | 23.4 | 46.9 | 100 | 100 |
| **FH II 28 B** | gvz | 125 | 250 | 180 | 22.9 | 45.8 | 100 | 100 | 32.7 | 65.5 | 120 | 120 |
| **FH II 32 B** | gvz | 150 | 300 | 200 | 30.1 | 60.2 | 120 | 120 | 43.0 | 86.1 | 160 | 180 |

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.
[2] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).
[3] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# High performance anchor FH II-I

Strong, secure and aesthetic with internal thread for the removal option of the attachment.







Stadium seating



Air conditioning units

## Applications

- Steel constructions
- Guard rails
- Consoles
- Ladders
- Cable trays
- Machines
- Staircases
- Pipeline routes
- Ventilation systems
- Sprinkler systems

## Advantages

- The international approvals guarantee maximum safety and the best performance.
- The internal threaded anchor allows the removal of the attachment and the fixing point can be reused.
- The design between the bolt and the sleeve ensures high shear load-bearing capacity. Thus, fewer fixing points are required.
- The optimised geometry intelligently reduces the energy required for assembly.
- The approval regulates the use of hollow drills.

## Certificates / Features

ETA-07/0025, in cracked concrete

M8 - M12

## Building materials

**Approved for:**

- Concrete C20/25 to C50/60, cracked and non-cracked

**Also suitable for:**

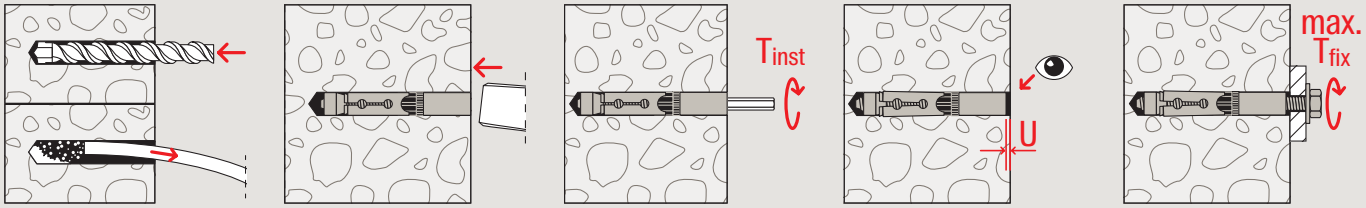
- Concrete C12/15
- Natural stone with dense structure

## Versions

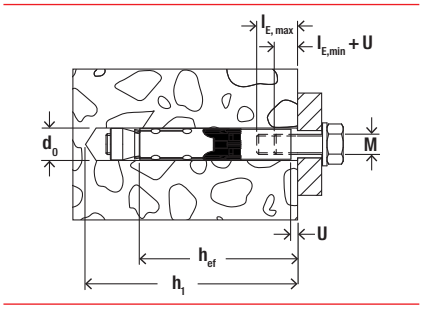
- Galvanised steel
- Stainless steel R

## Functioning

- The FH II-I is suitable for pre-positioned installation.
- When a hexagon wrench is used for installation, the internal thread bolt starts to rotate. This pulls the cone into the expansion sleeve and expands it against the drill-hole wall. At the same time, the anchor is tightened through compression of the black plastic ring. A gap U to the concrete surface is created (see image 4).
- The anchor is set according to the approval when the gap U is 3-5 mm. Alternatively, an installation torque of $T_{inst}$ can also be applied.






## Technical data

**High performance anchor FH II-I**




FH II-I FH II-I R

| | Galvanised steel | Stainless steel | Approval | Drill diameter | Min. drill hole depth for pre-positioned installation | Anchor length | Internal thread | Max. bolt penetration | Sales unit |
|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | ETA | $d_0$ [mm] | $h_1$ [mm] | l [mm] | M | $l_{E,max}$ [mm] | [pcs] |
| Item | gvz | R | | | | | | | |
| FH II 12/M6 I | 520358 | 520360 | ● | 12 | 85 | 77.5 | M6 | 25 | 25 |
| FH II 12/M8 I | 520359 | 520361 | ● | 12 | 85 | 77.5 | M8 | 25 | 25 |
| FH II 15/M10 I | 519014 | 519018 | ● | 15 | 95 | 90 | M10 | 25 | 25 |
| FH II 15/M12 I | 519015 | 519019 | ● | 15 | 95 | 90 | M12 | 25 | 20 |

## Technical data

**Setting tool FH II-I**



Setting tool FH II-I

| | Item no. | Matching anchor type | Sales unit |
|---|---|---|---|
| | | | [pcs] |
| Item | | | |
| Setting tool FH II-I M6-M10 | 532780 | FH II 12/M6 I, FH II 15/M 10 I | 10 |
| Setting tool FH II-I M8-M12 | 532781 | FH II 12/M8 I, FH II 15/M 12 I | 10 |

# Loads

## High performance anchor FH II-I

Permissible loads of a single anchor[1] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-07/0025 has to be considered.

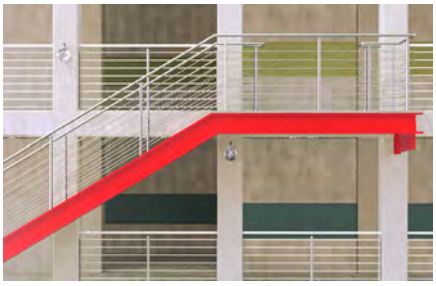
| | | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material/surface[2] | Screw material[2] | Effective anchorage depth | Minimum member thickness | Installation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst}$ [Nm] | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] |
| **FH II 12 / M6 I** | gvz | 5.8 | 60 | 125 | 15 | 4.3 | 2.9 | 50 | 50 | 4.8 | 2.9 | 60 | 60 |
| | gvz | 8.8 | 60 | 125 | 15 | 4.3 | 4.6 | 50 | 50 | 7.6 | 4.6 | 60 | 60 |
| | R | A4-70 | 60 | 125 | 15 | 4.3 | 3.2 | 50 | 50 | 5.3 | 3.2 | 60 | 60 |
| **FH II 12 / M8 I** | gvz | 5.8 | 60 | 125 | 15 | 4.3 | 5.1 | 50 | 50 | 9.0 | 5.1 | 60 | 60 |
| | gvz | 8.8 | 60 | 125 | 15 | 4.3 | 8.0 | 50 | 50 | 9.5 | 8.0 | 60 | 60 |
| | R | A4-70 | 60 | 125 | 15 | 4.3 | 6.0 | 50 | 50 | 9.5 | 6.0 | 60 | 60 |
| **FH II 15 / M10 I** | gvz | 5.8 | 70 | 150 | 25 | 5.7 | 8.6 | 60 | 60 | 13.7 | 8.6 | 70 | 70 |
| | gvz | 8.8 | 70 | 150 | 25 | 5.7 | 13.1 | 60 | 60 | 13.7 | 13.1 | 70 | 70 |
| | R | A4-70 | 70 | 150 | 25 | 5.7 | 9.2 | 60 | 60 | 13.7 | 9.2 | 70 | 70 |
| **FH II 15 / M12 I** | gvz | 5.8 | 70 | 150 | 25 | 5.7 | 12.0 | 60 | 60 | 13.7 | 12.0 | 70 | 70 |
| | gvz | 8.8 | 70 | 150 | 25 | 5.7 | 13.7 | 60 | 60 | 13.7 | 13.7 | 70 | 70 |
| | R | A4-70 | 70 | 150 | 25 | 5.7 | 13.7 | 60 | 60 | 13.7 | 13.7 | 70 | 70 |

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.
[2] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).
[3] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Strong undercut anchor FSU

The anchoring system for extreme safety and load requirements.





Steel constructions




Walkways



## Applications

- Heavy duty fixings
- Steel constructions
- Pipelines
- Ventilation ducts
- Cable trays
- Industrial machinery
- Elevator channels

## Advantages

- The perfect form fit in the undercut guarantees the absorption of high loads (head bolt theory) for applications with the highest level of safety.
- Six robust cutting teeth and the principle of self-undercutting enable precise and powerful setting in the concrete and thus simple and fast installation.
- The plastic element of the FSU prevents the anchor from falling out of the drill hole and allows easy and safe overhead installation.
- The low spreading forces of the FSU allow small edge and axial distances and offer maximum flexibility in all applications.
- The setting depth markings on the anchor and setting tool (FSU-ST) ensure a quick visual installation check and provide additional safety and installation convenience.
- The DMC (DataMatrix-Code) for unique identification and readout of product data on the anchor offers the possibility for flexible and exact data transparency and storage before and after installation. The code can be scanned using the fischer PRO app.

## Certificates / Features

CE ETA

ETA-22/0674, in cracked concrete

R 120

Seismic C2

100 Years Service life

FM APPROVED

BZS D 24-601

## Building materials

Approved for:

- Concrete C20/25 to C50/60, cracked and non cracked

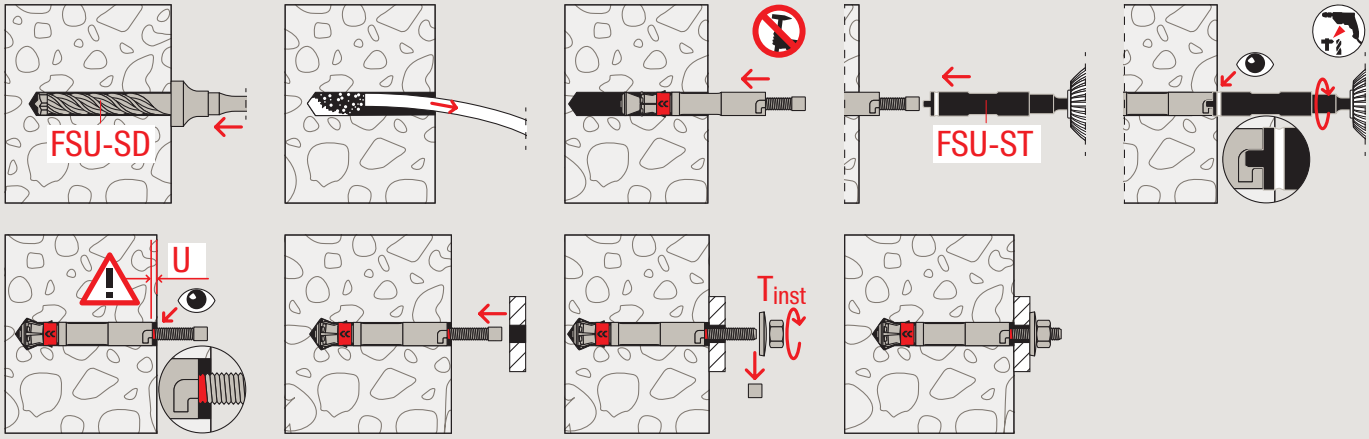
## Versions

- galvanized steel
- stainless steel R

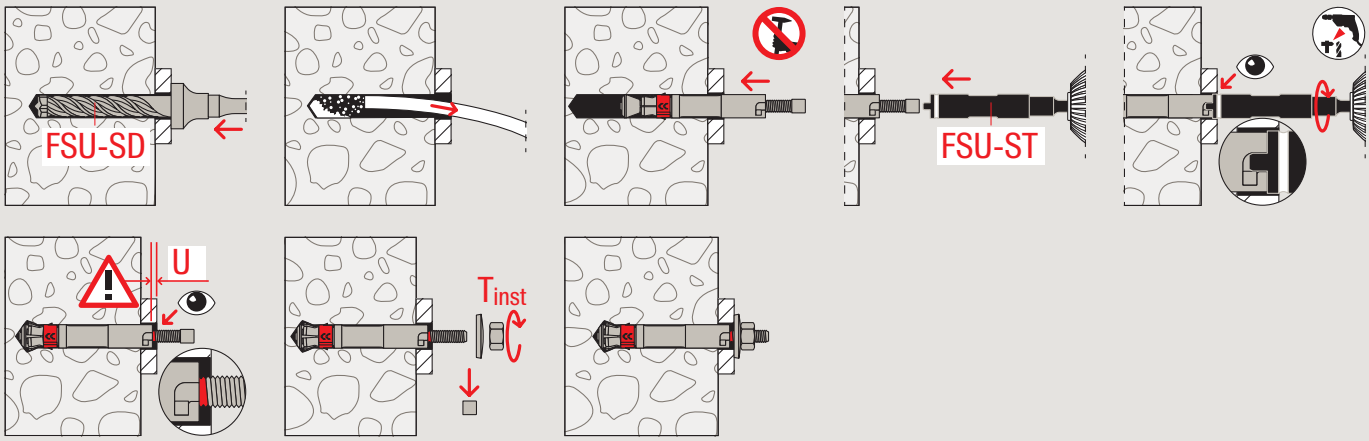
## Functioning

- The FSU is suitable for pre-positioned installation, the FSU-P for push-through installation.
- Available in galvanized steel for indoor use and in stainless steel for outdoor use.
- For installation, first, the drill hole is created with the FSU-SD stop drill.
- After cleaning the drill hole, the anchor is inserted with the FSU-ST setting tool. The anchor cuts itself the undercut, creating a positive connection.
- The setting depth markings on the anchor and setting tool indicate, when the anchor is set correctly.
- With the disassembly tool FSU-DT, the anchor can be completely removed quickly and easily.

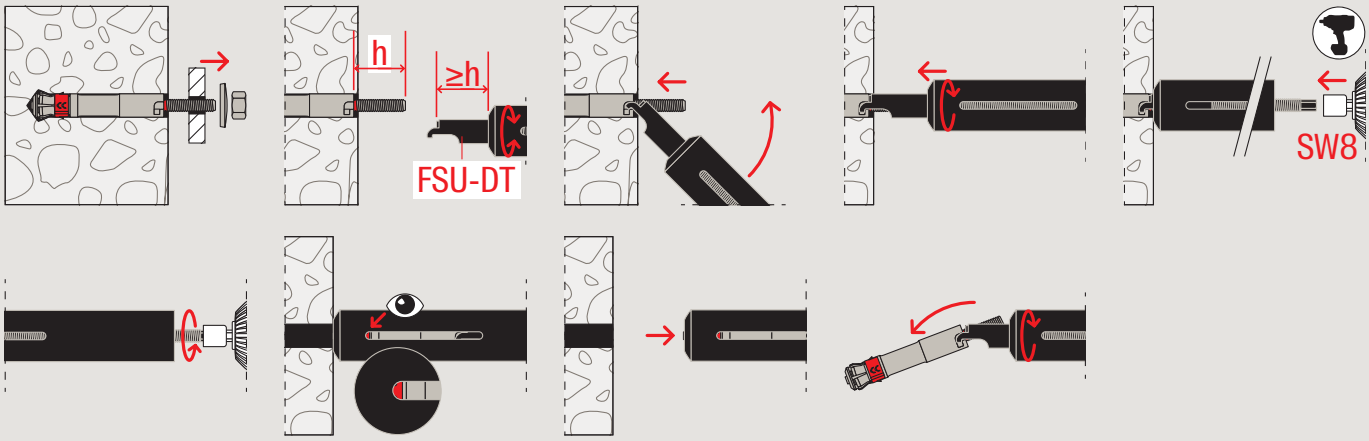
## Pre-positioned installation FSU



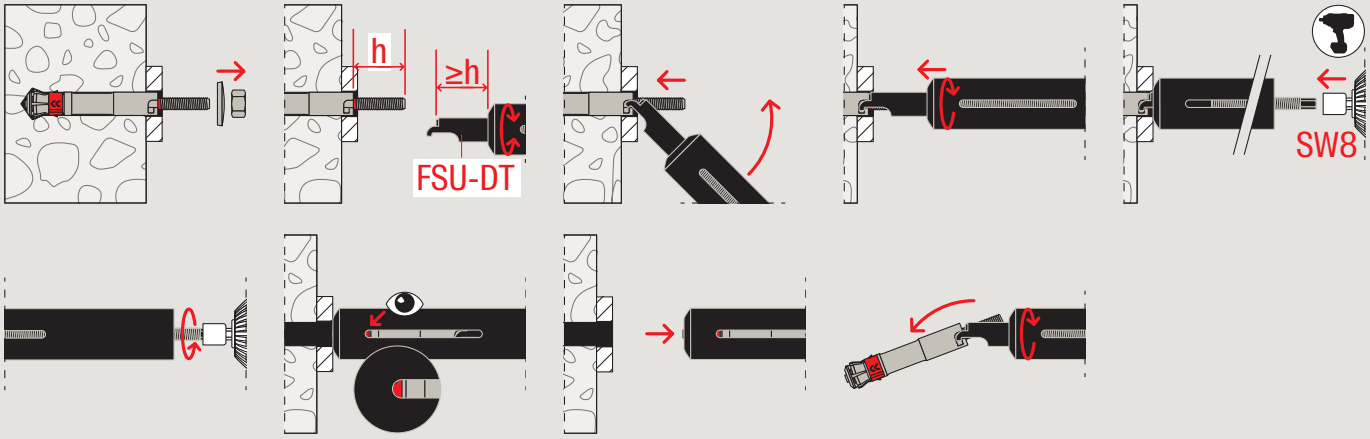

## Push-through installation FSU-P



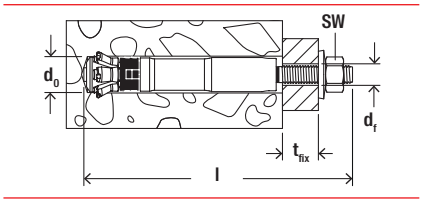

## Disassembly pre-setting anchor FSU



## Disassembly push-through anchor FSU-P





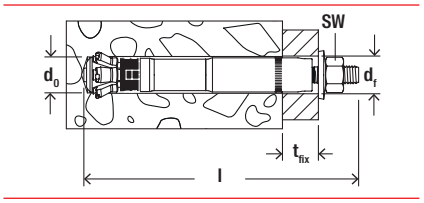

## Technical data

**Strong Undercut Anchor FSU pre-positioned installation**



FSU FSU R

| | Galvanised steel | Stainless steel | Approval | Seismic-Approval | Drill diameter $d_0$ | Drill hole diameter in fixture $d_f$ | Max. fixture thickness $t_{fix}$ | Anchor length l | Width across nut SW | Required drill bit FSU-SD | Required setting tool | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | ETA | | [mm] | [mm] | [mm] | [mm] | [mm] | | | [pcs] |
| **Item** | **gvz** | **R** | | | | | | | | | | |
| **FSU M10x100/20** | **567778** | **567779** | ● | C1 / C2 | 20 | 12 | 20 | 150 | 17 | 20 x 100 | FSU-ST M10 | 10 |
| **FSU M12x125/30** | **567782** | **567783** | ● | C1 / C2 | 22 | 14 | 30 | 190 | 19 | 22 x 125 | FSU-ST M12 | 10 |
| **FSU M12x125/50** | **567786** | **567787** | ● | C1 / C2 | 22 | 14 | 50 | 210 | 19 | 22 x 125 | FSU-ST M12 | 10 |




## Technical data

**Strong Undercut Anchor FSU push-through installation**



FSU-P FSU-P R

| | Galvanised steel | Stainless steel | Approval | Seismic-Approval | Drill diameter $d_0$ | Drill hole diameter in fixture $d_f$ | Fixture thickness $t_{fix}$ | Anchor length l | Width across nut SW | Required drill bit FSU-SD | Required setting tool | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | ETA | | [mm] | [mm] | [mm] | [mm] | [mm] | | | [pcs] |
| **Item** | **gvz** | **R** | | | | | | | | | | |
| **FSU-P M10x100/20** | **567780** | **567781** | ● | C1 / C2 | 20 | 21 | 10 - 20 | 150 | 17 | 20 x 120 | FSU-ST M10 | 10 |
| **FSU-P M12x125/30** | **567784** | **567785** | ● | C1 / C2 | 22 | 23 | 12 - 30 | 190 | 19 | 22 x 155 | FSU-ST M12 | 10 |
| **FSU-P M12x125/50** | **567788** | **567789** | ● | C1 / C2 | 22 | 23 | 12 - 50 | 210 | 19 | 22 x 175 | FSU-ST M12 | 10 |

## Technical data

**Stop drill FSU-SD**



FSU-SD

| Item | Item no. | Matching pre-positioned anchor | Matching push-through anchor | Sales unit [pcs] |
|---|---|---|---|---|
| **FSU-SD 20x100** | **567793** | FSU M10x100/20 | – | 1 |
| **FSU-SD 20x120** | **567794** | – | FSU-P M10x100/20 | 1 |
| **FSU-SD 22x125** | **567795** | FSU M12x125/30, FSU M12x125/50 | – | 1 |
| **FSU-SD 22x155** | **567796** | – | FSU-P M12x125/30 | 1 |
| **FSU-SD 22x175** | **567797** | – | FSU-P M12x125/50 | 1 |

4

## Technical data

**Setting tool FSU-ST**



FSU-ST

| Item | Item no. | Matching pre-positioned anchor | Matching push-through anchor | Sales unit [pcs] |
|---|---|---|---|---|
| **FSU-ST M10** | **568881** | FSU M10 | FSU-P M10 | 1 |
| **FSU-ST M12** | **568882** | FSU M12 | FSU-P M12 | 1 |

## Technical data

**Disassembly tool FSU-DT**




FSU-DT

| Item | Item no. | Matching pre-positioned anchor | Matching push-through anchor | Sales unit [pcs] |
|---|---|---|---|---|
| **FSU-DT M10** | **568879** | FSU M10 | FSU-P M10 | 1 |
| **FSU-DT M12** | **568880** | FSU M12 | FSU-P M12 | 1 |

# Loads

**Strong Undercut Anchor FSU**

Permissible loads of a single anchor[1] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-22/0674 of 12.04.2024 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material/ surface[2] | Effective anchorage depth | Minimum member thickness | Installation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst}$ [Nm] | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] |
| **FSU M10 x 100** | gvz | 100 | 170 | 40 | 14.3 | 15.3 | 80 | 80 | 21.0 | 15.3 | 80 | 80 |
| | R | 100 | 170 | 40 | 14.3 | 18.8 | 80 | 80 | 21.8 | 18.8 | 80 | 80 |
| **FSU M12 x 125** | gvz | 125 | 220 | 80 | 19.0 | 21.8 | 90 | 90 | 31.4 | 21.8 | 90 | 90 |
| | R | 125 | 220 | 80 | 19.0 | 28.5 | 90 | 90 | 32.1 | 28.5 | 90 | 90 |
| **FSU-P M10 x 100** | gvz | 100 | 170 | 40 | 14.3 | 37.8 | 80 | 80 | 21.0 | 37.8 | 80 | 80 |
| | R | 100 | 170 | 40 | 14.3 | 42.8 | 80 | 80 | 21.8 | 42.8 | 80 | 80 |
| **FSU-P M12 x 125** | gvz | 125 | 220 | 80 | 19.0 | 49.4 | 90 | 90 | 31.4 | 49.4 | 90 | 90 |
| | R | 125 | 220 | 80 | 19.0 | 58.8 | 90 | 90 | 32.1 | 58.8 | 90 | 90 |

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.

[2] For material details see ETA.

[3] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. Assumption $t_{fix} = 12$ mm; with $t_{fix} > 12$ mm the $V_{perm}$ values increase for FSU-P. We recommend using our anchor design software C-FIX.

# ZYKON undercut anchor FZA

The fixing system with the highest safety in cracked concrete.







Steel girders



Installations in tunnels

## Applications

- Steelwork constructions
- Guard rails
- Consoles
- Step irons (FZA-ST)
- Ladders
- Cable trays
- Machines
- Staircases
- Gates
- Façades

## Advantages

- The special ZYKON undercut technology allows for a positive fit connection and ensures maximum safety, even in large cracks.
- The almost expansion-free installation of the anchor allows small edge distances and axial spacing, and thereby enables flexible use.
- The FZUB special drill allows for a fast installation by creating the undercut without having to change tools.
- The drill hole geometry allows for a very low setting energy, thus reducing the energy required for installation.
- The ideal interaction of threaded bolts and sleeve with FZA-D allows for a high shear load and therefore fewer fixing points.

## Certificates / Features

ETA-98/0004, in concrete

R 120

Inox Stainless Steel

from M8

FM APPROVED

from M10

Seismic C2

BZS D 06-605

## Building materials

**Approved for:**

- Concrete C20/25 to C50/60, cracked and non-cracked

**Also suitable for:**

- Concrete C12/15
- Natural stone with dense structure

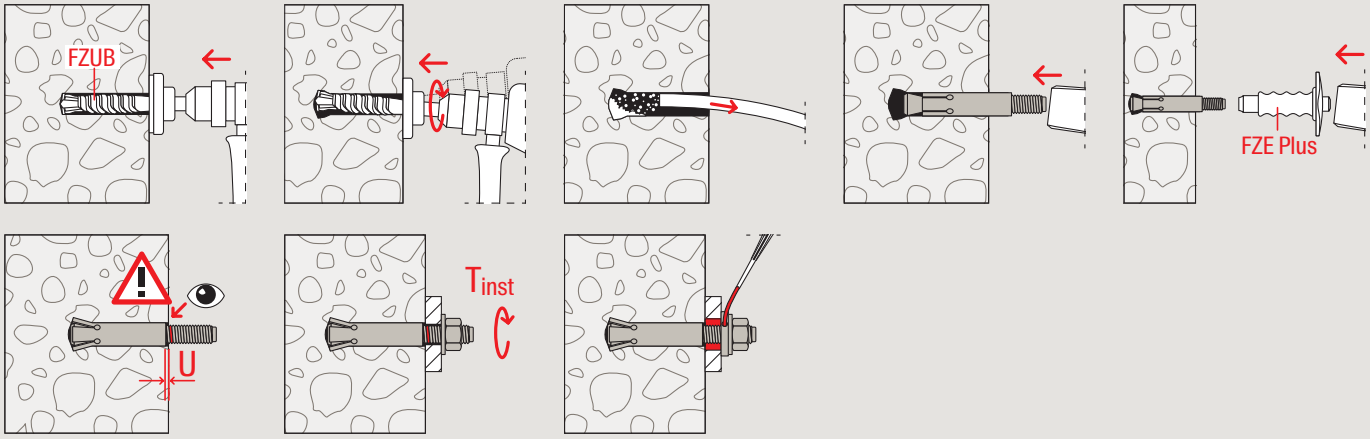
## Versions

- Galvanised steel
- Stainless steel R

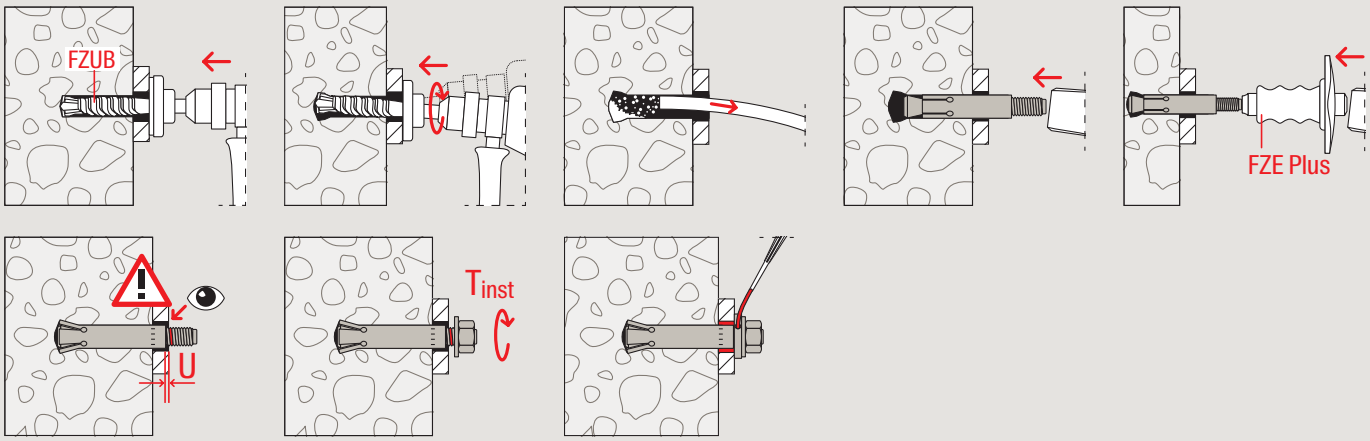
## Functioning

- The FZA and FZA-I is suitable for pre-positioned installation, whereas the FZA-D is suitable for push-through installation.
- The undercut drill hole is created using the special FZUB drill.
- Once the anchor has been placed in the drill hole, the expansion sleeve is driven over the cone using the FZE Plus setting tool, and the undercut drill hole is filled with a positive fit.

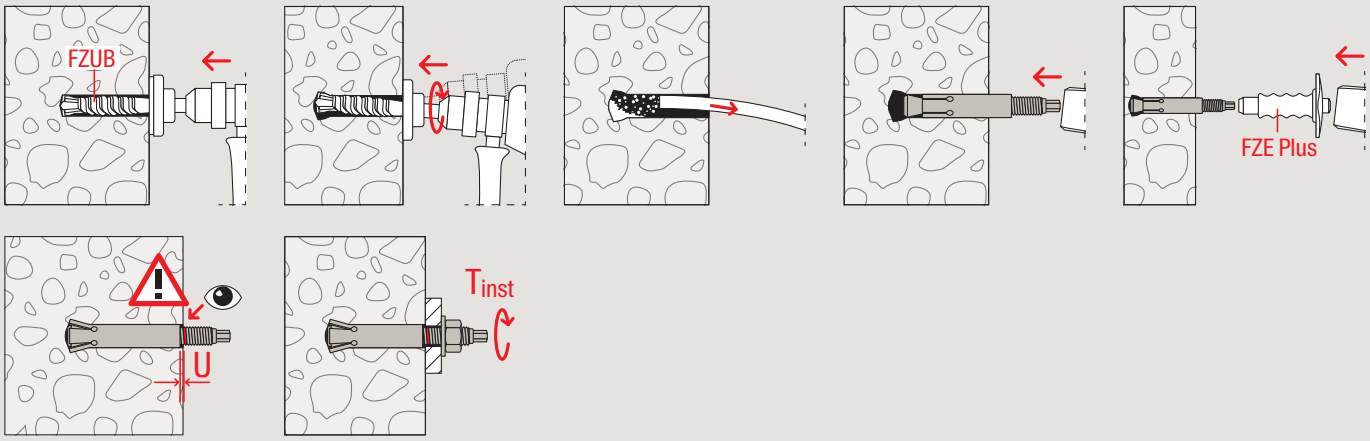
## Pre-positioned installation FZA



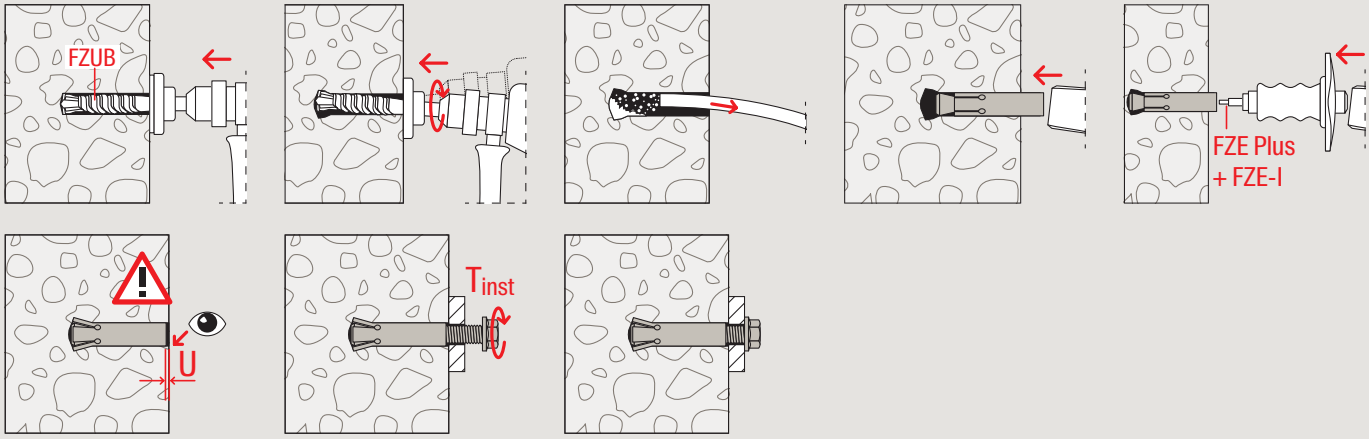

## Push-through installation FZA-D



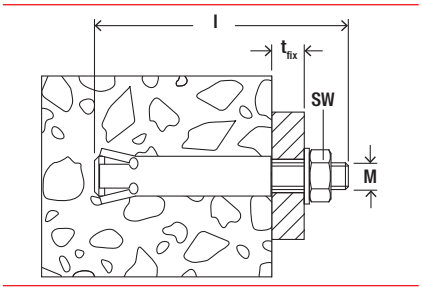

## Installation FZA-ST



## Installation FZA-I

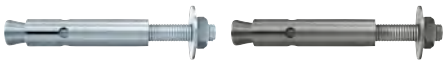




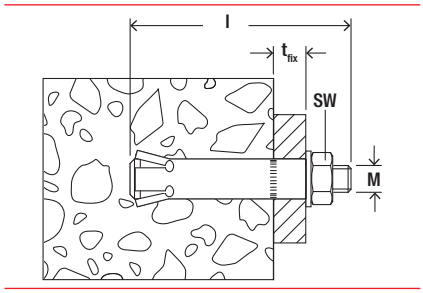

## Technical data

**ZYKON undercut anchor FZA**



FZA FZA R

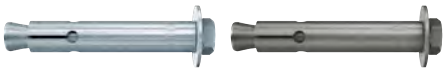
| Item | Galvanised steel<br>Item no.<br>gvz | Stainless steel<br>Item no.<br>R | Approval<br>ETA | <br>DIBt | Seismic-Approval | Required drill bit FZUB | Required setting tool | Anchor length<br>l<br>[mm] | Max. fixture thickness<br>$t_{fix}$<br>[mm] | Thread<br>M | Width across nut<br>SW<br>[mm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FZA 10 x 40 M6/10 | 060712 | 060772 | ● | ● | – | 10 x 40 | FZE 10 plus | 60 | 10 | M6 | 10 | 25 |
| FZA 12 x 40 M8/15 | 060715 | 060775 | ● | ● | – | 12 x 40 | FZE 12 plus | 69 | 15 | M8 | 13 | 25 |
| FZA 12 x 50 M8/15 | 060716 | 060776 | ● | ● | – | 12 x 50 | FZE 12 plus | 79 | 15 | M8 | 13 | 20 |
| FZA 12 x 50 M8/50 | – | 060774 | ● | ● | – | 12 x 50 | FZE 12 plus | 114 | 50 | M8 | 13 | 20 |
| FZA 14 x 40 M10/25 | 060718 | – | ● | ● | C1 / C2 | 14 x 60 | FZE 14 plus | 79 | 25 | M10 | 17 | 25 |
| FZA 14 x 40 M10/25 | – | 060778 | ● | ● | C1 / C2 | 14 x 60 | FZE 14 plus | 79 | 25 | M10 | 17 | 20 |
| FZA 14 x 60 M10/25 | 060719 | 060779 | ● | ● | C1 / C2 | 14 x 60 | FZE 14 plus | 102 | 25 | M10 | 17 | 10 |
| FZA 14 x 60 M10/50 | – | 060766 | ● | ● | C1 / C2 | 14 x 60 | FZE 14 plus | 126 | 50 | M10 | 17 | 10 |
| FZA 18 x 80 M12/25 | 060721 | 060781 | ● | ● | C1 / C2 | 18 x 80 | FZE 18 plus | 126 | 25 | M12 | 19 | 10 |
| FZA 18 x 80 M12/55 | – | 060767 | ● | ● | C1 / C2 | 18 x 80 | FZE 18 plus | 156 | 55 | M12 | 19 | 10 |
| FZA 22 x 100 M16/60 | 060724 | 060782 | ● | ● | C1 / C2 | 22 x 100 | FZE 22 plus | 184 | 60 | M16 | 24 | 10 |
| FZA 22 x 125 M16/60 | 060725 | 060768 | ● | ● | C1 / C2 | 22 x 125 | FZE 22 plus | 209 | 60 | M16 | 24 | 6 |




## Technical data

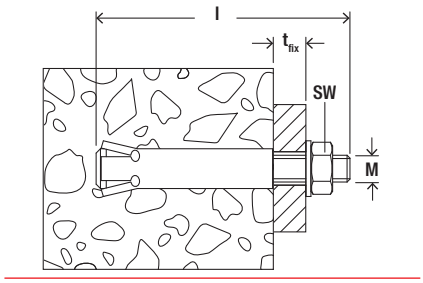


**ZYKON undercut anchor FZA-D**



FZA-D FZA-D R

| Item | Galvanised steel Item no. gvz | Stainless steel Item no. R | Approval ETA | Seismic-Approval | Required drill bit FZUB | Required setting tool | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Thread M | Width across nut SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **FZA 12 x 50 M8 D/10** | **060652** | **060664** | ● | – | 12 x 50 | FZE 12 plus | 69 | 10 | M8 | 13 | 25 |
| **FZA 12 x 60 M8 D/10** | **060653** | **060665** | ● | – | 12 x 60 | FZE 12 plus | 79 | 10 | M8 | 13 | 25 |
| **FZA 12 x 80 M8 D/30** | **060654** | **060666** | ● | – | 12 x 80 | FZE 12 plus | 99 | 30 | M8 | 13 | 25 |
| **FZA 14 x 80 M10 D/20** | **060657** | **060669** | ● | C1 / C2 | 14 x 80 | FZE 14 plus | 102 | 20 | M10 | 17 | 10 |
| **FZA 14 x 100 M10 D/40** | **060658** | **060670** | ● | C1 / C2 | 14 x 100 | FZE 14 plus | 126 | 40 | M10 | 17 | 10 |
| **FZA 18 x 100 M12 D/20** | **060684** | **060672** | ● | C1 / C2 | 18 x 100 | FZE 18 plus | 126 | 20 | M12 | 19 | 10 |
| **FZA 18 x 130 M12 D/50** | **060685** | **060673** | ● | C1 / C2 | 18 x 130 | FZE 18 plus | 156 | 50 | M12 | 19 | 10 |
| **FZA 22 x 125 M16 D/25** | **060663** | **060675** | ● | C1 / C2 | 22 x 125 | FZE 22 plus | 156 | 25 | M16 | 24 | 10 |




## Technical data

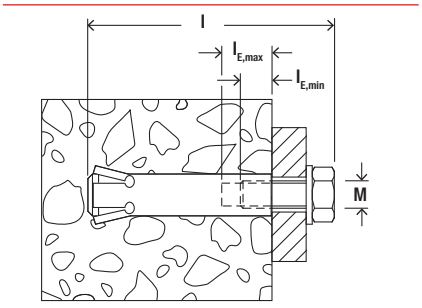
**ZYKON anchor for fixing step irons FZA-ST R**



FZA ST R

| Item | Item no. | Approval ETA | Required drill bit FZUB | Required setting tool | Max. fixture thickness $t_{fix}$ [mm] | Thread M | Width across nut SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FZA 14 x 40 ST R** | **060686**[1)] | ● | 14 x 40 | FZE 14 plus | 30 | M10 | 16 | 20 |
| **FZA 14 x 60 ST R** | **060687**[1)] | ● | 14 x 60 | FZE 14 plus | 30 | M10 | 16 | 20 |

[1)] According to DIN 1211GS/1212GS.






## Technical data

**ZYKON undercut anchor FZA-I**



FZA-I



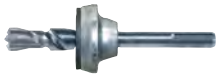
FZA-I R

| Item | Galvanised steel<br>Item no.<br>gvz | Stainless steel<br>Item no.<br>R | Approval<br>ETA | <br>DIBt | Required drill bit FZUB | Required setting tool | Internal thread<br>M | Min. bolt penetration<br>$l_{E,min}$<br>[mm] | Max. bolt penetration<br>$l_{E,max}$<br>[mm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| **FZA 12 x 40 M6 I** | **060758** | **060783** | ● | ● | 12 x 40 | FZE 12 plus | M6 | 10 | 15 | 25 |
| **FZA 12 x 50 M6 I** | **–** | **060784** | ● | ● | 12 x 50 | FZE 12 plus | M6 | 10 | 15 | 25 |
| **FZA 14 x 60 M8 I** | **060760** | **060786** | ● | ● | 14 x 60 | FZE 14 plus | M8 | 11 | 17 | 20 |
| **FZA 18 x 80 M10 I** | **060761** | **060787** | ● | ● | 18 x 80 | FZE 18 plus | M10 | 13 | 21 | 10 |
| **FZA 22 x 100 M12 I** | **060763** | **060788** | ● | ● | 22 x 100 | FZE 22 plus | M12 | 15 | 25 | 10 |
| **FZA 22 x 125 M12 I** | **060769** | **060770**[1)] | ● | ● | 22 x 125 | FZE 22 plus | M12 | 15 | 25 | 10 |

[1)] Delivery time on request.

## Technical data

**Drill bit FZUB**



FZUB

| Item | Item no. | Matching anchor type | Sales unit<br>[pcs] |
|---|---|---|---|
| **FZUB 10 x 40** | **060622** | FZEA II 10 x 40, FZA 10 x 40 M6 | 1 |
| **FZUB 12 x 40** | **060623** | FZEA II 12 x 40, FZA 12 x 40 M8 | 1 |
| **FZUB 12 x 50** | **060627** | FZA 12 x 50 M8, FZA 12 x 50 M8 D/10, FZA 12 x 50 M6 I | 1 |
| **FZUB 12 x 60** | **060625** | FZA 12 x 60 M8 D/10 | 1 |
| **FZUB 12 x 80** | **060626** | FZA 12 x 80 M8 | 1 |
| **FZUB 14 x 40** | **060624** | FZEA II 14 x 40, FZA 14 x 40 | 1 |
| **FZUB 14 x 60** | **060628** | FZA 14 x 60 M10, FZA 14 x 60 M8 I | 1 |
| **FZUB 14 x 80** | **060629** | FZA 14 x 80 M10 | 1 |
| **FZUB 14 x 100** | **060630** | FZA 14 x 100 M10 | 1 |
| **FZUB 18 x 80** | **060634** | FZA 18 x 80 M12, FZA 18 x 80 M10 I | 1 |
| **FZUB 18 x 100** | **060632** | FZA 18 x 100 M12 | 1 |
| **FZUB 18 x 130** | **060633** | FZA 18 x 130 M12 | 1 |
| **FZUB 22 x 100** | **060636** | FZA 22 x 100 M16 | 1 |
| **FZUB 22 x 125** | **060638** | FZA 22 x 125 M16, FZA 22 x 125 M16 D/25, FZA 22 x 125 M12 I | 1 |

## Technical data

**Setting tool FZE plus**



FZE plus

| Item | Item no. | Matching anchor type | Sales unit [pcs] |
|---|---|---|---|
| **FZE 10 plus** | **044637**[1] | FZA 10 x ...M6 | 1 |
| **FZE 12 plus** | **044638** | FZA 12 x ... M8, FZA 12 x ...M8 D, FZA 12 x ... M6 I | 1 |
| **FZE 14 plus** | **044639** | FZA 14 x ... M10, FZA 14 x ...M10 D, FZA 14 x ... M8 I, FZA 14 x ... ST | 1 |
| **FZE 18 plus** | **044640** | FZA 18 x ... M12, FZA 18 x ...M12 D, FZA 18 x ... M10 I | 1 |
| **FZE 22 plus** | **044641** | FZA 22 x 100 M16, FZA 22 x 100 M12 I | 1 |

[1] Without centring pin.

## Loads

**ZYKON undercut anchor FZA**

Permissible loads of a single anchor[1] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-98/0004 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | Material/ surface[2] | Effective anchorage depth $h_{ef}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Instal-lation torque $T_{inst}$ [Nm] | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] |
| **FZA 10 x 40 M6** | gvz | 40 | 100 | 8.5 | 2.4 | 5.0 | 40 | 35 | 4.8 | 5.0 | 40 | 35 |
| | R | 40 | 100 | 8.5 | 2.4 | 4.2 | 40 | 35 | 4.8 | 4.2 | 40 | 35 |
| **FZA 12 x 40 M8** | gvz | 40 | 100 | 20 | 2.4 | 5.4 | 40 | 40 | 4.8 | 7.7 | 40 | 40 |
| | R | 40 | 100 | 20 | 2.4 | 5.4 | 40 | 40 | 4.8 | 7.6 | 40 | 40 |
| **FZA 12 x 50 M8** | gvz | 50 | 110 | 20 | 4.3 | 7.5 | 50 | 45 | 8.3 | 9.2 | 50 | 45 |
| | R | 50 | 110 | 20 | 4.3 | 7.5 | 50 | 45 | 8.3 | 7.6 | 50 | 45 |
| **FZA 14 x 40 M10** | gvz | 40 | 100 | 40 | 2.4 | 10.0 | 70 | 70 | 4.8 | 14.2 | 70 | 70 |
| | R | 40 | 100 | 40 | 2.4 | 10.0 | 70 | 70 | 4.8 | 12.1 | 70 | 70 |
| **FZA 14 x 60 M10** | gvz | 60 | 130 | 40 | 5.7 | 14.6 | 60 | 55 | 10.9 | 14.6 | 60 | 55 |
| | R | 60 | 130 | 40 | 5.7 | 12.1 | 60 | 55 | 10.9 | 12.1 | 60 | 55 |
| **FZA 18 x 80 M12** | gvz | 80 | 160 | 60 | 11.4 | 21.2 | 80 | 70 | 16.8 | 21.2 | 80 | 70 |
| | R | 80 | 160 | 60 | 11.4 | 17.6 | 80 | 70 | 16.8 | 17.6 | 80 | 70 |
| **FZA 22 x 100 M16** | gvz | 100 | 200 | 100 | 16.4 | 39.5 | 100 | 100 | 23.4 | 39.5 | 100 | 100 |
| | R | 100 | 200 | 100 | 16.4 | 35.2 | 100 | 100 | 23.4 | 35.2 | 100 | 100 |
| **FZA 22 x 125 M16** | gvz | 125 | 250 | 100 | 19.0 | 39.5 | 125 | 125 | 32.7 | 39.5 | 125 | 125 |
| | R | 125 | 250 | 100 | 19.0 | 35.2 | 125 | 125 | 32.7 | 35.2 | 125 | 125 |

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.
[2] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).
[3] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

## Loads

**ZYKON undercut anchor FZA-D**

Permissible loads of a single anchor[1] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-98/0004 has to be considered.

| Type | Material/ surface[2] | Effective anchorage depth $h_{ef}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Installation torque $T_{inst}$ [Nm] | Cracked concrete: Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Non-cracked concrete: Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] |
| **FZA 12 x 50 M8 D** | gvz | 40 | 100 | 20 | 2.4 | 5.4 | 40 | 35 | 4.8 | 7.7 | 40 | 35 |
| | R | 40 | 100 | 20 | 2.4 | 5.4 | 40 | 35 | 4.8 | 7.7 | 40 | 35 |
| **FZA 12 x 60 M8 D** | gvz | 50 | 110 | 20 | 4.3 | 7.5 | 50 | 45 | 8.3 | 10.8 | 50 | 45 |
| | R | 50 | 110 | 20 | 4.3 | 7.5 | 50 | 45 | 8.3 | 10.8 | 50 | 45 |
| **FZA 14 x 80 M10 D** | gvz | 60 | 130 | 40 | 5.7 | 23.5 | 60 | 55 | 10.9 | 23.5 | 60 | 55 |
| | R | 60 | 130 | 40 | 5.7 | 16.1 | 60 | 55 | 10.9 | 16.1 | 60 | 55 |
| **FZA 18 x 100 M12 D** | gvz | 80 | 160 | 60 | 11.4 | 36.4 | 80 | 70 | 16.8 | 36.8 | 80 | 70 |
| | R | 80 | 160 | 60 | 11.4 | 36.4 | 80 | 70 | 16.8 | 40.4 | 80 | 70 |
| **FZA 22 x 125 M16 D** | gvz | 100 | 200 | 100 | 16.4 | 50.8 | 100 | 100 | 23.4 | 59.4 | 100 | 100 |
| | R | 100 | 200 | 100 | 16.4 | 50.8 | 100 | 100 | 24.4 | 64.6 | 100 | 100 |

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.
[2] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).
[3] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

## Loads

**ZYKON internally-threaded anchor FZA-I**

Permissible loads of a single anchor[1] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-98/0004 has to be considered.

| Type | Material/ surface[2] | Screw material | Effective anchorage depth $h_{ef}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Installation torque $T_{inst}$ [Nm] | Cracked concrete: Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Non-cracked concrete: Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] |
| **FZA 12 x 40 M6 I** | gvz | 8.8 | 40 | 100 | 8.5 | 2.4 | 4.1 | 40 | 35 | 4.8 | 4.1 | 40 | 35 |
| | R | A4-70 | 40 | 100 | 8.5 | 2.4 | 3.2 | 40 | 35 | 4.8 | 3.2 | 40 | 35 |
| **FZA 12 x 50 M6 I** | R | A4-70 | 50 | 110 | 8.5 | 4.3 | 3.2 | 50 | 45 | 5.4 | 3.2 | 50 | 45 |
| **FZA 14 x 60 M8 I** | gvz | 8.8 | 60 | 130 | 15 | 5.7 | 5.4 | 60 | 55 | 9.3 | 5.4 | 60 | 55 |
| | R | A4-70 | 60 | 130 | 15 | 5.7 | 4.3 | 60 | 55 | 7.1 | 4.3 | 60 | 55 |
| **FZA 18 x 80 M10 I** | gvz | 8.8 | 80 | 160 | 30 | 9.6 | 5.6 | 80 | 70 | 9.6 | 5.6 | 80 | 70 |
| | R | A4-70 | 80 | 160 | 30 | 9.0 | 5.4 | 80 | 70 | 9.0 | 5.4 | 80 | 70 |
| **FZA 22 x 100 M12 I** | gvz | 8.8 | 100 | 200 | 60 | 16.4 | 13.2 | 100 | 100 | 22.5 | 13.2 | 100 | 100 |
| | R | A4-70 | 100 | 200 | 60 | 16.4 | 12.7 | 100 | 100 | 21.1 | 12.7 | 100 | 100 |
| **FZA 22 x 125 M12 I** | gvz | 8.8 | 125 | 250 | 60 | 19.0 | 13.2 | 125 | 125 | 22.5 | 13.2 | 125 | 125 |
| | R | A4-70 | 125 | 250 | 60 | 19.0 | 12.7 | 125 | 125 | 21.1 | 12.7 | 125 | 125 |

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.
[2] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).
[3] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# ZYKON hammerset anchor FZEA II

The internally threaded anchor with low anchoring depth for individual fixings in cracked concrete.





Emergency exit signs in tunnels


Air conditioning units



## Applications

- Pipelines
- Ventilation systems
- Sprinkler systems
- Cable trays
- Suspended ceilings

## Advantages

- Hammerset anchor with ZYKON undercut technology for individual fixings in cracked and non-cracked concrete.
- The combination of hammerset and ZYKON undercut anchor allows for individual fixings in cracked concrete.
- The special ZYKON undercut technology reduces the energy required for installation.
- The FZUB special drill allows for a fast installation by creating the undercut without having to change tools.
- The embossing that is applied when expanding the anchor secures the simple control of the anchoring.
- The almost expansion-free installation of the anchor allows small edge distances and axial spacing, thereby enabling flexible use.

## Certificates / Features

CE ETA

ETA-06/0271, in concrete

R 120

Inox Stainless Steel

M8 - M20

FM APPROVED

from M10

## Building materials

**Approved for:**

- oncrete C20/25 to C50/60, cracked and non-cracked

**Also suitable for:**

- Concrete C12/15
- Natural stone with dense structure

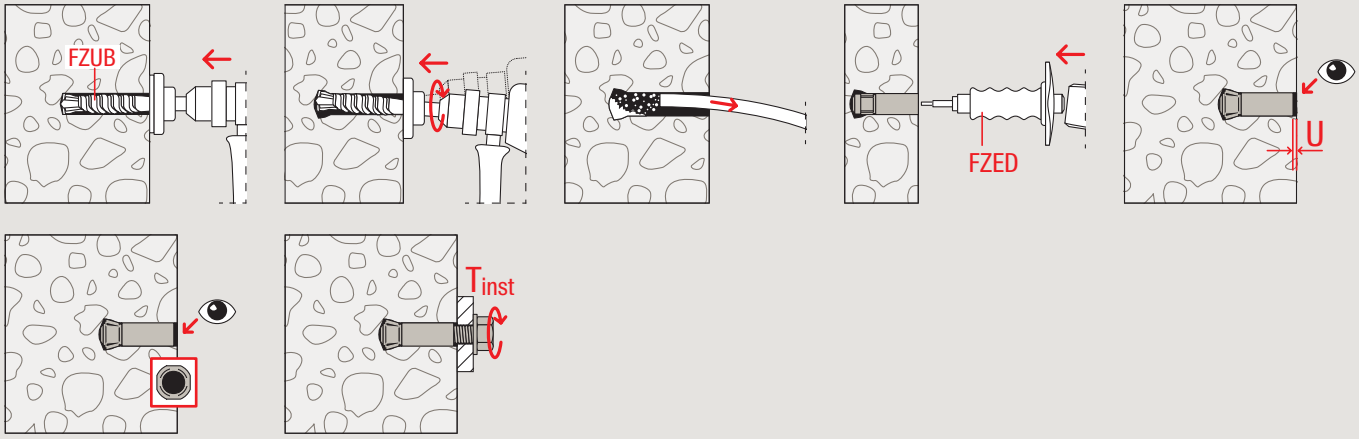
## Versions

- Galvanised steel
- Stainless steel R
- Highly corrosion-resistant steel HCR

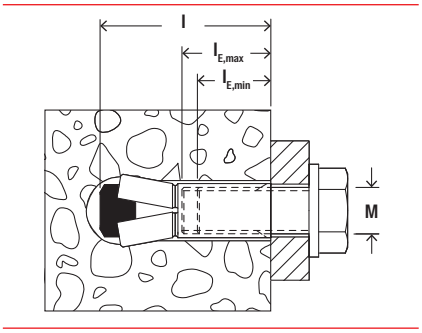
## Functioning

- The FZEA II is suitable for pre-positioned installation.
- The undercut drill hole is created using the special FZUB drill.
- Once the anchor has been placed in the drill hole, the expansion sleeve is expanded by the driving in of the internal expansion pin with the FZED Plus setting tool, and the undercut drill hole is filled with a positive fit.

## Installation FZEA II






## Technical data

**ZYKON hammerset anchor FZEA II**



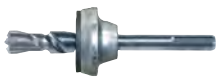
FZEA II FZEA II R FZEA II HCR

| | Galvanised steel | Stainless steel | Highly corrosion-resistant steel | Approval | Required drill bit FZUB | Required setting tool | Anchor length | Internal thread | Min. bolt penetration | Max. bolt penetration | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | Item no. | ETA | | | l [mm] | M | $l_{E,min}$ [mm] | $l_{E,max}$ [mm] | [pcs] |
| **Item** | **gvz** | **R** | **HCR** | | | | | | | | |
| **FZEA II 10 x 40 M 8** | **047303** | **047306** | **047309**[1] | ● | 10 x 40 | FZED 10 plus | 43 | M8 | 11 | 17 | 100 |
| **FZEA II 12 x 40 M10** | **047304** | **047307** | **047310**[1] | ● | 12 x 40 | FZED 12 plus | 43 | M10 | 13 | 19 | 100 |
| **FZEA II 14 x 40 M12** | **047305** | **047308** | – | ● | 14 x 40 | FZED 14 plus | 43 | M12 | 15 | 21 | 50 |

[1] Delivery time on request.

## Technical data

**Drill bit FZUB**



FZUB

| | Item no. | Matching anchor type | Sales unit [pcs] |
|---|---|---|---|
| **Item** | | | |
| **FZUB 10 x 40** | **060622** | FZEA II 10 x 40, FZA 10 x 40 M6 | 1 |
| **FZUB 12 x 40** | **060623** | FZEA II 12 x 40, FZA 12 x 40 M8 | 1 |
| **FZUB 14 x 40** | **060624** | FZEA II 14 x 40, FZA 14 x 40 | 1 |

# Technical data

**FZED plus**



FZED plus

| Item | Item no. | Matching anchor type | Sales unit [pcs] |
|---|---|---|---|
| **FZED 10 plus** | **044642** | FZEA II 10 x 40 M8 | 1 |
| **FZED 12 plus** | **044643** | FZEA II 12 x 40 M10 | 1 |
| **FZED 14 plus** | **044644** | FZEA II 14 x 40 M12 | 1 |



# Loads

**ZYKON hammerset anchor FZEA II**

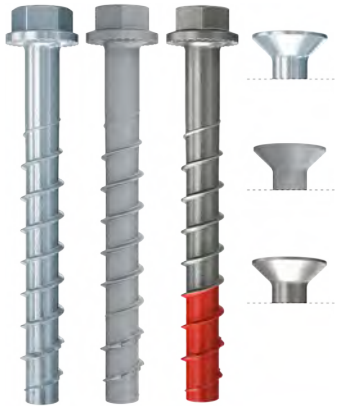
Permissible loads of a single anchor[1] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-06/0271 has to be considered.

| Type | Material/ surface[2] | Screw material | Effective anchorage depth $h_{ef}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Maximum installation torque $T_{inst,max}$ [Nm] | Cracked concrete: Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Non-cracked concrete: Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] |
| **FZEA II 10 x 40 M8** | gvz | 5.8 | 40 | 80 | 10 | 1.6 | 4.1 | 40 | 40 | 3.6 | 4.7 | 40 | 40 |
| | gvz | 8.8 | 40 | 80 | 10 | 1.6 | 4.1 | 40 | 40 | 3.6 | 4.7 | 40 | 40 |
| | R | A4-70 | 40 | 80 | 15 | 1.6 | 4.1 | 40 | 40 | 3.6 | 4.6 | 40 | 40 |
| **FZEA II 12 x 40 M10** | gvz | 5.8 | 40 | 80 | 15 | 3.0 | 4.1 | 45 | 45 | 3.6 | 5.9 | 45 | 45 |
| | gvz | 8.8 | 40 | 80 | 15 | 3.0 | 4.1 | 45 | 45 | 3.6 | 5.9 | 45 | 45 |
| | R | A4-70 | 40 | 80 | 20 | 3.0 | 4.1 | 45 | 45 | 3.6 | 5.9 | 45 | 45 |
| **FZEA II 14 x 40 M12** | gvz | 5.8 | 40 | 80 | 20 | 3.5 | 4.1 | 50 | 50 | 3.6 | 5.9 | 50 | 50 |
| | gvz | 8.8 | 40 | 80 | 20 | 3.5 | 4.1 | 50 | 50 | 3.6 | 5.9 | 50 | 50 |
| | R | A4-70 | 40 | 80 | 40 | 3.5 | 4.1 | 50 | 50 | 3.6 | 5.9 | 50 | 50 |

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.
[2] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).
[3] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Concrete screw UltraCut FBS II 8-14







Railings



Inclined supports

## Applications

- Guard rails
- Consoles/base plates
- Metal profiles
- Steel constructions
- Façades
- Protection barriers
- Results/beam anchors
- Shuttering props (only FBS II galvanised steel)
- Temporary anchoring, e.g. of building site equipment (only FBS II galvanised steel)
- Concrete-concrete connections (e.g. strengthening of bridges, parking garages or renovation of buildings)

## Advantages

- Unique saw-tooth geometry cuts quickly into the building material.
- The ETA covers applications in cracked and non-cracked concrete and performance categories seismic C1 and C2.
- With up to 3 embedment depths, the FBS II allows for the same screw to be used for different component thicknesses.
- The concrete screw FBS II 8-10 in zinc-plated steel and stainless steel R has an ETA for masonry brick (EN771-1), solid sand-lime brick (EN771-2) and perforated sand-lime brick (EN771-2) for a flexible use in different substrates.
- The high coating quality of the FBS II CP is prooved through the salt spray chamber test over 2,000h.
- For the zinc-plated steel version the checking gauge allows for reuse covered by the approval.
- The specially hardened red tip of the stainless steel R version provides faster and more secure installation.
- Together with the fischer adjusting washer FSW and the FBS II 10 wooden beams and wooden sleepers can be adjusted easily and quickly.

## Certificates / Features

ETA CE R 120

**ETA-17/0740, in cracked concrete**
**ETA-20/0134, in masonry**
**ETA-15/0352, in cracked concrete**
**ETA-20/0321, for strengthening of existing concrete structures by concrete overlay**

Inox Stainless Steel

Seismic C2

## Building materials

**Approved for:**

- Concrete C20/25 to C50/60, cracked and non-cracked
- Strengthening of existing concrete structures with top layer concrete
- Masonry brick (EN771-1), solid sand-lime brick (EN771-2) and perforated sand-lime brick (EN771-2)

**Also suitable for:**

- Concrete C12/15
- Solid building materials

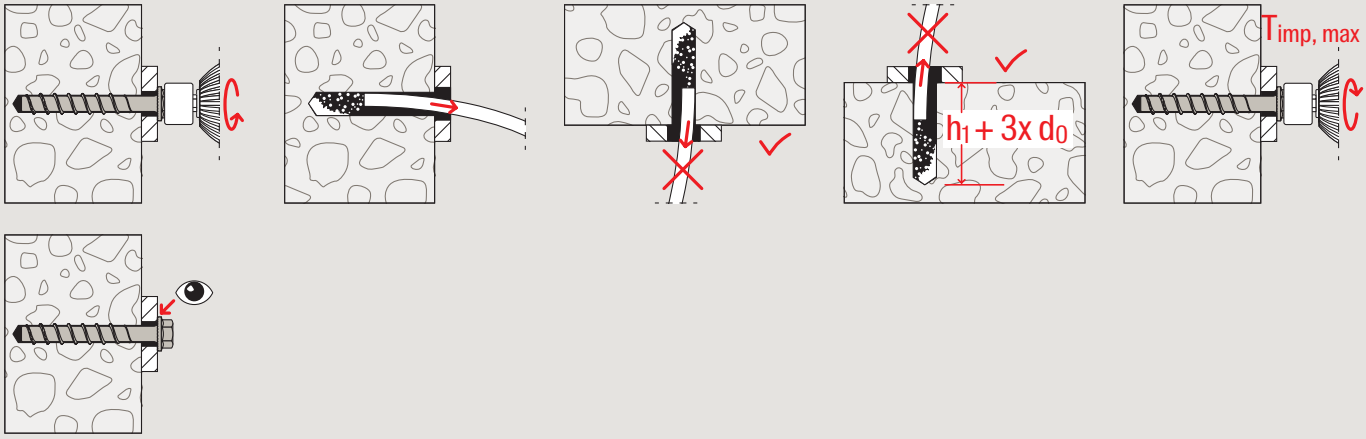
## Versions

- Galvanised steel
- Stainless steel R
- Corrosion protection coating (CP)

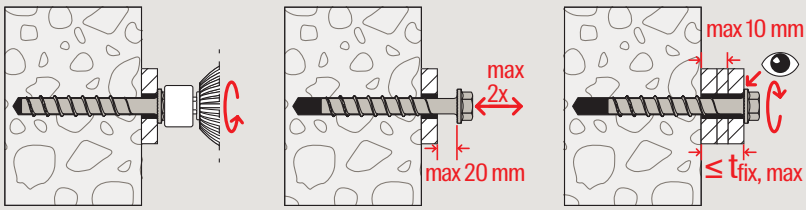
## Functioning

- The UltraCut FBSII is recommended for the push-through installation.
- Drill holes do not need to be cleaned during vertical installation (ceiling and floor). For floor fixings the hole must be drilled 3x drill hole diameter deeper.
- The approved adjustment for the concrete screws allows the screw to be unscrewed twice for a total length of 20 mm, to place maximum 10 mm packing below the base plates or to align the attached part.
- The screw is installed correctly when the screw head sits flush on the fixture (visual setting control).
- For the installation of restructuring of existing concrete structures by concrete overlay, the setting tool SC-ST can be used for a faster installation.

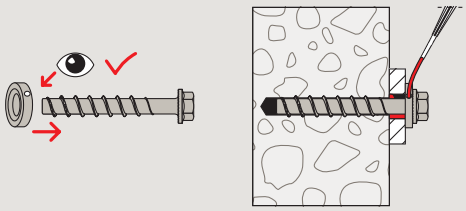
## Installation UltraCut FBS II in concrete



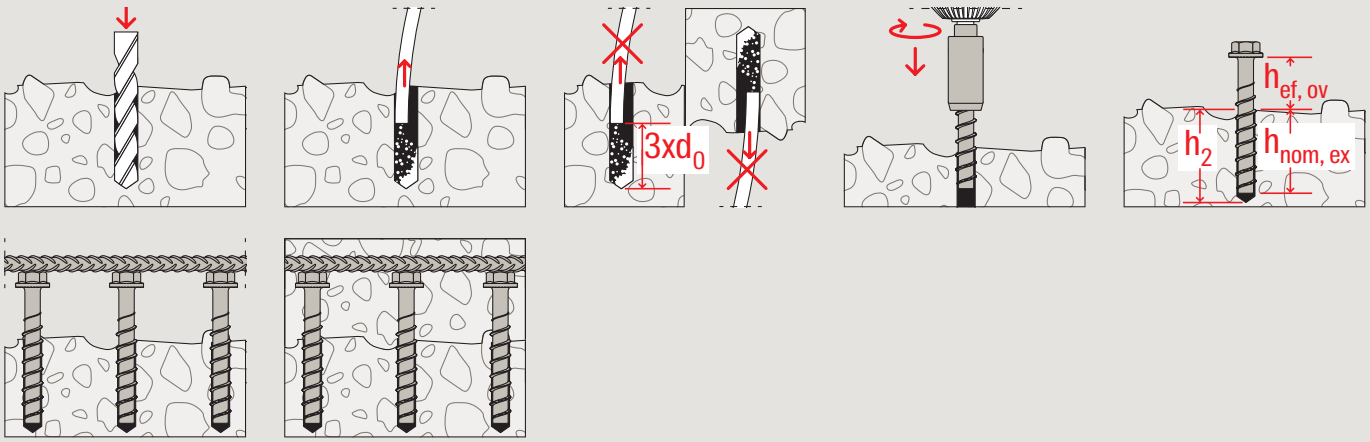

## Fixture adjustment



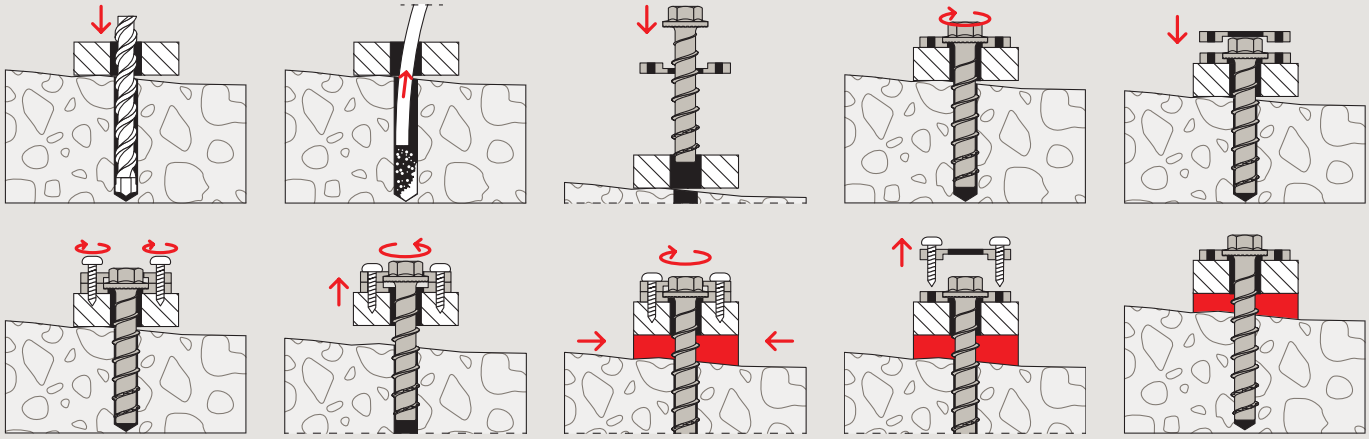

## Additional for seismic applications



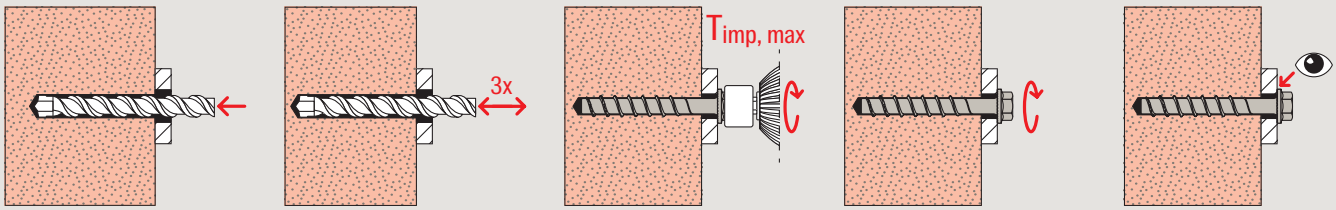
## Installation UltraCut FBS II (concrete-concrete connection)



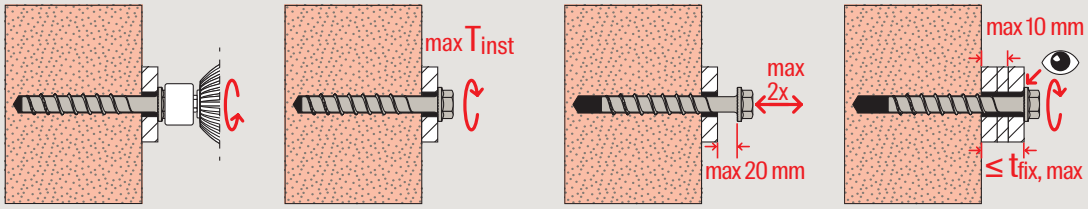
## Installation wooden sleeper with adjusting disc FWS

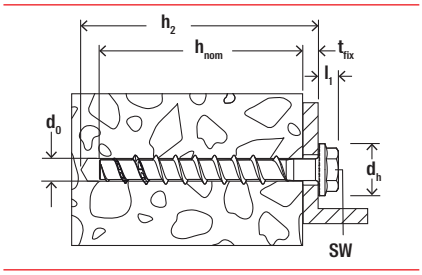


## Installation UltraCut FBS II gvz in masonry




## Fixture adjustment






## Technical data

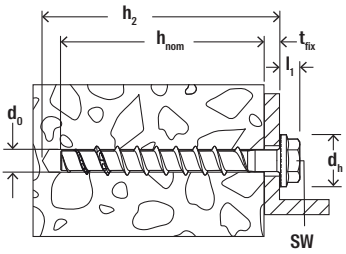


**Concrete screw UltraCut FBS II US**



FBS II US FBS II US CP

| Item | Item no. | Approval ETA | Approval DIBt | Drill diameter $d_0$ [mm] | Head-ø $d_h$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom1}$ / $t_{fix}$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom2}$ / $t_{fix}$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom3}$ / $t_{fix}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FBS II 8x55 5/- US TX gvz | 536851 | ● | ● | 8 | 18 | 65 | 10.0 x 55 | 50 / 5 | – | – | TX40 / SW 13 | 50 |
| FBS II 8x55 5/- US TX CP | 557781 | ● | – | 8 | 18 | 65 | 10.0 x 55 | 50 / 5 | – | – | TX40 / SW 13 | 50 |
| FBS II 8x70 20/5 US TX gvz | 536852 | ● | ● | 8 | 18 | 80 | 10.0 x 70 | 50 / 20 | - | 65 / 5 | TX40 / SW 13 | 50 |
| FBS II 8x70 20/5 US TX CP | 557782 | ● | – | 8 | 18 | 80 | 10.0 x 70 | 50 / 20 | – | 65 / 5 | TX40 / SW 13 | 50 |
| FBS II 8x80 30/15 US TX gvz | 536853 | ● | ● | 8 | 18 | 90 | 10.0 x 80 | 50 / 30 | - | 65 / 15 | TX40 / SW 13 | 50 |
| FBS II 8x80 30/15 US TX CP | 557783 | ● | – | 8 | 18 | 90 | 10.0 x 80 | 50 / 30 | – | 65 / 65 | TX40 / SW 13 | 50 |
| FBS II 8x90 40/25 US TX gvz | 536854 | ● | ● | 8 | 18 | 100 | 10.0 x 90 | 50 / 40 | - | 65 / 55 | TX40 / SW 13 | 50 |
| FBS II 8x90 40/25 US TX CP | 557784 | ● | – | 8 | 18 | 100 | 10.0 x 90 | 50 / 40 | – | 65 / 55 | TX40 / SW 13 | 50 |
| FBS II 8x100 50/35 US TX gvz | 536855 | ● | ● | 8 | 18 | 110 | 10.0 x 100 | 50 / 50 | - | 65 / 35 | TX40 / SW 13 | 50 |
| FBS II 8x100 50/35 US TX CP | 557785 | ● | – | 8 | 18 | 110 | 10.0 x 100 | 50 / 50 | - | 65 / 35 | TX40 / SW 13 | 50 |
| FBS II 8x110 60/45 US TX gvz | 536856 | ● | ● | 8 | 18 | 120 | 10.0 x 110 | 50 / 60 | - | 65 / 45 | TX40 / SW 13 | 50 |
| FBS II 8x130 80/65 US TX gvz | 536857 | ● | ● | 8 | 18 | 140 | 10.0 x 130 | 50 / 80 | - | – | TX40 / SW 13 | 50 |
| FBS II 8x150 100/85 US TX gvz | 558219 | ● | ● | 8 | 18 | 160 | 10.0 x 150 | 50 / 100 | – | 65 / 85 | TX40 / SW 13 | 50 |
| FBS II 8x170 120/105 US TX gvz | 558220 | ● | ● | 8 | 18 | 180 | 10.0 x 170 | 50 / 120 | – | 65 / 105 | TX40 / SW 13 | 50 |
| FBS II 8x190 140/125 US TX gvz | 558221 | ● | ● | 8 | 18 | 200 | 10.0 x 190 | 50 / 140 | – | 65 / 125 | TX40 / SW 13 | 20 |
| FBS II 10x60 5/-/- US gvz | 536858 | ● | ● | 10 | 20.5 | 70 | 12.0 x 60 | 55 / 5 | – | – | SW 15 | 50 |
| FBS II 10x60 5/-/- US CP | 557786 | ● | – | 10 | 20.5 | 70 | 12.0 x 60 | 55 / 5 | – | – | SW 15 | 50 |
| FBS II 10x70 15/5/- US gvz | 536859 | ● | ● | 10 | 20.5 | 80 | 12.0 x 70 | 55 / 15 | 65 / 5 | – | SW 15 | 50 |
| FBS II 10x70 15/5/- US CP | 557787 | ● | – | 10 | 20.5 | 80 | 12.0 x 70 | 55 / 15 | 65 / 5 | – | SW 15 | 50 |
| FBS II 10x80 25/15/- US gvz | 536860 | ● | ● | 10 | 20.5 | 90 | 12.0 x 80 | 55 / 25 | 65 / 15 | – | SW 15 | 50 |
| FBS II 10x80 25/15/- US CP | 557788 | ● | – | 10 | 20.5 | 90 | 12.0 x 80 | 55 / 25 | 65 / 65 | – | SW 15 | 50 |
| FBS II 10x90 35/25/5 US gvz | 536861 | ● | ● | 10 | 20.5 | 100 | 12.0 x 90 | 55 / 35 | 65 / 55 | 85 / 5 | SW 15 | 50 |
| FBS II 10x90 35/25/5 US CP | 557789 | ● | – | 10 | 20.5 | 100 | 12.0 x 90 | 55 / 35 | 65 / 55 | 85 / 5 | SW 15 | 50 |
| FBS II 10x100 45/35/15 US gvz | 536862 | ● | ● | 10 | 20.5 | 110 | 12.0 x 100 | 55 / 45 | 65 / 35 | 85 / 15 | SW 15 | 50 |
| FBS II 10x100 45/35/15 US CP | 557790 | ● | – | 10 | 20.5 | 110 | 12.0 x 100 | 55 / 45 | 65 / 35 | 85 / 15 | SW 15 | 50 |
| FBS II 10x120 65/55/35 US gvz | 536863 | ● | ● | 10 | 20.5 | 130 | 12.0 x 120 | 55 / 65 | 65 / 25 | 85 / 35 | SW 15 | 50 |
| FBS II 10x120 65/55/35 US CP | 557791 | ● | – | 10 | 20.5 | 130 | 12.0 x 120 | 55 / 65 | 65 / 25 | 85 / 35 | SW 15 | 50 |
| FBS II 10x140 85/75/55 US gvz | 536864 | ● | ● | 10 | 20.5 | 150 | 12.0 x 140 | 55 / 85 | 65 / 45 | 85 / 55 | SW 15 | 50 |
| FBS II 10x140 85/75/55 US CP | 557792 | ● | – | 10 | 20.5 | 150 | 12.0 x 140 | 55 / 85 | 65 / 45 | 85 / 55 | SW 15 | 50 |
| FBS II 10x160 105/95/75 US gvz | 536865 | ● | ● | 10 | 20.5 | 170 | 12.0 x 160 | 55 / 105 | 65 / 15 | 85 / 75 | SW 15 | 50 |
| FBS II 10x160 105/95/75 US CP | 557793 | ● | – | 10 | 20.5 | 170 | 12.0 x 160 | 55 / 105 | 65 / 15 | – | SW 15 | 50 |
| FBS II 10x200 145/135/115 US gvz | 536866 | ● | ● | 10 | 20.5 | 210 | 12.0 x 200 | 55 / 145 | 65 / 135 | 85 / 115 | SW 15 | 20 |
| FBS II 10x230 175/165/145 US gvz | 536867 | ● | ● | 10 | 20.5 | 240 | 12.0 x 230 | 55 / 175 | 65 / 165 | 85 / 145 | SW 15 | 20 |
| FBS II 10x260 205/195/175 US gvz | 536868 | ● | ● | 10 | 20.5 | 270 | 12.0 x 260 | 55 / 205 | 65 / 195 | 85 / 175 | SW 15 | 20 |
| FBS II 10x280 225/215/195 US gvz | 558222 | ● | ● | 10 | 20.5 | 290 | 12.0 x 280 | 55 / 225 | 65 / 215 | 85 / 195 | SW 15 | 20 |
| FBS II 12x70 10/-/- US gvz | 536869 | ● | ● | 12 | 23 | 80 | 14.0 x 70 | 60 / 10 | – | – | SW 17 | 20 |
| FBS II 12x85 25/10/- US gvz | 536870 | ● | ● | 12 | 23 | 95 | 14.0 x 85 | 60 / 25 | 75 / 10 | – | SW 17 | 20 |
| FBS II 12x85 25/10/- US CP | 557794 | ● | – | 12 | 23 | 95 | 14.0 x 85 | 60 / 25 | 75 / 10 | – | SW 17 | 20 |
| FBS II 12x110 50/35/10 US gvz | 536871 | ● | ● | 12 | 23 | 120 | 14.0 x 110 | 60 / 50 | 75 / 35 | 100 / 10 | SW 17 | 20 |
| FBS II 12x110 50/35/10 US CP | 557795 | ● | – | 12 | 23 | 120 | 14.0 x 110 | 60 / 50 | 75 / 35 | 100 / 10 | SW 17 | 20 |
| FBS II 12x130 70/55/30 US gvz | 536872 | ● | ● | 12 | 23 | 140 | 14.0 x 130 | 60 / 70 | 75 / 55 | 100 / 30 | SW 17 | 20 |
| FBS II 12x150 90/75/50 US gvz | 536873 | ● | ● | 12 | 23 | 160 | 14.0 x 150 | 60 / 90 | 75 / 75 | 100 / 50 | SW 17 | 20 |




## Technical data

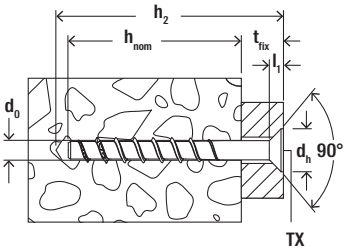
4

**Concrete screw UltraCut FBS II US**



FBS II US FBS II US CP

| Item | Item no. | Approval ETA | Approval DIBt | Drill diameter $d_0$ [mm] | Head-ø $d_h$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom1}$ / $t_{fix}$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom2}$ / $t_{fix}$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom3}$ / $t_{fix}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FBS II 12x170 110/95/70 US gvz | 558223 | ● | ● | 12 | 23 | 180 | 14.0 x 170 | 60 / 110 | 75 / 95 | 100 / 70 | SW 17 | 20 |
| FBS II 12x190 130/115/90 US gvz | 558224 | ● | ● | 12 | 23 | 200 | 14.0 x 190 | 60 / 130 | 75 / 115 | 100 / 90 | SW 17 | 20 |
| FBS II 12x210 150/135/110 US gvz | 558225 | ● | ● | 12 | 23 | 220 | 14.0 x 210 | 60 / 150 | 75 / 135 | 100 / 110 | SW 17 | 20 |
| FBS II 14x75 10/-/- US gvz | 536874 | ● | ● | 14 | 28 | 90 | 16.0 x 75 | 65 / 10 | – | – | SW 21 | 20 |
| FBS II 14x75 10/-/- US CP | 557796 | ● | – | 14 | 28 | 85 | 16.0 x 75 | 65 / 10 | – | – | SW 21 | 20 |
| FBS II 14x95 30/10/- US gvz | 536875 | ● | ● | 14 | 28 | 110 | 16.0 x 95 | 65 / 30 | 85 / 10 | – | SW 21 | 20 |
| FBS II 14x95 30/10/- US CP | 557797 | ● | – | 14 | 28 | 105 | 16.0 x 95 | 65 / 30 | 85 / 10 | – | SW 21 | 20 |
| FBS II 14x100 35/15/- US gvz | 536876 | ● | ● | 14 | 28 | 115 | 16.0 x 100 | 65 / 35 | 85 / 15 | – | SW 21 | 20 |
| FBS II 14x100 35/15/- US CP | 557798 | ● | – | 14 | 28 | 110 | 16.0 x 100 | 65 / 35 | 85 / 15 | – | SW 21 | 20 |
| FBS II 14x125 60/40/10 US gvz | 536877 | ● | ● | 14 | 28 | 140 | 16.0 x 125 | 65 / 60 | 85 / 40 | 85 / 5 | SW 21 | 10 |
| FBS II 14x125 60/40/10 US CP | 557799 | ● | – | 14 | 28 | 135 | 16.0 x 125 | 65 / 60 | 85 / 40 | 85 / 5 | SW 21 | 10 |
| FBS II 14x150 85/65/35 US gvz | 536878 | ● | ● | 14 | 28 | 165 | 16.0 x 150 | 65 / 85 | 85 / 65 | 115 / 35 | SW 21 | 10 |
| FBS II 14x180 115/85/65 US gvz | 558226 | ● | ● | 14 | 28 | 190 | 16.0 x 180 | 65 / 115 | 85 / 95 | 115 / 65 | SW 21 | 10 |
| FBS II 14x210 145/125/95 US gvz | 558227 | ● | ● | 14 | 28 | 220 | 16.0 x 210 | 65 / 145 | 85 / 125 | 115 / 95 | SW 21 | 10 |
| FBS II 14x240 175/155/125 US gvz | 558228 | ● | ● | 14 | 28 | 250 | 16.0 x 240 | 65 / 175 | 85 / 155 | 115 / 125 | SW 21 | 10 |



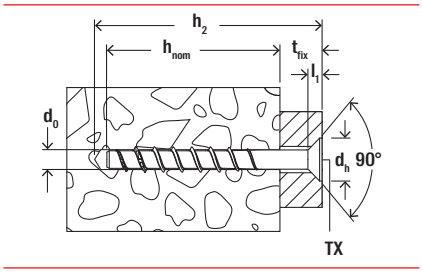

## Technical data

**Concrete screw UltraCut FBS II SK**



FBS II SK FBS II CP SK CP

| Item | Item no. | Approval ETA | Approval DIBt | Drill diameter $d_0$ [mm] | Head-ø $d_h$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom1}$ / $t_{fix}$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom2}$ / $t_{fix}$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom3}$ / $t_{fix}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FBS II 8x60 10/- SK gvz | 536880 | ● | ● | 8 | 18 | 70 | 10.0 x 60 | 50 / 10 | – | – | TX40 | 50 |
| FBS II 8x60 10/- SK CP | 557800 | ● | ● | 8 | 18 | 70 | 10.0 x 60 | 50 / 10 | – | – | TX40 | 50 |
| FBS II 8x80 30/15 SK gvz | 536881 | ● | ● | 8 | 18 | 90 | 10.0 x 80 | 50 / 30 | – | 65 / 15 | TX40 | 50 |




## Technical data

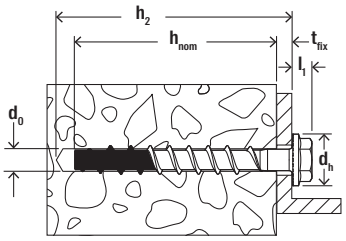


**Concrete screw UltraCut FBS II SK**



FBS II SK FBS II CP SK CP

| Item | Item no. | Approval ETA | Approval DIBt | Drill diameter $d_0$ [mm] | Head-ø $d_h$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom1}$ / $t_{fix}$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom2}$ / $t_{fix}$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom3}$ / $t_{fix}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **FBS II 8x80 30/15 SK CP** | **557801** | ● | ● | 8 | 18 | 90 | 10.0 x 80 | 50 / 30 | 65 / 65 | 65 / 15 | TX40 | 50 |
| **FBS II 8x90 40/25 SK gvz** | **536882** | ● | ● | 8 | 18 | 100 | 10.0 x 90 | 50 / 40 | – | 65 / 25 | TX40 | 50 |
| **FBS II 8x90 40/25 SK CP** | **557802** | ● | ● | 8 | 18 | 100 | 10.0 x 90 | 50 / 40 | 65 / 55 | 65 / 25 | TX40 | 50 |
| **FBS II 8x100 50/35 SK gvz** | **558229** | ● | ● | 8 | 18 | 110 | 10.0 x 100 | 50 / 50 | – | 65 / 35 | TX40 | 50 |
| **FBS II 8x110 60/45 SK gvz** | **558230** | ● | ● | 8 | 18 | 120 | 10.0 x 110 | 50 / 60 | – | 65 / 45 | TX40 | 50 |
| **FBS II 8x120 70/55 SK gvz** | **558231** | ● | ● | 8 | 18 | 130 | 10.0 x 120 | 50 / 70 | – | 65 / 55 | TX40 | 50 |
| **FBS II 8x140 90/75 SK gvz** | **558232** | ● | ● | 8 | 18 | 150 | 10.0 x 140 | 50 / 90 | – | 65 / 75 | TX40 | 50 |
| **FBS II 8x160 110/95 SK gvz** | **558233** | ● | ● | 8 | 18 | 170 | 10.0 x 160 | 50 / 110 | – | 65 / 95 | TX40 | 50 |
| **FBS II 8x180 130/115 SK gvz** | **558234** | ● | ● | 8 | 18 | 190 | 10.0 x 180 | 50 / 130 | – | 65 / 115 | TX40 | 20 |
| **FBS II 8x200 150/135 SK gvz** | **558235** | ● | ● | 8 | 18 | 210 | 10.0 x 200 | 50 / 150 | – | 65 / 135 | TX40 | 20 |
| **FBS II 10x65 10/-/- SK gvz** | **536884** | ● | ● | 10 | 21 | 75 | 12.0 x 65 | 55 / 10 | – | – | TX50 | 50 |
| **FBS II 10x65 10/-/- SK CP** | **557803** | ● | ● | 10 | 21 | 75 | 12.0 x 65 | 55 / 10 | – | – | TX50 | 50 |
| **FBS II 10x80 25/15/- SK gvz** | **536885** | ● | ● | 10 | 21 | 90 | 12.0 x 80 | 55 / 25 | 65 / 15 | – | TX50 | 50 |
| **FBS II 10x80 25/15/- SK CP** | **557804** | ● | ● | 10 | 21 | 90 | 12.0 x 80 | 55 / 25 | 65 / 15 | – | TX50 | 50 |
| **FBS II 10x95 40/30/10 SK gvz** | **536886** | ● | ● | 10 | 21 | 105 | 12.0 x 95 | 55 / 40 | 65 / 30 | 85 / 10 | TX50 | 50 |
| **FBS II 10x100 45/35/15 SK gvz** | **536887** | ● | ● | 10 | 21 | 110 | 12.0 x 100 | 55 / 45 | 65 / 35 | 85 / 15 | TX50 | 50 |
| **FBS II 10x100 45/35/15 SK CP** | **557805** | ● | ● | 10 | 21 | 110 | 12.0 x 100 | 55 / 45 | 65 / 35 | 85 / 15 | TX50 | 50 |
| **FBS II 10x120 65/55/35 SK gvz** | **536888** | ● | ● | 10 | 21 | 130 | 12.0 x 120 | 55 / 65 | 65 / 55 | 85 / 35 | TX50 | 50 |
| **FBS II 10x140 85/75/55 SK gvz** | **558236** | ● | ● | 10 | 21 | 150 | 12.0 x 140 | 55 / 85 | 65 / 75 | 85 / 55 | TX50 | 50 |
| **FBS II 10x160 105/95/75 SK gvz** | **558237** | ● | ● | 10 | 21 | 170 | 12.0 x 160 | 55 / 105 | 65 / 95 | 85 / 75 | TX50 | 50 |
| **FBS II 10x180 125/115/95 SK gvz** | **558238** | ● | ● | 10 | 21 | 190 | 12.0 x 180 | 55 / 125 | 65 / 115 | 85 / 95 | TX50 | 20 |




## Technical data

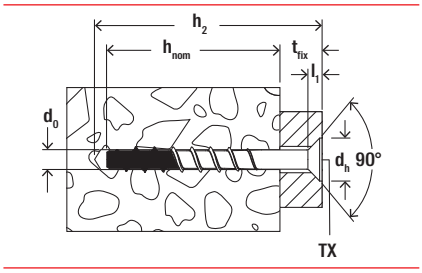


**Concrete screw UltraCut FBS II US R**



FBS II US R

| Item | Stainless steel Item no. R | Approval ETA | Drill diameter $d_0$ [mm] | Head-ø $d_h$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom1}$ / $t_{fix}$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom2}$ / $t_{fix}$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom3}$ / $t_{fix}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FBS II 8x60 10/- US | 543565 | ● | 8 | 18 | 70 | 10.0 x 60 | 50 / 10 | – | – | SW 13 | 50 |
| FBS II 8x70 20/5 US | 543566 | ● | 8 | 18 | 80 | 10.0 x 70 | 50 / 20 | – | 65 / 5 | SW 13 | 50 |
| FBS II 8x80 30/15 US | 543567 | ● | 8 | 18 | 90 | 10.0 x 80 | 50 / 30 | – | 65 / 15 | SW 13 | 50 |
| FBS II 8x90 40/25 US | 543568 | ● | 8 | 18 | 100 | 10.0 x 90 | 50 / 40 | – | 65 / 25 | SW 13 | 50 |
| FBS II 8x100 50/35 US | 558239 | ● | 8 | 18 | 110 | 10.0 x 100 | 50 / 50 | – | 65 / 35 | SW 13 | 50 |
| FBS II 8x120 70/55 US | 558240 | ● | 8 | 18 | 130 | 10.0 x 120 | 50 / 70 | – | 65 / 55 | SW 13 | 50 |
| FBS II 8x140 90/75 US | 558241 | ● | 8 | 18 | 150 | 10.0 x 140 | 50 / 90 | – | 65 / 75 | SW 13 | 50 |
| FBS II 8x160110/95 US | 558242 | ● | 8 | 18 | 170 | 10.0 x 160 | 50 / 110 | – | 65 / 95 | SW 13 | 50 |
| FBS II 10x60 5/-/- US | 543569 | ● | 10 | 20.5 | 70 | 12.0 x 60 | 55 / 5 | – | – | SW 15 | 50 |
| FBS II 10x70 15/5/- US | 543570 | ● | 10 | 20.5 | 80 | 12.0 x 70 | 55 / 15 | 65 / 5 | – | SW 15 | 50 |
| FBS II 10x80 25/15/- US | 543571 | ● | 10 | 20.5 | 90 | 12.0 x 80 | 55 / 25 | 65 / 15 | – | SW 15 | 50 |
| FBS II 10x90 35/25/5 US | 543572 | ● | 10 | 20.5 | 100 | 12.0 x 90 | 55 / 35 | 65 / 25 | 85 / 5 | SW 15 | 50 |
| FBS II 10x100 45/35/15 US | 543573 | ● | 10 | 20.5 | 110 | 12.0 x 100 | 55 / 45 | 65 / 35 | 85 / 15 | SW 15 | 50 |
| FBS II 10x120 65/55/35 US | 543574 | ● | 10 | 20.5 | 130 | 12.0 x 120 | 55 / 65 | 65 / 55 | 85 / 35 | SW 15 | 50 |
| FBS II 10x140 85/75/55 US | 558243 | ● | 10 | 20.5 | 150 | 12.0 x 140 | 55 / 85 | 65 / 75 | 85 / 55 | SW 15 | 50 |
| FBS II 10x160 105/95/75 US | 558244 | ● | 10 | 20.5 | 170 | 12.0 x 160 | 55 / 105 | 65 / 95 | 85 / 75 | SW 15 | 50 |
| FBS II 12x70 10/-/- US | 543575 | ● | 12 | 23 | 80 | 14.0 x 70 | 55 / 85 | – | – | SW 17 | 20 |
| FBS II 12x85 25/10/- US | 543576 | ● | 12 | 13 | 95 | 14.0 x 85 | 60 / 25 | 75 / 10 | – | SW 17 | 20 |
| FBS II 12x110 50/35/10 US | 543577 | ● | 12 | 23 | 120 | 14.0 x 110 | 60 / 50 | 75 / 35 | 100 / 10 | SW 17 | 20 |
| FBS II 12x130 70/55/30 US | 543578 | ● | 12 | 23 | 140 | 14.0 x 130 | 60 / 70 | 75 / 55 | 100 / 30 | SW 17 | 20 |
| FBS II 12x160 100/85/60 US | 558245 | ● | 12 | 23 | 170 | 14.0 x 160 | 60 / 100 | 75 / 95 | 100 / 60 | SW 17 | 20 |




## Technical data

**Concrete screw UltraCut FBS II SK R**



FBS II SK R

| Item | Item no. R | Approval ETA | Drill diameter $d_0$ [mm] | Head-ø $d_h$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom1}$ / $t_{fix}$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom2}$ / $t_{fix}$ [mm] | Nominal embedment depth / thickness of fixture $h_{nom3}$ / $t_{fix}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| FBS II 8x60 10/- SK | 543579 | ● | 8 | 18 | 70 | 50 / 10 | – | – | TX40 | 50 |
| FBS II 8x80 30/15 SK | 543580 | ● | 8 | 18 | 90 | 50 / 30 | – | 65 / 15 | TX40 | 50 |
| FBS II 8x90 40/25 SK | 543581 | ● | 8 | 18 | 100 | 50 / 40 | – | 65 / 25 | TX40 | 50 |
| FBS II 8x100 50/35 SK | 558246 | ● | 8 | 18 | 110 | 50 / 50 | – | 65 / 35 | TX40 | 50 |
| FBS II 10x65 10/-/- SK | 543582 | ● | 10 | 21 | 75 | 50 / 10 | – | – | TX50 | 50 |
| FBS II 10x80 25/15/- SK | 543583 | ● | 10 | 21 | 90 | 55 / 25 | 65 / 15 | 65 / 65 | TX50 | 50 |
| FBS II 10x95 40/30/10 SK | 543584 | ● | 10 | 21 | 105 | 55 / 40 | 65 / 30 | 85 / 10 | TX50 | 50 |
| FBS II 10x100 45/35/15 SK | 543585 | ● | 10 | 21 | 110 | 55 / 45 | 65 / 35 | 85 / 15 | TX50 | 50 |
| FBS II 10x120 65/55/35 SK | 543586 | ● | 10 | 21 | 130 | 55 / 65 | 65 / 55 | 85 / 35 | TX50 | 50 |

## Technical data

**Accessories UltraCut FBS II**



FUP



Socket SW




Socket 1/2“ - 1/4“




Socket TX50



FMB TX



FPB ProfiBit TX 50 5/16“



FMB II TX




SC-ST

| Item | Item no. | Approval DIBt | Internal diameter D [mm] | Drive | Match | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| FUP 8 | 537200 | – | 9.9 | – | FBS II 8 | 1 |
| FUP 10 | 537201 | ● | 12 | – | FBS II 10 | 1 |
| FUP 12 | 537202 | ● | 13.9 | – | FBS II 12 | 1 |
| FUP 14 | 537203 | ● | 15.6 | – | FBS II 14 | 1 |
| Socket 1/2“ size 10 | 538577 | – | – | 1/2“ / SW10 | FBS II 6 | 1 |
| Socket 1/2“ size 13 | 538578 | – | – | 1/2“ / SW13 | FBS II 8 | 1 |
| Socket 1/2“ size 15 | 538579 | – | – | 1/2“ / SW15 | FBS II 10 | 1 |
| Socket 1/2“ size 17 | 538580 | – | – | 1/2“ / SW17 | FBS II 12 | 1 |
| Socket 1/2“ size 21 | 538581 | – | – | 1/2“ / SW21 | FBS II 14 | 1 |
| Socket 1/2“- 1/4“ | 553928 | – | – | 1/2“ / 1/4“ | FBS II 6 / FBS II 8 / FBS II 8 SK | 1 |
| Socket 1/2“- 5/16“ | 538576 | – | – | 1/2“ - 5/16“ | FBS II 10 / FBS II 10 SK | 1 |
| Socket 1/2“ - TX50 | 553929 | – | – | 1/2“ / TX50 | FBS II 10 SK | 1 |
| FMB II TX20 Bit | 564312 | – | – | TX20 | – | 1 |
| FMB II TX25 Bit | 564313 | – | – | TX25 | – | 1 |
| FMB II TX30 Bit | 564314 | – | – | TX30 | FBS II 6 | 1 |
| FMB II TX40 Bit | 564315 | – | – | TX40 | FBS II 8 / FBS II 8 SK | 1 |

## Technical data

**Accessories UltraCut FBS II**



FUP



Socket SW




Socket 1/2“ - 1/4“




Socket TX50



FMB TX



FPB ProfiBit TX 50 5/16“



FMB II TX




SC-ST

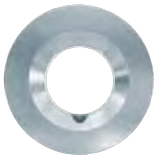
4

| | Item no. | Ap-pro-val DIBt | Internal diameter D [mm] | Drive | Match | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Item** | | | | | | |
| **FMB TX25 MaxxBit W5** | **533157** | – | – | TX20 | – | 1 |
| **FMB TX30 MaxxBit W5** | **533158** | – | – | TX30 | FBS II 6 | 1 |
| **FMB TX40 MaxxBit W5** | **533159** | – | – | TX40 | FBS II 8 / FBS II 8 SK | 1 |
| **FPB ProfiBit TX50 5/16“** | **557844** | – | – | TX50 | FBS II 10 SK | 1 |
| **SC-ST 8 setting tool** | **557872** | – | – | – | FBS II 8 | 1 |
| **SC-ST 10 setting tool** | **557874** | – | – | – | FBS II 10 | 1 |
| **SC-ST 12 setting tool** | **563090** | – | – | – | FBS II 12 | 1 |

## Technical data

**Accessories UltraCut FBS II**





FFD



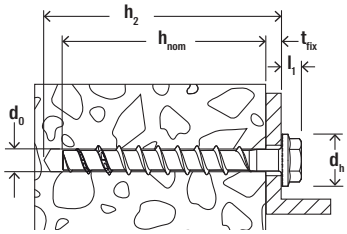
FSW 10



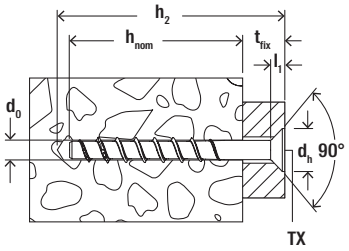
Washer U

| | Item no. | Internal diameter D [mm] | External-ø d [mm] | Match | Sales unit [pcs] |
|---|---|---|---|---|---|
| **Item** | | | | | |
| **FFD 22 x 9 x 6** | **547515** | 9 | 22 | FBS II 6 | 4 |
| **Adjusting washer FSW 10** | **557276** | 17.5 | 44 | FBS II 10 US | 40 |
| **Washer for FBS 10** | **520471** | 13.5 | 44 | FBS II 10 US | 50 |

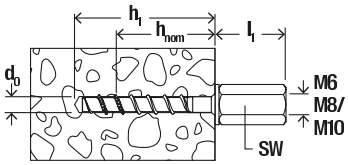
## Installation data - concrete C20/25 - C50/60



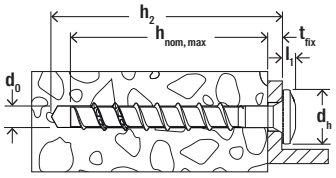
Type US



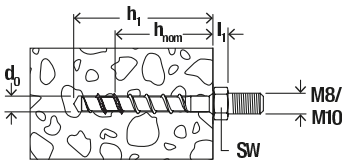
Type SK



Type I



Type P / Typ LP



Type M8 / M10

| UltraCut | | FBS II 8 | | FBS II 10 | | FBS II 6 | | | | FBS II M8/M10 | FBS II 6 I, M8/M10, M6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SK | SK R | SK | SK R | SK | P | LP | US | | |
| $l_1$ | [mm] | 6,0 | 7,0 | 7,0 | 7,0 | 6,0 | 3,9 | 3,6 | 6,2 | 3,6/5 | 15/16 |
| $d_K$ | [mm] | 20,0 | 23,0 | 23,0 | 25,0 | 13,5 | 14,4 | 17,5 | 17,0 | 37,0/32 | - |

| Concrete screw UltraCut FBS II 6-14 gvz / R | | | 6 | 8 | 10 | 12 | 14 |
|---|---|---|---|---|---|---|---|
| Drill hole diameter | $d_0$ | [mm] | 6 | 8 | 10 | 12 | 14 |
| Nominal screw-in depth | $h_{nom\,1}$ | [mm] | 25 - 55 | 50 | 55 | 60 | 65 |
| | $h_{nom\,2}$ | [mm] | 25 - 55 | - | 65 | 75 | 85 |
| | $h_{nom\,3}$ | [mm] | 25 - 55 | 65 | 85 | 100 | 115 |
| Drill hole depth (push-trough installation) | $h_2 \geq$ | [mm] | l + 10 | l + 10 | l + 10 | l + 10 | l + 15 |
| Clearance hole diameter | $d_f$ | [mm] | ≤ 8 | 10,6 - 12 | 12,8 - 14 | 14,8 - 16 | 16,9 - 18 |
| Maximum torque for installation with impact screw driver in concrete[3] | $t_{imp,\,max\,gvz}$ | [Nm] | 450[1] | 600 | 650 | 650 | 650 |
| | $t_{imp,\,max\,R}$ | [Nm] | - | 450 | 450 | 650 | - |
| Width across flat | SW | | 10[2] | 13 | 15 | 17 | 21 |
| Drive | TX | | T30 | T40 (SK u. US) | T50 (SK) | - | - |

1) Screw-in depth < 35 mm 80 Nm

2) SW 13 for FBS II ... M10 and FBS II ... M8/M10 I

3) The values apply to concrete strength of approx. 40 N/mm², for other concrete strength classes the values may differ. The conversion of nominal output into effective tightening torque varies from machine to machine - always therefore use torque control.

## Installation data masonry

| Concrete screw UltraCut FBS II 8-10 | | | | | |
|---|---|---|---|---|---|
| Building material | Compressive strength class [N/mm²] | max. $T_{inst}$ [Nm] | | $h_{nom}$ [mm] | |
| | | FBS II 8 | FBS II 10 | FBS II 8 | FBS II 10 |
| Solid clay brick (EN771-1) | ≥ 16 | 20 | 20 | 50 | 55 |
| Solid sand-lime brick (EN771-2) | ≥ 12 | 20 | 20 | 50 | 55 |
| Perforated sand-lime brick (EN771-2) | ≥ 12 | 4 | 8 | 50 | 55 |
| Aerated concrete (EN771-4)* | ≥ 6 | 5 | 5 | 65 | 85 |

* Not regulated in ETA-20/0134, only a recommendation.

## Loads

**Concrete screw Ultracut FBS II US hexagon head with integral washer and FBS II SK countersunk head**

Permissible loads of a single anchor[1] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-15/0352 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material/ surface | Screw-in depth | Minimum member thickness | Instal-lation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{nom}$ [mm] | $h_{min}$ [mm] | $T_{imp,\,max}$ [2] [Nm] | $N_{perm}$ [3] [kN] | $V_{perm}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] | $N_{perm}$ [3] [kN] | $V_{perm}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] |
| **FBS II 6** | gvz | 40 | 80 | 450 | 1.2 | 4.3 | 35 | 35 | 3.8 | 4.3 | 35 | 35 |
| | gvz | 45 | 90 | 450 | 1.7 | 4.3 | 35 | 35 | 4.8 | 4.3 | 35 | 35 |
| | gvz | 50 | 90 | 450 | 1.9 | 4.3 | 35 | 35 | 5.7 | 4.3 | 35 | 35 |
| | gvz | 55 | 100 | 450 | 2.4 | 6.3 | 35 | 35 | 6.4 | 6.3 | 35 | 35 |
| **FBS II 8** | gvz / CP | 50 | 100 | 600 | 2.9 | 4.1 | 35 | 35 | 5.9 | 5.9 | 35 | 35 |
| | gvz / CP | 65 | 120 | 600 | 5.7 | 9.0 | 35 | 35 | 8.8 | 9.0 | 35 | 35 |
| **FBS II 10** | gvz / CP | 55 | 100 | 650 | 4.3 | 4.6 | 40 | 40 | 6.6 | 6.6 | 40 | 40 |
| | gvz / CP | 65 | 120 | 650 | 5.7 | 11.9 | 40 | 40 | 8.5 | 14.0 | 40 | 40 |
| | gvz / CP | 85 | 140 | 650 | 9.2 | 16.6 | 40 | 40 | 13.1 | 16.6 | 40 | 40 |
| **FBS II 12** | gvz / CP | 60 | 110 | 650 | 5.3 | 10.6 | 50 | 50 | 7.5 | 15.1 | 50 | 50 |
| | gvz / CP | 75 | 130 | 650 | 7.6 | 15.2 | 50 | 50 | 10.9 | 15.2 | 50 | 50 |
| | gvz / CP | 100 | 150 | 650 | 12.0 | 20.3 | 50 | 50 | 17.1 | 20.3 | 50 | 50 |
| **FBS II 14** | gvz / CP | 65 | 120 | 650 | 5.8 | 11.6 | 60 | 60 | 8.3 | 16.6 | 60 | 60 |
| | gvz / CP | 85 | 140 | 650 | 9.0 | 18.0 | 60 | 60 | 12.8 | 22.1 | 60 | 60 |
| | gvz / CP | 115 | 180 | 650 | 14.7 | 29.4 | 60 | 60 | 21.0 | 29.4 | 60 | 60 |

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.
[2] Maximum allowable torque for installation with any tangential impact screw driver. Further technical data see ETA.
[3] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

## Loads

**Concrete screw UltraCut FBS II US R hexagon head with integral washer and FBS II SK R countersunk head**

Permissible loads of a single anchor[1] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-17/0740 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material/ surface | Screw-in depth | Minimum member thickness | Maximum installation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{nom}$ [mm] | $h_{min}$ [mm] | $T_{imp,\,max}$ [2] [Nm] | $N_{perm}$ [3] [kN] | $V_{perm}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] | $N_{perm}$ [3] [kN] | $V_{perm}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] |
| **FBS II 8** | R | 50 | 100 | 450 | 1.9 | 4.1 | 35 | 35 | 3.3 | 5.9 | 35 | 35 |
| **FBS II 8** | R | 65 | 120 | 450 | 4.3 | 6.1 | 35 | 35 | 6.7 | 8.8 | 35 | 35 |
| **FBS II 10** | R | 55 | 100 | 450 | 2.1 | 4.6 | 40 | 40 | 4.0 | 6.6 | 40 | 40 |
| **FBS II 10** | R | 65 | 120 | 450 | 2.9 | 6.0 | 40 | 40 | 6.7 | 8.5 | 40 | 40 |
| **FBS II 10** | R | 85 | 140 | 450 | 7.6 | 18.4 | 40 | 40 | 13.1 | 20.9 | 40 | 40 |
| **FBS II 12** | R | 60 | 110 | 650 | 2.1 | 5.3 | 50 | 50 | 4.8 | 7.5 | 50 | 50 |
| **FBS II 12** | R | 75 | 130 | 650 | 5.2 | 15.2 | 50 | 50 | 5.7 | 21.8 | 50 | 50 |
| **FBS II 12** | R | 100 | 150 | 650 | 12.0 | 23.9 | 50 | 50 | 17.1 | 26.2 | 50 | 50 |

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.
[2] Maximum allowable torque for installation with any tangential impact screw driver. Further technical data see ETA.
[3] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Loads

**Concrete screw UltraCut FBS II US/SK**

Permissible loads[1)2)] for a single anchor in masonry for Push-through installation.
For the design the complete current assessment ETA-20/0134 of 14.07.2022 has to be considered.

| Type | Min. compressive brick strength $f_b$ [N/mm²] | Brick raw density $\rho$ [kg/dm³] | Minimum brick dimensions (L x W x H) [mm] | Nominal anchorage depth $h_{nom}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Maximum Installation torque $T_{imp.\,max}$ [3)] [Nm] | Permissible tensile load[4)] $N_{perm}$ [kN] | Permissible shear load[4)] parallel[6)] $V_{perm\,\parallel}$ [kN] | Minimum spacing[5)] $s_{min\,\parallel}$ / $s_{min\,\perp}$ [mm] | Minimum edge distance[5)] $c_{min}$ [mm] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Solid brick Mz, acc. to EN 771-1** | | | | | | | | | | |
| **FBS II 6** | ≥ 12.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 40 | ≥ 115 | 80 | 0.54 | 0.34 | 80 | 50 |
| **FBS II 6** | ≥ 16.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 40 | ≥ 115 | 80 | 0.60 | 0.40 | 80 | 50 |
| **FBS II 6** | ≥ 17.5 | ≥ 1.8 | 240 x 115 x 71 | ≥ 40 | ≥ 115 | 80 | 0.66 | 0.40 | 80 | 50 |
| **FBS II 8** | ≥ 12.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 50 | ≥ 115 | 80 | 0.46 | 1.37 | 80 | 60 |
| **FBS II 8** | ≥ 16.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 50 | ≥ 115 | 80 | 0.54 | 1.60 | 80 | 60 |
| **FBS II 8** | ≥ 17.5 | ≥ 1.8 | 240 x 115 x 71 | ≥ 50 | ≥ 115 | 80 | 0.57 | 1.66 | 80 | 60 |
| **FBS II 10** | ≥ 12.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 55 | ≥ 115 | 80 | 0.40 | 1.26 | 80 | 70 |
| **FBS II 10** | ≥ 16.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 55 | ≥ 115 | 80 | 0.46 | 1.46 | 80 | 70 |
| **FBS II 10** | ≥ 17.5 | ≥ 1.8 | 240 x 115 x 71 | ≥ 55 | ≥ 115 | 80 | 0.49 | 1.51 | 80 | 70 |
| **Solid brick Mz, nordic, acc. to EN 771-1** | | | | | | | | | | |
| **FBS II 6** | ≥ 16.0 | ≥ 1.8 | 228 x 108 x 54 | ≥ 40 | ≥ 108 | 80 | 0.34 | 0.31 | 80 | 50 |
| **FBS II 6** | ≥ 20.0 | ≥ 1.8 | 228 x 108 x 54 | ≥ 40 | ≥ 108 | 80 | 0.40 | 0.37 | 80 | 50 |
| **FBS II 8** | ≥ 16.0 | ≥ 1.8 | 228 x 108 x 54 | ≥ 50 | ≥ 108 | 80 | 0.46 | 1.34 | 80 | 60 |
| **FBS II 8** | ≥ 20.0 | ≥ 1.8 | 228 x 108 x 54 | ≥ 50 | ≥ 108 | 80 | 0.51 | 1.49 | 80 | 60 |
| **FBS II 10** | ≥ 16.0 | ≥ 1.8 | 228 x 108 x 54 | ≥ 55 | ≥ 108 | 80 | 0.37 | 1.23 | 80 | 70 |
| **FBS II 10** | ≥ 20.0 | ≥ 1.8 | 228 x 108 x 54 | ≥ 55 | ≥ 108 | 80 | 0.43 | 1.37 | 80 | 70 |
| **Solid sand-lime brick KS, acc. to EN 771-2** | | | | | | | | | | |
| **FBS II 6** | ≥ 12.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 40 | ≥ 115 | 80 | 0.43 | 0.51 | 80 | 50 |
| **FBS II 6** | ≥ 16.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 40 | ≥ 115 | 80 | 0.49 | 0.60 | 80 | 50 |
| **FBS II 6** | ≥ 20.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 40 | ≥ 115 | 80 | 0.54 | 0.66 | 80 | 50 |
| **FBS II 8** | ≥ 12.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 50 | ≥ 115 | 80 | 0.54 | 0.66 | 80 | 60 |
| **FBS II 8** | ≥ 16.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 50 | ≥ 115 | 80 | 0.60 | 0.74 | 80 | 60 |
| **FBS II 8** | ≥ 20.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 50 | ≥ 115 | 80 | 0.69 | 0.83 | 80 | 60 |
| **FBS II 10** | ≥ 12.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 55 | ≥ 115 | 80 | 0.54 | 0.89 | 80 | 70 |
| **FBS II 10** | ≥ 16.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 55 | ≥ 115 | 80 | 0.63 | 1.00 | 80 | 70 |
| **FBS II 10** | ≥ 20.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 55 | ≥ 115 | 80 | 0.69 | 1.11 | 80 | 70 |
| **Perforated sand-lime brick KSL, acc. to EN 771-2** | | | | | | | | | | |
| **FBS II 6** | ≥ 10.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 40 | ≥ 175 | 65 | 0.09 | 0.80 | 80 | 50 |
| **FBS II 6** | ≥ 12.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 40 | ≥ 175 | 65 | 0.11 | 0.94 | 80 | 50 |
| **FBS II 6** | ≥ 16.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 40 | ≥ 175 | 65 | 0.14 | 1.17 | 80 | 50 |
| **FBS II 6** | ≥ 17.5 | ≥ 1.4 | 240 x 175 x 113 | ≥ 40 | ≥ 175 | 65 | 0.17 | 1.26 | 80 | 50 |
| **FBS II 8** | ≥ 10.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 50 | ≥ 175 | 65 | 0.26 | 0.66 | 80 | 60 |
| **FBS II 8** | ≥ 12.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 50 | ≥ 175 | 65 | 0.29 | 1.03 | 80 | 60 |
| **FBS II 8** | ≥ 16.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 50 | ≥ 175 | 65 | 0.37 | 1.40 | 80 | 60 |
| **FBS II 8** | ≥ 17.5 | ≥ 1.4 | 240 x 175 x 113 | ≥ 50 | ≥ 175 | 65 | 0.40 | 1.49 | 80 | 60 |
| **FBS II 10** | ≥ 10.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 55 | ≥ 175 | 65 | 0.23 | 0.77 | 80 | 70 |
| **FBS II 10** | ≥ 12.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 55 | ≥ 175 | 65 | 0.26 | 1.23 | 80 | 70 |
| **FBS II 10** | ≥ 16.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 55 | ≥ 175 | 65 | 0.34 | 1.66 | 80 | 70 |
| **FBS II 10** | ≥ 17.5 | ≥ 1.4 | 240 x 175 x 113 | ≥ 55 | ≥ 175 | 65 | 0.37 | 1.77 | 80 | 70 |

1) The partial safety factors for material resistance as regulated in assessment as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered. Load values are valid for zinc-plated steel all sizes and head shapes, for stainless steel R for the sizes 8 and 10. Exakt values see ETA.
2) The given loads are valid for installation and use of fixations in dry masonry, use category d/d, width of the joints $w_j \leq 3$ mm and general purpose mortar with strength class M2.5 -M9. Further information and details on drill hole preparation, etc., see ETA.
3) Maximum allowable device torque for installation with any tangential impact screw driver. Further technical data see ETA.
4) In the case of combinations of tensile and shear loads, bending moments and reduced edge and axial spacings (anchor groups), the design must be carried out in accordance with the provisions of the complete assessment.
5) Minimum feasible spacing resp. edge distance. Details as well as to the distances to joints see assessment.
6) Shear load parallel to the vertical joint. Load reduction for shear load perpendicular to the vertical joint see ETA.

# Loads

## Concrete screw UltraCut FBS II for temporary fastening

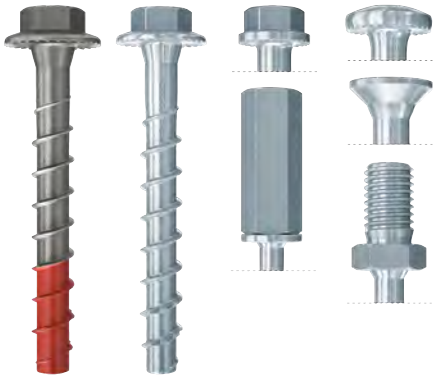
Permissible loads of a single anchor[1] in normal concrete of strength class C20/25 to C50/60.
For the design the complete current assessment Z-21.8-2049 has to be considered.

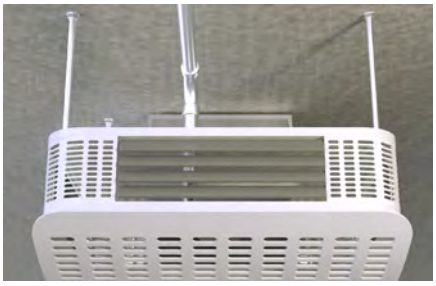
| Type | Material/ surface | Screw-in depth $h_{nom}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Maximum installation torque $T_{imp,\,max}$[2] [Nm] | Minimum spacing ($s_{min}$) and edge distances ($c_{min}$) $s_{min}$ [mm] | $c_{min}$[3] [mm] | Cracked and non-cracked concrete Permissible load $F_{perm}$[4] $f_{c,cube} \geq 10$ N/mm² [kN] | $f_{c,cube} \geq 15$ N/mm² [kN] | $f_{c,cube} \geq 20$ N/mm² [kN] | $f_{c,cube} \geq 25$ N/mm² [kN] |
|---|---|---|---|---|---|---|---|---|---|---|
| **FBS II 8** | gvz | 50 | 100 | 400 | 200 | 65 | 1.9 | 2.3 | 2.6 | 2.9 |
| | gvz | 65 | 150 | 400 | 300 | 100 | 3.6 | 4.4 | 5.1 | 5.6 |
| **FBS II 10** | gvz | 55 | 105 | 400 | 210 | 70 | 2.2 | 2.7 | 3.1 | 3.5 |
| | gvz | 65 | 130 | 400 | 260 | 85 | 2.9 | 3.5 | 4.1 | 4.5 |
| | gvz | 85 | 205 | 650 | 410 | 135 | 5.8 | 7.1 | 8.1 | 9.1 |
| **FBS II 12** | gvz | 60 | 120 | 400 | 240 | 80 | 2.8 | 3.4 | 3.9 | 4.4 |
| | gvz | 75 | 150 | 400 | 300 | 100 | 4.0 | 4.9 | 5.6 | 6.1 |
| | gvz | 100 | 240 | 650 | 480 | 160 | 7.6 | 9.3 | 10.8 | 12.0 |
| **FBS II 14** | gvz | 65 | 115 | 400 | 230 | 75 | 2.3 | 2.8 | 3.2 | 3.6 |
| | gvz | 85 | 150 | 400 | 300 | 100 | 3.6 | 4.4 | 5.0 | 5.6 |
| | gvz | 115 | 255 | 650 | 510 | 170 | 8.9 | 10.9 | 12.6 | 14.0 |

[1] Material safety factor as well as a partial safety factor for load actions of $\gamma_L = 1.4$ is considered. The screw may be used in the concrete member before the characteristic compressive strength $f_{ck,cube}$ is reached. In this case, the concrete compressive strength $f_{c,cube}$ must have reached a value of at least 10 N/mm². Only intended for temporary use and one-time screwing into the same drill hole. Conditions for reuse of the screw see, approval.
[2] Values for impulse wrenches with tangential impact and automatic stop device.
[3] In case of combined action of shear load and installation close to the edge, the edge distance must be ≥ $c_{min}$ x 1.5. Detail see approval.
[4] Values valid for all load directions.

# Concrete screw UltraCut FBS II 6

The high-performance concrete screw for absolute installation ease.





Suspended air-conditioners



Fastenings in outdoor areas with FBS II 6 R



## Applications

- Pipeline routes
- Suspension for individual pipes
- Suspended mounting rails
- Prestressed concrete hollow core ceilings
- Cable trays
- Ventilation ducts
- Perforated tapes
- Air conditioning units

## Advantages

- The European Technical Approval (ETA) Option 1 includes the use in cracked and non-cracked concrete for highest safety requirements.
- The UltraCut FBS II 6 is approved for multiple use of non-load bearing systems and thereby ideal for the installation of pipe routes and prestressed hollow concrete ceilings.
- The FBS II 6 also has an ETA for seismic performance category C1 for additional safety standards.
- The fischer concrete screw FBS II 6 zinc-plated offer the possibility for the ETA compliant application in masonry brick. This grants high security not only in concrete but also in solid clay bricks (ENtt1-1), sand-lime bricks KSL (EN711-2) and solid sand-lime bricks KSV (EN771-2.
- The expansion-free anchorage (undercut) ensures low edge and axial spacings.
- The stainless steel concrete screw guarantees a high level of corrosion resistance especially for wet rooms and external applications.

## Certificates / Features

CE

R 120

**ETA-18/0242, for use in concrete for redundant non-structural systems**
**ETA-20/0134, in masonry**
**ETA-15/0352, for in cracked concrete**
**ETA-17/0740 in cracked concrete**
**ETA-24/0973 for use in concrete for redundant non-structural systems**

Seismic C1

Inox Stainless Steel

## Building materials

**Approved for:**

- Concrete C20/25 to C50/60, cracked and non-cracked
- Prestressed hollow concrete ceilings C30/37 to C50/60 for the multiple use of non-load bearing systems
- Masonry brick (EN771-1), solid sand-lime brick (EN771-2) and perforated sand-lime brick (EN771-2)

**Also suitable for:**

- Concrete C12/15
- Solid building materials
- Masonry with dense structure

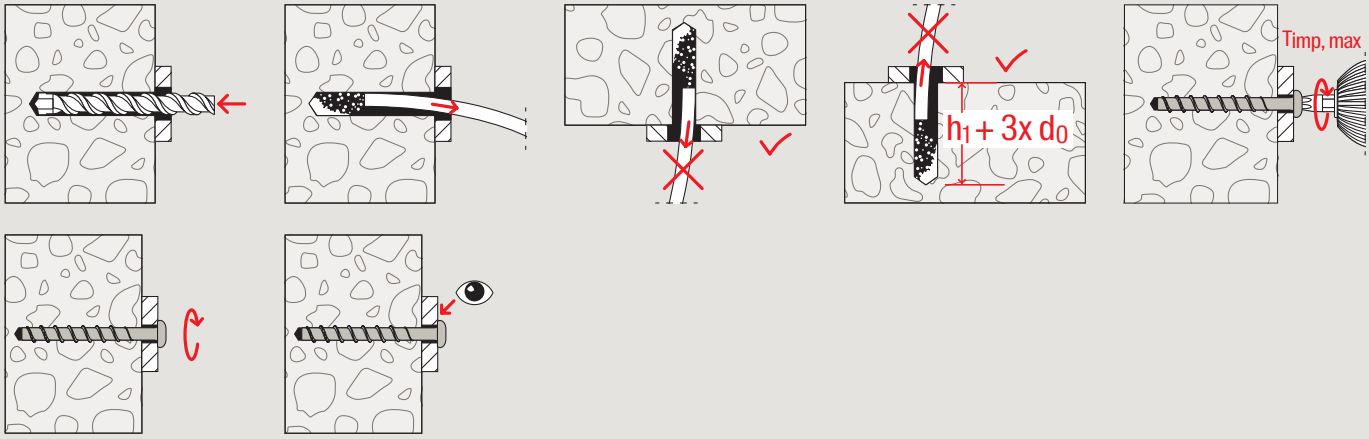
## Versions

- Galvanised steel
- Stainless steel

## Functioning

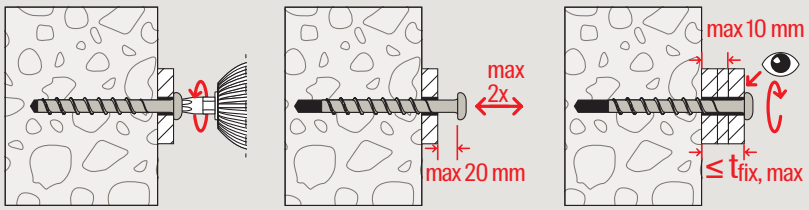
- The UltraCut FBS II is recommended for the push-through / pre-positioned installation.
- Drill holes do not need to be cleaned during vertical installation (ceiling and floor) with the FBS II 6 zinc-plated. For floor fixings the hole must be drilled 3x drill hole diameter deeper.
- The approved adjustment for the concrete screws allows the screw to be unscrewed twice for a total length of 20 mm, to place maximum 10 mm packing below the base plates or to align the attached part, and then to tighten the screw again.
- The screw is installed correctly when the screw head sits flush on the fixture (visual setting control).
- We recommend using a fischer impact wrench FSS 18V with a suitable impact screwdriver socket or an internal torx drive.

## Installation UltraCut FBS II 6 in concrete

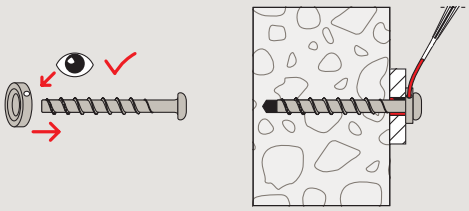



4

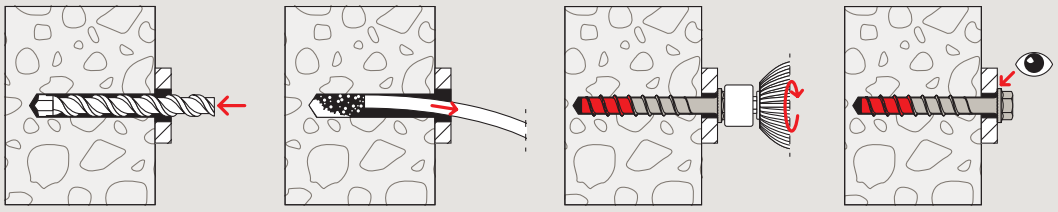
## Fixture adjustment UltraCut FBS II 6



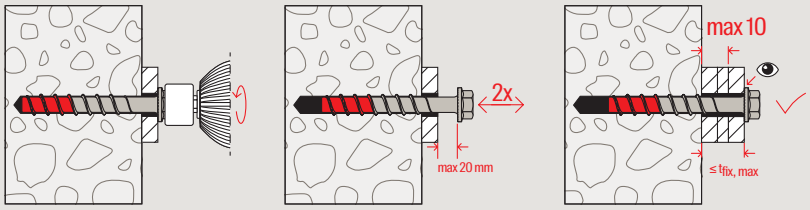

## Additional for seismic applications



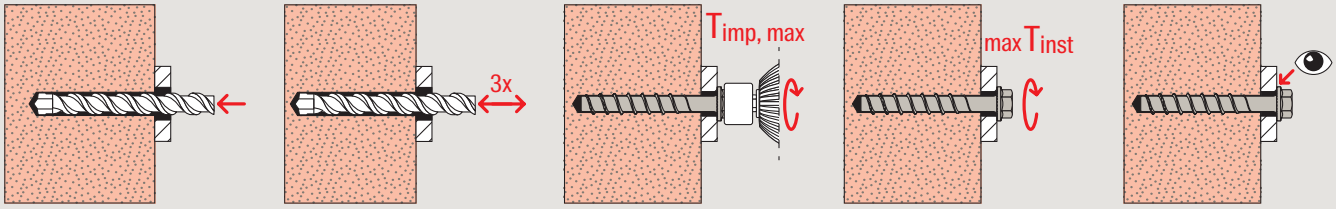
## Installation UltraCut FBS II 6 R in concrete



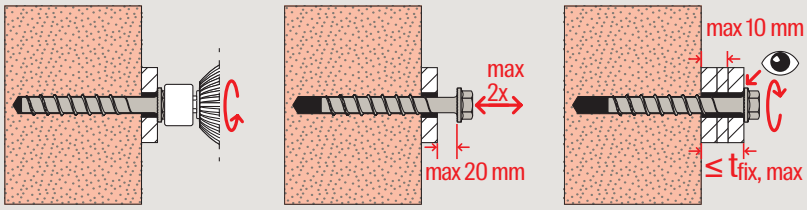
## Fixture adjustment UltraCut FBS II 6 R



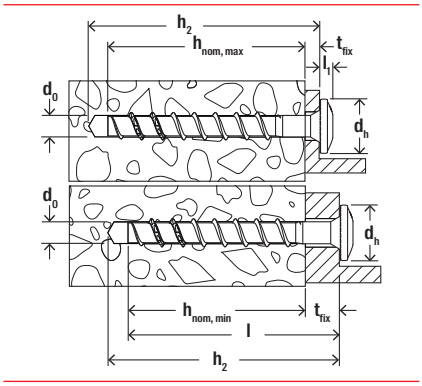
## Installation UltraCut FBS II gvz in masonry




## Fixture adjustment UltraCut FBS II gvz






## Technical data

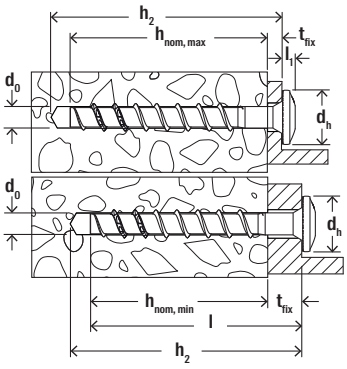
**Concrete screw UltraCut FBS II 6**



UltraCut FBS II 6 P / FBS II 6 LP | UltraCut FBS II 6 SK | UltraCut FBS II 6 US

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Screw length $l_s$ [mm] | Head-ø $d_h$ [mm] | Screw-in depth Multiple fixing ETA $h_{nom,min}$-$h_{nom,max}$ [mm] | Screw-in depth Single point fixing ETA $h_{nom,min}$-$h_{nom,max}$ [mm] | Usable length $t_{fix,min}$ - $t_{fix,max}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **FBS II 6 x 30/5 P** | **546377**[1] | ● | 6 | 40 | 30 | 14.4 | 25 | – | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 40/5 P** | **546378**[1] | ● | 6 | 50 | 40 | 14.4 | 25-35 | – | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 40/5 LP** | **546379**[1] | ● | 6 | 50 | 40 | 17.5 | 25-35 | – | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 60/5 P** | **546380**[2] | ● | 6 | 70 | 60 | 14.4 | 25-55 | 40-55 | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 80/25 P** | **546381**[2] | ● | 6 | 90 | 80 | 14.4 | 25-55 | 40-55 | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 30/5 SK** | **546382**[1] | ● | 6 | 40 | 30 | 13.5 | 25 | – | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 40/5 SK** | **546383**[1] | ● | 6 | 50 | 40 | 13.5 | 25-35 | – | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 60/5 SK** | **546384**[2] | ● | 6 | 70 | 60 | 13.5 | 25-55 | 40-55 | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 80/25 SK** | **546385**[2] | ● | 6 | 90 | 80 | 13.5 | 25-55 | 40-55 | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 100/45 SK** | **546386**[2] | ● | 6 | 110 | 100 | 13.5 | 25-55 | 40-55 | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 120/65 SK** | **546387**[2] | ● | 6 | 130 | 120 | 13.5 | 25-55 | 40-55 | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 140/85 SK** | **546388**[2] | ● | 6 | 150 | 140 | 13.5 | 25-55 | 40-55 | Screw length - $h_{nom}$ | TX30 | 100 |

[1] Values for screw-in depth according to ETA-18/0242 for multiple fixings.
[2] Values for screw-in depth according to ETA-15/0352 for single-point fixings and ETA-18/0242 for multiple fixings.




4

## Technical data

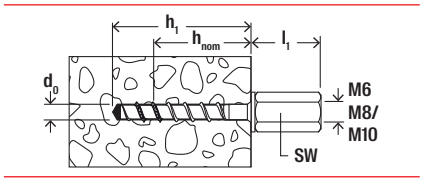
**Concrete screw UltraCut FBS II 6**

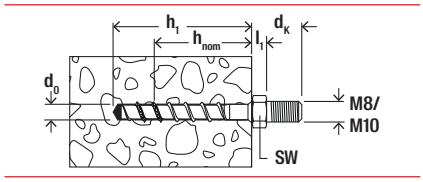


UltraCut FBS II 6 P / FBS II 6 LP | UltraCut FBS II 6 SK | UltraCut FBS II 6 US

| Item | Item no. | Approval | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Screw length $l_s$ [mm] | Head-ø $d_h$ [mm] | Screw-in depth Multiple fixing ETA $h_{nom,min}$-$h_{nom,max}$ [mm] | Screw-in depth Single point fixing ETA $h_{nom,min}$-$h_{nom,max}$ [mm] | Usable length $t_{fix,min}$ - $t_{fix,max}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **FBS II 6 x 160/105 SK** | **546389**[2] | ● | 6 | 170 | 160 | 13.5 | 25-55 | 40-55 | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 40/5 US** | **558601**[1] | ● | 6 | 50 | 40 | 17 | 25-35 | – | Screw length - $h_{nom}$ | SW 13 | 100 |
| **FBS II 6 x 40/5 US** | **546390**[1] | ● | 6 | 50 | 40 | 17 | 25-35 | – | Screw length - $h_{nom}$ | SW 10 | 100 |
| **FBS II 6 x 60/5 US** | **558602**[2] | ● | 6 | 70 | 60 | 17 | 25-55 | 40-55 | Screw length - $h_{nom}$ | SW 13 | 100 |
| **FBS II 6 x 60/5 US** | **546391**[2] | ● | 6 | 70 | 60 | 17 | 25-55 | 40-55 | Screw length - $h_{nom}$ | SW 10 | 100 |
| **FBS II 6 x 80/25 US** | **558603**[2] | ● | 6 | 90 | 80 | 17 | 25-55 | 40-55 | Screw length - $h_{nom}$ | SW 13 | 100 |
| **FBS II 6 x 80/25 US** | **546392**[2] | ● | 6 | 90 | 80 | 17 | 25-55 | 40-55 | Screw length - $h_{nom}$ | SW 10 | 100 |
| **FBS II 6 x 100/45 US** | **558604**[2] | ● | 6 | 110 | 100 | 17 | 25-55 | 40-55 | Screw length - $h_{nom}$ | SW 13 | 100 |
| **FBS II 6 x 100/45 US** | **546393**[2] | ● | 6 | 110 | 100 | 17 | 25-55 | 40-55 | Screw length - $h_{nom}$ | SW 10 | 100 |
| **FBS II 6 x 120/65 US** | **558605** | ● | 6 | 130 | 120 | 17 | 25 - 55 | 40 - 55 | Screw length - $h_{nom}$ | SW 13 | 100 |
| **FBS II 6 x 120/65 US** | **546394** | ● | 6 | 130 | 120 | 17 | 25 - 55 | 40 - 55 | Screw length - $h_{nom}$ | SW 10 | 100 |

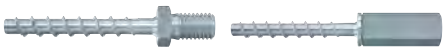
[1] Values for screw-in depth according to ETA-18/0242 for multiple fixings.
[2] Values for screw-in depth according to ETA-15/0352 for single-point fixings and ETA-18/0242 for multiple fixings.




## Technical data

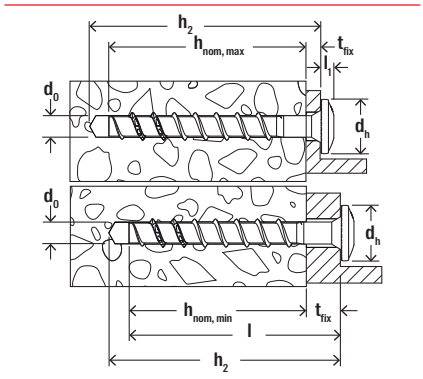
**Concrete screw UltraCut FBS II 6 M8/M10**



UltraCut FBS II M8/M10 UltraCut FBS II M6

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth for pre-positioned installation $h_1$ [mm] | Screw diameter $d_s$ [mm] | Screw length $l_s$ [mm] | Screw-in depth Multiple fixing ETA $h_{nom,min}$-$h_{nom,max}$ [mm] | Screw-in depth Single point fixing ETA $h_{nom,min}$-$h_{nom,max}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| **FBS II 6 x 25 M8/19** | **546395**[1] | ● | 6 | 35 | 6.0 | 25 | 25 | – | SW 10 | 100 |
| **FBS II 6 x 35 M8/19** | **546396**[1] | ● | 6 | 45 | 6.0 | 35 | 35 | – | SW 10 | 100 |
| **FBS II 6 x 55 M8/19** | **546397**[2] | ● | 6 | 65 | 6.0 | 55 | 55 | 55 | SW 10 | 100 |
| **FBS II 6 x 35 M10/21** | **546398**[1] | ● | 6 | 45 | 6.0 | 35 | 35 | – | SW 13 | 100 |
| **FBS II 6 x 55 M10/21** | **546399**[2] | ● | 6 | 65 | 6.0 | 55 | 55 | 55 | SW 13 | 100 |
| **FBS II 6x35 M6 I** | **554065**[1] | ● | 6 | 45 | 6.0 | 35 | 35 | – | SW 13 | 100 |
| **FBS II 6x55 M6 I** | **554066**[2] | ● | 6 | 65 | 6.0 | 55 | 55 | 55 | SW 13 | 100 |
| **FBS II 6 x 35 M8/M10 I** | **546400**[1] | ● | 6 | 45 | 6.0 | 35 | 35 | – | SW 13 | 100 |
| **FBS II 6 x 55 M8/M10 I** | **546401**[2] | ● | 6 | 65 | 6.0 | 55 | 55 | 55 | SW 13 | 100 |

[1] Values for screw-in depth according to ETA-18/0242 for multiple fixings.
[2] Values for screw-in depth according to ETA-15/0352 for single-point fixings and ETA-18/0242 for multiple fixings.




## Technical data

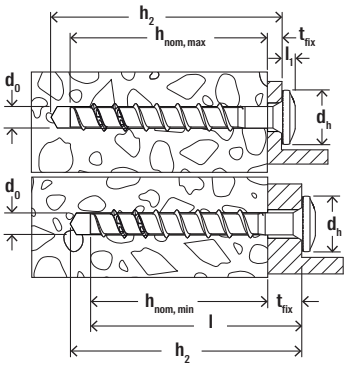
**Concrete screw UltraCut FBS II 6 R**



UltraCut FBS II P R UltraCut FBS II SK R UltraCut FBS II US R

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Screw length $l_s$ [mm] | Head-ø $d_h$ [mm] | Screw-in depth Multiple fixing ETA $h_{nom,min}$-$h_{nom,max}$ [mm] | Screw-in depth Single point fixing ETA $h_{nom,min}$-$h_{nom,max}$ [mm] | Usable length $t_{fix,min}$ - $t_{fix,max}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| **FBS II 6 x 50/5 P R** | **573429**[1] | ● | 6 | 50 | 14 | 45 | – | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 65/5 P R** | **573430**[2] | ● | 6 | 65 | 14 | 45 / 60 | 60 | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 85/25 P R** | **573431**[2] | ● | 6 | 85 | 14 | 45 / 60 | 60 | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 105/45 P R** | **573432**[2] | ● | 6 | 105 | 14 | – | 60 | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 50/5 SK R** | **573420**[1] | ● | 6 | 50 | 13.25 | 45 | – | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 65/5 SK R** | **573421**[2] | ● | 6 | 65 | 13.25 | 45 / 60 | 60 | Screw length - $h_{nom}$ | TX30 | 100 |
| **FBS II 6 x 85/5 SK R** | **573422**[2] | ● | 6 | 85 | 13.25 | 45 / 60 | 60 | Screw length - $h_{nom}$ | TX30 | 100 |

[1] Values for screw-in depth in accordance with ETA-24/0973 for multiple fixings.
[2] Values for screw-in depth in accordance with ETA-17/0740 for single-point fixings and ETA-24/0973 for multiple fixings.




4

## Technical data

**Concrete screw UltraCut FBS II 6 R**



UltraCut FBS II P R | UltraCut FBS II SK R | UltraCut FBS II US R

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Screw length $l_s$ [mm] | Head-ø $d_h$ [mm] | Screw-in depth Multiple fixing ETA $h_{nom,min}$-$h_{nom,max}$ [mm] | Screw-in depth Single point fixing ETA $h_{nom,min}$-$h_{nom,max}$ [mm] | Usable length $t_{fix,min}$ - $t_{fix,max}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| **FBS II 6 x 50/5 US R** | **573423**[1] | ● | 6 | 50 | 17 | 45 | – | Screw length - $h_{nom}$ | SW 10 | 100 |
| **FBS II 6 x 50/5 US R** | **573426**[1] | ● | 6 | 50 | 17 | 45 | – | Screw length - $h_{nom}$ | SW 13 | 100 |
| **FBS II 6 x 65/5 US R** | **573424**[2] | ● | 6 | 65 | 15 | 45 / 60 | 60 | Screw length - $h_{nom}$ | SW 10 | 100 |
| **FBS II 6 x 65/5 US R** | **573427**[2] | ● | 6 | 65 | 17 | 45 / 60 | 60 | Screw length - $h_{nom}$ | SW 13 | 100 |
| **FBS II 6 x 85/25 US R** | **573425**[2] | ● | 6 | 85 | 15 | 45 / 60 | 60 | Screw length - $h_{nom}$ | SW 10 | 100 |
| **FBS II 6 x 85/25 US R** | **573428**[2] | ● | 6 | 85 | 17 | 45 / 60 | 60 | Screw length - $h_{nom}$ | SW 13 | 100 |

[1] Values for screw-in depth in accordance with ETA-24/0973 for multiple fixings.
[2] Values for screw-in depth in accordance with ETA-17/0740 for single-point fixings and ETA-24/0973 for multiple fixings.

## Loads

**Concrete screw UltraCut FBS II 6**

Permissible loads of a single anchor[1] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-15/0352 has to be considered.

| Type | Material/ surface | Screw-in depth $h_{nom}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Maximum installation torque $T_{imp,max}$[2] [Nm] | Cracked concrete: Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Non-cracked concrete: Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] |
| **FBS II 6** | gvz | 40 | 80 | 450 | 1.2 | 4.3 | 35 | 35 | 3.8 | 4.3 | 35 | 35 |
| | gvz | 45 | 90 | 450 | 1.7 | 4.3 | 35 | 35 | 4.8 | 4.3 | 35 | 35 |
| | gvz | 50 | 90 | 450 | 1.9 | 4.3 | 35 | 35 | 5.7 | 4.3 | 35 | 35 |
| | gvz | 55 | 100 | 450 | 2.4 | 6.3 | 35 | 35 | 6.4 | 6.3 | 35 | 35 |

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered. As a single anchor counts e.g. an anchor with a spacing s ≥ 3 x $h_{ef}$ and an edge distance c ≥ 1.5 x $h_{ef}$. Accurate data see ETA.
[2] Maximum allowable torque for installation with any tangential impact screw driver. Further technical data see ETA.
[3] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

## Loads

**Concrete screw UltraCut FBS II 6**

Permissible loads for a single anchor[1] for multiple use of redundant non-structural applications* in normal concrete C20/25.
For the design the complete current assessment ETA - 18/0242 has to be considered.

| | | | | | Cracked concrete | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material/ surface | Screw-in depth | Minimum member thickness | Maximum installation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{nom}$ [mm] | $h_{min}$ [mm] | $T_{inst,max}$ [2] [Nm] | $N_{perm}$ [3] [kN] | $V_{perm}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] | $N_{perm}$ [3] [kN] | $V_{perm}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] |
| **FBS II 6** | gvz | 25 | 80 | ≤ 5 | 0.7 | 1.8 | 35 | 35 | 1.4 | 2.3 | 35 | 35 |
| | gvz | 30 | 80 | ≤ 5 | 1.2 | 2.3 | 35 | 35 | 2.4 | 2.3 | 35 | 35 |
| | gvz | 35 | 80 | ≤ 5 | 1.7 | 4.3 | 35 | 35 | 3.1 | 4.3 | 35 | 35 |
| | gvz | 40 | 80 | ≤ 10 | 2.4 | 4.3 | 35 | 35 | 3.8 | 4.3 | 35 | 35 |
| | gvz | 45 | 90 | ≤ 10 | 2.9 | 4.3 | 35 | 35 | 4.8 | 4.3 | 35 | 35 |
| | gvz | 50 | 90 | ≤ 10 | 3.6 | 4.3 | 35 | 35 | 5.7 | 4.3 | 35 | 35 |
| | gvz | 55 | 100 | ≤ 10 | 4.0 | 6.3 | 35 | 35 | 6.4 | 6.3 | 35 | 35 |

* In addition to the load table above, the following must be considered for multiple fastening of non-structural redundant systems:
A multiple fixing (redundant system) according to EN 1992-4 and CEN/TR 17079 is defined by
- at least 3 fixing points (per attached element) with at least one anchor at each fixing point and a permissible load per fixing point of 1.4 kN
- or by at least 4 fixing points with at least one anchor each fixing point and a permissible load per fixing point of 2.1 kN
- Additionally, it has to be proven that the stiffness of the attached element shall be large enough to ensure that in case of excessive slip or failure of a fastener the load on this fastener or fixing point can be transferred to neighbouring fixing points without significantly violating the requirements on the attached element in the serviceability and ultimate limit state.

For further details see EN 1992-4 section 7.3 and CEN/TR 17079.

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered.
[2] Further technical information for installation see ETA.
[3] In the case of combinations of tension and shear loads, bending moments with reduced or minimal edge and axial spacings (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018.

## Loads

**Concrete screw UltraCut FBS II 6**

Permissible loads for a single anchor[1] for multiple use of redundant non-structural applications* in pre-stressed hollow-core concrete slabs of concrete strength C30/37.
For the design the complete current assessment ETA - 18/0242 has to be considered.

| Type | | | FBS II 6 gvz | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Screw-in depth | | $h_{nom}$ | 25 | 30 | 35 | 40 | 45 | 50 | 55 |
| **Permissible load $F_{perm}$ [3] in the respective bottom flange thickness** | | | | | | | | | |
| $d_b \geq 25$ mm | | [kN] | 0.2 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| $d_b \geq 30$ mm | | [kN] | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 |
| $d_b \geq 35$ mm | | [kN] | 1.7 | 1.9 | 2.1 | 2.4 | 2.6 | 2.9 | 3.1 |
| $d_b \geq 40$ mm | | [kN] | 1.7 | 2.3 | 2.6 | 2.9 | 3.3 | 3.6 | 3.8 |
| $d_b \geq 50$ mm | | [kN] | 1.7 | 2.3 | 3.3 | 3.8 | 4.3 | 4.3 | 5.7 |
| Installation torque | $T_{inst,max}$ | [Nm] | 5.0 | 5.0 | 10 | 10 | 10 | 10 | 10 |
| Minimum spacing | $s_{i,s2}$ [2] | [mm] | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Minimum edge distance | $c_{1,c2}$ [2] | [mm] | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

* In addition to the load table above, the following must be considered for multiple fastening of non-structural redundant systems:
A multiple fixing (redundant system) according to EN 1992-4 and CEN/TR 17079 is defined by
- at least 3 fixing points (per attached element) with at least one anchor at each fixing point and a permissible load per fixing point of 1.4 kN
- or by at least 4 fixing points with at least one anchor each fixing point and a permissible load per fixing point of 2.1 kN
- Additionally, it has to be proven that the stiffness of the attached element shall be large enough to ensure that in case of excessive slip or failure of a fastener the load on this fastener or fixing point can be transferred to neighbouring fixing points without significantly violating the requirements on the attached element in the serviceability and ultimate limit state.

For further details see EN 1992-4 section 7.3 and CEN/TR 17079.

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered.
[2] Further technical information for installation see ETA.
[3] Valid for tensile load, shear load and oblique load under any angle. In the case of combinations of tensile, shear loads and bending moments, the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018.

# Loads

**Concrete screw UltraCut FBS II US/SK**

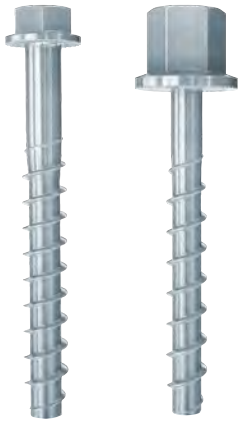
Permissible loads[1)2)] for a single anchor in masonry for Push-through installation.
For the design the complete current assessment ETA-20/0134 of 14.07.2022 has to be considered.

| Type | Min. compressive brick strength $f_b$ [N/mm²] | Brick raw density ρ [kg/dm³] | Minimum brick dimensions (L x W x H) [mm] | Nominal anchorage depth $h_{nom}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Maximum Installation torque $T_{imp.\,max}$[3)] [Nm] | Permissible tensile load[4)] $N_{perm}$ [kN] | Permissible shear load[4)] parallel[6)] $V_{perm\,\parallel}$ [kN] | Minimum spacing[5)] $s_{min\,\parallel}$ / $s_{min\,\perp}$ [mm] | Minimum edge distance[5)] $c_{min}$ [mm] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Solid brick Mz, acc. to EN 771-1** | | | | | | | | | | |
| **FBS II 6** | ≥ 12.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 40 | ≥ 115 | 80 | 0.54 | 0.34 | 80 | 50 |
| **FBS II 6** | ≥ 16.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 40 | ≥ 115 | 80 | 0.60 | 0.40 | 80 | 50 |
| **FBS II 6** | ≥ 17.5 | ≥ 1.8 | 240 x 115 x 71 | ≥ 40 | ≥ 115 | 80 | 0.66 | 0.40 | 80 | 50 |
| **FBS II 8** | ≥ 12.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 50 | ≥ 115 | 80 | 0.46 | 1.37 | 80 | 60 |
| **FBS II 8** | ≥ 16.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 50 | ≥ 115 | 80 | 0.54 | 1.60 | 80 | 60 |
| **FBS II 8** | ≥ 17.5 | ≥ 1.8 | 240 x 115 x 71 | ≥ 50 | ≥ 115 | 80 | 0.57 | 1.66 | 80 | 60 |
| **FBS II 10** | ≥ 12.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 55 | ≥ 115 | 80 | 0.40 | 1.26 | 80 | 70 |
| **FBS II 10** | ≥ 16.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 55 | ≥ 115 | 80 | 0.46 | 1.46 | 80 | 70 |
| **FBS II 10** | ≥ 17.5 | ≥ 1.8 | 240 x 115 x 71 | ≥ 55 | ≥ 115 | 80 | 0.49 | 1.51 | 80 | 70 |
| **Solid brick Mz, nordic, acc. to EN 771-1** | | | | | | | | | | |
| **FBS II 6** | ≥ 16.0 | ≥ 1.8 | 228 x 108 x 54 | ≥ 40 | ≥ 108 | 80 | 0.34 | 0.31 | 80 | 50 |
| **FBS II 6** | ≥ 20.0 | ≥ 1.8 | 228 x 108 x 54 | ≥ 40 | ≥ 108 | 80 | 0.40 | 0.37 | 80 | 50 |
| **FBS II 8** | ≥ 16.0 | ≥ 1.8 | 228 x 108 x 54 | ≥ 50 | ≥ 108 | 80 | 0.46 | 1.34 | 80 | 60 |
| **FBS II 8** | ≥ 20.0 | ≥ 1.8 | 228 x 108 x 54 | ≥ 50 | ≥ 108 | 80 | 0.51 | 1.49 | 80 | 60 |
| **FBS II 10** | ≥ 16.0 | ≥ 1.8 | 228 x 108 x 54 | ≥ 55 | ≥ 108 | 80 | 0.37 | 1.23 | 80 | 70 |
| **FBS II 10** | ≥ 20.0 | ≥ 1.8 | 228 x 108 x 54 | ≥ 55 | ≥ 108 | 80 | 0.43 | 1.37 | 80 | 70 |
| **Solid sand-lime brick KS, acc. to EN 771-2** | | | | | | | | | | |
| **FBS II 6** | ≥ 12.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 40 | ≥ 115 | 80 | 0.43 | 0.51 | 80 | 50 |
| **FBS II 6** | ≥ 16.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 40 | ≥ 115 | 80 | 0.49 | 0.60 | 80 | 50 |
| **FBS II 6** | ≥ 20.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 40 | ≥ 115 | 80 | 0.54 | 0.66 | 80 | 50 |
| **FBS II 8** | ≥ 12.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 50 | ≥ 115 | 80 | 0.54 | 0.66 | 80 | 60 |
| **FBS II 8** | ≥ 16.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 50 | ≥ 115 | 80 | 0.60 | 0.74 | 80 | 60 |
| **FBS II 8** | ≥ 20.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 50 | ≥ 115 | 80 | 0.69 | 0.83 | 80 | 60 |
| **FBS II 10** | ≥ 12.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 55 | ≥ 115 | 80 | 0.54 | 0.89 | 80 | 70 |
| **FBS II 10** | ≥ 16.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 55 | ≥ 115 | 80 | 0.63 | 1.00 | 80 | 70 |
| **FBS II 10** | ≥ 20.0 | ≥ 1.8 | 240 x 115 x 71 | ≥ 55 | ≥ 115 | 80 | 0.69 | 1.11 | 80 | 70 |
| **Perforated sand-lime brick KSL, acc. to EN 771-2** | | | | | | | | | | |
| **FBS II 6** | ≥ 10.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 40 | ≥ 175 | 65 | 0.09 | 0.80 | 80 | 50 |
| **FBS II 6** | ≥ 12.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 40 | ≥ 175 | 65 | 0.11 | 0.94 | 80 | 50 |
| **FBS II 6** | ≥ 16.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 40 | ≥ 175 | 65 | 0.14 | 1.17 | 80 | 50 |
| **FBS II 6** | ≥ 17.5 | ≥ 1.4 | 240 x 175 x 113 | ≥ 40 | ≥ 175 | 65 | 0.17 | 1.26 | 80 | 50 |
| **FBS II 8** | ≥ 10.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 50 | ≥ 175 | 65 | 0.26 | 0.66 | 80 | 60 |
| **FBS II 8** | ≥ 12.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 50 | ≥ 175 | 65 | 0.29 | 1.03 | 80 | 60 |
| **FBS II 8** | ≥ 16.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 50 | ≥ 175 | 65 | 0.37 | 1.40 | 80 | 60 |
| **FBS II 8** | ≥ 17.5 | ≥ 1.4 | 240 x 175 x 113 | ≥ 50 | ≥ 175 | 65 | 0.40 | 1.49 | 80 | 60 |
| **FBS II 10** | ≥ 10.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 55 | ≥ 175 | 65 | 0.23 | 0.77 | 80 | 70 |
| **FBS II 10** | ≥ 12.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 55 | ≥ 175 | 65 | 0.26 | 1.23 | 80 | 70 |
| **FBS II 10** | ≥ 16.0 | ≥ 1.4 | 240 x 175 x 113 | ≥ 55 | ≥ 175 | 65 | 0.34 | 1.66 | 80 | 70 |
| **FBS II 10** | ≥ 17.5 | ≥ 1.4 | 240 x 175 x 113 | ≥ 55 | ≥ 175 | 65 | 0.37 | 1.77 | 80 | 70 |

1) The partial safety factors for material resistance as regulated in assessment as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered. Load values are valid for zinc-plated steel all sizes and head shapes, for stainless steel R for the sizes 8 and 10. Exakt values see ETA.
2) The given loads are valid for installation and use of fixations in dry masonry, use category d/d, width of the joints $w_j \leq 3$ mm and general purpose mortar with strength class M2.5 -M9. Further information and details on drill hole preparation, etc., see ETA.
3) Maximum allowable device torque for installation with any tangential impact screw driver. Further technical data see ETA.
4) In the case of combinations of tensile and shear loads, bending moments and reduced edge and axial spacings (anchor groups), the design must be carried out in accordance with the provisions of the complete assessment.
5) Minimum feasible spacing resp. edge distance. Details as well as to the distances to joints see assessment.
6) Shear load parallel to the vertical joint. Load reduction for shear load perpendicular to the vertical joint see ETA.

# Concrete screw FBS IN

The powerful inch concrete screw for a fast and simple installation.





High-bay warehouses



Steel girders



## Applications

- Guard rails
- Consoles/Base plates
- Metal profiles
- Shelving systems
- Beam anchorage steel

## Advantages

- The special thread geometry enables fast cutting into the concrete and allow higher loads.
- The expansion-free anchorage (undercut) ensures low edge and axial clearances.
- The ribs under the head prevent accidental loosening of the concrete screw and making the system more secure.
- The hexagonal head for a visually aesthetic installation.

## Certificates / Features

ICC ES ESR-5456 See ICC-ES Evaluation Report at www.icc-es.org

## Building materials

- Concrete from 2.500psi until 8.000psi, non-cracked

## Versions

- Galvanised steel

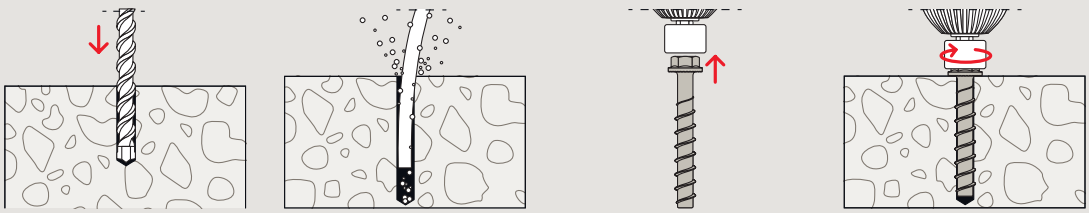
## Functioning

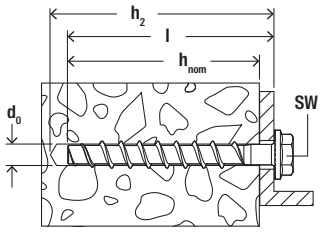
- The concrete screw FBS IN is suitable for push-through installation.
- If the screw head is in contact with the fixture, the correct installation of the screw is ensured (visual setting check).

## Installation steps exemplary for FBS IN I at the ceiling



## Installation steps exemplary for FBS IN HW at the floor






## Technical data

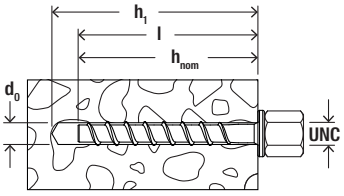
4

**Concrete screw FBS IN HW**



FBS IN HW

| | Item no. | Approval ICC | Drill diameter $d_0$ [in] | Min. drill hole depth for through fixings $h_2$ [in] | Anchor length l [in] | Screw-in depth $h_{nom}$ [in] | Max. usable length $t_{fix}$ [in] | Through hole $d_f$ [in] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | | | |
| **FBS IN 3/8x2-1/8 HW** | **574032** | ● | 3/8 | 2 1/4 | 2 1/8 | 1 5/8 | 1/2 | 1/2 | 50 |
| **FBS IN 3/8x3 HW** | **574033** | ● | 3/8 | 3 | 3 | 2 1/2 | 1/2 | 1/2 | 50 |
| **FBS IN 1/2x4 HW** | **574034** | ● | 1/2 | 3 1/2 | 4 | 3 | 1 | 5/8 | 25 |
| **FBS IN 1/2x6 HW** | **574035** | ● | 1/2 | 4 3/4 | 6 | 4 1/4 | 1 3/4 | 5/8 | 25 |
| **FBS IN 5/8x4 HW** | **574036** | ● | 5/8 | 3 3/4 | 4 | 3 1/4 | 3/4 | 3/4 | 15 |
| **FBS IN 3/4x5-1/2 HW** | **574037** | ● | 3/4 | 6 | 5 1/2 | 4 | 1 1/2 | 7/8 | 10 |
| **FBS IN 3/4x7 HW** | **574038** | ● | 3/4 | 7 1/2 | 7 | 6 1/4 | 3/4 | 7/8 | 10 |




## Technical data

**Concrete screw FBS IN I**



FBS IN I

| | Item no. | Approval ICC | Drill diameter $d_0$ [in] | Min. drill hole depth for pre-positioned installation $h_1$ [in] | Anchor length l [in] | Screw-in depth $h_{nom}$ [in] | Through hole $d_f$ [in] | Connection thread UNC [in] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | | | |
| **FBS IN 1/4 X 1-5/8 I 3/8** | **574028** | ● | 1/4 | 2 1/8 | 2 1/2 | 1 5/8 | 3/8 | 3/8 | 100 |
| **FBS IN 1/4 X 2-1/2 I 3/8** | **574029** | ● | 1/4 | 2 5/8 | 2 1/2 | 2 1/2 | 3/8 | 3/8 | 100 |
| **FBS IN 1/4 X 1-5/8 I 1/4** | **574030** | ● | 1/4 | 2 1/8 | 1 5/8 | 1 5/8 | 3/8 | 1/4 | 100 |
| **FBS IN 1/4 X 2-1/2 I 1/4** | **574031** | ● | 1/4 | 2 5/8 | 2 1/2 | 2 1/2 | 3/8 | 1/4 | 100 |

# Loads

**Ultimate strength of single anchors with large spacing and large edge distance**

**Mean values**[1]

| FBS IN HW (zp) (carbon steel, zinc-plated) | | | | Ø3/8 " | | Ø1/2 " | | | Ø5/8 " | Ø3/4 " | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nominal embedment depth | | $h_{nom}$ | [in] | 1 5/8 " | 2 1/2 " | 2 1/4 " | 3 " | 4 1/4 " | 3 1/4 " | 4 " | 5 1/2 " | 6 1/4 " |
| Effective embedment depth | | $h_{ef}$ | [in] | 1.21 | 1.98 | 1.66 | 2.30 | 3.37 | 2.54 | 3.14 | 4.41 | 5.05 |
| Uncracked concrete | | | | | | | | | | | | |
| Tension | 2,500 psi | $\bar{N}_u$ | [lb] | 1,594 | 3,417 | 3,411 | 4,703 | 8,554 | 6,457 | 8,875 | 14,771 | 18,101 |
| | 8,000 psi | $\bar{N}_u$ | [lb] | 2,852 | 6,113 | 6,102 | 8,413 | 15,302 | 11,550 | 15,876 | 26,424 | 32,380 |
| Shear | ≥ 2,500 psi | $\bar{V}_u$ | [lb] | 2,123 | *3,150* | 3,411 | 5,564 | *6,745* | *10,115* | *15,060* | *15,060* | *15,060* |
| Cracked concrete | | | | | | | | | | | | |
| Tension | 2,500 psi | $\bar{N}_u$ | [lb] | 823 | 2,006 | 1,543 | 3,189 | 5,937 | 3,571 | 5,034 | 8,377 | 10,046 |
| | 8,000 psi | $\bar{N}_u$ | [lb] | 1,472 | 3,588 | 2,760 | 5,704 | 10,621 | 5,687 | 9,006 | 14,985 | 17,970 |
| Shear | ≥ 2,500 psi | $\bar{V}_u$ | [lb] | 1,531 | *3,150* | 2,460 | 4,011 | *6,745* | 9,311 | 13,354 | *15,060* | *15,060* |

**Ultimate strength of single anchors with large spacing and large edge distance**

**Mean values**[1)2)]

| FBS IN I (zp) (carbon steel, zinc-plated) | | | | Ø1/4 " | |
|---|---|---|---|---|---|
| Nominal embedment depth | | $h_{nom}$ | [in] | 1 5/8 " | 2 1/2 " |
| Effective embedment depth | | $h_{ef}$ | [in] | 1.24 | 2.01 |
| Uncracked concrete | | | | | |
| Tension | 2,500 psi | $\bar{N}_u$ | [lb] | 2,202 | 4,545 |
| | 8,000 psi | $\bar{N}_u$ | [lb] | 3,940 | *4,585* |
| Shear | ≥ 2,500 psi | $\bar{V}_u$ | [lb] | *1,350* | *1,350* |
| Cracked concrete | | | | | |
| Tension | 2,500 psi | $\bar{N}_u$ | [lb] | 691 | 1,234 |
| | 8,000 psi | $\bar{N}_u$ | [lb] | 1,101 | 1,966 |
| Shear | ≥ 2,500 psi | $\bar{V}_u$ | [lb] | *1,350* | *1,350* |

[1)] Above values base on fischer ENSO specification and apply for following requirements:
- Concrete strength based on ACI 318-19
- Steel failure decisive = *Figures in italics*

[2)] Above values for FBS IN I (Hex coupler) do not consider the steel insert element used and resulting values might be lower depending on the steel grade of the used steel insert element.

## Loads

**Design strength of single anchors with large spacing and large edge distance**

**Design values**[1]

| FBS IN HW (zp) (carbon steel, zinc-plated) | | | | Ø3/8 " | | Ø1/2 " | | | Ø5/8 " | Ø3/4 " | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nominal embedment depth | | $h_{nom}$ | [in] | 1 5/8 " | 2 1/2 " | 2 1/4 " | 3 " | 4 1/4 " | 3 1/4 " | 4 " | 5 1/2 " | 6 1/4 " |
| Effective embedment depth | | $h_{ef}$ | [in] | 1.21 | 1.98 | 1.66 | 2.30 | 3.37 | 2.54 | 3.14 | 4.41 | 5.05 |
| Uncracked concrete | | | | | | | | | | | | |
| Tension | 2,500 psi | $\phi N_n$ | [lb] | 907 | 1,944 | 1,412 | 2,263 | 4,083 | 3,158 | 4,131 | 6,112 | 7,490 |
| | 8,000 psi | $\phi N_n$ | [lb] | 1,622 | 3,477 | 2,525 | 4,049 | 7,304 | 5,648 | 7,390 | 10,934 | 13,398 |
| Shear | ≥ 2,500 psi | $\phi V_n$ | [lb] | 1,118 | 1,890 | 1,797 | 2,930 | 4,047 | 6,069 | 9,036 | 9,036 | 9,036 |
| Cracked concrete | | | | | | | | | | | | |
| Tension | 2,500 psi | $\phi N_n$ | [lb] | 468 | 1,141 | 743 | 1,535 | 2,857 | 2,031 | 2,423 | 4,032 | 4,835 |
| | 8,000 psi | $\phi N_n$ | [lb] | 837 | 2,041 | 1,328 | 2,745 | 5,111 | 3,235 | 4,334 | 7,212 | 8,648 |
| Shear | ≥ 2,500 psi | $\phi V_n$ | [lb] | 792 | 1,658 | 1,273 | 2,075 | 4,047 | 4,817 | 9,036 | 9,036 | 9,036 |

**Design strength of single anchors with large spacing and large edge distance**

**Design values**[1)2)]

| FBS IN I (zp) (carbon steel, zinc-plated) | | | | Ø1/4 " | |
|---|---|---|---|---|---|
| Nominal embedment depth | | $h_{nom}$ | [in] | 1 5/8 " | 2 1/2 " |
| Effective embedment depth | | $h_{ef}$ | [in] | 1.24 | 2.01 |
| Uncracked concrete | | | | | |
| Tension | 2,500 psi | $\phi N_n$ | [lb] | 746 | 1,881 |
| | 8,000 psi | $\phi N_n$ | [lb] | 1,334 | 2,980 |
| Shear | ≥ 2,500 psi | $\phi V_n$ | [lb] | 810 | 810 |
| Cracked concrete | | | | | |
| Tension | 2,500 psi | $\phi N_n$ | [lb] | 272 | 594 |
| | 8,000 psi | $\phi N_n$ | [lb] | 434 | 946 |
| Shear | ≥ 2,500 psi | $\phi V_n$ | [lb] | 810 | 810 |

[1)] Above values base on ESR-5456 and ACI 318-19 and apply for following requirements.
[2)] Above values for FBS IN I (Hex coupler) do not consider the steel insert element used and resulting values might be lower depending on the steel grade of the used steel insert element.

# Loads

**Allowable loads of single anchors with large spacing and large edge distance**

**Allowable values**[1)]

| FBS IN HW (zp) (carbon steel, zinc-plated) | | | | Ø3/8 " | | Ø1/2 " | | | Ø5/8 " | Ø3/4 " | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nominal embedment depth | | $h_{nom}$ | [in] | 1 5/8 " | 2 1/2 " | 2 1/4 " | 3 " | 4 1/4 " | 3 1/4 " | 4 " | 5 1/2 " | 6 1/4 " |
| Effective embedment depth | | $h_{ef}$ | [in] | 1.21 | 1.98 | 1.66 | 2.30 | 3.37 | 2.54 | 3.14 | 4.41 | 5.05 |
| Uncracked concrete | | | | | | | | | | | | |
| Tension | 2,500 psi | $N_{allow}$ | [lb] | 613 | 1,313 | 954 | 1,529 | 2,759 | 2,133 | 2,791 | 4,130 | 5,061 |
| | 8,000 psi | $N_{allow}$ | [lb] | 1,096 | 2,349 | 1,706 | 2,736 | 4,935 | 3,816 | 4,993 | 7,388 | 9,053 |
| Shear | ≥ 2,500 psi | $V_{allow}$ | [lb] | 755 | 1,277 | 1,214 | 1,980 | 2,734 | 4,101 | 6,105 | 6,105 | 6,105 |
| Cracked concrete | | | | | | | | | | | | |
| Tension | 2,500 psi | $N_{allow}$ | [lb] | 316 | 771 | 502 | 1,037 | 1,931 | 1,372 | 1,637 | 2,724 | 3,267 |
| | 8,000 psi | $N_{allow}$ | [lb] | 566 | 1,379 | 897 | 1,855 | 3,454 | 2,186 | 2,928 | 4,873 | 5,843 |
| Shear | ≥ 2,500 psi | $V_{allow}$ | [lb] | 535 | 1,120 | 860 | 1,402 | 2,734 | 3,255 | 6,105 | 6,105 | 6,105 |

**Allowable loads of single anchors with large spacing and large edge distance**

**Allowable values**[1)2)]

| FBS IN I (zp) (carbon steel, zinc-plated) | | | | Ø1/4 " | |
|---|---|---|---|---|---|
| Nominal embedment depth | | $h_{nom}$ | [in] | 1 5/8 " | 2 1/2 " |
| Effective embedment depth | | $h_{ef}$ | [in] | 1.24 | 2.01 |
| Uncracked concrete | | | | | |
| Tension | 2,500 psi | $N_{allow}$ | [lb] | 504 | 1,271 |
| | 8,000 psi | $N_{allow}$ | [lb] | 901 | 2,014 |
| Shear | ≥ 2,500 psi | $V_{allow}$ | [lb] | 547 | 547 |
| Cracked concrete | | | | | |
| Tension | 2,500 psi | $N_{allow}$ | [lb] | 184 | 401 |
| | 8,000 psi | $N_{allow}$ | [lb] | 293 | 639 |
| Shear | ≥ 2,500 psi | $V_{allow}$ | [lb] | 547 | 547 |

[1)] Above values base on ESR-5456 and ACI 318-19 and apply for following requirements:
- Allowable loads consider a partial safety factor for action load of α = (1.2) D +(1.6) L = (1.2) (0.30) + (1.6) (0.70) = 1.48

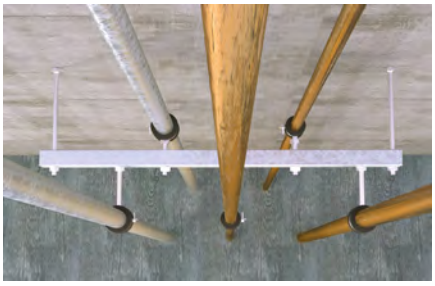
[2)] Above values for FBS IN I (Hex coupler) do not consider the steel insert element used and resulting values might be lower depending on the steel grade of the used steel insert element.

# Hammerset anchor EA II

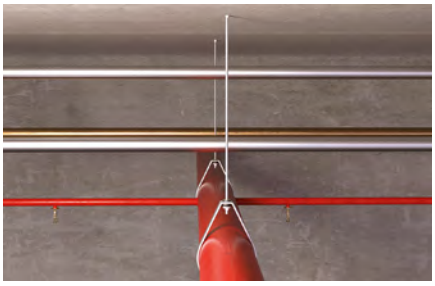
The cost-effective hammerset anchor with a rim for quick and easy installation.







Pipelines



Sprinklers

## Applications

- Pipelines and ventilation ducts
- Sprinkler systems
- Cable conduits and wires
- Gratings
- Steel constructions
- Machines
- Consoles
- Shuttering props
- Diamond or core drilling devices (EA II M12 D)

## Advantages

- The embossed rim prevents the anchor sleeve from slipping, thus ensuring a trouble-free hammerset installation.
- The metric internal thread means that it is possible to use standard screws or threaded rods for the ideal adaptation to suit the intended use.
- The EMS machine setting tool allows for effortless installation, particularly in the case of series installations.
- The embossing that is applied when expanding with the EHS Plus setting tool offers a simple control of the anchoring and provides increased safety.
- Fixing point at hef 25 mm prevents anchor of falling out of the drill hole before being expanded.
- The black fixing point prevents the anchor from falling out of the drill hole during overhead installation.

## Certificates / Features

ETA-07/0135, in concrete
ETA-07/0142, for non-structural applications in concrete

R 120

FM APPROVED

from M10

Inox Stainless Steel

from M8

## Building materials

**Approved for:**

- Concrete C20/25 to C50/60, cracked, for the multiple fixings of non-load-bearing systems
- Concrete C20/25 to C50/60, non-cracked

**Also suitable for:**

- Concrete C12/15
- Natural stone with dense structure

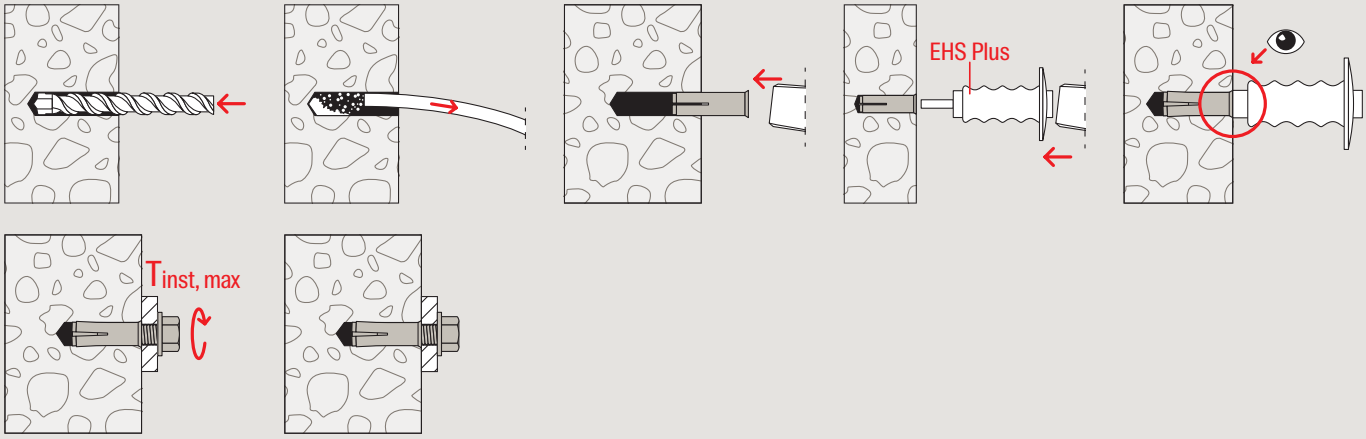
## Versions

- Galvanised steel
- Stainless steel R

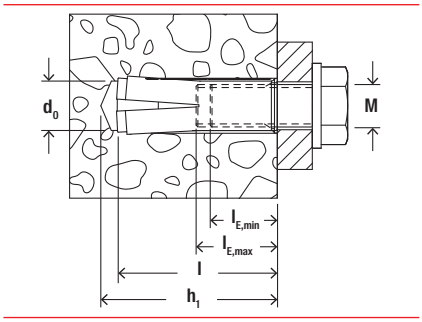
## Functioning

- The EA II is suitable for pre-positioned installation.
- Position the hammerset anchor in the drill hole and drive in flush to the surface of the anchor base using the hammer.
- The sleeve is then expanded by driving in the internal bolt with the EHS Plus setting tool (alternative: EMS machine setting tool), and expanded against the drill hole wall.
- The setting tools must sit on the rim of the anchor to ensure correct expansion.
- Use the special EA II M12 x 50 D / EA M 12 x 50 N D with thicker sleeve for fixing diamond and core drilling devices.

## Installation EA II






## Technical data

**Hammerset anchor EA II**



EA II with reduced anchorage depth hef 25 mm and a black fixing point which prevents the anchor from falling out of the drill hole



EA II not suitable for diamond drilling appliances and diamond saws

| Item | Galvanised steel Item no. gvz | Stainless steel Item no. R | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth for pre-positioned installation $h_1$ [mm] | Anchor length l [mm] | Internal thread M | Min. bolt penetration $l_{E,min}$ [mm] | Max. bolt penetration $l_{E,max}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| EA II M 6 x 25 | 532230 | – | ● | 8 | 27 | 25 | M6 | 6 | 14 | 100 |
| EA II M 6 x 30 | 048264 | 048410 | ● | 8 | 32 | 30 | M6 | 6 | 14 | 100 |
| EA II M 8 x 25 | 532231 | – | ● | 10 | 27 | 25 | M8 | 8 | 14 | 100 |
| EA II M 8 x 30 | 048284 | 048411 | ● | 10 | 33 | 30 | M8 | 8 | 14 | 100 |
| EA II M 8 x 40 | 048323 | 048412 | ● | 10 | 43 | 40 | M8 | 8 | 14 | 50 |
| EA II M 10 x 25 | 532232 | – | ● | 12 | 27 | 25 | M10 | 10 | 14 | 50 |
| EA II M 10 x 30 | 048332 | – | ● | 12 | 33 | 30 | M10 | 10 | 14 | 50 |
| EA II M 10 x 40 | 048339 | 048414 | ● | 12 | 43 | 40 | M10 | 10 | 17 | 50 |
| EA II M 12 x 25 | 532233 | – | ● | 15 | 27 | 25 | M12 | 12 | 14 | 25 |
| EA II M 12 x 50 | 048406 | 048415 | ● | 15 | 54 | 50 | M12 | 12 | 22 | 25 |
| EA II M 16 x 65 | 048408 | 048416 | ● | 20 | 70 | 65 | M16 | 16 | 28 | 20 |
| EA II M 20 x 80 | 048409 | 048417 | ● | 25 | 85 | 80 | M20 | 20 | 34 | 10 |

## Technical data

**Hammerset anchor EA II D**



EA II M12 x 50 D



EA M12 x 50 N D

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth for pre-positioned installation $h_1$ [mm] | Anchor length l [mm] | Internal thread M | Min. bolt penetration $l_{E,min}$ [mm] | Max. bolt penetration $l_{E,max}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **EA M12 x 50 N D gvz** | **500872** | – | 16 | 50 | 50 | M12 | 12 | 22 | 50 |
| **EA II M12 x 50 D** | **048407** | ● | 16 | 54 | 50 | M12 | 12 | 22 | 25 |

## Technical data

**Stop drill EBB**



EBB

| Item | Item no. | Drill diameter $d_0$ [mm] | Drill hole depth $h_0$ [mm] | Match | Sales unit [pcs] |
|---|---|---|---|---|---|
| **EBB 8 x 25** | **532607** | 8 | 27 | EA II M 6 x 25 | 1 |
| **EBB 10 x 25** | **532608** | 10 | 27 | EA II M 8 x 25 | 1 |
| **EBB 12 x 25** | **532609** | 12 | 27 | EA II M 10 x 25 | 1 |
| **EBB 15 x 25** | **532610** | 15 | 27 | EA II M 12 x 25 | 1 |

## Technical data

**Machine setting tool EMS**



EMS

| Item | Item no. | Tool holder | Match | Sales unit [pcs] |
|---|---|---|---|---|
| **EMS M 6 x 25/30** | **048065** | SDS-plus | EA II M 6 x 25, EA II M 6 x 30 | 1 |
| **EMS M 8 x 25/30** | **048066** | SDS-plus | EA II M 8 x 25, EA II M 8 x 30 | 1 |
| **EMS M 8 x 40** | **048067** | SDS-plus | EA II M 8 x 40 | 1 |
| **EMS M10 x 25/30** | **048068** | SDS-plus | EA II M 10 x 25, EA II M 10 x 30 | 1 |
| **EMS M10 x 40** | **048070** | SDS-plus | EA II M 10 x 40 | 1 |
| **EMS M12 x 50** | **048071** | SDS-plus | EA II M 12 x 50 D, EA II M 12 x 50, EA M 12 x 50 N D | 1 |
| **EMS M16 x 65** | **048072** | SDS-max | EA II M 16 x 65 | 1 |
| **EMS M 20 x 80** | **048073** | SDS-max | EA II M 20 x 80 | 1 |

## Technical data

**Setting tool EMS Plus**



EHS Plus



EA-ST

| Item | Item no. | Match | Sales unit [pcs] |
|---|---|---|---|
| **EHS M 6 x 25/30 Plus** | **044630** | EA II M 6 x 25, EA II M 6 x 30 | 1 |
| **EHS M 8 x 25/30 Plus** | **044631** | EA II M 8 x 25, EA II M 8 x 30 | 1 |
| **EHS M 8 x 40 Plus** | **044632** | EA II M 8 x 40 | 1 |

# Technical data

**Setting tool EMS Plus**



EHS Plus



EA-ST

| Item | Item no. | Match | Sales unit [pcs] |
|---|---|---|---|
| **EHS M10 x 40 Plus** | **044633** | EA II M 10 x 40 | 1 |
| **EHS M12 x 50 Plus** | **044634** | EA II M 12 x 50, EA II M 12 x 50 D | 1 |
| **EHS M16 x 65 Plus** | **044635** | EA II M 16 x 65 | 1 |
| **EHS M 20 x 80 Plus** | **044636** | EA II M 20 x 80 | 1 |
| **EHS M10 x 25/30 Plus** | **048487** | EA II M 10 x 25, EA II M 10 x 30 | 1 |
| **EA-ST 12** | **504585** | EA N M12, EA IM 1/2 N, EA I 1/2 N | 1 |
| **EHS M12 x 25 Plus** | **532568** | EA II M 12 x 25 | 1 |

# Loads

**Hammerset anchor EA II**

Permissible loads of a single anchor[1] in normal concrete of strength class C20/25.
For the design the complete current assessment ETA-07/0135 has to be considered.

| | | | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Material/surface[2] | Screw material | Effective anchorage depth | Member thickness | Maximum installation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | | $h_{ef}$ [mm] | $h_{req}$ [mm] | $T_{inst,max}$ [Nm] | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] |
| **EA II M8 x 40** | gvz | 5.8 | 40 | 100 | 8 | 5.9 | 4.9 | 70 | 115 |
| | gvz | 8.8 | 40 | 100 | 8 | 5.9 | 4.9 | 70 | 115 |
| | R | A4-70 | 40 | 100 | 8 | 5.9 | 5.6 | 70 | 115 |
| **EA II M10 x 40** | gvz | 5.8 | 40 | 120 | 15 | 5.9 | 6.2 | 95 | 150 |
| | gvz | 8.8 | 40 | 120 | 15 | 5.9 | 6.2 | 95 | 150 |
| | R | A4-70 | 40 | 120 | 15 | 5.9 | 7.1 | 95 | 150 |
| **EA II M12 x 50** | gvz | 5.8 | 50 | 120 | 35 | 8.3 | 11.3 | 145 | 200 |
| | gvz | 8.8 | 50 | 120 | 35 | 8.3 | 11.3 | 145 | 200 |
| | R | A4-70 | 50 | 120 | 35 | 8.3 | 12.9 | 145 | 200 |
| **EA II M16 x 65** | gvz | 5.8 | 65 | 160 | 60 | 12.3 | 18.3 | 180 | 240 |
| | gvz | 8.8 | 65 | 160 | 60 | 12.3 | 18.3 | 180 | 240 |
| | R | A4-70 | 65 | 160 | 60 | 12.3 | 21.1 | 180 | 240 |
| **EA II M20 x 80** | gvz | 5.8 | 80 | 200 | 120 | 16.8 | 29.1 | 190 | 280 |
| | gvz | 8.8 | 80 | 200 | 120 | 16.8 | 29.1 | 190 | 280 |
| | R | A4-70 | 80 | 200 | 120 | 16.8 | 33.5 | 190 | 280 |

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.
[2] For technical data on steel grade and variants, see ETA.
[3] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

## Loads

**Hammerset anchor EA II**

Permissible loads for a single anchor[1] for multiple use of redundant non-structural applications* in normal concrete C20/25 up to C50/60.
For the design the complete current assessment ETA-07/0142 has to be considered.

| | | | | | | Cracked and non-cracked concrete | | |
|---|---|---|---|---|---|---|---|---|
| | Material/ surface[2] | Screw material | Effective anchorage depth | Minimum member thickness | Maximum installation torque | Permissible load ($F_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | |
| Type | | | $h_{ef}$ [mm] | $h_{min}$[3] [mm] | $T_{inst,max}$ [Nm] | $F_{perm}$[4] [kN] | $s_{min}$ [mm] | $c_{min}$ [mm] |
| **EA II M6 x 25** | gvz | 4.6 | 25 | 80 | 4 | 1.0 | 30 | 60 |
| **EA II M6 x 30** | gvz | 4.6 | 30 | 80 | 4 | 1.2 | 70 | 150 |
| **EA II M8 x 25** | gvz | 4.6 | 25 | 80 | 8 | 1.4 | 70 | 100 |
| **EA II M8 x 30** | gvz | 4.6 | 30 | 80 | 8 | 2.0 | 110 | 150 |
| **EA II M8 x 40** | gvz | 4.6 | 40 | 80 | 8 | 2.0 | 200 | 150 |
| **EA II M10 x 25** | gvz | 4.6 | 25 | 80 | 15 | 1.9 | 80 | 120 |
| **EA II M10 x 30** | gvz | 4.6 | 30 | 80 | 15 | 2.0 | 200 | 150 |
| **EA II M10 x 40** | gvz | 4.6 | 40 | 80 | 15 | 3.0 | 200 | 150 |
| **EA II M12 x 25** | gvz | 4.6 | 25 | 80 | 35 | 1.9 | 100 | 130 |
| **EA II M12 x 50** | gvz | 4.6 | 50 | 100 | 35 | 4.3 | 200 | 200 |

* In addition to the load table above, the following must be considered for multiple fastening of non-structural redundant systems:
A multiple fixing (redundant system) according to EN 1992-4 and CEN/TR 17079 is defined by
- at least 3 fixing points (per attached element) with at least one anchor at each fixing point and a permissible load per fixing point of 1.4 kN
- or by at least 4 fixing points with at least one anchor each fixing point and a permissible load per fixing point of 2.1 kN
- Additionally, it has to be proven that the stiffness of the attached element shall be large enough to ensure that in case of excessive slip or failure of a fastener the load on this fastener or fixing point can be transferred to neighbouring fixing points without significantly violating the requirements on the attached element in the serviceability and ultimate limit state.

For further details see EN 1992-4 section 7.3 and CEN/TR 17079.

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered.
[2] For details of steel grade, variants and further concrete classes, see ETA.
[3] Minimum possible member thickness while increasing the spacing and edge distances at the same time. The combination of minimum spacing and edge distances with the minimum member thickness is not possible. Exact data see ETA.
[4] Valid for tensile load, shear load and oblique load under any angle. In the case of combinations of tensile, shear loads and bending moments, the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018.

## Loads

**Hammerset anchor EA II**

Permissible loads for a single anchor[1] for multiple use of redundant non-structural applications* in pre-stressed hollow core slabs of concrete C30/37 up to C50/60.
For the design the complete current assessment ETA-07/0142 has to be considered.

| | | | | | | Cracked and non-cracked concrete | | |
|---|---|---|---|---|---|---|---|---|
| | Material/ surface[2] | Screw material | Effective anchorage depth | Bottom flange thickness[4] | Maximum installation torque | Permissible load ($F_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | |
| Type | | | $h_{ef}$ [mm] | $d_b$ [mm] | $T_{inst,max}$ [Nm] | $F_{perm}$[3] [kN] | $s_{min}$ [mm] | $c_{min}$ [mm] |
| **EA II M6 x 25** | gvz | 4.6 | 25 | ≥ 35 | 4 | 1.0 | 200 | 150 |
| **EA II M8 x 25** | gvz | 4.6 | 25 | ≥ 35 | 8 | 1.4 | 200 | 150 |
| **EA II M10 x 25** | gvz | 4.6 | 25 | ≥ 35 | 15 | 1.9 | 200 | 150 |
| **EA II M12 x 25** | gvz | 4.6 | 25 | ≥ 35 | 35 | 1.9 | 200 | 150 |

* In addition to the load table above, the following must be considered for multiple fastening of non-structural redundant systems:
A multiple fixing (redundant system) according to EN 1992-4 and CEN/TR 17079 is defined by
- at least 3 fixing points (per attached element) with at least one anchor at each fixing point and a permissible load per fixing point of 1.4 kN
- or by at least 4 fixing points with at least one anchor each fixing point and a permissible load per fixing point of 2.1 kN
- Additionally, it has to be proven that the stiffness of the attached element shall be large enough to ensure that in case of excessive slip or failure of a fastener the load on this fastener or fixing point can be transferred to neighbouring fixing points without significantly violating the requirements on the attached element in the serviceability and ultimate limit state.

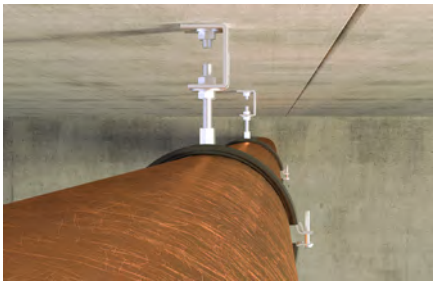
For further details see EN 1992-4 section 7.3 and CEN/TR 17079.

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered.
[2] For details of steel grade and variants, see ETA.
[3] Valid for tensile load, shear load and oblique load under any angle. In the case of combinations of tensile, shear loads and bending moments, the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018.
[4] The anchor may be used in a flange thickness $d_b = 30$ mm with the same characteristic resistance, but the drill hole must not cut a cavity.

# Hammerset anchor EA-N

The cost-effective hammerset anchor without approval for multiple fixings in non-structural systems.





Height adjustable pipe installation



Pipelines



## Applications

- Pipelines
- Cable trays
- Consoles

## Advantages

- Simple hammerset installation
- The metric internal thread allows for the use of standard screws or threaded rods for ideal adaptation in line with the intended use.
- The hand setting tool EA-ST facilitates fast installation.

## Building materials

- Concrete C12/15, non-cracked
- Concrete C20/25, non-cracked

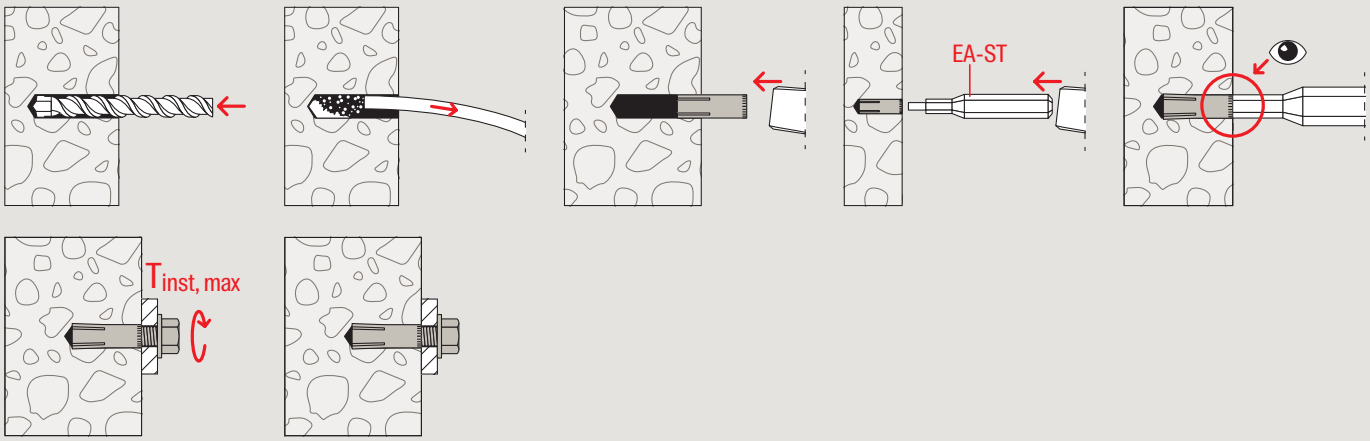
## Versions

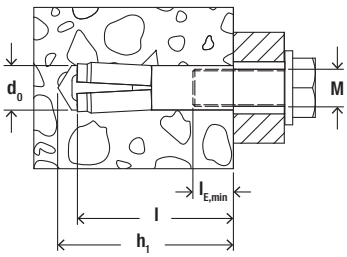
Galvanised steel

## Functioning

- The EA N is suitable for pre-positioned installation.
- Position the hammerset anchor in the drill hole and drive in flush to the surface of the base material using the hammer.
- The setting tool EA-ST is then used to expand the sleeve against the drill hole wall by driving in the internal pin.
- The setting tools must sit on the edge of the anchor to ensure correct expansion.

## Installation EA-N






## Technical data

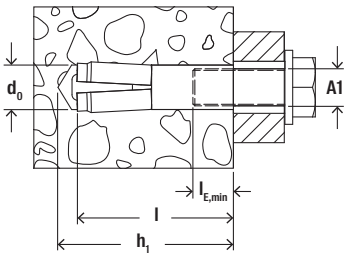
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**Hammerset anchor EA N (metric)**



EA N

| | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth for pre-positioned installation $h_1$ [mm] | Anchor length l [mm] | Internal thread M | Min. bolt penetration $l_{E,min}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | |
| **EA M 6 x 25 N gvz** | **090159** | 8 | 25 | 25 | M6 | 6 | 100 |
| **EA M 8 x 30 N gvz** | **090160** | 10 | 30 | 30 | M8 | 8 | 100 |
| **EA M10 x 40 N gvz** | **090161** | 12 | 40 | 40 | M10 | 10 | 50 |
| **EA M12 x 50 N gvz** | **090162** | 15 | 50 | 50 | M12 | 12 | 50 |
| **EA M16 x 65 N gvz** | **090163** | 20 | 65 | 65 | M12 | 16 | 25 |
| **EA M 20 x 80 N gvz** | **090164** | 25 | 80 | 80 | M20 | 20 | 25 |




## Technical data

**Hammerset anchor EA N (imperial - metric)**



EA N

| | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth for pre-positioned installation $h_1$ [mm] | Anchor length l [mm] | Internal thread A1 [in] | Min. bolt penetration $l_{E,min}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | |
| **EA IM 1/4 x 25 N gvz** | **048103** | 8 | 25 | 25 | 1/4“ | 6 | 100 |
| **EA IM 5/16 x 30 N gvz** | **048104** | 10 | 30 | 30 | 5/16“ | 8 | 100 |
| **EA IM 3/8 x 40 N gvz** | **048105** | 12 | 40 | 40 | 3/8“ | 10 | 50 |
| **EA IM 1/2 x 50 N gvz** | **048106** | 16 | 50 | 50 | 1/2“ | 12 | 50 |
| **EA IM 5/8 x 65 N gvz** | **048107** | 20 | 65 | 65 | 5/8“ | 16 | 25 |
| **EA IM 3/4 x 80 N gvz** | **048108** | 25 | 80 | 70 | 3/4“ | 20 | 25 |

Internal thread BSW

## Technical data

**Hammerset anchor EA N (imperial)**



EA N

| Item | Item no. | Drill diameter $d_0$ [in] | Min. drill hole depth for pre-positioned installation $h_1$ [in] | Total length l [in] | Internal thread A1 [in] | Min. bolt penetration $l_{E,min}$ [in] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **EA I 1/4 x 1“ N gvz** | **049185** | 3/8 | 1 | 1 | 1/4 | 1/4 | 100 |
| **EA I 5/16 x 1 3/16“ N gvz** | **049194** | 3/8 | 13/16 | 13/16 | 3/8 | 5/16 | 100 |
| **EA I 3/8 x 1 9/16“ N gvz** | **049195** | 1/2 | 1 9/16 | 19/16 | 3/8 | 3/8 | 50 |
| **EA I 1/2 x 2“ N gvz** | **049197** | 5/8 | 2 | 2 | 1/2 | 1/2 | 50 |
| **EA I 5/8 x 2 1/2“ N gvz** | **049198** | 7/8 | 2 1/2 | 2 1/2 | 5/8 | 5/8 | 25 |

Internal thread UNC

## Technical data

**Setting tool EA-ST**



EA-ST

| Item | Item no. | Match | Sales unit [pcs] |
|---|---|---|---|
| **EA-ST 6** | **504573** | EA N M6, EA IM 1/4 N, EA I 1/4 N | 1 |
| **EA-ST 8** | **504576** | EA N M8, EA IM 5/16 N, EA I 5/16 N | 1 |
| **EA-ST 10** | **504584** | EA N M10, EA IM 3/8 N, EA I 3/8 N | 1 |
| **EA-ST 16** | **504586** | EA N M16, EA IM 5/8 N, EA I 5/8 N | 1 |
| **EA-ST 20** | **504587** | EA N M20, EA IM 3/4 N | 1 |

## Loads

**Hammerset anchor EA N**

Recommended loads[1] of a single anchor in normal concrete of strength class C20/25.

| | | | | | | Non-cracked concrete | | |
|---|---|---|---|---|---|---|---|---|
| | Material/ surface[2] | Screw material | Effective anchorage depth | Minimum member thickness | Maximum installation torque | Recommended tension load ($N_{rec}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | |
| Type | | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,max}$ [Nm] | $N_{rec}$ [kN] | $s_{min}$[2] [mm] | $c_{min}$[2] [mm] |
| **EA M6 x 25 N[3]** | gvz | ≥ 4.6 | 25 | 100 | 4 | 2.0 | 65 | 115 |
| **EA M8 x 30 N[3]** | gvz | ≥ 4.6 | 30 | 100 | 8 | 2.5 | 95 | 140 |
| **EA M10 x 40 N** | gvz | ≥ 4.6 | 40 | 100 | 15 | 4.5 | 150 | 180 |
| **EA M12 x 50 N** | gvz | ≥ 4.6 | 50 | 120 | 35 | 6.0 | 145 | 200 |
| **EA M12 x 50 N D** | gvz | ≥ 4.6 | 50 | 120 | 35 | 6.0 | 145 | 200 |
| **EA M16 x 65 N** | gvz | ≥ 4.6 | 65 | 160 | 60 | 11.5 | 180 | 240 |
| **EA M20 x 80 N** | gvz | ≥ 4.6 | 80 | 200 | 120 | 16.0 | 190 | 280 |

[1] Required safety factors are considered.
[2] Minimum possible axial spacings resp. edge distance while reducing the recommended load.
[3] Only suitable for statically intederminate systems.

## Loads

**Hammerset anchor EA N imperial-metric**

Recommended loads for a single anchor[1] in normal concrete of strength class C20/25.

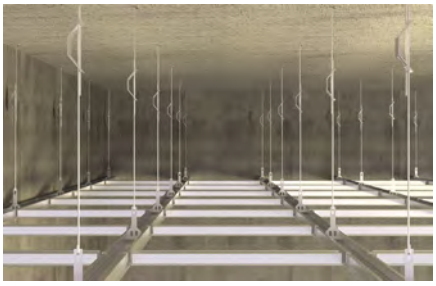
| Type | Material/ surface | Screw material | Effective anchorage depth $h_{ef}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Maximum installation torque $T_{inst,max}$ [Nm] | Non-cracked concrete: Recommended tension load ($N_{rec}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | $N_{rec}$ [kN] | $s_{min}$ [2] [mm] | $c_{min}$ [2] [mm] |
| **EA IM 1/4x25 N** | gvz | ≥ 4.6 | 25 | 100 | 4 | 3.0 | 65 | 115 |
| **EA IM 5/16x30 N** | gvz | ≥ 4.6 | 30 | 100 | 8 | 4.0 | 95 | 140 |
| **EA IM 3/8x40 N** | gvz | ≥ 4.6 | 40 | 100 | 15 | 6.0 | 150 | 180 |
| **EA IM 1/2x50 N** | gvz | ≥ 4.6 | 50 | 120 | 35 | 7.0 | 145 | 200 |
| **EA IM 5/8x65 N** | gvz | ≥ 4.6 | 65 | 160 | 60 | 12.0 | 180 | 240 |
| **EA IM 3/4x80 N** | gvz | ≥ 4.6 | 80 | 200 | 120 | 18.0 | 190 | 280 |

[1] Only suitable for statically indeterminate systems. Required safety factors are considered.
[2] Minimum possible axial spacings resp. edge distance while reducing the recommended load.

# Nail anchor FNA II

The installation-friendly hammerset anchor for multiple fixings.





Suspended ceilings



Fire protection boards



## Applications

- Fire protection plates
- Fire protection boards
- Ventilation systems
- Wire and nonious hangers
- Mounting rails
- Metal clamps
- Substructures made of wood and metal

## Advantages

- The special active principle allows for a simple hammerset installation and, therefore, a short processing time.
- The extremely short anchor depth prevents reinforcement hits, and creates the conditions for a trouble-free installation.
- The optimised expansion clip ensures hold when placing in the drill hole, and prevents it falling out during overhead installations.
- The massive shaft cross-section guarantees a high load-bearing capacity, thus offering an extremely high level of safety.
- A range of head shapes allows for the fixing of wide-ranging fixtures, and for the ideal adaptation to suit the intended use.

## Certificates / Features

ETA-16/0175, multiple use for non-structural applications in concrete

R 120

ZTV

RWS

Inox Stainless Steel

from M8

## Building materials

**Approved for:**

- Concrete C12/15 to C50/60, cracked, for multiple fixings of non-structural applications

**Also suitable for:**

- Solid sand-lime brick
- Natural stone with dense structure
- Prestressed hollow-core concrete slabs

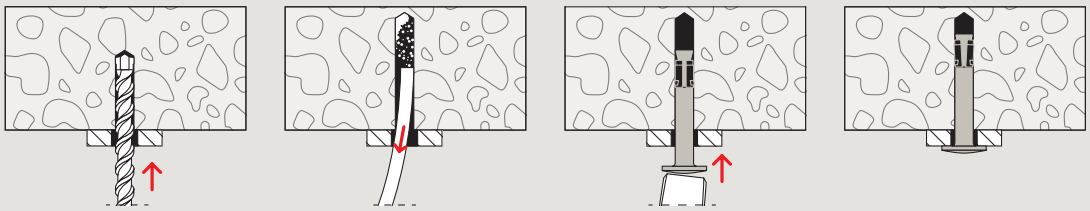
## Versions

- Galvanised steel
- Stainless steel
- Highly corrosion-resistant steel

## Functioning

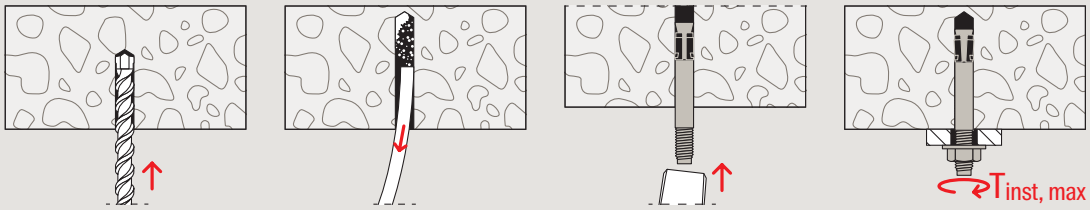
- The FNA II with nail head is suitable for push-through installation. The FNA II M6 is suitable for pre-positioned and push-through installation. The FNA II OE and H are suitable for pre-positioned installation.
- The installed nail anchor FNA II expands automatically under load. The cone is pulled into the expansion clip and expands it against the drill hole wall.
- Available setting tools:
  FNA S-SBO to slip onto the drill,
  FNA S-SDS for series installation with a drilling hammer,
  FNA S-H for the manual installation of mounting rails.

## Installation FNA II

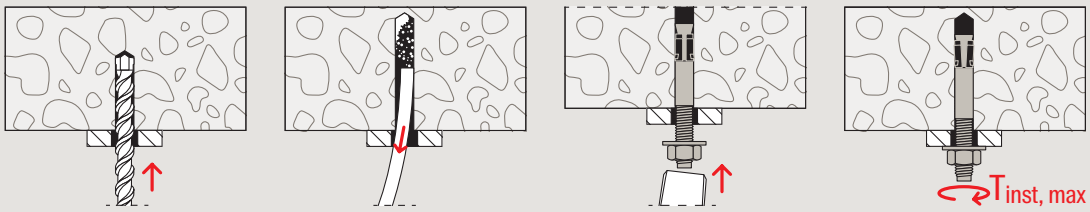




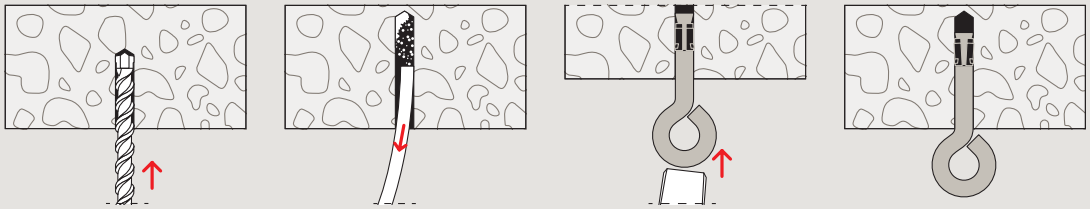
## Pre-positioned installation FNA II M6

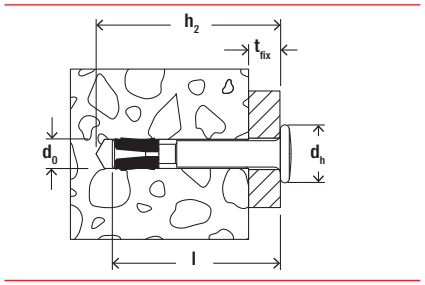



## Push-through installation FNA II M6




## Installation FNA II OE






## Technical data

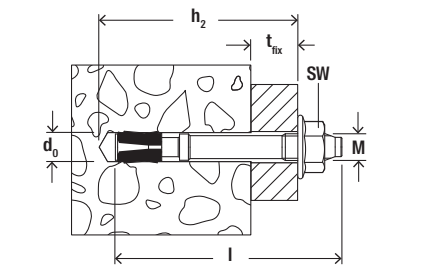
**Nail anchor FNA II**



FNA II FNA II R FNA II HCR

| | Galvanised steel | Stainless steel | Highly corrosion-resistant steel | Approval | Drill diameter | Min. drill hole depth for through fixings | Anchor length | Max. fixture thickness | Head-ø | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $d_0$ | $h_2$ | l | $t_{fix}$ | $d_h$ | |
| | Item no. | Item no. | Item no. | ETA | [mm] | [mm] | [mm] | [mm] | [mm] | [pcs] |
| Item | gvz | R | HCR | | | | | | | |
| FNA II 6 x 25/5 | 044121[1] | – | – | ● | 6 | 40 | 37.5 | 5 | 13 | 100 |
| FNA II 6 x 30/5 | 044115[1] | 044122 | – | ● | 6 | 45 | 42.5 | 5 | 13 | 100 |
| FNA II 6 x 30/5 | – | – | 044124 | ● | 6 | 45 | 42.5 | 5 | 13 | 25 |
| FNA II 6 x 30/15 | 530419 | – | – | ● | 6 | 55 | 52.5 | 15 | 13 | 50 |
| FNA II 6 x 30/30 | 044116 | 044123 | – | ● | 6 | 70 | 67.5 | 30 | 13 | 50 |
| FNA II 6 x 30/30 | – | – | 044125 | ● | 6 | 70 | 67.5 | 30 | 13 | 25 |
| FNA II 6 x 30/40 | – | 046023 | – | ● | 6 | 80 | 77.5 | 40 | 13 | 50 |
| FNA II 6 x 30/50 | 044117 | 046024 | 500569 | ● | 6 | 90 | 87.5 | 50 | 13 | 50 |
| FNA II 6 x 30/60 | – | 046025 | – | ● | 6 | 100 | 97.5 | 60 | 13 | 50 |
| FNA II 6 x 30/75 | 044118 | – | 500573[2] | ● | 6 | 115 | 112.5 | 75 | 13 | 50 |
| FNA II 6 x 30/100 | 044119 | – | 500574[2] | ● | 6 | 140 | 137.5 | 100 | 13 | 50 |
| FNA II 6 x 30/120 | 044120 | – | 500575[2] | ● | 6 | 160 | 157.5 | 120 | 13 | 50 |

[1] With hexagon below the nail head for anti-rotation lock of hole and wire hangers (for example) and centring for optional setting tool FNA II S.
[2] Delivery time on request.




## Technical data

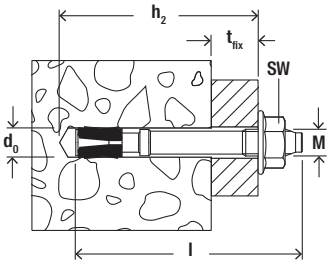
**Nail anchor FNA II M6**



FNA II M6 FNA II M6 R FNA II M6 HCR

| | Galvanised steel | Stainless steel | Highly corrosion-resistant steel | Approval | Drill diameter | Min. drill hole depth for through fixings | Anchor length | Max. fixture thickness | Thread | Width across nut | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $d_0$ | $h_2$ | l | $t_{fix}$ | M | SW | |
| | Item no. | Item no. | Item no. | ETA | [mm] | [mm] | [mm] | [mm] | | [mm] | [pcs] |
| Item | gvz | R | HCR | | | | | | | | |
| FNA II 6 x 25 M6/5 | 044111 | – | – | ● | 6 | 40 | 45 | 5 | M6 | 10 | 100 |
| FNA II 6 x 30 M6/5 | 044109 | – | – | ● | 6 | 45 | 50 | 5 | M6 | 10 | 100 |
| FNA II 6 x 30 M6/5 | – | 044112[1] | – | ● | 6 | 45 | 50 | 5 | M6 | 10 | 50 |

[1] With nut and washer (no flange nut).
[2] Without nut, e.g. for fixing of pipe clamps.




## Technical data

4

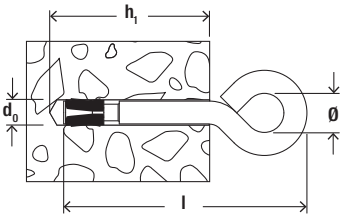
**Nail anchor FNA II M6**



FNA II M6 FNA II M6 R FNA II M6 HCR

| | Galvanised steel | Stainless steel | Highly corrosion-resistant steel | Approval | Drill diameter | Min. drill hole depth for through fixings | Anchor length | Max. fixture thickness | Thread | Width across nut | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $d_0$ | $h_2$ | l | $t_{fix}$ | M | SW | |
| | Item no. | Item no. | Item no. | ETA | [mm] | [mm] | [mm] | [mm] | | [mm] | [pcs] |
| **Item** | **gvz** | **R** | **HCR** | | | | | | | | |
| **FNA II 6 x 30 M6/5** | – | – | 044113[1] | ● | 6 | 45 | 50 | 5 | M6 | 10 | 25 |
| **FNA II 6 x 30 M6/10** | 046022 | – | – | ● | 6 | 45 | 55 | 10 | M6 | 10 | 100 |
| **FNA II 6 x 30 M6 x 41** | 044110[2] | – | – | ● | 6 | 40 | 41 | – | M6 | 10 | 100 |
| **FNA II 6 x 30 M8/5** | 044114 | – | – | ● | 6 | 45 | 51 | 5 | M8 | 13 | 50 |

[1] With nut and washer (no flange nut).
[2] Without nut, e.g. for fixing of pipe clamps.



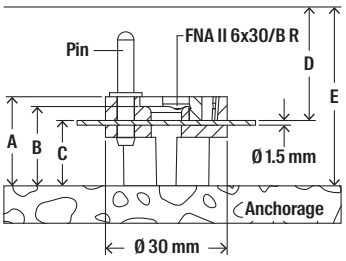

## Technical data

**Nail anchor FNA II-H / Nail anchor FNA II-OE**



FNA II-H FNA II-OE

| | | Approval | Drill diameter | Anchor length | Min. drill hole depth | Inner diameter of the hook/eye | Sales unit |
|---|---|---|---|---|---|---|---|
| | | | $d_0$ | l | $h_1$ | $d_H$ | |
| | Item no. | ETA | [mm] | [mm] | [mm] | [mm] | [pcs] |
| **Item** | | | | | | | |
| **FNA II 6 x 25 H** | 044126 | – | 6 | 54 | 35 | 10 | 50 |
| **FNA II 6 x 25 OE** | 044127 | ● | 6 | 54 | 35 | 10 | 50 |




## Technical data

**Spacer FNA II**



Spacer FNA II

| Item | Item no. | Height A [mm] | Height B [mm] | Height C [mm] | Adapted for | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Spacer FNA II 30x17/13** | **504533** | 17 | 15 | 13 | FNA II 6/15 | 1,000 |
| **Spacer FNA II 30x22/18** | **502724** | 22 | 20 | 18 | FNA II 6/20 | 1,000 |
| **Pin 16** | **504534** | – | – | – | – | 1,000 |

The Spacer enables the fixing of reinforcement mats for sprayed mortar on concrete walls in tunnels. The guaranteed same distance through the spacer between the reinforcement mat and the wall ensures maximum safety in the passive fire protection.

## Technical data

**Setting tool FNA II**



FNA II S-SDS



FNA II S-SBO



FNA II S-H

| Item | Item no. | Match | Contents | Sales unit [pcs] |
|---|---|---|---|---|
| **FNA II S-SDS** | **061547** | for all FNA II with nail head | Optimum professional setting tool with SDS fixture - the ideal setting tool for series installation | 1 |
| **FNA II S-SBO** | **061548** | for all FNA II with nail head | Optimum setting tool for mopunting on the drill - for effortless and speedy installation | 1 |
| **FNA II S-H** | **095990** | for all FNA II with metric thread M6 | Hand setting tool with outer diameter of 15 mm for installation of installation channels | 1 |

# Loads

**Nail anchor FNA II**

Permissible loads for a single anchor[1] for multiple use of redundant non-structural applications* in normal concrete C20/25 up to C50/60[2].
For the design the complete current assessment ETA-06/0175 has to be considered.

| | | | | | Cracked and non-cracked concrete | | |
|---|---|---|---|---|---|---|---|
| | Material/ surface | Effective anchorage depth | Minimum member thickness | Maximum installation torque | Permissible load ($F_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst,max}$ [Nm] | $F_{perm}$ [3] [kN] | $s_{min}$ [mm] | $c_{min}$ [mm] |
| **FNA II 6 x 25** | gvz | 25 | 80 | - | 1.4 | 40 | 40 |
| **FNA II 6 x 30** | gvz | 30 | 80 | - | 2.4 | 40 | 40 |
| | R | 30 | 80 | - | 2.4 | 40 | 40 |
| | HCR | 30 | 80 | - | 2.4 | 40 | 40 |
| **FNA 6 x 25 M6** | gvz | 25 | 80 | 4 | 1.4 | 40 | 40 |
| **FNA 6 x 30 M6** | gvz | 30 | 80 | 4 | 2.4 | 40 | 40 |
| | R | 30 | 80 | 4 | 2.4 | 40 | 40 |
| | HCR | 30 | 80 | 4 | 2.4 | 40 | 40 |
| **FNA II 6 x 30 M8** | gvz | 30 | 80 | 4 | 2.4 | 40 | 40 |
| **FNA II 6 x 25 OE** | gvz | 25 | 80 | - | 0.7 | 40 | 40 |

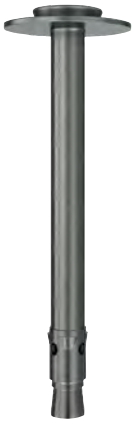
* In addition to the load table above, the following must be considered for multiple fastening of non-structural redundant systems:
A multiple fixing (redundant system) according to EN 1992-4 and CEN/TR 17079 is defined by
- at least 3 fixing points (per attached element) with at least one anchor at each fixing point and a permissible load per fixing point of 1.4 kN
- or by at least 4 fixing points with at least one anchor each fixing point and a permissible load per fixing point of 2.1 kN
- Additionally, it has to be proven that the stiffness of the attached element shall be large enough to ensure that in case of excessive slip or failure of a fastener the load on this fastener or fixing point can be transferred to neighbouring fixing points without significantly violating the requirements on the attached element in the serviceability and ultimate limit state.

For further details see EN 1992-4 section 7.3 and CEN/TR 17079.

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered.
[2] For concrete strength class C12/15 see ETA.
[3] Valid for tensile load, shear load and oblique load under any angle. In the case of combinations of tensile, shear loads and bending moments, the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018.

# Nail anchor FNA II RB

The easy-to-assemble fixing solution for demanding fixings.





Fire protection boards



Fire protection boards



## Applications

- Fire protection plates
- Fire protection boards
- Ventilation systems
- Wire and Nonius hangers
- Mounting rails
- Metal clamps
- Substructures made of wood and metal

## Advantages

- The special active principle allows for a simple hammerset installation and therefore a short processing time.
- The extremely short anchor depth prevents reinforcement hits and creates the conditions for a trouble-free installation.
- The optimised expansion clip ensures a good hold when the anchor is placed into the drill hole and prevents it from falling out during overhead installations.
- The massive shaft cross-section guarantees a high load-bearing capacity, thus offering an extremely high level of safety.

## Certificates / Features

ETA-16/0175, multiple use for non-structural applications in concrete

R 120

ZTV 1200°

RWS 1350°

Inox Stainless Steel

from M8

## Building materials

**Approved for:**

- Concrete C12/15 to C50/60, cracked, for multiple fixings of non-structural applications

**Also suitable for:**

- Solid sand-lime brick
- Natural stone with dense structure
- Prestressed hollow-core concrete slabs

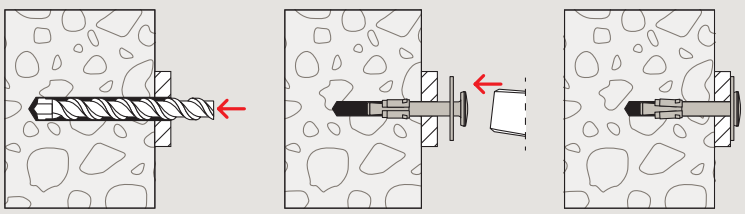
## Versions

- Stainless steel R
- Highly corrosion-resistant steel HCR

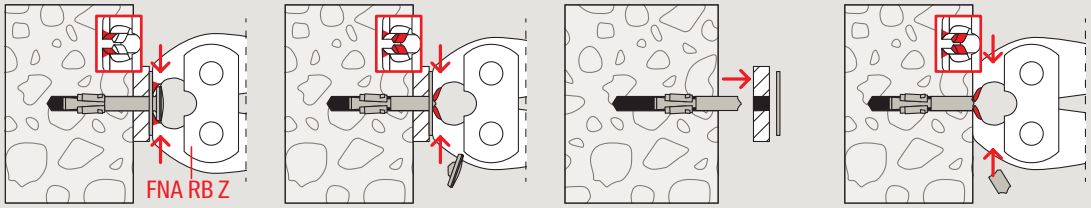
## Functioning

- The FNA II with nail head is suitable for push-through installation.
- The installed nail anchor FNA II expands automatically under load. The cone is pulled into the expansion clip and expands it against the hole wall.
- Available setting tools:
  FNA S-SBO for attachment to drill
  FNA S-SDS for series installation with a hammer drill
  FNA S-H for the manual installation of mounting rails

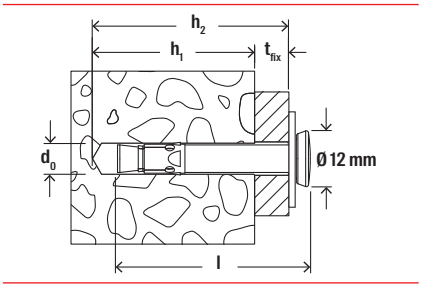
## Installation FNA II RB



## Deinstallation






## Technical data

**Nail anchor FNA II RB**



FNA II U RB

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Washer (outer diameter x thickness) [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Max. usable length $t_{fix}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **FNA II 6 x30/30 RB** | **530674**[1] | ● | 6 | 66 | – | 30 | 68 | 30 | 50 |
| **FNA II 6 x30/30 RB** | **530798**[1] | ● | 6 | 66 | – | 30 | 68 | 30 | 200 |
| **FNA II 6 x 30/30 U R RB** | **569384** | ● | 6 | 66 | 30 x 2.5 | 30 | 68 | 30 | 300 |
| **FNA II 6 x 30/40 U R RB** | **569385** | ● | 6 | 80 | 30 x 2.5 | 30 | 77.5 | 40 | 300 |

[1] Delivery time on request.

## Technical data

**2-stage plier (FNA II RB)**



FNA-RB Z

| Item | Item no. | Adapted for | Sales unit [pcs] |
|---|---|---|---|
| **FNA RB Z** | **531142** | Plier for removal of FNA II RB | 1 |

## Technical data

**Air compressed setting tool (FNA II)**



Air compressed setting tool

| Item | Item no. | Match | Required for | Sales unit [pcs] |
|---|---|---|---|---|
| **Air compressed setting tool** | **093731** | for FNA II + FNA II RB | – | 1 |
| **Drop in element** | **093729** | – | Air compressed setting tool Item No. 93731 | 1 |
| **Stop ring** | **093730** | – | Air compressed setting tool Item No. 93731 | 5 |
| **Fitting** | **093732** | – | Air compressed setting tool Item No. 93731 | 1 |

## Loads

**Nail anchor FNA II RB**

Permissible loads for a single anchor[1] for multiple use of redundant non-structural applications* in normal concrete C20/25 up to C50/60[2].
For the design the complete current assessment ETA-06/0175 has to be considered.

| Type | Material/ surface | Effective anchorage depth $h_{ef}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Cracked and non-cracked concrete: Permissible load ($F_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | |
|---|---|---|---|---|---|---|
| | | | | $F_{perm}$[3] [kN] | $s_{min}$ [mm] | $c_{min}$ [mm] |
| **FNA II 6 x 30 RB** | R | 30 | 80 | 2.4 | 40 | 40 |
| | HCR | 30 | 80 | 2.4 | 40 | 40 |

* In addition to the load table above, the following must be considered for multiple fastening of non-structural redundant systems:
A multiple fixing (redundant system) according to EN 1992-4 and CEN/TR 17079 is defined by
- at least 3 fixing points (per attached element) with at least one anchor at each fixing point and a permissible load per fixing point of 1.4 kN
- or by at least 4 fixing points with at least one anchor each fixing point and a permissible load per fixing point of 2.1 kN
- Additionally, it has to be proven that the stiffness of the attached element shall be large enough to ensure that in case of excessive slip or failure of a fastener the load on this fastener or fixing point can be transferred to neighbouring fixing points without significantly violating the requirements on the attached element in the serviceability and ultimate limit state.

For further details see EN 1992-4 section 7.3 and CEN/TR 17079.

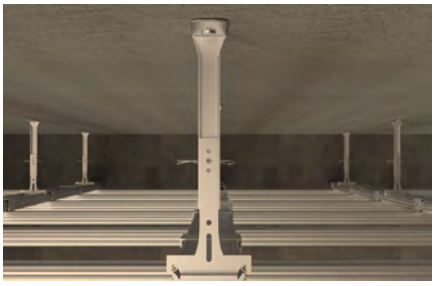
[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered.
[2] For concrete strength class C12/15 see ETA.
[3] Valid for tensile load, shear load and oblique load under any angle. In the case of combinations of tensile, shear loads and bending moments, the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018.

# Ceiling nail FDN II

The installation-friendly push-through anchor for multiple fixings.







Suspended ceilings with Nonius hangers



Suspended ceilings

## Applications

- Wire and Nonius hangers
- Ventilation systems
- Slats
- Metal profiles
- Perforated tapes
- Sub-structures made of metal

## Advantages

- The simple active principle allows for cost-efficient hammerset installation.
- The new short version FDN II with reduced anchorage depth ist faster to install and reduces reinforcement hits.
- The flush-sunk expansion nail signifies the complete expansion of the anchor, and thereby ensures minimum movement when under load.
- The fischer FDN II can be installed without cleaning of the drill hole.
- The head embossing offers a simple control of the anchoring, and thus saves time.

## Certificates / Features

ETA-17/0736, for non-structural applications in concrete

## Building materials

**Approved for:**

- oncrete C12/15 to C50/60
- Concrete C20/25 to C50/60, cracked, for the multiple fixings of non-load-bearing systems

**Also suitable for:**

- Natural stone with dense structure

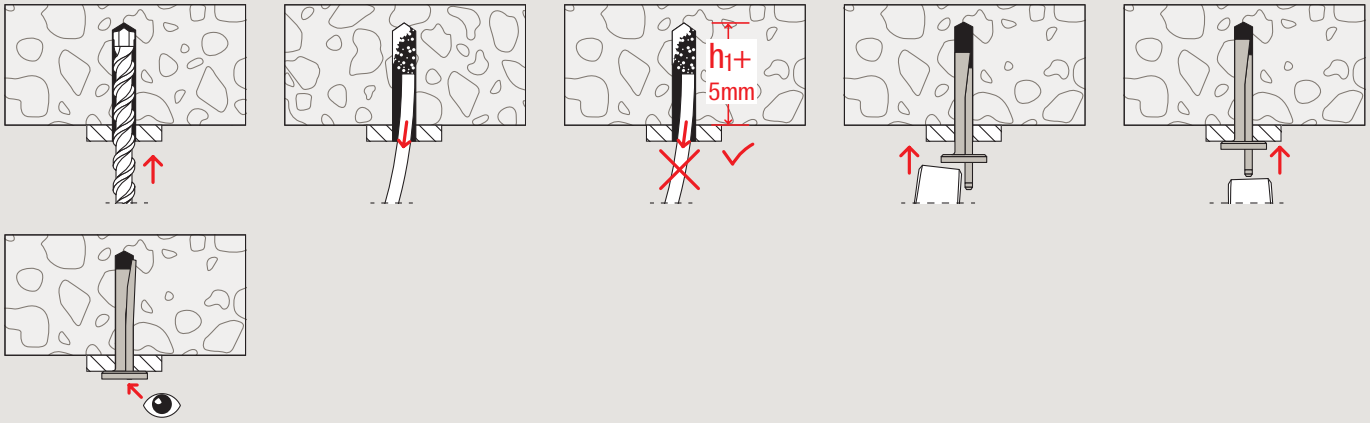
## Versions

- Galvanised steel

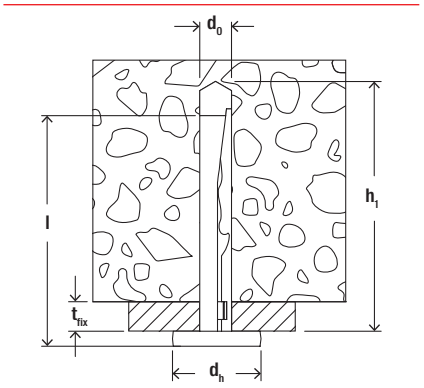
## Functioning

- The FDN II is suitable for push-through installation.
- The FDN II ceiling nail is driven into the drill hole with a hammer until it is firmly in position. Do not hit the expansion wedge at this stage.
- Then, drive the expansion wedge in flush to the nail head. This causes the FDN II to expand against the drill hole wall.

## Installation FDN II

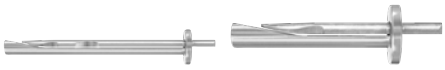





## Technical data

**Ceiling anchor FDN II**



FDN II FDN II K

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Min. drill hole depth without cleaning $h_1$ [mm] | Min. drill hole depth with cleaning $h_1$ [mm] | Head-ø $d_h$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **FDN II 6/5** | **545636** | ● | 6 | 40 | 5 | 47 | 42 | 15 | 100 |
| **FDN II 6/5 K** | **545638** | ● | 6 | 33 | 5 | 40 | 35 | 15 | 100 |
| **FDN II 6/35** | **545637** | ● | 6 | 70 | 35 | 77 | 72 | 15 | 100 |
| **FDN II 6/35 K** | **545639** | ● | 6 | 64 | 35 | 70 | 65 | 15 | 100 |

# Loads

**Ceiling Anchor FDN II**

Permissible loads for a single anchor[1] for multiple use of redundant non-structural applications* in normal concrete C20/25 up to C50/60[2].
For the design the complete current assessment ETA-17/0736 has to be considered.

| | | | | Cracked and non-cracked concrete | | |
|---|---|---|---|---|---|---|
| | Material/ surface | Effective anchorage depth | Minimum member thickness | Permissible load ($F_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $F_{perm}$ [3] [kN] | $s_{min}$ [mm] | $c_{min}$ [mm] |
| **FDN II 6/5 K** | gvz | 25 | 80 | 1.2 | 60 | 70 |
| **FDN II 6/35 K** | gvz | 25 | 80 | 1.2 | 60 | 70 |
| **FDN II 6/5** | gvz | 32 | 80 | 1.7 | 50 | 60 |
| **FDN II 6/35** | gvz | 32 | 80 | 1.7 | 50 | 60 |

* In addition to the load table above, the following must be considered for multiple fastening of non-structural redundant systems:
A multiple fixing (redundant system) according to EN 1992-4 and CEN/TR 17079 is defined by
- at least 3 fixing points (per attached element) with at least one anchor at each fixing point and a permissible load per fixing point of 1.4 kN
- or by at least 4 fixing points with at least one anchor each fixing point and a permissible load per fixing point of 2.1 kN
- Additionally, it has to be proven that the stiffness of the attached element shall be large enough to ensure that in case of excessive slip or failure of a fastener the load on this fastener or fixing point can be transferred to neighbouring fixing points without significantly violating the requirements on the attached element in the serviceability and ultimate limit state.

For further details see EN 1992-4 section 7.3 and CEN/TR 17079.

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered.
[2] For concrete strength class C12/15 see ETA.
[3] Valid for tensile load, shear load and oblique load under any angle. In the case of combinations of tensile, shear loads and bending moments, the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018.

# Ceiling nail FDZ

The cost-efficient push-through anchor for multiple fixings.





Suspended ceilings with Nonius hangers



Drywall profiles



## Applications

- Drywall profiles
- Wire and Nonius hangers
- Ventilation systems
- Slats
- Metal profiles
- Perforated tapes
- Sub-structures made of metal

## Certificates / Features

ETA-17/0737, for non-structural applications in concrete

## Advantages

- The simple active principle allows for fast hammerset installation.
- The efficient anchor offers the perfect price-performance ratio for an economical installation.
- The flush-sunk expansion nail signifies the complete expansion of the anchor, and thereby ensures minimum movement when under load.
- The head embossing offers a simple control of the anchoring, and thus saves time.

## Building materials

**Approved for:**

- Concrete C20/25 to C50/60, cracked, for the multiple fixings of non-load-bearing systems

**Also suitable for:**

- Concrete C12/15
- Natural stone with dense structure

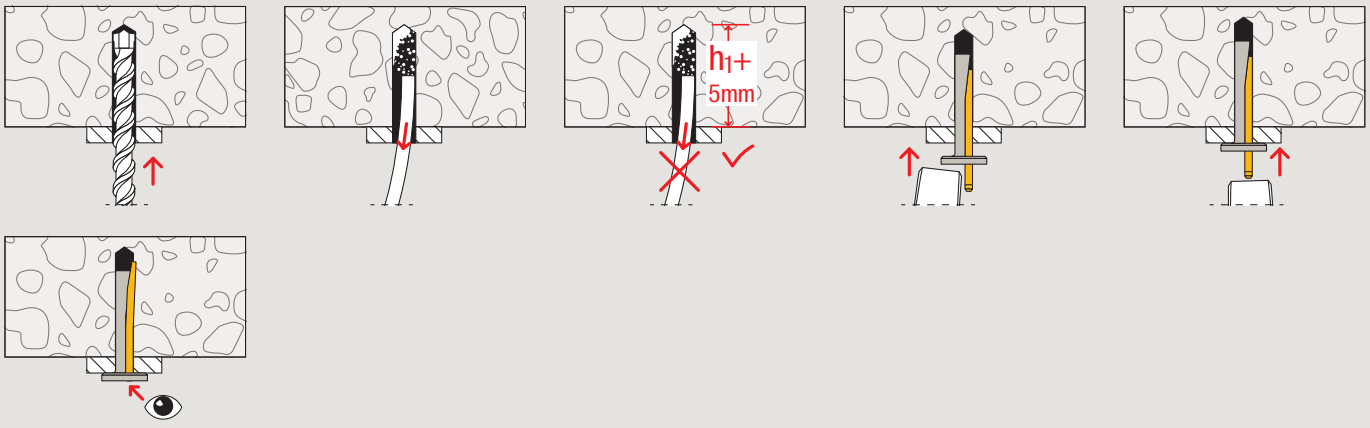
## Versions

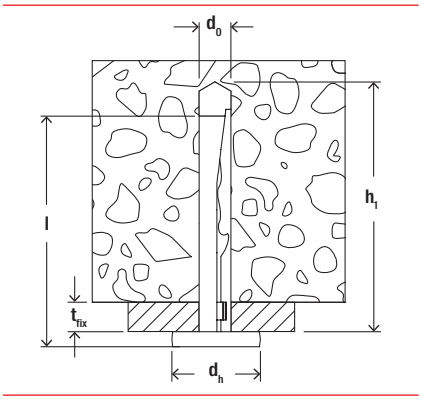
- Galvanised steel

## Functioning

- The FDZ is suitable for push-through installation.
- The FDZ ceiling nail is driven into the drill hole with a hammer until it is firmly in position. Do not hit the expansion wedge at this stage.
- Then, drive the expansion wedge in flush to the nail head. This causes the FDZ to expand against the drill hole wall.

## Installation FDZ






## Technical data

**Ceiling nail FDZ**



FDZ

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Min. drill hole depth without cleaning $h_1$ [mm] | Min. drill hole depth with cleaning $h_1$ [mm] | Head-ø $d_h$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **FDZ 6/5** | **554899** | ● | 6 | 40 | 5 | 47 | 42 | 15 | 100 |
| **FDZ 6/35** | **554898** | ● | 6 | 70 | 35 | 77 | 72 | 15 | 100 |

## Loads

**Ceiling nail FDZ**

Permissible loads for a single anchor[1] for multiple use of redundant non-structural applications* in normal concrete C20/25 up to C50/60[2].
For the design the complete current assessment ETA-17/0737 has to be considered.

| Type | Material/ surface | Effective anchorage depth $h_{ef}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Cracked and non-cracked concrete: Permissible load ($F_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | |
|---|---|---|---|---|---|---|
| | | | | $F_{perm}$[3] [kN] | $s_{min}$ [mm] | $c_{min}$ [mm] |
| **FDZ 6** | gvz | 25 | 80 | 0.7 | 60 | 70 |
| **FDZ 6** | gvz | 32 | 80 | 1.0 | 50 | 60 |

* In addition to the load table above, the following must be considered for multiple fastening of non-structural redundant systems:
A multiple fixing (redundant system) according to EN 1992-4 and CEN/TR 17079 is defined by
- at least 3 fixing points (per attached element) with at least one anchor at each fixing point and a permissible load per fixing point of 1.4 kN
- or by at least 4 fixing points with at least one anchor each fixing point and a permissible load per fixing point of 2.1 kN
- Additionally, it has to be proven that the stiffness of the attached element shall be large enough to ensure that in case of excessive slip or failure of a fastener the load on this fastener or fixing point can be transferred to neighbouring fixing points without significantly violating the requirements on the attached element in the serviceability and ultimate limit state.

For further details see EN 1992-4 section 7.3 and CEN/TR 17079.

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered.
[2] For concrete strength class C12/15 see ETA.
[3] Valid for tensile load, shear load and oblique load under any angle. In the case of combinations of tensile, shear loads and bending moments, the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018.

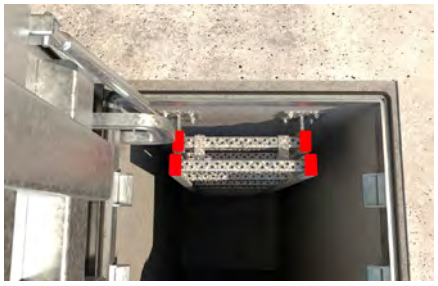
# Bolt anchor FBN II

The cost-efficient fixing for flexible use in non-cracked concrete.





Column bases



Stormwater overflow tank manholes



## Applications

- Steel constructions
- Guard rails
- Consoles
- Ladders
- Cable trays
- Machines
- Staircases
- Gates
- Façades

## Advantages

- The standard anchorage depth achieves the maximum load-bearing capacities.
- The reduced anchorage depth reduces the drill hole depth. This minimises the amount of time needed for installation whilst increasing flexibility.
- Additional short version „K“ with short anchoring depth.
- The long thread balances component tolerances and allows for stand-off installations, thus increasing flexibility.
- Few hammer blows and the minimal torque slippage allow for a noticeably simpler installation.
- The drive-in pin protects the thread from damage, and thus ensures a faster installation and dismantling of the attachment.
- The larger washer included with the FBN II GS creates a larger supporting surface and, as such, allows for the fixing of wood constructions.
- When using hollow drills with suction is no drill hole cleaning required.
- New ETA assessment for hot-dip galvanised version for variable working life in outdoor areas.

## Certificates / Features

ETA-07/0211, in concrete
ETA-18/0101, for non-cracked concrete and variable working life for outdoor areas

## Building materials

**Approved for:**

- Concrete C20/25 to C50/60, non-cracked

**Also suitable for:**

- Concrete C12/15
- Natural stone with dense structure

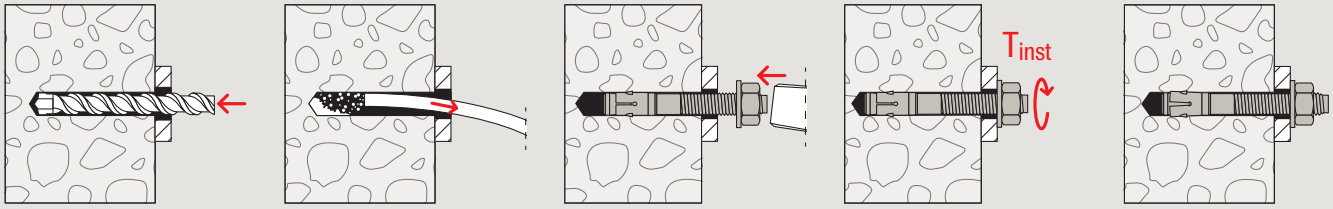
## Versions

- Galvanised steel
- Stainless steel R
- Hot-dip galvanised steel (with variable working life for outdoor areas)

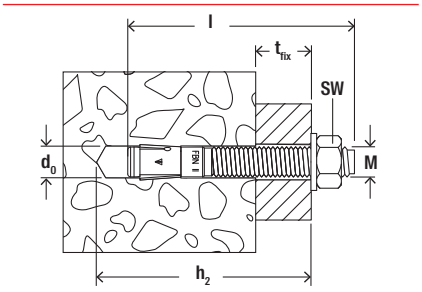
## Functioning

- The FBN II is suitable for pre-positioned and push-through installation; also suitable for stand-off installation under certain conditions.
- Prior to installation, place the hexagon nut in the optimal position (the drive-in pin projects by approx. 3 mm out of the hexagon nut).
- When applying the torque, the cone bolt is pulled into the expansion clip and expands it against the drill hole wall.
- The head embossing offers a simple control of the anchoring.
- In the case of series installation, we recommend using the FABS bolt anchor setting tool.

## Installation FBN II






## Technical data

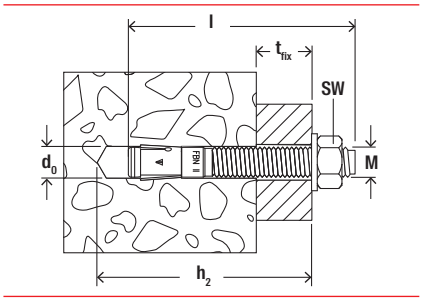
**Bolt anchor FBN II**



FBN II FBN II HDG FBN II R

| Item | Galvanised steel Item no. gvz | Hot-dip galvanised steel Item no. hdg | Stainless steel Item no. R | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Anchor length l [mm] | Max. usable length hef,stand./ hef,min. $t_{fix}$ [mm] | Thread ø x length [mm] | Width across nut SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FBN II 6/5 | 505526[1)2)] | – | – | ● | 6 | 45 | 50 | 5 / - | M6 x 12 | 10 | 100 |
| FBN II 6/10 | 505527[1)2)] | – | 505532[1)2)] | ● | 6 | 50 | 55 | 10 / - | M6 x 17 | 10 | 100 |
| FBN II 6/30 | 505528[1)2)] | – | 505535[1)2)] | ● | 6 | 70 | 75 | 30 / - | M6 x 35 | 10 | 100 |
| FBN II 8/5 | 040662 | – | – | ● | 8 | 61 | 65 | 5 / 15 | M8 x 34 | 13 | 50 |
| FBN II 8/10 | 040664 | 507575 | 507555 | ● | 8 | 66 | 70 | 10 / 20 | M8 x 39 | 13 | 50 |
| FBN II 8/20 | 040669 | – | – | ● | 8 | 76 | 80 | 20 / 30 | M8 x 49 | 13 | 50 |
| FBN II 8/30 | 040700 | 507576 | 507556 | ● | 8 | 86 | 90 | 30 / 40 | M8 x 59 | 13 | 50 |
| FBN II 8/50 | 040771 | 507577 | 507557 | ● | 8 | 106 | 110 | 50 / 60 | M8 x 79 | 13 | 50 |
| FBN II 8/70 | 040777 | 507578 | – | ● | 8 | 126 | 130 | 70 / 80 | M8 x 99 | 13 | 20 |
| FBN II 8/100 | 040783 | – | – | ● | 8 | 156 | 160 | 100 / 110 | M8 x 129 | 13 | 20 |
| FBN II 10/10 | 040827 | 507579 | 507558 | ● | 10 | 78 | 85 | 10 / 20 | M10 x 46 | 17 | 50 |
| FBN II 10/20 | 040851 | – | 507559 | ● | 10 | 88 | 95 | 20 / 30 | M10 x 56 | 17 | 50 |
| FBN II 10/30 | 040854 | 507580 | 507560 | ● | 10 | 98 | 105 | 30 / 40 | M10 x 66 | 17 | 50 |
| FBN II 10/50 | 040855 | 507582 | 507561 | ● | 10 | 118 | 125 | 50 / 60 | M10 x 86 | 17 | 20 |
| FBN II 10/70 | 040931 | – | – | ● | 10 | 138 | 145 | 70 / 80 | M10 x 106 | 17 | 20 |
| FBN II 10/100 | 040943 | 507583 | 507562 | ● | 10 | 168 | 175 | 100 / 110 | M10 x 136 | 17 | 20 |
| FBN II 10/140 | 040944 | – | – | ● | 10 | 208 | 215 | 140 / 150 | M10 x 176 | 17 | 20 |
| FBN II 10/160 | 040945 | – | – | ● | 10 | 228 | 235 | 160 / 170 | M10 x 196 | 17 | 20 |
| FBN II 12/10 | 040950 | 507589 | 507563 | ● | 12 | 95 | 104 | 10 / 25 | M12 x 59 | 19 | 20 |
| FBN II 12/20 | 044558 | – | 507564 | ● | 12 | 105 | 114 | 20 / 35 | M12 x 69 | 19 | 20 |
| FBN II 12/30 | 045263 | 507591 | 507565 | ● | 12 | 115 | 124 | 30 / 45 | M12 x 79 | 19 | 20 |
| FBN II 12/50 | 045264 | 507592 | 507566 | ● | 12 | 135 | 144 | 50 / 65 | M12 x 99 | 19 | 20 |
| FBN II 12/80 | 045265 | – | – | ● | 12 | 165 | 174 | 80 / 95 | M12 x 129 | 19 | 20 |
| FBN II 12/100 | 045266 | 507596 | 507567 | ● | 12 | 185 | 194 | 100 / 115 | M12 x 149 | 19 | 20 |
| FBN II 12/120 | 045267 | – | – | ● | 12 | 205 | 214 | 120 / 135 | M12 x 169 | 19 | 20 |
| FBN II 12/140 | 045268 | – | – | ● | 12 | 225 | 234 | 140 / 155 | M12 x 189 | 19 | 20 |
| FBN II 12/160 | 045269 | – | – | ● | 12 | 245 | 254 | 160 / 175 | M12 x 189 | 19 | 20 |
| FBN II 16/10 | – | – | 507568 | ● | 16 | 114 | 128 | 10 / 25 | M16 x 74 | 24 | 10 |

[1)] Use restricted to anchoring of structural components which are statically indeterminate.
[2)] Nut and washer not pre-assembled/supplied loose.






## Technical data

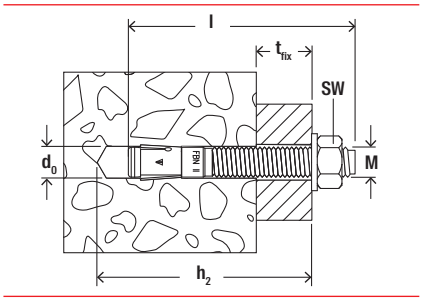
**Bolt anchor FBN II**



FBN II | FBN II HDG | FBN II R

| | Galvanised steel | Hot-dip galvanised steel | Stainless steel | Approval | Drill diameter | Min. drill hole depth for through fixings | Anchor length | Max. usable length hef,stand./ hef,min. | Thread | Width across nut | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $d_0$ | $h_2$ | l | $t_{fix}$ | ø x length | SW | |
| | Item no. | Item no. | Item no. | ETA | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [pcs] |
| Item | gvz | hdg | R | | | | | | | | |
| FBN II 16/25 | 045564 | 507598 | 507569 | ● | 16 | 129 | 143 | 25 / 40 | M16 x 89 | 24 | 10 |
| FBN II 16/50 | 045565 | 507553 | 507570 | ● | 16 | 154 | 168 | 50 / 65 | M16 x 105 | 24 | 10 |
| FBN II 16/80 | 045566 | – | – | ● | 16 | 184 | 198 | 80 / 95 | M16 x 144 | 24 | 10 |
| FBN II 16/100 | 045567 | 507554 | – | ● | 16 | 204 | 218 | 100 / 115 | M16 x 164 | 24 | 10 |
| FBN II 16/140 | 045568 | – | – | ● | 16 | 244 | 258 | 140 / 155 | M16 x 184 | 24 | 10 |
| FBN II 16/160 | 045569 | – | – | ● | 16 | 264 | 278 | 160 / 175 | M16 x 184 | 24 | 10 |
| FBN II 16/200 | 045570 | – | – | ● | 16 | 304 | 318 | 200 / 215 | M16 x 184 | 24 | 10 |
| FBN II 20/30 | 045573 | 508015 | 507571 | ● | 20 | 165 | 187 | 30 / 55 | M20 x 90 | 30 | 10 |
| FBN II 20/60 | 045574 | – | 507572 | ● | 20 | 195 | 217 | 60 / 85 | M20 x 90 | 30 | 10 |
| FBN II 20/80 | 045575 | – | 547590 | ● | 20 | 215 | 237 | 80 / 105 | M20 x 90 | 30 | 10 |
| FBN II 20/120 | 045576 | – | – | ● | 20 | 255 | 277 | 120 / 145 | M20 x 90 | 30 | 10 |

[1] Use restricted to anchoring of structural components which are statically indeterminate.
[2] Nut and washer not pre-assembled/supplied loose.



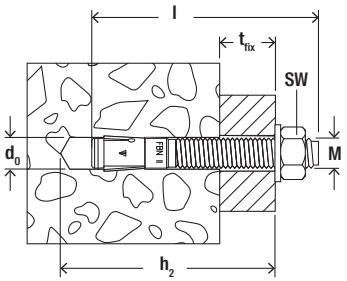

## Technical data

**Bolt anchor FBN II K**



FBN II K | FBN II K HDG | FBN II R

| | Galvanised steel | Hot-dip galvanised steel | Stainless steel | Approval | Drill diameter | Min. drill hole depth for through fixings | Anchor length | Max. usable length hef,stand./ hef,min. | Thread | Width across nut | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $d_0$ | $h_2$ | l | $t_{fix}$ | ø x length | SW | |
| | Item no. | Item no. | Item no. | ETA | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [pcs] |
| Item | gvz | hdg | R | | | | | | | | |
| FBN II 8/5 K | 040806 | 508012 | 508007 | ● | 8 | 51 | 55 | - / 5 | M8 x 24 | 13 | 50 |
| FBN II 8/10 K | 040807 | – | – | ● | 8 | 56 | 60 | - / 10 | M8 x 29 | 13 | 50 |
| FBN II 10/5 K | 040946 | 508013 | 508010 | ● | 10 | 63 | 70 | - / 5 | M10 x 31 | 17 | 50 |
| FBN II 10/10 | 040947 | – | – | ● | 10 | 68 | 75 | - / 10 | M10 x 36 | 17 | 50 |




## Technical data

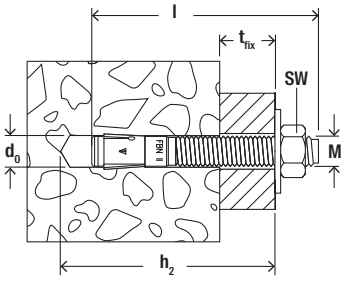
4

**Bolt anchor FBN II K**



FBN II K FBN II K HDG FBN II R

| | Galvanised steel | Hot-dip galvanised steel | Stainless steel | Approval | Drill diameter | Min. drill hole depth for through fixings | Anchor length | Max. usable length hef,stand./ hef,min. | Thread | Width across nut | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $d_0$ | $h_2$ | l | $t_{fix}$ | ø x length | SW | |
| | Item no. | Item no. | Item no. | ETA | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [pcs] |
| Item | gvz | hdg | R | | | | | | | | |
| FBN II 12/5 K | 045272 | 508014 | 508011 | ● | 12 | 75 | 84 | - / 5 | M12 x 39 | 19 | 20 |
| FBN II 12/10 | 045273 | – | – | ● | 12 | 80 | 89 | - / 10 | M12 x 44 | 19 | 20 |
| FBN II 12/30 | 045274 | – | – | ● | 12 | 100 | 109 | - / 30 | M12 x 64 | 19 | 20 |
| FBN II 16/15 K | 045571 | 507597 | 508745 | ● | 16 | 104 | 118 | - / 15 | M16 x 64 | 24 | 10 |
| FBN II 16/25 K | 045572 | – | – | ● | 16 | 114 | 128 | - / 25 | M16 x 74 | 24 | 10 |
| FBN II 20/10 K | 045577 | 543973 | – | ● | 20 | 120 | 142 | - / 10 | M20 x 50 | 30 | 10 |



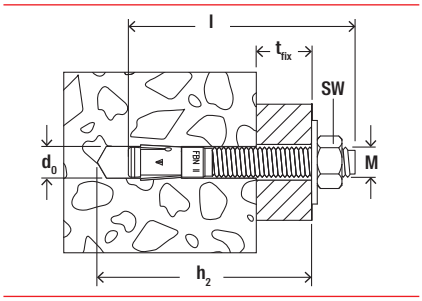

## Technical data

**Bolt anchor FBN II GS**



FBN II GS

| | Galvanised steel | Approval | Drill diameter | Min. drill hole depth for through fixings | Anchor length | Max. usable length hef,stand./ hef,min. | Thread | Width across nut | Washer (outer diameter x thickness) | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | $d_0$ | $h_2$ | l | $t_{fix}$ | ø x length | SW | | |
| | Item no. | ETA | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [pcs] |
| Item | gvz | | | | | | | | | |
| FBN II 12/80 GS | 045578 | ● | 12 | 165 | 174 | 80 / 95 | M12 x 129 | 19 | 44 x 4 | 20 |
| FBN II 12/100 GS | 045579 | ● | 12 | 185 | 194 | 100 / 115 | M12 x 149 | 19 | 44 x 4 | 20 |
| FBN II 12/120 GS | 045580 | ● | 12 | 205 | 214 | 120 / 135 | M12 x 169 | 19 | 44 x 4 | 20 |
| FBN II 12/140 GS | 045581 | ● | 12 | 225 | 234 | 140 / 155 | M12 x 189 | 19 | 44 x 4 | 10 |
| FBN II 12/160 GS | 045583 | ● | 12 | 245 | 254 | 160 / 175 | M12 x 189 | 19 | 44 x 4 | 10 |
| FBN II 12/180 GS | 045584 | ● | 12 | 265 | 274 | 180 / 195 | M12 x 189 | 19 | 44 x 4 | 10 |
| FBN II 12/200 GS | 045585 | ● | 12 | 285 | 294 | 200 / 215 | M12 x 189 | 19 | 44 x 4 | 10 |
| FBN II 12/250 GS | 045586 | ● | 12 | 335 | 344 | 250 / 265 | M12 x 100 | 19 | 44 x 4 | 10 |
| FBN II 16/100 GS | 045588 | ● | 16 | 204 | 218 | 100 / 115 | M16 x 164 | 24 | 56 x 5 | 10 |
| FBN II 16/140 GS | 045590 | ● | 16 | 244 | 258 | 140 / 155 | M16 x 184 | 24 | 56 x 5 | 10 |
| FBN II 16/160 GS | 045591 | ● | 16 | 264 | 278 | 160 / 175 | M16 x 184 | 24 | 56 x 5 | 10 |




## Technical data

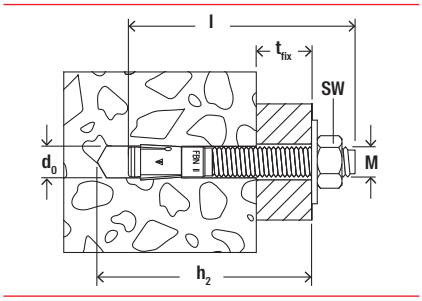


**Bolt anchor FBN II GS**



FBN II GS

| | Galvanised steel | Approval | Drill diameter | Min. drill hole depth for through fixings | Anchor length | Max. usable length hef,stand./ hef,min. | Thread | Width across nut | Washer (outer diameter x thickness) | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | Item no. | ETA | $d_0$ [mm] | $h_2$ [mm] | l [mm] | $t_{fix}$ [mm] | ø x length [mm] | SW [mm] | [mm] | [pcs] |
| **Item** | **gvz** | | | | | | | | | |
| **FBN II 16/200 GS** | **045593** | ● | 16 | 304 | 318 | 200 / 215 | M16 x 100 | 24 | 56 x 5 | 10 |




## Technical data

**Bolt anchor FBN II K GS**



FBN II K GS

| | Item no. | Approval | Drill diameter | Min. drill hole depth for through fixings | Anchor length | Max. usable length hef,stand./hef,min. | Thread | Width across nut | Sales unit |
|---|---|---|---|---|---|---|---|---|---|
| | | ETA | $d_0$ [mm] | $h_2$ [mm] | l [mm] | $t_{fix}$ [mm] | ø x length [mm] | SW [mm] | [pcs] |
| **Item** | | | | | | | | | |
| **FBN II 8/5 K GS** | **558204** | ● | 8 | 51 | 55 | - / 5 | M8 x 24 | 13 | 50 |
| **FBN II 10/10 K GS** | **558205** | ● | 10 | 68 | 75 | - / 10 | M10 x 36 | 17 | 50 |
| **FBN II 12/10 K GS** | **558206** | ● | 12 | 80 | 89 | - / 10 | M12 x 44 | 19 | 20 |

## Technical data

**Bolt anchor setting tool**



FABS



FA-ST II



FA-ST II Set



Replacement spring

| Item | Item no. | Match | Contents | Sales unit [pcs] |
|---|---|---|---|---|
| **FA-ST II M10** | **558790** | Bolt anchor M10 | 1 x SDS Adapter, 1 x Socket SW17 | 1 |
| **FA-ST II M12** | **558791** | Bolt anchor M12 | 1 x SDS Adapter, 1 x Socket SW19 | 1 |
| **FA-ST II M16** | **558792** | Bolt anchor M16 | 1 x SDS Adapter, 1 x Socket SW24 | 1 |
| **FA-ST II Set** | **558789** | Bolt anchor M10 - M16 | 1 x SDS Adapter<br>1 x Socket SW17, SW19, SW24 | 1 |
| **FA-ST II Spring** | **558793** | FA-ST II M10/M12/M16 | 5 x Replacement spring | 1 |
| **FABS** | **077937** | Bolt anchor M6 - M12 | | 1 |

## Loads

**Bolt anchor FBN II**

Permissible loads of a single anchor[1] in normal concrete of strength class C20/25.
For the design the complete assessment ETA-07/0211 of 13.07.202 has to be considered.

| | | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|
| | Material/ surface[2] | Effective anchorage depth | Minimum member thick-ness | Installation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst}$ [Nm] | $N_{perm}$ [3] [kN] | $V_{perm}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] |
| **FBN II 6** | gvz | 30 | 100 | 4 | 2.9 | 3.4 | 40 | 40 |
| | R | 30 | 100 | 4 | 2.9 | 3.0 | 40 | 40 |
| **FBN II 8** | gvz | 30 | 100 | 15 | 2.9 | 6.9 | 40 | 40 |
| | gvz | 40 | 100 | 15 | 5.9 | 7.6 | 40 | 40 |
| | R | 30 | 100 | 10 | 2.9 | 6.9 | 50 | 45 |
| | R | 40 | 100 | 10 | 5.9 | 7.3 | 40 | 45 |
| **FBN II 10** | gvz | 40 | 100 | 30 | 5.9 | 12.0 | 50 | 80 |
| | gvz | 50 | 100 | 30 | 8.3 | 12.0 | 50 | 50 |
| | R | 40 | 100 | 20 | 5.9 | 11.6 | 50 | 80 |
| | R | 50 | 100 | 20 | 8.3 | 11.6 | 70 | 55 |
| **FBN II 12** | gvz | 50 | 100 | 50 | 8.3 | 17.9 | 70 | 100 |
| | gvz | 65 | 120 | 50 | 12.3 | 17.9 | 70 | 70 |
| | R | 50 | 100 | 35 | 8.3 | 15.7 | 70 | 100 |
| | R | 65 | 120 | 35 | 12.3 | 15.7 | 70 | 70 |
| **FBN II 16** | gvz | 65 | 120 | 100 | 12.3 | 28.2 | 90 | 120 |
| | gvz | 80 | 160 | 100 | 16.8 | 31.5 | 90 | 90 |
| | R | 65 | 120 | 80 | 12.3 | 28.2 | 90 | 120 |
| | R | 80 | 160 | 80 | 16.8 | 29.1 | 120 | 80 |
| **FBN II 20** | gvz | 80 | 160 | 200 | 16.8 | 38.3 | 120 | 120 |
| | gvz | 105 | 200 | 200 | 25.2 | 38.3 | 120 | 120 |
| | R | 80 | 160 | 150 | 16.8 | 38.6 | 140 | 120 |
| | R | 105 | 200 | 150 | 25.2 | 49.1 | 120 | 120 |

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA. For anchorage depths below 40 mm, the use of a single anchor is only permitted as part of multiple fastening of non-structural redundant system.
[2] Further steel grades, versions and technical data see ETA, e.g. for dry internal conditions, galvanised steel (gvz); for damp interiors and for outdoor use, stainless steel (R).
[3] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Bolt anchor FWA Plus

The economic fixing solution with ETA approval for non-cracked concrete.





Railings



Steel girders



## Applications

- Steel structures
- Railings
- Consoles
- Ladders
- Cable trays
- Staircases
- Gates

## Advantages

- The ETA Option 7 for non-cracked concrete ensures a high quality standard.
- With the standard anchoring depth, the FWA Plus achieves the highest load-bearing capacity. This means fewer fixing points and smaller anchoring plates.
- The impact pin protects the thread from damage and thus ensures time-saving installation and removal of the attachment.
- The comprehensive M8 - M16 range in galvanised steel enables a wide range of indoor fastenings.
- Quick and easy installation is made possible with the help of the FA-ST II setting tool.

## Certificates / Features

ETA-24/0714, in concrete

## Building materials

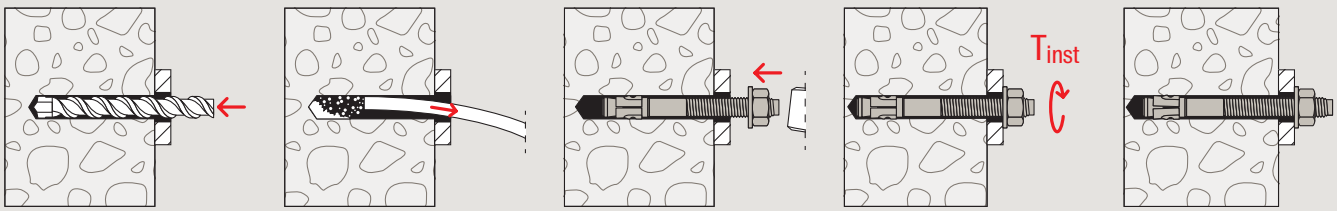
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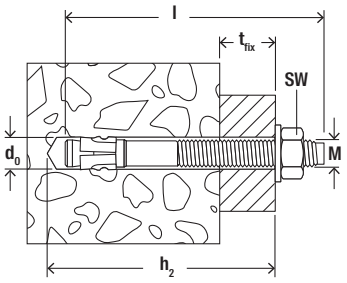
- Concrete C20/25 to C50/60, non-cracked

## Functioning

- The FWA Plus is suitable for pre-positioned and push-through installation.
- When the nut is tightened, the conical bolt is pulled into the expansion clip and braces it against the wall of the drill hole.
- When the specified torque is reached, the anchor is set in accordance with the approval.
- For series installation, we recommend using the FABS or FA-ST II bolt anchor setting tools.

## Installation FWA Plus push-through installation






## Technical data

4

**Bolt anchor FWA Plus**



FWA Plus zp

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Max. fixture thickness $t_{fix}$ [mm] | Anchor length l [mm] | Thread ø x length [mm] | Width across nut SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| **FWA Plus 8/5 zp** | **573557** | ● | 8 | 70 | 48 | 5 | 71 | M8 x 36 | 13 | 50 |
| **FWA Plus 8/10 zp** | **573558** | ● | 8 | 75 | 48 | 10 | 76 | M8 x 41 | 13 | 50 |
| **FWA Plus 8/30 zp** | **573559** | ● | 8 | 95 | 48 | 30 | 96 | M8 x 59 | 13 | 50 |
| **FWA Plus 8/50 zp** | **573560** | ● | 8 | 115 | 48 | 50 | 116 | M8 x 81 | 13 | 50 |
| **FWA Plus 10/10 zp** | **573561** | ● | 10 | 85 | 50 | 10 | 84 | M10 x 46 | 17 | 50 |
| **FWA Plus 10/20 zp** | **573562** | ● | 10 | 95 | 50 | 20 | 94 | M10 x 56 | 17 | 50 |
| **FWA Plus 10/30 zp** | **573563** | ● | 10 | 105 | 50 | 30 | 104 | M10 x 66 | 17 | 50 |
| **FWA Plus 10/50 zp** | **573564** | ● | 10 | 125 | 50 | 50 | 124 | M10 x 86 | 17 | 20 |
| **FWA Plus 10/100 zp** | **573565** | ● | 10 | 175 | 50 | 100 | 174 | M10 x 136 | 17 | 20 |
| **FWA Plus 12/10 zp** | **573566** | ● | 12 | 110 | 70 | 10 | 108 | M12 x 66 | 19 | 20 |
| **FWA Plus 12/20 zp** | **573567** | ● | 12 | 120 | 70 | 20 | 118 | M12 x 76 | 19 | 20 |
| **FWA Plus 12/30 zp** | **573568** | ● | 12 | 130 | 70 | 30 | 128 | M12 x 86 | 19 | 20 |
| **FWA Plus 12/50 zp** | **573569** | ● | 12 | 150 | 70 | 50 | 148 | M12 x 106 | 19 | 20 |
| **FWA Plus 12/100 zp** | **573570** | ● | 12 | 200 | 70 | 100 | 202 | M12 x 160 | 19 | 20 |
| **FWA Plus 16/25 zp** | **573571** | ● | 16 | 145 | 84 | 25 | 144 | M16 x 89 | 24 | 10 |
| **FWA Plus 16/50 zp** | **573572** | ● | 16 | 170 | 84 | 50 | 169 | M16 x 114 | 24 | 10 |
| **FWA Plus 16/100 zp** | **573573** | ● | 16 | 220 | 84 | 100 | 221 | M16 x 166 | 24 | 10 |

## Technical data

**Accessories FA-ST II**



FA-ST II

| Item | Item no. | Match | Contents | Sales unit [pcs] |
|---|---|---|---|---|
| **FA-ST II M10** | **558790** | Bolt anchor M10 | 1 x SDS Adapter, 1 x Socket SW17 | 1 |
| **FA-ST II M12** | **558791** | Bolt anchor M12 | 1 x SDS Adapter, 1 x Socket SW19 | 1 |
| **FA-ST II M16** | **558792** | Bolt anchor M16 | 1 x SDS Adapter, 1 x Socket SW24 | 1 |

# Loads

**Bolt anchor FWA Plus**

Permissible loads of a single anchor[1] in normal concrete of strength class C20/25.
For the design the complete assessment ETA-24/0714 of 2024.10.15 has to be considered.

| | | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|
| | Material/ surface[2] | Effective anchorage depth | Minimum member thickness | Installation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst}$ [Nm] | $N_{perm}$ [3] [kN] | $V_{perm}$ [3] [kN] | $s_{min}$ [3] [mm] | $c_{min}$ [3] [mm] |
| **FWA Plus 8** | gvz | 48 | 100 | 10 | 5.9 | 6.3 | 65 | 65 |
| **FWA Plus 10** | gvz | 50 | 120 | 15 | 7.9 | 8.3 | 95 | 95 |
| **FWA Plus 12** | gvz | 70 | 140 | 35 | 13.4 | 14.5 | 100 | 100 |
| **FWA Plus 16** | gvz | 84 | 170 | 110 | 16.6 | 22.9 | 115 | 115 |

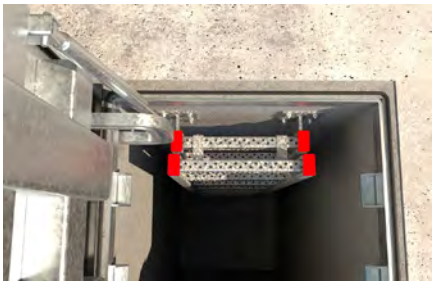
[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_c = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.
[2] Steel material and technical data see ETA.
[3] In the case of combinations of tension and shear loads, bending moments, as well as reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the full ETA and EN 1992-4:2018.

# Bolt anchor FWA (metric)

The cost-effective fixation without approval - for use in non-cracked concrete.







Stormwater overflow tank manholes



Column bases

## Applications

- Steel constructions
- Guard rails
- Consoles
- Ladders
- Cable trays
- Machines
- Staircases
- Gates
- Façades

## Advantages

- The standard anchorage depth achieves high load-bearing capacities. This means that fewer fixing points and smaller anchor plates are required.
- The reduced anchorage depth reduces the drill hole depth. This minimises the amount of time needed for installation whilst increasing flexibility.
- Available with metric and imperial threads

## Building materials

- Concrete C20/25, non-cracked

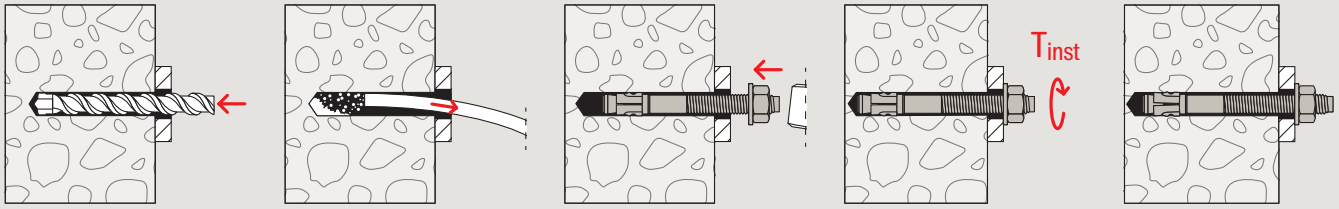
## Versions

- Galvanised steel
- Hot-dip galvanised steel

## Functioning

- The FWA is suitable for pre-positioned and push-through installation.
- Prior to installation, place the hex nut in the optimal position (the drive-in pin projects by approx. 3 mm out of the hex nut).
- When the torque is applied, the cone bolt is pulled into the expansion clip and expands it against the drill hole wall.

## Installation FWA



## Technical data

**Bolt anchor FWA (metric)**



FWA FWA hdg

| Item | Galvanised steel Item no. gvz | Hot-dip galvanised steel Item no. hdg | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Width across nut SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| FWA 6 x 40 | 045536 | – | 6 | 40 | 40 | 3 | 10 | 100 |
| FWA 6 x 55 | 045582 | – | 6 | 55 | 55 | 15 | 10 | 100 |
| FWA 6 x 70 | 045598 | – | 6 | 70 | 70 | 30 | 10 | 100 |
| FWA 8 x 50 | 045644 | – | 8 | 50 | 50 | 5 | 13 | 50 |
| FWA 8 x 60 | 502893 | – | 8 | 60 | 60 | 15 | 13 | 50 |
| FWA 8 x 65 | 045788 | 502922 | 8 | 65 | 65 | 20 | 13 | 50 |
| FWA 8 x 80 | 045789 | 502923 | 8 | 80 | 80 | 35 | 13 | 50 |
| FWA 8 x 95 | 045790 | 502924 | 8 | 95 | 95 | 50 | 13 | 50 |
| FWA 8 x 120 | 045791 | 502925 | 8 | 120 | 120 | 75 | 13 | 50 |
| FWA 10 x 65 | 045645 | – | 10 | 65 | 65 | 10 | 17 | 50 |
| FWA 10 x 80 | 045792 | 502926 | 10 | 80 | 80 | 25 | 17 | 50 |
| FWA 10 x 95 | 045793 | 502927 | 10 | 95 | 95 | 40 | 17 | 50 |
| FWA 10 x 115 | 045794 | 502928 | 10 | 115 | 115 | 60 | 17 | 25 |
| FWA 10 x 130 | 045646 | 502929 | 10 | 130 | 130 | 75 | 17 | 25 |
| FWA 10 x 140 | 503367 | – | 10 | 140 | 140 | 85 | 17 | 25 |
| FWA 10 x 160 | 503368 | – | 10 | 160 | 160 | 105 | 17 | 25 |
| FWA 10 x 180 | 503369 | – | 10 | 180 | 180 | 115 | 17 | 25 |
| FWA 10 x 200 | 503370 | – | 10 | 200 | 200 | 135 | 17 | 25 |
| FWA 12 x 80 | 045647 | 502972 | 12 | 80 | 80 | 10 | 19 | 25 |
| FWA 12 x 100 | 045648 | 502973 | 12 | 100 | 100 | 30 | 19 | 25 |
| FWA 12 x 120 | 045795 | 502974 | 12 | 120 | 120 | 50 | 19 | 25 |
| FWA 12 x 150 | 045796 | 502975 | 12 | 150 | 150 | 80 | 19 | 25 |
| FWA 12 x 160 | 503371 | – | 12 | 160 | 160 | 90 | 19 | 25 |
| FWA 12 x 180 | 503372 | – | 12 | 180 | 180 | 110 | 19 | 25 |
| FWA 12 x 200 | 503373 | – | 12 | 200 | 200 | 130 | 19 | 25 |
| FWA 12 x 220 | 503374 | – | 12 | 220 | 220 | 150 | 19 | 25 |
| FWA 12 x 240 | 503377 | – | 12 | 240 | 240 | 170 | 19 | 25 |
| FWA 16 x 105 | 045649 | 502976 | 16 | 105 | 105 | 15 | 24 | 20 |
| FWA 16 x 125 | – | 502977 | 16 | 125 | 125 | 35 | 24 | 20 |
| FWA 16 x 125 | 502921 | – | 16 | 115 | 125 | 35 | 24 | 20 |
| FWA 16 x 140 | 045798 | 502978 | 16 | 140 | 140 | 50 | 24 | 10 |
| FWA 16 x 180 | 045799 | 502979 | 16 | 180 | 180 | 90 | 24 | 10 |
| FWA 16 x 200 | 503379 | – | 16 | 190 | 200 | 110 | 24 | 10 |
| FWA 20 x 120 | – | 502872 | 20 | 120 | 120 | – | 30 | 10 |
| FWA 20 x 160 | 045800 | 502980 | 20 | 160 | 160 | 40 | 30 | 10 |
| FWA 20 x 200 | 503382 | – | 20 | 190 | 200 | 80 | 30 | 10 |
| FWA 20 x 220 | 056133 | – | 20 | 210 | 220 | 100 | 30 | 10 |
| FWA 20 x 240 | 503383 | – | 20 | 230 | 240 | 120 | 30 | 10 |

## Technical data

**Bolt anchor FWA (imperial)**



FWA

| Item | Item no. | Drill diameter $d_0$ [in] | Min. drill hole depth $h_1$ [in] | Anchor length l [in] | Max. fixing thickness [in] | Thread [in] | Width across nut SW [in] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| FWA 1/2 x 2-3/4 | 048988 | 1/2 | 2 5/8 | 2 3/4 | 1/4 | 1/2 | 3/4 | 20 |
| FWA 1/2 x 3-3/4 | 048992 | 1/2 | 3 5/8 | 3 3/4 | 1/2 | 1/2 | 3/4 | 20 |
| FWA 1/2 x 4 | 048993 | 1/2 | 3 7/8 | 4 | 3/4 | 1/2 | 3/4 | 20 |

## Technical data

**Bolt anchor FWA (imperial)**



FWA

| Item | Item no. | Drill diameter $d_0$ [in] | Min. drill hole depth $h_1$ [in] | Anchor length l [in] | Max. fixing thickness [in] | Thread [in] | Width across nut SW [in] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| FWA 1/2 x 4-1/4 | 048995 | 1/2 | 4 3/8 | 4 1/4 | 1 | 1/2 | 3/4 | 20 |
| FWA 1/2 x 5-1/2 | 048996 | 1/2 | 5 3/8 | 5 1/2 | 2 1/4 | 1/2 | 3/4 | 20 |
| FWA 1/2 x 7 | 049013 | 1/2 | 6 7/8 | 7 | 3 3/4 | 1/2 | 3/4 | 20 |
| FWA 1/4 x 1-3/4 | 048934 | 1/4 | 1 5/8 | 1 3/4 | – | 1/4 | 7/16 | 100 |
| FWA 1/4 x 2-1/4 | 048936 | 1/4 | 2 1/8 | 2 1/4 | 5/8 | 1/4 | 7/16 | 100 |
| FWA 1/4 x 3 | 048937 | 1/4 | – | 3 | – | 1/4 | 7/16 | 100 |
| FWA 1/4 x 3-1/4 | 048938 | 1/4 | 3 1/8 | – | 3/8 | 1/4 | 7/16 | 100 |
| FWA 1 x 6 | 049120 | 1 | 5 7/8 | 6 | – | 1 | 1 1/2 | 5 |
| FWA 1 x 9 | 049122 | 1 | 8 7/8 | 9 | 3 | 1 | 1 1/2 | 5 |
| FWA 3/4 x 4-1/4 | 049084 | 3/4 | 4 3/8 | 4 1/4 | 1/4 | 3/4 | 1 1/8 | 10 |
| FWA 3/4 x 4-3/4 | 049085 | 3/4 | 4 5/8 | 4 3/4 | 1/4 | 3/4 | 1 1/8 | 10 |
| FWA 3/4 x 5-1/2 | 049086 | 3/4 | 5 3/8 | 5 1/2 | 1 | 3/4 | 1 1/8 | 10 |
| FWA 3/4 x 6-1/4 | 049087 | 3/4 | 6 3/8 | 6 1/4 | 1 3/4 | 3/4 | 1 1/8 | 10 |
| FWA 3/4 x 7 | 049088 | 3/4 | 6 7/8 | 7 | – | 3/4 | 1 1/8 | 5 |
| FWA 3/4 x 8-1/2 | 049089 | 3/4 | 8 3/8 | 8 1/2 | 4 | 3/4 | 1 1/8 | 5 |
| FWA 3/4 x 10 | 049095 | 3/4 | 9 7/8 | 10 | 5 1/2 | 3/4 | 1 1/8 | 5 |
| FWA 3/8 x 2-1/4 | 048944 | 3/8 | 2 1/8 | 2 1/4 | 1/8 | 5/8 | 9/16 | 50 |
| FWA 3/8 x 2-3/4 | 048945 | 3/8 | 2 5/8 | 2 3/4 | 1/4 | 5/8 | 9/16 | 50 |
| FWA 3/8 x 3 | 048946 | 3/8 | 2 7/8 | 3 | 1/2 | 5/8 | 9/16 | 50 |
| FWA 3/8 x 3-1/2 | 048947 | 3/8 | 3 3/8 | 3 1/2 | 1 | 5/8 | 9/16 | 50 |
| FWA 3/8 x 3-3/4 | 048948 | 3/8 | 3 5/8 | 3 3/4 | 3/8 | 5/8 | 9/16 | 50 |
| FWA 3/8 x 4-1/2 | 048949 | 3/8 | 4 3/8 | 4 1/2 | 2 | 5/8 | 9/16 | 20 |
| FWA 3/8 x 5 | 048950 | 3/8 | 4 7/8 | 5 | – | 5/8 | 9/16 | 20 |
| FWA 5/8 x 3-1/2 | 049022 | 5/8 | 3 3/8 | 3 1/2 | 1/4 | 7/8 | 15/16 | 10 |
| FWA 5/8 x 4-1/2 | 049025 | 5/8 | 4 3/8 | 4 1/2 | 1 | 7/8 | 15/16 | 10 |
| FWA 5/8 x 5 | 049026 | 5/8 | 4 7/8 | 5 | 1 | 7/8 | 15/16 | 10 |
| FWA 5/8 x 6 | 049031 | 5/8 | 5 7/8 | 6 | 2 1/8 | 7/8 | 15/16 | 10 |
| FWA 5/8 x 7 | 049043 | 5/8 | 6 7/8 | 7 | 3 1/8 | 7/8 | 15/16 | 10 |
| FWA 5/8 x 8-1/2 | 049080 | 5/8 | 8 3/8 | 8 1/2 | 4 1/2 | 7/8 | 15/16 | 10 |
| FWA 5/16 x 2 | 048939 | 5/16 | – | 2 | – | 5/16 | 1/2 | 50 |
| FWA 5/16 x 2-3/4 | 048940 | 5/16 | 2 5/8 | 2 3/4 | – | 5/16 | 1/2 | 50 |
| FWA 5/16 x 3-1/2 | 048941 | 5/16 | 3 3/8 | 3 1/2 | 1 3/8 | 5/16 | 1/2 | 50 |

## Loads

**Wedge Anchor FWA**

Recommended loads of a single anchor[1] in normal concrete of strength class C20/25.

| | | | | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Recommended tension ($N_{rec}$), shear loads ($V_{rec}$), minimum spacing ($s_{min}$) and edge distances ($c_{min}$) | | | |
| Type | Material / surface[3] | Effective anchorage depth $h_{ef} \geq$ [mm] | Minimum member thickness $h_{min}$ [mm] | Drill hole diameter $d_0$ [mm] | Drill hole diameter in fixture[2] $d_f$ [mm] | Installation torque $T_{inst}$ [Nm] | $N_{rec}$[3] [kN] | $V_{rec}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] |
| **FWA 6** | gvz | 25 | 100 | 6 | 8 | 4 | 1.3 | 1.3 | 80 | 40 |
| | gvz | 30 | 100 | 6 | 8 | 4 | 2.1 | 1.7 | 100 | 50 |
| **FWA 8** | gvz / shrd | 25 | 100 | 8 | 10 | 10 | 1.4 | 1.4 | 80 | 40 |
| | gvz / shrd | 35 | 100 | 8 | 10 | 10 | 2.8 | 2.8 | 90 | 45 |
| **FWA 10** | gvz / shrd | 25 | 100 | 10 | 13 | 25 | 1.8 | 1.8 | 90 | 45 |
| | gvz / shrd | 35 | 100 | 10 | 13 | 25 | 2.8 | 2.8 | 120 | 60 |
| | gvz / shrd | 45 | 100 | 10 | 13 | 25 | 3.8 | 3.8 | 150 | 75 |
| **FWA 12** | gvz / shrd | 35 | 100 | 12 | 15 | 40 | 3.2 | 3.2 | 120 | 60 |
| | gvz / shrd | 45 | 100 | 12 | 15 | 40 | 4.4 | 4.4 | 150 | 75 |
| | gvz / shrd | 55 | 110 | 12 | 15 | 40 | 5.8 | 5.8 | 180 | 90 |
| **FWA 16** | shrd | 45 | 100 | 16 | 19 | 100 | 4.4 | 4.4 | 150 | 75 |
| | gvz | 50 | 100 | 16 | 19 | 100 | 4.4 | 4.4 | 150 | 75 |
| | shrd | 60 | 120 | 16 | 19 | 100 | 6.2 | 6.2 | 200 | 100 |
| | gvz | 65 | 130 | 16 | 19 | 100 | 6.2 | 6.2 | 200 | 100 |
| | shrd | 75 | 150 | 16 | 19 | 100 | 8.5 | 8.5 | 240 | 120 |
| | gvz | 80 | 160 | 16 | 19 | 100 | 8.5 | 8.5 | 240 | 120 |
| **FWA 20** | shrd | 70 | 150 | 20 | 23 | 200 | 8.0 | - | 210 | 105 |
| | gvz / shrd | 75 | 150 | 20 | 23 | 200 | 9.7 | 9.7 | 240 | 120 |
| | gvz / shrd | 95 | 190 | 20 | 23 | 200 | 13.5 | 13.5 | 300 | 150 |
| **FWA 24** | gvz | 95 | 190 | 24 | 28 | 260 | 15.0 | - | 300 | 150 |
| | gvz | 120 | 240 | 24 | 28 | 260 | 16.0 | - | 360 | 180 |

[1] The partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$.
[2] For push-throught installation.
[3] As recommended loades are given in the table, combinations of tensile and shear loads, bending moments and reduced edge and axial spacings (anchor groups) can not be carried out.

## Loads

**Wedge Anchor FWA**

Recommended loads of a single anchor[1] in normal concrete of strength class 3000 Psi.

| | | | | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Recommended tension ($N_{rec}$), shear loads ($V_{rec}$), minimum spacing ($s_{min}$) and edge distances ($c_{min}$) | | | |
| Type | Material / surface[3] | Effective anchorage depth $h_{ef} \geq$ [in] | Minimum member thickness $h_{min}$ [in] | Drill hole diameter $d_0$ [in] | Drill hole diameter in fixture[2] $d_f$ [in] | Installation torque $T_{inst}$ [lbf-ft] | $N_{rec}$[3] [lb] | $V_{rec}$[3] [lb] | $s_{min}$[3] [in] | $c_{min}$[3] [in] |
| **FWA 1/4** | gvz | 1 | 4 | 1/4 | 3/8 | 3 | 202 | - | 3 | 1 1/2 |
| | gvz | 1 1/8 | 4 | 1/4 | 3/8 | 3 | 540 | 315 | 3 1/2 | 1 3/4 |
| **FWA 5/16** | gvz | 1 1/4 | 4 | 5/16 | 7/16 | 7 | 719 | 427 | 3 3/4 | 1 7/8 |
| **FWA 3/8** | gvz | 1 1/8 | 4 | 3/8 | 1/2 | 19 | 472 | - | 3 1/2 | 1 3/4 |
| | gvz | 1 5/16 | 4 | 3/8 | 1/2 | 19 | 944 | 562 | 4 | 2 |
| **FWA 1/2** | gvz | 1 3/8 | 4 | 1/2 | 5/8 | 30 | 764 | - | 4 1/8 | 2 1/8 |
| | gvz | 1 7/8 | 4 | 1/2 | 5/8 | 30 | 1461 | 854 | 5 3/4 | 2 7/8 |
| **FWA 5/8** | gvz | 2 | 4 | 5/8 | 7/8 | 74 | 1124 | - | 6 | 3 1/8 |
| | gvz | 2 3/8 | 4 3/4 | 5/8 | 7/8 | 74 | 2158 | 1281 | 7 1/8 | 3 5/8 |
| **FWA 3/4** | gvz | 2 1/2 | 5 | 3/4 | 1 | 148 | 2428 | - | 7 5/8 | 3 7/8 |
| | gvz | 2 3/4 | 5 1/2 | 3/4 | 1 | 148 | 3147 | 1866 | 8 1/4 | 4 1/8 |
| **FWA 1"** | gvz | 3 3/4 | 7 1/2 | 1 | 1 1/4 | 192 | 4406 | - | 11 1/4 | 5 5/8 |
| | gvz | 3 7/8 | 7 3/4 | 1 | 1 1/4 | 192 | 4676 | - | 11 5/8 | 5 7/8 |

[1] The partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$.
[2] For push-throught installation.
[3] As recommended loades are given in the table, combinations of tensile and shear loads, bending moments and reduced edge and axial spacings (anchor groups) can not be carried out.

# Heavy-duty anchor TA M

The installation-friendly internally threaded anchor for fixings in non-cracked concrete.








Fall protection devices



Plant construction

## Applications

- Steel constructions
- Handrails
- Consoles
- Ladders
- Cable trays
- Machines
- Staircases
- Gates
- Façades
- Stand-off installations

## Advantages

- The optimised geometry minimises setting energy and allows for use in extremely narrow spaces. This allows for user-friendly installation.
- The three-part expansion sleeve creates even load distribution, thus allowing small edge and axial spacing. Thus the TA M is extremely flexible.
- The metric internal thread allows to use standard screws or threaded rods for the ideal adaptation to suit the intended use.
- The red plastic cap protects against soiling and thus ensures free-running of the thread.

## Certificates / Features

ETA-04/0003, for non-crcked concrete

## Building materials

**Approved for:**

- Concrete C20/25 to C50/60, non-cracked

**Also suitable for:**

- Concrete C12/15
- Natural stone with dense structure

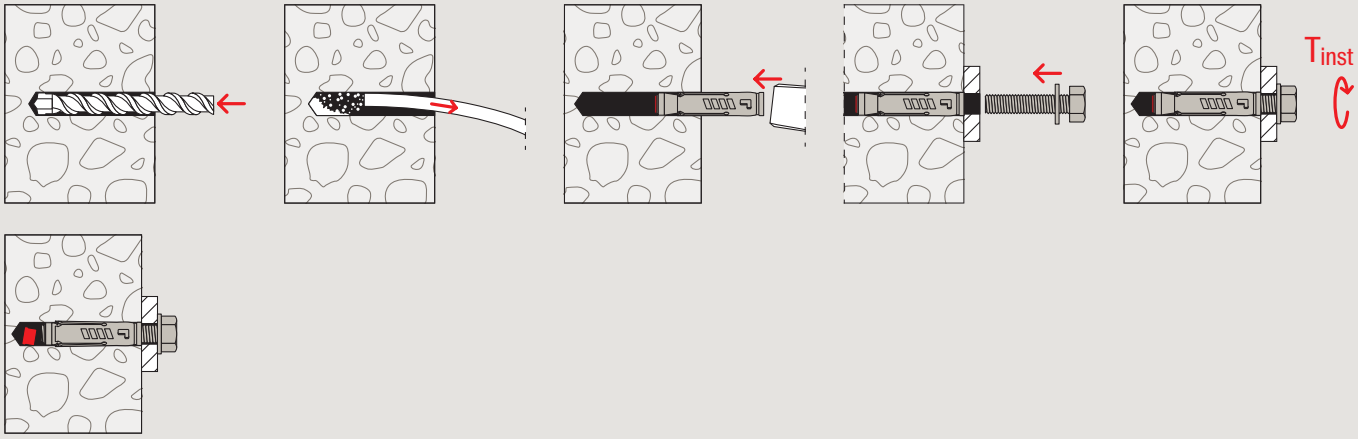
## Versions

- Galvanised steel

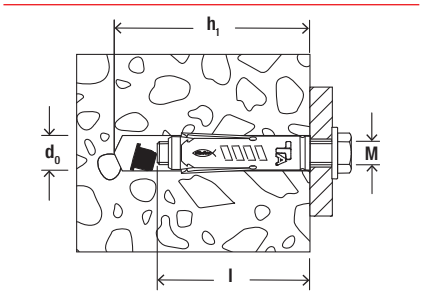
## Functioning

- The TAM is suitable for pre-positioned installation.
- When applying the torque, the cone is pulled into the expansion sleeve and expands it against the drill hole wall.
- For correct installation, it must be ensured that the pre-positioned anchor TA M can be supported on the attachment, or that the threaded rod is countered.
- Determining the screw length ls:
  Screw length $l_s$ =
  Length of fixing
  + Thickness of fixture $t_{fix}$
  + Thickness of washer.

## Installation TA M





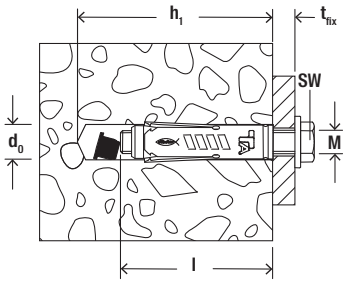

## Technical data

**Heavy-duty anchor TA M**



TA M

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Internal thread M | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **TA M6** | **090245** | ● | 10 | 65 | 49 | M6 | 50 |
| **TA M8** | **090246** | ● | 12 | 70 | 56 | M8 | 50 |
| **TA M10** | **090247** | ● | 15 | 90 | 69 | M10 | 25 |
| **TA M12** | **090248** | ● | 18 | 105 | 86 | M12 | 25 |





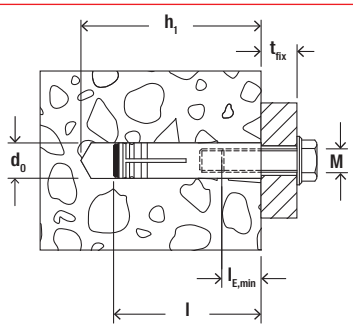

## Technical data

**Heavy-duty anchor TA M-S**



TA M-S

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Width across nut SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **TA M6 S/10** | **090249** | ● | 10 | 65 | 49 | 10 | M6 x 60 | 10 | 50 |
| **TA M8 S/10** | **090250** | ● | 12 | 70 | 56 | 10 | M8 x 65 | 13 | 50 |
| **TA M10 S/20** | **090251** | ● | 15 | 90 | 69 | 20 | M10 x 90 | 17 | 25 |
| **TA M12 S/25** | **090252** | ● | 18 | 105 | 86 | 25 | M12 x 110 | 19 | 20 |



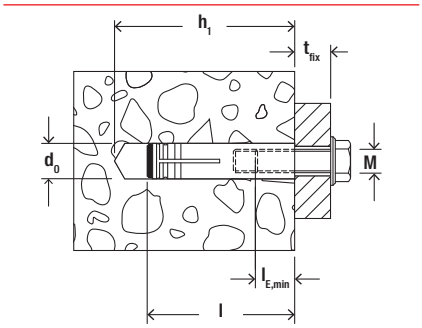

## Technical data

**Heavy-duty anchor SL M**



SL M

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Internal thread M | Min. bolt penetration $l_{E,min}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **SL M16** | **050556** | 24 | 110 | 90 | M16 | 90 | 10 |
| **SL M20** | **050557** | 30 | 130 | 110 | M20 | 110 | 5 |
| **SL M24** | **050558** | 35 | 150 | 125 | M24 | 125 | 5 |






## Technical data

**Heavy-duty anchor SL M-N**



SL M-N R

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Internal thread M | Min. bolt penetration $l_{E,min}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **SL M8 N R** | **050526** | 12 | 60 | 54 | M8 | 52 | 25 |
| **SL M10 N R** | **050527** | 16 | 70 | 62 | M10 | 62 | 20 |

## Loads

**Heavy-duty anchor TA M**

Permissible loads of a single anchor[1] in normal concrete of strength class C20/25.
For the design the complete current assessmentt ETA-04/0003 has to be considered.

| Type | Material/ surface[2] | Screw material | Effective anchorage depth $h_{ef}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Installation torque $T_{inst}$ [Nm] | Non-cracked concrete: Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] |
| **TA M6** | gvz | 8.8 | 40 | 100 | 10 | 3.6 | 3.3 | 80 | 50 |
| **TA M8** | gvz | 8.8 | 45 | 100 | 20 | 5.7 | 6.7 | 90 | 60 |
| **TA M10** | gvz | 8.8 | 55 | 110 | 40 | 9.5 | 11.0 | 110 | 70 |
| **TA M12** | gvz | 8.8 | 70 | 140 | 75 | 11.9 | 17.0 | 160 | 120 |

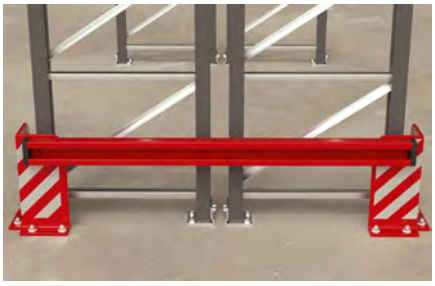
[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered. As a single anchor counts e.g. an anchor with a spacing s ≥ 3 x $h_{ef}$ and an edge distance c ≥ 1.5 x $h_{ef}$. Accurate data see ETA.
[2] For technical data on steel grade and variants, see ETA.
[3] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Heavy-duty anchor TA M-T

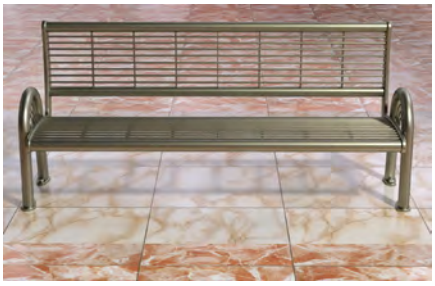
The installation-friendly push-through anchor for fixings in non-cracked concrete.







Collision protection



Benches

## Applications

- Steel constructions
- Handrails
- Consoles
- Ladders
- Cable trays
- Machines
- Staircases
- Gates
- Façades

## Advantages

- The optimised geometry minimises setting energy and allows for use in extremely narrow spaces. This allows for user-friendly installation.
- The three-part expansion sleeve creates even load distribution, thus allowing small edge and axial spacing. Thus the TA M-T is extremely flexible.
- The TA M-BP version with twist-off head hinders the dismantling of the fixture for use as a theft-deterrent and break-in protection.
- The detachable screw connection allows for surface flush removal.

## Certificates / Features

ETA-04/0003, for non-crcked concrete

## Building materials

**Approved for:**

- Concrete C20/25 to C50/60, non-cracked

**Also suitable for:**

- Concrete C12/15
- Natural stone with dense structure

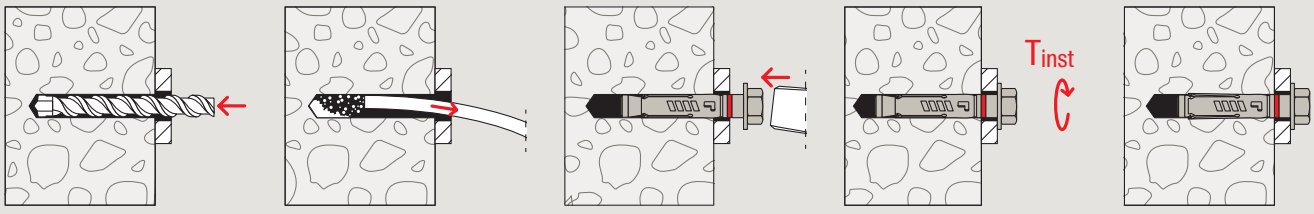
## Versions

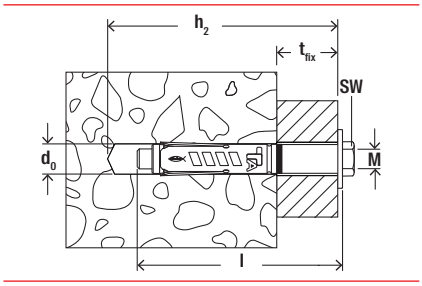
- Galvanised steel

## Functioning

- The TA M-T is suitable for push-through installation.
- When applying the torque, the cone is pulled into the expansion sleeve and expands it against the drill hole wall.
- The hexagonal head of the TA M-BP is tightened until it breaks off.

## Installation TA M-T






## Technical data

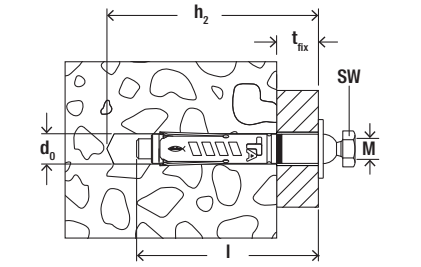


**Heavy-duty anchor TA M-T push-through installation**



TA M-T

| | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Thread M | Width across nut SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | | | |
| **TA M8 T/25 S** | **090268** | ● | 12 | 95 | 84 | 25 | M8 | 13 | 50 |
| **TA M10 T/25 S** | **090269** | ● | 15 | 110 | 100 | 25 | M10 | 17 | 25 |
| **TA M12 T/25 S** | **090270** | ● | 18 | 120 | 114 | 25 | M12 | 19 | 20 |




## Technical data

**Heavy-duty anchor TA M-T BP**



TA M-BP

| | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Thread M | Width across nut SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | | |
| **TA M8 BP** | **090265** | 12 | 95 | 84 | 25 | M8 | 13 | 50 |

# Loads

**Heavy-duty anchor TA M-T**

Permissible loads of a single anchor[1] in normal concrete of strength class C20/25.
For the design the complete current assessmentt ETA-04/0003 has to be considered.

| | | | | | | Non-cracked concrete | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Material/ surface[2] | Screw material | Effective anchorage depth | Minimum member thickness | Installation torque | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| Type | | | $h_{ef}$ [mm] | $h_{min}$ [mm] | $T_{inst}$ [Nm] | $N_{perm}$[3] [kN] | $V_{perm}$[3] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] |
| **TA M8 T** | gvz | 8.8 | 45 | 100 | 20 | 5.7 | 6.7 | 90 | 60 |
| **TA M10 T** | gvz | 8.8 | 55 | 110 | 40 | 9.5 | 11.0 | 110 | 70 |
| **TA M12 T** | gvz | 8.8 | 70 | 140 | 75 | 11.9 | 17.0 | 160 | 120 |

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see ETA.
[2] For technical data on steel grade and variants, see ETA.
[3] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete ETA and the provisions of the EN 1992-4:2018. We recommend using our anchor design software C-FIX.

# Sleeve anchor FSA

The sleeve anchor for the push-through installation of structural anchorings in non-cracked concrete.





Bicycle racks



Waste bins



## Applications

- Handrails
- Consoles
- Ladders
- Cable trays
- Gates
- Façades
- Temporary or structural fixings

## Advantages

- The optimised geometry minimises setting energy and enables the use in extremely narrow spaces. This allows for user-friendly installation.
- The anchor design makes it possible to use different head shapes for flexible design solutions: Hexagon head (type S), bolt version with nut and washer (type B).
- The detachable screw connection allows for surface flush removal.

## Building materials

**Suitable for:**

- Concrete C12/15 to C20/25, non-cracked
- Natural stone with dense structure

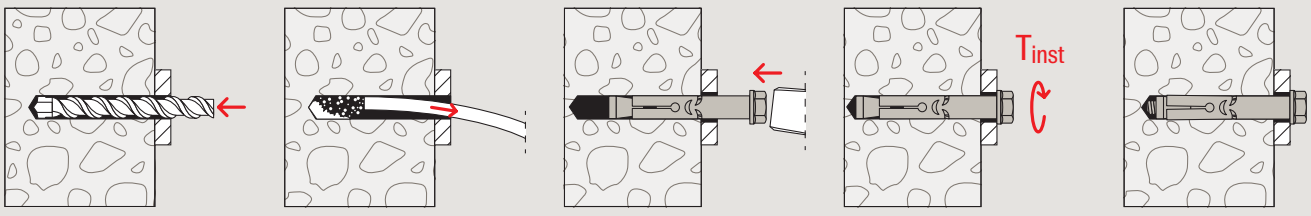
## Versions

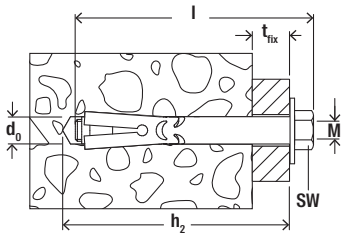
- Galvanised steel

## Functioning

- The FSA is suitable for push-through installation.
- When applying the torque, the cone is pulled into the expansion sleeve and expands it against the drill hole wall.
- The half-moon shaped recesses act as a crumple zone to take the torque slippage, so that the attachment is pulled onto the anchor base.

## Installation FSA






## Technical data

4

**Sleeve anchor FSA-S**



FSA-S

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Max. fixture thickness $t_{fix}$ [mm] | Anchor length l [mm] | Thread M | Width across nut SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FSA 8 x 60/15 S** | **068520** | 8 | 65 | 15 | 64 | M6 | 10 | 50 |
| **FSA 8 x 85/40 S** | **068521** | 8 | 90 | 40 | 89 | M6 | 10 | 50 |
| **FSA 8 x 110/65 S** | **068522** | 8 | 115 | 65 | 114 | M6 | 10 | 50 |
| **FSA 10 x 60/10 S** | **068523** | 10 | 65 | 10 | 65 | M8 | 13 | 20 |
| **FSA 10 x 85/35 S** | **068524** | 10 | 90 | 35 | 90 | M8 | 13 | 20 |
| **FSA 10 x 110/60 S** | **068525** | 10 | 115 | 60 | 115 | M8 | 13 | 20 |
| **FSA 12 x 70/10 S** | **068526** | 12 | 75 | 10 | 76 | M10 | 17 | 20 |
| **FSA 12 x 85/25 S** | **068527** | 12 | 90 | 25 | 91 | M10 | 17 | 20 |
| **FSA 12 x 110/50 S** | **068528** | 12 | 115 | 50 | 116 | M10 | 17 | 20 |

## Technical data

**Sleeve anchor FSA-B**



FSA-B

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Max. fixture thickness $t_{fix}$ [mm] | Anchor length l [mm] | Thread M | Width across nut SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FSA 8 x 55/15 B** | **068500** | 8 | 65 | 15 | 65 | M6 | 10 | 50 |
| **FSA 8 x 80/40 B** | **068501** | 8 | 90 | 40 | 90 | M6 | 10 | 50 |
| **FSA 8 x 105/65 B** | **068502** | 8 | 115 | 65 | 115 | M6 | 10 | 50 |
| **FSA 10 x 55/10 B** | **068503** | 10 | 65 | 10 | 69 | M8 | 13 | 20 |
| **FSA 10 x 80/35 B** | **068504** | 10 | 90 | 35 | 94 | M8 | 13 | 20 |
| **FSA 10 x 105/60 B** | **068505** | 10 | 115 | 60 | 119 | M8 | 13 | 20 |
| **FSA 12 x 65/10 B** | **068506** | 12 | 75 | 10 | 81 | M10 | 17 | 20 |
| **FSA 12 x 80/25 B** | **068507** | 12 | 90 | 25 | 96 | M10 | 17 | 20 |
| **FSA 12 x 105/50 B** | **068508** | 12 | 115 | 50 | 121 | M10 | 17 | 20 |
| **FSA 12 x 130/75 B** | **068509** | 12 | 140 | 75 | 146 | M10 | 17 | 20 |

# Loads

**Sleeve anchor FSA**

Recommended loads[1] of a single anchor in normal concrete of strength class C20/25.

| Type | Material/ surface | Effective anchorage depth $h_{ef}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Installation torque $T_{inst}$ [Nm] | Char. spacing $s_{cr,N}$ [mm] | Char. edge distance $c_{cr,N}$ [mm] | Non-cracked concrete: Recommended tension ($N_{rec}$) and shear loads ($V_{rec}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | $N_{rec}$[2] [kN] | $V_{rec}$[2] [kN] | $s_{min}$[3] [mm] | $c_{min}$[3] [mm] |
| **FSA 8** | gvz | 35 | 70 | 8 | 105 | 53 | 2.0 | 3.4 | 70 | 50 |
| **FSA 10** | gvz | 40 | 80 | 25 | 120 | 60 | 3.5 | 6.3 | 80 | 60[4] |
| **FSA 12** | gvz | 50 | 100 | 40 | 150 | 75 | 5.0 | 9.9 | 100 | 75[4] |

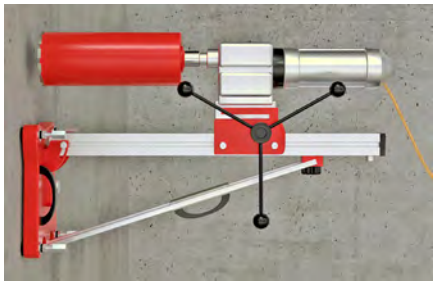
[1] Required safety factors are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$.
[2] In the case of combinations of tension and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance the provisions of the EN 1992-4:2018.
[3] Minimum possible axial spacings resp. edge distance while reducing the recommended load.
[4] No reduction of the recommended tensile load.

# Fixing set for diamond drills FDBB

The reusable fixing system for diamond drills and saws.







Diamond drills



Detail: Diamond drills

## Applications

- Diamond and core drilling devices
- Diamond saws

## Advantages

- The detachable screw connection between the expansion element and spindle enables simple dismantling and ensures that the spindle bolt can be reused.
- The robust, reusable spindle bolt guarantees a long life span.
- The active principle of the anchor bolt enables an active controlled expansion, thus offering a high level of safety.
- The large steel cross-section provides high shear load-bearing capability and, as such, high security for the jerky stoppage of the drill bit.

## Building materials

**Suitable for:**

- Concrete C12/15 to C50/60, non-cracked
- Natural stone with dense structure

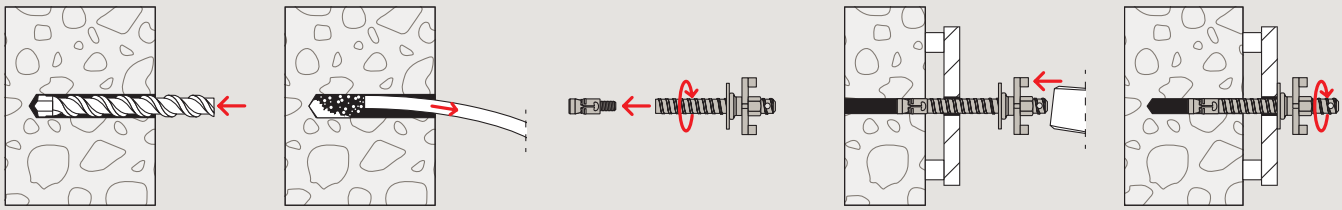
## Versions

- Galvanised steel

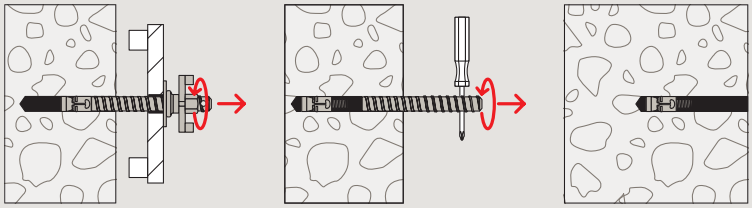
## Functioning

- The FDBB is suitable for pre-positioned and push-through installation.
- An expansion element must be added to the spindle bolt before installation.
- Use a hammer to drive the FDBB through the base plate of the drilling device into the drill hole.
- When the nut is tightened, the cone bolt is pulled into the expansion clip and expands it against the drill hole wall.
- The expansion element remains in the drill hole when dismantling the spindle bolt. The spindle bolt is once again completed with an expansion element and can be reused.

## Installation FDBB



## Deinstallation





## Technical data

**Fixing set for diamond drills FDBB**



FDBB FDBB SE

| | Item no. | Drill diameter $d_0$ [mm] | Usable length $t_{fix}$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Width across nut SW [mm] | Length l [mm] | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | | |
| **FDBB 16/50 Set** | **090680** | 16 | 50 | 85 | 27 | 200 | 1 x Expansion element 16 SE, 1 x spindle bolt 16/50/160, 1 x washer, 1 x nut | 1 |
| **FDBB 16/250 Set** | **554060** | 16 | 250 | 85 | 27 | 400 | 1 x Expansion element 16 SE, 1 x spindle bolt 16/260/360, 1 x washer, 1 x nut | 1 |
| **FDBB 16 SE** | **090681** | 16 | – | – | – | – | 25 x Expansion element 16 SE | 25 |

## Loads

**Fixing set for Diamond Drills FDBB**

Recommended loads[1] for a single anchor in normal concrete of strength class C12/15 and C20/25.

| | | Non-cracked concrete C12/15 | | C20/25 | |
|---|---|---|---|---|---|
| | Recommended bending moment | Recommended tension ($N_{rec}$) and shear loads ($V_{rec}$) | | | |
| Type | $M_{empf}$ [Nm] | $N_{rec}$ [kN] | $V_{rec}$ [2] [kN] | $N_{rec}$ [mm] | $V_{rec}$ [2] [mm] |
| **FDBB** | 98.0 | 9.0 | 13.3 | 12.0 | 13.3 |

[1] Required safety factors are considered.
[2] Only steel failure is considered.

# Wall screw MR

The fixing with simple hammerset installation in non-cracked concrete.







Radiators

## Applications

- Non-approval-relevant fixings only
- Handrails
- Gratings
- Garden gates

## Advantages

- The special construction of the anchor sleeve enables it to be set into the drill hole with a low number of hammer blows. This enables easy installation.
- The flush-sunk expansion pin signifies the complete expansion of the anchor, and thereby ensures minimum movement when under load.
- The special geometry of the expansion pin reduces the setting energy, thereby enabling a fast and energy-saving installation.

## Building materials

**Suitable for:**

- Concrete C12/15 to C50/60, non-cracked
- Natural stone with dense structure

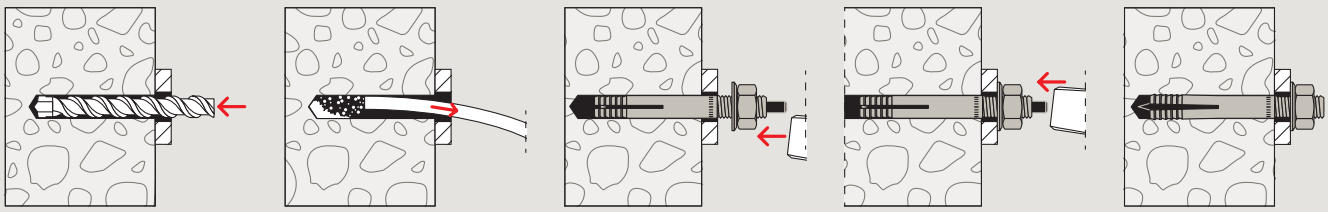
## Versions

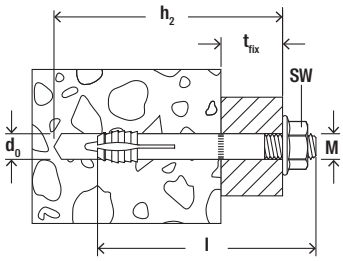
- Galvanised steel

## Functioning

- The MR is suitable for pre-positioned and push-through installation.
- The anchor sleeve is driven into the drill hole with a hammer, without the need for an expansion pin.
- Then the expansion pin is driven in with a hammer, and the wall screw expands against the drill hole wall.

## Installation MR






## Technical data



**Wall screw MR**



MR

| Item | Item no. | Drill diameter $d_0$ [mm] | Anchor length l [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Thread M | Width across nut SW [mm] | Max. fixture thickness $t_{fix}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **MR 8** | **050583** | 8 | 70 | 70 | M8 | 13 | 22 | 25 |
| **MR 10** | **050584** | 10 | 85 | 85 | M10 | 15 | 24 | 20 |
| **MR 12** | **050585** | 12 | 100 | 100 | M12 | 18 | 27 | 10 |

# Hollow-ceiling anchor FHY

The installation-friendly internally threaded anchor for fixings in pre-stressed hollow-core concrete slabs.







Air conditioning units in pre-stressed hollow-core concrete slabs



Cable trays in pre-stressed hollow-core concrete

## Applications

- Pipelines
- Cable trays
- Ventilation systems
- Sprinkler systems
- Suspended ceilings
- Consoles
- Steel constructions
- Timber constructions

## Advantages

- The active principle of the anchor means that the FHY can be used in cavities or in solid materials up to 5 cm from the tensioning wire. This ensures the highest flexibility and user-friendly installation.
- The embossed edge prevents the anchor sleeve from slipping in the cavity. The optimised geometry minimises setting energy and allows for use in extremely narrow spaces.
- The metric internal thread means that it is possible to use standard screws or threaded rods for the ideal adaptation to suit the intended use.
- External report for the usage of the FHY in seismic conditions.
- In the stainless steel version, the FHY is also suitable for outdoor fixings.
- The ETA approval of the FHY for multiple fixing and general construction technique permit for individual fixing provides an additional plus in safety.

## Certificates / Features

ETA-21/0857, for redundant non-structural systems in concrete

R 120

Inox Stainless Steel

from M8

## Building materials

**Approved for:**

- Pre-stressed hollow-core concrete slabs ≥ C45/55
- Concrete C20/25 to C50/60

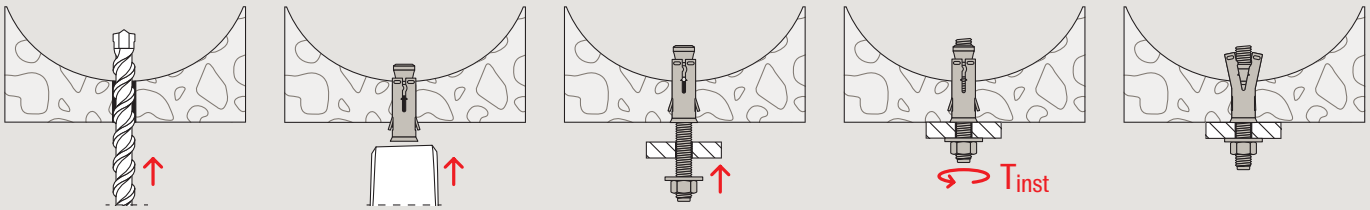
## Versions

- Galvanised steel
- Stainless steel R

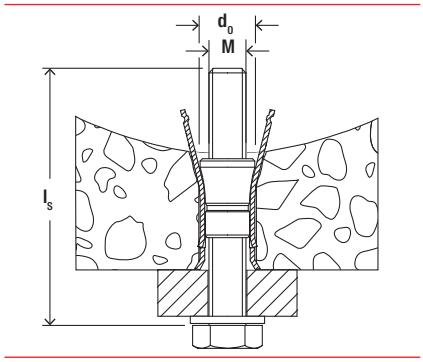
## Functioning

- The FHY is suitable for pre-positioned installation.
- Position the FHY hollow-ceiling anchor in the drill hole and drive in flush to the surface of the anchor base using the hammer.
- The FHY pre-positioned anchor must be able to be supported on the attachment for expansion.
- When applying the torque, the cone is pulled into the expansion sleeve and expands it into the cavity or expands it in the solid material against the drill hole wall.
- Screw length ls =
  Minimum screw-in depth $e_2$
  + Thickness of fixture $t_{fix}$
  + Thickness of washer
  (with threaded rod: + height of nut)

## Installation FHY

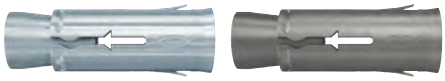





## Technical data

**Hollow-ceiling anchor FHY**



FHY FHY R

| Item | Galvanised steel Item no. gvz | Stainless steel Item no. R | Approval ETA | Approval DIBt | Drill diameter $d_0$ [mm] | Anchor length l [mm] | Internal thread M | Min. drill hole depth $h_1$ [mm] | Min. bolt penetration $l_{E,min}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| **FHY M6** | **566667** | **–** | ● | ● | 10 | 37 | M6 | 50 | 37 | 50 |
| **FHY M6 R** | **–** | **566671** | ● | ● | 10 | 37 | M6 | 50 | 37 | 50 |
| **FHY M8** | **566668** | **–** | ● | ● | 12 | 43 | M8 | 60 | 43 | 25 |
| **FHY M8 R** | **–** | **566672** | ● | ● | 12 | 43 | M8 | 60 | 43 | 25 |
| **FHY M10** | **566669** | **–** | ● | ● | 16 | 52 | M10 | 65 | 52 | 20 |
| **FHY M10 R** | **–** | **566673** | ● | ● | 16 | 52 | M10 | 65 | 52 | 20 |
| **FHY M12** | **566670** | **–** | ● | – | 18 | 55 | M12 | 70 | 55 | 25 |
| **FHY M12 R** | **–** | **566674** | ● | – | 18 | 55 | M12 | 70 | 55 | 25 |

# Loads

**Hollow-ceiling anchor FHY**

Permissible loads[1] for multiple use of redundant non-structural applications* in pre-stressed hollow-core concrete slabs of strength class ≥ C45/55.
For the design the complete current assessment ETA-21/0857 of 30.08.2022 has to be considered.

| | | | | | | Pre-stressed hollow-core concrete slabs | | |
|---|---|---|---|---|---|---|---|---|
| | Material/ surface | Screw material[2] | Bottom flange thickness | Installation torque | Required edge distance (with one edge) for max. load | Permissible load ($F_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | |
| Type | | | $d_b$ [mm] | $T_{inst}$ [Nm] | $c_{cr}$ [mm] | $F_{perm}$ [3] [kN] | $s_{min}$ [4] [mm] | $c_{min}$ [4] [mm] |
| **FHY M6** | gvz | 8.8 | 25 - 29 | 8 | 100 | 2.4 | 70 | 100 |
| | gvz | 8.8 | 30 - 39 | 8 | 100 | 2.4 | 70 | 100 |
| | gvz | 8.8 | ≥ 40 | 8 | 100 | 2.4 | 70 | 100 |
| **FHY M8** | gvz | 4.6 | 25 - 29 | 10 | 100 | 3.3 | 70 | 100 |
| | gvz | 4.6 | 30 - 39 | 10 | 100 | 3.3 | 70 | 100 |
| | gvz | 4.6 | ≥ 40 | 10 | 105 | 3.3 | 70 | 100 |
| **FHY M10** | gvz | 4.6 | 25 - 29 | 20 | 100 | 3.8 | 80 | 100 |
| | gvz | 4.6 | 30 - 39 | 20 | 100 | 4.8 | 80 | 100 |
| | gvz | 4.6 | ≥ 40 | 20 | 120 | 4.8 | 80 | 100 |
| **FHY M12** | gvz | 4.6 | 25 - 29 | 30 | 150 | 4.3 | 80 | 150 |
| | gvz | 4.6 | 30 - 39 | 30 | 150 | 4.3 | 80 | 150 |
| | gvz | 4.6 | ≥ 40 | 30 | 150 | 4.8 | 80 | 150 |
| **FHY M6 R** | R | ≥ A4-70 | 25 - 29 | 15 | 100 | 2.4 | 70 | 100 |
| | R | ≥ A4-70 | 30 - 39 | 15 | 100 | 2.4 | 70 | 100 |
| | R | ≥ A4-70 | ≥ 40 | 15 | 100 | 2.4 | 70 | 100 |
| **FHY M8 R** | R | ≥ A4-70 | 25 - 29 | 20 | 100 | 3.3 | 70 | 100 |
| | R | ≥ A4-70 | 30 - 39 | 20 | 100 | 3.3 | 70 | 100 |
| | R | ≥ A4-70 | ≥ 40 | 20 | 105 | 3.3 | 70 | 100 |
| **FHY M10 R** | R | ≥ A4-70 | 25 - 29 | 40 | 100 | 3.8 | 80 | 100 |
| | R | ≥ A4-70 | 30 - 39 | 40 | 100 | 4.8 | 80 | 100 |
| | R | ≥ A4-70 | ≥ 40 | 40 | 120 | 4.8 | 80 | 100 |
| **FHY M12 R** | R | ≥ A4-70 | 25 - 29 | 50 | 150 | 4.3 | 80 | 150 |
| | R | ≥ A4-70 | 30 - 39 | 50 | 150 | 4.3 | 80 | 150 |
| | R | ≥ A4-70 | ≥ 40 | 50 | 150 | 4.8 | 80 | 150 |

* In addition to the load table above, the following must be considered for multiple fastening of non-structural redundant systems:
A multiple fixing (redundant system) according to EN 1992-4 and CEN/TR 17079 is defined by
- at least 3 fixing points (per attached element) with at least one anchor at each fixing point and a permissible load per fixing point of 1.4 kN
- or by at least 4 fixing points with at least one anchor each fixing point and a permissible load per fixing point of 2.1 kN
- Additionally, it has to be proven that the stiffness of the attached element shall be large enough to ensure that in case of excessive slip or failure of a fastener the load on this fastener or fixing point can be transferred to neighbouring fixing points without significantly violating the requirements on the attached element in the serviceability and ultimate limit state.

For further details see EN 1992-4 section 7.3 and CEN/TR 17079.

[1] The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered.
[2] Further steel grades, versions and technical data see ETA.
[3] Maximum load for char. spacing and edge distances. Valid for tensile load, shear load and oblique load under any angle. In the case of shear loads with lever arm (bending) as well as reduced/minimum spacing or edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete technical permit.
[4] Minimum possible axial spacings resp. edge distance while reducing the permissible load.

# Loads

**Hollow-ceiling anchor FHY**

Permissible loads[1] of a single anchor in pre-stressed hollow-core concrete slabs of strength class ≥ C45/55.
For the design the complete general construction technique permit Z-21.1-1711 from 05.12.2022 has to be considered.

| | | | | | | Pre-stressed hollow-core concrete slabs | | |
|---|---|---|---|---|---|---|---|---|
| | Material/ surface | Screw material[2] | Bottom flange thickness | Installation torque | Required edge distance (with one edge) for max. load | Permissible load ($F_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | |
| Type | | | $d_b$ [mm] | $T_{inst}$ [Nm] | $c_{cr}$ [mm] | $F_{perm}$[3] [kN] | $s_{min}$[4] [mm] | $c_{min}$[4] [mm] |
| **FHY M6** | gvz | 8.8 | 25 - 29 | 8 | 150 | 0.7 | 70 | 100 |
| | gvz | 8.8 | 30 - 39 | 8 | 150 | 0.9 | 80 | 100 |
| | gvz | 8.8 | ≥ 40 | 8 | 150 | 2.0 | 100 | 100 |
| | R | A4 - 70 | 25 - 29 | 15 | 150 | 0.7 | 70 | 100 |
| | R | A4 - 70 | 30 - 39 | 15 | 150 | 0.9 | 80 | 100 |
| | R | A4 - 70 | ≥ 40 | 15 | 150 | 2.0 | 100 | 100 |
| **FHY M8** | gvz | 4.6 | 25 - 29 | 10 | 150 | 0.7 | 70 | 100 |
| | gvz | 4.6 | 30 - 39 | 10 | 150 | 0.9 | 80 | 100 |
| | gvz | 4.6 | ≥ 40 | 10 | 150 | 2.0 | 100 | 100 |
| | R | A4 - 70 | 25 - 29 | 20 | 150 | 0.7 | 70 | 100 |
| | R | A4 - 70 | 30 - 39 | 20 | 150 | 0.9 | 80 | 100 |
| | R | A4 - 70 | ≥ 40 | 20 | 150 | 2.0 | 100 | 100 |
| **FHY M10** | gvz | 4.6 | 30 - 39 | 20 | 150 | 1.2 | 80 | 100 |
| | gvz | 4.6 | ≥ 40 | 20 | 150 | 3.0 | 100 | 100 |
| | R | A4 - 70 | 30 - 39 | 40 | 150 | 1.2 | 80 | 100 |
| | R | A4 - 70 | ≥ 40 | 40 | 150 | 3.0 | 100 | 100 |

[1] The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered.
[2] Further steel grades, versions and technical data see approval.
[3] Maximum load for char. spacing and edge distances. Valid for tensile load, shear load and oblique load under any angle. In the case of shear loads with lever arm (bending) as well as reduced/minimum spacing or edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete technical permit.
[4] Minimum possible axial spacings resp. edge distance while reducing the permissible load.

# Aircrete anchor FPX-I

The strong internally threaded anchor with unique 4-way expansion for fixings in aerated concrete.







Air conditioning units



Rail fixing

## Applications

- Suspended ceilings
- Cable trays
- Pipelines
- Ventilation ducts
- Guard rails/hand rails
- TV consoles
- Kitchen cupboards
- Stand-off installations

## Advantages

- The FPX-I enables easy tightening via the hexagon wrench using a cordless screwdriver or ratchet and therefore offers top installation comfort.
- The deformation-controlled expansion of the anchor with the hexagon wrench ensures safe, even and gentle installation.
- The unique 4-way expansion of the FPX-I with a square expansion sleeve prevents the rotation of the anchor in the drill hole and ensures high tension and shear loads, which means fewer fixing points.
- The releasing of the hexagonal wrench guarantees an automatical setting control for each installation process.
- The first steel anchor with an ETA-Approval and fire protection certificate for fixings in aerated concrete enables use for safety-relevant fixings, too.

## Certificates / Features

ETA-12/0456, in autoclaved aerated concrete

M8 - M12

## Building materials

**Approved for:**

- Aerated concrete with compressive strength 2 to 7 N/mm²
- Aerated concrete wall or ceiling boards with compressive strength 3.3 to 4.4 N/mm²
- Planked aerated concrete masonry, e.g. plastered, tiled, papered etc.

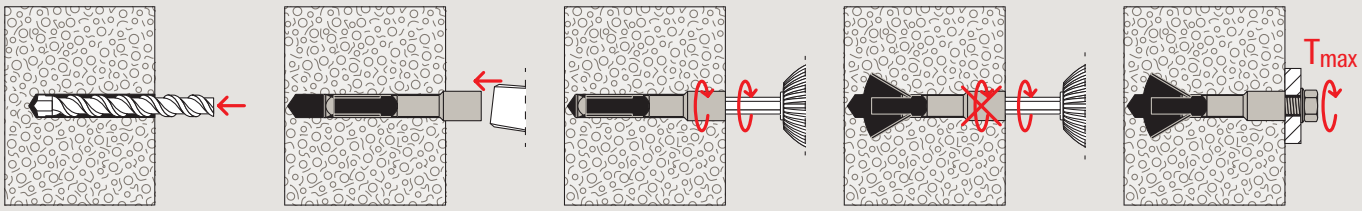
## Versions

- Galvanised steel

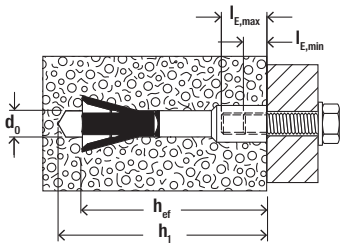
## Functioning

- The FPX-I with internal thread is suitable for pre-positioned installation.
- Pre-drilling enables easy hammering in, even in high-strength aerated concrete. There is no need to clean the drill hole.
- When the anchor is tightened with the hexagon wrench, the internal thread sleeve starts to rotate and the cone is pulled into the square expansion sleeve. The aerated concrete is compressed on the four sides and generates an undercut in the drill hole.
- When reached the optimum expansion, the hexagon wrench is released automatically from the anchor.

## Installation FPX-I






## Technical data

**Aircrete anchor FPX-I**



FPX-I

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth for pre-positioned installation $h_1$ [mm] | Anchor length l [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Min. bolt penetration $l_{E,min}$ [mm] | Max. bolt penetration $l_{E,max}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **FPX M6-I** | **519021** | ● | 10 | 95 | 75 | 70 | 10 | 15 | 25 |
| **FPX M8-I** | **519022** | ● | 10 | 95 | 75 | 70 | 8 | 15 | 25 |
| **FPX M10-I** | **519023** | ● | 10 | 95 | 75 | 70 | 10 | 15 | 25 |
| **FPX M12-I** | **519024** | ● | 10 | 95 | 75 | 70 | 12 | 15 | 25 |

## Technical data

**Setting tool FPX-I**



Setting tool FPX M6 I



Setting tool FPX M8-M12 I

| Item | Item no. | Matching anchor type | Sales unit [pcs] |
|---|---|---|---|
| **Setting tool FPX M6 I** | **522517** | FPX M6-I | 10 |
| **Setting tool FPX M8-M12 I** | **522518** | FPX M8-I - FPX M12-I | 10 |

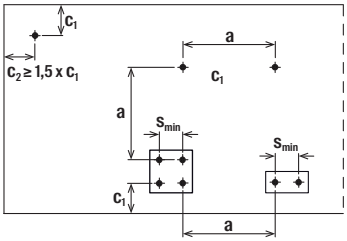
# Loads

**Aircrete anchor FPX-I**

Permissible loads[1] and required component dimensions in cracked and non-cracked aerated concrete wall and slab plates.
For the design the complete current assessment ETA-12/0456 has to be considered.

| Type | | | FPX-I M6 , M8 , M10 , M12 | |
|---|---|---|---|---|
| **Effective anchorage depth** | $h_{ef}$ | **[mm]** | **70** | |
| **Permissible load[2] ($F_{perm}$) per anchor in cracked AAC-slabs** | | | | |
| $f_{AAC} \geq 3{,}3$ N /mm² / $\rho_m \geq 0{,}50$ kg/dm³ | $F_{perm}$ | **[kN]** | 0.62 | |
| $f_{AAC} \geq 4{,}4$ N /mm² / $\rho_m \geq 0{,}55$ kg/dm³ | $F_{perm}$ | **[kN]** | 0.83 | |
| **Permissible load[2] ($F_{perm}$) per anchor in uncracked AAC-slabs** | | | | |
| $f_{AAC} \geq 3{,}3$ N /mm² / $\rho_m \geq 0{,}50$ kg/dm³ | $F_{perm}$ | **[kN]** | 0.83 | |
| $f_{AAC} \geq 4{,}4$ N /mm² / $\rho_m \geq 0{,}55$ kg/dm³ | $F_{perm}$ | **[kN]** | 1.24 | |
| **Component dimensions** | | | | |
| Minimum member thickness with drill hole cleaning | $h_{min}$ | **[mm]** | 100 | |
| Minimum member thickness without drill hole cleaning | $h_{min}$ | **[mm]** | 120 | |
| **Single anchor** | | | | |
| Minimum spacing | a | **[mm]** | 600 | |
| Minimum edge distance | $c_1$ | **[mm]** | 125 / 150[3] | |
| Minimum edge distance orthogonal to $c_1$ | $c_2$ | **[mm]** | 190 | |
| **Anchor groups[4] with 2 or 4 ancors** | | | | |
| Actions | | | **shear and oblique tension** | **only axial tension** |
| Minimum spacing between anchor group and 2 single anchors | $s_{min}$ | **[mm]** | 100 | 100 |
| Minimum edge distance | $c_1$ | **[mm]** | 250 | 125 / 150[3] |
| Minimum spacing | a | **[mm]** | 750 | 600 |
| Minimum edge distance orthogonal to $c_1$ | $c_2$ | **[mm]** | 375 | 190 |

[1] Permissible loads of a single anchor for all load directions. The required partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered.
[2] Grade of the screw resp. threaded rod ≥ 4.8.
[3] In case of reinforced plates with a width ≤ 700 mm.
[4] $F_{perm,group} = 2 \times F_{perm,single\ anchor}$ valid in case of anchor groups with 2 or 4 anchors. Accurate deta see ETA.



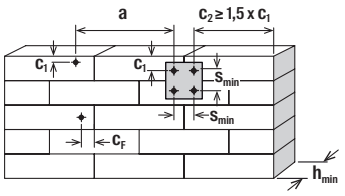
# Loads

**Aircrete anchor FPX-I**

Permissible loads[1] and required component dimensions in aerated concrete masonry.
For the design the complete current assessment ETA-12/0456 has to be considered.

| Type | | | FPX-I<br>M6 , M8 , M10 , M12 | |
|---|---|---|---|---|
| **Effective anchorage depth** | $h_{ef}$ | **[mm]** | **70** | |
| **Permissible load[2] ($F_{perm}$) per anchor** | | | | |
| $f_{AAC} \geq 1{,}6$ N /mm² / $\rho_m \geq 0{,}25$ kg/dm³ | $F_{perm}$ | **[kN]** | 0.32 | |
| $f_{AAC} \geq 2{,}0$ N /mm² / $\rho_m \geq 0{,}35$ kg/dm³ | $F_{perm}$ | **[kN]** | 0.43 | |
| $f_{AAC} \geq 4{,}0$ N /mm² / $\rho_m \geq 0{,}50$ kg/dm³ | $F_{perm}$ | **[kN]** | 0.89 | |
| $f_{AAC} \geq 6{,}0$ N /mm² / $\rho_m \geq 0{,}65$ kg/dm³ | $F_{perm}$ | **[kN]** | 1.43 | |
| **Component dimensions** | | | | |
| Minimum member thickness with drill hole cleaning | $h_{min}$ | **[mm]** | 100 | |
| Minimum member thickness without drill hole cleaning | $h_{min}$ | **[mm]** | 120 | |
| **Single anchor** | | | | |
| Minimum spacing | a | **[mm]** | 375 | |
| Minimum edge distance | $c_1$ | **[mm]** | 125 | |
| Minimum distance to joints | $c_F$[3] | **[mm]** | 75[4] / 125 | |
| Minimum edge distance orthogonal to $c_1$ | $c_2$ | **[mm]** | 190 | |
| **Anchor groups[5] with 2 or 4 ancors** | | | | |
| Actions | | | **shear and oblique tension** | **only axial tension** |
| Minimum spacing between anchor group and 2 single anchors | $s_{min}$ | **[mm]** | 100 | 100 |
| Minimum edge distance | $c_1$ | **[mm]** | 250 | 125 |
| Minimum spacing | a | **[mm]** | 750 | 375 |
| Minimum edge distance orthogonal to $c_1$ | $c_2$ | **[mm]** | 375 | 190 |

[1] Permissible loads of a single anchor for all load directions. The required partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered.
[2] Grade of the screw resp. threaded rod ≥ 4.8.
[3] In case of non visible joints $F_{perm}$ has to be divided in halve. Accurate data see ETA.
[4] $c_F$ for tensile load and/or shear load parallel to the joint which is not filled with mortar with width ≤ 2 mm.
[5] $F_{perm,group} = 2 \times F_{perm,single\ anchor}$ valid in case of anchor groups with 2 or 4 anchors. Accurate deta see ETA.



# 5

# Frame fixings/ Stand-off installation




| | | |
|---|---|---|
| Frame fixing DuoXpand | 378 |  |
| Frame fixing SXRL | 382 |  |
| Frame fixing SXR | 388 |  |
| Anti-corrosion spray FTC-CP | 393 |  |
| Hammerfix N | 394 |  |
| Hammerfix N Green | 398 |  |
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| Metal frame fixing F-M | 404 |  |
| Window frame screws FFSZ and FFs | 407 |  |
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| Stand-off installation TherMax 8/10 | 419 |  |
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| Remedial wall tie mechanical VBS-M | 429 |  |

# Frame fixing DuoXpand

Anchor with a smart bite.







Façade substructures



Timber constructions

## Applications

- Facade, ceiling and roof substructures made of wood and metal
- Windows
- Gates and doors
- Wardrobes
- Kitchen hanging cabinets
- Squared timbers
- Beams
- TV consoles
- Wall covering
- Metal brackets
- Metal supports
- Cable ducts
- Cable trays

## Advantages

- The combination of design and material adapts to all building materials and enables universal use.
- The special lamella geometry expands gently in the respective building material. This avoids fractures in porous building materials and enables anchoring close to the edge.
- The grey main body made of high-quality nylon provides the strength, while the red material component ensures flexibility and optimal spreading.
- The European Technical Assessment (ETA) for multiple use for non-structural applications ensures secure hold in all building material classes.
- The pre-mounted safety screw is perfectly matched to the plug and ensures time savings during installation.
- The frame fixing DuoXpand 10 with lengths 80, 100, 180 und 200 mm is suitable for anchoring under seismic influence in hollow brick masonry.

## Certificates / Features

ETA CE Inox Stainless Steel

**ETA-22/0186, Seismic ETA-21/0324, for redundant non-structural systems in concrete and masonry**

R 120

DuoLine

## Building materials

**Approved for:**

- Concrete ≥ C12/15
- Solid brick
- Solid sand-lime brick
- Solid block made from lightweight concrete
- Vertically perforated bricks
- Perforated sand-lime brick
- Hollow blocks made from lightweight concrete
- Aerated concrete

**Also suitable for:**

- Natural stone with dense structure
- Solid panel mad from gypsum

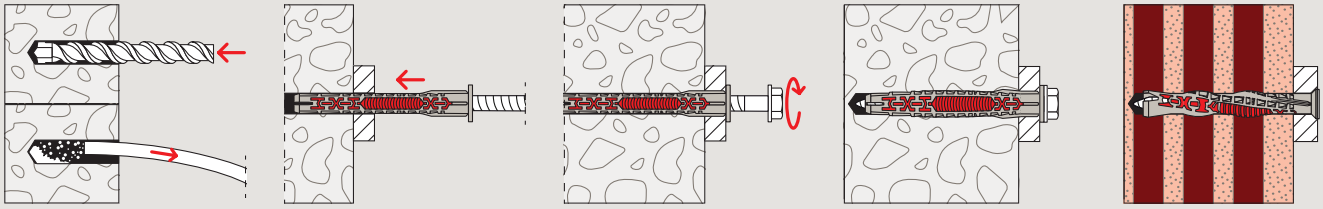
## Versions

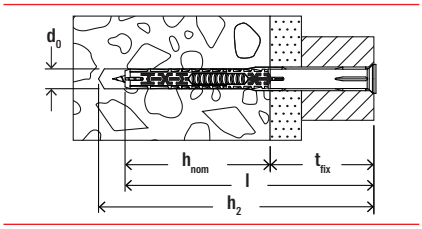
- Galvanised steel
- Stainless steel

## Functioning

- The DuoXpand is suitable for push-through installation.
- In solid building materials, the product design guarantees equal load distribution into the substrate.
- In perforated brickwork, the lamellas expand at the stone web and form an undercut in the cavity. The anchor geometry ensures that the force is transferred evenly to the material, so that porous stone webs are not destroyed.
- The version with countersunk screw is particularly suitable for fastening timber to concrete and masonry. For fixing metal constructions, the version with a wide sleeve rim and a hexagon head screw with moulded washer is recommended.

## Installation DuoXpand







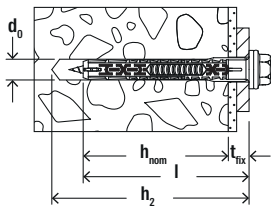

## Technical data

**Frame fixing DuoXpand T**



DuoXpand T

| Item | Galvanised steel<br>Item no.<br>gvz | Stainless steel<br>Item no.<br>R | Approval<br>ETA | Drill diameter<br>$d_0$<br>[mm] | Min. drill hole depth for through fixings<br>$h_2$<br>[mm] | Usable length at anchorage depth 50 mm<br>$t_{fix}$<br>[mm] | Usable length at anchorage depth 70 mm<br>$t_{fix}$<br>[mm] | Usable length at anchorage depth 140 mm<br>$t_{fix}$<br>[mm] | Usable length at anchorage depth 160 mm<br>$t_{fix}$<br>[mm] | Anchor length<br>l<br>[mm] | Drive | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **DuoXpand 8 x 80 T** | **562149** | **–** | ● | 8 | 90 | 30 | 10 | – | – | 80 | TX30 | 50 |
| **DuoXpand 8 x 100 T** | **562150** | **–** | ● | 8 | 110 | 50 | 30 | – | – | 100 | TX30 | 50 |
| **DuoXpand 8 x 120 T** | **562151** | **–** | ● | 8 | 130 | 70 | 50 | – | – | 120 | TX30 | 50 |
| **DuoXpand 10 x 80 T** | **562155** | **562163** | ● | 10 | 90 | 30 | 10 | – | – | 80 | TX40 | 50 |
| **DuoXpand 10 x 100 T** | **562156** | **562164** | ● | 10 | 110 | 50 | 30 | – | – | 100 | TX40 | 50 |
| **DuoXpand 10 x 120 T** | **562157** | **562165** | ● | 10 | 130 | 70 | 50 | – | – | 120 | TX40 | 50 |
| **DuoXpand 10 x 140 T** | **562158** | **562166** | ● | 10 | 150 | 90 | 70 | – | – | 140 | TX40 | 50 |
| **DuoXpand 10 x 160 T** | **562159** | **–** | ● | 10 | 170 | 110 | 90 | 20 | – | 160 | TX40 | 50 |
| **DuoXpand 10 x 180 T** | **562160** | **–** | ● | 10 | 190 | 130 | 110 | 40 | 20 | 180 | TX40 | 50 |
| **DuoXpand 10 x 200 T** | **562161** | **–** | ● | 10 | 210 | 150 | 130 | 60 | 40 | 210 | TX40 | 50 |
| **DuoXpand 10 x 230 T** | **562162** | **–** | ● | 10 | 240 | 180 | 160 | 90 | 70 | 230 | TX40 | 50 |




## Technical data

**Frame fixing DuoXpand FUS**



DuoXpand FUS

5

| Item | Galvanised steel<br>Item no.<br>gvz | Stainless steel<br>Item no.<br>R | Approval<br>ETA | Drill diameter<br>$d_0$<br>[mm] | Min. drill hole depth for through fixings<br>$h_2$<br>[mm] | Usable length at anchorage depth 50 mm<br>$t_{fix}$<br>[mm] | Usable length at anchorage depth 70 mm<br>$t_{fix}$<br>[mm] | Usable length at anchorage depth 140 mm<br>$t_{fix}$<br>[mm] | Usable length at anchorage depth 160 mm<br>$t_{fix}$<br>[mm] | Anchor length<br>l<br>[mm] | Drive | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **DuoXpand 8 x 80 FUS** | **562152** | – | ● | 8 | 90 | 30 | 10 | – | – | 80 | TX30 / SW 10 | 50 |
| **DuoXpand 8 x 100 FUS** | **562153** | – | ● | 8 | 110 | 50 | 30 | – | – | 100 | TX30 / SW 10 | 50 |
| **DuoXpand 8 x 120 FUS** | **562154** | – | ● | 8 | 130 | 70 | 50 | – | – | 120 | TX30 / SW 10 | 50 |
| **DuoXpand 10 x 80 FUS** | **562167** | **562175** | ● | 10 | 90 | 30 | 10 | – | – | 80 | TX40 / SW 13 | 50 |
| **DuoXpand 10 x 100 FUS** | **562168** | **562176** | ● | 10 | 110 | 50 | 30 | – | – | 100 | TX40 / SW 13 | 50 |
| **DuoXpand 10 x 120 FUS** | **562169** | **562177** | ● | 10 | 130 | 70 | 50 | – | – | 120 | TX40 / SW 13 | 50 |
| **DuoXpand 10 x 140 FUS** | **562170** | **562178** | ● | 10 | 150 | 90 | 70 | – | – | 140 | TX40 / SW 13 | 50 |
| **DuoXpand 10 x 160 FUS** | **562171** | – | ● | 10 | 170 | 110 | 90 | 20 | – | 160 | TX40 / SW 13 | 50 |
| **DuoXpand 10 x 180 FUS** | **562172** | – | ● | 10 | 190 | 130 | 110 | 40 | 20 | 180 | TX40 / SW 13 | 50 |
| **DuoXpand 10 x 200 FUS** | **562173** | – | ● | 10 | 210 | 150 | 130 | 60 | 40 | 200 | TX40 / SW 13 | 50 |
| **DuoXpand 10 x 230 FUS** | **562174** | – | ● | 10 | 240 | 180 | 160 | 90 | 70 | 230 | TX40 / SW 13 | 50 |

## Loads

**Frame fixing DuoXpand**

Permissible loads[1)2)3)] of a single anchor as part of a multiple fixing of non-structural systems.
For the design the complete current assessment ETA-21/0324 of 19.10.2023 has to be considered.

| Type | | | DuoXpand 8 | | DuoXpand 10 | | | |
|---|---|---|---|---|---|---|---|---|
| **Anchor diameter** | $d_0$ | **[mm]** | 8 | | 10 | | | |
| **Anchorage in concrete ≥ C16/20[4)]** | | | | | | | | |
| **Anchorage depth** | $h_{nom}$ ≥ | **[mm]** | 50 | 70 | 50 | 70 | – | – |
| **Permissible tensile load $N_{perm}$** | | **[kN]** | 1.39 | 1.59 | 1.59 | 1.79 | – | – |
| **Permissible shear load $V_{perm}$** | zinc coated screws (gvz) | **[kN]** | 4.23 | 4.23 | 5.98 | 5.98 | – | – |
| | stainless steel screw (R) | **[kN]** | 3.93 | 3.93 | 5.98 | 5.98 | – | – |
| **Minimum member thickness** | $h_{min}$ | **[mm]** | 80 | 100 | 80 | 100 | – | – |
| **Characteristic edge distance** | $c_{cr,N}$ | **[mm]** | 50 | 50 | 50 | 50 | – | – |
| **Characteristic spacing** | a resp. $s_{cr,N}$ | **[mm]** | 65 | 70 | 70 | 80 | – | – |
| **Minimum spacing** | $s_{min}$ | **[mm]** | 50 | 50 | 50 | 50 | – | – |
| **with an edge distance** | c ≥ | **[mm]** | 100 | 100 | 100 | 100 | – | – |
| **Minimum edge distance** | $c_{min}$ | **[mm]** | 50 | 50 | 50 | 50 | – | – |
| **with a spacing** | s ≥ | **[mm]** | 100 | 100 | 100 | 100 | – | – |
| **Anchorage in masonry[5)6)]** | | | | | | | | |
| **Anchorage depth** | $h_{nom}$ | **[mm]** | 50 | 70 | 50 | 70 | 140 | 160 |
| **Permisible load $F_{perm}$ in solid brick Mz,** | ≥ NF 10/1,8 | **[kN]** | 0.43 | 0.43 | 0.26 | 0.26 | – | – |
| **e.g. Ziegelwerk Nordhausen** | ≥ NF 20/1,8 | **[kN]** | 0.86 | 1.00 | 0.57 | 0.57 | – | – |
| **Permissible load $F_{perm}$ in solid sand-lime brick KS,** | ≥ NF 10/2,0 | **[kN]** | 0.43 | 0.57 | 0.57 | 0.57 | – | – |
| **e.g. Wemding** | ≥ NF 20/2,0 | **[kN]** | 1.00 | 1.14 | 1.14 | 1.14 | – | – |
| **Permissible load[7)] $F_{perm}$ in lightweight concrete** | ≥ 2 DF 2/1,4 | **[kN]** | 0.11 | 0.17 | 0.09 | 0.17 | – | – |
| **block Vbl, e.g. KLB** | ≥ 2 DF 4/1,4 | **[kN]** | 0.21 | 0.34 | 0.17 | 0.34 | – | – |
| **Permissible load[7)] $F_{perm}$ in vertically perforated** | 3 DF ≥ 10/0,9 | **[kN]** | 0.21 | 0.34 | 0.21 | 0.34 | – | – |
| **brick HLz, e.g. Schlagmann** | 3 DF ≥ 12/0,9 | **[kN]** | 0.26 | 0.43 | 0.26 | 0.43 | – | – |
| **Permissible load $F_{perm}$ in perforated sand-lime** | 3 DF ≥ 8/1,4 | **[kN]** | 0.26 | 0.21 | 0.17 | 0.26 | – | – |
| **brick KSL, e.g. Wemding** | 3 DF ≥ 16/1,4 | **[kN]** | 0.43 | 0.43 | 0.34 | 0.57 | – | – |
| **Permissible load[7)] $F_{perm}$ in hollow lightweight** | 16 DF ≥ 2/0,7 | **[kN]** | 0.14 | 0.14 | 0.21 | 0.21 | – | – |
| **concrete blocks Hbl, e.g Knobel, DE** | 16 DF ≥ 4/0,7 | **[kN]** | 0.26 | 0.26 | 0.43 | 0.43 | – | – |
| **Permissible load[7)] $F_{perm}$ in hollow lightweight** | ≥ 2/1,0 | **[kN]** | 0.09 | – | 0.14 | 0.14 | – | 0.09 |
| **concrete blocks Hbl, eg. Sepa Parpaing, FR** | ≥ 4/1,0 | **[kN]** | 0.21 | 0.14 | 0.26 | 0.26 | 0.14 | 0.14 |
| **Minimum member thickness** | $h_{min}$ | **[mm]** | 115 | 115 | 115 | 115 | 200 | 200 |
| **Minimum spacing (single anchor)** | $a_{min}$ | **[mm]** | 250 | 250 | 250 | 250 | 250 | 250 |
| **Minimum spacing (anchor group)** | $s_{min}$ | **[mm]** | 100 | 100 | 100 | 100 | 100 | 100 |
| **Minimum edge distance (anchor group)** | $c_{min}$ | **[mm]** | 100 | 100 | 100 | 100 | 100 | 100 |
| **Anchorage in aerated concrete[6)]** | | | | | | | | |
| **Anchorage depth** | $h_{nom}$ ≥ | **[mm]** | - | 70 | - | 70 | - | - |
| **Permissible load $F_{perm}$ in aerated concrete,** | AAC 2 | **[kN]** | - | 0.11 | - | 0.14 | - | - |
| **acc.to EN 771-4:2011+A1:2015** | AAC 4 | **[kN]** | - | 0.27 | - | 0.21 | - | - |
| | AAC 6 | **[kN]** | - | 0.54 | - | 0.32 | - | - |
| **Permissible load $F_{perm}$ in reinforced aerated** | AAC 4; $f_{ck}$ ≥ 4 N/mm² | **[kN]** | - | - | - | 0.18 | - | - |
| **concrete, acc. to EN 12602:2016** | AAC 6; $f_{ck}$ ≥ 6 N/mm² | **[kN]** | - | - | - | 0.32 | - | - |
| **Minimum member thickness** | $h_{min}$ | **[mm]** | - | 100 / 175[8)] | - | 100 / 175[8)] | - | - |
| **Minimum spacing (single anchor)** | $a_{min}$ | **[mm]** | - | 250 | - | 250 | - | - |
| **Minimum spacing (anchor group)** | $s_{min}$ | **[mm]** | - | 100 / 80[8)] | - | 100 / 80[8)] | - | - |
| **Minimum edge distance (anchor group)** | $c_{min}$ | **[mm]** | - | 100 | - | 100 | - | - |

1) Valid for zinc coated screws (gvz) and for screws made of stainless steel (R). For exterior use of the zinc coated screws measures against incoming humidity according to assessment have to be taken.
2) The required partial safety factors for material resistance as well as a partial safety factor for load actions $\gamma_L$ = 1.4 are considered.
As a single anchor counts e.g. an anchor with a minimum spacing a according to the ETA.
3) Valid for temperatures in the substrate up to +50 °C (resp. short term up to +80 °C). For long term temperatures up to +30 °C higher permissible loads may be possible.
4) For concrete specifications in C12/15, see ETA.
5) Stone property data in min. compressive strength [N/mm²] and bulk density [kg/dm³] e.g. for Mz as 10/1.8. Corresponding mean compressive strengths according to EN 771 and other brick variants or brick geometries are listed in the ETA.
6) Load data are valid for tensile load, shear load and oblique load under any angle. For bending moments and invisible or not mortar-filled joints the design specifications of the ETA must be observed.
7) Rotary drilling method.
8) Only valid for groups of anchors in AAC with compression strength ≥ 6 N/mm².

# Frame fixing SXRL

The versatile with multiple anchorage depth.







Timber substructures



Wall consoles

## Applications

- Façade, ceiling and roof substructures made of wood and metal
- Facade substructures under compression load (e.g. distance installation without a wall bracket)
- Windows
- Gates and doors
- Wardrobes
- Kitchen hanging cabinets
- Squared timbers
- Beams
- TV consoles
- Wall covering
- Metal brackets

## Advantages

- The long expansion element with multiple anchorage depths of 50, 70 or 90 mm for SXRL 8 and SXRL 10 and 70 or 90 mm for SXRL 14 makes the SXRL a versatile applicable product.
- Through the special geometry of the plug, the loads are evenly distributed in the drill hole.
- When the plug is to be set below the plaster, the longer ribs prevent plug rotation during installation.
- The approval for single-point fixing in cracked concrete makes the SXRL the designated specialist in concrete particularly for tasks such as the installation of awning roofs and outdoor railings compared to steel anchors.
- The SXRL 10 and SXRL 14 are additionally approved for applications that are subject to pressure and may be used for façade structures that are installed without wall bracket with a spacing.
- Complete range available with diameters of 8, 10 and 14 mm and usable lengths up to 290 mm.

## Certificates / Features

CE ETA

aBG Z-21.2-2037

**ETA-07/0121, for redundant non-structural systems in concrete and masonry**

aBG Z-21.2-2092

Inox Stainless Steel

R 120

★★★★★ Nylon Quality

## Building materials

**Approved for:**

- Vertically perforated brick
- Aerated concrete
- Hollow blocks made from lightweight concrete
- Perforated sand-lime brick
- Thermal insulation blocks
- Solid block made from lightweight and normal weight concrete
- Solid brick
- Solid sand-lime brick
- Concrete ≥ C12/15

**Also suitable for:**

- Natural stone with dense structure
- Solid panel made from gypsum

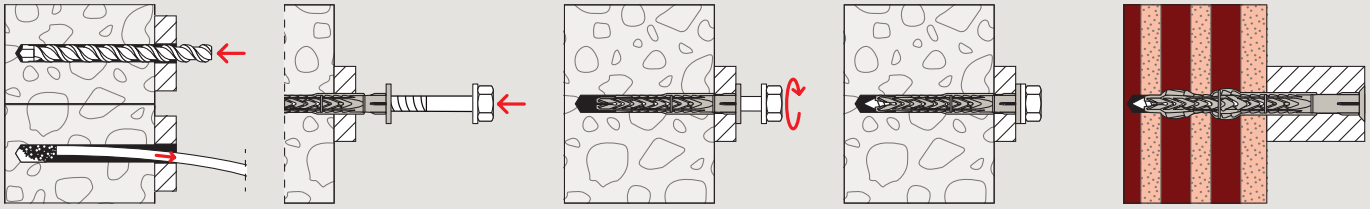
## Versions

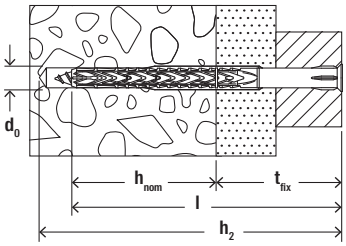
- Galvanised steel
- Stainless steel

## Functioning

- In hollow building materials, the two expansion zones ensure that the introduction of force is gentle on the substrate. The porous block fillets are not crushed by the second expansion zone and therefore serve to transmit the force
- In aerated concrete and solid building material, the two expansion zones combine to form one long expansion element, thus providing for a uniform and flat distribution of the load into substrate.
- SXRL-T with countersunk head screw is recommended for the installation of timber constructions; in the case of metal constructions, use SXRL-FUS with a wide sleeve rim and a moulded washer on the screw, which also features an integrated hexagon socket.

## Installation SXRL








## Technical data

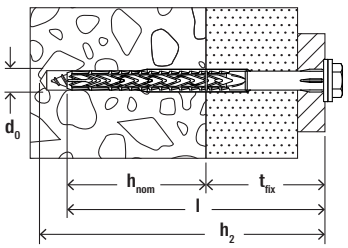
**Frame fixing SXRL-T**



SXRL-T

| Item | Galvanised steel Item no. gvz | Stainless steel Item no. R | Approval ETA | Approval DIBt | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Usable length at anchorage depth 50 mm $t_{fix}$ [mm] | Usable length at anchorage depth 70 mm $t_{fix}$ [mm] | Usable length at anchorage depth 90 mm $t_{fix}$ [mm] | Anchor length l [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SXRL 8 x 60 T | 540113 | 540119 | ● | – | 8 | 70 | 10 | – | – | 60 | TX30 | 50 |
| SXRL 8 x 80 T | 540114 | 540121 | ● | – | 8 | 90 | 30 | 10 | – | 80 | TX30 | 50 |
| SXRL 8 x 100 T | 540115 | 540123 | ● | – | 8 | 110 | 50 | 30 | 10 | 100 | TX30 | 50 |
| SXRL 8 x 120 T | 540116 | 540124 | ● | – | 8 | 130 | 70 | 50 | 30 | 120 | TX30 | 50 |
| SXRL 8 x 140 T | 540117 | 540125 | ● | – | 8 | 150 | 90 | 70 | 50 | 140 | TX30 | 50 |
| SXRL 8 x 160 T | 540118 | 540126 | ● | – | 8 | 170 | 110 | 90 | 70 | 160 | TX30 | 50 |
| SXRL 10 x 60 T | 546477 | 546505 | ● | ● | 10 | 70 | 10 | – | – | 60 | TX40 | 50 |
| SXRL 10 x 80 T | 522698 | 522709 | ● | ● | 10 | 90 | 30 | 10 | – | 80 | TX40 | 50 |
| SXRL 10 x 100 T | 522699 | 522710 | ● | ● | 10 | 110 | 50 | 30 | 10 | 100 | TX40 | 50 |
| SXRL 10 x 120 T | 522700 | 522711 | ● | ● | 10 | 130 | 70 | 50 | 30 | 120 | TX40 | 50 |
| SXRL 10 x 140 T | 522701 | 522712 | ● | ● | 10 | 150 | 90 | 70 | 50 | 140 | TX40 | 50 |
| SXRL 10 x 160 T | 522703 | 522713 | ● | ● | 10 | 170 | 110 | 90 | 70 | 160 | TX40 | 50 |
| SXRL 10 x 180 T | 522704 | 522714 | ● | ● | 10 | 190 | 130 | 110 | 90 | 180 | TX40 | 50 |
| SXRL 10 x 200 T | 522705 | 522715 | ● | ● | 10 | 210 | 150 | 130 | 110 | 200 | TX40 | 50 |
| SXRL 10 x 230 T | 522706 | 522716 | ● | ● | 10 | 240 | 180 | 160 | 140 | 230 | TX40 | 50 |
| SXRL 10 x 260 T | 522707[1)] | 522717[1)] | ● | ● | 10 | 270 | 210 | 190 | 170 | 260 | TX40 | 50 |
| SXRL 10 x 290 T | 522708[1)] | 522718[1)] | ● | ● | 10 | 300 | 240 | 220 | 200 | 290 | TX40 | 50 |
| SXRL 14 x 80 T | 530920 | – | ● | ● | 14 | 95 | – | 10 | – | 80 | TX50 | 50 |
| SXRL 14 x 100 T | 530921 | – | ● | ● | 14 | 115 | – | 30 | 10 | 100 | TX50 | 50 |
| SXRL 14 x 120 T | 530922 | – | ● | ● | 14 | 135 | – | 50 | 30 | 120 | TX50 | 50 |
| SXRL 14 x 140 T | 530923 | – | ● | ● | 14 | 155 | – | 70 | 50 | 140 | TX50 | 50 |
| SXRL 14 x 160 T | 530924 | – | ● | ● | 14 | 175 | – | 90 | 70 | 160 | TX50 | 50 |
| SXRL 14 x 180 T | 530925 | 530937 | ● | ● | 14 | 195 | – | 110 | 90 | 180 | TX50 | 50 |
| SXRL 14 x 200 T | 530926 | – | ● | ● | 14 | 215 | – | 130 | 110 | 200 | TX50 | 50 |
| SXRL 14 x 230 T | 530927 | – | ● | ● | 14 | 245 | – | 160 | 140 | 230 | TX50 | 50 |
| SXRL 14 x 260 T | 530928 | – | ● | ● | 14 | 275 | – | 190 | 170 | 260 | TX50 | 50 |
| SXRL 14 x 300 T | 530929[1)] | – | ● | ● | 14 | 315 | – | 230 | 210 | 300 | TX50 | 20 |
| SXRL 14 x 330 T | 530930[1)] | – | ● | ● | 14 | 345 | – | 260 | 240 | 330 | TX50 | 20 |
| SXRL 14 x 360 T | 530931[1)] | – | ● | ● | 14 | 375 | – | 290 | 270 | 360 | TX50 | 20 |

[1)] Not pre-assembled.




## Technical data

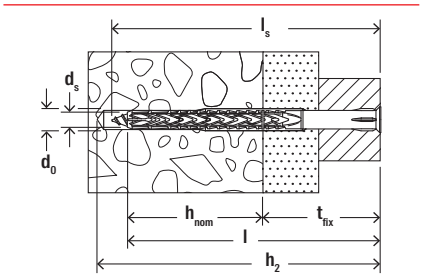
**Frame fixing SXRL-FUS**



SXRL-FUS

| Item | Galvanised steel Item no. gvz | Stainless steel Item no. R | Approval ETA | Approval DIBt | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Usable length at anchorage depth 50 mm $t_{fix}$ [mm] | Usable length at anchorage depth 70 mm $t_{fix}$ [mm] | Usable length at anchorage depth 90 mm $t_{fix}$ [mm] | Anchor length l [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SXRL 8 x 60 FUS | 540127 | 540135 | ● | – | 8 | 70 | 10 | – | – | 60 | TX30 / SW 10 | 50 |
| SXRL 8 x 80 FUS | 540129 | 540136 | ● | – | 8 | 90 | 30 | 10 | – | 80 | TX30 / SW 10 | 50 |
| SXRL 8 x 100 FUS | 540130 | 540137 | ● | – | 8 | 110 | 50 | 30 | 10 | 100 | TX30 / SW 10 | 50 |
| SXRL 8 x 120 FUS | 540131 | – | ● | – | 8 | 130 | 70 | 50 | 30 | 120 | TX30 / SW 10 | 50 |
| SXRL 8 x 140 FUS | 540133 | – | ● | – | 8 | 150 | 90 | 70 | 50 | 140 | TX30 / SW 10 | 50 |
| SXRL 8 x 160 FUS | 540134 | – | ● | – | 8 | 170 | 110 | 90 | 70 | 160 | TX30 / SW 10 | 50 |
| SXRL 10 x 60 FUS | 546506 | 546507 | ● | ● | 10 | 70 | 10 | – | – | 60 | TX40 / SW 13 | 50 |
| SXRL 10 x 80 FUS | 522719 | 522730 | ● | ● | 10 | 90 | 30 | 10 | – | 80 | TX40 / SW 13 | 50 |
| SXRL 10 x 100 FUS | 522720 | 522731 | ● | ● | 10 | 110 | 50 | 30 | 10 | 100 | TX40 / SW 13 | 50 |
| SXRL 10 x 120 FUS | 522721 | 522732 | ● | ● | 10 | 130 | 70 | 50 | 30 | 120 | TX40 / SW 13 | 50 |
| SXRL 10 x 140 FUS | 522723 | 522733 | ● | ● | 10 | 150 | 90 | 70 | 50 | 140 | TX40 / SW 13 | 50 |
| SXRL 10 x 160 FUS | 522724 | 522734 | ● | ● | 10 | 170 | 110 | 90 | 70 | 160 | TX40 / SW 13 | 50 |
| SXRL 10 x 180 FUS | 522725 | 522735 | ● | ● | 10 | 190 | 130 | 110 | 90 | 180 | TX40 / SW 13 | 50 |
| SXRL 10 x 200 FUS | 522726 | 522736 | ● | ● | 10 | 210 | 150 | 130 | 110 | 200 | TX40 / SW 13 | 50 |
| SXRL 10 x 230 FUS | 522727 | 522737 | ● | ● | 10 | 240 | 180 | 160 | 140 | 230 | TX40 / SW 13 | 50 |
| SXRL 10 x 260 FUS | 522728[1)] | 522738[1)] | ● | ● | 10 | 270 | 210 | 190 | 170 | 260 | TX40 / SW 13 | 50 |
| SXRL 10 x 290 FUS | 522729[1)] | – | ● | ● | 10 | 300 | 240 | 220 | 200 | 290 | TX40 / SW 13 | 50 |
| SXRL 14 x 80 FUS | 530946 | – | ● | ● | 14 | 95 | – | 10 | – | 80 | TX50 / SW 17 | 50 |
| SXRL 14 x 100 FUS | 530947 | 530956[2)] | ● | ● | 14 | 115 | – | 30 | 10 | 100 | TX50 / SW 17 | 50 |
| SXRL 14 x 120 FUS | 530948 | – | ● | ● | 14 | 135 | – | 50 | 30 | 120 | TX50 / SW 17 | 50 |
| SXRL 14 x 140 FUS | 530949 | – | ● | ● | 14 | 155 | – | 70 | 50 | 140 | TX50 / SW 17 | 50 |
| SXRL 14 x 160 FUS | 530950 | – | ● | ● | 14 | 175 | – | 90 | 70 | 160 | TX50 / SW 17 | 50 |
| SXRL 14 x 180 FUS | 530951 | – | ● | ● | 14 | 195 | – | 110 | 90 | 180 | TX50 / SW 17 | 50 |
| SXRL 14 x 200 FUS | 530952 | – | ● | ● | 14 | 215 | – | 130 | 110 | 200 | TX50 / SW 17 | 50 |
| SXRL 14 x 230 FUS | 530953 | – | ● | ● | 14 | 245 | – | 160 | 140 | 230 | TX50 / SW 17 | 50 |
| SXRL 14 x 260 FUS | 530954 | – | ● | ● | 14 | 275 | – | 190 | 170 | 260 | TX50 / SW 17 | 50 |

[1)] Not pre-assembled.
[2)] Without integrated bit recess TX50.




## Technical data

**Frame fixing SXRL**



SXRL

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Usable length at anchorage depth 50 mm $t_{fix}$ [mm] | Usable length at anchorage depth 70 mm $t_{fix}$ [mm] | Usable length at anchorage depth 90 mm $t_{fix}$ [mm] | Anchor length $l$ [mm] | Screw diameter $d_s$ [mm] | Min. screw length $l_s$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| **SXRL 8 x 60** | **540879** | 8 | 70 | 10 | – | – | 60 | 5.5 - 6.0 | 65 | 100 |
| **SXRL 8 x 80** | **540880** | 8 | 90 | 30 | 10 | – | 80 | 5.5 - 6.0 | 85 | 100 |
| **SXRL 8 x 100** | **540881** | 8 | 110 | 50 | 30 | 10 | 100 | 5.5 - 6.0 | 105 | 100 |
| **SXRL 8 x 120** | **540882** | 8 | 130 | 70 | 50 | 30 | 120 | 5.5 - 6.0 | 125 | 100 |

## Loads

**Frame fixing SXRL 8**

Recommended loads[1)2)3)] for a single anchor as part of a multiple fixing of non-structural systems.
The given loads are valid for wood screws acc. DIN 571 with the specified diameter.

| Type | | | SXRL 8 | | |
|---|---|---|---|---|---|
| **Screw diameter** | | **[mm]** | 6.0 | 6.0 | 6.0 |
| **Anchorage depth** | $h_{nom}$ | **[mm]** | 50 | 70 | 90 |
| **Minimum edge distance concrete** | $c_{min}$ | **[mm]** | 60 | 80 | 100 |
| **Recommended loads in the respective base material $F_{rec}$ [2)]** | | | | | |
| **Concrete** | ≥ C20/25 | **[kN]** | 0.60 | 1.00 | 1.00 |
| **Solid brick** | ≥ Mz 12 | **[kN]** | 0.45 | 0.60 | 0.60 |
| **Solid sand-lime brick** | ≥ KS 12 | **[kN]** | 0.40 | 0.50 | 0.50 |
| **Vertically perforated brick** | ≥ HLz 12; ρ ≥ 1.0 [kg/dm³] | **[kN]** | 0.15 | 0.15 | 0.15 |
| **Perforated sand-lime brick** | ≥ KSL 12 | **[kN]** | 0.10 | 0.40 | 0.40 |
| **Aerated concrete** | AAC 2 | **[kN]** | – | 0.10 | 0.10 |
| **Aerated concrete** | AAC 4 | **[kN]** | – | 0.15 | 0.20 |

1) Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
2) Valid for tensile load, shear load and oblique load under any angle.
3) Valid for zinc coated screws (gvz) and for screws made of stainless steel (R).
For exterior use of the zinc coated screws measures against incoming humidity have to be taken.

# Loads

**Frame fixing SXRL**

Permissible loads[1)2)3)] of a single anchor as part of a multiple fixing of non-structural systems.
For the design the complete assessment ETA-07/0121 of 20.12.2022 has to be considered.

| Type | | | SXRL 8 | | | SXRL 10 | | | SXRL 14 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Drill hole diameter** | $d_0$ | [mm] | 8 | 8 | 8 | 10 | 10 | 10 | 14 | 14 |
| **Anchorage depth** | $h_{nom} \geq$ | [mm] | 50 | 70 | 90 | 50 | 70 | 90 | 70 | 90 |
| **Anchorage in concrete ≥ C12/15** | | | | | | | | | | |
| **Permissible tensile load $N_{perm}$** | | [kN] | 1.59 | 1.98 | 1.98 | 1.98 | 2.58 | 2.58 | 3.37 | 3.37 |
| **Permissible shear load $V_{perm}$** | zinc coated screw (gvz) | [kN] | 4.23 | 4.23 | 4.23 | 5.98 | 5.98 | 5.98 | 12.40 | 12.40 |
| | stainless steel screw (R) | [kN] | 3.93 | 3.93 | 3.93 | 5.98 | 5.98 | 5.98 | 11.63 | 11.63 |
| **Minimum member thickness** | $h_{min}$ | [mm] | 80 | 100 | 120 | 100 | 100 | 120 | 110 | 130 |
| **Characteristic edge distance** | $c_{cr,N}$ | [mm] | 85 | 85 | 85 | 140 | 140 | 140 | 140 | 140 |
| **Characteristic spacing** | a resp. $s_{cr,N}$ | [mm] | 90 | 105 | 105 | 120 | 120 | 120 | 135 | 135 |
| **Minimum spacing** | $s_{min}$ | [mm] | 85 | 85 | 85 | 70 | 70 | 70 | 85 | 85 |
| **with an edge distance** | c ≥ | [mm] | 85 | 85 | 85 | 140 | 140 | 140 | 140 | 140 |
| **Minimum edge distance** | $c_{min}$ | [mm] | 85 | 85 | 85 | 70 | 70 | 70 | 85 | 85 |
| **with a spacing** | s ≥ | [mm] | 85 | 85 | 85 | 175 | 175 | 175 | 175 | 175 |
| **Anchorage in narrow concrete members (h ≥ 40 mm) made of concrete ≥ C12/15** | | | | | | | | | | |
| **Permissible tensile load $N_{perm}$** | | [kN] | – | – | – | 0.99 | – | – | – | – |
| **Permissible shear load $V_{perm}$** | | [kN] | – | – | – | 5.98 | – | – | – | – |
| **Anchorage in masonry[4)]** | | | | | | | | | | |
| **Permisible load $F_{perm}$ in solid brick Mz** | ≥ NF 12/1.8 | [kN] | 0.43 | 0.57 | 0.57 | 0.57[6)] | 1.14 | 1.14 | 0.71 | 0.71 |
| | ≥ NF 28/1.8 | [kN] | 0.86 | 1.29 | 1.29 | 1.29[6)] | 1.43[6)] | 1.43[6)] | 1.57 | 1.57 |
| **Permissible load $F_{perm}$ in solid sand-lime brick KS** | ≥ NF 12/1.8 | [kN] | 0.34[6)] | 0.26[6)] | 0.26[6)] | – | 0.71 | 0.71 | 0.57 | 0.57 |
| | ≥ NF 28/1.8 | [kN] | 0.57 | 0.57 | 0.57 | – | 1.57 | 1.57 | 1.29 | 1.29 |
| **Permissible load $F_{perm}$ in solid sand-lime brick Vbl** | ≥ 8 DF 2/1.6 | [kN] | 0.17[6)] | 0.26[6)] | 0.26[6)] | 0.26[6)] | 0.57[6)] | 0.57[6)] | 0.43[6)] | 0.43[6)] |
| | ≥ 8 DF 8/1.6 | [kN] | 0.71[6)] | 0.86[6)] | 0.86[6)] | 0.86[6)] | 2.14[6)] | 2.14[6)] | 1.00[6)] | 1.00[6)] |
| **Permissible load[5)] $F_{perm}$ in vertically perforated brick HLz** | ≥ 2 DF 12/1.2 | [kN] | 0.17[6)] | 0.17[6)] | 0.17 | – | 0.26[6)] | – | 0.71[6)7)] | 0.71[6)7)] |
| | ≥ 2 DF 28/1.2 | [kN] | 0.34[6)] | 0.34[6)] | 0.43 | – | 0.57[6)] | – | – | – |
| **Permissible load $F_{perm}$ in perforated sand-lime brick KSL** | ≥ 2 DF 12/1.6 | [kN] | 0.26 | 0.43 | 0.34[6)] | – | 0.71[6)] | 0.71 | 0.57 | 0.71 |
| **Permissible load[5)] $F_{perm}$ in hollow lightweight concrete blocks Hbl** | ≥ 2/0.8 | [kN] | 0.34[6)] | 0.34[6)] | 0.34[6)] | 0.34[6)] | 0.43[6)] | – | 0.57[6)] | 0.43[6)] |
| **Permissible load[5)] $F_{perm}$ in ceilings made of vertically perforated bricks** | ≥ 8/0.7 | [kN] | – | – | – | – | 0.57[6)] | – | – | – |
| **Minimum member thickness** | $h_{min}$ | [mm] | 115 | 115 | 115 | 110 | 110 | 110 | 115 | 115 |
| **Minimum spacing (single anchor)** | $a_{min}$ | [mm] | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| **Minimum spacing (anchor group)** | $s_{min}$ | [mm] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| **Minimum edge distance (anchor group)** | $c_{min}$ | [mm] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| **Anchorage in aerated concrete[4)]** | | | | | | | | | | |
| **Permissible load $F_{perm}$** | AAC ≥ 2 N/mm² | [kN] | – | 0.14 | 0.21 | – | 0.18 | 0.21[8)] | 0.32 | 0.43 |
| **in aerated concrete** | AAC ≥ 6 N/mm² | [kN] | – | 0.54 | 0.71 | – | 0.89 | 1.10[8)] | 1.43 | 1.79 |
| **Permissible load $F_{perm}$** | AAC ≥ 2 N/mm² | [kN] | – | – | – | – | 0.18[9)] | 0.18[9)] | - | - |
| **in reinforced aerated concrete** | AAC ≥ 6 N/mm² | [kN] | – | – | – | – | 1.07[10)] | 1.25[10)] | - | - |
| **Minimum member thickness** | $h_{min}$ | [mm] | – | 175 | 175 | – | 100 | 120 | 175 | 175 |
| **Minimum spacing (single anchor)** | $a_{min}$ | [mm] | – | 250 | 250 | – | 250 | 250 | 250 | 250 |
| **Minimum spacing (anchor group)** | $s_{min}$ | [mm] | – | 80/110[11)] | 80/110[11)] | – | 100/120[11)] | 100/120[11)] | 80 | 100 |
| **Minimum edge distance (anchor group)** | $c_{min}$ | [mm] | – | 90/110[11)] | 90/110[11)] | – | 120 | 120 | 120 | 120 |

1) Valid for zinc coated screws (gvz) and for screws made of stainless steel (R). For exterior use of the zinc coated screws measures against incoming humidity according to ETA have to be taken.
2) The required partial safety factors for material resistance as well as a partial safety factor for load actions $\gamma_L = 1.4$ are considered.
As a single anchor counts e.g. an anchor with a minimum spacing a according to annexes of the ETA.
3) Valid for temperatures in the substrate up to +50 °C (resp. short term up to +80 °C). For long term temperatures up to +30 °C higher permissible loads may be possible.
4) Valid for tensile load, shear load and oblique load under any angle. For bending moments and non-visible or non-mortared masonry joints, the design specifications of the ETA must be observed. Masonry properties in min. compressive strength [N/mm²] and density [kg/dm³] e.g. for Mz as 12/1.8. The corresponding average stone compressive strengths according to EN 771 and other masonry variants and geometries can be found in the ETA.
5) Rotary drilling.
6) Only for axial distance s ≥ 250 mm.
7) Valid for HLz ≥ 3 DF 12/1.0.
8) Only for axial distance $s_{1,min} \geq 240$ mm and $s_{2,min} \geq 250$ mm.
9) Valid for member thickness $h_{min} \geq 175$ mm. Minimum spacing and edge distances see ETA.
10) Valid for member thickness $h_{min} \geq 240$ mm. Minimum spacing and edge distances see ETA.
11) Valid for AAC with compression strength ≥ 6 N/mm².

# Loads

**Frame fixing SXRL 10**

Permissible loads of a single anchor[1] in normal concrete of strength class C20/25.
For the design the complete current general construction technique permit Z-21.2-2092 has to be considered.

| | | | Cracked concrete | | | | | Non-cracked concrete | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Material/ surface[2] | Nominal anchorage depth | Minimum member thickness | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | | Minimum member thickness | Permissible tension ($N_{perm}$) and shear loads ($V_{perm}$); minimum spacing ($s_{min}$) and edge distances ($c_{min}$) with reduced loads | | | |
| | | $h_{nom}$ | $h_{min}$ | $N_{perm}$[3] | $V_{perm}$[3] | $s_{min}$[3] | $c_{min}$[3] | $h_{min}$ | $N_{perm}$[3] | $V_{perm}$[3] | $s_{min}$[3] | $c_{min}$[3] |
| Type | | [mm] | [mm] | [kN] | [kN] | [mm] | [mm] | [mm] | [kN] | [kN] | [mm] | [mm] |
| **SXRL 10** | gvz | 70 | 100 | 1.5 | 3.4 | 50 | 50 | 110 | 2.6 | 6.0 | 80 | 80 |
| | R | 70 | 100 | 1.5 | 3.4 | 50 | 50 | 110 | 2.6 | 6.0 | 80 | 80 |

[1] Design according to EN 1992-4:2018 (for static resp. quasi-static loads). The partial safety factors for material resistance well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times$ hef. Accurate data see approval.
[2] Further steel grades, versions and technical data see current general construction technique permit.
[3] In the case of combinations of tensile and shear loads, bending moments with reduced or minimum spacing and edge distances (anchor groups), the design must be carried out in accordance with the provisions of the complete approval and the provisions of the EN 1992-4:2018. The given loads are valid for temperature range II. We recommend using our anchor design software C-FIX.

# Frame fixing SXR

The efficient with short expansion element.







Façade substructures



Façade substructures

## Applications

- Façade, ceiling and roof substructures made of wood and metal
- Windows
- Gates and doors
- Wardrobes
- Kitchen hanging cabinets
- Squared timbers
- Beams
- TV consoles
- Wall covering
- Metal brackets
- Metal supports

## Advantages

- The special functioning allows for use in solid and hollow building materials with an anchorage depth of just 50 mm, ensuring an economical fixing.
- The ETA assessment covers use in a range of solid and hollow building materials, and guarantees a secure fixing.
- The specially developed combination of plugs and screws ensures the very best handling. The plug has a noticeable hold, making installation more convenient.
- Extensive range with diameters of 6, 8 and 10 mm, usable lengths up to 210 mm.

## Certificates / Features

ETA-07/0121, for redundant non-structural systems in concrete and masonry

Inox Stainless Steel

★★★★★ Nylon Quality

## Building materials

**Approved for:**

- Concrete ≥ C12/15
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Aerated concrete
- Solid block made from lightweight and normal weight concrete
- Solid brick
- Thermal insulation blocks

**Also suitable for:**

- Natural stone with dense structure
- Solid panel made from gypsum

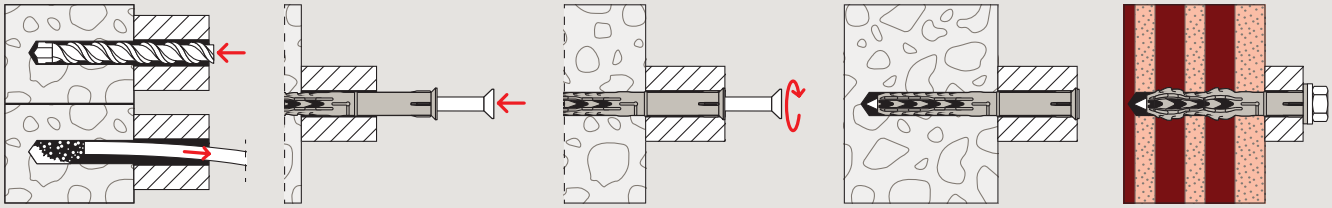
## Versions

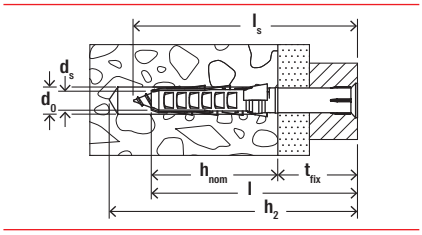
- Galvanised steel
- Stainless steel
- Hot-dip galvanised steel

## Functioning

- The SXR is suitable for push-through installation.
- The SXR expands in solid building materials. In hollow building materials the loads are transmitted to the substrate webs.
- With vertically perforated bricks, only use rotary drilling (no impact drilling).
- SXR-T with countersunk head screw is recommended for the installation of timber constructions; in the case of metal constructions, use SXR-FUS with a wide sleeve rim and a moulded washer on the screw, which also features an integrated hexagon socket.

## Installation SXR








## Technical data

**Frame fixing SXR**



SXR

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Usable length at anchorage depth 30 mm $t_{fix}$ [mm] | Usable length at anchorage depth 50 mm $t_{fix}$ [mm] | Screw diameter $d_s$ [mm] | Min. screw length $l_s$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **SXR 6 x 60** | **503230** | 6 | 70 | 30 | – | 4.5 | 65 | 100 |
| **SXR 8 x 60** | **506194** | 8 | 70 | – | 10 | 5.5 - 6.0 | 65 | 100 |
| **SXR 8 x 80** | **506196** | 8 | 90 | – | 30 | 5.5 - 6.0 | 85 | 100 |
| **SXR 8 x 100** | **506198** | 8 | 110 | – | 50 | 5.5 - 6.0 | 105 | 100 |
| **SXR 8 x 120** | **506199** | 8 | 130 | – | 70 | 5.5 - 6.0 | 125 | 100 |

## Technical data

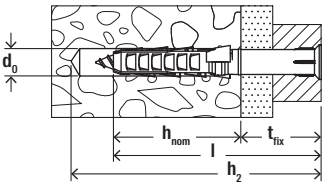
**Frame fixing SXR-Z**



SXR-Z

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Usable length at anchorage depth 30 mm $t_{fix}$ [mm] | Anchor length $l$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **SXR 6 x 60 Z** | **503233**[1)] | 6 | 70 | 30 | 60 | PZ2 | 50 |

[1)] Not pre-assembled.




## Technical data

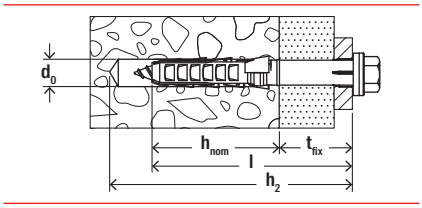
**Frame fixing SXR-T**



SXR-T

5

| Item | Galvanised steel<br>Item no.<br>gvz | Hot-dip galvanised steel<br>Item no.<br>hdg | Stainless steel<br>Item no.<br>R | Approval<br>ETA | Drill diameter<br>$d_0$<br>[mm] | Min. drill hole depth for through fixings<br>$h_2$<br>[mm] | Anchor length<br>l<br>[mm] | Usable length at anchorage depth 50 mm<br>$t_{fix}$<br>[mm] | Drive | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| **SXR 8 x 60 T** | **502999** | **–** | **–** | ● | 8 | 70 | 60 | 10 | TX30 | 50 |
| **SXR 8 x 80 T** | **503000** | **–** | **–** | ● | 8 | 90 | 80 | 30 | TX30 | 50 |
| **SXR 8 x 100 T** | **503001** | **–** | **–** | ● | 8 | 110 | 100 | 50 | TX30 | 50 |
| **SXR 8 x 120 T** | **503002** | **–** | **–** | ● | 8 | 130 | 120 | 70 | TX30 | 50 |
| **SXR 10 x 80 T** | **046263** | **–** | **046272** | ● | 10 | 90 | 80 | 50 | TX40 | 50 |
| **SXR 10 x 100 T** | **046264** | **509534** | **046274** | ● | 10 | 110 | 100 | 50 | TX40 | 50 |
| **SXR 10 x 120 T** | **046265** | **509535** | **046278** | ● | 10 | 130 | 120 | 70 | TX40 | 50 |
| **SXR 10 x 140 T** | **046266** | **509536** | **046279** | ● | 10 | 150 | 140 | 90 | TX40 | 50 |
| **SXR 10 x 160 T** | **046267** | **–** | **046283** | ● | 10 | 170 | 160 | 110 | TX40 | 50 |
| **SXR 10 x 180 T** | **046268** | **–** | **046285** | ● | 10 | 190 | 180 | 130 | TX40 | 50 |
| **SXR 10 x 200 T** | **046269** | **–** | **046286** | ● | 10 | 210 | 200 | 150 | TX40 | 50 |
| **SXR 10 x 230 T** | **046270** | **–** | **–** | ● | 10 | 240 | 230 | 180 | TX40 | 50 |
| **SXR 10 x 260 T** | **046271** | **–** | **–** | ● | 10 | 270 | 260 | 210 | TX40 | 50 |




## Technical data

**Frame fixing SXR-FUS**



SXR-FUS

| Item | Galvanised steel<br>Item no.<br>gvz | Hot-dip galvanised steel<br>Item no.<br>hdg | Stainless steel<br>Item no.<br>R | Approval<br>ETA | Drill diameter<br>$d_0$<br>[mm] | Min. drill hole depth for through fixings<br>$h_2$<br>[mm] | Anchor length<br>l<br>[mm] | Usable length at anchorage depth 50 mm<br>$t_{fix}$<br>[mm] | Drive | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| **SXR 10 x 52 FUS** | **502456**[1] | – | – | ● | 10 | 62 | 52 | 2 | TX40 / SW 13 | 50 |
| **SXR 10 x 60 FUS** | **046329** | – | **046339** | ● | 10 | 70 | 60 | 10 | TX40 / SW 13 | 50 |
| **SXR 10 x 80 FUS** | **046330** | **509538** | **046340** | ● | 10 | 90 | 80 | 30 | TX40 / SW 13 | 50 |
| **SXR 10 x 100 FUS** | **046331** | **509539** | **046342** | ● | 10 | 110 | 100 | 50 | TX40 / SW 13 | 50 |
| **SXR 10 x 120 FUS** | **046332** | – | **046343** | ● | 10 | 130 | 120 | 70 | TX40 / SW 13 | 50 |
| **SXR 10 x 140 FUS** | **046333** | **509540** | **046344** | ● | 10 | 150 | 140 | 90 | TX40 / SW 13 | 50 |
| **SXR 10 x 160 FUS** | **046334** | – | **046345** | ● | 10 | 170 | 160 | 110 | TX40 / SW 13 | 50 |
| **SXR 10 x 180 FUS** | **046335** | – | **046361** | ● | 10 | 190 | 180 | 130 | TX40 / SW 13 | 50 |
| **SXR 10 x 200 FUS** | **046336** | – | **046362** | ● | 10 | 210 | 200 | 150 | TX40 / SW 13 | 50 |
| **SXR 10 x 230 FUS** | **046337** | – | – | ● | 10 | 240 | 230 | 180 | TX40 / SW 13 | 50 |
| **SXR 10 x 260 FUS** | **046338** | – | – | ● | 10 | 270 | 260 | 50 | TX40 / SW 13 | 50 |
| **SXR 10 x 80 FUS** | **705028** | – | – | ● | 10 | 90 | 80 | 30 | TX40 / SW 13 | 1 |

[1] Not pre-assembled.

## Loads

**Frame fixing SXR**

Recommended loads[1][2][3] for a single anchor as part of a multiple fixing of non-structural systems.
The given loads are valid for wood screws with the specified diameter.

| Type | | | SXR 6 | SXR 8 |
|---|---|---|---|---|
| **Screw diameter** | | **[mm]** | 4.5 | 6.0 |
| **Anchorage depth** | $h_{nom}$ | **[mm]** | 30 | 50 |
| **Minimum edge distance concrete** | $c_{min}$ | **[mm]** | 50 | 60 |
| **Recommended loads in the respective base material $F_{rec}$**[2] | | | | |
| **Concrete** | ≥ C20/25 | **[kN]** | 0.25 | 0.40 |
| **Solid brick** | ≥ Mz 12 | **[kN]** | 0.20 | 0.30 |
| **Solid sand-lime brick** | ≥ KS 12 | **[kN]** | 0.20 | 0.30 |
| **Vertically perforated brick** | ≥ HLz 12; ρ ≥ 1.0 [kg/dm³] | **[kN]** | 0.10 | 0.10 |
| **Perforated sand-lime brick** | ≥ KSL 12 | **[kN]** | 0.20 | 0.30 |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tensile load, shear load and oblique load under any angle.
[3] Valid for zinc coated screws (gvz) and for screws made of stainless steel (R). For exterior use of the zinc coated screws measures against incoming humidity have to be taken.

## Loads

**Frame fixing SXR**

Permissible loads[1)2)3)] of a single anchor as part of a multiple fixing of non-structural systems.
For the design the complete current assessment ETA-07/0121 has to be considered.

| Type | | | SXR 8 | SXR 10 |
|---|---|---|---|---|
| **Drill hole diameter** | $d_0$ | **[mm]** | 8 | 10 |
| **Anchorage depth** | $h_{nom} \geq$ | **[mm]** | 50 | 50 |
| **Anchorage in concrete ≥ C12/15** | | | | |
| **Permissible tensile load $N_{perm}$** | | **[kN]** | 0.99 | 1.79 |
| **Permissible shear load $V_{perm}$** | zinc coated screws (gvz) | **[kN]** | 4.23 | 5.98 |
| | stainless steel screw (R) | **[kN]** | 3.93 | 5.98 |
| **Minimum member thickness** | $h_{min}$ | **[mm]** | 100 | 100 |
| **Characteristic edge distance** | $c_{cr,N}$ | **[mm]** | 70 | 140 |
| **Characteristic spacing** | a resp. $s_{cr,N}$ | **[mm]** | 70 | 100 |
| **Minimum spacing** | $s_{min}$ | **[mm]** | 70 | 70 |
| **with an edge distance** | c ≥ | **[mm]** | 70 | 210 |
| **Minimum edge distance** | $c_{min}$ | **[mm]** | 70 | 85 |
| **with a spacing** | s ≥ | **[mm]** | 70 | 100 |
| **Anchorage in narrow concrete members (h ≥ 40 mm) made of concrete ≥ C12/15, e. g. weather shells of triple-skin outer wall panels** | | | | |
| **Permissible tensile load $N_{perm}$** | | **[kN]** | – | 1.19 |
| **Permissible shear load $V_{perm}$** | | **[kN]** | – | 5.98 |
| **Anchorage in masonry[4)]** | | | | |
| **Anchorage depth** | $h_{nom}$ | **[mm]** | 50 | 50 |
| **Permisible load $F_{perm}$ in solid brick Mz** | ≥ NF 12/1.8 | **[kN]** | 0.34[6)] | 0.34[6)] |
| | ≥ NF 20/1.8 | **[kN]** | 0.57[6)] | 0.57[6)] |
| **Permissible load $F_{perm}$ in solid sand-lime brick KS** | ≥ NF 12/1.8 | **[kN]** | 0.43 | 0.43[6)] |
| | ≥ NF 20/1.8 | **[kN]** | 0.71 | 0.71[6)] |
| **Permissible load $F_{perm}$ in solid sand-lime brick Vbl** | ≥ 2 DF 2/1.2 | **[kN]** | 0.14[6)] | 0.21[6)] |
| | ≥ 8 DF 6/1.4 | **[kN]** | 0.21[6)] | 0.71[6)] |
| **Permissible load [5)] $F_{perm}$ in vertically perforated brick HLz** | ≥ 2 DF 12/1.2 | **[kN]** | 0.17[6)] | 0.43[6)] |
| | ≥ 2 DF 20/1.2 | **[kN]** | 0.34[6)] | 0.71[6)] |
| **Permissible load $F_{perm}$ in perforated sand-lime brick KSL** | ≥ 2 DF 8/1.4 | **[kN]** | 0.26[6)] | 0.34[6)] |
| | ≥ 2 DF 12/1.4 | **[kN]** | 0.43[6)] | 0.57[6)] |
| **Permissible load $F_{perm}$ in hollow lightweight concrete blocks Hbl** | ≥ 2/1.2 | **[kN]** | 0.21[6)] | 0.26[6)] |
| | ≥ 8/1.2 | **[kN]** | 0.71[6)] | 0.71[6)] |
| **Minimum member thickness** | $h_{min}$ | **[mm]** | 100 | 100 |
| **Minimum spacing (single anchor)** | $a_{min}$ | **[mm]** | 250 | 250 |
| **Minimum spacing (anchor group)** | $s_{min}$ | **[mm]** | 100 | 100 |
| **Minimum edge distance (anchor group)** | $c_{min}$ | **[mm]** | 100 | 100 |
| **Anchorage in aerated concrete[4)]** | | | | |
| **Anchorage depth** | $h_{nom} \geq$ | **[mm]** | 50 | 50 |
| **Permissible load $F_{perm}$ in aerated concrete** | AAC ≥ 2 N/mm² | **[kN]** | – | 0.14 |
| | AAC ≥ 4 N/mm² | **[kN]** | – | 0.27 |
| | AAC ≥ 6 N/mm² | **[kN]** | – | 0.27 |
| **Minimum member thickness** | $h_{min}$ | **[mm]** | – | 100 |
| **Minimum spacing (single anchor)** | $a_{min}$ | **[mm]** | – | 400 |
| **Minimum spacing (anchor group)** | $s_{min}$ | **[mm]** | – | 400 |
| **Minimum edge distance (anchor group)** | $c_{min}$ | **[mm]** | – | 100 |

[1)] Valid for zinc coated screws (gvz) and for screws made of stainless steel (R). For exterior use of the zinc coated screws measures against incoming humidity according to ETA have to be taken.
[2)] The required partial safety factors for material resistance as well as a partial safety factor for load actions $\gamma_L$ = 1.4 are considered.
As a single anchor counts e.g. an anchor with a minimum spacing according to ETA.
[3)] Valid for temperatures in the substrate up to +50 °C (resp. short term up to +80 °C). For long term temperatures up to +30 °C higher permissible loads may be possible.
[4)] Valid for tensile load, shear load and oblique load under any angle. For bending moments and non-visible or non-mortared masonry joints, the design specifications of the ETA must be observed. Masonry properties in min. compressive strength [N/mm²] and density [kg/dm³] e. g. for Mz as 12/1.8. The corresponding average stone compressive strengths according to EN 771 and other masonry variants and geometries can be found in the ETA.
[5)] Rotary drilling.
[6)] For axial spacing s ≥ 250 mm.

# Anti-corrosion spray FTC-CP

The elastic protective coating for use with frame fixings.






Sealing of the screw heads



Sealing of the screw heads



## Applications

- Façade anchorings in line with the assessments for frame fixings, e.g. SXR, SXRL and DuoXpand
- For all substructures, e.g. made from wood, aluminium, metal

## Advantages

- FTC-CP professionally prevents the penetration of moisture into the anchor shaft and securely protects the connection from corrosion - as required in the ETA assessments.
- Once dry, the optimised formulation provides a long-lasting, elastic protective coating with a secure hold and a high abrasion resistance.
- The thixotropic anti-corrosion agent is also ideally suited to other corrosion protection applications and thus offers a wide range of uses.

## Building materials

- Galvanised frame fixing
- Corrosive metals

## Functioning

- Thixotropic, bitumen-based anti-corrosion agent.
- Good stability under load; non-drip, no spray mist.
- Shake canister for at least 2 minutes from the time the mixing balls can be heard.
- Spray as evenly as possible from a distance of 15 to 20 cm.
- Ideal processing temperature +16 °C to +25 °C.
- Quick-drying (dried through after 3-4 hours at 600 mµ and 20 °C).
- Temperature-resistant from -25 °C to 80 °C.
- Salt and water-resistant, and resistant to abrasion.
- With one can about 300 screw heads can be coated.

## Technical data

| Item | Item no. | Colour | Contents [ml] | Adapted for | Sales unit [pcs] |
|---|---|---|---|---|---|
| FTC-CP | 511440[1)] | black | 500 | up to 300 fixing points | 1 |

[1)] Dangerous goods - no express shipping possible.

# Hammerfix N

The hammer-in plug for a simple, fast and economical installation.







Timber substructures



Cable ducts

## Applications

- Substructures made of wood and metal
- Wall connection or plaster profiles
- Slides
- Sheets
- Cable and pipe clips
- Perforated tapes

## Advantages

- The rapid hammerset installation reduces the amount of time required and allows for an economic series installation.
- The integrated hammer-in stop prevents the plug from expanding prematurely (jamming), thus enabling a problem-free installation.
- Together with the cross-slot recess, the thread of the nail screw allows the screw to be removed, thus allowing for subsequent dismantling.
- The wide range of diameters, usage lengths and head shapes provides the correct plug for every fixing.

## Certificates / Features

★★★★★ Nylon Quality

Inox Stainless Steel

## Building materials

- Concrete
- Solid sand-lime brick
- Building brick
- Natural stone
- Solid brick made from lightweight concrete
- Aerated concrete
- Solid panel made from gypsum

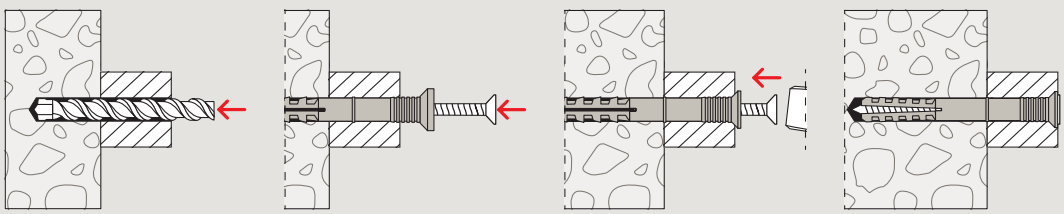
## Versions

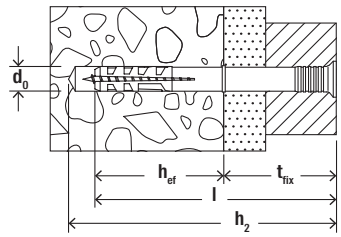
- Galvanised steel
- Stainless steel

## Functioning

- The Hammerfix N is suitable for push-through installation.
- When hammered in, the nail screw causes the plug to expand in two directions, thus providing a secure anchoring in the building material.
- Countersunk head plugs are recommended for the installation of timber constructions; in the case of metal constructions, use plugs with cylindrical head, and use flat edge plugs for long holes.

## Installation N






## Technical data

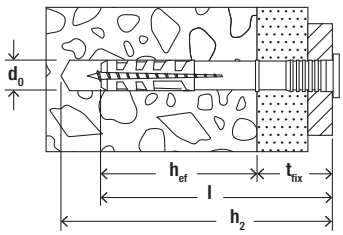
**Hammerfix N-S**



N-S N-S A2

| Item | Galvanised steel Item no. gvz | Stainless steel A2 Item no. A2 | Drill diameter $d_0$ [mm] | Effect. anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Max. fixture thickness $t_{fix}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **N 5 x 30/5 S (100)** | **050395**[1] | **050370** | 5 | 25 | 30 | 45 | 5 | PZ2 | 100 |
| **N 5 x 40/15 S (100)** | **050351** | **–** | 5 | 25 | 40 | 55 | 15 | PZ2 | 100 |
| **N 5 x 50/25 S (100)** | **050352** | **–** | 5 | 25 | 50 | 65 | 25 | PZ2 | 100 |
| **N 6 x 40/10 S (50)** | **050354** | **050372** | 6 | 30 | 40 | 55 | 10 | PZ2 | 50 |
| **N 6 x 40/10 S (100)** | **048788** | **–** | 6 | 30 | 40 | 55 | 10 | PZ2 | 100 |
| **N 6 x 40/10 S (200)** | **513834**[1] | **–** | 6 | 30 | 40 | 55 | 10 | PZ2 | 200 |
| **N 6 x 60/30 S (50)** | **050355** | **050373** | 6 | 30 | 60 | 75 | 30 | PZ2 | 50 |
| **N 6 x 60/30 S (100)** | **048789** | **–** | 6 | 30 | 60 | 75 | 30 | PZ2 | 100 |
| **N 6 x 60/30 S (200)** | **513835**[1] | **–** | 6 | 30 | 60 | 75 | 30 | PZ2 | 200 |
| **N 6 x 80 /50 S (50)** | **050353** | **–** | 6 | 30 | 80 | 95 | 50 | PZ2 | 50 |
| **N 6 x 80/50 S (100)** | **048790** | **–** | 6 | 30 | 80 | 95 | 50 | PZ2 | 100 |
| **N 6 x 80/50 S (200)** | **513836**[1] | **–** | 6 | 30 | 80 | 95 | 50 | PZ2 | 200 |
| **N 8 x 60/20 S (50)** | **050356** | **050374** | 8 | 40 | 60 | 75 | 20 | PZ3 | 50 |
| **N 8 x 60/20 S (100)** | **048791** | **–** | 8 | 40 | 60 | 75 | 20 | PZ3 | 100 |
| **N 8 x 80/40 S (50)** | **050358** | **050375** | 8 | 40 | 80 | 95 | 40 | PZ3 | 50 |
| **N 8 x 80/40 S (100)** | **048792** | **–** | 8 | 40 | 80 | 95 | 40 | PZ3 | 100 |
| **N 8 x 100/60 S (50)** | **050357** | **050376** | 8 | 40 | 100 | 115 | 60 | PZ3 | 50 |
| **N 8 x 100/60 S (100)** | **048793** | **–** | 8 | 40 | 100 | 115 | 60 | PZ3 | 100 |
| **N 8 x 120/80 S (50)** | **050359** | **–** | 8 | 40 | 120 | 135 | 80 | PZ3 | 50 |
| **N 8 x 120/80 S (100)** | **048794** | **–** | 8 | 40 | 120 | 135 | 80 | PZ3 | 100 |
| **N 10 x 100/50 S (50)** | **050346**[2] | **–** | 10 | 50 | 100 | 115 | 50 | PZ3 | 50 |
| **N 10 x 135/85 S (50)** | **050347**[2] | **–** | 10 | 50 | 135 | 150 | 85 | PZ3 | 50 |
| **N 10 x 160/110 S (50)** | **050348**[2] | **–** | 10 | 50 | 160 | 175 | 110 | PZ3 | 50 |

[1] Also specially suitable for fischer pipe clips FC, see chapter electrical fixings.
[2] Not pre-assembled.




## Technical data

**Remedial wall tie mechanical VBS-M**





N-F

| Item | Item no. | Drill diameter $d_0$ [mm] | Effect. anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Max. fixture thickness $t_{fix}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| N 5 x 25/1 F (100) | 514872 | 5 | 25 | 25 | 40 | 1 | PZ2 | 100 |
| N 5 x 25/1 F (200) | 514873 | 5 | 25 | 25 | 40 | 1 | PZ2 | 200 |
| N 5 x 30/5 F (100) | 513736 | 5 | 25 | 30 | 45 | 5 | PZ2 | 100 |
| N 5 x 30/5 F (200) | 513739 | 5 | 25 | 30 | 45 | 5 | PZ2 | 200 |
| N 5 x 40/15 F (100) | 513737 | 5 | 25 | 40 | 55 | 15 | PZ2 | 100 |
| N 5 x 40/15 F (200) | 513740 | 5 | 25 | 40 | 55 | 15 | PZ2 | 200 |
| N 5 x 50/25 F (100) | 513738 | 5 | 25 | 50 | 65 | 25 | PZ2 | 100 |
| N 5 x 50/25 F (200) | 513741 | 5 | 25 | 50 | 65 | 25 | PZ2 | 200 |
| N 6 x 35/5 F (100) | 522948 | 6 | 30 | 35 | 40 | 5 | PZ2 | 100 |
| N 6 x 40/10 F (100) | 513840 | 6 | 30 | 40 | 55 | 10 | PZ2 | 100 |
| N 6 x 40/10 F (200) | 513843 | 6 | 30 | 40 | 55 | 10 | PZ2 | 200 |
| N 6 x 60/30 F (100) | 513841 | 6 | 30 | 60 | 75 | 30 | PZ2 | 100 |
| N 6 x 60/30 F (200) | 513844 | 6 | 30 | 60 | 75 | 30 | PZ2 | 200 |
| N 6 x 80/50 F (100) | 513842 | 6 | 30 | 80 | 95 | 50 | PZ2 | 100 |
| N 6 x 80/50 F (200) | 513845 | 6 | 30 | 80 | 95 | 50 | PZ2 | 200 |
| N 8 x 60/20 F (100) | 513701 | 8 | 40 | 60 | 75 | 20 | PZ3 | 100 |
| N 8 x 80/40 F (100) | 513702 | 8 | 40 | 80 | 95 | 40 | PZ3 | 100 |
| N 8 x 100/60 F (100) | 513703 | 8 | 40 | 100 | 115 | 60 | PZ3 | 100 |
| N 8 x 120/80 F (100) | 513704 | 8 | 40 | 120 | 135 | 80 | PZ3 | 100 |

## Technical data

**Hammerfix N-P K/-S M/-S D A2**



N-P K

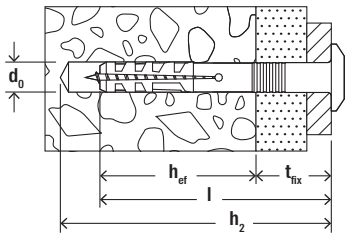


N-S M



N-S D A2

| Item | Galvanised steel Item no. | Stainless steel A2 Item no. | Drill diameter $d_0$ [mm] | Effect. anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Diameter of washer [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| N 6 x 40/7 P K (50) | 050342 | – | 6 | 30 | 40 | 7 | 55 | – | – | 50 |
| N 6 x 40/10 S M6 (50) | 050398 | – | 6 | 30 | 40 | 10 | 55 | – | – | 50 |
| N 6 x 40/10 S D A2 (50) | – | 050367 | 6 | 30 | 40 | 10 | 55 | 19 | PZ2 | 50 |
| N 6 x 60/30 S D A2 (50) | – | 050368 | 6 | 30 | 60 | 30 | 75 | 19 | PZ2 | 50 |




## Technical data

**Hammerfix N-P**



N-P N-P A2

| | Galvanised steel | Stainless steel A2 | Drill diameter | Effect. anchorage depth | Anchor length | Min. drill hole depth for through fixings | Max. fixture thickness | Drive | Sales unit |
|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | $d_0$ [mm] | $h_{ef}$ [mm] | l [mm] | $h_2$ [mm] | $t_{fix}$ [mm] | | [pcs] |
| **Item** | **gvz** | **A2** | | | | | | | |
| **N 5 x 30/5 P (100)** | **050338** | **–** | 5 | 25 | 30 | 45 | 5 | PZ2 | 100 |
| **N 6 x 30/1 P (100)** | **514869** | **–** | 6 | 30 | 30 | 45 | 1 | PZ2 | 100 |
| **N 6 x 40/7 P (50)** | **050339** | **050369** | 6 | 30 | 40 | 55 | 7 | PZ2 | 50 |
| **N 6 x 40/7 P (100)** | **048795** | **–** | 6 | 30 | 40 | 55 | 7 | PZ2 | 100 |
| **N 6 x 40/7 P (200)** | **514871** | **–** | 6 | 30 | 40 | 55 | 7 | PZ2 | 200 |
| **N 8 x 40/1 P (50)** | **015903** | **–** | 8 | 40 | 40 | 55 | 1 | PZ3 | 50 |
| **N 8 x 40/1 P (100)** | **514870** | **–** | 8 | 40 | 40 | 55 | 1 | PZ3 | 100 |

## Loads

**Hammerfix N**

Recommended loads[1] for a single anchor.
The given loads are valid for screw nails with the specified diameter.

| Type | | | N 5 | N 6[3] | N 8 | N 10 |
|---|---|---|---|---|---|---|
| **Screw nail diameter** | | [mm] | 3.5 | 3.7 | 4.7 | 7.0 |
| **Recommended loads in the respective base material $F_{rec}$[2]** | | | | | | |
| **Concrete** | ≥ C20/25 | [kN] | 0.20 | 0.25 | 0.27 | 0.33 |
| **Solid brick** | ≥ Mz 12 | [kN] | 0.14 | 0.18 | 0.24 | 0.30 |
| **Solid sand-lime brick** | ≥ KS 12 | [kN] | 0.18 | 0.22 | 0.24 | 0.33 |
| **Solid brick of lightweight aggregate concrete** | ≥ V 4 | [kN] | 0.05 | 0.12 | 0.15 | 0.16 |
| **Aerated concrete** | ≥ AAC 2 | [kN] | 0.03 | 0.04 | 0.05 | 0.10 |
| **Aerated concrete** | ≥ AAC 4 | [kN] | 0.07 | 0.10 | 0.13 | 0.16 |

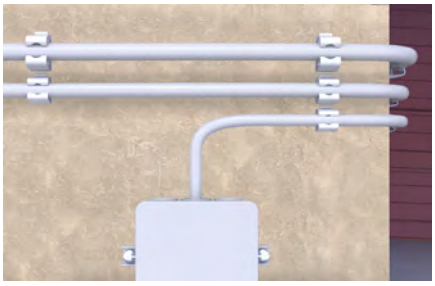
[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tensile load, shear load and oblique load under any angle.
[3] The values have to be reduced by 50% for N 6 x 40/7 P K.

# Hammerfix N Green

The hammer-in plug for a simple, fast and economical installation.







Cable fixing



Timber substructures

## Applications

- Substructures made of wood and metal
- Wall connection or plaster profiles
- Slides
- Sheets
- Cable and pipe clips
- Perforated tapes

## Advantages

- Produced with at least 50% renewable raw materials and therefore particularly environmentally friendly.
- Just as effective, secure and durable as regular hammerfix N plugs.
- The rapid push-through and hammer-set installation reduces the amount of work required and allows for economic series installation.
- The integrated hammer-in stop prevents the plug from expanding prematurely, thus enabling problem-free installation.
- Together with the cross-slot recess, the thread of the nail screw allows the screw to be removed, thus allowing for subsequent dismantling.

## Certificates / Features

★★★★★ Nylon Quality

BIOBASED 50 - 85% DIN Geprüft 8C029

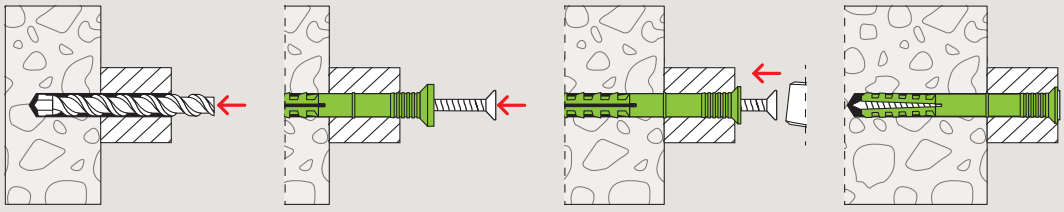
## Building materials

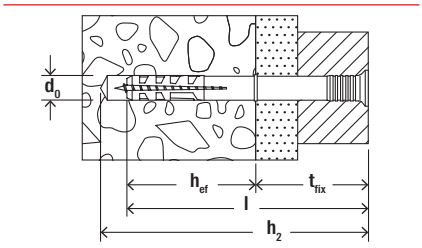
- Concrete
- Solid sand-lime brick
- Building brick
- Natural stone
- Solid brick made from lightweight concrete
- Aerated concrete
- Solid panel made from gypsum

## Functioning

- The hammerfix N Green is suitable for push-through installation.
- The easiest installation: drill, knock in and you're done.
- When being hammered in, the nail screw causes the plug to expand in two directions, thus providing a secure anchoring in the building material.

## Installation N Green






## Technical data

**Hammerfix N Green**



N Green S

| Item | Item no. | Drill diameter $d_0$ [mm] | Effect. anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Max. fixture thickness $t_{fix}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **N Green 6 x 40/10 S** | **524845** | 6 | 30 | 40 | 55 | 10 | PZ2 | 45 |
| **N Green 6 x 60/30 S** | **524847** | 6 | 30 | 60 | 75 | 30 | PZ2 | 45 |
| **N Green 6 x 80/50 S** | **524848** | 6 | 30 | 80 | 95 | 50 | PZ2 | 45 |
| **N Green 8 x 80/40 S** | **524849** | 8 | 40 | 80 | 95 | 40 | PZ3 | 45 |
| **N Green 8 x 100/60 S** | **524850** | 8 | 40 | 100 | 115 | 60 | PZ3 | 45 |

## Loads

**Hammerfix N Green**

Recommended loads[1] for a single anchor.
The given loads are valid for screw nails with the specified diameter.

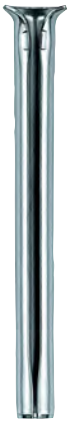
| Type | | | N Green 6 | N Green 8 |
|---|---|---|---|---|
| **Screw nail diameter** | | [mm] | 4 | 5 |
| **Recommended loads in the respective base material $F_{rec}$** [2] | | | | |
| **Concrete** | ≥ C20/25 | [kN] | 0.25 | 0.27 |
| **Solid brick** | ≥ Mz 12 | [kN] | 0.18 | 0.24 |
| **Solid sand-lime brick** | ≥ KS 12 | [kN] | 0.22 | 0.24 |
| **Solid brick of lightweight aggregate concrete** | ≥ V 4 | [kN] | 0.12 | 0.15 |
| **Aerated concrete** | ≥ AAC 2 | [kN] | 0.04 | 0.05 |
| **Aerated concrete** | ≥ AAC 4 | [kN] | 0.10 | 0.13 |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tensile load, shear load and oblique load under any angle.

# Nail sleeve FNH

The user-friendly spring sleeve for light fixings in solid building materials.







Timber substructures

## Applications

- Squared timbers
- Substructures made of wood and metal
- Metal profiles

## Advantages

- No plugs or screws are required for the one-piece nail sleeve. This guarantees a simple and easy installation.
- The geometry of the nail sleeve makes it easy to push it into the drill hole. This saves time and money.

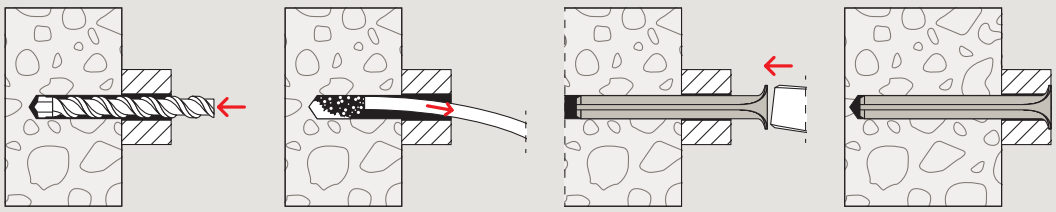
## Building materials

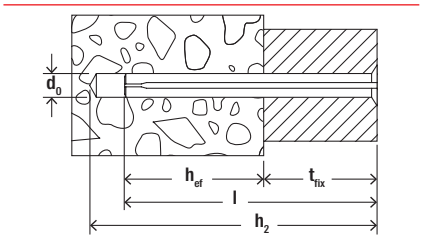
- Concrete
- Solid sand-lime brick
- Natural stone with dense structure
- Solid brick

## Functioning

- The FNH nail sleeve is suitable for push-through installation.
- The nail sleeve is hammered in and expands its entire length in the hole.
- FNH is suitable for interior applications and for temporary external fixings.

## Installation FNH






## Technical data

**Nail sleeve FNH**



FNH

| Item | Item no. | Drill diameter $d_0$ [mm] | Effect. anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FNH 5/50** | **541893** | 5 | 20 | 50 | 30 | 60 | 100 |
| **FNH 6/30** | **541894** | 6 | 30 | 30 | – | 40 | 100 |
| **FNH 6/40** | **541895** | 6 | 30 | 40 | 10 | 50 | 100 |
| **FNH 6/50** | **541896** | 6 | 30 | 50 | 20 | 60 | 100 |
| **FNH 6/60** | **541897** | 6 | 30 | 60 | 30 | 70 | 100 |
| **FNH 6/80** | **541898** | 6 | 30 | 80 | 50 | 90 | 100 |
| **FNH 8/70** | **541899** | 8 | 40 | 70 | 30 | 80 | 100 |
| **FNH 8/90** | **541905** | 8 | 40 | 90 | 50 | 100 | 50 |
| **FNH 8/110** | **541906** | 8 | 40 | 110 | 70 | 120 | 50 |
| **FNH 8/130** | **541907** | 8 | 40 | 130 | 90 | 140 | 50 |
| **FNH 8/150** | **541908** | 8 | 40 | 150 | 110 | 160 | 50 |
| **FNH 8/180** | **541909** | 8 | 40 | 180 | 140 | 190 | 50 |

## Loads

**Nail sleeve FNH**

Recommended loads[1] of a single anchor as part of a multiple fixing of non-structural systems.

| Type | | FNH 5 | FNH 6 | FNH 8 |
|---|---|---|---|---|
| **Minimum member thickness** | **[mm]** | 50 | 60 | 70 |
| **Anchorage in concrete ≥ C20/25** | | | | |
| **Recommended tension load $N_{rec}$** | **[kN]** | 0.10 | 0.50 | 0.70 |
| **Recommended shear load $V_{rec}$** | **[kN]** | 0.40 | 1.40 | 2.00 |

[1] Required safety factors are considered.

# Window frame fixing F-S

The nylon fixing for stress-free stand-off installation of window and door frames.







Window frames

## Applications

- Window frames
- Door frames

## Advantages

- The operating principle of the plug prevents the frame from being pulled against the substrate, and ensures a stress-free and long-lasting fixing of the frame.
- The special plug geometry anchors the metal and plastic profiles against compressive and tensile loads, and allows for a secure hold of the window frame.

## Certificates / Features

★★★★★
Nylon
Quality

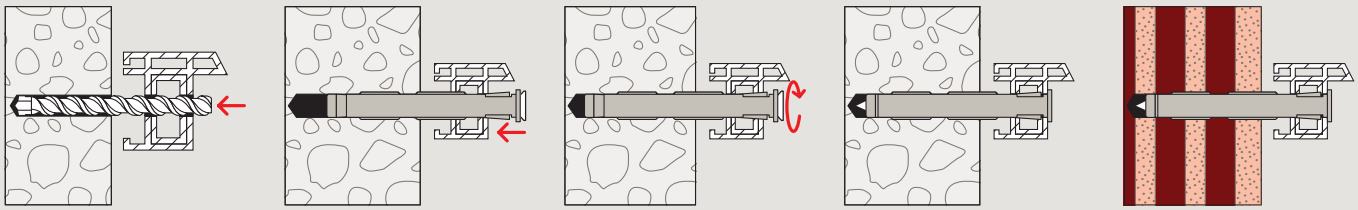
## Building materials

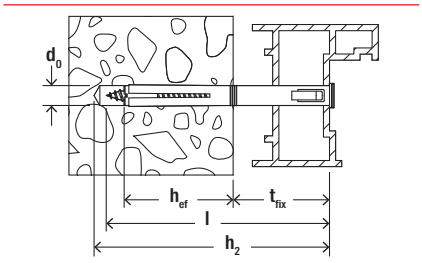
- Concrete
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Solid brick made from lightweight concrete
- Solid brick

## Functioning

- The F-S is suitable for push-through installation.
- By tightening the screw, the glass-fibre-reinforced plastic cone is drawn into the sleeve, whereby it is expanded and wedged inside the drill hole. The window frames are thus fixed in a stress-free manner.
- The maximum installation torque is 6 Nm.

## Installation F-S






## Technical data

**Window frame fixing F-S**



F-S

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Max. installation torque $T_{inst}$ [Nm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **F 10 S 75** | **088625** | 10 | 50 | 75 | 15 | 90 | 6 | 50 |
| **F 10 S 100** | **088626** | 10 | 50 | 100 | 40 | 115 | 6 | 50 |
| **F 10 S 120** | **088627** | 10 | 50 | 120 | 60 | 135 | 6 | 50 |
| **F 10 S 140** | **088628** | 10 | 50 | 140 | 80 | 155 | 6 | 50 |
| **F 10 S 165** | **088629** | 10 | 50 | 165 | 105 | 180 | 6 | 50 |

## Loads

**Window frame F-S**

Recommended loads[1] of a single anchor as part of a multiple fixing of non-structural systems.

| Type | | | F 10 S |
|---|---|---|---|
| **Recommended loads in the respective base material $F_{rec}$[2]** | | | |
| **Concrete** | ≥ C20/25 | **[kN]** | 1.48 |
| **Solid brick** | ≥ Mz 12 | **[kN]** | 1.25 |
| **Solid sand-lime brick** | ≥ KS 12 | **[kN]** | 1.25 |
| **Vertically perforated clay bricks** | ≥ HLz 12 | **[kN]** | 0.25 |

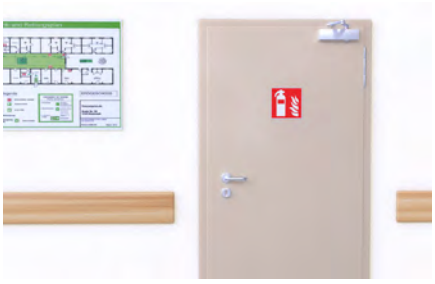
[1] Required safety factors are considered.
Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tensile load, shear load and oblique load under any angle.

# Metal frame fixing F-M

The fixing for stress-free installation of window and door frames with fire classification.







Fire protection doors

## Applications

- Window frames
- Door frames
- Squared timbers

## Advantages

- The F-M metal frame plug achieves fire resistance R 120. This allows for use in areas where fire resistance is relevant.
- The operating principle prevents the window frame from being pulled against the substrate, and ensures a stress-free and long-lasting fixing of the frame.
- The special plug geometry anchors the metal and plastic profiles against compressive and tensile loads, and allows for a secure hold of the window frame.
- The cover caps (available separately) can be used to discreetly cover the screw heads.

## Certificates / Features

R 120

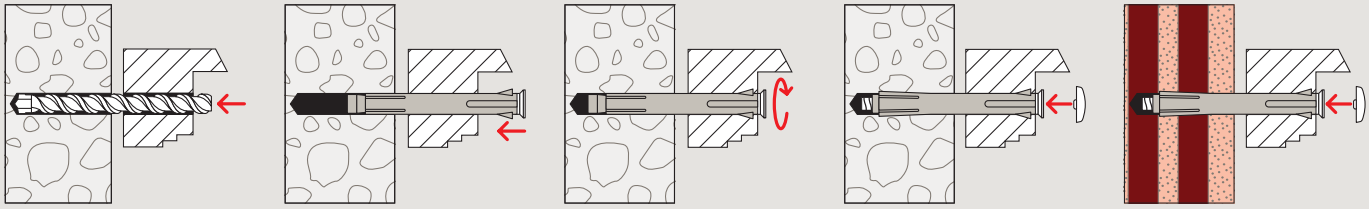
## Building materials

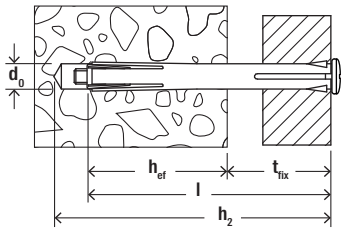
- Concrete
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Aerated concrete
- Solid brick made from lightweight concrete
- Solid brick

## Functioning

- The F-M is suitable for push-through installation.
- By tightening the screw, the cone is drawn into the sleeve and the fixing is expanded which wedges it inside the drill hole. The window frames are thus fixed in a stress-free manner.
- The maximum installation torque is 5 Nm.

## Installation F-M






## Technical data

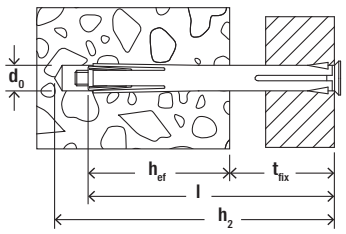
**Metal frame fixing F 8 M**



F 8 M

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Effect. anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **F 8 M 72** | **088660**[1] | 8 | 90 | 30 | 72 | 42 | PZ2 | 100 |
| **F 8 M 92** | **088662**[1] | 8 | 110 | 30 | 92 | 62 | PZ2 | 100 |
| **F 8 M 112** | **088664**[1] | 8 | 130 | 30 | 112 | 82 | PZ2 | 100 |
| **F 8 M 132** | **088666**[1] | 8 | 150 | 30 | 132 | 102 | PZ2 | 100 |

[1] Screw head Ø 10 mm.




## Technical data

**Metal frame fixing F 10 M**



F 10 M

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Effect. anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **F 10 M 72** | **088670**[1] | 10 | 90 | 30 | 72 | 42 | PZ3 | 100 |
| **F 10 M 92** | **088672**[1] | 10 | 110 | 30 | 92 | 62 | PZ3 | 100 |
| **F 10 M 112** | **088674**[1] | 10 | 130 | 30 | 112 | 82 | PZ3 | 100 |
| **F 10 M 132** | **088676**[1] | 10 | 150 | 30 | 132 | 102 | PZ3 | 100 |
| **F 10 M 152** | **088678**[1] | 10 | 170 | 30 | 152 | 122 | PZ3 | 100 |
| **F 10 M 182** | **088680**[1] | 10 | 200 | 30 | 182 | 152 | PZ3 | 50 |
| **F 10 M 202** | **061064**[1] | 10 | 220 | 30 | 202 | 172 | PZ3 | 50 |

[1] Screw head Ø 13 mm.

## Accessories

**Cover cap (F-M)**



ADM 10 W

| Item | Item no. | Colour | Cap height [mm] | Cap-Ø [mm] | Match | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **ADM 10 W** | **088688** | white | 4 | 16.5 | F 10 M | 100 |



## Loads

**Metal frame fixing F-M**

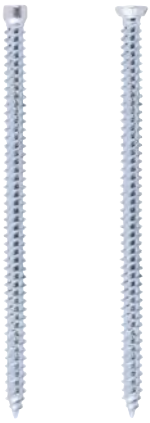
Recommended loads[1] of a single anchor as part of a multiple fixing of non-structural systems.

| Type | | | F 8 M | F 10 M |
|---|---|---|---|---|
| **Recommended loads in the respective base material $F_{rec}$** [2] | | | | |
| **Concrete** | ≥ C20/25 | **[kN]** | 1.00 | 1.40 |
| **Solid brick** | ≥ Mz 12 | **[kN]** | 0.30 | 1.30 |
| **Solid sand-lime brick** | ≥ KS 12 | **[kN]** | 0.70 | 1.30 |
| **Solid brick of lightweight aggregate concrete** | ≥ V 2 | **[kN]** | - | 0.50 |
| **Perforated sand-lime brick** | ≥ KSL 6 | **[kN]** | 0.25 | 0.60 |

[1] Required safety factors are considered.
[2] Valid for tensile load, shear load and oblique load under any angle.

# Window frame screws FFSZ and FFS

The economical special screw for window installation.





Window frames



## Applications

- Window frames made of wood, plastic and aluminium
- Door frames
- Squared timbers

## Advantages

- Screw installation without plug for economical processing.
- The small drill bit diameter of 6 mm allows for efficient series installation.
- The continuous thread ensures a stress-free fixing of the frame in the substrate.
- The high-low-thread at the screw tip as well as several cutting notches reduce the amount of force required for screwing in the screws. The installation process can be completed without excessive effort.
- With two head types applicable for all common frame materials.
- According to the ift Rosenheim suitable for the fixation of a plastic window in brick masonry.

## Certificates / Features



**Test report no.: 14-000559-PR02**

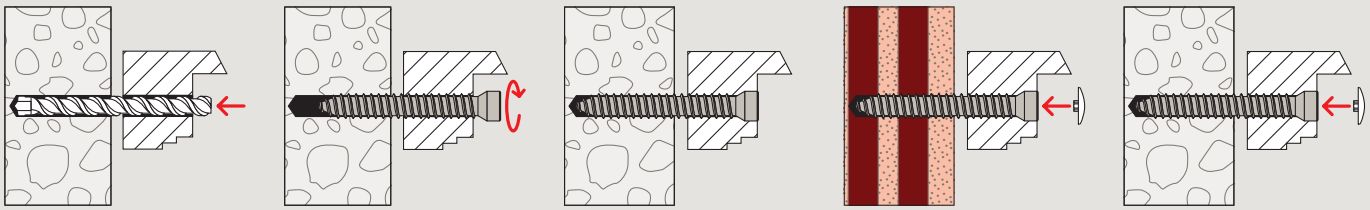
## Building materials

- Concrete
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Solid brick made from lightweight concrete
- Solid brick
- Aerated concrete

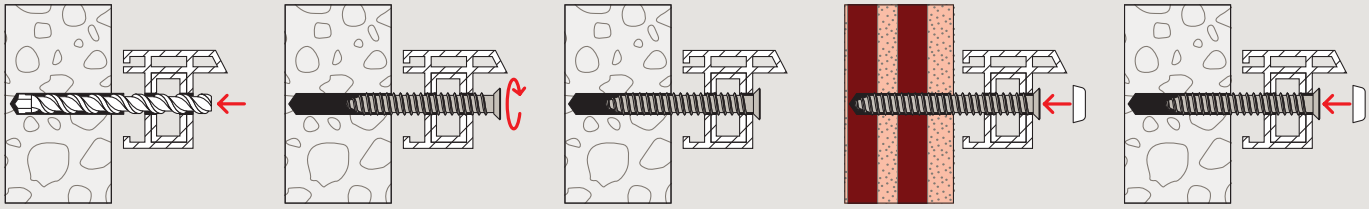
## Functioning

- Note the drill hole and screw-in depths for the different building materials listed in the table.
- Cylinder head screws are recommended for recessed installation in wooden profiles.
- Flat head screws are recommended for installation in plastic and aluminium profiles.

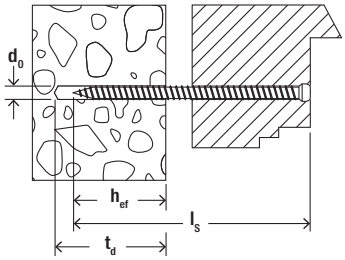
## Installation FFSZ



## Installation FFS








Anchorage depth $h_{ef}$
$h_{ef} \geq 30$ mm in concrete
$h_{ef} \geq 40$ mm in solid brick
$h_{ef} \geq 60$ mm in perforated brick / aerated concrete

$t_d$ : drill hole depth $\geq h_{ef} + 10$ mm

## Technical data

**Window frame screws FFSZ**



FFSZ

| Item | Item no. | Drill diameter $d_0$ [mm] | Screw length $l_s$ [mm] | Drive | Head-ø $d_h$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FFSZ 7,5 x 52 TX30** | **532906** | 6 | 52 | TX30 | 8.0 | 100 |
| **FFSZ 7,5 x 62 TX30** | **532907** | 6 | 62 | TX30 | 8.0 | 100 |
| **FFSZ 7,5 x 72 TX30** | **532908** | 6 | 72 | TX30 | 8.0 | 100 |
| **FFSZ 7,5 x 82 TX30** | **532909** | 6 | 82 | TX30 | 8.0 | 100 |
| **FFSZ 7,5 x 92 TX30** | **532910** | 6 | 92 | TX30 | 8.0 | 100 |
| **FFSZ 7,5 x 102 TX30** | **532911** | 6 | 102 | TX30 | 8.0 | 100 |
| **FFSZ 7,5 x 112 TX30** | **532912** | 6 | 112 | TX30 | 8.0 | 100 |
| **FFSZ 7,5 x 122 TX30** | **532913** | 6 | 122 | TX30 | 8.0 | 100 |
| **FFSZ 7,5 x 132 TX30** | **532914** | 6 | 132 | TX30 | 8.0 | 100 |
| **FFSZ 7,5 x 152 TX30** | **532915** | 6 | 152 | TX30 | 8.0 | 100 |
| **FFSZ 7,5 x 182 TX30** | **532916** | 6 | 182 | TX30 | 8.0 | 100 |
| **FFSZ 7,5 x 202 TX30** | **532917** | 6 | 202 | TX30 | 8.0 | 100 |
| **FFSZ 7,5 x 212 TX30** | **532919** | 6 | 212 | TX30 | 8.0 | 100 |
| **FFSZ 7,5 x 252 TX30** | **532920** | 6 | 252 | TX30 | 8.0 | 100 |
| **FFSZ 7,5 x 302 TX30** | **532921** | 6 | 302 | TX30 | 8.0 | 100 |

No pre-drilling in aerated concrete.

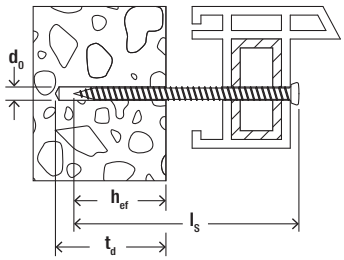
## Accessories

**Cover cap FFSZ-A**



FFSZ-A W

| Item | Item no. | Colour | Cap-Ø [mm] | Cap height [mm] | Match | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FFSZ-A W** | **538708** | white | 14 | 2.2 | FFSZ - cylinder head | 100 |
| **FFSZ-A BR** | **538709** | brown | 14 | 2.2 | FFSZ - cylinder head | 100 |




**Anchorage depth $h_{ef}$**
**$h_{ef}$ ≥ 30 mm in concrete**
**$h_{ef}$ ≥ 40 mm in solid brick**
**$h_{ef}$ ≥ 60 mm in perforated brick / aerated concrete**

**$t_d$ : drill hole depth ≥ $h_{ef}$ + 10 mm**

## Technical data

**Window frame screws FFS**



FFS

| Item | Item no. | Drill diameter $d_0$ [mm] | Screw length $l_s$ [mm] | Drive | Head-ø $d_h$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FFS 7,5 x 42 TX30** | **532922** | 6 | 42 | TX30 | 11.5 | 100 |
| **FFS 7,5 x 52 TX30** | **532923** | 6 | 52 | TX30 | 11.5 | 100 |
| **FFS 7,5 x 62 TX30** | **532925** | 6 | 62 | TX30 | 11.5 | 100 |
| **FFS 7,5 x 72 TX30** | **532927** | 6 | 72 | TX30 | 11.5 | 100 |
| **FFS 7,5 x 82 TX30** | **532928** | 6 | 82 | TX30 | 11.5 | 100 |
| **FFS 7,5 x 92 TX30** | **532930** | 6 | 92 | TX30 | 11.5 | 100 |
| **FFS 7,5 x 102 TX30** | **532931** | 6 | 102 | TX30 | 11.5 | 100 |
| **FFS 7,5 x 112 TX30** | **532932** | 6 | 112 | TX30 | 11.5 | 100 |
| **FFS 7,5 x 122 TX30** | **532934** | 6 | 122 | TX30 | 11.5 | 100 |
| **FFS 7,5 x 132 TX30** | **532935** | 6 | 132 | TX30 | 11.5 | 100 |
| **FFS 7,5 x 152 TX30** | **532941** | 6 | 152 | TX30 | 11.5 | 100 |
| **FFS 7,5 x 182 TX30** | **532942** | 6 | 182 | TX30 | 11.5 | 100 |
| **FFS 7,5 x 202 TX30** | **532943** | 6 | 202 | TX30 | 11.5 | 100 |
| **FFS 7,5 x 212 TX30** | **532944** | 6 | 212 | TX30 | 11.5 | 100 |
| **FFS 7,5 x 252 TX30** | **532945** | 6 | 252 | TX30 | 11.5 | 100 |
| **FFS 7,5 x 302 TX30** | **532946** | 6 | 302 | TX30 | 11.5 | 100 |

No pre-drilling in aerated concrete.

## Accessories

**Cover cap FFS-A**



FFS-A W

| Item | Item no. | Colour | Cap-Ø [mm] | Cap height [mm] | Match | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FFS A-W** | **061560** | white | 15 | 4.8 | FFS - flat head | 100 |
| **FFS-A BR** | **061561** | brown | 15 | 4.8 | FFS - flat head | 100 |

## Loads

**Window frame screws FFSZ and FFS**

Recommended loads[1] of a single screw.

| Type | | | FFSZ | | | FFS | | |
|---|---|---|---|---|---|---|---|---|
| **Screw diameter** | | **[mm]** | 7.5 | | | 7.5 | | |
| **Anchorage depth** | $h_{ef} \geq$ | **[mm]** | 30 | 40 | 60 | 30 | 40 | 60 |
| **Recommended loads in concrete ≥ C20/25** | | | | | | | | |
| **Tension load $N_{rec}$** | | **[kN]** | 1.00 | – | – | 1.00 | – | – |
| **Shear load $V_{rec}$** | | **[kN]** | 0.70 | – | – | 0.70 | – | – |
| **Minimum edge distance[2]** | $c_{min}$ | **[mm]** | 30 | – | – | 30 | – | – |
| **Recommended loads in masonry** | | | | | | | | |
| **Tension load $N_{rec}$ in solid brick** | ≥ Mz 12 | **[kN]** | – | 0.40[3] | 0.80 | – | 0.40[3] | 0.80 |
| **Shear load $V_{rec}$ in solid brick** | ≥ Mz 12 | **[kN]** | – | 0.30[3] | 0.70 | – | 0.30[3] | 0.70 |
| **Tension load $N_{rec}$ in solid sand-lime brick** | ≥ KS 12 | **[kN]** | – | 1.00 | – | – | 1.00 | – |
| **Shear load $V_{rec}$ in solid sand-lime brick** | ≥ KS 12 | **[kN]** | – | 0.60 | – | – | 0.60 | – |
| **Tension load $N_{rec}$ in vertically perforated brick** | ≥ Hlz 12 | **[kN]** | – | – | 0.25[3] | – | – | 0.25[3] |
| **Shear load $V_{rec}$ in vertically perforated brick** | ≥ Hlz 12 | **[kN]** | – | – | 0.40[3] | – | – | 0.40[3] |
| **Minimum edge distance[2]** | $c_{min}$ | **[mm]** | – | 40 | 40 | – | 40 | 40 |
| **Recommended loads in aerated concrete** | | | | | | | | |
| **Load[4] $F_{rec}$ in aerated concrete** | ≥ AAC 2 | **[kN]** | – | – | 0.10[5] | – | – | 0.10[5] |
| | ≥ AAC 4 | **[kN]** | – | – | 0.25[5] | – | – | 0.25[5] |
| **Minimum edge distance[2]** | $c_{min}$ | **[mm]** | – | – | 40 | – | – | 40 |

[1] Required safety factors are considered.
As a single screw counts e.g. a screw with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$.
[2] Minimal possible edge distance while reducing the recommended loads.
[3] Rotary drilling.
[4] Valid for tensile load, shear load and oblique load under any angle.
[5] Without pre-drilling.

# Adjustable fixing S10J

The fixing for infinite adjustment of timber constructions in all standard solid building materials.





Stand-off installations



## Applications

- Substructures made of wooden battens of 20-25mm thickness.

## Advantages

- The combination of adjustment plug and spacing screw allows for universal usage in wooden and solid building materials.
- The special operating principle of the adjustable fixing S10J allows for infinite adjustment. This saves on the use of wedges and blocks when fixing the fixture.

## Certificates / Features

★★★★★
Nylon
Quality

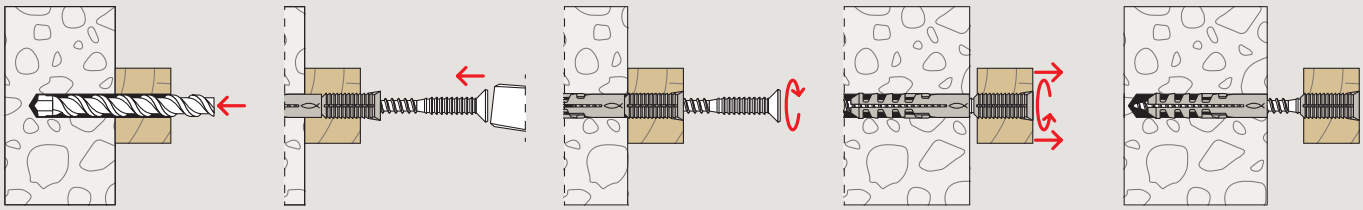
## Building materials

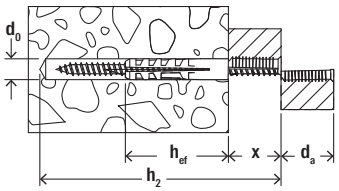
- Concrete
- Wood
- Solid sand-lime brick
- Natural stone with dense structure
- Aerated concrete
- Solid panel made from gypsum
- Solid brick made from lightweight concrete
- Solid brick

## Functioning

- The S10J is suitable for push-through installation.
- Once the screw has been screwed in the fixture distance can be infinitely adjusted by modifying the rotation direction.

## Installation S10J






## Technical data

**Adjustable fixing S10J**



S10J

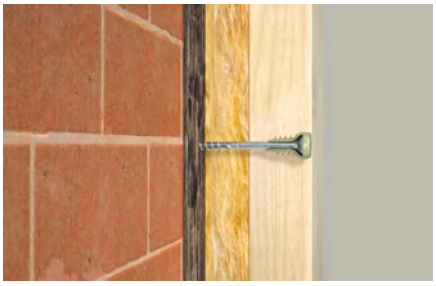
5

| | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Effect. anchorage depth $h_{ef}$ [mm] | Screw length $l_s$ [mm] | Timber thickness $d_a$ [mm] | Max. adjustment travel x [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | | | |
| **S 10 J 75 S** | **080710** | 10 | 115 | 50 | 110 | 25 | 30 | TX40 | 50 |

# Adjusting screw FAFS

The removable frame screw for precise adjustment.





Wall substructures



Ceiling substructures



## Applications

- Wooden substructures
- Window frames
- Door frames
- Wall covering

## Advantages

- The countersunk clip of the screw does not rotate during adjustment. The screw head maintains its position in the attachment part. Flush installation is ensured, without protruding screw heads.
- The special operating principle allows for stepless adjustment. The attachment part can be aligned with a high level of precision.
- The thread on the clip enables an unscrewing from the attachment part, facilitating disassembly.
- The PowerFast II chipboard screw used ensures the screw bites quickly into the material and screws in fast.

## Certificates / Features

ETA-19/0175, for timber constructions

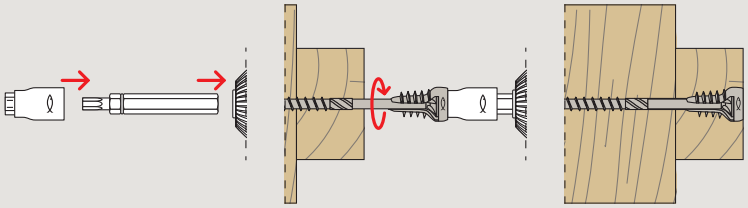
## Building materials

- Wood and wooden materials or wooden panels

## Functioning

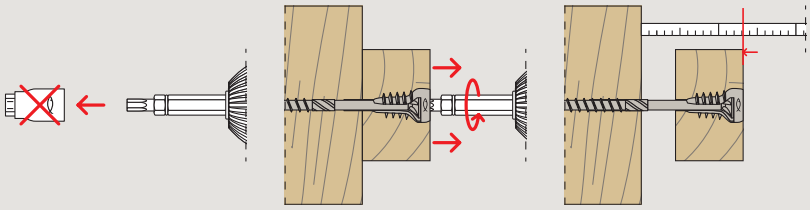
- FAFS is suitable for push-through installation.
- With the separately available setting tool attached to the bit, the adjusting screw can be screwed into the attachment flush with the surface or slightly countersunk.
- The bit can be used to steplessly adjust the component distance, without the setting tool and by changing the direction of rotation. The clip maintains its position in the attachment part during adjustment.
- Pre-drilling a 6 mm diameter hole is recommended for wooden boards > 30 mm thick, or hardwoods, as well as assembly near an edge. For application according approval, the specifications of ETA-19/0175 must be observed.
- The screw can be used in masonry with the fischer DuoPower 6x50 or UX 6x50 and after pre-drilling a 6 mm diameter hole.
- With the bit and the setting tool attached, the adjusting screw can be dismantled by turning it anti-clock-wise.

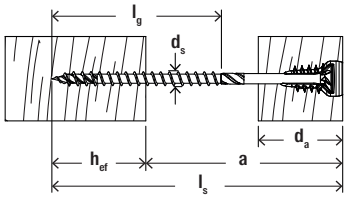
## Installation FAFS



## Adjustment FAFS








## Technical data

**Adjusting screw FAFS**



FAFS

| Item | Item no. | Approval ETA | Screw dimension $d_s$ x $l_s$ [mm] | Thread length $l_g$ [mm] | Effect. anchorage depth $h_{ef}$ [mm] | Min. timber thickness $d_a$ [mm] | Max. distance a [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **FAFS 5 x 80 TX25** | **558879**[1] | ● | 5.0 x 80 | 45 | 20 | 20 | 60 | TX25 | 100 |
| **FAFS 5 x 90 TX25** | **558880**[1] | ● | 5.0 x 90 | 54 | 20 | 20 | 70 | TX25 | 100 |
| **FAFS 5 x 100 TX25** | **558881**[1] | ● | 5.0 x 100 | 60 | 20 | 20 | 80 | TX25 | 100 |
| **FAFS 5 x 120 TX25** | **558882**[1] | ● | 5.0 x 120 | 70 | 20 | 20 | 100 | TX25 | 100 |

[1] When used in accordance with ETA-19/0175, a minimum timber thickness $d_a$ of 30 mm applies.

## Accessories

**Setting tool and bit**



FAFS setting tool and bit

| Item | Item no. | Match | Drive | Packaging | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FAFS setting tool and bit** | **558883** | FAFS | TX25 | Plastic box | 1 x Setting tool<br>1 x Bit | 1 |

# Adjustable screw JUSS

The adjustable screw for fast and infinitely adjustable installation of timber constructions.





Stand-off installations



Stand-off installations



## Applications

- Substructures made of wooden battens of 20-30 mm thickness.

## Advantages

- The special operating principle of the adjustable screw JUSS allows for infinite adjustment. This saves on the use of wedges and blocks when fixing the fixture.
- The self-drilling thread of the adjustable screw JUSS cuts directly into the wood.

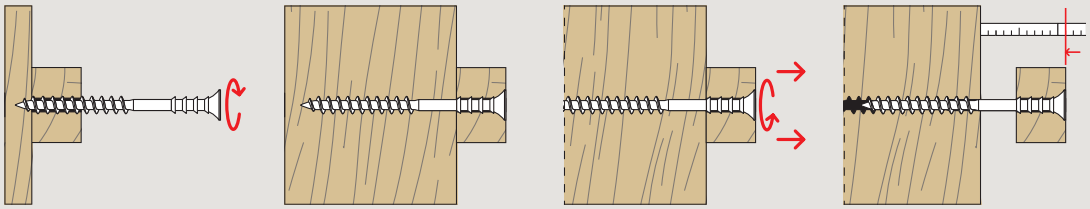
## Building materials

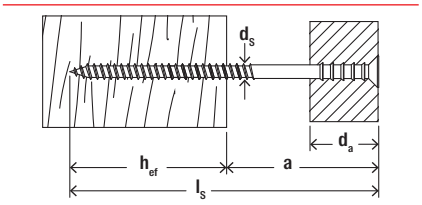
- Wood and wooden materials or wooden panels

## Functioning

- The JUSS is suitable for push-through installation.
- Once the screw has been screwed in, the parallel thread below the screw head causes the fixture to initially pull against the substrate. The fixture distance can then be infinitely adjusted by modifying the rotation direction.

## Installation JUSS






## Technical data

**Adjustable screw JUSS**



JUSS



| Item | Item no. | Effect. anchorage depth $h_{ef}$ [mm] | Max. distance a [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Timber thickness $d_a$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **JUSS 6 x 60** | **059040** | 30 | 30 | 6.0 x 60 | 20 | TX25 | 100 |
| **JUSS 6 x 70** | **059041** | 30 | 40 | 6.0 x 70 | 30 | TX25 | 100 |
| **JUSS 6 x 80** | **059042** | 30 | 50 | 6.0 x 80 | 30 | TX25 | 100 |
| **JUSS 6 x 90** | **059043** | 30 | 60 | 6.0 x 90 | 30 | TX25 | 100 |
| **JUSS 6 x 100** | **059044** | 30 | 70 | 6.0 x 100 | 30 | TX25 | 100 |
| **JUSS 6 x 110** | **059045** | 30 | 80 | 6.0 x 110 | 30 | TX25 | 100 |
| **JUSS 6 x 120** | **059046** | 30 | 90 | 6.0 x 120 | 30 | TX25 | 100 |
| **JUSS 6 x 145** | **059047** | 30 | 115 | 6.0 x 145 | 30 | TX25 | 100 |

# Spacing screw ASL

The spacing screw for flexible positioning and alignment of wooden fixtures.





Stand-off installations



Stand-off installations



## Applications

- Window frames
- Door frames
- Squared timbers
- Claddings
- Substructures made of wood

## Advantages

- The coordinated threads with the same pitch allow for the pin-point positioning and alignment of the fixture, which can even be mounted at an angle to the screw. This allows for an exact and flexible fixing.
- During the installation, the fixture is not pulled onto the substrate, instead it is brought directly to the desired distance and position. This allows for a simple and exact installation.
- When combined with SX Plus 8 and UX 8 plugs, it can be used in almost all wall materials, guaranteeing a secure fixing.

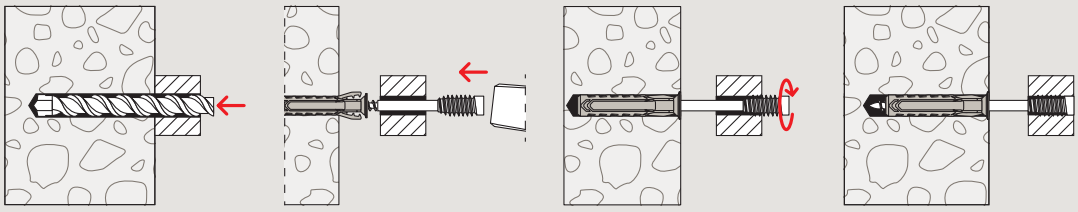
## Building materials

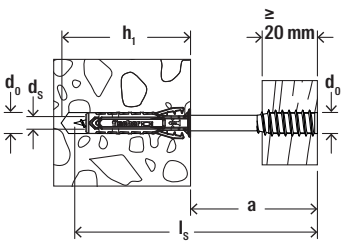
- Without plug: suitable for wooden materials and wooden panels
- With SX Plus or UX plugs: all concrete and masonry materials

## Functioning

- The ASL is suitable for push-through installation.
- Pre-drill the fixture at the desired angle in order to achieve the correct positioning and alignment.
- When screwing in the screw, the external thread cuts into the pre-drilled fixture, and fixes it into the stipulated position.
- The angled position of the screws (15° - 30°) allows high shear loads to be supported.

## Installation ASL






## Technical data

**Spacing screw ASL**



ASL

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Max. distance a [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **ASL 4,5 x 60** | **059050** | 6 | 40 | 25 | 4.5 x 60 | TX25 | 100 |
| **ASL 4,5 x 80** | **059052** | 6 | 40 | 45 | 4.5 x 80 | TX25 | 100 |
| **ASL 4,5 x 100** | **059054** | 6 | 40 | 65 | 4.5 x 100 | TX25 | 100 |
| **ASL 6 x 80** | **059061** | 8 | 55 | 35 | 6.0 x 80 | TX25 | 100 |
| **ASL 6 x 100** | **059062** | 8 | 55 | 55 | 6.0 x 100 | TX25 | 100 |
| **ASL 6 x 120** | **059063** | 8 | 55 | 75 | 6.0 x 120 | TX25 | 100 |
| **ASL 6 x 150** | **059064** | 8 | 55 | 105 | 6.0 x 150 | TX25 | 50 |

# Stand-off installation TherMax 8/10

The thermally separated stand-off installation in external thermal insulation composite systems.





External lighting



Down pipes



## Applications

**For the thermally separated fixing of:**

- Signs
- Lighting
- Letter boxes
- Motion detectors
- Downpipes
- Lightning rods
- Blind guide rails

## Advantages

- The stand-off installation allows for the fixture to be adjusted to the exact position required, which avoids pressure marks and damage to the ETICS.
- The plastic cone creates a thermal barrier between the fixture and the inner fixture, and offers an energy-optimised fixing.
- The glass-fibre-reinforced plastic cone cuts its own way through the ETICS with a positive fit, and allows for a simple and fast installation without the need for any special tools.
- Combining with the universal plug UX provides secure anchoring in the substrate.
- Without the UX plug, direct installation in a wooden substrate is possible after pre-drilling, too.

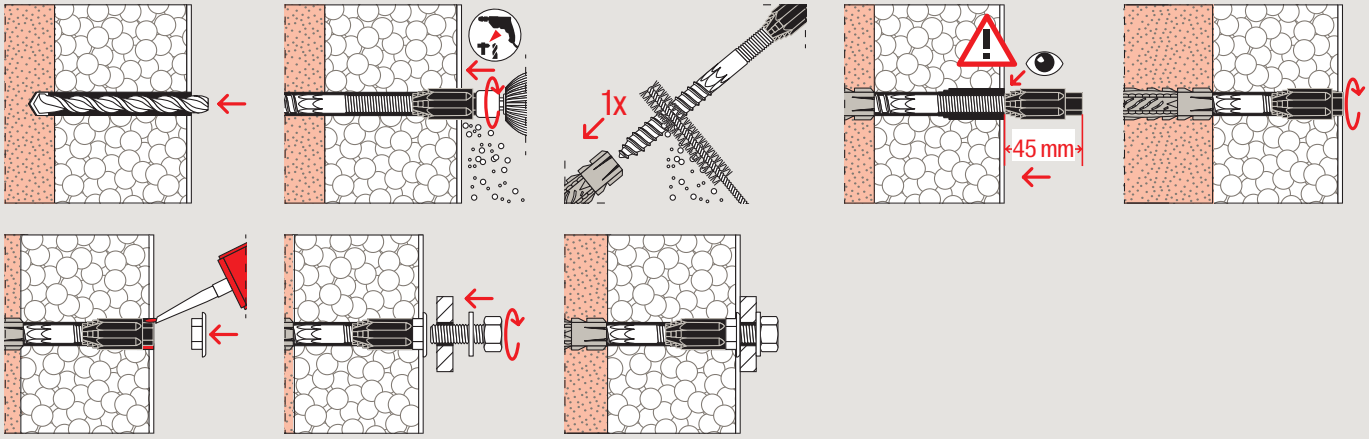
## Building materials

- Concrete
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Building brick
- Aerated concrete
- Wood

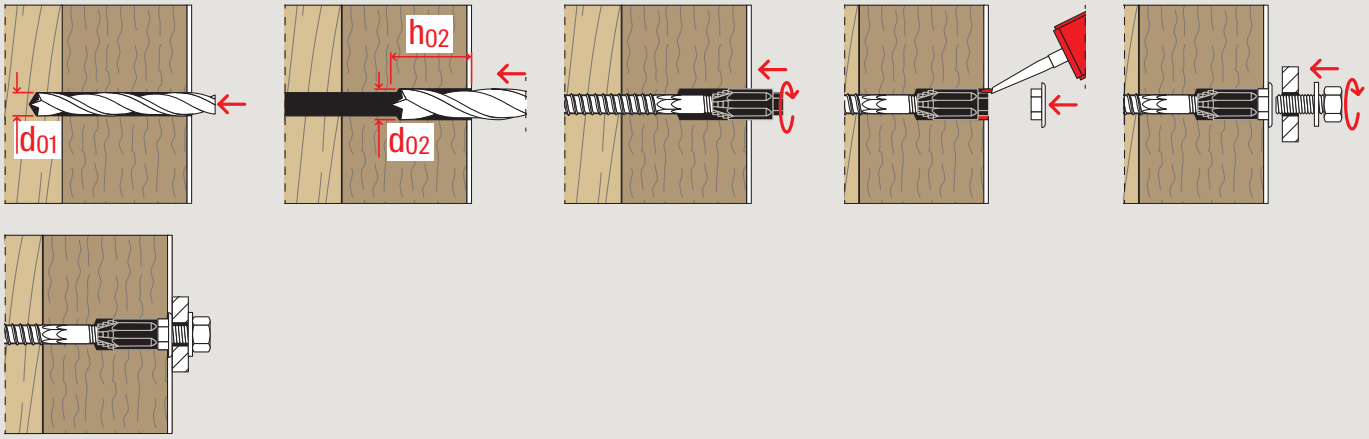
## Functioning

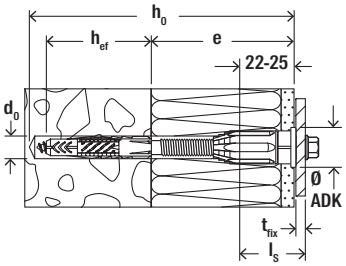
- The TherMax 8 and 10 systems are suitable for pre-positioned installation.
- The self-tapping, glass-fibre-reinforced cone cuts its own way through the plaster into the insulation during installation.
- The anti-cold cone uses a thermal barrier to minimise heat losses.
- Installation without any special tools.
- For use in wood without plug, the wood (footnote below load table) as well as the plaster has to be pre-drilled:
  TherMax8:
  $d_{02}$ = 14 mm, $h_{02}$ = 50 mm;
  TherMax10:
  $d_{02}$ = 18 mm, $h_{02}$ = 50 mm
- The extensive range features fitting options with metric screws (M6/8/10), sheet screws (6.3 mm), chipboard screws (6.0 mm) or chipboard screws (4.5 - 5.5 mm) when using an SX Plus 5 expansion plug.

## Installation in masonry




## Installation in wooden substrate




## Technical data

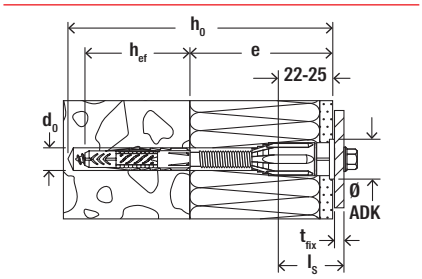
**Stand-off installation TherMax 8/10**



TherMax 8/10

| Item | Item no. | Drill diameter $d_0$ [mm] | Drill hole depth $h_0$ [mm] | Max. thickness of non-bearing layer e [mm] | Anchorage depth $h_{ef}$ [mm] | Cover cap-ø ADK [mm] | Width across nut SW [mm] | Chipboard / metric / sheet metal screw | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **TherMax 8/60 M6** | **045685**[1)2)] | 10 | 120 | 45 - 60 | 60 | 18 | 10 | 4.5 - 6.0 / M6 / 6.3 | 20 |
| **TherMax 8/80 M6** | **045686**[1)2)] | 10 | 140 | 60 - 80 | 60 | 18 | 10 | 4.5 - 6.0 / M6 / 6.3 | 20 |
| **TherMax 8/100 M6** | **045687**[1)2)] | 10 | 160 | 80 - 100 | 60 | 18 | 10 | 4.5 - 6.0 / M6 / 6.3 | 20 |

[1)] Including SX Plus 5.
[2)] Min. screw length $l_s$ = 22mm + thickness of mounting member $t_{fix}$; for use in wood without universal plug UX, consider drill hole diameter in footnote under load table.




## Technical data

**Stand-off installation TherMax 8/10**



TherMax 8/10

| Item | Item no. | Drill diameter $d_0$ [mm] | Drill hole depth $h_0$ [mm] | Max. thickness of non-bearing layer e [mm] | Anchorage depth $h_{ef}$ [mm] | Cover cap-ø ADK [mm] | Width across nut SW [mm] | Chipboard / metric / sheet metal screw | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **TherMax 8/120 M6** | **045688**[1)2)] | 10 | 180 | 100 - 120 | 60 | 18 | 10 | 4.5 - 6.0 / M6 / 6.3 | 20 |
| **TherMax 8/140 M6** | **045689**[1)2)] | 10 | 200 | 120 - 140 | 60 | 18 | 10 | 4.5 - 6.0 / M6 / 6.3 | 20 |
| **TherMax 8/160 M6** | **045690**[1)2)] | 10 | 220 | 140 - 160 | 60 | 18 | 10 | 4.5 - 6.0 / M6 / 6.3 | 20 |
| **TherMax 8/180 M6** | **045691**[1)2)] | 10 | 240 | 160 - 180 | 60 | 18 | 10 | 4.5 - 6.0 / M6 / 6.3 | 20 |
| **TherMax 10/100 M6** | **045692**[1)2)] | 12 | 160 | 80 - 100 | 70 | 22 | 13 | 4.5 - 6.0 / M6 / 6.3 | 20 |
| **TherMax 10/120 M6** | **045693**[1)2)] | 12 | 180 | 100 - 120 | 70 | 22 | 13 | 4.5 - 6.0 / M6 / 6.3 | 20 |
| **TherMax 10/140 M6** | **045694**[1)2)] | 12 | 200 | 120 - 140 | 70 | 22 | 13 | 4.5 - 6.0 / M6 / 6.3 | 20 |
| **TherMax 10/160 M6** | **045695**[1)2)] | 12 | 220 | 140 - 160 | 70 | 22 | 13 | 4.5 - 6.0 / M6 / 6.3 | 20 |
| **TherMax 10/180 M6** | **045696**[1)2)] | 12 | 240 | 160 - 180 | 70 | 22 | 13 | 4.5 - 6.0 / M6 / 6.3 | 20 |
| **TherMax 10/200 M6** | **512605**[1)2)] | 12 | 260 | 180 - 200 | 70 | 22 | 13 | 4.5 - 6.0 / M6 / 6.3 | 20 |
| **TherMax 10/220 M6** | **514250**[1)2)] | 12 | 280 | 200 - 220 | 70 | 22 | 13 | 4.5 - 6.0 / M6 / 6.3 | 20 |
| **TherMax 10/240 M6** | **514251**[1)2)] | 12 | 300 | 220 - 240 | 70 | 22 | 13 | 4.5 - 6.0 / M6 / 6.3 | 20 |
| **TherMax 10/100 M8** | **045697**[2)] | 12 | 160 | 80 - 100 | 70 | 22 | 13 | M8 | 20 |
| **TherMax 10/120 M8** | **045698**[2)] | 12 | 180 | 100 - 120 | 70 | 22 | 13 | M8 | 20 |
| **TherMax 10/140 M8** | **045699**[2)] | 12 | 200 | 120 - 140 | 70 | 22 | 13 | M8 | 20 |
| **TherMax 10/160 M8** | **045700**[2)] | 12 | 220 | 140 - 160 | 70 | 22 | 13 | M8 | 20 |
| **TherMax 10/180 M8** | **514252**[2)] | 12 | 240 | 160 - 180 | 70 | 22 | 13 | M8 | 20 |
| **TherMax 10/200 M8** | **514253**[2)] | 12 | 260 | 180 - 200 | 70 | 22 | 13 | M8 | 20 |
| **TherMax 10/220 M8** | **514254**[2)] | 12 | 280 | 200 - 220 | 70 | 22 | 13 | M8 | 20 |
| **TherMax 10/240 M8** | **514255**[2)] | 12 | 300 | 220 - 240 | 70 | 22 | 13 | M8 | 20 |
| **TherMax 10/100 M10** | **045702**[2)] | 12 | 160 | 80 - 100 | 70 | 22 | 13 | M10 | 20 |
| **TherMax 10/120 M10** | **045703**[2)] | 12 | 180 | 100 - 120 | 70 | 22 | 13 | M10 | 20 |
| **TherMax 10/140 M10** | **045704**[2)] | 12 | 200 | 120 - 140 | 70 | 22 | 13 | M10 | 20 |
| **TherMax 10/160 M10** | **045705**[2)] | 12 | 220 | 140 - 160 | 70 | 22 | 13 | M10 | 20 |
| **TherMax 10/180 M10** | **514256**[2)] | 12 | 240 | 160 - 180 | 70 | 22 | 13 | M10 | 20 |
| **TherMax 10/200 M10** | **514257**[2)] | 12 | 260 | 180 - 200 | 70 | 22 | 13 | M10 | 20 |
| **TherMax 10/220 M10** | **514258**[2)] | 12 | 280 | 200 - 220 | 70 | 22 | 13 | M10 | 20 |
| **TherMax 10/240 M10** | **514259**[2)] | 12 | 300 | 220 - 240 | 70 | 22 | 13 | M10 | 20 |

[1)] Including SX Plus 5.
[2)] Min. screw length $l_s$ = 22mm + thickness of mounting member $t_{fix}$; for use in wood without universal plug UX, consider drill hole diameter in footnote under load table.

## Loads

| Stand-off installation TherMax 8 and 10 | | | | | |
|---|---|---|---|---|---|
| Recommended loads[1] of a single anchor in concrete and masonry. | | | | | |
| **Type** | | | | **TherMax 8** | **TherMax 10** |
| **Supplied type of plug for the anchorage in the base material** | | | | UX 10 x 60 | UX 12 x 70 |
| **Recommended tensile loads in the respective base material $N_{rec}$ [2]** | | | | | |
| **Concrete**[3] [4] | ≥ C20/25 | | **[kN]** | 1.00 | 1.00 |
| **Solid brick**[3] [4] | ≥ Mz 12 | | **[kN]** | 0.50 | 0.70 |
| **Perforated sand-lime brick**[3] [4] | ≥ KSL 12 | | **[kN]** | 0.60 | 0.80 |
| **Vertically perforated brick**[4] | ≥ HLz 12 | | **[kN]** | 0.20 | 0.30 |
| **Aerated concrete**[3] [4] | ≥ AAC 4 | | **[kN]** | 0.40 | 0.60 |
| **Recommended shear load $V_{rec}$, valid für all above mentioned base materials for the stated insulation thickness** | | | | | |
| **External Thermal Insulation Composite System**[5] | ≤ 240 mm | | **[kN]** | 0.15 | 0.20 |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] The drilling method is to be adapted to the building material used. As different joint qualities are possible, the given values only apply for installation in the brick.
[3] The given recommended tensile loads apply for fastenings with metric screws.
When using chipboard screws with diameter 6.0 mm they have to be reduced to 0.35 kN.
[4] The given recommended tensile loads apply for fastenings with metric screws.
When using a SX Plus 5 plug chipboard screws with diameter 4.5 - 5.5 mm they have to be reduced to 0.1 kN.
[5] Values are valid for an ETICS made from PS- respectively PU-rigid foam panels. Thickness of rendering minimum 6 mm.

## Loads

| Stand-off installation TherMax 8 and 10 | | | | | |
|---|---|---|---|---|---|
| Recommended tensile loads[1] for a single anchor in wood. | | | | | |
| **Type** | | | | **TherMax 8** | **TherMax 10** |
| **Recommended tensile loads in the respective base material $N_{rec}$ [2]** | | | | | |
| **Beech** | ≥ D35 | | **[kN]** | 1.00[3] | 1.00[5] |
| **Spruce** | ≥ C24 | | **[kN]** | 1.00[4] | 1.00[5] |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Installation without UX plug. Edge distances and spacings following Eurocode 5.
[3] Pre-drilled wood with diameter 6 mm.
[4] Pre-drilled wood with diameter 5 mm.
[5] Pre-drilled wood with diameter 7 mm.

## Loads

| Stand-off installation TherMax 8 and 10 | | | | | |
|---|---|---|---|---|---|
| Recommended shear loads[1] for a single anchor. | | | | | |
| **Type** | | | | **UX 10 + TherMax 8**[3] | **UX 12 + TherMax 10**[3] |
| **Recommended shear loads $V_{rec}$** [1] | | | | | |
| **External thermal insulation composite system**[2] | ≤ 240 mm | | **[kN]** | 0.15 | 0.20 |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Values are valid for an ETICS made from PS- respectively PU-rigid foam panels. Thickness of rendering minimum 6 mm.
[3] In wood installation without plug.

# Stand-off installation TherMax 12/16

The approved stand-off installation with thermal separation in external thermal insulation composite systems.





Awnings



Satellite dishes and air conditioning units



## Applications

**For the thermally separated fixing of:**

- Awnings
- Canopies
- French balcony railings
- Air conditioning units
- Satellite dishes

## Advantages

- When combined with the injection mortars FIS EM Plus, FIS V Plus, FIS SB and FIS Green, the stand-off installation is approved for high loads in a range of materials. This allows for a secure fixing.
- Usable lengths of 62 to 290mm can be covered with just one TherMax.
- The plastic cone creates a thermal barrier between the fixture and the inner fixture, and offers an energy-optimised fixing.
- The glass-fibre-reinforced plastic cone cuts its own way through the ETICS with a positive fit, and allows for a simple, fast and adjustable installation without the need for any special tools.

## Certificates / Features

## Building materials

**Approved for:**

- Concrete, cracked and non-cracked
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Solid brick
- Aerated concrete

## Versions

- Galvanised steel
- Stainless steel

## Functioning

- The TherMax 12 and 16 systems are suitable for pre-positioned installation.
- The self-tapping, glass-fibre-reinforced cone cuts its own way through the plaster into the insulation during installation.
- The anti-cold cone uses a thermal barrier to minimise heat losses.
- In the case of resistant plaster (e.g. thick cement plaster), it is recommended that the TherMax cutting blade included is used for grinding out the plaster.
- The sealing of the annular gap with sealing adhesive Multi MS seals the facade at plaster level.

**See also:**

Product family Injection mortar FIS V Plus Page 87



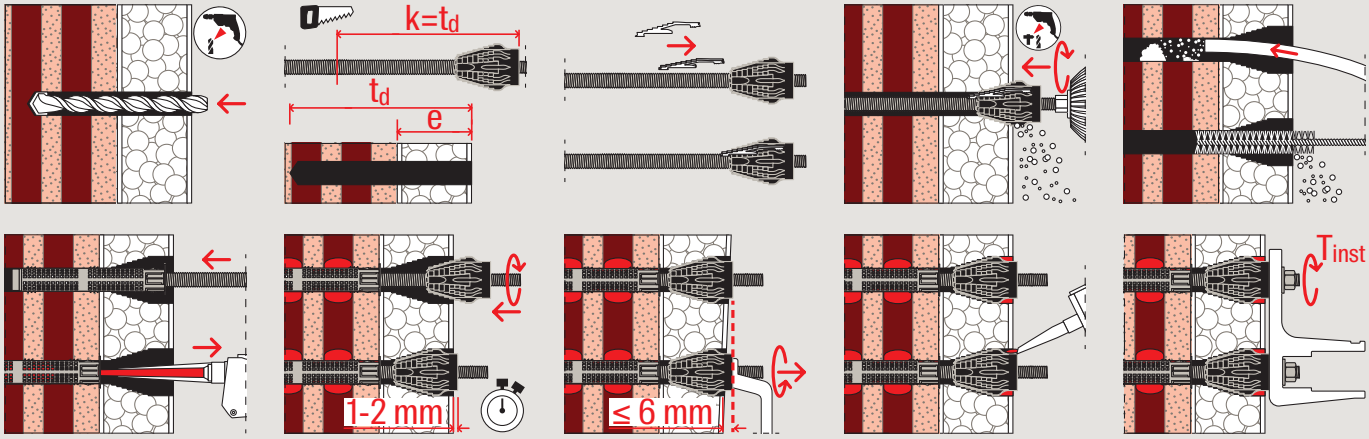
**See also:**

Product family Superbond-System FSB Page 60



**See also:**

## Installation TherMax 12/16





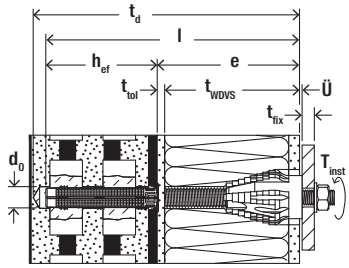

## Technical data

**Stand-off installation TherMax 12/16**



TherMax 12/110 M12 TherMax 16/170 M12

| | Galvanised steel<br>Item no. | Stainless steel<br>Item no. | Approval<br>DIBt | Contents | Sales unit<br>[pcs] |
|---|---|---|---|---|---|
| **Item** | **gvz** | **R** | | | |
| **TherMax 12/110 M12** | **051291** | – | ● | 20 x TherMax M12<br>20 x Sleeve 20 x 130<br>5 x Bit<br>5 x Cutting blade<br>5 x Manual | 20 |
| **TherMax 12/110 M12 (2)** | **051290** | – | ● | 2 x TherMax M12<br>2 x Sleeve 20 x 130<br>1 x Bit<br>1 x Cutting blade<br>1 x Multi MS white 80 ml<br>1 x Manual | 1 |
| **TherMax 12/110 M12 R** | – | **051537** | ● | 10 x TherMax M12 R<br>10 x Sleeve 20 x 130<br>3 x Bit<br>3 x Cutting blade<br>3 x Manual | 10 |
| **TherMax 16/170 M12** | **051293** | – | ● | 20 x TherMax M16<br>20 x Sleeve 20 x 200<br>5 x Bit<br>5 x Cutting blade<br>5 x Extension hose<br>5 x Manual | 20 |
| **TherMax 16/170 M12 (2)** | **051292** | – | ● | 2 x TherMax M16<br>2 x Sleeve 20 x 200<br>1 x Bit<br>1 x Cutting blade<br>1 x Extension hose<br>1 x Multi MS white 80 ml<br>1 x Manual | 1 |
| **TherMax 16/170 M12 R** | – | **051543** | ● | 10 x TherMax M16 R<br>10 x Sleeve 20 x 200<br>3 x Bit<br>3 x Cutting blade<br>3 x Extension hose<br>3 x Manual | 10 |




## Installation data

| Type | Length of TherMax incl. anti-cold cone l [mm] | Building material + insulation: Threaded rod in building material | Building material | Suitable injection anchor sleeve | Drill hole diameter $d_0$ [mm] | Min. anchorage depth $h_{ef}$ [mm] | Drill hole depth $t_d$ [mm] | Thickness of non-bearing layer e [mm] | Fixture: Max. fixture thickness $t_{fix}$ [mm] | Connection thread | Max. installation torque $T_{inst}$ [Nm] | Required resin quantity [Scale unit] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TherMax M12** | **240** | **M12** | **Concrete** | - | 14 | 70 | $h_{ef}$ + e | 62 - 170 | 16[1)] | M12 | 20 | 5 |
| | **240** | **M12** | **Solid brick** | - | 14 | 80 | $h_{ef}$ + e | 62 - 160 | 16[1)] | M12 | 20 | 6 |
| | **240** | **M12** | **Perforated brick** | FIS H 20x130 K | 20 | 130 | $h_{ef}$ + e + 10 mm | 62 - 110 | 16[1)] | M12 | 20 | 26 |
| | **240** | **M12** | **Aerated concrete** | - | 14 | 100 | $h_{ef}$ + e | 62 - 140 | 16[1)] | M12 | 20 | 8 |
| **TherMax M16** | **370** | **M16** | **Concrete** | - | 18 | 80 | $h_{ef}$ + e | 62 - 290 | 16[1)] | M12 | 20 | 7 |
| | **370** | **M16** | **Solid brick** | - | 18 | 80 | $h_{ef}$ + e | 62 - 290 | 16[1)] | M12 | 20 | 7 |
| | **370** | **M16** | **Perforated brick** | FIS H 20x200 K | 20 | 200 | $h_{ef}$ + e + 10 mm | 62 - 170 | 16[1)] | M12 | 20 | 40 |
| | **370** | **M16** | **Aerated concrete** | - | 18 | 100 | $h_{ef}$ + e | 62 - 270 | 16[1)] | M12 | 20 | 9 |

[1)] The setscrews may be replaced by a setscrew / fixing screw up to a length 200 mm.

## Technical data

**Injection mortar**


FIS EM Plus 390 S


FIS SB 390 S

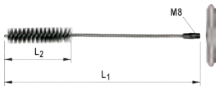

FIS V Plus 360 S


Multi MS

| Item | Item no. | Approval: ETA | DIBt | ICC | Language on label | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FIS EM Plus 390 S** | **544154** | ● | ● | ● | EN, FR, NL | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS EM Plus 390 S** | **544155** | ● | ● | ● | AR, EN, ZH | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS SB 390 S** | **519451** | ● | – | ● | DE, FR, NL | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS SB 390 S** | **518831** | ● | – | ● | EN, ES, PT | 1 x Cartridge 390 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S** | **558745** | ● | ● | ● | DE | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S** | **558746** | ● | ● | ● | EN, ES, PT | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **FIS V Plus 360 S** | **558752** | ● | ● | ● | DE, FR, NL | 1 x Cartridge 360 ml, 2 x static mixer FIS MR Plus | 1 |
| **Multi MS white 290 ml** | **059389** | – | – | – | DE, EN, FR | 1 x Cartridge 290 ml | 1 |

## Accessories drill hole cleaning

**Drill bits**




BS

| | Item no. | Length $L_1$ [mm] | Length $L_2$ [mm] | Brush diameter [mm] | For drill diameter [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Item** | | | | | | |
| **BS Ø14** | **078180** | 250 | 80 | 16 | 14 | 1 |
| **BS Ø16/18** | **078181** | 250 | 80 | 20 | 16 / 18 | 1 |
| **BS Ø20/22** | **052277** | 300 | 80 | 25 | 20 / 22 | 1 |

5

## Accessories drill hole cleaning

**Blow-out pump**




AB G

| | Item no. | | Sales unit [pcs] |
|---|---|---|---|
| **Item** | | | |
| **Blow-out pump AB G** | **567792** | | 1 |

## Accessories

**Accessories**



TherMax cutting blade



TherMax thread reducing pin

| | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **Item** | | | |
| **TherMax cutting blade, 25 pcs** | **547723** | 25 x Cutting blades | 1 |
| **TherMax thread reducing pin M12/M8 R** | **569858** | 10 x Thread reducing pin M12/M8 R (total length 59 mm; M12 29 mm, M8 30 mm)<br>10 x Washer 8,4 x 16 x 1,6 A4<br>10 x Hexagon nut M8 A4 SW13<br>1 x Installation instruction | 10 |
| **TherMax thread reducing pin M12/M10 R** | **553834** | 10 x Thread reducing pin M12/M10 R (total length 59 mm; M12 29 mm, M10 30 mm)<br>10 x Washer 10,5 x 25 x 3 A4<br>10 x Hexagon nut M10 A4 SW17<br>1 x Installation instruction | 10 |

## Loads

**Stand-off installation TherMax 12 and 16 with load-bearing anchor rod made of zinc-plated steel 8.8 and a displacement of 1 mm**

The below load table is valid for short-term loading (e.g. wind load). If the sealing of the annular gap between TherMax and plaster is assured by fischer sealant and adhesive Multi MS, KD or DKM, the TherMax version with an anchor rod on base substrate side made of zinc-plated steel may be used.
Highest permissible loads[1)5)7)] of a TherMax within an anchor group[2)] in concrete with the injection mortars FIS V Plus or FIS SB and in masonry with the injection mortar FIS V Plus.

| Type | Minimum effective anchorage depth $h_{ef}$ [4)8)] [mm] | Permissible tensile load $N_{perm}$ [3)] [kN] | Permissible shear load at e = 62 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 100 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 120 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 140 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 160 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 180 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 200 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 250 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 300 mm $V_{perm}$ [3)] [kN] | Minimum member thickness $h_{min}$ [mm] | Minimum spacing $s_{min\parallel}$ / $s_{min\perp}$ [9)] [mm] | Minimum edge distance $c_{min}$ [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Concrete, cracked and non-cracked, strength class ≥ C20/25** | | | | | | | | | | | | | | |
| **TherMax 12[8)]** | 70 | 3.40[6)] | 1.22 | 0.75 | 0.63 | 0.54 | 0.40 | 0.29 | 0.22 | 0.10 | 0.05 | 100 | 55 | 55 |
| **TherMax 16[8)]** | 80 | 3.40[6)] | 1.59 | 0.99 | 0.82 | 0.70 | 0.62 | 0.55 | 0.46 | 0.22 | 0.10 | 116 | 65 | 65 |
| **Solid brick, Mz, EN 771-1; $f_b$ ≥ 12 N/mm²; ρ ≥ 1.8 kg/dm³; LxWxH ≥ 240x115x71 mm, NF** | | | | | | | | | | | | | | |
| **TherMax 12[8)]** | 200 | 2.71 | 0.85 | 0.75 | 0.63 | 0.54 | 0.36 | 0.29 | 0.22 | 0.10 | 0.05 | 240 | 80/80 | 60 |
| **TherMax 16[8)]** | 200 | 2.71 | 1.29 | 0.99 | 0.82 | 0.70 | 0.62 | 0.55 | 0.46 | 0.22 | 0.10 | 240 | 80/80 | 60 |
| **Solid sand-lime brick, KS, EN 771; $f_b$ ≥ 20 N/mm²; ρ ≥ 2.0 kg/dm³; LxWxH ≥ 250x240x240 mm, 8DF** | | | | | | | | | | | | | | |
| **TherMax 12[8)]** | 50 | 2.86 | 1.22 | 0.75 | 0.63 | 0.54 | 0.40 | 0.29 | 0.22 | 0.10 | 0.05 | 240 | 80/80 | 60 |
| **TherMax 16[8)]** | 50 | 2.14 | 1.59 | 0.99 | 0.82 | 0.70 | 0.62 | 0.55 | 0.46 | 0.22 | 0.10 | 240 | 80/80 | 60 |
| **Vertically perforated brick type B, HLz, EN 771-1; $f_b$ ≥ 12 N/mm²; ρ ≥ 1.0 kg/dm³; LxWxH = 370x240x237 mm resp. 500x175x237 mm** | | | | | | | | | | | | | | |
| **TherMax 12[4)]** | 110 | 1.14 | 0.57 | 0.57 | 0.57 | 0.54 | 0.40 | 0.29 | 0.22 | 0.10 | 0.05 | 175 | 100/100 | 100 |
| **TherMax 16[4)]** | 110 | 1.14 | 0.57 | 0.57 | 0.57 | 0.57 | 0.57 | 0.55 | 0.46 | 0.22 | 0.10 | 175 | 100/100 | 100 |
| **Perforated sand-lime brick, KSL, EN 771-2; $f_b$ ≥ 12 N/mm²; ρ ≥ 1.4 kg/dm³; LxWxH = 240x175x113 mm, 3DF** | | | | | | | | | | | | | | |
| **TherMax 12[4)]** | 85 | 1.00 | 1.22 | 0.75 | 0.63 | 0.54 | 0.40 | 0.29 | 0.22 | 0.10 | 0.05 | 175 | 100/115 | 80 |
| **TherMax 16[4)]** | 85 | 1.00 | 1.14 | 0.99 | 0.82 | 0.70 | 0.62 | 0.55 | 0.46 | 0.22 | 0.10 | 175 | 100/115 | 80 |
| **Hollow block made of light weight concrete, Hbl, EN 771-3; $f_b$ ≥ 2 N/mm²; ρ ≥ 1.0 kg/dm³; LxWxH = 362x240x240 mm** | | | | | | | | | | | | | | |
| **TherMax 12[4)]** | 110 | 0.43 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.22 | 0.10 | 0.05 | 240 | 100/240 | 60 |
| **TherMax 16[4)]** | 180 | 0.71 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.22 | 0.10 | 240 | 100/240 | 60 |
| **Aerated concrete (cylindrical drill hole), EN 771-4; $f_b$ ≥ 2 N/mm²; ρ ≥ 0.35 kg/dm³; LxWxH ≥ 599x240x249 mm** | | | | | | | | | | | | | | |
| **TherMax 12[8)]** | 200 | 1.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.40 | 0.29 | 0.22 | 0.10 | 0.05 | 240 | 80/80 | 100 |
| **TherMax 16[8)]** | 200 | 1.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.22 | 0.10 | 240 | 80/80 | 100 |

For the design the complete approval Z-21.8-1837 issued on 21.01.2022 as well as the European Technical Assessments ETA-20/0603, ETA-20/0729 or ETA-12/0258 have to be considered.

1) The required partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered.

2) Set-up of one or more TherMax in a row in direction of shear, for which the clamping of the attachment prevents a torsion on attachment side due to a sufficient stiffness of the attachment or connecting construction. For a clamping on base substrate side only, see approval.

3) For combinations of tensile and shear loads as well as reduced spacing or edge distances (anchor groups) see approval. The values for tensile loads in masonry are valid only, if the joints of the masonry is completely filled with masonry mortar. If the joints are not filled with masonry mortar are not filled with masonry mortar and the edge distance towards the joints is less than $c_{min}$, the loads have to be reduced by the factor $a_j$ = 0.75. The values for shear loads are valid only, if the joints are filled with masonry mortar. For not completely filled joints they have to be handled like a free edge and a minimum edge distance $c_{min}$ of the anchors to the joints has to be observed. For compression loads and perforated bricks or hollow blocks see approval. Calculative assumed thickness of the attachment $t_{fix}$ = 6 mm.

4) In vertically perforated bricks HLz, perforated sand-lime bricks KSL as well as hollow blocks made of light weight concrete Hbl the TherMax 12 (standard version) can bridge non-load bearing layers up to 110 mm and the TherMax 16 can bridge them up to 170 mm. Larger usable lengths up to 300 mm are possible, if other perforated sleeves and where required longer anchor rods are used and again the anchorage depth gets reduced - see approval.

5) The stated permissible loads are valid for anchorages in dry base substrates - use category d/d - and for temperatures up to +50 °C (resp. short-term up to +80 °C) in the area of the injection mortar and during drill hole cleaning in accordance with the approval. The load values apply to anchor rods on base substrate side made of zinc-plated steel grade 8.8 - for other steel grades or stainless steel see approval.

6) Complies with the permissible tensile load of the TherMax cone.

7) Intermediate values of the shear load may be linearly interpolated in dependence of "e", if nothing else is mentioned in the approval.

8) In solid bricks Mz and solid sand-lime bricks KS the TherMax 12 (standard version) can bridge non-load bearing layers up to 190 mm (140 mm in aerated concrete) and the TherMax 16 can bridge them up to 300 mm (270 mm in aerated concrete) - but in solid brick Mz and aerated concrete the above load values have to be reduced. In concrete the TherMax 12 (standard version) can bridge non-loadbearing layers up to 170 mm and the TherMax 16 can bridge them up to 290 mm. Larger usable lengths up to 300 mm are possible, if longer anchor rods are used and again in solid bricks Mz if the anchorage depth (compared to above values) gets reduced where required - see approval.

9) Minimum spacing with simultaneous reduction of the permissible load for each TherMax.

# Loads

**Stand-off installation TherMax 12 and 16 with load-bearing anchor rod made of stainless steel R-70 and a displacement of 3 mm**

The below load table is valid for short-term loading (e.g. wind load). Measures for sealing see approval, section 3.2.4.
Highest permissible loads[1)5)7)] of a TherMax within an anchor group[2)] in concrete with the injection mortars FIS V Plus or FIS SB and in masonry with the injection mortar FIS V Plus.

| Type | Minimum effective anchorage depth $h_{ef}$ [4)8)] [mm] | Permissible tensile load $N_{perm}$ [3)] [kN] | Permissible shear load at e = 62 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 100 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 120 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 140 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 160 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 180 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 200 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 250 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 300 mm $V_{perm}$ [3)] [kN] | Minimum member thickness $h_{min}$ [mm] | Minimum spacing $s_{min\parallel}$ / $s_{min\perp}$ [9)] [mm] | Minimum edge distance $c_{min}$ [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Concrete, cracked and non-cracked, strength class ≥ C20/25** | | | | | | | | | | | | | | |
| **TherMax 12[8)]** | 70 | 3.40[6)] | 1.22 | 0.75 | 0.63 | 0.54 | 0.47 | 0.42 | 0.38 | 0.30 | 0.15 | 100 | 55 | 55 |
| **TherMax 16[8)]** | 80 | 3.40[6)] | 1.59 | 0.99 | 0.82 | 0.70 | 0.62 | 0.55 | 0.49 | 0.39 | 0.31 | 116 | 65 | 65 |
| **Solid brick, Mz, EN 771-1; $f_b$ ≥ 12 N/mm²; ρ ≥ 1.8 kg/dm³; LxWxH ≥ 240x115x71 mm, NF** | | | | | | | | | | | | | | |
| **TherMax 12[8)]** | 200 | 2.71 | 0.85 | 0.75 | 0.63 | 0.54 | 0.47 | 0.42 | 0.38 | 0.30 | 0.15 | 240 | 80/80 | 60 |
| **TherMax 16[8)]** | 200 | 2.71 | 1.29 | 0.99 | 0.82 | 0.70 | 0.62 | 0.55 | 0.49 | 0.39 | 0.31 | 240 | 80/80 | 60 |
| **Solid sand-lime brick, KS, EN 771; $f_b$ ≥ 20 N/mm²; ρ ≥ 2.0 kg/dm³; LxWxH ≥ 250x240x240 mm, 8DF** | | | | | | | | | | | | | | |
| **TherMax 12[8)]** | 50 | 2.86 | 1.22 | 0.75 | 0.63 | 0.54 | 0.47 | 0.42 | 0.38 | 0.30 | 0.15 | 240 | 80/80 | 60 |
| **TherMax 16[8)]** | 50 | 2.14 | 1.59 | 0.99 | 0.82 | 0.70 | 0.62 | 0.55 | 0.49 | 0.39 | 0.31 | 240 | 80/80 | 60 |
| **Vertically perforated brick type B, HLz, EN 771-1; $f_b$ ≥ 12 N/mm²; ρ ≥ 1.0 kg/dm³; LxWxH = 370x240x237 mm resp. 500x175x237 mm** | | | | | | | | | | | | | | |
| **TherMax 12[4)]** | 110 | 1.14 | 0.57 | 0.57 | 0.57 | 0.54 | 0.47 | 0.42 | 0.38 | 0.30 | 0.15 | 175 | 100/100 | 100 |
| **TherMax 16[4)]** | 110 | 1.14 | 0.57 | 0.57 | 0.57 | 0.57 | 0.57 | 0.55 | 0.49 | 0.39 | 0.31 | 175 | 100/100 | 100 |
| **Perforated sand-lime brick, KSL, EN 771-2; $f_b$ ≥ 12 N/mm²; ρ ≥ 1.4 kg/dm³; LxWxH = 240x175x113 mm, 3DF** | | | | | | | | | | | | | | |
| **TherMax 12[4)]** | 85 | 1.00 | 1.22 | 0.75 | 0.63 | 0.54 | 0.47 | 0.42 | 0.38 | 0.30 | 0.15 | 175 | 100/115 | 80 |
| **TherMax 16[4)]** | 85 | 1.00 | 1.14 | 0.99 | 0.82 | 0.70 | 0.62 | 0.55 | 0.49 | 0.39 | 0.31 | 175 | 100/115 | 80 |
| **Hollow block made of light weight concrete, Hbl, EN 771-3; $f_b$ ≥ 2 N/mm²; ρ ≥ 1.0 kg/dm³; LxWxH = 362x240x240 mm** | | | | | | | | | | | | | | |
| **TherMax 12[4)]** | 110 | 0.43 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.15 | 240 | 100/240 | 60 |
| **TherMax 16[4)]** | 180 | 0.71 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 240 | 100/240 | 60 |
| **Aerated concrete (cylindrical drill hole), EN 771-4; $f_b$ ≥ 2 N/mm²; ρ ≥ 0.35 kg/dm³; LxWxH ≥ 599x240x249 mm** | | | | | | | | | | | | | | |
| **TherMax 12[8)]** | 200 | 1.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.42 | 0.38 | 0.30 | 0.15 | 240 | 80/80 | 100 |
| **TherMax 16[8)]** | 200 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.39 | 0.31 | 240 | 80/80 | 100 |

For the design the complete approval Z-21.8-1837 issued on 21.01.2022 as well as the European Technical Assessments ETA-20/0603, ETA-20/0729 or ETA-12/0258 have to be considered.

1) The required partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L$ = 1.4 are considered.

2) Set-up of one or more TherMax in a row in direction of shear, for which the clamping of the attachment prevents a torsion on attachment side due to a sufficient stiffness of the attachment or connecting construction. For a clamping on base substrate side only, see approval.

3) For combinations of tensile and shear loads as well as reduced spacing or edge distances (anchor groups) see approval. The values for tensile loads in masonry are valid only, if the joints of the masonry is completely filled with masonry mortar. If the joints are not filled with masonry mortar are not filled with masonry mortar and the edge distance towards the joints is less than $c_{min}$, the loads have to be reduced by the factor $a_j$ = 0.75. The values for shear loads are valid only, if the joints are filled with masonry mortar. For not completely filled joints they have to be handled like a free edge and a minimum edge distance $c_{min}$ of the anchors to the joints has to be observed. For compression loads and perforated bricks or hollow blocks see approval. Calculative assumed thickness of the attachment $t_{fix}$ = 6 mm.

4) In vertically perforated bricks HLz, perforated sand-lime bricks KSL as well as hollow blocks made of light weight concrete Hbl the TherMax 12 (standard version) can bridge non-load bearing layers up to 110 mm and the TherMax 16 can bridge them up to 170 mm. Larger usable lengths up to 300 mm are possible, if other perforated sleeves and where required longer anchor rods are used and again the anchorage depth gets reduced - see approval.

5) The stated permissible loads are valid for anchorages in dry base substrates - use category d/d - and for temperatures up to +50 °C (resp. short-term up to +80 °C) in the area of the injection mortar and during drill hole cleaning in accordance with the approval. The load values apply to anchor rods on base substrate side made of stainless steel of the grade A4-70.

6) Complies with the permissible tensile load of the TherMax cone.

7) Intermediate values of the shear load may be linearly interpolated in dependence of "e", if nothing else is mentioned in the approval.

8) In solid bricks Mz and solid sand-lime bricks KS the TherMax 12 (standard version) can bridge non-load bearing layers up to 190 mm (140 mm in aerated concrete) and the TherMax 16 can bridge them up to 300 mm (270 mm in aerated concrete) - but in solid brick Mz and aerated concrete the above load values have to be reduced. In concrete the TherMax 12 (standard version) can bridge non-loadbearing layers up to 170 mm and the TherMax 16 can bridge them up to 290 mm. Larger usable lengths up to 300 mm are possible, if longer anchor rods are used and again in solid bricks Mz if the anchorage depth (compared to above values) gets reduced where required - see approval.

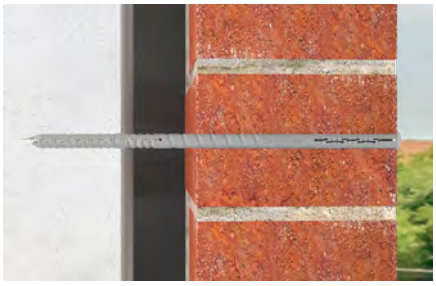
9) Minimum spacing with simultaneous reduction of the permissible load for each TherMax.

# Remedial wall tie mechanical VBS-M

The quick repair for double- shell facades.







Facing masonry



Repairing outer leafs

## Applications

- VBS-M is especially suitable for applications where external thermal insulation composite systems (ETICS) have been previously installed.
- Retrorespective repair of facing masonry.

## Advantages

- The approved fixing in stone and in joints from at least 50 mm facing masonry provides a high degree of flexibility and security.
- Use in joints and with a low anchorage depth of just 50 mm allows for a quick and economical installation.
- The small anchor rim and screw head allow for a surface-flush or deep-set installation.
- The drill hole can be retrospectively sealed so that it is no longer visible in the façade.
- A drip coil prevents condensate running into the load-bearing layer, thus preventing frost and corrosive damage.

## Certificates / Features




## Building materials

- Facing masonry with and without an air layer

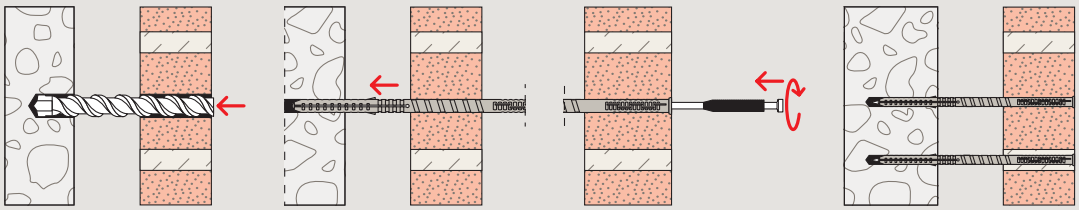
## Versions

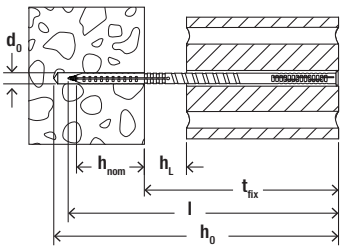
- Galvanised steel
- Stainless steel

## Functioning

- The remedial wall tie VBS-M is set in the load-bearing layer and into facing masonry using push-through installation.
- In accordance with the approval, no drill hole cleaning is required.
- The two expansion zones in the load-bearing layer and in the facing masonry ensure a secure fixation.
- The plug doesn‘t fix into the facing masonry until the head grips into the load-bearing layer. This ensures the very best installation safety.

## Installation VBS-M






## Technical data

**Remedial wall tie mechanical VBS-M**



VBS-M

| Item | Galvanised steel<br>Item no.<br>gvz | Stainless steel<br>Item no.<br>R | Approval<br>DIBt | Max. shell distance at 115 mm facing masonry, flush installation<br>$h_L$<br>[mm] | Max. shell distance at 115 mm facing masonry, 20 mm sunk installation<br>$h_L$<br>[mm] | Facing masonry + cavity<br>$t_{fix}$<br>[mm] | Drill diameter<br>$d_0$<br>[mm] | Drill hole depth<br>$h_0$<br>[mm] | Effect. anchoring depth<br>$h_{nom}$<br>[mm] | Anchor length<br>l<br>[mm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **VBS-M 8 x 120** | **514243**[1] | **–** | ● | – | – | 70 | 8 | 140 | > 50 | 120 | 100 |
| **VBS-M 8 x 120** | **–** | **514236**[1] | ● | 20 | – | 70 | 8 | 140 | > 50 | 120 | 100 |
| **VBS-M 8 x 185** | **514244** | **514237** | ● | 20 | 40 | 135 | 8 | 205 | > 50 | 185 | 100 |
| **VBS-M 8 x 205** | **514245** | **514238** | ● | 40 | 60 | 155 | 8 | 225 | > 50 | 205 | 100 |
| **VBS-M 8 x 225** | **514246** | **514239** | ● | 60 | 80 | 175 | 8 | 245 | > 50 | 225 | 100 |
| **VBS-M 8 x 245** | **514247** | **514240** | ● | 80 | 100 | 195 | 8 | 265 | > 50 | 245 | 100 |
| **VBS-M 8 x 265** | **514248** | **514241** | ● | 100 | 120 | 215 | 8 | 285 | > 50 | 265 | 100 |
| **VBS-M 8 x 285** | **514249** | **514242** | ● | 120 | 140 | 235 | 8 | 305 | > 50 | 285 | 100 |

[1] Max. 20 mm mortar layer in the case of 50 mm thick economy facing.

## Accessories

**Drill bits**



SDS Plus IV



SDS Plus II

| Item | Item no. | Description | Sales unit<br>[pcs] |
|---|---|---|---|
| **SDS Plus IV 8/100/400** | **517689** | fischer Quattric drill bit with SDS fixture and short flute for drilling in concrete | 1 |
| **SDS Plus II 8/400/460** | **531785** | fischer hammer drill bit for drilling in concrete and in the facing brick | 1 |

## ProfiBit

**ProfiBit**



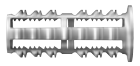
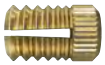
FPB TX

| Item | Item no. | Description | Sales unit<br>[pcs] |
|---|---|---|---|
| **FPB TX25 ProfiBit** | **517693** | fischer ProfiBit long, which can be extended to 50 mm bit, allows for deep setting in stone and in the bed joint | 1 |



# 6
# General fixings




| | | |
|---|---|---|
| DuoPower | 434 |  |
| DuoSeal | 439 |  |
| Universal plug UX | 442 |  |
| Universal plug UX Green | 447 |  |
| Expansion plug SX Plus | 450 |  |
| Expansion plug SX Plus Green | 455 |  |
| Expansion plug S | 458 |  |
| Threaded rod plug RodForce FGD | 461 |  |
| Metal expansion anchor FMD | 464 |  |
| Expansion plug M-S | 466 |  |
| EasyHook | 468 |  |
| Anchor M | 471 |  |
| Brass fixing MS | 473 |  |
| Aircrete anchor GB | 475 |  |
| Aircrete anchor GB Green | 477 |  |
| Turbo aircrete anchor FTP K | 479 |  |
| Turbo aircrete anchor FTP M | 481 |  |
| Brass fixing PA 4 | 483 |  |
| Balcony cladding fixing P 9 K | 485 |  |
| Stair-tread fixing TB / TBB | 487 |  |
| Repair pad FixIt | 489 |  |
| Doorstop TS | 491 |  |

# DuoPower

The duo of power and intelligence.







Console



Pipelines

## Applications

- TV consoles
- Lighting
- Shelves
- Mirror cabinets
- Letter boxes
- Pictures
- Fixing blinds
- Curtain rails
- Wash basin fixings
- Plumbing and heating fixings
- Bath and toilet installations
- Wall cabinets
- Range hood

## Advantages

- Two component materials for top load values and intelligent functioning depending on the substrate.
- Great feedback (feel-good factor) of the plug. You can feel exactly when the plug is installed perfectly.
- The narrow plug rim prevents slipping into the drill hole.
- The serrated anti-rotation feature prevents rotation in the drill hole during installation.
- The greater anchorage depth of the DuoPower 6 x 50, 8 x 65 and 10 x 80 means that the plug is especially suited to fixings in hollow building materials, aerated concrete and to bridge plaster.
- The European Technical Assessment (ETA) for certain DuoPower dimensions guarantees tested safety for safety-relevant applications in concrete and asonry (see load table).

## Certificates / Features

ETA CE 2K Technology

**ETA-22/0512, for multiple non-structural systems in concrete and masonry**

DuoLine

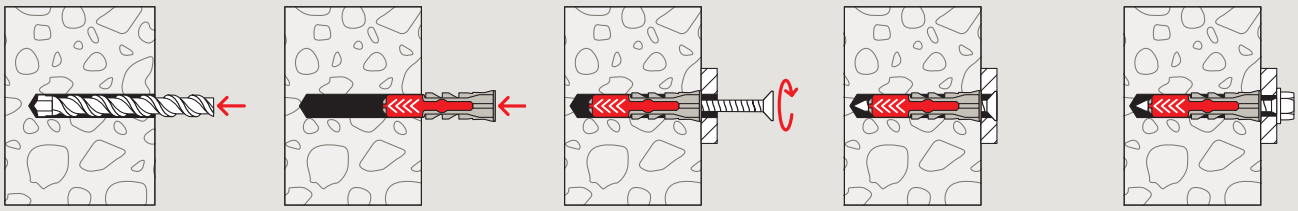
## Building materials

- Concrete
- Solid brick
- Solid sand-lime brick
- Aerated concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Plasterboard
- Gypsum plasterboard and gypsum fibreboards
- Hollow blocks made from lightweight concrete
- Cavity floor slabs made from bricks and concrete or similar
- Natural stone
- Chipboard
- Solid panel made from gypsum
- Solid brick made from lightweight concrete

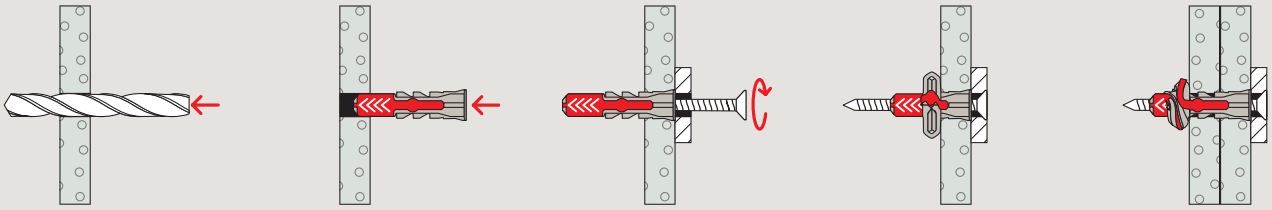
## Functioning

- The grey component made from high quality nylon automatically activates for the optimum product function (expansion, folding, knotting) for the best hold.
- The required screw length is given by the plug length + fixture thickness + the screw diameter.
- Suitable for wood and chipboard screws, as well as stud screws.
- In the case of fixing boards, the threadless part of the screw must not be longer than the fixture.
- The fischer DuoPower ETA 10x50 with fischer safety screw is approved for concrete and masonry. The DuoPower ETA 8x40 with FPF II or fischer safety screw is approved for concrete.

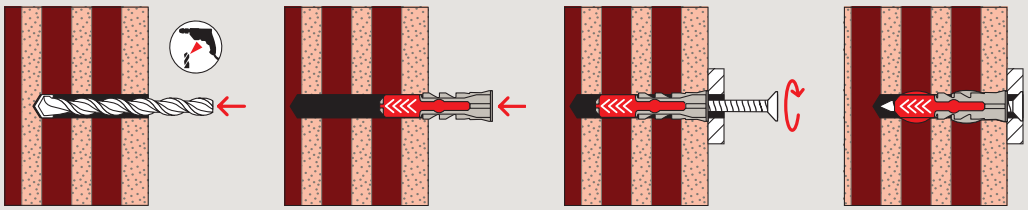
## Installation in solid building materials

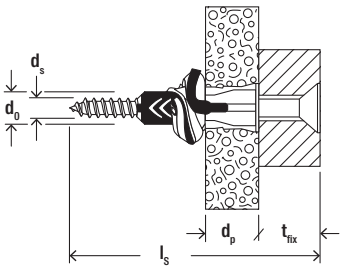


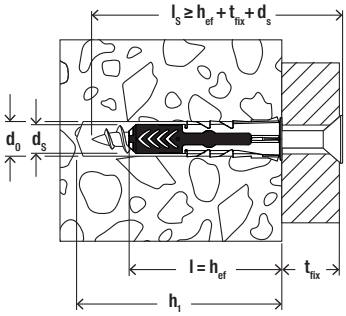
## Installation in panel building materials



## Installation in hollow building materials





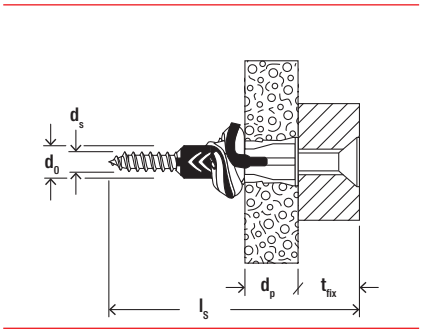

## Technical data

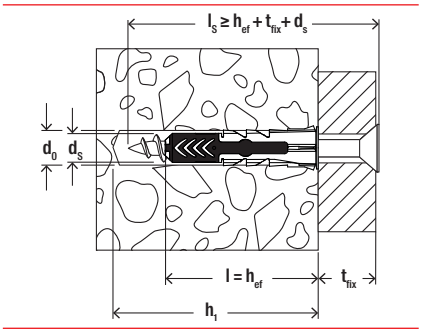
**DuoPower**



DuoPower DuoPower longversion

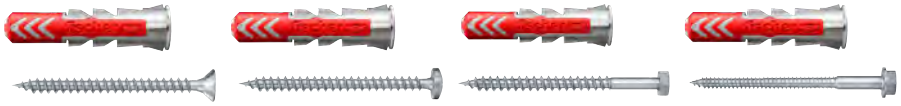
| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. panel thickness $d_p$ [mm] | Min. bolt penetration $l_{E,min}$ [mm] | Anchor length l [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **DuoPower 5 x 25** | **535452** | 5 | 35 | 12.5 | 29 | 25 | 100 |
| **DuoPower 6 x 30** | **535453** | 6 | 40 | 12.5 | 35 | 30 | 100 |
| **DuoPower 6 x 50** | **538250** | 6 | 60 | 12.5 | 55 | 50 | 100 |
| **DuoPower 8 x 40** | **535455** | 8 | 50 | 12.5 | 46 | 40 | 100 |
| **DuoPower 8 x 65** | **538251** | 8 | 55 | 12.5 | 71 | 65 | 50 |
| **DuoPower 10 x 50** | **535456** | 10 | 60 | 12.5 | 58 | 50 | 50 |
| **DuoPower 10 x 80** | **538252** | 10 | 65 | 12.5 | 88 | 80 | 25 |
| **DuoPower 12 x 60** | **538253** | 12 | 90 | 12.5 | 70 | 60 | 25 |
| **DuoPower 14 x 70** | **538254** | 14 | 90 | 12.5 | 80 | 70 | 20 |



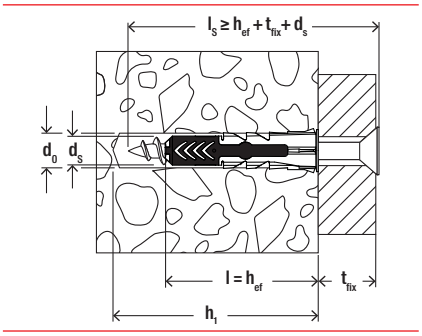

## Technical data

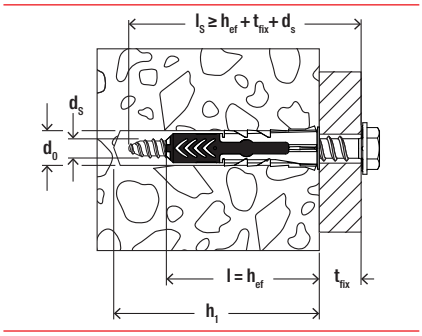
**DuoPower with screws**



DuoPower S | DuoPower S PH | DuoPower S | DuoPower S

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. panel thickness $d_p$ [mm] | Min. bolt penetration $l_{E,min}$ [mm] | Anchor length $l$ [mm] | Screw dimension $d_s \times l_s$ [mm] | Drive | Max. fixture thickness $t_{fix}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| **DuoPower 5 x 25 S** | **535458** | 5 | 40 | 12.5 | 29 | 25 | 3.5 x 35 | PZ2 | 6 | 50 |
| **DuoPower 6 x 30 S** | **535459** | 6 | 45 | 12.5 | 35 | 30 | 4.5 x 40 | PZ2 | 5 | 50 |
| **DuoPower 6 x 30 S PH** | **535463** | 6 | 45 | 12.5 | 34 | 30 | 4.5 x 40 | PZ2 | 6 | 50 |
| **DuoPower 6 x 30 S PH TX** | **545838** | 6 | 45 | 12.5 | 35 | 30 | 4.5 x 40 | TX20 | 5 | 100 |
| **DuoPower 6 x 50 S** | **538255** | 6 | 65 | – | 55 | 50 | 4.5 x 60 | PZ2 | 5 | 50 |
| **DuoPower 6 x 50 S PH** | **538260** | 6 | 65 | 12.5 | 55 | 50 | 4.5 x 60 | PZ2 | 5 | 50 |
| **DuoPower 8 x 40 S** | **535460** | 8 | 60 | 12.5 | 45 | 40 | 5.0 x 55 | PZ2 | 10 | 50 |
| **DuoPower 8 x 65 S** | **538256** | 8 | 85 | – | 70 | 65 | 5.0 x 80 | PZ2 | 10 | 25 |
| **DuoPower 8 x 65 S PH** | **538261** | 8 | 85 | – | 70 | 65 | 5.0 x 80 | PH2 | 13 | 25 |
| **DuoPower 10 x 50 S** | **535461** | 10 | 74 | 12.5 | 57 | 50 | 7.0 x 69 | TX40 / SW 13 | 12 | 25 |
| **DuoPower 10 x 80 S** | **538257** | 10 | 80 | – | 87 | 80 | 7.0 x 107 | SW 13 | 20 | 10 |
| **DuoPower 12 x 60 S** | **538258** | 12 | 85 | 12.5 | 68 | 60 | 8.0 x 80 | SW 13 | 12 | 10 |
| **DuoPower 14 x 70 S** | **538259** | 14 | 100 | – | 80 | 70 | 10.0 x 95 | SW 17 | 15 | 8 |




## Technical data

**DuoPower ETA**



DuoPower ETA FPF II



DuoPower ETA Safety Screw

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. bolt penetration $l_{E,min}$ [mm] | Anchor length $l$ [mm] | Screw dimension $d_s \times l_s$ [mm] | Drive | Max. fixture thickness $t_{fix}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| **DuoPower ETA 8 x 40 FPF II** | **564789** | ● | 8 | 69 | 45 | 40 | 6.0 x 60 | TX30 | 14 | 50 |
| **DuoPower ETA 8 x 40 Safety Screw** | **564790** | ● | 8 | 78 | 45 | 40 | 6.0 x 66.5 | TX30 / SW 10 | 20 | 50 |
| **DuoPower ETA 10 x 50 Safety Screw** | **564792** | ● | 10 | 78 | 57 | 50 | 7.0 x 69 | TX40 / SW 13 | 12 | 50 |

The drill diameter is relative to the substrate compressive strength. Generally, the higher the compressive strength, the greater the drill diameter.

## Loads

**DuoPower**

Recommended loads[1] for a single anchor.
The given loads are valid for wood screws with the specified diameter.

| Type | | | 5 x 25 | 6 x 30 | 6 x 50 | 8 x 40 | 8 x 65 | 10 x 50 | 10 x 80 | 12 x 60 | 14 x 70 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Wood screw diameter** | | [mm] | 4 | 5 | 5 | 6 | 6 | 8 | 8 | 10 | 12 |
| **Min. edge distance concrete** | $c_{min}$ | [mm] | 30 | 35 | 35 | 50 | 50 | 65 | 65 | 80 | 100 |
| **Recommended loads in the respective base material $F_{rec}$[2]** | | | | | | | | | | | |
| **Concrete** | ≥ C20/25 | [kN] | 0.40 | 0.95 | 1.65 | 1.10 | 2.30 | 2.15 | 4.20 | 3.30 | 5.30 |
| **Solid brick** | ≥ Mz 12 | [kN] | 0.30 | 0.50 | 0.55 | 0.62 | 0.69 | 1.20 | 1.45 | 1.30 | 1.35 |
| **Solid sand-lime brick** | ≥ KS 12 | [kN] | 0.50 | 1.00 | 1.60 | 1.25 | 2.25 | 2.20 | 3.85 | 2.80 | 4.50 |
| **Aerated concrete** | ≥ AAC 2 | [kN] | 0.05 | 0.10 | 0.15 | 0.10 | 0.16 | 0.20 | 0.30 | 0.24 | 0.35 |
| **Aerated concrete** | ≥ AAC 4 | [kN] | 0.25 | 0.38 | 0.55 | 0.42 | 0.60 | 0.60 | 1.10 | 1.00 | 1.45 |
| **Sand-lime hollow block** | ≥ KSL 12 ($\rho \geq 1.6$ kg/dm$^3$) | [kN] | 0.40 | 0.60 | 0.60 | 0.70 | 1.00 | 0.70 | 2.00 | 0.75 | 1.50 |
| **Vertically perforated brick** | ≥ HLz 12 ($\rho \geq 0.9$ kg/dm$^3$) | [kN] | 0.13 | 0.15 | 0.17 | 0.25 | 0.40 | 0.25 | 0.40 | 0.35 | 0.40 |
| **Vertically perforated brick** | Doppio UNI 19 | [kN] | 0.15 | 0.15 | 0.23 | 0.25 | 0.30 | 0.25 | 0.52 | 0.35 | 0.35 |
| **Vertically perforated brick** | Forato Typ F8 | [kN] | 0.15 | 0.15 | - | 0.25 | - | 0.25 | - | - | - |
| **Light-weight concrete hollow block** | Sepa Parpaing | [kN] | 0.30 | 0.45 | 0.25[3] | 0.45 | 0.45[3] | 0.45 | 0.45[3] | 0.60[3] | 0.60[3] |
| **Gypsum block** | ($\rho \geq 0.9$ kg/dm$^3$) | [kN] | 0.10 | 0.18 | 0.37 | 0.25 | 0.50 | 0.35 | 0.65 | 0.50 | 0.50 |
| **Gypsum fibreboard** | 12.5 mm | [kN] | 0.24 | 0.33 | 0.35 | 0.35 | - | 0.50 | - | - | - |
| **Gypsum plasterboard** | 12.5 mm | [kN] | 0.12 | 0.15 | 0.15 | 0.15 | - | 0.15 | - | - | - |
| **Gypsum plasterboard** | 2 x 12.5 mm | [kN] | 0.13 | 0.15 | 0.24 | 0.20 | 0.32 | 0.30 | - | - | - |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tensile load, shear load and oblique load under any angle.
[3] Load determination on plastered wall.

# Loads

**Universal plug DuoPower**

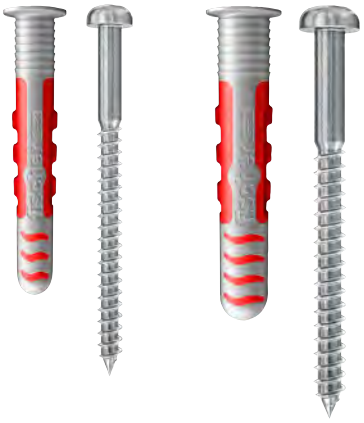
Permissible loads[1)2)3)] of a single anchor as part of a multiple fixing of non-structural systems.
For the design the complete current assessment ETA-22/0512 of 04.11.2022 has to be considered.

| Type | | | DuoPower ETA 8x40 Power Fast II | DuoPower ETA 8x40 Spezialschraube | DuoPower ETA 10x50 Spezialschraube | |
|---|---|---|---|---|---|---|
| **Anchor diameter** | $d_0$ | **[mm]** | 8 | 8 | 10 | |
| **Screw diameter** | d | **[mm]** | 6 | 6 | 7 | |
| **Anchorage depth** | $h_{nom}$ | **[mm]** | 40 | 40 | 50 | |
| **Anchorage in concrete ≥ C16/20[4)]** | | | | | | |
| **Permissible tensile load $N_{perm}$** | | **[kN]** | 0.12 | 0.79 | 0.79 | |
| **Permissible shear load $V_{perm}$** | zinc coated screws (gvz) | **[kN]** | 3.10 | 4.23 | 5.98 | |
| | stainless steel screw (R) | **[kN]** | - | 3.93 | 5.98 | |
| **Minimum member thickness** | $h_{min}$ | **[mm]** | 150 | 150 | 150 | |
| **Characteristic edge distance** | $c_{cr,N}$ | **[mm]** | 55 | 90 | 80 | |
| **Characteristic spacing** | a resp. $s_{cr,N}$ | **[mm]** | 15 | 50 | 50 | |
| **Minimum spacing** | $s_{min}$ | **[mm]** | 50 | 50 | 50 | |
| **with an edge distance** | c ≥ | **[mm]** | 100 | 100 | 100 | |
| **Minimum edge distance** | $c_{min}$ | **[mm]** | 50 | 80 | 80 | |
| **with a spacing** | s ≥ | **[mm]** | 100 | 160 | 160 | |
| **Anchorage in masonry** | | | | | | |
| **Permisible load[5)] $F_{perm}$ in solid brick** | ≥ Mz 10/2; NF | **[kN]** | - | - | 0.40 | - |
| | ≥ Mz 16/2; NF | **[kN]** | - | - | 0.57 | - |
| | ≥ Mz 20/2; NF | **[kN]** | - | - | 0.71 | - |
| **Permissible load[5)] $F_{perm}$ in solid sand-lime brick** | ≥ KS 8/2; 2DF | **[kN]** | - | - | 0.60 | 0.70[6)] |
| | ≥ KS 12/2; 2DF | **[kN]** | - | - | 0.60 | 0.70[6)] |
| **Permissible load[5)] $F_{perm}$ in perforated clay brick** | ≥ Hlz 10/1.2; 9 DF | **[kN]** | - | - | 0.17 | |
| | ≥ Hlz 12/1.2; 9 DF | **[kN]** | - | - | 0.21 | |
| **Minimum member thickness** | $h_{min}$ | **[mm]** | - | - | 115 | |
| **Minimum spacing (single anchor)** | $a_{min}$ | **[mm]** | - | - | 250 | |
| **Minimum spacing (anchor group)** | $s_{min}$ | **[mm]** | - | - | 50 | |
| **Minimum edge distance (anchor group)** | $c_{min}$ | **[mm]** | - | - | 80 | |

1) Valid for zinc coated (gvz) Power Fast II and special screw and as well as for special screw made of stainless steel (R). For exterior use of the zinc coated screws measures against incoming humidity have to be taken.
2) The required partial safety factors for material resistance as well as a partial safety factor for load actions $\gamma_L$ = 1.4 are considered.
As a single anchor counts e.g. an anchor with a minimum spacing a according to Annex B 2 or B 3 of the assessment.
3) Valid for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
4) For values in concrete C12/15 see assessment.
5) Valid for tensile load, shear load and oblique load under any angle. For combinations of tensile loads, shear loads and bending moments see assessment. Bulk density of stone in [kg/dm³] and minimum compressive strength in [N/mm²] according to EN 771.
6) Only valid for $c_{1min}$ 110 mm and $c_{2min}$ 165 mm.

# DuoSeal

The sealing plug for wet areas.





Fixings on tiled surfaces



Accessories in wet areas



## Applications

**In tiled non-permanent wet areas like:**
- Bathrooms
- Kitchens
- Spas
- Swimming pools
- Sports facilities

**Suitable for:**
- Accessories
- Faucets
- Shower panels
- Mirrors

## Advantages

- The DuoSeal completely seals drill holes in tiles without additional sealing compound and thus prevents structural damage caused by moisture in the building material.
- The DuoSeal is ideally suited for tiled surfaces which are exposed to very frequent splashing water and temporarily accumulated water.
- The universal plug can be installed gently on tiles with very little effort.
- It´s red component ensures a secure hold in all building materials. Thus, the DuoSeal achieves the same load values as conventional nylon plugs.
- The stainless steel screw included in the set is ideally suited for installation in wet areas and avoids rusting.
- The soft plastic rim closes the drill hole completely and flexibly adapts to the shape of the attachment part.

## Certificates / Features

DIN 18534
ETAG 022

SFV

DuoLine

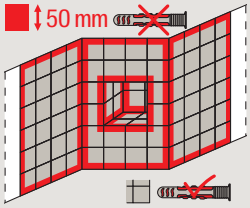
## Building materials

- Concrete
- Solid brick
- Solid sand-lime brick
- Light concrete (solid brick)
- Light concrete (hollow brick)
- Vertically perforated brick
- Perforated sand-lime brick
- Aerated concrete
- Gypsum plasterboard
- Gypsum fibreboard
- Chipboard
- Gypsum block

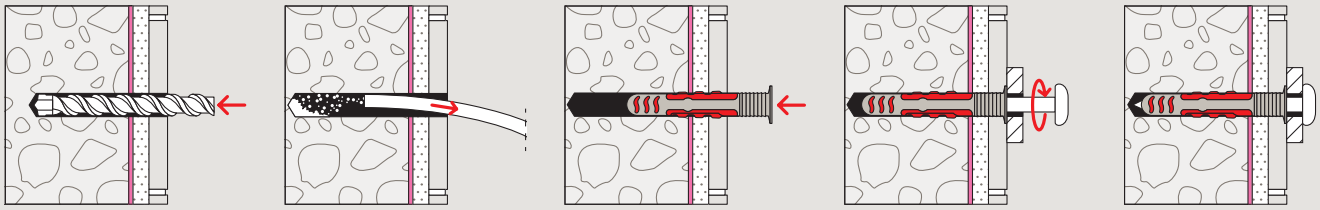
## Functioning

- The DuoSeal is only suitable for application on tiles and can only be mounted as pre-position installation. A suitable diamond or tile drill should be used for drilling the hole.
- The DuoSeal can be installed gently on tiles with just a few hammer blows. The rim of the shaft prevents the plug from being set too deep and additionally seals the drill hole.
- The red component made of high-quality nylon automatically activates the optimum function principle (spreading, folding, knotting) depending on the building material for best hold.
- The soft grey component is pressed against the drill hole wall by screwing in the screw and seals the drill hole completely.
- The grooves in the plug shaft compensate for unevenness in the hole, so that the sealing function is guaranteed even if the drill hole is not perfect.

## Installation of the DuoSeal with a minimum distance of 50 mm to all free edges

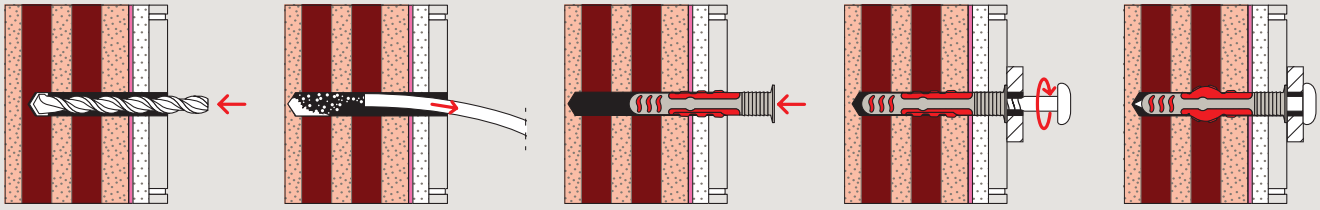



## Installation in solid building materials

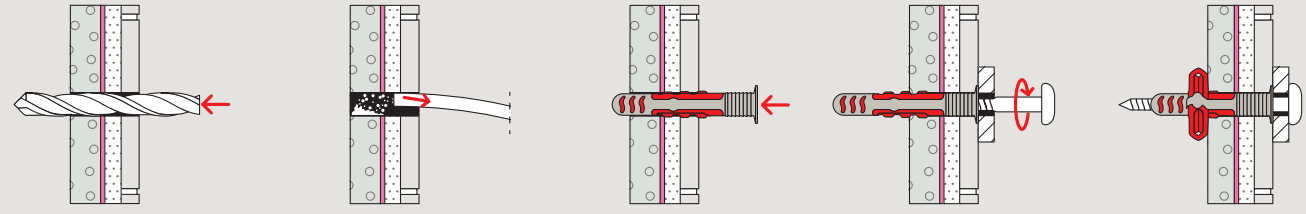


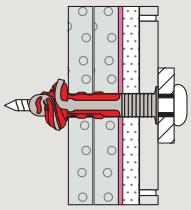


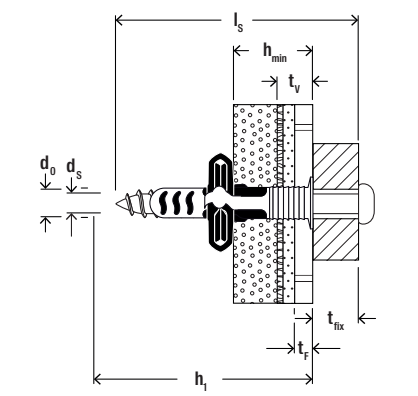
## Installation in hollow building materials



## Installation in panel building materials



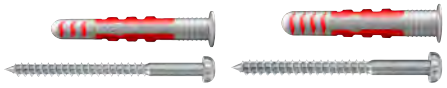







## Technical data

**DuoSeal**



DuoSeal 6 S DuoSeal 8 S

| | Item no. | Drill diameter $d_0$ [mm] | Drill hole diameter tolerance [mm] | Max. fixture thickness $t_{fix}$ [mm] | Min. building material thickness $h_{min}$ [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Drive | Sealing depth $t_v$ [mm] | Tile thickness $t_F$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | | | | |
| **DuoSeal 6 x 38 S PH TX A2** | **557727** | 6 | 6 - 6.4 | 12 | 22 | 4.5 x 60 | TX20 | 5 - 14 | 5 - 10 | 50 |
| **DuoSeal 8 x 48 S PH TX A2** | **557728** | 8 | 8 - 8.45 | 16 | 25 | 6.0 x 70 | TX30 | 5 - 14 | 5 - 10 | 25 |

## Loads

**DuoSeal**

Recommended loads[1] for a single anchor.

| Type | | | DuoSeal 6 | DuoSeal 8 |
|---|---|---|---|---|
| **Screw diameter** | | [mm] | **4.5** | **6.0** |
| **Recommended loads in the respective base material $F_{rec}$ [2) 3)]** | | | | |
| **Concrete** | ≥ C20/25 | [kN] | 0.40 | 0.60 |
| **Solid brick** | ≥ Mz 12 | [kN] | 0.20 | 0.30 |
| **Solid sand-lime brick** | ≥ KS 12 | [kN] | 0.30 | 0.40 |
| **Aerated concrete** | ≥ AAC 2 | [kN] | 0.10 | 0.10 |
| **Vertically perforated brick** | ≥ HLz 12 | [kN] | 0.20 | 0.30 |
| **Perforated sand-lime brick** | ≥ KSL 12 | [kN] | 0.30 | 0.40 |
| **Gypsum plasterboard impregnated (green)** | 12.5 mm | [kN] | 0.10 | 0.104) |
| **Gypsum plasterboard impregnated (green)** | 2 x 12.5 mm | [kN] | 0.15 | 0.15 |
| **Gypsum plasterboard hard and impregnated (e. g. Knauf Diamant board or Rigipis Die Harte)** | 12.5 mm | [kN] | 0.15 | 0.15 |
| **Gypsum plasterboard hard and impregnated (e. g. Knauf Diamant board or Rigipis Die Harte)** | 2 x 12.5 mm | [kN] | 0.20 | 0.20 |
| **Gypsum fibreboard** | 12.5 mm | [kN] | 0.20 | 0.20 |
| **Gypsum block** | $\rho \geq 0.85$ kg/dm$^3$ | [kN] | 0.10 | 0.10 |

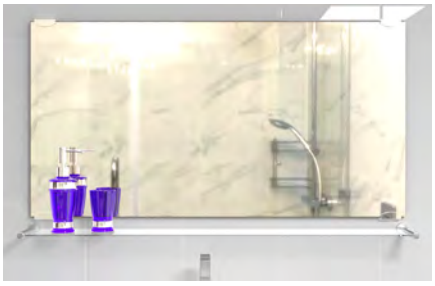
[1] Required safety factor is considered.
Load values are valid for using the supplied screws and under consideration of the total tile thickness: tile + tile glue + sealing compound.
[2] Valid for tensile load, shear load and oblique load under any angle. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[3] Values apply to tile thickness 5 - 10 mm and total tile thickness 9.5 - 14.5 mm.
[4] Value applies to tile thickness 8 - 10 mm and total tile thickness 12.5 - 14.5 mm.

# Universal plug UX

The nylon plug for all building materials.







Mirror fixings



Pictures

## Applications

- Pictures
- Lighting
- Skirting
- Light cabinets
- Towel rails
- Mirror cabinets
- Curtain rails
- Wash basin fixings
- TV consoles
- Plumbing and heating fixings

## Advantages

- The universal operating principle (knotting or expanding) allows for use in all solid, hollow and board building materials. Thus the UX is the correct choice for unknown base materials.
- The UX's angled connection ridges allow for optimum screw guidance. Serrated anti-rotation locks prevent rotation in the drill hole. This guarantees the greatest possible installation safety.
- Fixing sets with screws, eye screws and hooks provide the right solution for all applications.

## Certificates / Features

★★★★★
Nylon
Quality

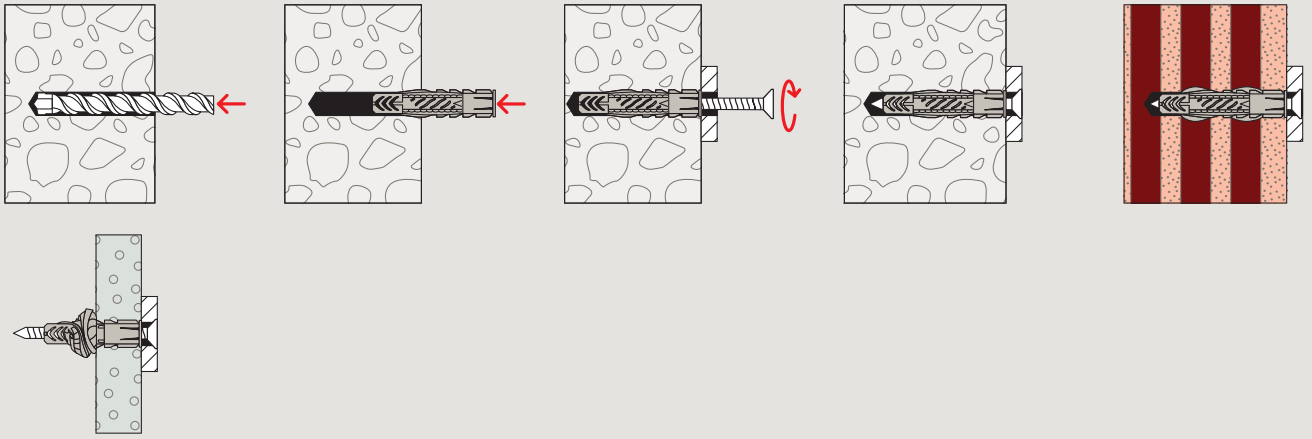
## Building materials

- Concrete
- Gypsum plasterboard and gypsum fibreboards
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Cavity floor slabs made from bricks and concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Natural stone
- Aerated concrete
- Chipboard
- Solid panel made from gypsum
- Solid brick made from lightweight concrete
- Solid brick

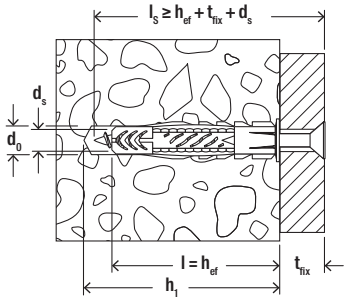
## Functioning

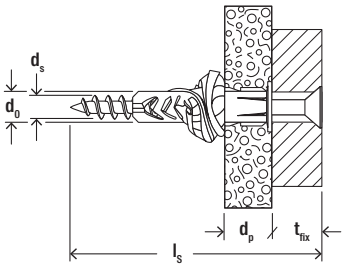
- The UX with rim is suitable for pre-positioned installation; the UX without rim is suitable for push-through installation.
- Turning in the screw causes the UX to expand in the solid building material and to knot within the cavity.
- The required screw length is given by the plug length + fixture thickness + 1 x screw diameter.
- Suitable for wood and chipboard screws, as well as stud screws.
- In the case of board building materials, the threadless part of the screw must not be longer than the fixture, and the UX with rim is to be used.
- The edge distance must be at least one plug length.

## Installation UX







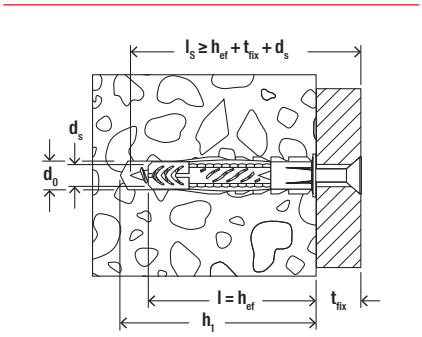

## Technical data

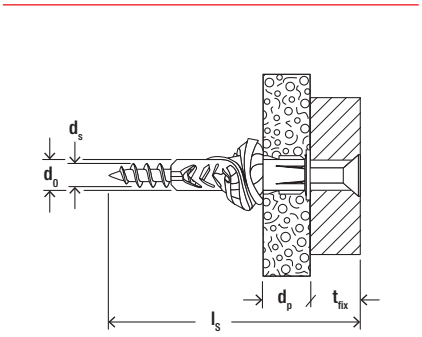
**Universal plug UX**



UX UX R

| Item | With rim<br>Item no. | Without rim<br>Item no. | Drill diameter<br>$d_0$<br>[mm] | Min. drill hole depth<br>$h_1$<br>[mm] | Min. panel thickness<br>$d_p$<br>[mm] | Anchor length<br>l<br>[mm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|
| UX 5 x 30 | – | 094721 | 5 | 40 | 9.5 | 30 | 100 |
| UX 5 x 30 | 094722 | – | 5 | 40 | 9.5 | 30 | 100 |
| UX 6 x 35 | 062756 | 062754 | 6 | 45 | 9.5 | 35 | 100 |
| UX 6 x 50 | 072095 | 072094 | 6 | 60 | 9.5 | 50 | 100 |
| UX 8 x 40 | 505483 | – | 8 | 50 | 9.5 | 40 | 100 |
| UX 8 x 50 | 077870 | 077869 | 8 | 60 | 9.5 | 50 | 100 |
| UX 10 x 60 | 077872 | 077871 | 10 | 75 | 12.5 | 60 | 50 |
| UX 12 x 70 | – | 062758 | 12 | 85 | – | 70 | 25 |
| UX 14 x 75 | – | 062757 | 14 | 95 | – | 75 | 20 |
| UX 10 x 60 R in bucket | 508029 | – | 10 | 75 | 12.5 | 60 | 600 |
| UX 6 x 35 R in bucket | 508027 | – | 6 | 45 | 9.5 | 40 | 2,500 |
| UX 8 x 50 R in bucket | 508028 | – | 8 | 60 | 9.5 | 50 | 1,000 |




## Technical data

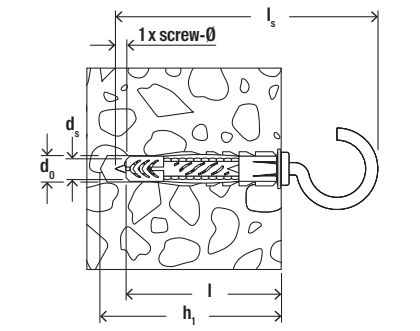
6

**Universal plug UX with screws**



UX R S

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. panel thickness $d_p$ [mm] | Anchor length l [mm] | Wood and chipboard screws $d_s$ [mm] | Max. fixture thickness $t_{fix}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **UX 6 x 35 R S/20** | **094758** | 6 | 50 | 9.5 | 35 | 4.5 x 45 | 5 | 25 |
| **UX 6 x 50 R S/20** | **094759** | 6 | 65 | 9.5 | 50 | 4.5 x 60 | 5 | 25 |
| **UX 8 x 50 R S/25** | **094760** | 8 | 70 | 9.5 | 50 | 5.0 x 65 | 10 | 25 |
| **UX 10 x 60 S/20** | **094761** | 10 | 90 | 12.5 | 60 | 6.0 x 85 | 20 | 10 |




## Technical data

**Universal plug UX with hook**



UX WH UX WH N UX OH N UX RH UX RH N

| Item | With rim and angle hook Item no. | With round hook (white coated) Item no. | With rim and round hook Item no. | With angle hook (white coated) Item no. | With eye-bolt (white coated) Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. panel thickness $d_p$ [mm] | Anchor length l [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **UX 6 x 35** | **WH** | **RH N** | **RH** | **WH N** | **OH N** | | | | | | |
| **UX 6 x 35** | – | – | **094407** | – | – | 6 | 45 | 9.5 | 35 | 4.5 x 67 | 25 |
| **UX 6 x 35** | **094408** | – | – | – | – | 6 | 45 | 9.5 | 35 | 4.5 x 51 | 25 |
| **UX 8 x 50** | – | **094412** | **094409** | – | **094414** | 8 | 60 | 9.5 | 50 | 5.5 x 87 | 25 |
| **UX 8 x 50** | **094410** | – | – | **094413** | – | 8 | 60 | 9.5 | 50 | 5.5 x 70 | 25 |

## Technical data

**Universal plug UX in bucket**




UX R in bucket

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Min. panel thickness $d_p$ [mm] | Wood and chipboard screws $d_s$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **UX 6 x 35 R in bucket** | **508027** | 6 | 45 | 40 | 9.5 | 4.0 - 5.0 | 2,500 |
| **UX 8 x 50 R in bucket** | **508028** | 8 | 60 | 50 | 9.5 | 4.5 - 6.0 | 1,000 |
| **UX 10 x 60 R in bucket** | **508029** | 10 | 75 | 60 | 12.5 | 6.0 - 8.0 | 600 |

6

## Technical data

**Assortment boxes**



Installation box Universal plug UX



Meister-Box UX + screws + hooks



Meister-Box UX / UX-R



Profi-Box UX



Profi-Box UX

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **Box UX 6/8/10** | **093182** | International version:<br>100 x Universal plug UX 6 x 35<br>70 x Universal plug UX 8 x 50<br>20 x Universal plug UX 10 x 60 | 1 |
| **Meister-Box UX + Screws + Hooks** | **513894** | German version:<br>50 x Universal plug UX 6 x 35 R<br>25 x Universal plug UX 8 x 50 R<br>20 x Countersunk screw 4.5 x 45<br>15 x Countersunk screw 5.0 x 65<br>4 x Angle hook 5.5 x 70<br>4 x Round hook 5.5 x 70 | 1 |
| **Meister-Box UX / UX-R** | **513893** | German version:<br>25 x Universal plug UX 6 x 35<br>25 x Universal plug UX 6 x 35 R<br>25 x Universal plug UX 8 x 50<br>25 x Universal plug UX 8 x 50 R<br>10 x Universal plug UX 10 x 60 | 1 |
| **Profi-Box UX + Screws + Hooks** | **518526** | International version:<br>50 x Universal plug UX 6 x 35 R<br>25 x Universal plug UX 8 x 50 R<br>20 x Chipboard screw 4.5 x 45<br>15 x Chipboard screw 5.0 x 65<br>4 x Angle hook 5.5 x 70<br>4 x Round hook 5.5 x 70 | 1 |
| **Profi-Box UX / UX-R** | **518527** | International version:<br>25 x Universal plug UX 6 x 35<br>25 x Universal plug UX 6 x 35 R<br>25 x Universal plug UX 8 x 50<br>25 x Universal plug UX 8 x 50 R<br>10 x Universal plug UX 10 x 60 | 1 |

## Loads

**Universal plug UX**

Recommended loads[1] for a single anchor.
The given loads are valid for wood screws with the specified diameter.

| Type | | | UX 5 x 30 | UX 6 x 35 | UX 6 x 50 | UX 8 x 40<br>UX 8 x 50 | UX 10 x 60 | UX 12 x 70 | UX 14 x 75 |
|---|---|---|---|---|---|---|---|---|---|
| **Wood screw diameter** | | **[mm]** | **4** | **5** | **5** | **6** | **8** | **10** | **12** |
| **Recommended loads in the respective base material $F_{rec}$[2]** | | | | | | | | | |
| **Concrete** | ≥ C20/25 | **[kN]** | 0.30 | 0.40 | 0.60 | 0.60 | 1.00 | 1.50 | 1.80 |
| **Solid brick** | ≥ Mz 12 | **[kN]** | 0.20 | 0.20 | 0.30 | 0.30 | 0.50 | 0.70 | 0.80 |
| **Perforated sand-lime brick** | ≥ KSL 12 | **[kN]** | 0.30 | 0.40 | 0.40 | 0.50 | 0.60 | 0.80 | 0.80 |
| **Vertically perforated brick** | ≥ HLz 12 | **[kN]** | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.30 | 0.40 |
| **Aerated concrete** | ≥ AAC 4 (G4) | **[kN]** | 0.15 | 0.20 | 0.20 | 0.30 | 0.40 | 0.60 | 0.70 |
| **Gypsum plasterboard** | 12.5 mm | **[kN]** | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | - | - |
| **Gypsum plasterboard** | 25 mm | **[kN]** | 0.10 | 0.15 | 0.15 | 0.15 | 0.15 | - | - |
| **Gypsum fibreboard** | (Fermacell) | **[kN]** | 0.20 | 0.20 | 0.20 | 0.20 | 0.25 | - | - |
| **Gypsum block** | $\rho \geq 0.9$ kg/dm$^3$ | **[kN]** | - | - | - | 0.15 | 0.35 | 0.45 | 0.50 |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tensile load, shear load and oblique load under any angle.

## Loads

**Universal plug UX with hook screws respective eye screws**

Recommended loads[1] for a single anchor.
The given loads are valid for the included hook screws respective eye screws.

| Type | | | UX 6 x 35 RH | UX 6 x 35 WH | UX 8 x 50 RH | UX 8 x 50 WH | UX 8 x 50 OE |
|---|---|---|---|---|---|---|---|
| **Recommended loads in the respective base material $F_{rec}$[2]** | | | | | | | |
| **Concrete** | ≥ C20/25 | **[kN]** | 0.25 | 0.30 | 0.40 | 0.45 | 0.40 |
| **Vertically perforated brick** | ≥ HLz 12 | **[kN]** | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| **Gypsum plasterboard** | 12.5 mm | **[kN]** | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tensile load, shear load and oblique load under any angle.

# Universal plug UX Green

The first plug made from renewable resources.





Curtain rails



Shelves



## Applications

- Pictures
- Lighting
- Skirting
- Light cabinets
- Towel rails
- Mirror cabinets
- Curtain rails
- Wash basin fixings
- TV consoles
- Plumbing and heating fixings

## Advantages

- Produced with at least 50% renewable raw materials and therefore particularly environmentally friendly.
- Just as effective, secure and durable as regular UX plugs.
- The universal operating principle (knotting or expanding) allows for use in all solid, hollow and board building materials. Thus the UX Green is the correct choice for unknown base materials.
- Plug collar for anti-slip safety and saw tooth sides as turning lock ensure the highest installation safety.

## Certificates / Features

BIOBASED 50 - 85%
DIN Geprüft
8C029

★★★★★
Nylon Quality

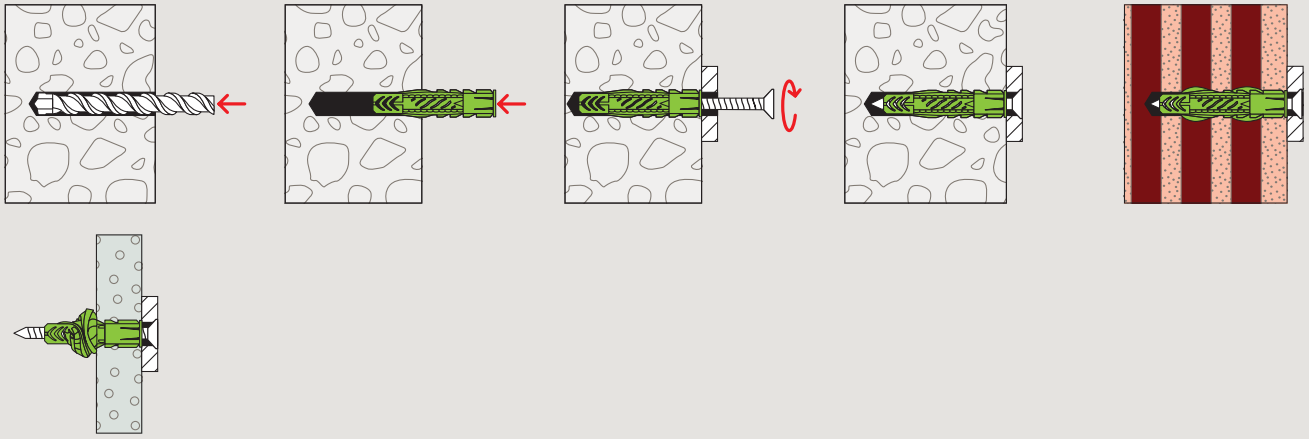
## Building materials

- Concrete
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Cavity floor slabs made from bricks and concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Natural stone with dense structure
- Aerated concrete
- Solid panel made from gypsum
- Solid brick made from lightweight concrete
- Solid brick

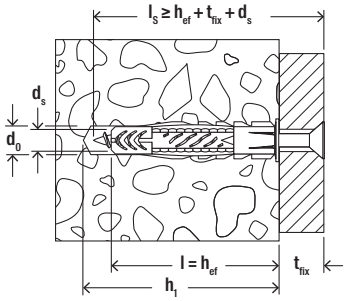
## Functioning

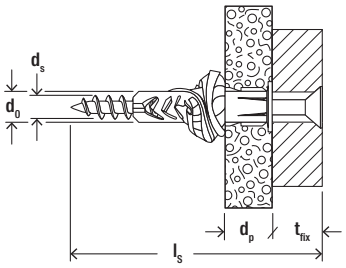
- The Universal plug UX with rim is suitable for pre-positioned installation; the UX without rim is suitable for push-through installation.
- When screwing in the screw, the UX Green expands in solid building materials and knots itself into cavities.
- Suitable for woodand chipboard screws, as well as stud screws.
- The required screw length is given by: the plug length + fixture thickness + 1x screw diameter.
- In the case of board building materials, the threadless part of the screw must not be longer than the fixture.
- The edge distance must be at least one plug length.

## Installation UX Green








## Technical data

**Universal plug UX Green**



UX Green R



UX Green

| | With rim | Without rim | Drill diameter | Min. drill hole depth | Min. panel thickness | Anchor length | Wood and chipboard screws | Sales unit |
|---|---|---|---|---|---|---|---|---|
| | | | $d_0$ | $h_1$ | $d_p$ | $l$ | $d_s$ | |
| | Item no. | Item no. | [mm] | [mm] | [mm] | [mm] | [mm] | [pcs] |
| **Item** | | | | | | | | |
| **UX Green 6 x 35 R** | **518885** | **–** | 6 | 45 | 9.5 | 35 | 4.0 - 5.0 | 40 |
| **UX Green 6 x 50 R** | **524855** | **–** | 6 | 60 | 9.5 | 50 | 4.0 - 5.0 | 40 |
| **UX Green 8 x 50 R** | **518886** | **–** | 8 | 60 | 9.5 | 50 | 4.5 - 6.0 | 40 |
| **UX Green 10 x 60 R** | **518887** | **–** | 10 | 75 | 12.5 | 60 | 6.0 - 8.0 | 20 |
| **UX Green 12 x 70** | **–** | **524858** | 12 | 85 | – | 70 | 8.0 - 10.0 | 18 |

# Loads

**Universal plug UX Green**

Recommended loads[1] for a single anchor.
The given loads are valid for wood screws with the specified diameter.

| Type | | | UX Green 6 x 35 | UX Green 6 x 50 | UX Green 8 x 50 | UX Green 10 x 60 | UX Green 12 x 70 |
|---|---|---|---|---|---|---|---|
| **Wood screw diameter** | | **[mm]** | **5** | **5** | **6** | **8** | **10** |
| **Recommended loads in the respective base material $F_{rec}$[2]** | | | | | | | |
| **Concrete** | ≥ C20/25 | **[kN]** | 0.40 | 0.60 | 0.60 | 1.00 | 1.50 |
| **Solid brick** | ≥ Mz 12 | **[kN]** | 0.20 | 0.30 | 0.30 | 0.50 | 0.70 |
| **Perforated sand-lime brick** | ≥ KSL 12 | **[kN]** | 0.40 | 0.40 | 0.50 | 0.60 | 0.80 |
| **Vertically perforated brick** | ≥ HLz 12 | **[kN]** | 0.20 | 0.20 | 0.20 | 0.20 | 0.30 |
| **Aerated concrete** | ≥ AAC 4 | **[kN]** | 0.20 | 0.20 | 0.30 | 0.40 | 0.60 |
| **Gypsum plasterboard** | 12.5 mm | **[kN]** | 0.10 | 0.10 | 0.10 | 0.10 | - |
| **Gypsum plasterboard** | 25 mm | **[kN]** | 0.15 | 0.15 | 0.15 | 0.15 | - |
| **Gypsum fibreboard** | (Fermacell) | **[kN]** | 0.20 | 0.20 | 0.20 | 0.25 | - |
| **Gypsum block** | $\rho \geq 0.9$ kg/dm$^3$ | **[kN]** | - | - | 0.15 | 0.35 | 0.45 |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tensile load, shear load and oblique load under any angle.

# Expansion plug SX Plus

The specialist for solid building materials.







Wall consoles



Shelves

## Applications

- Lamps
- Wardrobes
- Motion detectors
- Skirting boards
- Light wall shelves
- Mirror cabinets
- Mailboxes
- TV consoles
- Trellis
- Folding shutters
- Fire detector

## Advantages

- The 4-way expansion ensures optimum force transmission into the building material and guarantees high holding values in solid and perforated building materials.
- The special fixing wings ensure pre-fixation of the screw, leaving both of the user‘s hands free during the setting process.
- The expansion-free plug neck prevents the creation of expansion forces on the material surface whilst screwing in the screw. This helps to prevent damage to tiles and plaster.
- The special shape of the plug makes it easy to insert into the drill hole with just a few hammer blows.
- The pronounced edge of the plug prevents it from slipping deeper into the drill hole and enables secure installation.
- Due to the noticeable tightening torque, the user automatically recognizes when the screw is properly installed and thus prevents overtightening of the screw.

## Certificates / Features

★★★★★
Nylon
Quality

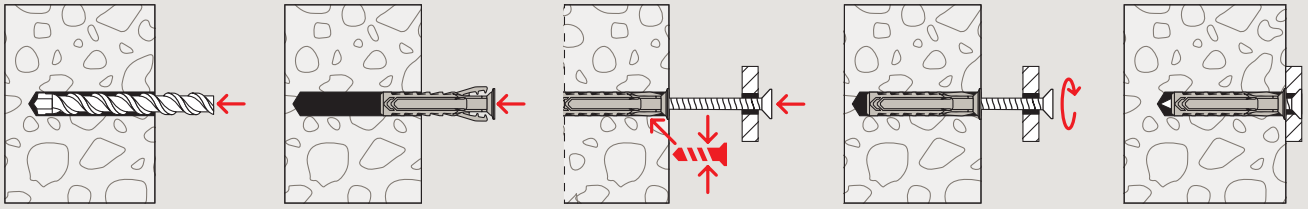
## Building materials

- Concrete
- Solid brick
- Solid sand-lime brick
- Aerated concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Solid stone of leightweight concrete
- Hollow block of leightweight concrete
- Natural stone
- Hollow brick & concrete ceilings
- Solid gypsum boards

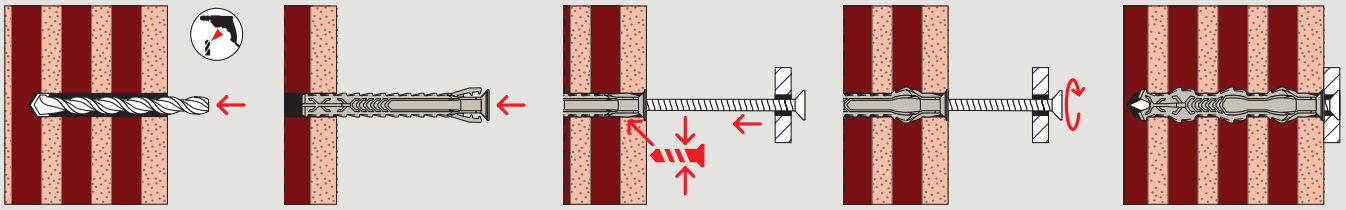
## Functioning

- The SX Plus is suitable for pre-positioned and push-through installation.
- When the plug is inserted, the fixing wings fold inwards. This locks the screw in place when it is inserted into the plug and prevents it from falling out, which is particularly helpful in overhead applications.
- When the screw is tightened, the SX Plus expands in four directions and thus anchors itself securely in the building material.
- The anti-rotation lock prevents the plug from twisting and allows for easy installation.
- Suitable for wood and chipboard screws, as well as stud screws.
- The required screw length is given by the plug length + fixture thickness + the screw diameter.

## SX Plus in concrete

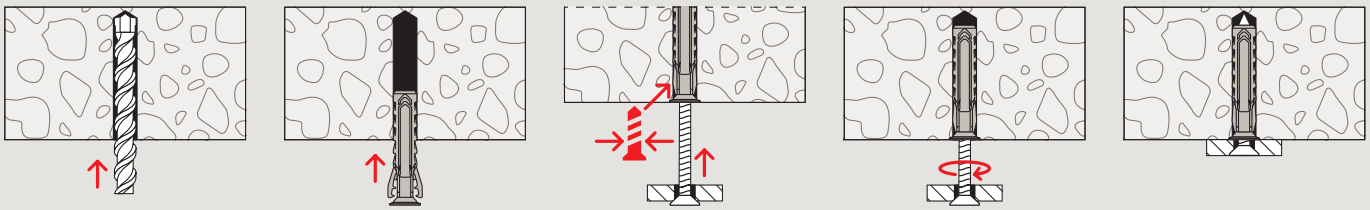


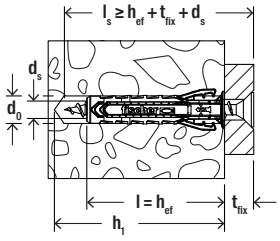
## SX Plus Long version in vertically perforated brick





## SX Plus overhead use





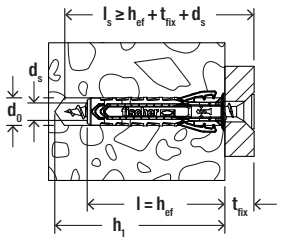

## Technical data

**Expansion plug SX Plus**



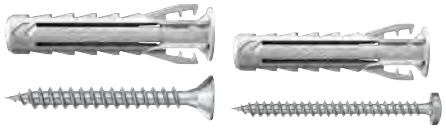
SX Plus SX Plus longversion

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|
| SX Plus 4 x 20 | 568004 | 4 | 30 | 20 | 200 |
| SX Plus 5 x 25 | 568005 | 5 | 35 | 25 | 100 |
| SX Plus 6 x 30 | 568006 | 6 | 40 | 30 | 100 |
| SX Plus 6 x 50 | 568106 | 6 | 60 | 50 | 100 |
| SX Plus 8 x 40 | 568008 | 8 | 50 | 40 | 100 |
| SX Plus 8 x 65 | 568108 | 8 | 75 | 65 | 50 |
| SX Plus 10 x 50 | 568010 | 10 | 70 | 50 | 50 |
| SX Plus 10 x 80 | 568110 | 10 | 100 | 80 | 25 |
| SX Plus 12 x 60 | 568012 | 12 | 80 | 60 | 25 |
| SX Plus 14 x 70 | 568014 | 14 | 90 | 70 | 20 |




## Technical data

**Expansion plug SX Plus with screws**



SX Plus S SX Plus S PH TX

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Wood and chipboard screws $d_s$ [mm] | Max. fixture thickness $t_{fix}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **SX Plus 6 x 30 S** | **568206** | 6 | 45 | 30 | 4.5 x 40 | 5 | 50 |
| **SX Plus 6 x 30 S PH TX** | **567935** | 6 | 45 | 30 | 4.5 x 40 | 5 | 100 |
| **SX Plus 8 x 40 S** | **568208** | 8 | 60 | 40 | 5.0 x 55 | 10 | 50 |

## Technical data

**Expansion plug SX Plus in bucket**




SX Plus in bucket

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Wood and chipboard screws $d_s$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **SX Plus 6 x 30** | **567893** | 6 | 40 | 30 | 4.0 - 5.0 | 1 |
| **SX Plus 8 x 40** | **567899** | 8 | 50 | 40 | 4.5 - 6.0 | 1 |
| **SX Plus 10 x 50** | **567900** | 10 | 60 | 50 | 6.0 - 8.0 | 1 |
| **SX Plus 12 x 60** | **567901** | 12 | 80 | 60 | 8.0 - 10.0 | 1 |

## Technical data

**Assortment boxes**



fischer Box SX Plus



ProfiBox SX Plus




FixTainer SX Plus



RedBox SX Plus / UX

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **fischer Box SX Plus, UX 6,8 S** | **567919** | 50 x Universal plug UX 6 x 35<br>50 x Chipboard screw 4.5 x 45<br>50 x Expansion plug SX Plus 6 x 30<br>50 x Chipboard screw 4.5 x 40<br>25 x Universal plug UX 8 x 50<br>25 x Chipboard screw 5.0 x 65<br>25 x Expansion plug SX Plus 8 x 40<br>25 x Chipboard screw 5.0 x 55 | 1 |
| **fischer Box SX Plus 5,6,8** | **567891** | 100 x Expansion plug SX Plus 5 x 25<br>100 x Expansion plug SX Plus 6 x 30<br>100 x Expansion plug SX Plus 8 x 40 | 1 |
| **ProfiBox SX Plus 6,8 + screws** | **567897** | 50 x Expansion plug SX Plus 6 x 30<br>30 x Expansion plug SX Plus 8 x 40<br>50 x Chipboard screw 4.5 x 40<br>30 x Chipboard screw 5.0 x 55 | 1 |
| **ProfiBox SX Plus 6,8,10** | **567896** | 60 x Expansion plug SX Plus 6 x 30<br>60 x Expansion plug SX Plus 8 x 40<br>12 x Expansion plug SX Plus 10 x 50 | 1 |
| **ProfiBox SX Plus Green 6,8 + screws A2** | **567898** | 50 x Expansion plug SX Plus Green 6 x 30<br>30 x Expansion plug SX Plus Green 8 x 40<br>25 x Chipboard screw 4.5 x 40<br>15 x Chipboard screw 5.0 x 55 | 1 |
| **FixTainer SX Plus, UX, GK 6 + screws** | **567905** | 50 x Expansion plug SX Plus 6 x 30<br>50 x Universal plug UX 6 x 35<br>25 x Plasterboard fixing GK<br>15 x Plasterboard fixing metal GKM<br>50 x Chipboard screw 4.5 x 40<br>50 x Chipbaord screw 4.5 x 45 | 1 |
| **FixTainer SX Plus 6,8,10** | **567904** | 120 x Expansion plug SX Plus 6 x 30<br>60 x Expansion plug SX Plus 8 x 40<br>30 x Expansion plug SX Plus 10 x 50 | 1 |
| **FixTainer SX Plus 5,6,8 + hooks + screws** | **567903** | 50 x Expansion plug SX Plus 5 x 25<br>25 x Chipboard screw 3.5 x 35<br>50 x Expansion plug SX Plus 6 x 30<br>25 x Chipboard screw 4.5 x 40<br>20 x Expansion plug SX Plus 8 x 40<br>10 x Chipboard screw 5.0 x 55<br>8 x Wall hook Fast & Fix black<br>8 x Wall hook Fast & Fix white<br>8 x Plasterboard fixing metal GKM<br>8 x Panhead screw 4.5 x 35 | 1 |
| **RedBox SX Plus/UX** | **569147** | 60 x Expansion plug SX Plus 6 x 30<br>50 x Expansion plug SX Plus 8 x 40<br>20 x Expansion plug SX Plus 10 x 50<br>60 x Universal plug UX 6 x 35 R<br>40 x Universal plug UX 6 x 50 R<br>50 x Universal plug UX 8 x 50 R<br>10 x Universal plug UX 10 x 60 R | 1 |

# Loads

**Expansion plug SX Plus**

Recommended loads[1] for a single anchor.
The given loads are valid for wood screws with the specified diameter.

| Type | | | SX Plus 4x20 | SX Plus 5x25 | SX Plus 6x30 | SX Plus 6x50 | SX Plus 8x40 | SX Plus 8x65 | SX Plus 10x50 | SX Plus 10x80 | SX Plus 12x60 | SX Plus 14x70 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Wood screw diameter** | | **[mm]** | **3** | **4** | **5** | **5** | **6** | **6** | **8** | **8** | **10** | **12** |
| **Min. edge distance in concrete** | $c_{min}$ | **[mm]** | **20** | **25** | **35** | **35** | **40** | **50** | **50** | **65** | **65** | **100** |
| **Recommended loads in the respective base material $F_{rec}$** [2] | | | | | | | | | | | | |
| **Concrete** | ≥ C20/25 | **[kN]** | 0.20 | 0.35 | 0.65 | 1.30 | 0.75 | 1.50 | 1.40 | 2.90 | 2.40 | 3.50 |
| **Solid brick** | ≥ Mz 12 | **[kN]** | 0.15 | 0.27 | 0.35 | 0.50 | 0.60 | 0.80 | 1.00 | 1.40 | 1.25 | 1.30 |
| **Solid sand-lime brick** | ≥ KS 12 | **[kN]** | 0.20 | 0.35 | 0.65 | 1.30 | 0.75 | 1.50 | 1.40 | 2.90 | 2.40 | 3.50 |
| **Aerated concrete** | ≥ AAC 2 | **[kN]** | 0.03 | 0.03 | 0.07 | 0.12 | 0.10 | 0.15 | 0.18 | 0.28 | 0.22 | 0.35 |
| **Aerated concrete** | ≥ AAC 4 | **[kN]** | 0.10 | 0.15 | 0.20 | 0.35 | 0.30 | 0.40 | 0.50 | 0.90 | 0.80 | 1.00 |
| **Perforated sand-lime brick** | ≥ KSL 12 | **[kN]** | 0.18 | 0.25 | 0.30 | 0.35 | 0.40 | 0.80 | 0.45 | 1.50 | 0.70 | 1.00 |
| **Vertically perforated brick** | ≥ HLz 12, Doppio UNI 19 | **[kN]** | 0.13 | 0.13 | 0.15 | 0.17 | 0.25 | 0.40 | 0.25 | 0.50 | 0.35 | 0.40 |
| **Vertically perforated brick** | Forato Type F8 | **[kN]** | 0.08[3] | 0.08[3] | 0.10[3] | - | 0.10[3] | - | 0.12[3] | - | - | - |
| **Light-weight concrete hollow block** | Sepa Parpaing | **[kN]** | 0.15 | 0.20 | 0.25 | 0.30[3] | 0.25 | 0.30[3] | 0.35 | 0.40[3] | 0.50[3] | 0.50[3] |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tension, shear and combined tension and shear load.
[3] Load determination on plastered wall.

# Expansion plug SX Plus Green

The specialist for solid building materials with renewable raw materials.





Curtain rails



Mirrors



## Applications

- Lamps
- Wardrobes
- Motion detectors
- Skirting boards
- Light wall shelves
- Mirror cabinets
- Mailboxes
- TV consoles
- Trellis
- Folding shutters
- Fire detector

## Advantages

- The SX Plus Green is produced with at least 50% renewable raw materials and therefore particularly environmentally friendly.
- The 4-way expansion ensures optimum force transmission into the building material and guarantees high holding values in solid and perforated building materials.
- The special fixing wings ensure pre-fixation of the screw, leaving both of the user's hands free during the setting process.
- The expansion-free plug neck prevents the creation of expansion forces on the material surface whilst screwing in the screw. This helps to prevent damage to tiles and plaster.
- The special shape of the plug makes it easy to insert into the drill hole with just a few hammer blows.
- The pronounced edge of the plug prevents it from slipping deeper into the drill hole and enables secure installation.

## Certificates / Features

BIOBASED 50 - 85%
DIN Geprüft
8C029

★★★★★
Nylon
Quality

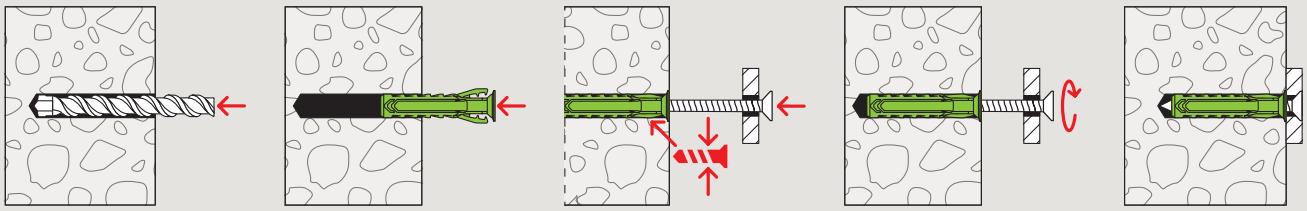
## Building materials

- Concrete
- Solid brick
- Solid sand-lime brick
- Aerated concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Solid stone of leightweight concrete
- Hollow block of leightweight concrete
- Natural stone
- Hollow brick & concrete ceilings
- Solid gypsum boards

## Functioning

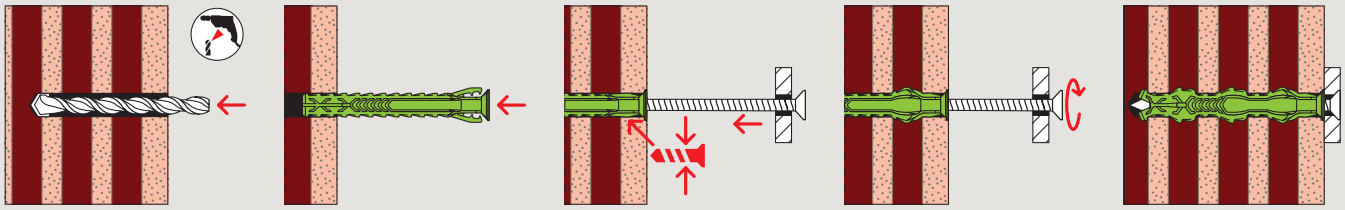
- The SX Plus Green is suitable for pre-positioned and push-through installation.
- When the plug is inserted, the fixing wings fold inwards. This locks the screw in place when it is inserted into the plug and prevents it from falling out, which is particularly helpful in overhead applications.
- When the screw is tightened, the SX Plus Green expands in four directions and thus anchors itself securely in the building material.
- The anti-rotation lock prevents the plug from twisting and allows for easy installation.
- Suitable for wood and chipboard screws, as well as stud screws.
- The required screw length is given by: the plug length + fixture thickness + the screw diameter.

## SX Plus Green in concrete

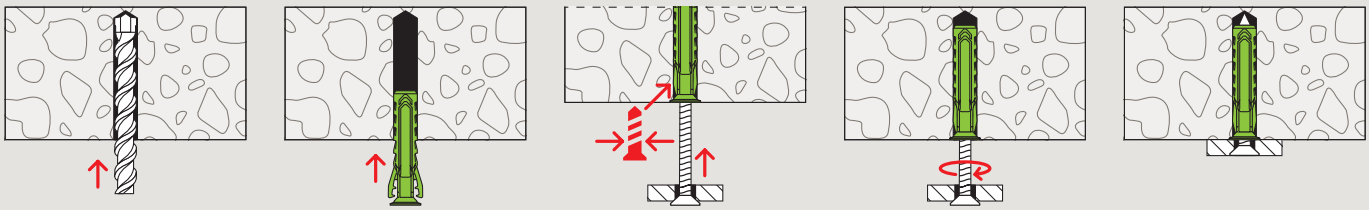


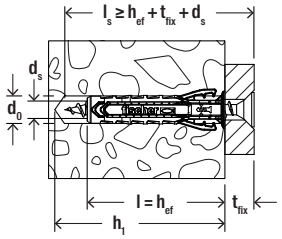
## SX Plus Green long version in vertically perforated brick





## SX Plus Green overhead use





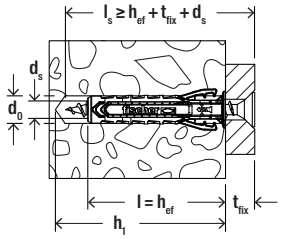

## Technical data

**Expansion plug SX Plus Green**



SX Plus Green SX Plus Green long version

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Wood and chipboard screws $d_s$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| SX Plus Green 5 x 25 | 567806 | 5 | 35 | 25 | 3.0 - 4.0 | 90 |
| SX Plus Green 6 x 30 | 567807 | 6 | 40 | 30 | 4.0 - 5.0 | 90 |
| SX Plus Green 6 x 50 | 567808 | 6 | 60 | 50 | 4.0 - 5.0 | 90 |
| SX Plus Green 8 x 40 | 567809 | 8 | 50 | 40 | 4.5 - 6.0 | 90 |
| SX Plus Green 8 x 65 | 567810 | 8 | 75 | 65 | 4.5 - 6.0 | 45 |
| SX Plus Green 10 x 50 | 567811 | 10 | 60 | 50 | 6.0 - 8.0 | 45 |
| SX Plus Green 12 x 60 | 567812 | 12 | 80 | 60 | 8.0 - 10.0 | 20 |




## Technical data

**Expansion plug SX Plus Green with screws**



SX Plus Green S

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Wood and chipboard screws $d_s$ [mm] | Max. fixture thickness $t_{fix}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **SX Plus Green 6 x 30 S** | **567813** | 6 | 45 | 30 | 4.5 x 40 | 5 | 45 |
| **SX Plus Green 8 x 40 S** | **567814** | 8 | 60 | 40 | – | 10 | 45 |

## Loads

**Expansion plug SX Plus Green**

Recommended loads[1] for a single anchor.
The given loads are valid for wood screws with the specified diameter.

| Type | | | SX Plus Green 5x25 | SX Plus Green 6x30 | SX Plus Green 6x50 | SX Plus Green 8x40 | SX Plus Green 8x65 | SX Plus Green 10x50 | SX Plus Green 12x60 |
|---|---|---|---|---|---|---|---|---|---|
| **Wood screw diameter** | | [mm] | **4** | **5** | **5** | **6** | **6** | **8** | **10** |
| **Min. edge distance in concrete** | $c_{min}$ | [mm] | **25** | **35** | **35** | **40** | **50** | **50** | **65** |
| **Recommended loads in the respective base material $F_{rec}$[2]** | | | | | | | | | |
| **Concrete** | ≥ C20/25 | [kN] | 0.35 | 0.65 | 1.30 | 0.75 | 1.50 | 1.40 | 2.40 |
| **Solid brick** | ≥ Mz 12 | [kN] | 0.27 | 0.35 | 0.50 | 0.60 | 0.80 | 1.00 | 1.25 |
| **Solid sand-lime brick** | ≥ KS 12 | [kN] | 0.35 | 0.65 | 1.30 | 0.75 | 1.50 | 1.40 | 2.40 |
| **Aerated concrete** | ≥ AAC 2 | [kN] | 0.03 | 0.07 | 0.12 | 0.10 | 0.15 | 0.18 | 0.22 |
| **Aerated concrete** | ≥ AAC 4 | [kN] | 0.15 | 0.20 | 0.35 | 0.30 | 0.40 | 0.50 | 0.80 |
| **Perforated sand-lime brick** | ≥ KSL 12 | [kN] | 0.25 | 0.30 | 0.35 | 0.40 | 0.80 | 0.45 | 0.70 |
| **Vertically perforated brick** | ≥ HLz 12, Doppio UNI 19 | [kN] | 0.13 | 0.15 | 0.17 | 0.25 | 0.40 | 0.25 | 0.35 |
| **Vertically perforated brick** | Forato Type F8 | [kN] | 0.08[3] | 0.10[3] | - | 0.10[3] | - | 0.12[3] | - |
| **Light-weight concrete hollow block** | Sepa Parpaing | [kN] | 0.20 | 0.25 | 0.30[3] | 0.25 | 0.30[3] | 0.35 | 0.50[3] |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tension, shear and combined tension and shear load.
[3] Load determination on plastered wall.

# Expansion plug S

The installation-friendly nylon plug with 2-way expansion.







Small shelves



Signs

## Applications

- Pictures
- Lighting
- Skirting
- Light shelves
- Mirror cabinets
- Letter boxes
- Motion detectors
- Information boards
- Curtain rails
- Electrical installations

## Advantages

- The rimless plug sleeve allows for the plug to be set as deep as required below the plaster to the bearing substrate to achieve the maximum load-bearing capacity.
- As the plug only expands in two directions, it is possible to direct the expansion forces so that they run parallel to the edge of the building material by turning the plug. This allows for smaller edge distances.
- The slimline plug geometry makes it easy to push the plug into the drill hole. For a fast and simple installation.
- The anti-rotation lock prevents the plug rotating in the drill hole, thus guaranteeing a high level of installation safety.

## Certificates / Features

★★★★★
Nylon
Quality

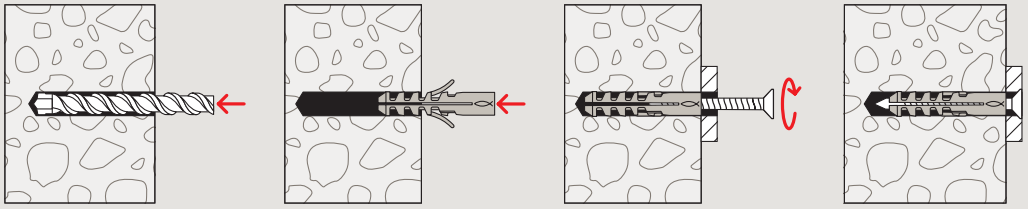
## Building materials

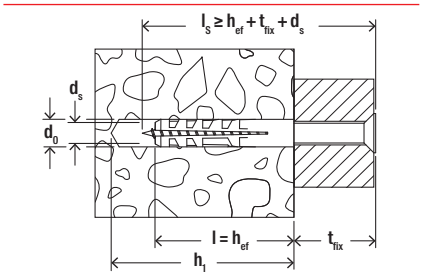
- Concrete
- Solid sand-lime brick
- Natural stone with dense structure
- Solid brick made from lightweight concrete
- Solid brick

## Functioning

- The expansion plug S is suitable for pre-positioned and push-through installation.
- When turning in the screw, the expansion plug S expands in two directions, thus providing a secure anchoring in the building material.
- The required screw length is given by the plug length + plaster and/or insulation material thickness + fixture thickness + 1 x screw diameter.
- Suitable for wood and chipboard screws.
- The edge distance must be at least one plug length.
- For installations close to the edge, turn the plug so that the expansion force acts parallel to the edge.

## Installation plug S








## Technical data

**Expansion plug S**



S

| Item | Item no. | Drill diameter $d_0$ [mm] | Anchor length l [mm] | Min. drill hole depth $h_1$ [mm] | Wood and chipboard screws $d_s$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **S 4** | **050104** | 4 | 20 | 25 | 2.0 - 3.0 | 200 |
| **S 5** | **050105** | 5 | 25 | 35 | 3.0 - 4.0 | 100 |
| **S 5** | **050124** | 5 | 25 | 35 | 3.0 - 4.0 | 200 |
| **S 6** | **050106** | 6 | 30 | 40 | 4.0 - 5.0 | 100 |
| **S 6** | **050125** | 6 | 30 | 40 | 4.0 - 5.0 | 200 |
| **S 8** | **050108** | 8 | 40 | 55 | 4.5 - 6.0 | 100 |
| **S 8** | **050126** | 8 | 40 | 55 | 4.5 - 6.0 | 200 |
| **S 10** | **050110** | 10 | 50 | 70 | 6.0 - 8.0 | 50 |
| **S 10** | **050127** | 10 | 50 | 70 | 6.0 - 8.0 | 100 |
| **S 12** | **050112** | 12 | 60 | 80 | 8.0 - 10.0 | 25 |
| **S 14** | **050114** | 14 | 75 | 90 | 10.0 - 12.0 | 20 |
| **S 16** | **050116** | 16 | 80 | 100 | 12 (1/2") | 10 |
| **S 20** | **050120** | 20 | 90 | 120 | 16 | 5 |

## Technical data

**Expansion plug S in bucket**




S in bucket

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Wood and chipboard screws $d_s$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **S 6 in bucket** | **508024** | 6 | 40 | 30 | 4.0 - 5.0 | 3,200 |

## Technical data

**Assortment boxes**



Box S6/8/10



ST 1

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **Box S 6.8.10** | **060515** | 100 x Expansion plug S 6<br>100 x Expansion plug S 8<br>25 x Expansion plug S 10 | 1 |
| **ST 1 S6 S** | **060509** | 50 x Expansion plug S 6<br>50 x Countersunk wood screw SH 4.5 x 45 | 1 |
| **ST 1 S8 S** | **060510** | 34 x Expansion plug S 8<br>34 x Countersunk wood screw SH 5.0 x 60 | 1 |

## Loads

**S-Plug**

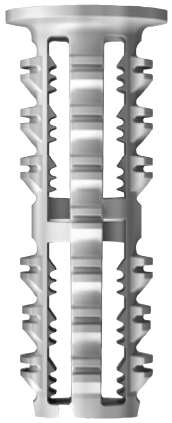
Recommended loads[1] for a single anchor.
The given loads are valid for wood screws with the specified diameter.

| Type | | | S 4 | S 5 | S 6 | S 8 | S 10 | S 12 | S 14 | S 16 | S 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Wood screw diameter** | | [mm] | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 12 | 16 |
| **Min. edge distance concrete** | $c_{min}$ | [mm] | 20 | 25 | 30 | 40 | 50 | 60 | 70 | 80 | 100 |
| **Recommended loads in the respective base material $F_{rec}$** [2] | | | | | | | | | | | |
| **Concrete** | ≥ C20/25 | [kN] | 0.16 | 0.28 | 0.40 | 0.60 | 1.10 | 1.50 | 1.85 | 2.26 | 3.88 |
| **Solid brick** | ≥ Mz 12 | [kN] | 0.14 | 0.24 | 0.28 | 0.50 | [3] | [3] | [3] | [3] | [3] |
| **Solid sand-lime brick** | ≥ KS 12 | [kN] | 0.14 | 0.24 | 0.28 | 0.55 | [3] | [3] | [3] | [3] | [3] |
| **Aerated concrete** | ≥ AAC 4 | [kN] | [3] | [3] | 0.05 | 0.07 | 0.16 | 0.28 | 0.40 | [3] | [3] |
| **Gypsum block** | | [kN] | [3] | [3] | [3] | 0.15 | 0.23 | 0.37 | 0.60 | [3] | [3] |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tensile load, shear load and oblique load under any angle.
[3] Due to that the failure of the substrate varies too much no reproducible values can be given.

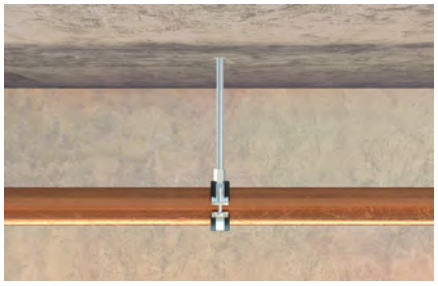
# Threaded rod plug RodForce FGD

The economical hammerset plug - easy and quick fixing of threaded rods.





Suspended ceilings



Single pipe suspension



## Applications

- Suspension for individual pipes
- Plumbing and heating fixings
- Cable and pipe clips
- Ceiling lights
- Consoles
- Mounting rails

## Advantages

- The innovative plug geometry allows quick and easy installation of the threaded rod with a few hammer blows.
- The short plug length prevents reinforcement hits and guarantees a secure utilization in reinforced concrete.
- The teeth inside the plug allow standard, metric threads to be held: This saves a large assortment of stud screws.
- Installation without special tools: The only thing needed to set the plug is a hammer. Visible edge of the plug serves as visual setting check and guarantees correct setting.
- The visible edge of the plug serves as visual setting check and guarantees correct setting.
- Easy to check and adjust: To check the setting depth, the closed plug tip is used as a stop point. This predetermined break point also allows the threaded rod to be hammered-in deeper.

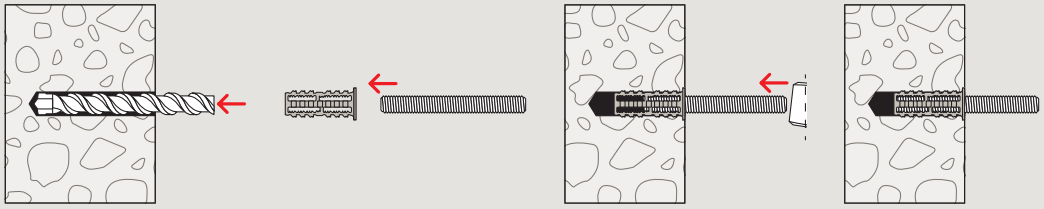
## Building materials

- Concrete
- Solid sand-lime brick
- Solid brick

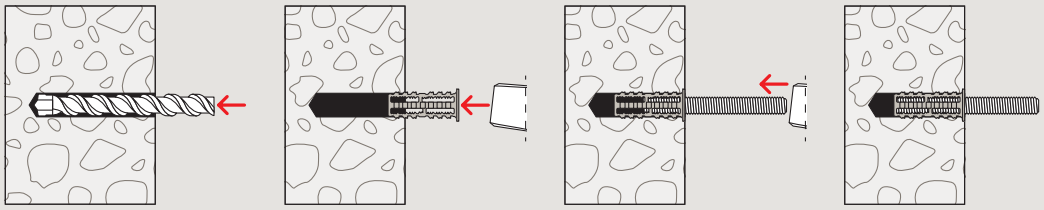
## Functioning

- When hammering-in the threaded rod, the plug expands in four directions as a result of the conical inner geometry.
- The plug is set using pre-positioned installation and this is possible in two different ways: Pre-installation of the threaded rods in the plug with both being hammered into the wall together or pre-inserting of the RodForce into the drill hole followed by hammering-in of the threaded rod.
- The teeth inside the plug mechanically interlock the metric thread securely with the threaded rod.
- The unique elements on the outside of the plug brace against the wall of the drill hole.

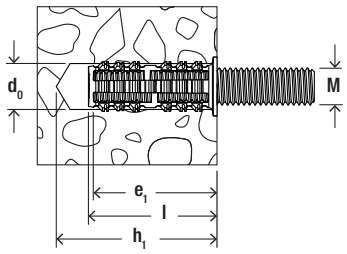
## Installation within the system



## Installation with individual components

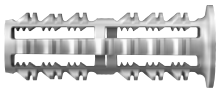




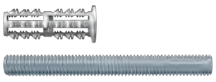



## Technical data

**Threaded rod plug RodForce FGD**



RodForce FGD



RodForce FGD TR

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Min. drop-in penetration $e_1$ [mm] | Threaded rod ø x length [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **RodForce FGD 10 M6** | **542106** | 10 | 40 | 35 | 33 | – | 50 |
| **RodForce FGD 12 M8** | **542111** | 12 | 40 | 35 | 33 | – | 50 |
| **RodForce FGD 10 M6 TR 80** | **542109** | 10 | 40 | 35 | 33 | M6 x 80 | 25 |
| **RodForce FGD 10 M6 TR 50** | **542107** | 10 | 40 | 35 | 33 | M6 x 50 | 25 |
| **RodForce FGD 10 M6 TR 60** | **542108** | 10 | 40 | 35 | 33 | M6 x 60 | 25 |
| **RodForce FGD 12 M8 TR 50** | **542112** | 12 | 40 | 35 | 33 | M8 x 50 | 25 |
| **RodForce FGD 12 M8 TR 60** | **542113** | 12 | 40 | 35 | 33 | M8 x 60 | 25 |
| **RodForce FGD 12 M8 TR 80** | **542114** | 12 | 40 | 35 | 33 | M8 x 60 | 25 |

## Loads

**Threaded rod plug RodForce FGD**

Recommended loads[1] for a single anchor.
The given loads are valid for machine screws or threaded rods with the specifi ed thread size.

| Type | | | RodForce FGD M6 | RodForce FGD M8 |
|---|---|---|---|---|
| **Thread size** | | | **M6** | **M8** |
| **Recommended loads in the respective base material $F_{rec}$[2]** | | | | |
| **Concrete** | ≥ C20/25 | **[kN]** | 0.31 | 0.36 |
| **Solid brick** | ≥ Mz 12 | **[kN]** | 0.31 | 0.36 |
| **Solid sand-lime brick** | ≥ KS 12 | **[kN]** | 0.19 | 0.33 |

[1] Required safety factors are considered.
[2] Valid for tensile load, shear load and oblique load under any angle.

# Metal expansion anchor FMD

The metal anchor for wood and chipboard screws.







Pipes



Gas meters

## Applications

- Gas pipes
- Water pipes
- Cable and pipe clips

## Advantages

- The metal expansion anchor FMD is especially suited to applications in installation technology.
- The external teeth expand in the building material, thus ensuring a high load-bearing capacity.
- The ribbed internal geometry of the FMD is suitable for wood and chipboard screws, and makes it possible to guide the screw securely. This offers increased installation safety, and enables a broad range of applications.

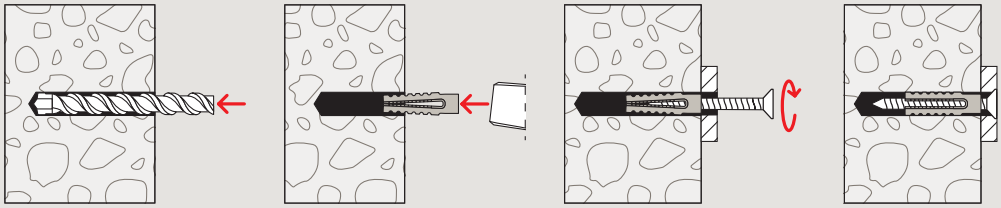
## Building materials

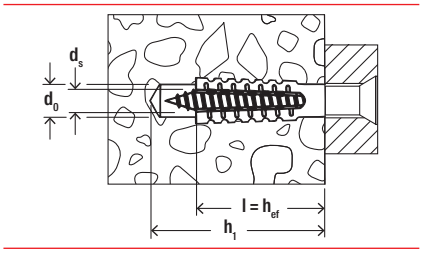
- Concrete
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Cavity floor slabs made from bricks and concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Natural stone with dense structure
- Aerated concrete
- Solid brick made from lightweight concrete
- Solid panel made from gypsum

## Functioning

- The FMD is suitable for pre-positioned installation.
- Inserting the screw causes the FMD to expand, and the metal teeth fix the anchor securely in the building material.
- The required (stud) screw length is given by: Anchor length + plaster and/or insulation layer thickness + fixture thickness or installation spacing + 1 x screw diameter.
- Suitable for wood and chipboard screws.
- The drill diameter is relative to the compressive strength of the building material. The higher the compressive strength, the greater the drill diameter. The 6x32 and 8x38 sizes can be hammered directly into low-strength aerated concrete without the need for pre-drilling.

## Installation FMD








## Technical data

**Metal expansion anchor FMD**



FMD

| Item | Item no. | Drill hole diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length $l$ [mm] | Screw diameter $d_s$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FMD 6 x 32** | **061224**[1] | 6 - 7 | 38 | 32 | 5.0 - 6.0 | 100 |
| **FMD 8 x 38** | **061225**[1] | 10 - 12 | 46 | 38 | 6.0 - 8.0 | 100 |
| **FMD 8 x 60** | **061226**[1] | 10 - 12 | 68 | 60 | 6.0 - 8.0 | 50 |
| **FMD 10 x 60** | **061209**[1] | 12 - 14 | 68 | 60 | 8.0 - 10.0 | 50 |

[1] The drill diameter is relative to the substrate compressive strength. Generally, the higher the compressive strength, the greater the drill diameter.

## Recommended drill hole diameter [mm]

| Type | | FMD 6 x 32 | FMD 8 x 38 | FMD 8 x 60 | FMD 10 x 60 |
|---|---|---|---|---|---|
| **Concrete** | C 20/25 | 7 | 10 | 12 | 14 |
| **Aerated concrete** | ACC 4 | 6 | 10 | 10 | 12 |
| **Vertically perforated brick** | Hlz 12 | 7 | 10 | 10 | 12 |

## Loads

**Metal expansion fixing FMD**

Recommended loads[1] for a single anchor.
The given loads are valid for wood screws with maximum diameter.

| Type | | | FMD 6 x 32 | FMD 8 x 38 | FMD 8 x 60 | FMD 10 x 60 |
|---|---|---|---|---|---|---|
| **Wood screw diameter** | | [mm] | **6** | **8** | **8** | **10** |
| **Recommended loads in the respective base material $F_{rec}$**[2] | | | | | | |
| **Aerated concrete** | ≥ AAC 2 | [kN] | 0.05 | 0.20 | 0.30 | 0.40 |
| **Aerated concrete** | ≥ AAC 4 | [kN] | 0.15 | 0.30 | 0.40 | 0.60 |

[1] Required safety factors are considered.
[2] Valid for tensile load, shear load and oblique load under any angle.

# Expansion plug M-S

The expansion plug for metric screws and threaded bolts.







Downpipes



Folding shutters

## Applications

- Handles
- Folding shutters
- Trellis
- Downpipes
- Stand-off installation
- Window fittings
- Gratings

## Advantages

- The internal geometry of the M-S allows for the use of standard metric screws or threaded rods for the ideal adaptation to suit the intended use.
- The rimless plug sleeve allows for the plug to be set as deep as required below the plaster to the bearing substrate to achieve the maximum load-bearing capacity.
- As the plug only expands in two directions, it is possible to direct the expansion forces so that they run parallel to the edge of the building material by turning the plug. This allows for smaller edge distances.
- The slimline plug geometry makes it easy to push the plug into the drill hole, for a fast and simple installation.

## Certificates / Features

★★★★★
Nylon
Quality

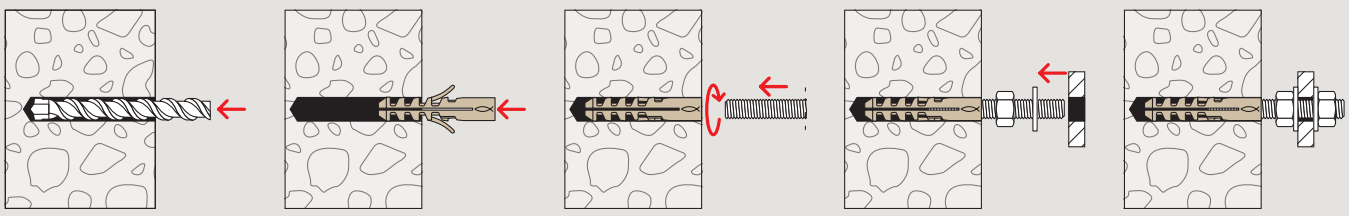
## Building materials

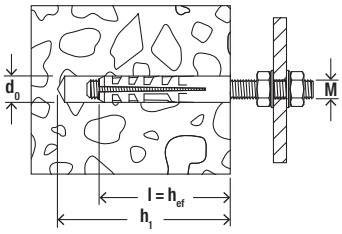
- Concrete
- Cavity floor slabs made from bricks and concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Natural stone with dense structure
- Solid brick made from lightweight concrete
- Solid brick
- Solid panel made from gypsum
- Vertically perforated brick
- Aerated concrete

## Functioning

- The M-S is suitable for pre-positioned and push-through installation.
- When turning in the screw, the M-S expands in two directions, thus providing a secure anchoring in the building material.
- The required screw length is given by: Plug length + plaster and/or insulation layer thickness + fixture thickness + 1 x screw diameter.
- Suitable for metric screws and threaded bolts.
- Chamfer the thread to make it easier to screw in screws and threaded rods.

## Installation M-S






## Technical data

**Expansion plug M-S for metric screws**



M-S

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Thread M | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **M 6 S** | **050152** | 8 | 55 | 40 | M6 | 100 |
| **M 8 S** | **050153** | 10 | 70 | 50 | M8 | 50 |
| **M 10 S** | **050154** | 14 | 90 | 70 | M10 | 20 |
| **M 12 S** | **050155** | 16 | 100 | 80 | M12 | 10 |

## Loads

**Anchor M-S**

Recommended loads[1] for a single anchor.
The given loads are valid for metric screws with the specified thread size.

| Type | | | M6 S | M8 S | M10 S | M12 S |
|---|---|---|---|---|---|---|
| **Thread size** | | | **M6** | **M8** | **M10** | **M12** |
| **Recommended loads in the respective base material $F_{rec}$ [2]** | | | | | | |
| **Concrete** | C20/25 | **[kN]** | 0.30 | 0.54 | 0.66 | 1.06 |
| **Solid brick** | Mz 12 | **[kN]** | 0.24 | 0.33 | 0.46 | 0.79 |
| **Solid sand-lime brick** | KS 12 | **[kN]** | 0.24 | 0.33 | 0.43 | 0.71 |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tensile load, shear load and oblique load under any angle.

# EasyHook

Turn screws into hooks.







Bookshelves



Hanging baskets

## Applications

- Pictures
- Light shelves
- Decorative items
- Ceiling lights
- Light cabinets
- Mirrors
- Letter boxes
- Chains

## Advantages

- The attachable hook is installed quickly and easily using a cordless screwdriver.
- Due to the predetermined breaking point, the hook can be positioned optimally.
- The EasyHook can be installed at different distances from the wall depending on the screw-in depth.
- The glass-fibre reinforced plastic ensures a high load level and secure hold.
- The use of the cover ring and cap ensures a visually appealing design of the EasyHook Round and Loop.
- The EasyHook can be used with the DuoPower, the DuoBlade or without plugs in wood, covering a wide range of substrates

## Building materials

- Concrete C20/25 to C50/60
- Solid brick
- Solid sand-lime brick
- Aerated concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Gypsum plasterboard and gypsum fibreboards
- Hollow blocks made from lightweight concrete
- Natural stone
- Wood

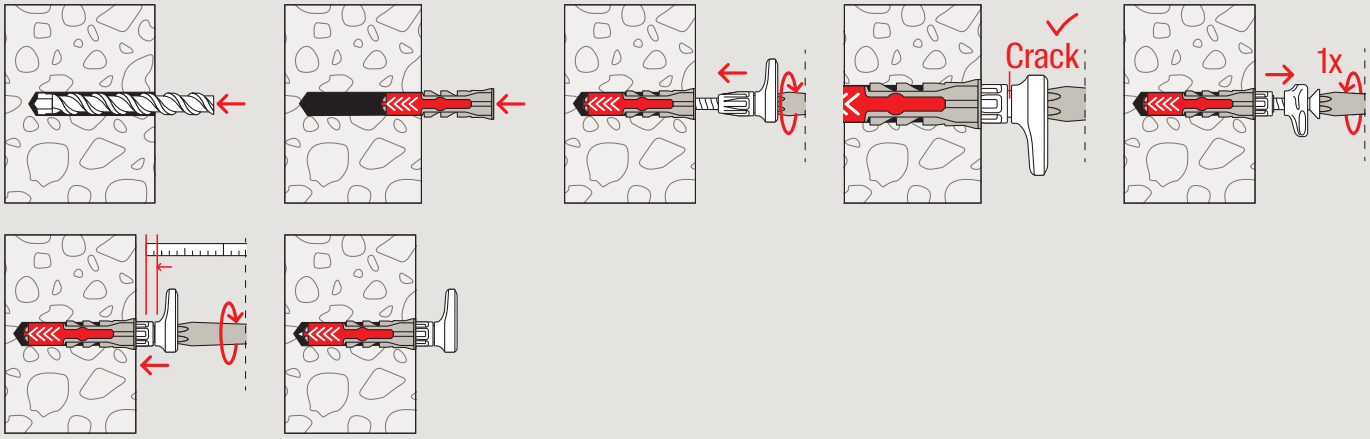
## Versions

- EasyHook Angle
- EasyHook Round
- EasyHook Loop

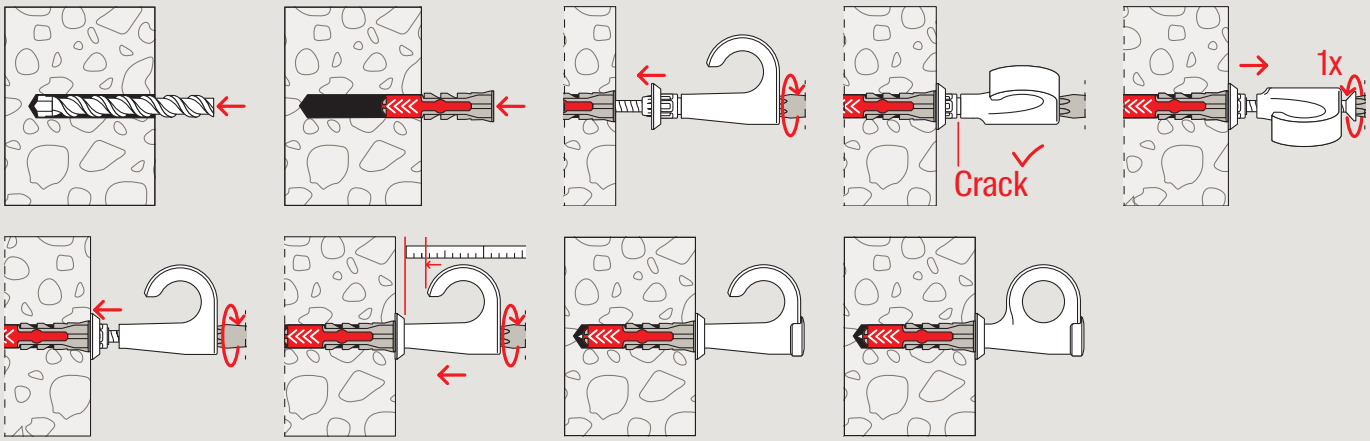
## Functioning

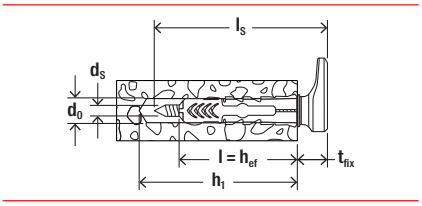
- For easier installation in wood, the shaft area of the eye and round hook can be broken off.
- The screw is inserted through the EasyHook and screwed in with a cordless screwdriver without holding the hook.
- By turning the hook to the left, it is released at the predetermined breaking point. This allows the EasyHook to be aligned and tightened as required.
- Depending on the depth of the screw, the distance to the wall can be adjusted.
- The cover cap of the EasyHook Round and Loop is placed on the screw head from behind.
- If needed, the hook can be easily removed with a cordless screwdriver or screwdriver.

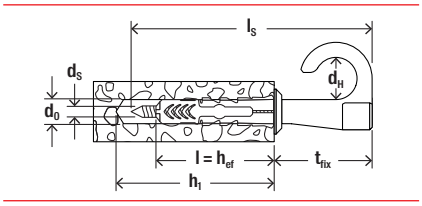
## Installation EasyHook Angle

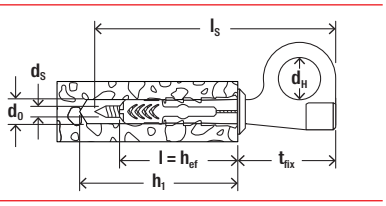



## Installation EasyHook Round & Loop






## Technical data

**EasyHook**



DuoPower EasyHook Angle



DuoPower EasyHook Round



DuoPower EasyHook Loop

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. panel thickness $d_p$ [mm] | Min. bolt penetration $l_{E,min}$ [mm] | Anchor length $l$ [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Drive | Wall distance $t_{fix}$ [mm] | Inner diameter of the hook/eye $d_H$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EasyHook Angle DuoPower 6x30** | **564168** | 6 | 40 | 12.5 | 35 | 30 | 4.0 x 50 | TX20 | 2.0 - 7.0 | – | 25 |
| **EasyHook Angle DuoPower 8x40** | **564169** | 8 | 50 | 12.5 | 46 | 40 | 5.0 x 60 | TX20 | 2.0 - 8.0 | – | 25 |
| **EasyHook Round DuoPower 6x30** | **564170** | 6 | 40 | 12.5 | 35 | 30 | 4.0 x 70 | TX20 | 24.0 - 28.0 | 11 | 25 |
| **EasyHook Round DuoPower 8x40** | **564171** | 8 | 50 | 12.5 | 46 | 40 | 5.0 x 80 | TX20 | 30.0 - 35.0 | 14 | 25 |
| **EasyHook Loop DuoPower 6x30** | **564172** | 6 | 40 | 12.5 | 35 | 30 | 4.0 x 70 | TX20 | 24.0 - 28.0 | 11 | 25 |
| **EasyHook Loop DuoPower 8x40** | **564173** | 8 | 50 | 12.5 | 46 | 40 | 5.0 x 80 | TX20 | 30.0 - 35.0 | 14 | 25 |

## Loads

**EasyHook Angle in combination with DuoPower**

Recommended loads[1] for a single anchor.

| Type | | | EH 5 | | EH 6 | | EH 8 | | EH 10 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Screw diameter** | | [mm] | 3.5 | 3.5 | 4 | 4 | 5 | 5 | 6 | 6 |
| **DuoPower plug** | | [mm] | 5 x 25 | 5 x 25 | 6 x 30 | 6 x 30 | 8 x 40 | 8 x 40 | 10 x 50 | 10 x 50 |
| **Recommended shear ($V_{empf}$)[2] or inclined tension loads ($F_{empf,45°}$)[3] in the respective base material** | | | $V_{rec}$ | $F_{rec,45°}$ | $V_{rec}$ | $F_{rec,45°}$ | $V_{rec}$ | $F_{rec,45°}$ | $V_{rec}$ | $F_{rec,45°}$ |
| **Concrete** | ≥ C20/25 | [kg] | 25 | 8 | 30 | 9 | 80 | 20 | 90 | 25 |
| **Vertically perforated brick** | ≥ Hlz 12 (ρ ≥ 0.9 kg/dm³) | [kg] | 25 | 8 | 30 | 9 | 35 | 15 | 40 | 18 |
| **Aerated concrete** | ≥ PB2, PP2 | [kg] | 6 | 5 | 11 | 6 | 15 | 13 | 20 | 15 |
| **Gypsum plasterboard** | 12.5 mm | [kg] | 6 | 5 | 13 | 6 | 18 | 8 | 20 | 9 |

[1] Required safety factors are considered. Load values are valid for using the supplied screw.
[2] Recommended shear load. Load 90° to the screw axis.
[3] Recommended inclined tensile load. Load at an angle of 45° to 89° to the screw axis.

## Loads

**EasyHook Round and Loop in combination with DuoPower**

Recommended loads[1] for a single anchor.

| Type | | | Round 6 | | Round 8 | | Loop 6 | | Loop 8 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Screw diameter** | | [mm] | 4 | 4 | 5 | 5 | 4 | 4 | 5 | 5 |
| **DuoPower plug** | | [mm] | 6 x 30 | 6 x 30 | 8 x 40 | 8 x 40 | 6 x 30 | 6 x 30 | 8 x 40 | 8 x 40 |
| **Recommended tension ($N_{rec}$)[2] or shear loads ($V_{rec}$)[3] in the respective base material** | | | $N_{rec}$ | $V_{rec}$ | $N_{rec}$ | $V_{rec}$ | $N_{rec}$ | $V_{rec}$ | $N_{rec}$ | $V_{empf}$ |
| **Concrete** | ≥ C20/25 | [kg] | 12 | 5 | 23 | 10 | 34 | 13 | 60 | 20 |
| **Vertically perforated brick** | ≥ Hlz 12 (ρ ≥ 0.9 kg/dm³) | [kg] | 12 | 4 | 19 | 10 | 34 | 13 | 38 | 18 |
| **Aerated concrete** | ≥ PB2, PP2 | [kg] | 8 | 4 | 7 | 6 | 8 | 6 | 8 | 8 |
| **Gypsum plasterboard** | 12.5 mm | [kg] | 7 | 5 | 8 | 5 | 7 | 10 | 8 | 8 |

[1] Required safety factors are considered. Load values are valid for using the supplied screw.
[2] Recommended tension load. Load at an angle +/- 10° to the screw axis.
[3] Recommended shear load. Load at an angle of +/- 90° to the screw axis.

# Anchor M

The powerful nylon expansion anchor with brass cone for metric threads.





Plant construction



Protective grilles



## Applications

- Machines
- Curbs
- Control boxes

## Advantages

- The anchor‘s large external diameter helps to achieve a large applied load in the building material. This allows for maximum load-bearing capacity.
- The anchor‘s high expansion makes it insensitive to building material tolerances. This guarantees a simple and secure installation.
- The internal thread allows for the use of standard metric screws or threaded rods, and for surface flush removal and reuse of the fixing point. This provides great flexibility.

## Certificates / Features

★★★★★
Nylon
Quality

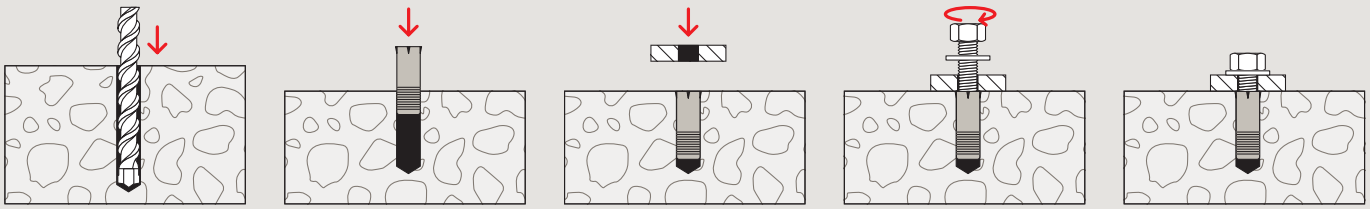
## Building materials

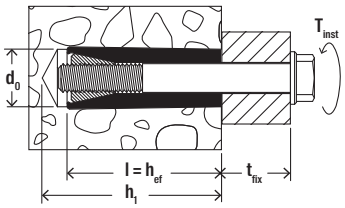
- Concrete
- Natural stone with dense structure
- Solid brick
- Solid sand-lime brick
- Solid brick made from lightweight concrete
- Aerated concrete
- Solid panel made from gypsum
- Hollow blocks made from lightweight concrete

## Functioning

- The M anchor is suitable for pre-positioned installation.
- Turning in the screw causes the internal brass cone to expand the M anchor, thus reliably anchoring it in the building material.
- The required screw length is given by anchor length + fixture thickness.
- Suitable for metric screws and threaded bolts.

## Installation M






## Technical data

**Anchor M**



M

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Thread M | Max. installation torque $T_{inst}$ [Nm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **M 5** | **050505**[1] | 10 | 45 | 35 | M5 | 4 | 50 |
| **M 6** | **050506**[1] | 12 | 50 | 40 | M6 | 7 | 50 |
| **M 8** | **050508**[1] | 16 | 65 | 50 | M8 | 16 | 20 |
| **M 10** | **050510**[1] | 20 | 80 | 60 | M10 | 32 | 10 |
| **M 12** | **050512**[1] | 24 | 90 | 65 | M12 | 54 | 5 |

[1] The given torque values apply to screws of strength class ≥ 5.8.

## Loads

**Anchor M**

Recommended loads[1] for a single anchor.
The given loads are valid for metric screws with the specified thread size.

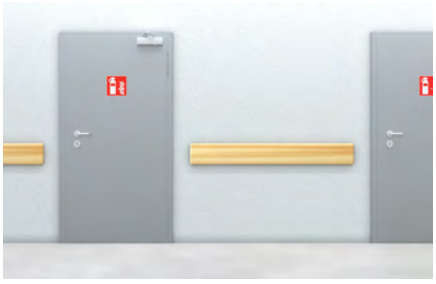
| Type | | | M5 | M6 | M8 | M10 | M12 |
|---|---|---|---|---|---|---|---|
| **Thread size** | | | **M5** | **M6** | **M8** | **M10** | **M12** |
| **Recommended loads in the respective base material $F_{rec}$**[2] | | | | | | | |
| **Concrete** | ≥ C20/25 | **[kN]** | 1.10 | 1.80 | 2.60 | 4.40 | 5.00 |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tensile load, shear load and oblique load under any angle.

# Brass fixing MS

The brass expansion fixing with metric thread.





Protective wall panels



Small shelves



## Applications

- Cellar shelves
- Substructures made of wood and metal
- Boilers
- Aggregates
- Control boxes
- Curtain rails

## Advantages

- The compact design of the brass fixing reduces the amount of drilling required, helping to ensure a fast installation.
- The special surface structure of the MS prevents the fixing from rotating in the drill hole. This provides increased installation safety.
- The internal thread allows for the use of standard metric screws or threaded rods, and for surface flush removal and reuse of the fixing point. This provides great flexibility.

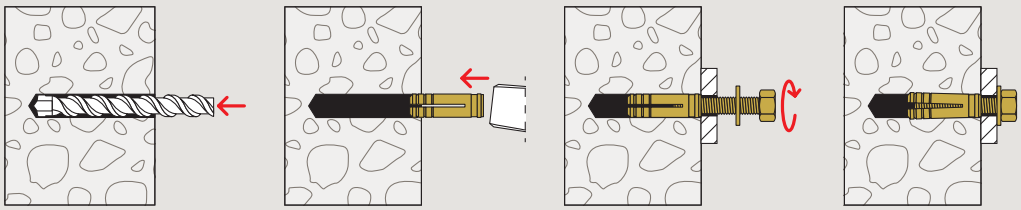
## Building materials

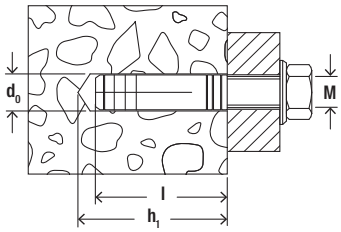
- Concrete
- Solid sand-lime brick
- Natural stone with dense structure
- Solid brick

## Functioning

- The MS brass fixing is suitable for pre-positioned and push-through installation.
- Turning in the metric screw causes the front part of the brass fixing to expand, thus securely anchoring it in the substrate.
- Calculating screw length for flush fixing installation: Fixing length + fixture thickness = min. screw length.
- Suitable for metric screws and threaded bolts.
- The brass fixing may have to be expanded slightly before installation by turning in the threaded screw.

## Installation MS






## Technical data

**Brass fixing MS**



MS

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Thread M | Min. bolt penetration $l_{E,min}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **MS 4 x 15** | **026424** | 5 | 20 | 15 | M4 | 15 | 100 |
| **MS 5 x 18** | **026425** | 6 | 25 | 18 | M5 | 18 | 100 |
| **MS 6 x 22** | **078660** | 8 | 27 | 22 | M6 | 22 | 100 |
| **MS 8 x 28** | **078981** | 10 | 35 | 28 | M8 | 28 | 50 |
| **MS 10 x 32** | **078661** | 12 | 39 | 32 | M10 | 32 | 25 |
| **MS 12 x 37** | **078662** | 15 | 46 | 37 | M12 | 37 | 10 |
| **MS 16 x 43** | **078663** | 20 | 50 | 43 | M16 | 43 | 10 |

## Loads

**Brass fixing MS**

Recommended loads[1] for a single anchor.
The given loads are valid for metric screws with the specified thread size.

| Type | | | MS 4 x 15 | MS 5 x 18 | MS 6 x 22 | MS 8 x 28 | MS 10 x 32 | MS 12 x 37 | MS 16 x 43 |
|---|---|---|---|---|---|---|---|---|---|
| **Thread size** | | | **M4** | **M5** | **M6** | **M8** | **M10** | **M12** | **M16** |
| **Recommended loads in the respective base material $F_{rec}$[2]** | | | | | | | | | |
| **Concrete** | ≥ C20/25 | **[kN]** | 0.25 | 0.40 | 0.65 | 1.10 | 1.60 | 2.20 | 3.30 |
| **Solid brick** | ≥ Mz 12 | **[kN]** | 0.20 | 0.35 | 0.55 | 0.90 | 1.30 | 1.60 | 2.30 |

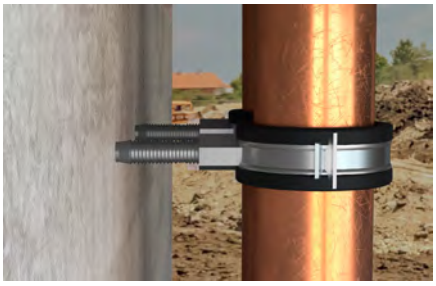
[1] Required safety factors are considered.
[2] Valid for tensile load, shear load and oblique load under any angle.

# Aircrete anchor GB

The special plug for different fixings in aerated concrete.







Pipes



Trellis

## Applications

- Light cable trays
- Pipelines
- Guard rails
- Façade and roof constructions made of wood and metal
- Light canopy brackets
- Letter boxes
- Trellis

## Advantages

- The general building approval guarantees approved safety for use in safety-relevant applications.
- The spiral-shaped outer ribs cut a positive fit in the soft building material, thus ensuring the best pressure distribution and load-bearing capacity.
- Can be applied with a hammer - there is no need for special tools, thus saving time and money for the installation.
- The GB can also be used safely outside (e.g. in façade installation) when combined with the approved fischer safety screw in A4.

## Certificates / Features

Zulassung

★★★★★ Nylon Quality

DIBt Approval

## Building materials

**Approved for (GB 10) resp. suitable for (GB 8 and GB 14):**

- Aerated concrete ≥ PB2, PP2

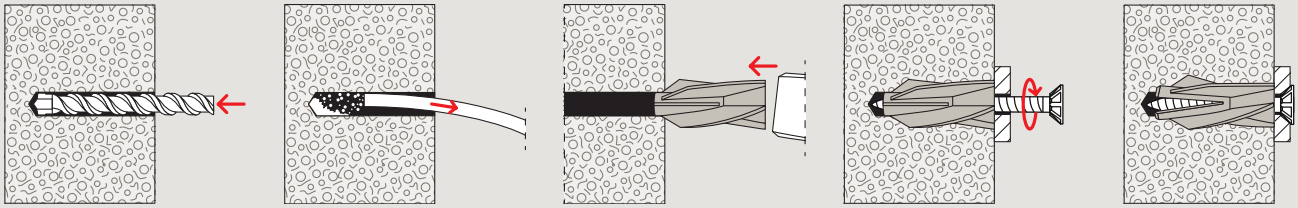
**Also suitable for:**

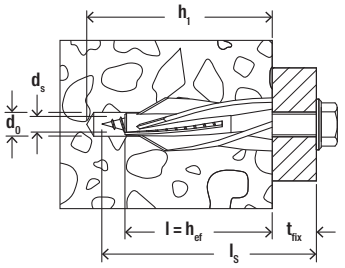
- Aerated concrete and ceiling panels of compressive strength ≥ 3.3

## Functioning

- The GB is suitable for pre-positioned installation.
- The spiral-shaped outer ribs ensure a positive fit connection between the building material and anchor.
- The required screw length is given by: Anchor length + fixture thickness + 1 x screw diameter.
- The GB 10 must be used with fischer safety screws to fulfil the approval and to achieve the maximum load-bearing capacity.
- Use rotary drilling to create the drill hole
- Can be used in unplastered aerated concrete

## Installation GB






## Technical data

**Aircrete anchor GB**



GB

| Item | Item no. | Approval DIBt | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Plug length = min. anchorage depth $l = h_{ef}$ [mm] | fischer safety screw $d_s$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **GB 8** | **050491** | – | 8 | 60 | 50 | 5 | 25 |
| **GB 10** | **050492** | ● | 10 | 65 | 55 | 7 | 20 |
| **GB 14** | **050493** | – | 14 | 90 | 75 | 10 | 10 |

## fischer Safety screw for GB

| Type | Usable length | | Screw dimension[1] | Zinc plated and passivated steel | |
|---|---|---|---|---|---|
| | min. $t_{fix}$ [mm] | max. $t_{fix}$ [mm] | Ø x $l_s$ | Countersunk head, TX star recess drive Item No. | Hexagonal head Item No. |
| **GB 10** | 0 | 5 | 7 x 67 | | 80404 |
| | 5 | 25 | 7 x 87 | 89170 | 80405 |
| | 25 | 45 | 7 x 107 | 89172 | |
| | 85 | 105 | 7 x 167 | 89178 | |
| **GB 14** | 0 | 10 | 10 x 95 | | 80412 |

[1] Further sizes on request.

## Loads

**Aircrete anchor GB**

Permissible or recommended loads[1] [2] for a single anchor in aerated concrete.

| Type | | | GB 10[2] | GB 8[3] | GB 10[3] | GB 14[3] |
|---|---|---|---|---|---|---|
| **Screw diameter** | | [mm] | **7** | **5** | **6** | **10** |
| **Minimum spacing**[4] | $s_{min}$ | [mm] | 100 | 150 (100)[6] | 150 (100)[6] | 300 (200)[6] |
| **Minimum edge distance**[5] | $c_{min}$ | [mm] | 100 | 100 (75)[6] | 100 (75)[6] | 200 (150)[6] |
| **Minimum member thickness** | $h_{min}$ | [mm] | 120 | 75 | 120 | 200 |
| **Nominal embedment depth** | $h_{nom}$ | [mm] | 55 | 50 | 55 | 75 |
| **Load in the respective base material** | | | Permissible loads $F_{perm}$[7] | Recommended loads $F_{rec}$[8] | | |
| **AAC 2** | ρ ≥ 0.35 [kg/dm³] | [kN] | 0.21 | 0.18 | 0.20 | 0.40 |
| **AAC 4** | ρ ≥ 0.50 [kg/dm³] | [kN] | 0.54 (0,71)[9] | 0.40 | 0.50 | 0.90 |

[1] Required safety factors are considered. Valid for tension load, shear load and oblique load under any angle.
[2] In case of the design of the GB 10 for tension, shear and bending the complete approval Z-21.2-123 has to be considered.
[3] Not part of the approval. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[4] Minimum possible axial spacing while reducing the permissible load.
[5] Minimum possible edge distance.
[6] Values in brackets apply to AAC 2.
[7] Value only applies in connection with GB 10 and fischer safety screw according to approval Z-21.2-123.
[8] Values are valid in combination with wood screws acc. DIN 571.
[9] The values in brackets are decisive for member thickness ≥ 150 mm.

# Aircrete anchor GB Green

Secure in aerated concrete.





Radiators



Trellis



## Applications

- Pipelines
- Letter boxes
- Anopy brackets
- Handles
- Gratings
- Electrical installations

## Advantages

- Produced with at least 50% renewable raw materials and therefore particularly environmentally friendly.
- The spiral-shaped outer ribs cut a positive fit in the soft building material, thus ensuring best pressure distribution and load-bearing capacity.
- Can be applied with a hammer – there is no need for special tools, thus saving time and money for the installation.

## Certificates / Features

BIOBASED 50 - 85% DIN CERTCO Geprüft 8C029

★★★★★ Nylon Quality

## Building materials

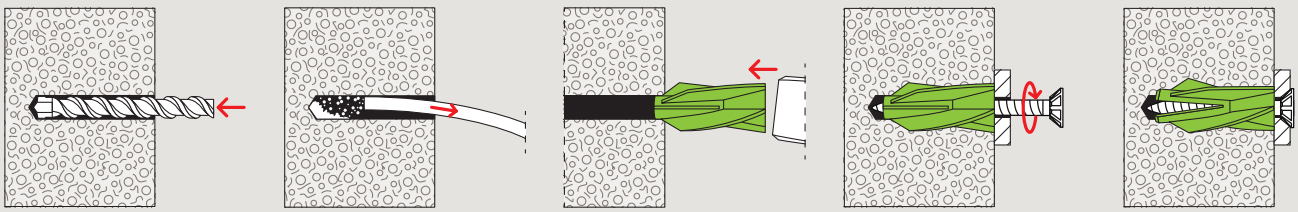
**Suitable for:**

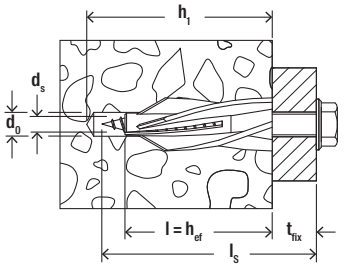
- Aerated concrete ≥ PB2, PP2
- Aerated concrete and ceiling panels of compressive strength ≥ 3.3

## Functioning

- The aircrete anchor GB Green is suitable for pre-positioned installation.
- The spiral-shaped outer ribs cut a positive fit into the soft building material when knocked in, thus ensuring optimal pressure distribution and load-bearing capacity.
- The required screw length is given by the plug length + fixture thickness + 1x screw diameter.
- Rotary drilling of the hole is required.
- Can be used in unplastered aerated concrete.

## Installation GB Green






## Technical data

**Aircrete anchor GB Green**



GB Green

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Plug length = min. anchorage depth $l = h_{ef}$ [mm] | fischer safety screw $d_s$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **GB Green 8** | **524870** | 8 | 60 | 50 | 5 | 20 |
| **GB Green 10** | **524871** | 10 | 65 | 55 | 7 | 18 |

## fischer Safety screw for GB

| Type | Usable length | | Screw dimension[1] | Zinc plated and passivated steel | |
|---|---|---|---|---|---|
| | min. $t_{fix}$ [mm] | max. $t_{fix}$ [mm] | Ø x $l_s$ | Countersunk head, TX star recess drive Item No. | Hexagonal head Item No. |
| **GB 10** | 0 | 5 | 7 x 67 | | 80404 |
| | 5 | 25 | 7 x 87 | 89170 | 80405 |
| | 25 | 45 | 7 x 107 | 89172 | |
| | 85 | 105 | 7 x 167 | 89178 | |
| **GB 14** | 0 | 10 | 10 x 95 | | 80412 |

[1] Further sizes on request.

## Loads

**Aircrete anchor GB Green**

Recommended loads[1] for a single anchor in aerated concrete.
Load values apply when using fischer safety screws[2] according to selection table.

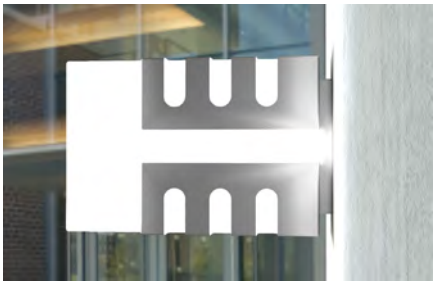
| Type | | | GB Green 8 | GB Green 10 |
|---|---|---|---|---|
| **Diameter fischer safety screw** | | [mm] | **5** | **7** |
| **Minimum spacing[3]** | $s_{min}$ | [mm] | 150 (100)[5] | 100 |
| **Minimum edge distance[4]** | $c_{min}$ | [mm] | 100 (75)[5] | 100 |
| **Minimum member thickness** | $h_{min}$ | [mm] | 75 | 120 |
| **Anchorage depth** | $h_{nom}$ | [mm] | 50 | 55 |
| **Recommended load ($F_{rec}$) in the respective base material** | | | | |
| **AAC 2** | ρ ≥ 0.35 [kg/dm³] | [kN] | 0.18 | 0.21 |
| **AAC 4** | ρ ≥ 0.50 [kg/dm³] | [kN] | 0.40 | 0.54 (0.71)[6] |

[1] Required safety factors are considered. Valid for tensile load, shear load and oblique load under any angle. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Galvanised steel (gvz) and stainless steel (R).
[3] Minimum possible axial spacing while reducing the load.
[4] Minimum permissible edge distance.
[5] Values in brackets apply to AAC 2.
[6] The values in brackets are decisive for member thickness ≥ 150mm.

# Turbo aircrete anchor FTP K

The versatile nylon anchor for aerated concrete.





External lighting



Radiators



## Applications

- Pictures
- Lighting
- Shelves
- Mirror cabinets
- Letter boxes
- Signs
- Motion detectors
- Cable and pipe clips
- Stand-off installations

## Advantages

- The FTP K is suitable for both wood screws and metric screws, and thus offers flexibility in screw choice.
- The spiral-shaped outer thread taps itself into the soft aerated concrete with a positive fit, thus ensuring a secure hold.
- Setting with the FTP EK setting tool requires only a small amount of force. For a convenient installation.
- The special geometry allows for an almost expansion-force-free anchoring. This allows for small edge and spacing distances, and avoids splitting in the case of plastered surfaces.

## Certificates / Features

★★★★★
Nylon
Quality

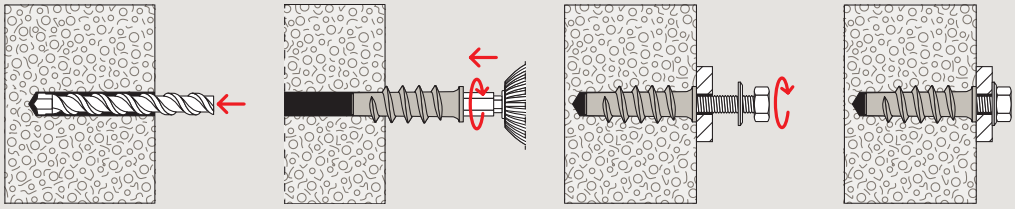
## Building materials

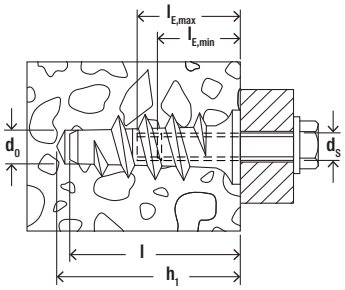
- Aerated concrete
- Solid panel made from gypsum

## Functioning

- The FTP K is suitable for pre-positioned installation.
- Set the FTP K with setting tool FTP EK. The aircrete anchor taps itself into the aerated concrete with a positive fit during the installation process.
- Suitable for wood and metric screws with diameter 4 to 10 mm.

## Installation FTP






## Technical data

**Turbo aircrete anchor FTP K**





FTP K

| Item | Item no. | Drill hole diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Woodscrew diameter $d_s$ [mm] | Metric screw M | Min. bolt penetration $l_{E,min}$ [mm] | Max. bolt penetration $l_{E,max}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **FTP K 4** | **078411**[1] | 8 - (10) | 60 | 50 | 4 - 4.5 | M4 | 35 | 60 | 25 |
| **FTP K 6** | **078412**[1] | 8 - (10) | 60 | 50 | 5 - 6 | M5 - M6 | 40 | 60 | 25 |
| **FTP K 8** | **078413**[1] | 10 - (12) | 70 | 60 | 7 - 8 | M8 | 45 | 70 | 25 |
| **FTP K 10** | **078414**[1] | 12 - (14) | 80 | 70 | 9 - 10 | M8 - M10 | 50 | 80 | 10 |

[1] Values in brackets for drill hole diameter apply for aerated concrete, compressive strength of 5,0 N/mm² or higher.

## Technical data

**Accessories**



FTP EK 4/6



FTP EK 8



FTP EK 10

| Item | Item no. | Match | Sales unit [pcs] |
|---|---|---|---|
| **FTP EK 4/6** | **090990** | FTP K4 / FTP K6 | 1 |
| **FTP EK 8** | **090991** | FTP K8 | 1 |
| **FTP EK 10** | **090992** | FTP K10 | 1 |

## Loads

**Turbo aircrete anchor FTP K**

Recommended loads[1] for a single anchor in aerated concrete and gypsum blocks.
The given loads are valid for screws with the specified diameter.

| Type | | | FTP K 4 | FTP K 6 | FTP K 8 | FTP K 10 |
|---|---|---|---|---|---|---|
| **Screw diameter** | | [mm] | **4** | **5 - 6** | **8** | **8 - 10** |
| **Min. edge distance** | $c_{min}$ | [mm] | **100** | **100** | **150** | **200** |
| **Recommended loads in the respective base material $F_{rec}$**[2] | | | | | | |
| **Aerated concrete** | ACC 2 ≥ 2.5 N/mm² | [kN] | 0.15 | 0.20 | 0.30 | 0.40 |
| **Aerated concrete** | ACC 4 ≥ 5.0 N/mm² | [kN] | 0.25 | 0.30 | 0.40 | 0.50 |
| **Gypsum block** | | [kN] | - | - | 0.29 | 0.54 |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tensile load, shear load and oblique load under any angle.

# Turbo aircrete anchor FTP M

The metal anchor for metric screws for aerated concrete.





Shelves



Wall consoles



## Applications

- Pictures
- Lighting
- Shelves
- Mirror cabinets
- Curtain rails
- Cable and pipe clips
- Stand-off installations
- Radiators
- TV consoles

## Advantages

- The Allen key chuck makes it possible to set the FTP M without the need for a special setting tool. This allows for a simple installation.
- The FTP M achieves a very high load-bearing capacity in aerated concrete for increased safety.
- The spiral-shaped outer thread taps itself into the aerated concrete with a positive fit. This means that it can be set without the need for much force.
- The special geometry allows for an almost expansion-force-free anchoring. This allows for small edge and spacing distances, and avoids splitting in the case of plastered surfaces.

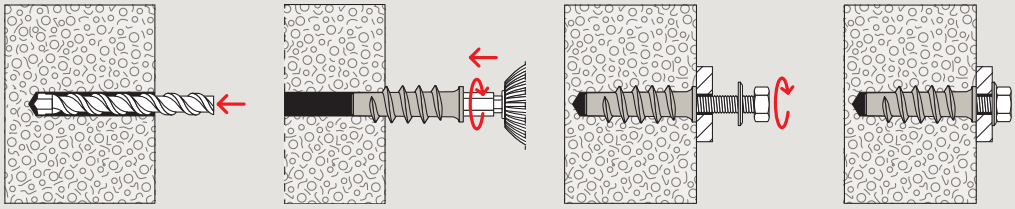
## Building materials

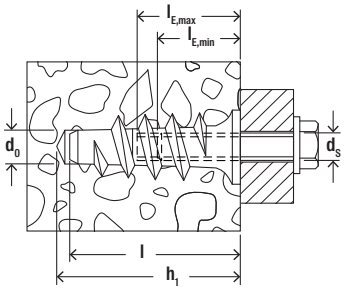
- Aerated concrete
- Solid panel made from gypsum

## Functioning

- The FTP M is suitable for pre-positioned installation.
- The aircrete anchor taps itself into the aircrete with a positive fit during the installation process.
- Suitable for metric screws with diameter 6 to 10 mm.
- For installation with a hexagon socket: Size of the hexagon socket corresponds to screw diameter, e.g. FTP M6 is installed with hexagon socket size 6.
- For installation with cordless screwdriver: use a low torque and use the correct 6-kt bit FTP EM.

## Installation FTP






## Technical data

**Turbo aircrete anchor FTP M**





FTP M (metal)

| Item | Item no. | Drill hole diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Metric screw M | Min. bolt penetration $l_{E,min}$ [mm] | Max. bolt penetration $l_{E,max}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **FTP M 6** | **078415**[1] | 8 - (10) | 60 | 50 | M6 | 15 | 20 | 25 |
| **FTP M 8** | **078416**[1] | 10 - (12) | 70 | 60 | M8 | 20 | 25 | 25 |
| **FTP M 10** | **078417**[1] | 12 - (14) | 80 | 70 | M10 | 25 | 30 | 25 |

[1] Values in brackets for drill hole diameter apply for aerated concrete, compressive strength of 5,0 N/mm² or higher.

## Technical data

**Accessories**



FTP EM for FTP M (metal)

| Item | Item no. | Match | Sales unit [pcs] |
|---|---|---|---|
| **FTP EM 6** | **078577** | FTP M6 | 1 |
| **FTP EM 8** | **078578** | FTP M8 | 1 |
| **FTP EM 10** | **078579** | FTP M10 | 1 |

## Loads

**Turbo aircrete anchor FTP M**

Recommended loads[1] for a single anchor in aerated concrete and gypsum blocks.
The given loads are valid for metric screws with the specified thread size.

| Type | | | FTP M6 | FTP M8 | FTP M10 |
|---|---|---|---|---|---|
| **Thread size** | | [mm] | **M6** | **M8** | **M10** |
| **Min. edge distance** | $c_{min}$ | [mm] | **100** | **150** | **200** |
| **Recommended loads in the respective base material $F_{rec}$**[2] | | | | | |
| **Aerated concrete** | AAC 2 ≥ 2.5 N/mm² | [kN] | 0.30 | 0.45 | 0.60 |
| **Aerated concrete** | AAC 4 ≥ 5.0 N/mm² | [kN] | 0.50 | 0.65 | 0.70 |
| **Aerated concrete** | AAC 6 ≥ 7.5 N/mm² | [kN] | 0.70 | 0.80 | 0.90 |
| **Gypsum block** | | [kN] | - | 0.45 | 0.65 |

[1] Required safety factors are considered.
[2] Valid for tensile load, shear load and oblique load under any angle.

# Brass fixing PA 4

The brass fixing for thin board building materials and solid building materials.





Furniture fittings



Furniture hinges



## Applications

- Handles
- Angle brackets
- Furniture fittings
- Lamps

## Advantages

- The short brass fixing PA 4 only requires a very low anchorage depth and is therefore the solution for thin board building materials.
- The special surface structure of the PA 4 prevents the fixing from rotating in the drill hole. This provides increased installation safety.
- The internal thread allows for the use of standard metric screws and enables the ideal adaptation to suit the intended use.

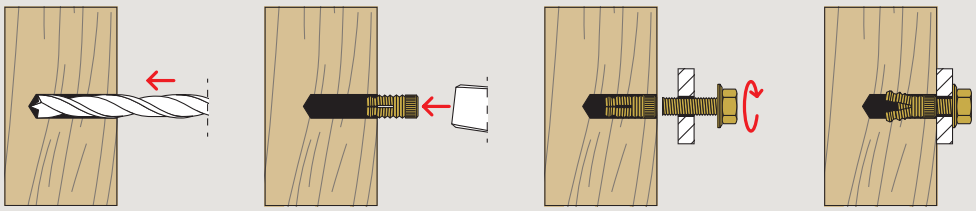
## Building materials

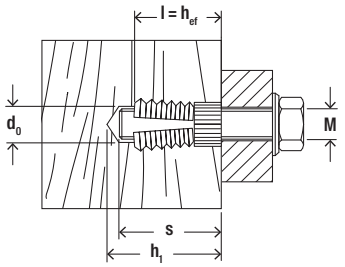
- Wooden board building materials
- Plastic boards
- Concrete
- Solid brick
- Solid sand-lime brick
- Natural stone with dense structure

## Functioning

- The PA 4 is suitable for pre-positioned installation.
- Turning in the metric screw causes the front part of the brass fixing to expand, thus securely anchoring it in the substrate.
- Calculating screw length for flush fixing installation: Fixing length + fixture thickness = min. screw length

## Installation PA 4

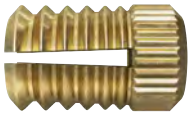




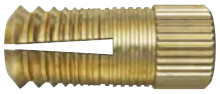

## Technical data

**Brass fixing PA 4**





PA 4 M6



PA 4 M8 + M10

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Thread M | Bolt penetration s [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **PA 4 M6/7,5** | **050484**[1] | 8 | 7.5 | 7.5 | M6 | 7.5 | 7.5 | 200 |
| **PA 4 M6/10,5** | **058484**[1] | 8 | 10.5 | 10.5 | M6 | 10.5 | 10.5 | 100 |
| **PA 4 M6/13,5** | **059484**[1] | 8 | 13.5 | 13.5 | M6 | 13.5 | 13.5 | 100 |
| **PA 4 M8/25** | **050485**[1] | 10 | 25 | 25 | M8 | 25 | 25 | 50 |
| **PA 4 M10/25** | **050486**[1] | 12 | 25 | 25 | M10 | 25 | 25 | 25 |

[1] Values of drill hole diameter apply for hard building materials. For soft building materials the drill diameter needs to be reduced by 0.5 mm.

## Loads

**Brass fixing PA 4**

Recommended loads[1] for a single anchor.
The given loads are valid for metric screws with the specified thread size.

| Type | | | PA 4 M6/7,5 | PA 4 M6/10,5 | PA 4 M6/13,5 | PA 4 M8/25 | PA 4 M10/25 |
|---|---|---|---|---|---|---|---|
| **Thread size** | | [mm] | M6 | M6 | M6 | M8 | M10 |
| **Recommended loads in the respective base material $F_{rec}$**[2] | | | | | | | |
| **Chipboard** | | [kN] | 0.20 | 0.30 | 0.40 | - | - |
| **Fir wood** | | [kN] | 0.18 | 0.25 | 0.38 | - | - |
| **Beech wood** | | [kN] | 0.50 | 0.75 | 1.00 | - | - |
| **Plastic material** | | [kN] | 0.75 | 1.50 | 2.00 | - | - |
| **Solid brick** | Mz 12 | [kN] | - | - | 0.80 | 1.95 | 2.30 |

[1] Required safety factors are considered.
[2] Valid for tensile load, shear load and oblique load under any angle.

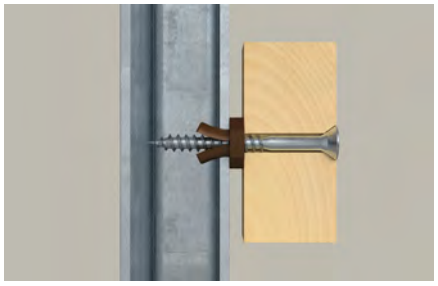
# Balcony cladding fixing P 9 K

For the rear-ventilated stand-off fastening of balcony cladding to hollow profiles.





Balcony cladding



Fixing onto hollow metal profiles



## Applications

- Balcony cladding
- Fittings
- Electrical switches
- Lamps
- Motion detectors

## Advantages

- The wide collar of the P9K plug fixes the balcony cladding to the hollow profile with a spacing. This avoids the formation of rot.
- The expansion within the railing post means that no second drilling on the opposite side of the post is necessary. This allows for a practically invisible fixing of the balcony cladding.
- The material quality of the P9K creates an elastic yet load-bearing connection. This allows for the absorption of thermal stresses, thus increasing the lifespan of the cladding.
- The short expansion element means that the balcony cladding fixing only requires a very small cavity. It is therefore suitable for narrow hollow profiles.

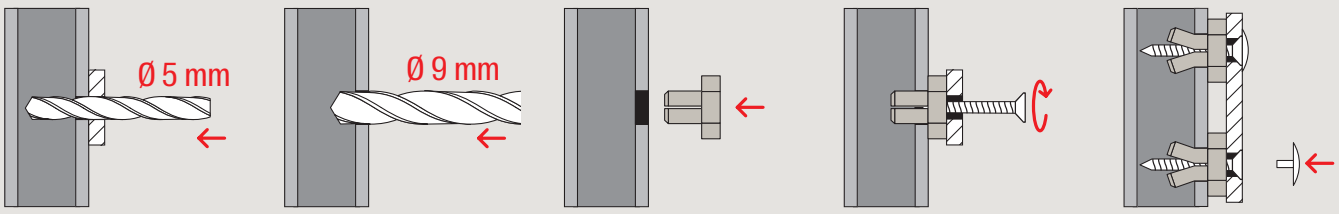
## Building materials

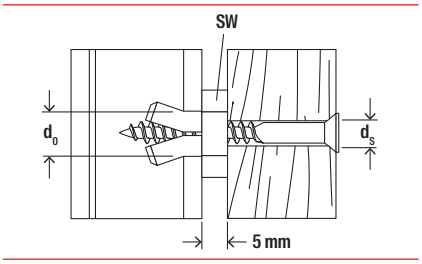
- For fixing onto hollow metal profiles

## Functioning

- Turning in the screw causes the plug to expand in the hollow profile, thus ensuring a load-bearing connection.
- The wide collar prevents direct contact between the fixture and the hollow profile.

## Installation P 9 K






## Technical data

**Balcony cladding fixing P 9 K**



P 9 K

| | Item no. | Drill diameter $d_0$ [mm] | Screw diameter $d_s$ [mm] | Collar height [mm] | Width across nut SW [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Item** | | | | | | |
| **P 9 K** | **059395** | 9 | 5 | 5 | 15 | 50 |

## Loads

**Balcony cladding fixing P 9 K**

Recommended loads[1] for a single anchor.
The given loads are valid for wood screws with the specified diameter.

| **Type** | | | **P 9 K** |
|---|---|---|---|
| **Screw diameter** | | **[mm]** | **5** |
| **Recommended loads in the respective base material $F_{rec}$** [2] | | | |
| **Wall thickness of hollow profile** | 2 mm | **[kN]** | 0.27 |
| **Wall thickness of hollow profile** | 3 mm | **[kN]** | 0.29 |
| **Wall thickness of hollow profile** | 4 mm | **[kN]** | 0.31 |

[1] Required safety factors are considered.
[2] Valid for tensile load, shear load and oblique load under any angle.

# Stair-tread fixing TB / TBB

To fix wooden step treads in concrete and steel sub-structures.





Stair treads on steel stair stringers



Stair treads on concrete stair stringers



## Applications

- Wooden step treads

## Advantages

- The elastic shaft geometry allows for the absorption of vibrations, prevents creaking, and thus increases comfort.
- The stair-tread fixing for steel sub-structures (TB) only requires a very small cavity due to the short expansion element. Thus it is suitable even for narrow steel profiles.

## Building materials

**TB for fixing in:**

- Hollow steel profiles

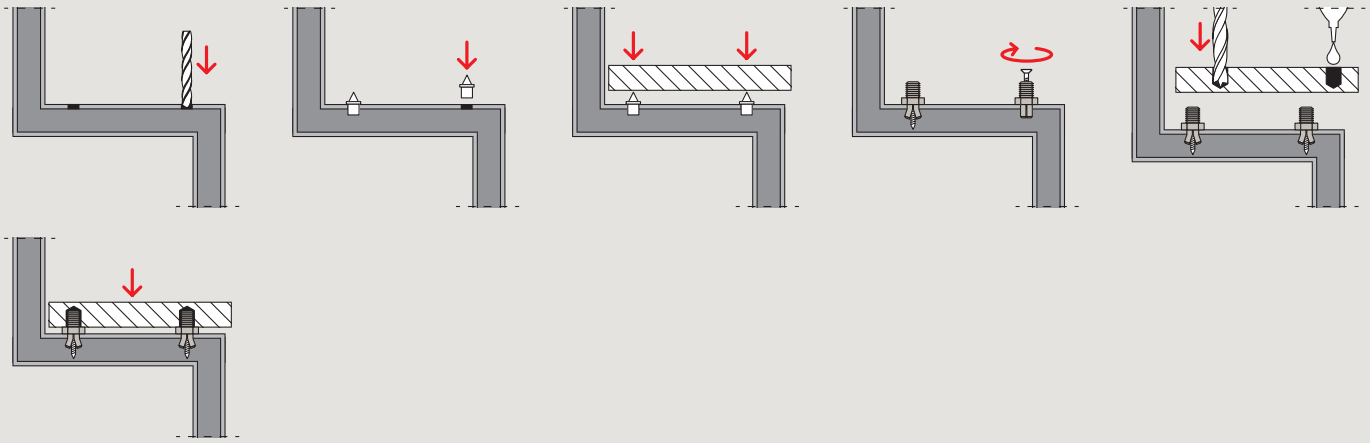
**TBB for fixing in:**

- Concrete
- Solid building materials

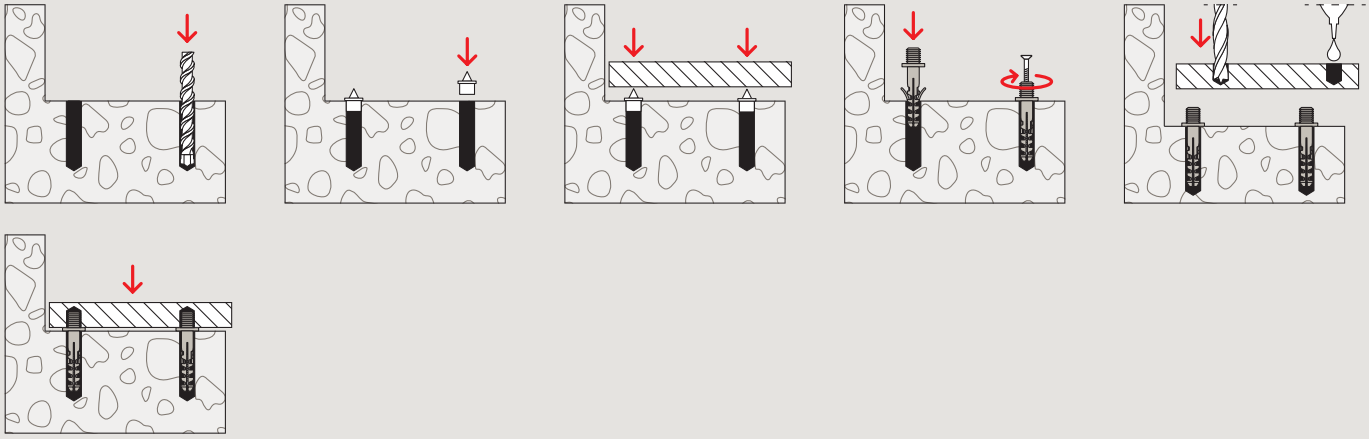
## Functioning

- The plastic expansion plugs are suitable for anchoring wooden step treads and wooden boards >30 mm to steel profiles (TB) or in solid building materials (TBB).
- The ideal retention forces are only achieved when using cold wood glue for the fixing in wooden step treads.
- The plastic washers included with the TBB allow you to level out any unevenness in the substrate.

## Installation TB



## Installation TBB





## Technical data

**Stair-tread fixing TB/TBB**



TB TBB TBZ 2 for centre-marking the stair-tread holes

| | Item no. | Drill hole in stair thread [mm] | Drill hole in steel staircase stringer [mm] | Drill hole in concrete [mm] | Collar height [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Width across nut SW [mm] | Adapted for | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | | | |
| **TB** | **060580** | 14 x 25 | 9 | – | 5 | 5.0 x 40 | 15 | – | 50 |
| **TBB** | **060583** | 14 x 25 | – | 8 x 55 | – | 8.0 x 70 | – | – | 50 |
| **TBZ 2** | **060584** | – | – | – | – | – | – | TB and TBB | 10 |

# Repair pad FixIt

To repair over-sized or damaged drill holes.






Repairing damaged drill holes



Repairing damaged drill holes



## Applications

- To repair over-sized or damaged drill holes for use with plastic plugs

## Advantages

- Using FixIt means that you can avoid having to drill another hole, and makes it possible to reuse a pre-existing drill hole.
- The repair pad FixIt can be used as a single layer or as multiple layers, and thus can be flexibly adapted to suit various drill hole sizes and shapes.
- The pad, which is covered with a special mortar, hardens after only approx. three minutes in the drill hole. This allows for a fast installation of the fixture.

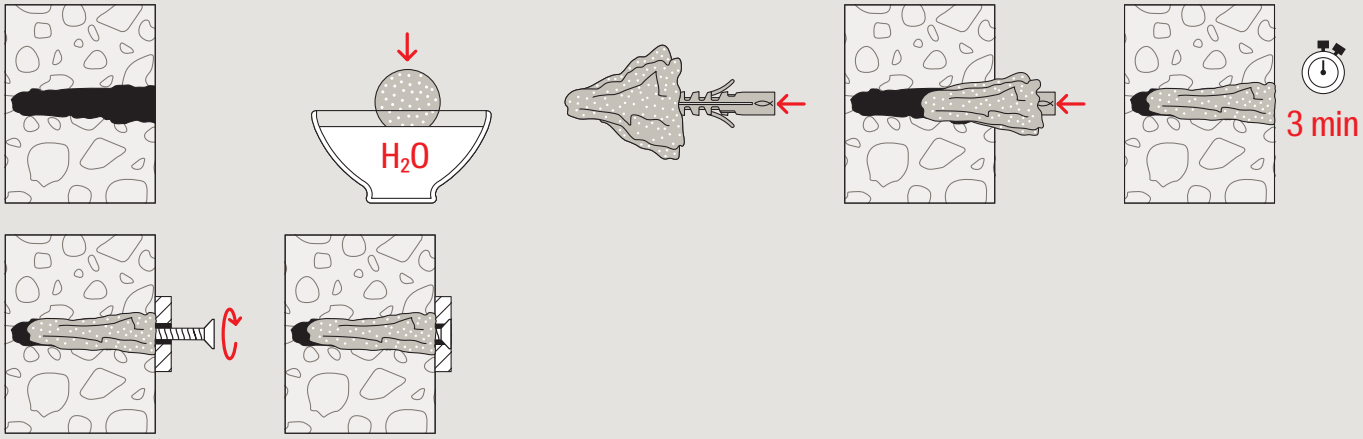
## Building materials

- Concrete
- Cavity floor slabs made from bricks and concrete or similar
- Vertically perforated brick made from lightweight concrete
- Solid sand-lime brick
- Natural stone with dense structure
- Aerated concrete
- Solid brick made from lightweight concrete
- Solid brick

## Functioning

- The pad, which is covered with a special mortar, hardens in the drill hole, thus anchoring the plug securely in the damaged or over-sized drill hole.
- Wet the pad with water, wrap it around the plug and push it into the damaged drill hole.
- After about three minutes the special pad will harden and the fixture can then be attached.
- Use several pads for larger tolerances.
- The curing time for the first pad is approx. three minutes. Add an additional minute for each additional pad used.

## Installation FixIt




6

## Technical data

**Repair pad FixIt**



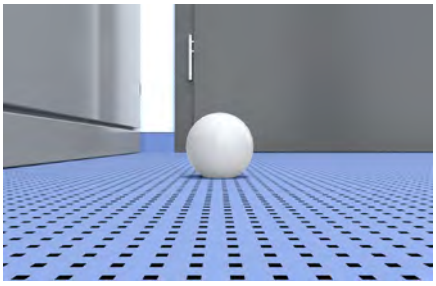

FixIt

| | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **Item** | | | |
| **FixIt** | **092507** | Card with 10 FixIt pads | 1 |

# Doorstop TS

The installation-friendly doorstop.





Doorstop



## Applications

- Doorstop with flexible positioning

## Advantages

- The extended plug shaft makes it possible to attach the doorstop directly, thus simplifying installation.
- The invisible fixing ensures visual appeal.
- The TS contains all the components required for installation and is therefore a convenient complete solution.
- The doorstop is available in a range of colours to suit every floor covering and individual design wishes.

## Certificates / Features

★★★★★
Nylon
Quality

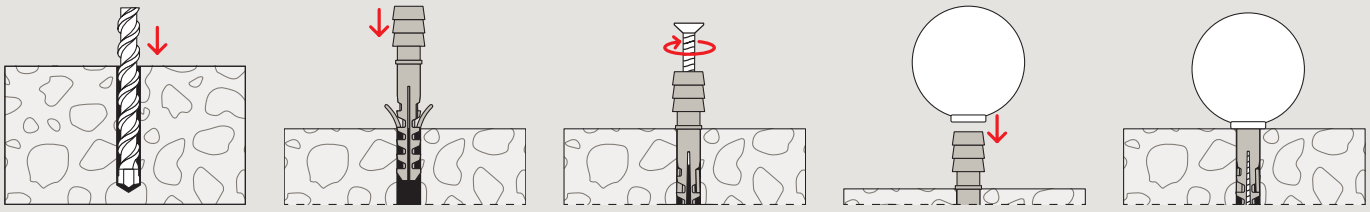
## Building materials

- Concrete
- Floor screed

## Functioning

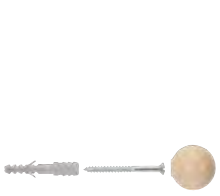
- The doorstop TS is suitable for pre-positioned installation.
- When turning in the screw, the plug expands and anchors itself in the building material.
- The plug must be pushed into the drill hole up to the point where the plug shaft thickens.
- It can be removed by removing the doorstop, unscrewing the screw, and pulling out the plug.

## Installation TS



## Technical data

**Doorstop TS**



TS



Assortment TS-SORT

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Colour | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **TS-SORT** | **060521** | 8 | 50 | grey | 5 x Grey, white, beige, black, brown | 1 |
| **TS 8 BG** | **060551** | 8 | 50 | beige | | 10 |
| **TS 8 BR** | **060540** | 8 | 50 | brown | | 10 |
| **TS 8 G** | **060535** | 8 | 50 | grey | | 10 |
| **TS 8 S** | **060539** | 8 | 50 | black | | 10 |
| **TS 8 W** | **060536** | 8 | 50 | white | | 10 |

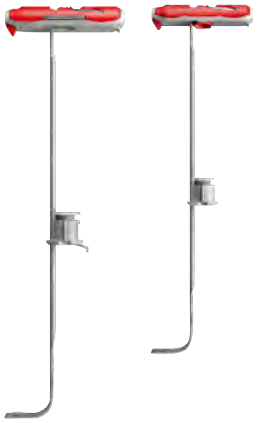


# 7
# Cavity fixings


| | | |
|---|---|---|
| Nylon toggle fischer DuoTec | 496 |  |
| Cavity fixing DuoHM | 500 |  |
| Metal cavity fixing HM | 503 |  |
| Toggle and spring fixing KD/KDH | 507 |  |
| Plasterboard fixing DuoBlade | 512 |  |
| Plasterboard fixing GK | 515 |  |
| Plasterboard fixing GK Green | 518 |  |
| Plasterboard fixing metal GKM | 521 |  |

# Nylon toggle fischer DuoTec

Easy to install nylon toggle for high loads in all panel building materials.





Kitchen hanging cabinets



Shelves



## Applications

- Kitchen hanging cabinets
- Living room cabinets
- Shelves
- Wardrobes
- Handrails
- Pictures
- Mirrors
- Lamps
- Heavy hanging baskets

## Advantages

- Flexible screw mount allows for the use of screws and hooks with different thread shapes.
- Glass fibre-reinforced plastics and a metal skeleton insert (fischer DuoTec 12) allow the toggle to handle heavy tensile and transverse loads in all panel building materials.
- Soft grey nylon contact surface distributes the load over the panel surface, thereby minimising weakening of the supporting building material.
- Standard drill hole diameters and short tilting element for easy installation in narrow cavities, including cavities with insulation.
- White flush sleeve with snap function allows the plug to be pre-installed quickly and securely in the drill hole.
- With scale on the grip strap (fischer DuoTec 12) for determining the required screw length (scale value + 20 mm).

## Certificates / Features

★★★★★ Nylon Quality

Glass Fibre Power

DuoLine

## Building materials

**Suitable for:**

- Gypsum plasterboard
- Gypsum fibreboard
- Wooden panels, such as OSB boards, chipboard, MDF sheets
- Steel plates
- Plastic boards
- Hollow blocks made from concrete

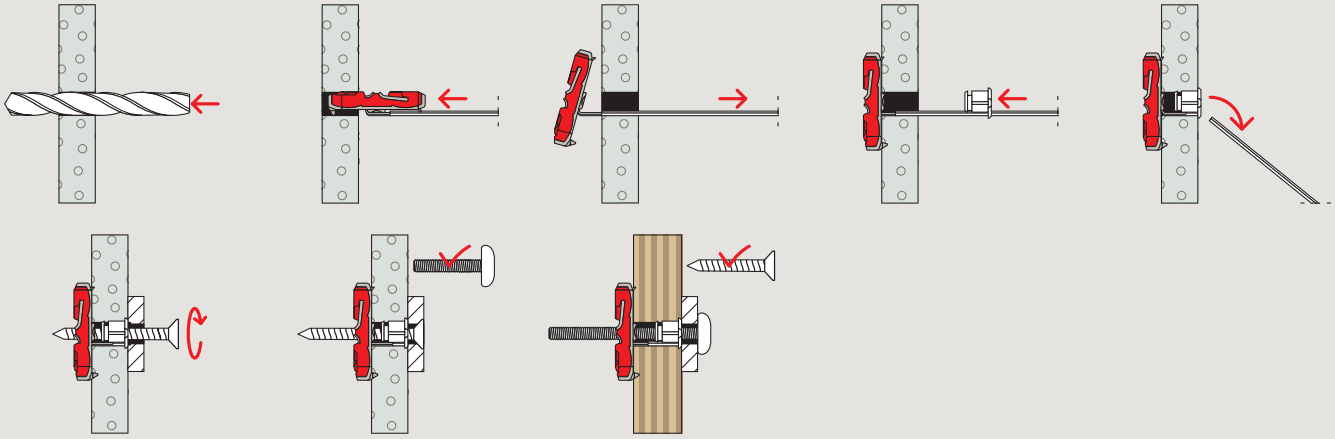
**Also functioning in:**

- Solid materials, such as concrete and wood

## Functioning

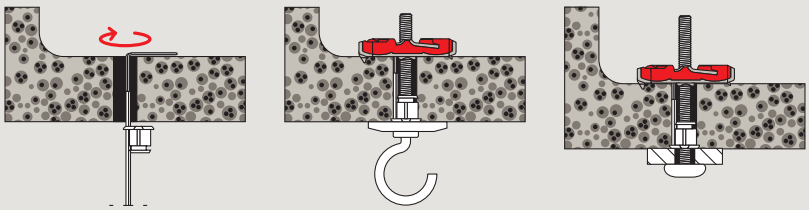
- The fischer DuoTec is designed for pre-positioned installation.
- Simple installation with a standard diameter 10 or 12 mm drill bit.
- The short toggle element makes it suitable for narrow and even with mineral wool insulated cavities. Note the length of the toggle element!
- Functions like an expansion plug in solid building materials such as concrete or wood. Note, not with metric screws!
- Flexible screw insert allows for the use of wood, chipboard and metric screws and hooks.

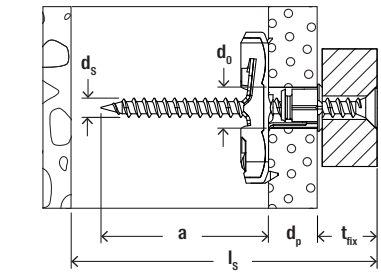
## Installation in board materials





## Installation in cavities






## Technical data

**fischer DuoTec in board materials**

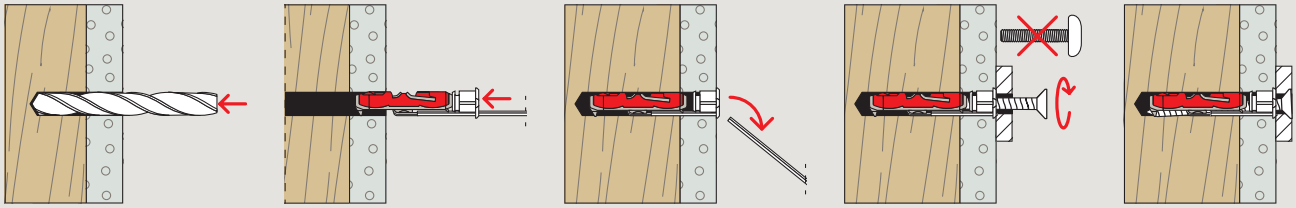


fischer DuoTec 10 | fischer DuoTec 10 S PH | fischer DuoTec 12 | fischer DuoTec 12 S PH

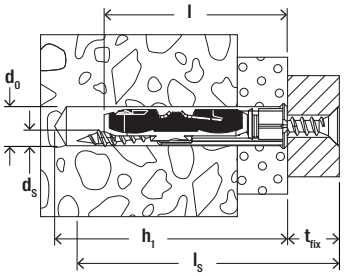
| Item | Item no. | Drill diameter $d_0$ [mm] | Min. panel thickness $d_p$ [mm] | Max. panel thickness $d_p$ [mm] | Min. cavity depth a [mm] | Screw diameter $d_s$ [mm] | Screw length $l_s$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **fischer DuoTec 10** | **537258** | 10 | 9.5 | 55 | 40 | 4.5 - 5.0 | – | 50 |
| **fischer DuoTec 10 S** | **537259**[1] | 10 | 9.5 | 55 | 40 | 5 | 60 | 25 |
| **fischer DuoTec 10 S PH** | **539025**[2] | 10 | 9.5 | 55 | 40 | 5 | 60 | 25 |
| **fischer DuoTec 12** | **542796** | 12 | 9.5 | 55 | 50 | 5.0 - 6.0 | – | 10 |
| **fischer DuoTec 12 RH** | **542798**[3] | 12 | 9.5 | 55 | 50 | 5.5 | 70 | 10 |
| **fischer DuoTec 12 S PH M** | **542797**[4] | 12 | 9.5 | 55 | 50 | M6 | 70 | 10 |

[1] fischer DuoTec S with chipboard screw countersunk head.
[2] fischer DuoTec S PH with chipboard screw panhead.
[3] fischer DuoTec RH with screw with round hook.
[4] fischer DuoTec S PH M with machine screw panhead.

## Installation for hits in solid building materials

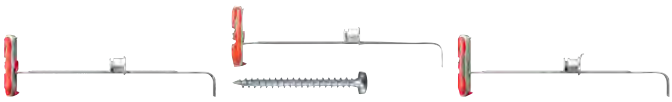







## Technical data

**Nylon toggle fischer DuoTec in solid materials**



fischer DuoTec 10 | fischer DuoTec 10 S PH | fischer DuoTec 12

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Screw diameter $d_s$ [mm] | Min. screw length $l_s$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **fischer DuoTec 10** | **537258** | 10 | – | 4.5 - 5.0 | tfix + 55 | 50 | ls - 55 | 50 |
| **fischer DuoTec 10 S** | **537259**[1] | 10 | 65 | 5 | 60 | 50 | 27 | 25 |
| **fischer DuoTec 10 S PH** | **539025**[2] | 10 | 65 | 5 | 60 | 50 | 27 | 25 |
| **fischer DuoTec 12** | **542796** | 12 | – | 5.0 - 6.0 | tfix + 65 | 60 | ls - 65 | 10 |
| **fischer DuoTec 12 RH** | **542798**[3] | 12 | 75 | 5.5 | 55 | 60 | – | 10 |

[1] fischer DuoTec S with chipboard screw countersunk head.
[2] fischer DuoTec S PH with chipboard screw panhead.
[3] fischer DuoTec RH with screw with round hook.

## Loads

**Nylon toggle fischer DuoTec**

Recommended loads[1) 2)] for a single anchor.

| Type | | | fischer DuoTec 10 | | | fischer DuoTec 12 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Chipboard screws | | fischer Hook | Chipboard screws | | Metrical screw | fischer Hook |
| Screw diameter | | [mm] | 4.5 | 5.0 | 5.0 | 5.0 | 6.0 | 6.0 | 5.5 |
| Recommended loads in the respective base material $F_{rec}$[3)] for a span in the construction b = 625 mm | | | | | | | | | |
| Gypsum plasterboard | 9.5 mm | [kN] | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |
| Gypsum plasterboard | 12.5 mm | [kN] | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| Gypsum plasterboard | 2 x 12.5 mm | [kN] | 0.43 | 0.43 | 0.30[4)] | 0.43 | 0.43 | 0.43 | 0.43 |
| Gypsum fibreboard | 12.5 mm | [kN] | 0.51 | 0.51 | 0.30[4)] | 0.51 | 0.51 | 0.51 | 0.50[4)] |
| Chipboard | 16 mm | [kN] | 0.71 | 0.71 | 0.30[4)] | 0.75 | 0.80 | 0.80 | 0.50[4)] |
| OSB board | 18 mm | [kN] | 0.75 | 0.75 | 0.30[4)] | 0.75 | 1.30 | 1.30 | 0.50[4)] |
| Recommended loads in the respective base material $F_{rec}$[3)] for a span in the construction b = 120 mm | | | | | | | | | |
| Gypsum plasterboard | 9.5 mm | [kN] | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| Gypsum plasterboard | 12.5 mm | [kN] | 0.36 | 0.36 | 0.30[4)] | 0.36 | 0.36 | 0.36 | 0.20 |
| Gypsum plasterboard | 2 x 12.5 mm | [kN] | 0.59 | 0.59 | 0.30[4)] | 0.70 | 0.80 | 0.80 | 0.50[4)] |
| Gypsum fibreboard | 12.5 mm | [kN] | 0.75 | 0.75 | 0.30[4)] | 0.80 | 1.10 | 1.10 | 0.50[4)] |
| Chipboard | 16 mm | [kN] | 0.75 | 0.75 | 0.30[4)] | 0.80 | 1.40 | 1.30 | 0.50[4)] |
| OSB board | 18 mm | [kN] | 0.75 | 0.75 | 0.30[4)] | 0.80 | 1.50 | 1.40 | 0.50[4)] |
| Recommended loads in solid building materials $F_{rec}$[3)] | | | | | | | | | |
| Concrete | ≥ C20/25 | [kN] | 0.45 | 0.75 | 0.30[4)] | 0.40 | 0.75 | - | 0.30 |
| Wood | | [kN] | 0.30 | 0.75 | 0.30[4)] | 0.20 | 0.65 | - | 0.30 |
| Recommended loads in the respective base material $F_{rec}$[3)] | | | | | | | | | |
| Hollow block of lightweight aggregate concrete ‚Sepa Parpaing' | $f_b \geq 8$ N/mm² | [kN] | - | - | - | 0.65 | 1.00 | 1.00 | 0.50[4)] |
| Pre-stressed hollow-core concrete slabs | | [kN] | - | - | - | 1.00 | 1.40 | 1.30 | 0.50[4)] |
| Lightweight concrete hollow block Hbl acc. to EN 771-3 | $f_b \geq 2$ N/mm² | [kN] | - | - | - | 0.90 | 1.00 | 1.00 | 0.50[4)] |

[1)] Required safety factors are considered.
[2)] The recommended loads are reference values and depending to the building material and the workmanship. The values are only valid for the given screw diameter.
[3)] Valid for tensile load, shear load and oblique load under any angle.
[4)] Bending of the hook is decisive. Only for tension load.

# Cavity fixing DuoHM

One panel plug for all common building material thicknesses.







TV mountings



Shelves

## Applications

- Pictures
- TV mountings
- Lamps
- Wall shelves
- Towel rails
- Mirror cabinets
- Curtain rails
- Substructures

## Advantages

- The DuoHM can be installed quickly and easily using a cordless screwdriver without additional setting tools. This reduces installation time by up to 50% compared to conventional panel plugs.
- The unique 2-component technology meets high load requirements. The metal sleeve presses against the back of the panel and the nylon base body knots in the building material.
- One plug length covers all common building material thicknesses from 9.5-30mm for flexible and cost-efficient use.
- Thanks to the metric internal thread, the screw can be unscrewed and screwed in again several times.
- The nylon anti-rotation lock ensures correct installation and also prevents damage to the building material.
- The fixing is no longer visible behind the attachment part due to the narrow plug edge.

## Certificates / Features

2K Technology

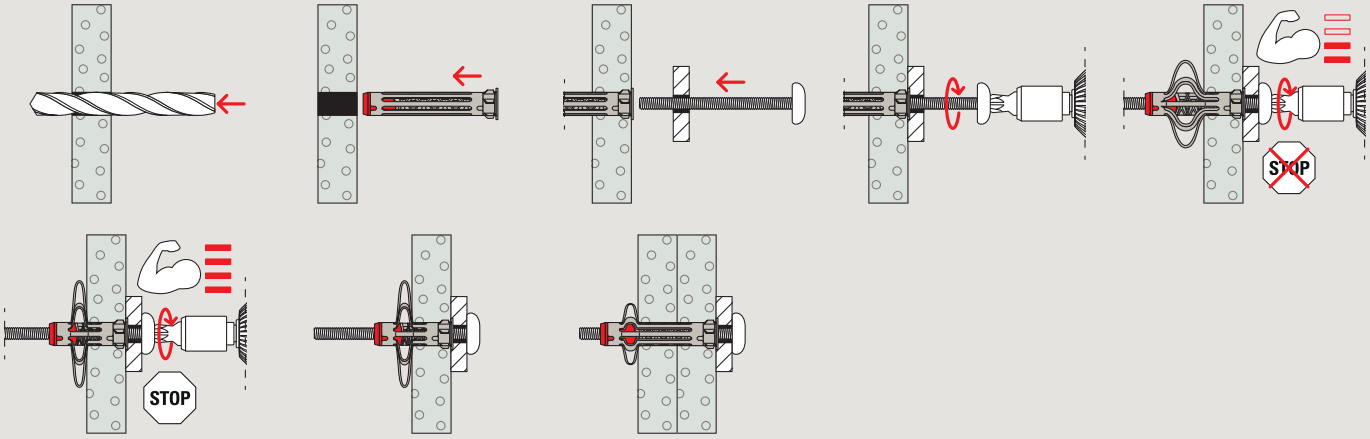
## Building materials

- Plasterboard and gypsum fiberboards
- Wood wool lightweight boards
- Chipboard
- Plywood panels

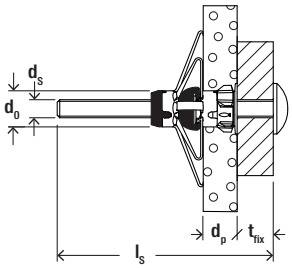
## Functioning

- The DuoHM is suitable for panel thicknesses from 9.5 to 30 mm.
- The DuoHM is mounted as a push-fit installation, i.e. the screw is installed directly through the attachment part.
- The metal sleeve folds behind the building material and presses against the back of the panel, the nylon base body knots in the building material.
- Installation is only complete when the tightening torque is clearly noticeable and the metal sleeve is fully pressed against the panel.
- Thanks to the metric internal thread, the attachment can be fastened and unfastened several times.

## Installation DuoHM with panhead screw

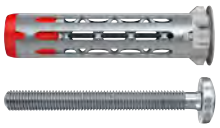





## Technical data

**Cavity fixing DuoHM**



DuoHM PH PZ/TX

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Panel thickness $d_p$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **DuoHM 4 x 55 S PH TX** | **572923** | 8 | 55 | 55 | 4.0 x 55 | 9.5 - 30 | TX20 | 25 |
| **DuoHM 5 x 55 S PH TX** | **572924** | 10 | 55 | 55 | 5.0 x 55 | 9.5 - 30 | TX25 | 25 |
| **DuoHM 6 x 55 S PH TX** | **572925** | 12 | 55 | 55 | 6.0 x 55 | 9.5 - 30 | TX30 | 25 |

## Loads

**Cavity fixing DuoHM**

Recommended loads[1)2)] for a single anchor.

| Type | | | DuoHM 4x55 | DuoHM 5x55 | DuoHM 6x55 |
|---|---|---|---|---|---|
| **Thread size** | | | **M4** | **M5** | **M6** |
| **Recommended loads in the respective base material $F_{rec}$[3)]** | | | | | |
| **Gypsum plasterboard** | 9.5 mm | **[kN]** | 0.15 | 0.15 | 0.15 |
| **Gypsum plasterboard** | 2 x 9.5 mm | **[kN]** | 0.25 | 0.25 | 0.25 |
| **Gypsum plasterboard** | 12.5 mm | **[kN]** | 0.20 | 0.20 | 0.20 |
| **Gypsum plasterboard** | 2 x 12.5 mm | **[kN]** | 0.36 | 0.38 | 0.40 |
| **Gypsum plasterboard (e.g. Knauf Diamant or Rigips Die Harte)** | 12.5 mm | **[kN]** | 0.36 | 0.38 | 0.40 |
| **Gypsum fiberboard** | 12.5 mm | **[kN]** | 0.38 | 0.40 | 0.42 |
| **Chipboard** | 16 mm | **[kN]** | 0.48 | 0.50 | 0.52 |
| **OSB-Board** | 15 mm | **[kN]** | 0.52 | 0.54 | 0.56 |
| **OSB-Board** | 18 mm | **[kN]** | 0.58 | 0.60 | 0.62 |
| **Gypsum plasterboard + OSB-Board** | 12.5 mm + 15 mm | **[kN]** | 0.58 | 0.60 | 0.62 |

[1)] Required safety factors are considered.
[2)] The recommended loads are reference values and depending to the building material and the workmanship.
[2)] Valid for tensile load, shear load and oblique load under any angle.

# Metal cavity fixing HM

The versatile metal cavity fixing with metric screws.





Curtain rails



Shelves



## Applications

- Pictures
- Lighting
- Light shelves
- Towel rails
- Mirror cabinets
- Curtain rails
- Sub-structures

## Advantages

- Due to the extensive range, the HM is suitable for board building materials with a thickness of 3-50 mm and thus suitable for a number of different applications.
- The metric internal thread allows the attachment to be removed and refitted several times, thus offering the best possible flexibility.
- The HM‘s expanding arms ensure a large supporting surface, thus allowing a high load-bearing capacity.
- The claws around the edge of the fixing penetrate the board building material, preventing the fixing from rotating, thus ensuring a secure installation.

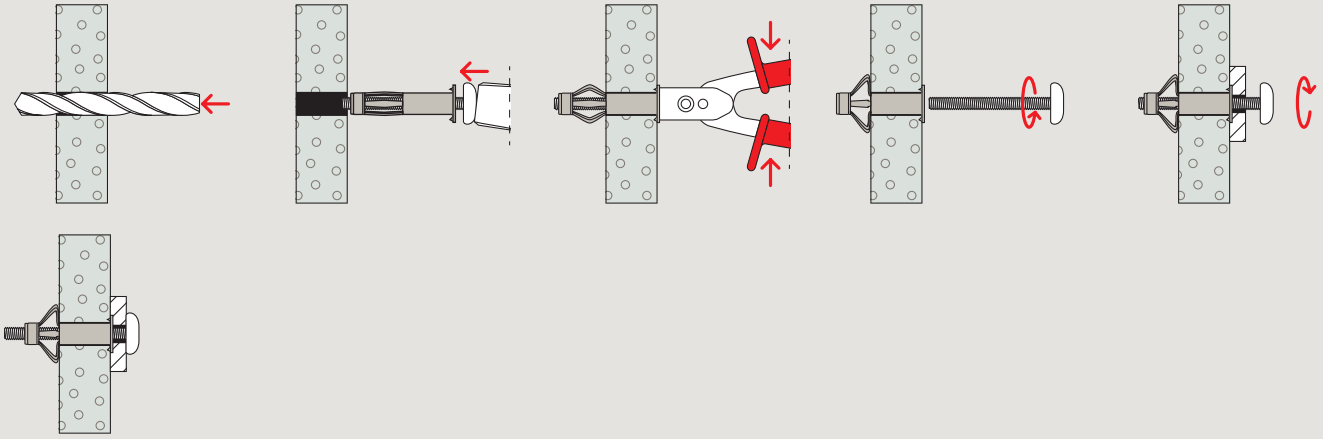
## Building materials

- Gypsum plasterboard and gypsum fibreboards
- Cavity floor slabs
- Light building boards made of wood wool
- Chipboard
- Plywood boards

## Functioning

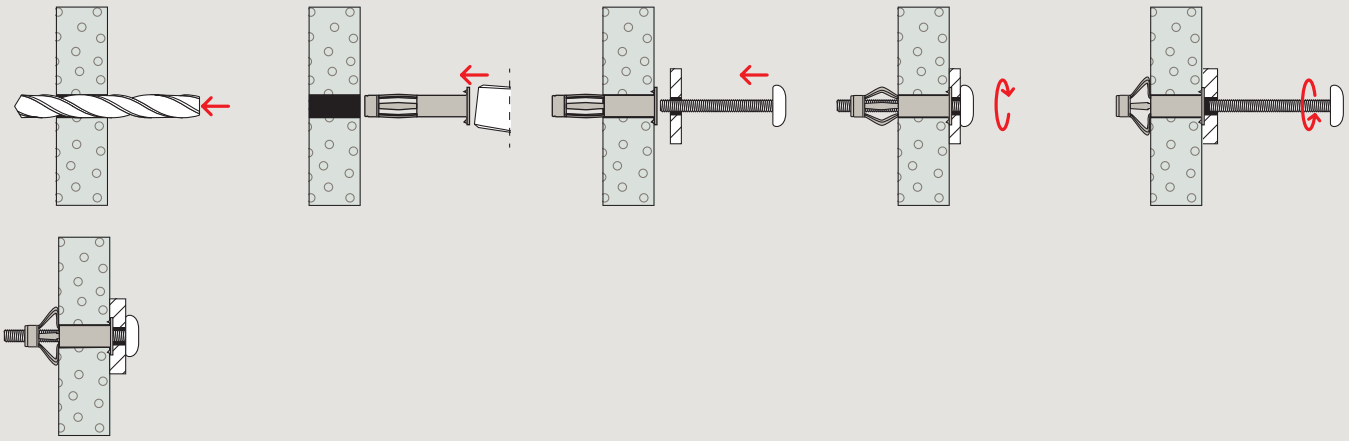
- The metal cavity fixing HM is suitable for pre-positioned installation.
- The fixing should be selected based on the thickness of the board building material, to allow the very best expansion in the cavity.
- During installation, the expanding arms swing open and press onto the reverse side of the board.
- The HM can be installed using installation pliers. If using a battery operated screwdriver or screwdriver for installation, the pre-assembled screws must be removed first. When screwing in and expanding the fixing, the attachment, or a max. 6 mm plate, needs to be used as a turning stop.

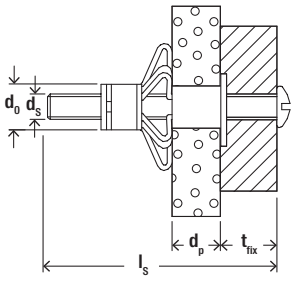
## Installation HM





## Installation HM






## Technical data

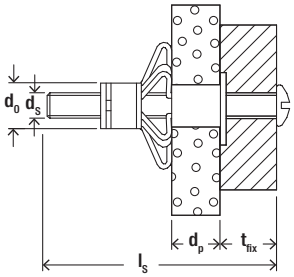
**Metal cavity fixing HM**



HM S HM SS HM H

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Panel thickness $d_p$ [mm] | Fixture thickness $t_{fix}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **HM 4 x 32 S** | **519769** | 8 | 40 | 32 | M4 x 40 | 3 - 13 | ≤ 15 - 25 | PH2 | 50 |
| **HM 4 x 45 S** | **519770** | 8 | 52 | 45 | M4 x 52 | 16 - 23 | ≤ 12 - 21 | PH2 | 50 |
| **HM 4 x 60 S** | **519771** | 8 | 65 | 60 | M4 x 65 | 31 - 40 | ≤ 12 - 21 | PH2 | 50 |

[1] with hexagon headed screw, assembly only by using the professional installation tool HM Z 1




## Technical data

**Metal cavity fixing HM**



HM S HM SS HM H

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Panel thickness $d_p$ [mm] | Fixture thickness $t_{fix}$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **HM 5 x 37 S** | **519772** | 10 | 45 | 37 | M5 x 45 | 6 - 15 | ≤ 8 - 17 | PH2 | 50 |
| **HM 5 x 52 S** | **519774** | 10 | 58 | 52 | M5 x 58 | 7 - 21 | ≤ 10 - 24 | PH2 | 50 |
| **HM 5 x 65 S** | **519775** | 10 | 71 | 65 | M5 x 71 | 20 - 34 | ≤ 12 - 26 | PH2 | 50 |
| **HM 6 x 37 S** | **519777** | 12 | 45 | 37 | M6 x 45 | 6 - 15 | ≤ 12 - 21 | PH3 | 50 |
| **HM 6 x 52 S** | **519778** | 12 | 58 | 52 | M6 x 58 | 7 - 21 | ≤ 14 - 28 | PH3 | 50 |
| **HM 6 x 65 S** | **519782** | 12 | 71 | 65 | M6 x 71 | 17 - 34 | ≤ 13 - 30 | PH2 | 50 |
| **HM 6 x 80 S** | **519779** | 12 | 88 | 80 | M6 x 88 | 32 - 50 | ≤ 16 - 34 | PH3 | 50 |
| **HM 8 x 54 SS** | **519783**[1)] | 12 | 60 | 54 | M8 x 60 | 7 - 21 | ≤ 16 - 30 | SW 13 | 50 |
| **HM 4 x 32 H** | **519780** | 8 | 45 | 32 | – | 3 - 13 | – | – | 50 |
| **HM 5 x 65 H** | **519781** | 10 | 71 | 65 | – | 20 - 34 | – | – | 50 |

[1)] with hexagon headed screw, assembly only by using the professional installation tool HM Z 1

## Technical data

**Installation pliers HMZ**



HM Z 1 HM Z 2 HM Z 3

| Item | Item no. | Adapted for | Sales unit [pcs] |
|---|---|---|---|
| **HM Z 1** | **062320** | HM 4 - HM 8 | 1 |
| **HM Z 2** | **062321** | HM 4 - HM 6 | 1 |
| **HM Z 3** | **539723** | HM 4 - HM 6 | 1 |

## Loads

**Metal cavity fixing HM**

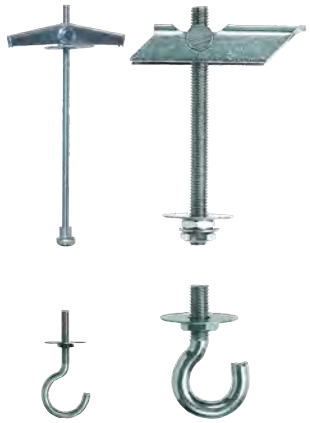
Recommended loads[1] for a single anchor.

| Type | | | HM 4 x 32 S | HM 4 x 46 S | HM 5 x 37 S | HM 5 x 52 S | HM 5 x 65 S | HM 6 x 37 S | HM 6 x 52 S | HM 6 x 65 S | HM 8 x 55 SS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Thread size** | | | M4 | M4 | M5 | M5 | M5 | M6 | M6 | M6 | M8 |
| **Recommended loads in the respective base material $F_{rec}$** [2] | | | | | | | | | | | |
| **Gypsum plasterboard** | 9.5 mm | **[kN]** | 0.15 | 0.15 | 0.15 | 0.15 | - | 0.15 | - | - | - |
| **Gypsum plasterboard** | 12.5 mm | **[kN]** | 0.20 | 0.20 | 0.20 | 0.20 | - | 0.20 | 0.20 | - | 0.20 |
| **Gypsum plasterboard** | 19 mm (2 x 9.5 mm) | **[kN]** | - | - | - | 0.25 | - | - | 0.25 | 0.25 | 0.25 |
| **Gypsum plasterboard** | 25 mm (2 x 12.5 mm) | **[kN]** | - | - | - | - | 0.30 | - | - | 0.30 | - |
| **Chipboard** | 10 mm | **[kN]** | 0.25 | 0.25 | 0.25 | 0.25 | - | 0.25 | 0.25 | - | 0.25 |
| **Chipboard** | 13 mm | **[kN]** | 0.25 | 0.25 | 0.25 | 0.25 | - | 0.25 | 0.25 | - | 0.25 |
| **Chipboard** | 28 mm | **[kN]** | - | - | - | - | 0.50 | - | - | 0.50 | - |
| **Plywood** | 4 mm | **[kN]** | 0.10 | - | - | - | - | - | - | - | - |
| **Hardboard** | 3 mm | **[kN]** | 0.10 | - | - | - | - | - | - | - | - |
| **Wood wool slab** | 16 mm | **[kN]** | - | 0.05 | - | 0.05 | - | - | 0.05 | - | 0.05 |
| **Wood wool slab** | 25 mm | **[kN]** | - | - | - | - | 0.05 | - | - | 0.05 | - |
| **Fibre cement board** | 8 mm | **[kN]** | 0.25 | 0.25 | 0.25 | 0.25 | - | 0.25 | - | - | - |
| **Gypsum fibreboard** | 10 mm | **[kN]** | 0.25 | 0.25 | 0.25 | 0.25 | - | 0.25 | 0.25 | - | 0.25 |
| **Gypsum fibreboard** | 15 mm | **[kN]** | - | 0.25 | 0.25 | 0.25 | - | 0.25 | 0.25 | - | 0.25 |

[1] Required safety factors are considered.
[2] Valid for tensile load, shear load and oblique load under any angle.

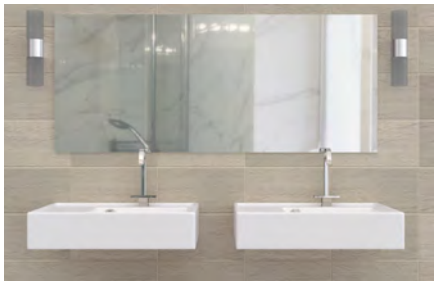
# Toggle and spring fixing KD/KDH

The cavity fixing for different board thicknesses and large usage lengths.





Ceiling lamps



Wash basins



## Applications

- Pictures
- Lighting
- Light shelves
- Towel rails
- Mirror cabinets
- Light cabinets
- Cable and pipe clips

## Advantages

- Universal fixing for fastenings in a wide range of drywall and hollow wall materials.
- When the metal crosspiece is pushed. through the drill hole, pull it firmly against the inner wall cavity by tugging the plastic pull ring on the outer wall.
- Afterwards cut the plastic legs off and fasten the fixture with e.g. a screw or screw in a hook or an eyebolt according to your demands.
- Suitable for pre-positioned installation.

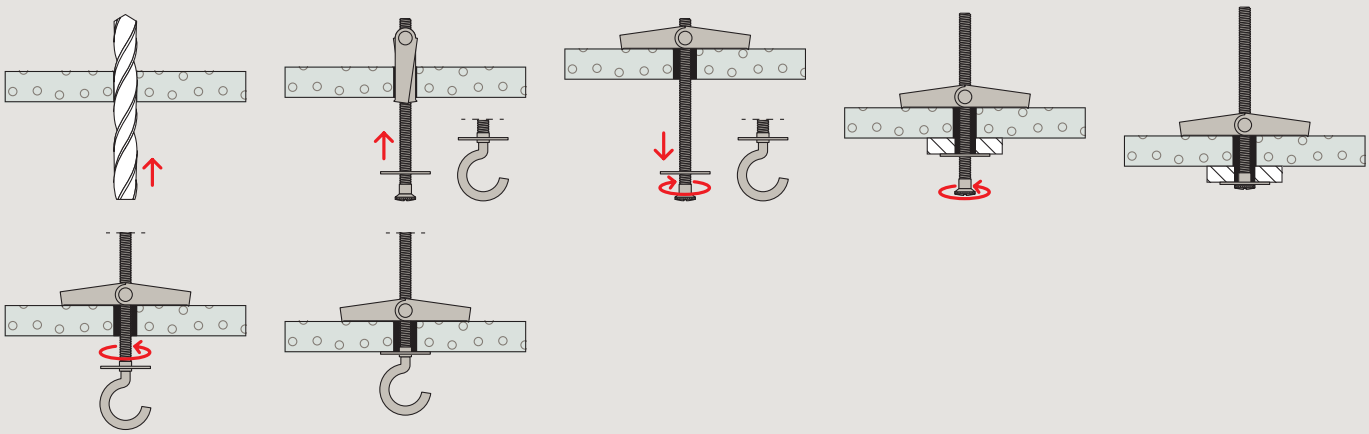
## Building materials

- Gypsum plasterboard and gypsum fibreboards
- Cavity floor slabs made from bricks and concrete
- Chipboard
- Plywood

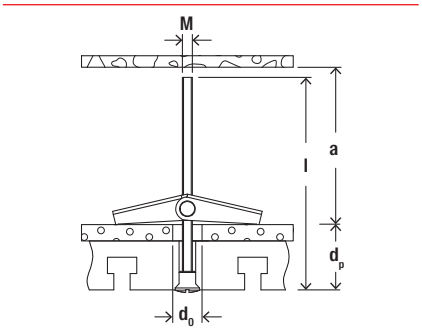
## Functioning

- The gravity and spring toggle are suitable for pre-positioned installation.
- When placed in the drill hole, the bearing elements of the gravity and spring toggle independently swing open behind the board.
- No special installation tool required. For a fast and convenient installation.
- The KM10 is specially suited to fixing wash basins and urinals into installation and cavity walls.

## Montage KD / KHD

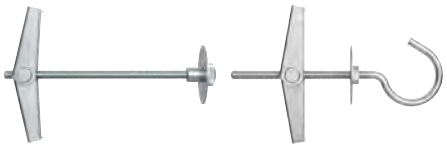






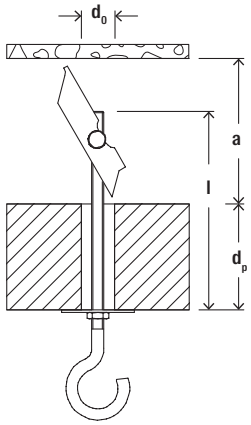

## Technical data

**Spring-toggle KD/KDH**



KD 3 / KD 4 KDH 3 / KDH 4

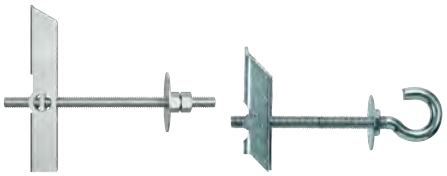
| Item | Item no. | Drill diameter $d_0$ [mm] | Max. panel thickness $d_p$ [mm] | Min. cavity depth a [mm] | Anchor length l [mm] | Thread ø x length [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **KD 3** | **080181** | 12 | 65 | 27 | 95 | M3 x 90 | 50 |
| **KDH 3** | **080182** | 12 | 51 | 27 | 105 | M3 x 80 | 25 |
| **KD 4** | **080183** | 14 | 69 | 34 | 105 | M4 x 100 | 25 |
| **KDH 4** | **080184** | 14 | 35 | 34 | 95 | M4 x 70 | 25 |
| **KD 3 B** | **080192** | 12 | 65 | 27 | 95 | M3 x 90 | 10 |
| **KD 4 B** | **080193** | 14 | 69 | 34 | 105 | M4 x 100 | 10 |




## Technical data

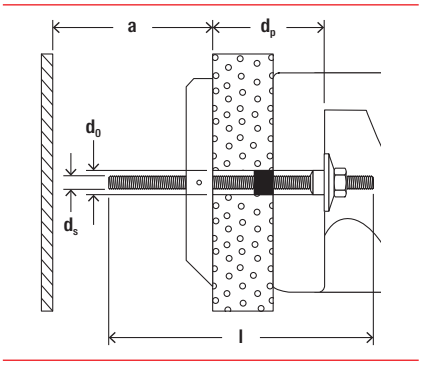


**Gravity toggle KD/KDH**



KD 5 + 6 + 8 KDH 5 + 6 + 8

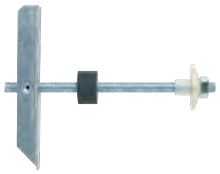
| Item | Item no. | Drill diameter $d_0$ [mm] | Max. panel thickness $d_p$ [mm] | Min. cavity depth a [mm] | Anchor length l [mm] | Thread ø x length [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **KD 5** | **080187** | 16 | 63 | 70 | 100 | M5 x 100 | 25 |
| **KDH 5** | **080188** | 16 | 60 | 70 | 130 | M5 x 90 | 20 |
| **KD 6** | **080185** | 16 | 63 | 70 | 100 | M6 x 100 | 25 |
| **KDH 6** | **080186** | 16 | 60 | 70 | 130 | M6 x 100 | 20 |
| **KD 8** | **080178** | 20 | 55 | 75 | 100 | M8 x 100 | 20 |
| **KDH 8** | **080179** | 20 | 55 | 75 | 130 | M8 x 100 | 20 |




## Technical data

**Gravity toggle KM**





KM 10

| | Item no. | Drill diameter $d_0$ [mm] | Max. panel thickness $d_p$ [mm] | Min. cavity depth a [mm] | Anchor length l [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | |
| **KM 10** | **050326** | 30 | 90 | 140 | 180 | M10 x 180 | 25 |

## Loads

**Toggle fixing KD**

Recommended loads[1] for a single anchor.

| Type | | | KD 3 | KD 4 | KD 5 | KD 6 | KD 8 |
|---|---|---|---|---|---|---|---|
| **Thread size** | | | M3 | M4 | M5 | M6 | M8 |
| **Recommended loads in the respective base material $F_{rec}$** [2] | | | | | | | |
| **Gypsum plasterboard** | 12.5 mm | [kN] | 0.15 | 0.15 | 0.15 | 0.15 | 0.18 |
| **OSB board** | ≥ 15 mm | [kN] | 0.34 | 0.58 | 0.85 | 0.85 | 0.89 |

[1] Required safety factors are considered.
[2] Valid for axial tensile load.
[3] Bending of the hook is decisive. Only for tension load.

## Loads

**Toggle fixing KDH**

Recommended loads[1] for a single anchor.

| Type | | | KDH 3 | KDH 4 | KDH 5 | KDH 6 | KDH 8 |
|---|---|---|---|---|---|---|---|
| **Thread size** | | | M3 | M4 | M5 | M6 | M8 |
| **Recommended loads in the respective base material $F_{rec}$** [2] | | | | | | | |
| **Gypsum plasterboard** | 12.5 mm | [kN] | 0.07[3] | 0.13[3] | 0.15 | 0.15 | 0.18 |
| **OSB board** | ≥ 15 mm | [kN] | 0.07[3] | 0.13[3] | 0.30[3] | 0.45[3] | 0.89 |

[1] Required safety factors are considered.
[2] Valid for axial tensile load.
[3] Bending of the hook is decisive. Only for tension load.

## Loads

| Toggle fixing KM | | |
|---|---|---|
| Mean ultimate loads. | | |
| **Type** | | **KM 10** |
| **Screw diameter** | | M10 |
| **Mean ultimate loads $F_u$** [1)2)3)] | **[kN]** | 13.0 |

[1)] Upon these failure loads an appropriate safety factor has to be considered.
[2)] Valid for tensile load, shear load and oblique load under any angle.
[3)] If the failure of the base material is not possible.

# Plasterboard fixing DuoBlade

The self-drilling plasterboard plug for fast and easy installation.





Smoke detectors



Mirrors



## Applications

- Smoke detectors
- Mirrors
- Curtain rods
- Blinds
- Lamps
- Pictures

## Advantages

- An innovative product of the fischer DuoLine with intelligent combinations for more power and more intelligence.
- The self-drilling fischer DuoBlade allows fast and easy installation in gypsum plasterboard and gypsum fibreboard.
- The black metal tip guarantees simple and safe installation.
- High torque when anchor is installed for the feelgood-factor and an optimum feeling when setting.
- PZ 2 drive - same drive for plug and screw.

## Certificates / Features

★★★★★ Nylon Quality

Glass Fibre Power

DuoLine

reddot design award winner 2019

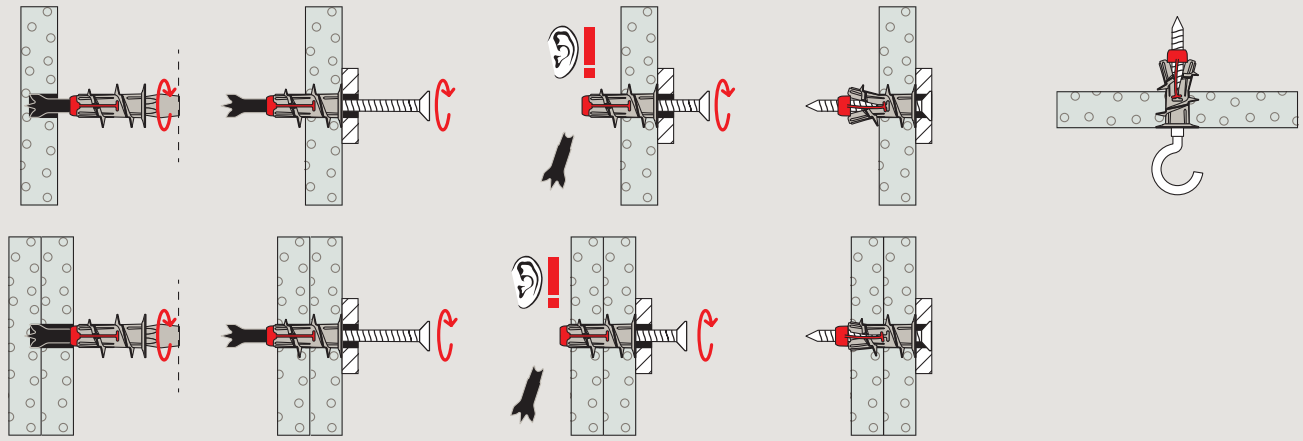
## Building materials

- Gypsum plasterboard, single and double-planked
- Gypsum fibreboard
- Lightweight cement boards

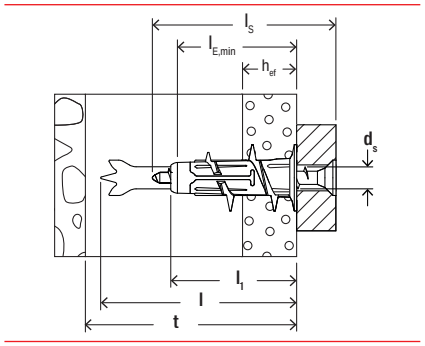
## Functioning

- The fischer DuoBlade is suitable for pre-positioned installation.
- The metal tip for better heat-resistant and cutting characteristics. Especially in double-layered plasterboard.
- The fischer DuoBlade can be used with wood, metal and chipboard screws of Ø4.0 to Ø5.0 mm.
- In gypsum fibreboard, pre-drilling with a drill Ø 8mm is recommended.

## Installation DuoBlade

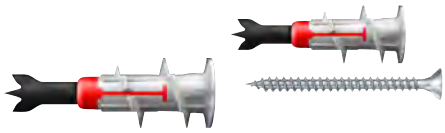







## Technical data

**Plasterboard fixing DuoBlade**



DuoBlade DuoBlade S

| Item | Item no. | Min. thickness to first supporting layer t [mm] | Anchor length l [mm] | Anchor length without drill tip $l_1$ [mm] | Anchorage depth $h_{ef}$ [mm] | Min. bolt penetration $l_{E,min}$ [mm] | Wood and chipboard screws $d_s$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **DuoBlade** | **545675** | 50 | 44 | 29 | 9.5 - 25 | 28 | 4.0 - 5.0 | PZ2 | 50 |
| **DuoBlade S** | **545676**[1] | 50 | 44 | 29 | 9.5 - 25 | 28 | 4.5 x 40 | PZ2 | 25 |
| **DuoBlade WH K NV** | **545685**[2] | 50 | 44 | 29 | 9.5 - 25 | 28 | 4.2 x 40 | – | 1 |
| **DuoBlade RH K NV** | **545686**[3] | 50 | 44 | 29 | 9.5 - 25 | 28 | 4.0 x 46 | – | 1 |

[1] With chipboard screw countersunk head.
[2] With screw with angle hook.
[3] With screw with round hook.

## Loads

**Plasterboard fixing DuoBlade**

Recommended loads[1] for a single anchor.

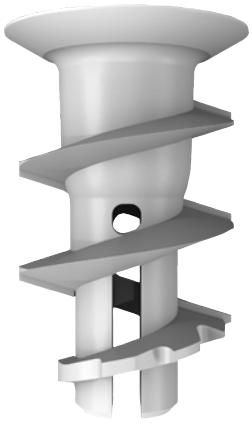
| Type | | | DuoBlade |
|---|---|---|---|
| **Chipboard screw diameter** | | **[mm]** | **4.0 - 5.0** |
| **Recommended loads in the respective base material $F_{rec}$** [2] | | | |
| **Gypsum plasterboard** | 9.5 mm | **[kN]** | 0.08 |
| **Gypsum plasterboard** | 12.5 mm | **[kN]** | 0.10 |
| **Gypsum plasterboard (e.g. Knauf Diamant board or Rigips Die Harte)** | 12.5 mm | **[kN]** | 0.18 |
| **Gypsum plasterboard** | 2 x 12.5 mm | **[kN]** | 0.20 |
| **Lightweight cement board** | 12.5 mm | **[kN]** | 0.08 |
| **Gypsum fibreboard** | 12.5 mm | **[kN]** | 0.34 |

[1] Required safety factors are considered. The given loads are valid for chipboard screws with the specified diameters. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).

[2] Valid for tensile load, shear load and oblique load under any angle.

# Plasterboard fixing GK

The fastest installation in gypsum plasterboard.





Wall lamps



Pictures



## Applications

- Pictures
- Lighting
- Electrical installations
- Fitting accessories
- Series installations

## Advantages

- The included setting tool combines the drilling and fixing setting functions. It thus allows for a fast and simple installation.
- The sharp, self-tapping thread of the GK enables a secure, positive fit fixing. This achieves a high load-bearing capacity.
- The short fixing length means that only a small amount of space is required behind the board. As a result, the GK can also be used in the case of unknown board thickness and cavity depth.
- The cross-drive recess in the head of the fixing means that the GK can also be screwed out like a screw without a setting tool.
- The GK can be used with the most wide-ranging screws, hooks and eye screws. This allows for a broad range of applications.

## Certificates / Features

★★★★★
Nylon
Quality

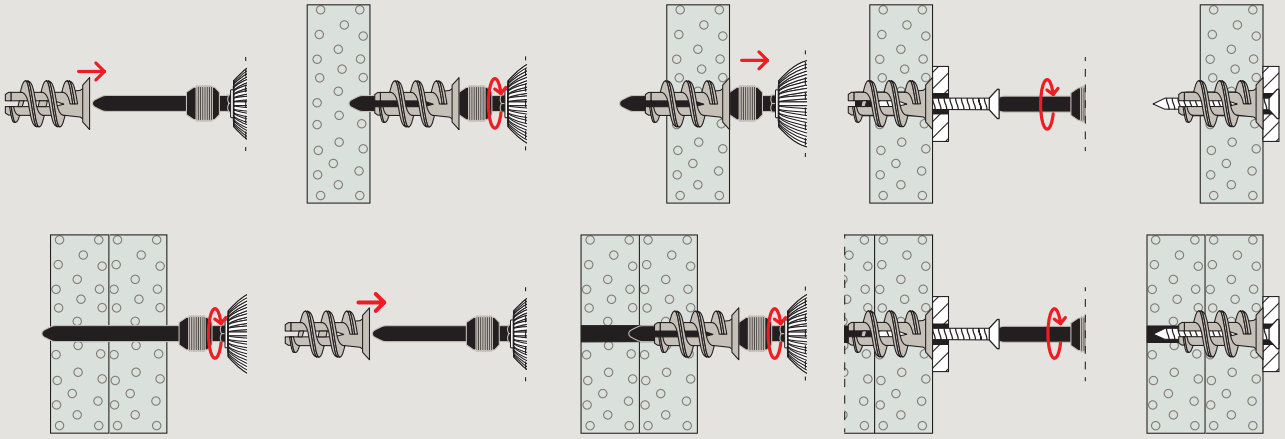
## Building materials

- Gypsum plasterboard, single and double-planked

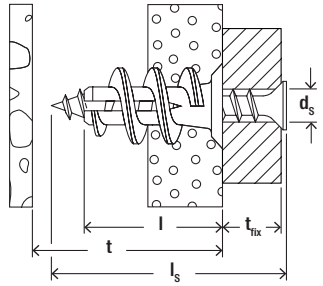
## Functioning

- The gypsum plasterboard fixing GK is suitable for pre-positioned installation.
- The GK is screwed flush into the gypsum plasterboard using the setting tool provided. Overtightening the fixing should be avoided. Therefore, the installation torque should be limited when using a battery operated screwdriver.
- Adapted for wood, self-tapping and chipboard screws of 4.0 to 5.0 mm diameter.
- For board thicknesses greater than 15 mm, drill a hole first by using the setting tool.
- Not suitable for gypsum fibreboard and tiled plasterboard.

## Installation GK








## Technical data

**Plasterboard fixing GK**



GK GK S

| Item | Item no. | Anchor length l [mm] | Min. thickness to first supporting layer t [mm] | Max. fixture thickness $t_{fix}$ [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **GK** | **052389**[1)2)] | 22 | 25 | – | 4.0 - 5.0 x Ls | – | 100 |
| **GK S** | **052390**[1)3)] | 22 | 25 | 13 | 4.5 x 35 | PZ2 | 50 |

[1)] Including installation tool GKW.
[2)] Min. screw length = length of plug 22 mm + thickness of building component.
[3)] Supplied with plasterboard screw.



GKW

| Item | Item no. | | Sales unit [pcs] |
|---|---|---|---|
| **GKW** | **052393** | | 10 |

## Loads

**Plasterboard fixing GK**

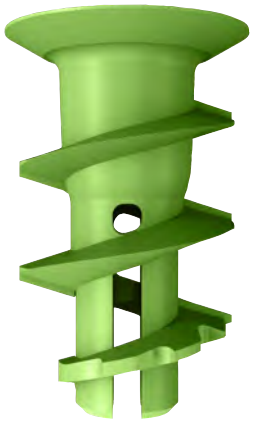
Recommended loads[1] for a single anchor.

| Type | | | GK |
|---|---|---|---|
| **Chipboard screw diameter** | | **[mm]** | 4.0 - 5.0 |
| **Recommended loads in the respective base material $F_{rec}$[2]** | | | |
| **Gypsum plasterboard** | 9.5 mm | **[kN]** | 0.07 |
| **Gypsum plasterboard** | 12.5 mm | **[kN]** | 0.08 |
| **Gypsum plasterboard** | 2 x 12.5 mm | **[kN]** | 0.11 |

[1] Required safety factors are considered. The given loads are valid for chipboard screws with the specified diameters. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tensile load, shear load and oblique load under any angle.

# Plasterboard fixing GK Green

The fastest installation in gypsum plasterboard.





Wall lamps



Pictures



## Applications

- Pictures
- Lighting
- Electrical installations
- Fitting accessories
- Series installations

## Advantages

- Produced with at least 50% renewable raw materials and therefore particularly environmentally friendly.
- Just as effective, secure and durable as regular GK plugs.
- The included setting tool combine the functions of drilling and setting fixings for direct and easy installation.
- Sharp, self-tapping thread for a positive-fit connection with a high load-bearing capacity.
- The cross-drive recess in the head of the fixing means that the GK Green can also easily be screwed out like a screw.
- The GK Green can be used with various screws, hooks and eye screws, making it very versatile in its applications.

## Certificates / Features

BIOBASED 50 - 85%
DIN Geprüft
8C029

★★★★★
Nylon
Quality

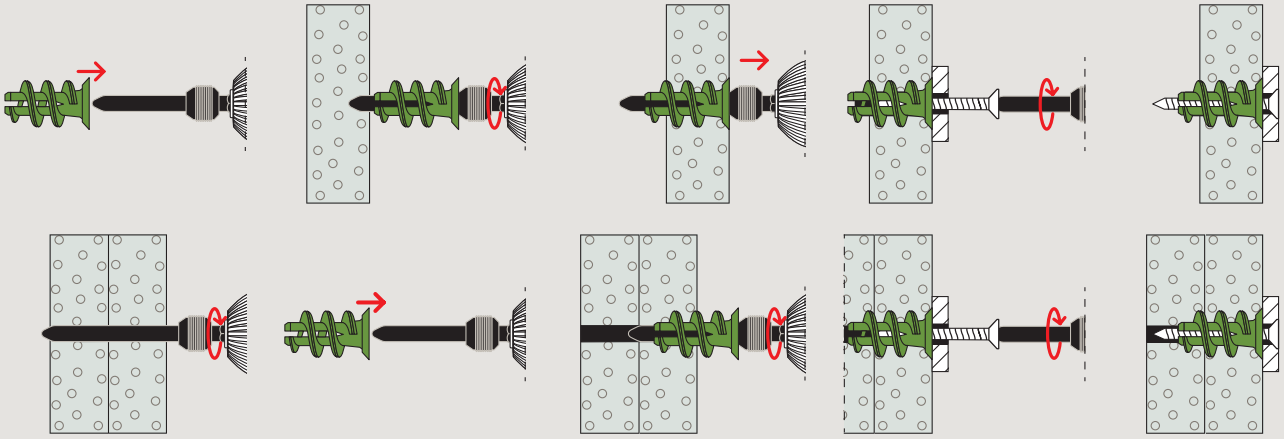
## Building materials

- Gypsum plasterboard, single and double-planked

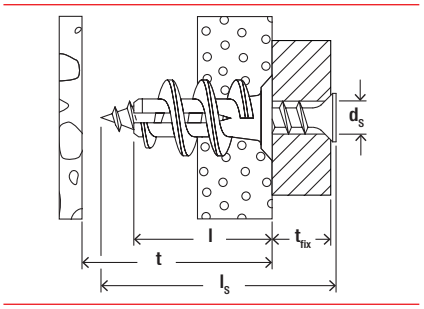
## Functioning

- The gypsum plasterboard fixing GK Green is suitable for pre-positioned installation.
- The gypsum plasterboard fixing GK Green is screwed flush into the gypsum plasterboard using the setting tool provided. Avoid manual and machine-aided overtightening.
- For board thicknesses greater than 15 mm, drill a hole first by using the setting tool.
- Not suitable for gypsum fibreboard and tiled gypsum plasterboard.
- Adapted for wood, sheet metal and chipboard screws with a diameter of 4.0 to 5.0 mm.

## Installation GK Green








## Technical data

**Plasterboard fixing GK Green**



GK Green



GK Green S

| Item | Item no. | Anchor length l [mm] | Min. thickness to first supporting layer t [mm] | Max. fixture thickness $t_{fix}$ [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **GK Green** | **524868**[1)2)] | 22 | 25 | – | 4.0 - 5.0 x Ls | – | 90 |
| **GK Green S** | **524869**[1)3)] | 22 | 25 | 13 | 4.5 x 35 | PZ2 | 45 |

[1)] Including installation tool GKW.
[2)] Min. screw length = length of plug 22 mm + thickness of building component.
[3)] Supplied with plasterboard screw.

## Installation tool GKW

**Installation tool GKW**



GKW

| Item | Item no. | | Sales unit [pcs] |
|---|---|---|---|
| **GKW** | **052393** | | 10 |

## Loads

**Plasterboard fixing GK Green**

Recommended loads[1] for a single anchor.

| Type | | | GK |
|---|---|---|---|
| **Chipboard screw** | | **[mm]** | 4.0 - 5.0 |
| **Recommended loads in the respective base material $F_{rec}$** [2] | | | |
| **Gypsum plasterboard** | 9.5 mm | **[kN]** | 0.07 |
| **Gypsum plasterboard** | 12.5 mm | **[kN]** | 0.08 |
| **Gypsum plasterboard** | 2 x 12.5 mm | **[kN]** | 0.11 |

[1] Required safety factors are considered. The given loads are valid for chipboard screws with the specified diameters. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for tensile load, shear load and oblique load under any angle.

# Plasterboard fixing metal GKM

The self-tapping metal fixing for gypsum plasterboard and gypsum fibreboard.





Wall lamps



Speaker cabinets



## Applications

- Pictures
- Lighting
- Electrical installations
- Fitting accessories

## Advantages

- Due to its material properties, the GKM can be used in gypsum plasterboard and gypsum fibreboard, and can be used with the most wide-ranging screws, hooks and eye screws. This allows for a broad range of applications.
- The sharp, self-tapping thread enables a secure, positive fit fixing. This achieves a high load-bearing capacity.
- The cross-drive recess means that a standard screwdriver or bit can be used. No special setting tool is required.
- The short fixing length means that only a small amount of space is required behind the board. As a result, the GKM can also be used in the case of unknown board thickness and cavity depth.

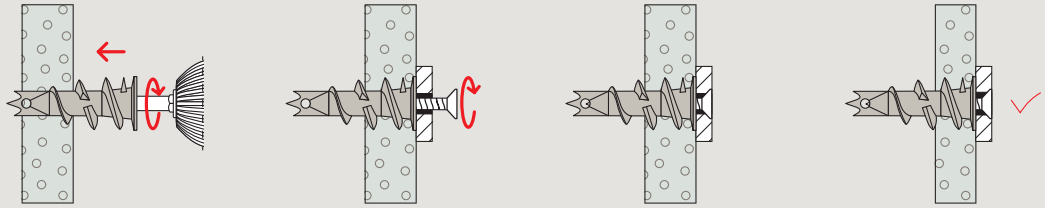
## Building materials

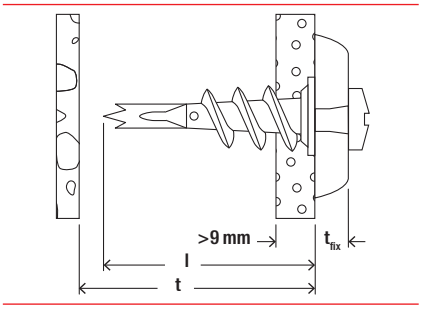
- Gypsum fibreboard
- Gypsum plasterboard

## Functioning

- The GKM is suitable for pre-positioned installation.
- The self-tapping metal fixing GKM taps itself into the plasterboard with a positive fit.
- Flush installation in the board building material. Overtightening the fixing should be avoided. Therefore, the installation torque should be limited when using a battery operated screwdriver.
- Adapted for wood, self-tapping and chipboard screws of 4.0 to 5.0 mm diameter.
- Pre-drill with a Ø 8 mm drill bit when using gypsum fibreboard and double-planked gypsum plasterboard.
- Not suitable for tiled plasterboard.

## Installation GKM








## Technical data

**Plasterboard fixing metal GKM**



GKM

| Item | Item no. | Anchor length l [mm] | Min. thickness to first supporting layer t [mm] | Max. fixture thickness $t_{fix}$ [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **GKM** | **024556** | 31 | 35 | – | 4.0 - 5.0 x Ls | – | 100 |
| **GKM S 12** | **040432**[1] | 31 | 35 | 12 | 4.5 x 35 | PZ2 | 100 |
| **GKM S 27** | **040434**[1] | 31 | 35 | 27 | 4.5 x 50 | PZ2 | 100 |

[1] Supplied with plasterboard screws countersunk head.

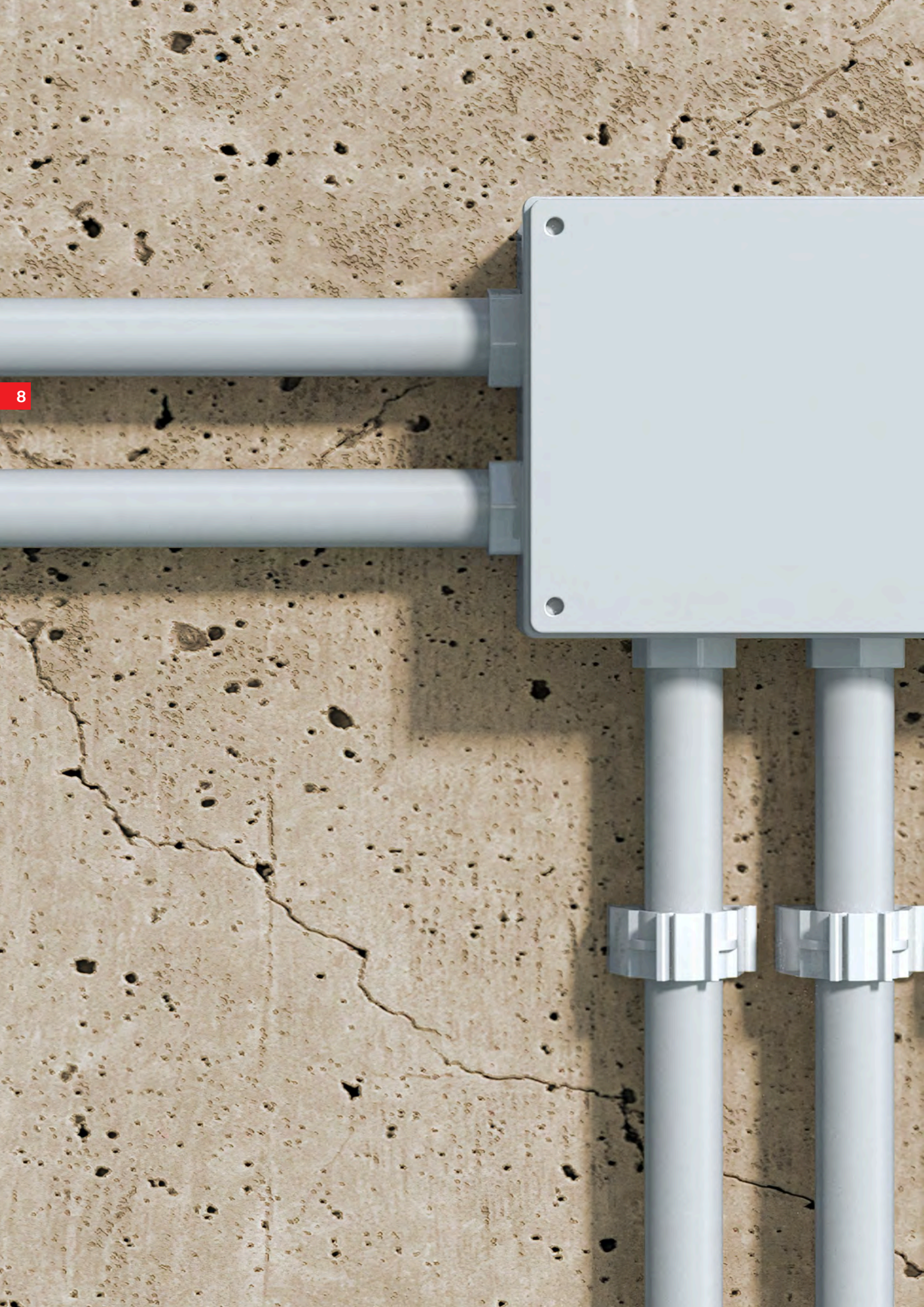
## Loads

**Plasterboard fixing metal GKM**

Recommended loads[1] for a single anchor.

| Type | | | GKM |
|---|---|---|---|
| **Chipboard screw diameter** | | **[mm]** | 4.0 - 5.0 |
| **Recommended loads in the respective base material $F_{rec}$**[2] | | | |
| **Gypsum plasterboard** | 9.5 mm | **[kN]** | 0.07 |
| **Gypsum plasterboard** | 12.5 mm | **[kN]** | 0.08 |
| **Gypsum plasterboard** | 2 x 12.5 mm | **[kN]** | 0.11 |

[1] Required safety factors are considered. The given loads are valid for chipboard screws with the specified diameters.
[2] Valid for tensile load, shear load and oblique load under any angle.


8

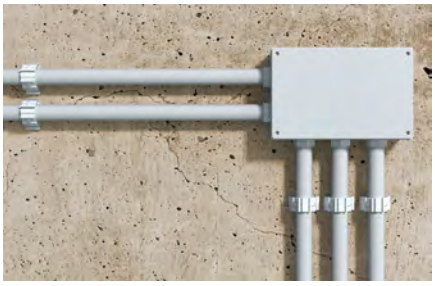
# 8
# Electrical fixings


| | | |
|---|---|---|
| Locking clip SCN | 526 |  |
| Pipe clip RC | 528 |  |
| Pipe clip FC | 530 |  |
| Saddle clip SCH | 532 |  |
| Fastening tie FF | 534 |  |
| ClipFix plus LS/ES/ZS | 536 |  |
| ClipFix plus SD | 538 |  |
| Cable clasp KB | 540 |  |
| Cable harness SHA | 542 |  |
| Multi cable support metal SHA M | 544 |  |
| Wall slot clip FWSC | 546 |  |
| Nail disc NSB | 548 |  |
| Nail clip NS/MNS | 550 |  |
| Spacer pipe clamp AM | 552 |  |
| Conduit clip BSM/BSMD/BSMZ | 554 |  |
| Textile web strapping GWB | 556 |  |
| Perforated steel banding LBV/LBK | 558 |  |
| Impact nail ED | 560 |  |
| Cable tie BN/UBN/GBN | 562 |  |
| Cable tie plug FCTP | 564 |  |
| Wireclip WIC | 566 |  |

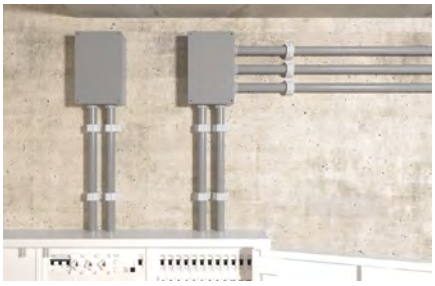
# Locking clip SCN

The easy-to-install and secure locking clip for fixing of pipes.





Plastic pipes



Plastic pipes



## Applications

- Plastic, empty pipes
- Flexible and rigid electric tubes
- Aluminium-, copper- and steel pipes

## Advantages

- When pressing, the locking clip SCN automatically embraces and locks the pipe, thus enabling convenient installation.
- The mechanical lock provides a secure and reopenable fixing.
- The integrated slotted hole allows for an easy and adjustable installation.
- The double-sided couplings allow several clips to be coupled together. This saves installation time and money.
- Flexible mounting with plugs and screws or with 11 mm C-profile rails.
- The durable nylon material is halogen- and silicone-free, allows year-round use even under frost and thus ensures a high level of safety.

## Certificates / Features

★★★★★
Nylon
Quality

## Building materials

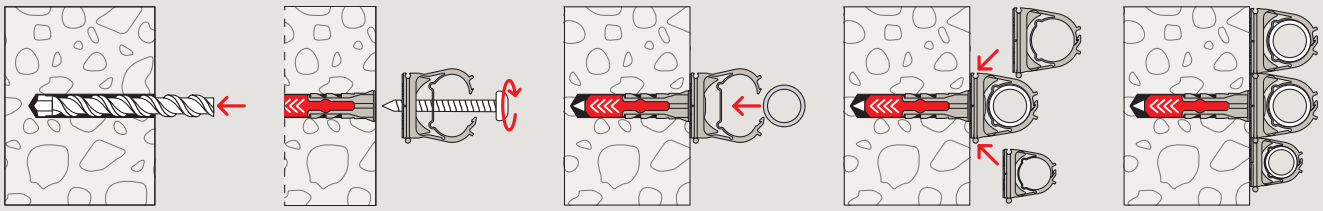
**When using 2-component DuoPower plug:**

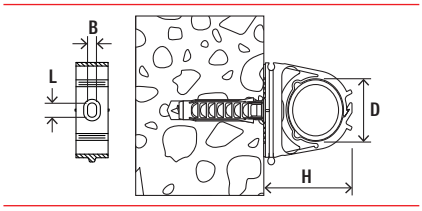
- Concrete
- Solid brick
- Solid sand-lime brick
- Aerated concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Plasterboard
- Gypsum plasterboard and gypsum fibreboards
- Hollow blocks made from lightweight concrete
- Cavity floor slabs made from bricks and concrete or similar
- Natural stone
- Chipboard
- Solid panel made from gypsum
- Solid brick made from lightweight concrete

## Functioning

- The locking clip SCN is fixed in pre-positioned installation with a suitable plug and screw or in 11 mm C-profile rails.
- Due to the mechanical locking, the pipes are securely fixed with the clip.
- Installation temperature -20 °C + 60 °C
- Temperature resistance when installed -40 °C to +80 °C.

## Installation SCN








## Technical data

**Locking clip SCN**



SCN

| Item | Item no. | Pipe to wall distance [mm] | Clamping range D [mm] | Dimension of slot B x L [mm] | Height H [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **SCN 16** | **501261** | 11 | 16 | 4.5 x 4.5 | 30 | 100 |
| **SCN 20** | **501262** | 11 | 20 | 4.5 x 6.5 | 36 | 100 |
| **SCN 25** | **501263** | 11 | 25 | 4.5 x 6.5 | 42 | 50 |
| **SCN 32** | **501264** | 13 | 32 | 4.5 x 7.5 | 48 | 50 |
| **SCN 40** | **501265** | 13 | 40 | 4.5 x 7.5 | 60 | 25 |
| **SCN 50** | **501266** | 14 | 50 | 4.5 x 7.5 | 73 | 25 |

# Pipe clip RC

The convenient pipe fixing.





Fixing plastic insulating conduits



Fixing plastic insulating conduits



## Applications

- Flexible and rigid plastic insulating pipes

## Advantages

- The pipe clip RC can be used with pre-installed clip fixing SD, with Hammerfix N 6 or in 11 mm C-shaped profile-rails, and thus allows for a flexible and cost-effective installation.
- The 6 mm-long hole allows for the optimal alignment of the pipe fixing and ensures a more user-friendly installation.
- Two additional pipe clips can be added to the sides of a pre-fixed pipe clip. This saves assembly time and materials.
- The long-lasting nylon material is halogen- and silicone-free. It can be used all year round, including during a frost. This ensures a high level of safety.

## Certificates / Features

★★★★★
Nylon
Quality

## Building materials

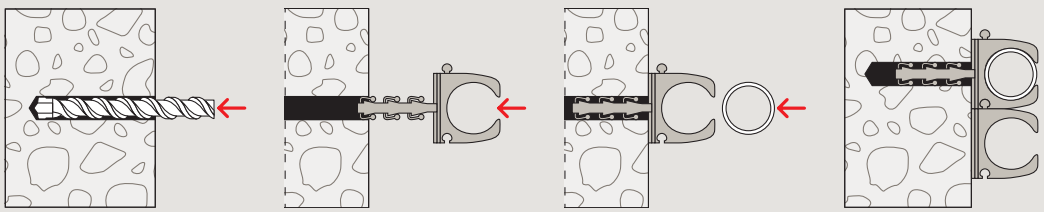
**When using ClipFix SD:**

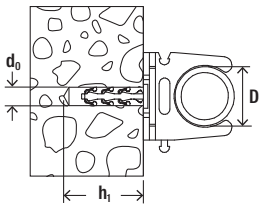
- Concrete
- Solid pumice block
- Solid sand-lime brick
- Natural stone with dense structure
- Solid brick

## Functioning

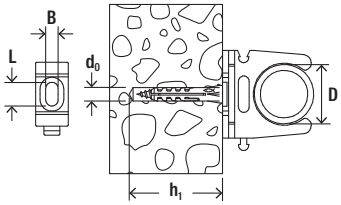
- Plastic insulation pipes are laid into the pipe clip. The pre-tensioning of the pipe clip holds the pipes securely.
- The pipe clip RC is adapted to be fixed with either clip fixing SD or Hammerfix N 6.
- Manually place the ClipFix plus SD directly into the drill hole. No additional screws are needed.
- The Hammerfix N is expanded when the nail is driven in, and holds by friction in the drill hole.
- Temperature resistance once installed from -20 °C to +80 °C.

## Installation RC






SF plus RC




RC IEC

## Technical data

**Pipe clip RC**



SF plus RC RC IEC

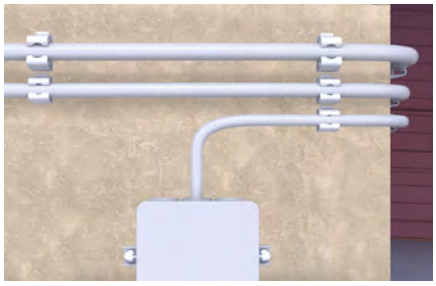
| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Suitable for IEC | Clamping range D [mm] | Dimension of slot B x L [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **SF plus RC IEC 16** | **048191** | 6 | 35 | – | 15 - 16 | 6 x 8 | 100 |
| **SF plus RC IEC 19** | **553383** | 6 | 35 | – | 18 - 19 | 6 x 10 | 100 |
| **SF plus RC IEC 20** | **048193** | 6 | 35 | – | 20 - 21 | 6 x 10 | 100 |
| **SF plus RC IEC 25** | **048197** | 6 | 35 | – | 24 - 25 | 6 x 10 | 50 |
| **SF plus RC IEC 32** | **048198** | 6 | 35 | – | 31 - 32 | 6 x 10 | 25 |
| **RC IEC 12** | **058194** | – | – | 12 | 12 - 13 | 6 x 7 | 100 |
| **RC IEC 16** | **058120** | – | – | 16 | 15 - 16 | 6 x 8 | 100 |
| **RC IEC 19** | **553363** | – | – | 19 | 18 - 19 | 6 x 10 | 100 |
| **RC IEC 20** | **058122** | – | – | 20 | 20 - 21 | 6 x 10 | 100 |
| **RC IEC 25** | **058198** | – | – | 25 | 24 - 25 | 6 x 10 | 50 |
| **RC IEC 32** | **058199** | – | – | 32 | 31 - 32 | 6 x 10 | 40 |
| **RC IEC 40** | **058200** | – | – | 40 | 38 - 40 | 6 x 10 | 40 |
| **RC IEC 50** | **079194**[1)] | – | – | 50 | 50 - 51 | 6 x 10 | 20 |
| **RC IEC 63** | **079196**[1)] | – | – | 63 | 62 - 64 | 6 x 10 | 15 |

[1)] Does not include latching catches, therefore cannot be mounted side by side.

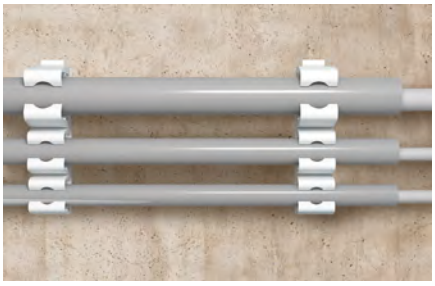
# Pipe clip FC

The flexible pipe clip for various diameters.





Cable fixing



Fixing plastic insulating conduits

8

## Applications

- Electric cables
- Flexible and rigid plastic insulating pipes

## Advantages

- The flexible pipe clip socket ensures a secure hold for various cable and pipe diameters, and reduces the number of products required.
- The pipe clip FC can be installed with both N 5 Hammerfixes and 11 mm-C-shaped profile-rails, and thus offers great flexibility.
- Two additional pipe clips can be added to the sides of a pre-fixed clip clamp. This saves assembly time and materials.
- The long-lasting nylon material is halogen-free. It can be used all year round, including during a frost. This ensures a high level of safety.

## Certificates / Features

★★★★★
Nylon
Quality

## Building materials

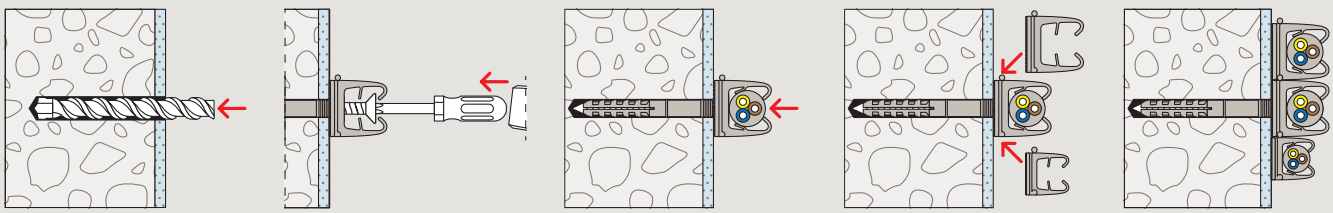
**When using Hammerfix N:**

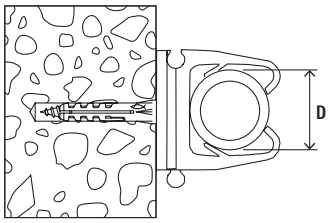
- Concrete
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Building brick
- Natural stone
- Aerated concrete
- Solid panel made from gypsum
- Solid brick made from lightweight concrete

## Functioning

- The clip clamp FC is adapted to suit the fixture using N 5 Hammerfixes.
- The Hammerfix N is expanded when the nail is driven in, and holds by friction in the drill hole.
- The cables or pipes are then laid in the clip clamp FC. The pre-tensioning of the clip clamp holds the cables or pipes securely.
- Temperature resistance once installed from -40 °C to +80 °C.

## Installation FC






## Technical data

**Pipe clip FC**



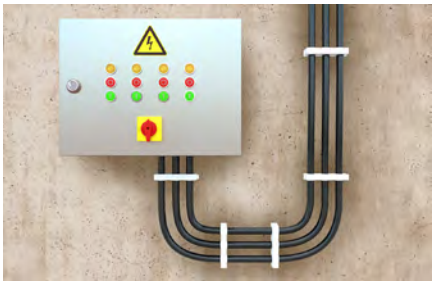
FC

| Item | Item no. | Clamping range D [mm] | Sales unit [pcs] |
|---|---|---|---|
| **FC 6 - 9 GR** | **068060** | 6 - 9 | 100 |
| **FC 9 - 12 GR** | **068062** | 9 - 12 | 100 |
| **FC 12 - 16 GR** | **068064** | 12 - 16 | 50 |
| **FC 16 - 20 GR** | **068066** | 16 - 20 | 25 |

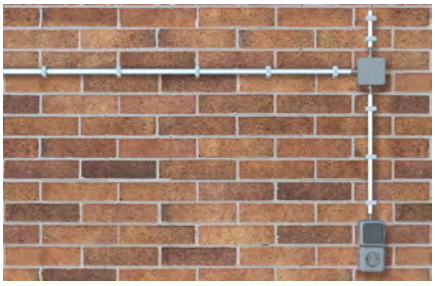
# Saddle clip SCH

The flexible cable clamp for various diameters.





Fixing cable harnesses



Plastic conduits



## Applications

- Electric cables
- Flexible and rigid plastic insulating pipes

## Advantages

- With its elastic spring tabs, the saddle clip SCH can bear different cable diameters. This increases flexibility and reduces the number of products required.
- Additional clips can be added to the sides of a pre-fixed clip. This saves installation time and materials.
- The long-lasting nylon material is halogen- and silicone-free. It can be used all year round, including during a frost. This ensures a high level of safety.

## Certificates / Features

★★★★★
Nylon
Quality

## Building materials

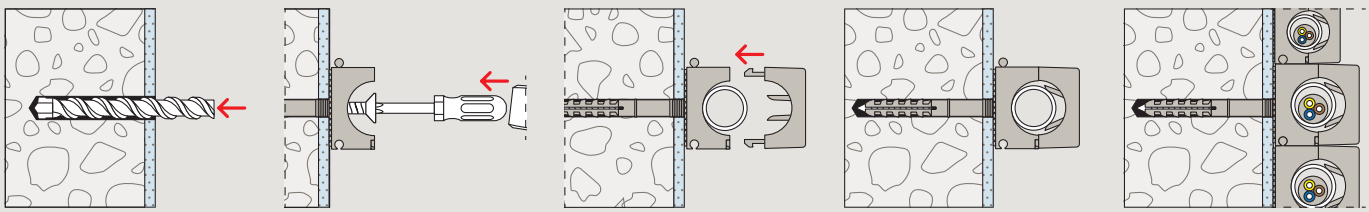
**When using Hammerfix N:**

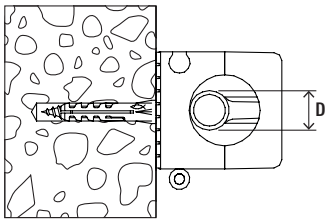
- Concrete
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Building brick
- Natural stone
- Aerated concrete
- Solid panel made from gypsum
- Solid brick made from lightweight concrete

## Functioning

- The clamp SCH is adapted to suit the fixture using N 5 Hammerfixes.
- The Hammerfix N is expanded when the nail is driven in, and holds by friction in the drill hole.
- The cables or pipes are then laid in the clamp SCH and fixed by inserting the locking latch.
- The internal tabs adapt to fit various cable or pipe diameters.
- Temperature resistance once installed from -40 °C to +80 °C.

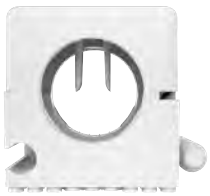
## Installation SCH






## Technical data

**Saddle clip SCH**



SCH grey



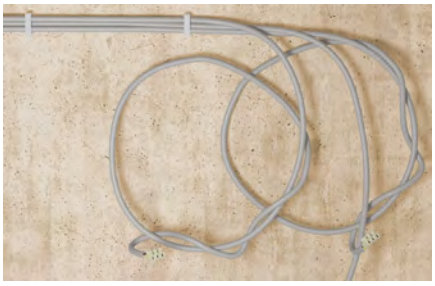
SCH transparent

| | RAL 7035 cable grey | transpa-rent | Clamping range D | Dimension of insulated pipes | Sales unit |
|---|---|---|---|---|---|
| | Item no. | Item no. | [mm] | | [pcs] |
| **Item** | | | | | |
| **SCH 812** | **068012** | **060012** | 8 - 12 | 6 x 1 - 8 x 1 | 100 |
| **SCH 1216** | **068016** | **060016** | 12 - 16 | 10 x 1 - 12 x 1 | 50 |
| **SCH 1619** | **068019** | **069019** | 16 - 19 | 15 x 1 | 50 |
| **SCH 1623** | **068023** | **060023** | 16 - 23 | 15 x 1 - 18 x 1 | 50 |
| **SCH 2332** | **068032** | **060032** | 23 - 32 | 22 x 1 - 22 x 1.5 | 25 |
| **SCH 3242** | **–** | **060042** | 32 - 42 | 22 x 1 - 22 x 1.5 | 25 |

# Fastening tie FF

Fixing tie for bundling and fixing of cables and pipes to the substrate.





Electric cables



Plastic pipes



## Applications

- Electric cables
- Flexible and rigid electric tubes
- Steel conduits

## Advantages

- The socket of the FF fixing tie is fixed to the substrate with a screw or screw and plug.
- The fixing tie can be used to bundle and fix several cables or pipes.
- Adjustable diameter of the tie loop.
- The socket of the fixing tie can be adjusted through its slotted hole.

## Certificates / Features

★★★★★
Nylon
Quality

## Building materials

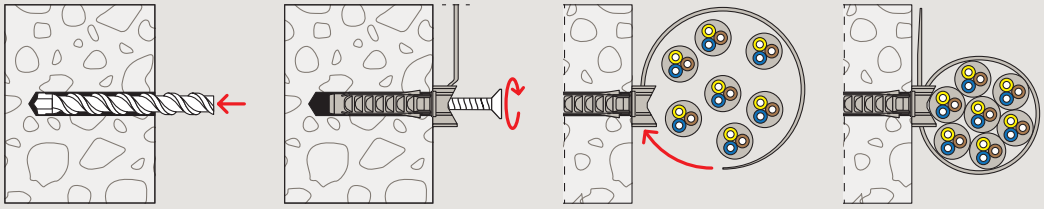
**When using 2-component DuoPower plug:**

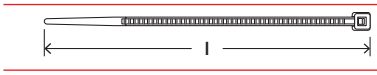
- Concrete
- Solid brick
- Solid sand-lime brick
- Aerated concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Plasterboard
- Gypsum plasterboard and gypsum fibreboards
- Hollow blocks made from lightweight concrete
- Cavity floor slabs made from bricks and concrete or similar
- Natural stone
- Chipboard
- Solid panel made from gypsum
- Solid brick made from lightweight concrete

## Functioning

- The socket of the fixing tie is fixed with the plug and screw suitable for the substrate.
- Recommended application temperature -20 °C to +60 °C.
- Temperature resistant when installed -40 °C to +80 °C.

## Installation FF






## Technical data

**Fastening tie FF**



FF

| Item | Item no. | Length l [mm] | Dimension fixing base [mm] | For cables and pipes from / to $d_{min}$ - $d_{max}$ [mm] | max. screw diameter [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FF 8 - 32** | **519808** | 24.5 | 25 x 15 x 20 | 8 - 32 | 4.5 | 80 |
| **FF 16 - 63** | **519809** | 24.5 | 25 x 15 x 20 | 16 - 63 | 4.5 | 40 |

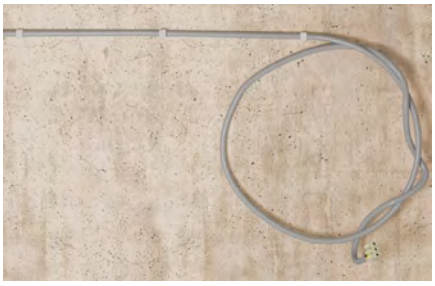
# ClipFix plus LS/ES/ZS

The user-friendly clip fixing for pipes and conduits.





Fixing flexible pipes



Cable fixing



## Applications

- Individual electric cables
- Cable bundles
- Flexible pipes
- Rigid plastic pipes

## Advantages

- The complete element combines anchor, screw and clamp. This saves materials, allows for one-handed installation, and reduces assembly time.
- The slimline geometry of the fixing element only protrudes slightly, thus saving space.
- The three different sizes of each of the cable strap LS, twin clamp ZS and single clamp ES cover a range of cable diameters, thus reducing storage.
- The long-lasting nylon material is flame resistant, halogen- and silicone-free, can be used all year round, including during a frost. This ensures a high level of safety.

## Certificates / Features

★★★★★
Nylon
Quality

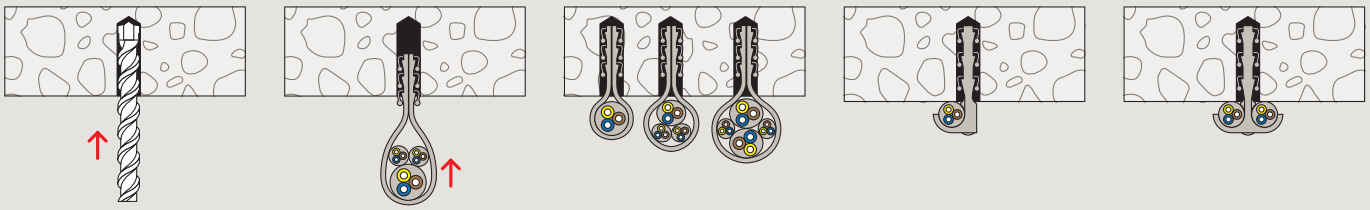
## Building materials

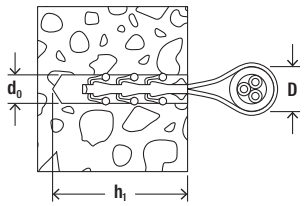
- Concrete
- Solid pumice block
- Solid sand-lime brick
- Natural stone with dense structure
- Solid brick

## Functioning

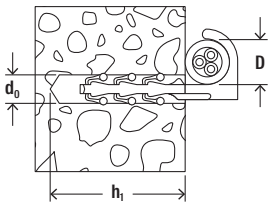
- The clip fixing is set into the drill hole without the need for any additional screws and fixes the pipe directly to the base material.
- The clamping force of the locking catch allows the ClipFix to hold itself in the drill hole.
- Place the clasp of the cable strap LS into the drill hole so that it is level and the teeth grip.
- Recommended loads (required safety factor considered): cable strap LS up to 6 kg, twin clamp ZS and single clamp ES up to 11 kg.
- Temperature resistance once installed from -20 °C to +80 °C.
- Flammability material UL 94-V0.

## Installation LS/ES/ZS

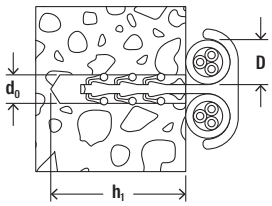





SF plus LS




SF plus ES




SF plus ZS



## Technical data

**ClipFix plus LS/ES/ZS**



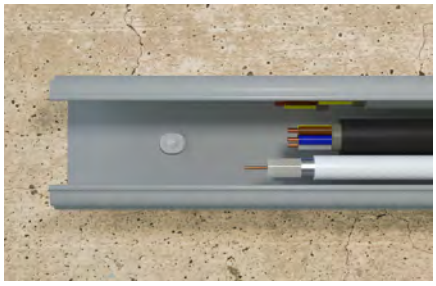
SF plus LS SF plus ES SF plus ZS

| Item | Item no. | Min. drill hole depth $h_1$ [mm] | Clamping range D [mm] | Sales unit [pcs] |
|---|---|---|---|---|
| **SF plus LS 3/13** | **058155** | 35 | 3 - 13 | 100 |
| **SF plus LS 8/28** | **058156** | 50 | 8 - 28 | 100 |
| **SF plus LS 20/40** | **058157** | 50 | 20 - 40 | 100 |
| **SF plus ES 10** | **048151** | 40 | 3 - 12 | 100 |
| **SF plus ES 18** | **048152** | 40 | 10 - 25 | 100 |
| **SF plus ES 28** | **058183** | 40 | 15 - 31 | 100 |
| **SF plus ZS 10** | **058184** | 35 | 3 - 12 | 100 |
| **SF plus ZS 18** | **048161** | 40 | 10 - 25 | 100 |
| **SF plus ZS 28** | **048162** | 40 | 15 - 31 | 75 |

# ClipFix plus SD

The user-friendly clip fixing for cable ducts and cable clasps.





Fixing cable ducts



Fixing cable harnesses



## Applications

- Cable channels
- Cable clasps
- Installation base cable harness
- Flat building components

## Advantages

- The ClipFix plus SD combines anchor and screw. This saves on materials and makes it easier to affix cable ducts that are difficult to access without the need for additional tools.
- The simple clip fixing reduces installation time.
- The extended shank of the FS plus SD 40 allows bridging of non-bearing plaster layers, as well as the fixing of thicker attachments.
- The long-lasting nylon material is flame resistant, halogen- and silicone-free. It can be used all year round, including during a frost. This ensures a high level of safety.

## Certificates / Features

★★★★★
Nylon
Quality

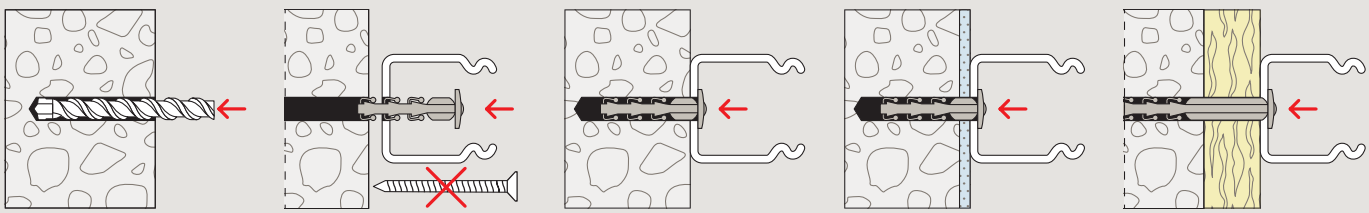
## Building materials

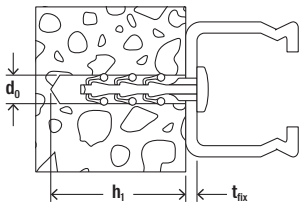
- Concrete
- Solid pumice block
- Solid sand-lime brick
- Natural stone with dense structure
- Solid brick

## Functioning

- To fix, manually place the ClipFix plus SD directly into the drill hole. No additional screws are needed.
- The clamping force of the locking catch allows the ClipFix to hold itself in the drill hole.
- Recommended loads (required safety factor considered): clip fixing SD up to 11 kg.
- Temperature resistance once installed from -20 °C to +80 °C.
- Flammability material UL 94-V0.

## Installation SD






## Technical data

**ClipFix plus SD**



SF plus SD

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Max. usable length $t_{fix}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|
| **SF plus SD 30** | **058178** | 6 | 35 | 4 | 200 |
| **SF plus SD 40** | **058179** | 6 | 35 | 15 | 100 |

# Cable clasp KB

The flat cable clasp for space-saving cable fixing.





Fixing cable harnesses



Fixing cable harnesses



## Applications

- Several individual cables in a small installation space
- Multiple single cables in false ceilings

## Advantages

- The flat design of the KB cable clasp allows for a space-saving cable fixing, and simplifies subsequent cable-laying.
- The combination of cable clasp KB and ClipFix SD allows for one-handed installation, thus enabling a flexible and economic installation.
- The long-lasting nylon material is halogen- and silicone-free. It can be used all year round, including during a frost. This ensures a high level of safety.

## Certificates / Features

★★★★★
Nylon
Quality

## Building materials

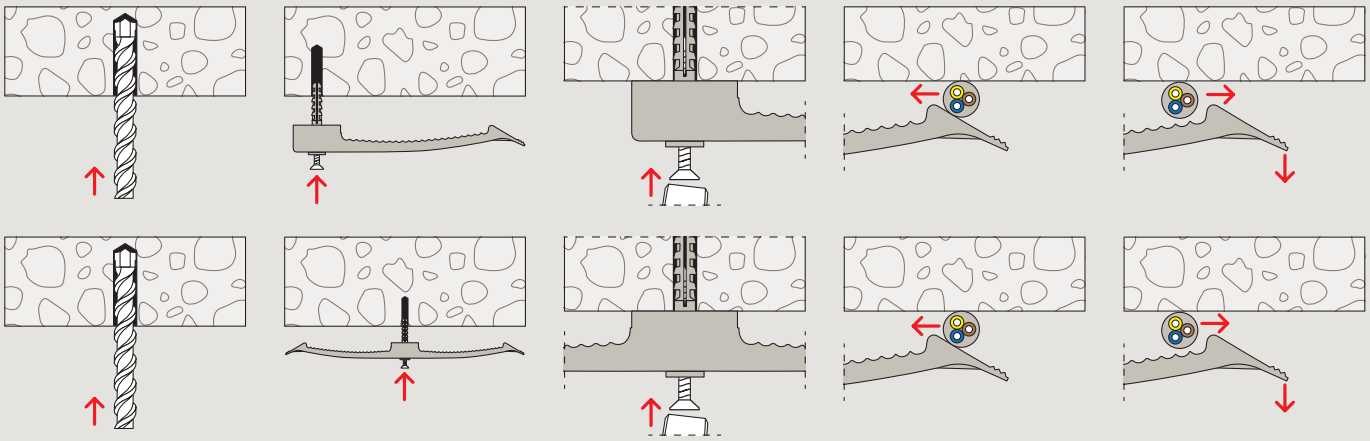
**When using ClipFix SD:**

- Concrete
- Solid pumice block
- Solid sand-lime brick
- Natural stone with dense structure
- Solid brick

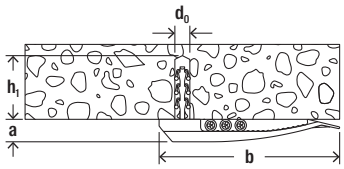
## Functioning

- The cable clasp KB is adapted to suit the fixture with clip fixing SD or Hammerfix N6.
- Place the ClipFix plus SD directly into the drill hole by hand. No additional screws are needed.
- The Hammerfix N is expanded when the nail is driven in, and holds by friction in the drill hole.
- After installation, the cables are pulled under the clasp. Additional cables can be easily laid after installation too.
- Temperature resistance once installed from -20 °C to +80 °C.

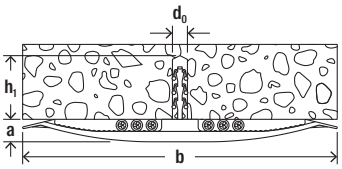
## Installation KB



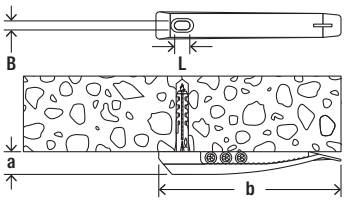




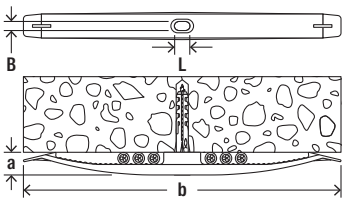

SF plus KB 8




SF plus KB 16




KB 8




KB 16

## Technical data

**Cable clasp KB**



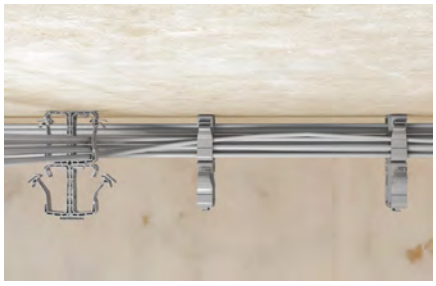
SF plus KB 8 | SF plus KB 16 | KB 8 | KB 16

| Item | Item no. | Dimensions a x b [mm] | Dimension of slot B x L [mm] | Max. number of ducts | Sales unit [pcs] |
|---|---|---|---|---|---|
| **SF plus KB 8** | **048171** | 15 x 133 | 6 x 10 | 8 ducts NYM 3 x 1,5 | 50 |
| **SF plus KB 16** | **048172** | 15 x 230 | 6 x 10 | 16 ducts NYM 3 x 1,5 | 25 |
| **KB 8** | **058135** | 15 x 133 | 6 x 10 | 8 ducts NYM 3 x 1,5 | 50 |
| **KB 16** | **058136** | 15 x 230 | 6 x 10 | 16 ducts NYM 3 x 1,5 | 50 |

# Cable harness SHA

The adaptable cable harness for fixing cable bundles.





Fixing cable bundles



Fixing cable bundles



## Applications

- Electric cables, loose and bundled

## Advantages

- Simple bundling and economical laying of multiple electric cables.
- The seal of the cable harness SHA makes it easy to lay cables at a later date, thus ensuring high user-friendliness.
- Combining several SHA cable harnesses allows for a cost-effective fixing of cables to just one MS installation base.
- The MS installation base allows for various fixing options, and offers great flexibility for the installation.
- The long-lasting nylon material is halogen- and silicone-free, can be used all year round, including during a frost, and thus ensures a high level of safety.

## Certificates / Features

★★★★★
Nylon
Quality

## Building materials

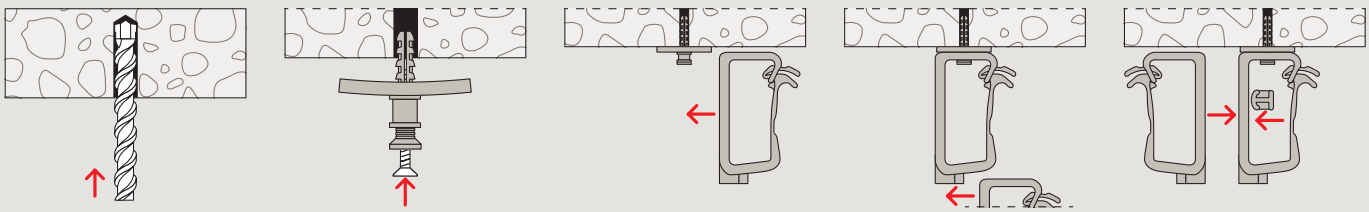
**When using ClipFix SD:**

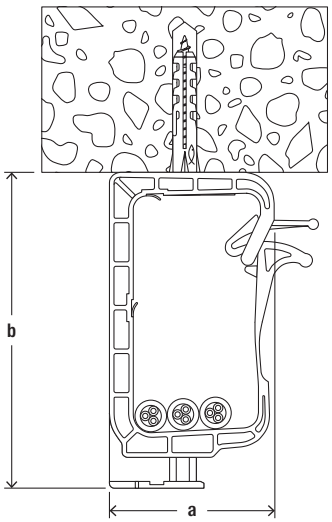
- Concrete
- Solid pumice block
- Solid sand-lime brick
- Natural stone with dense structure
- Solid brick

## Functioning

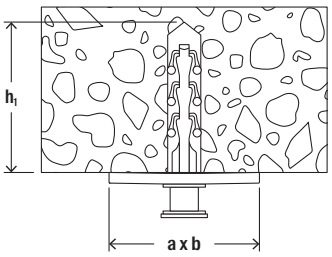
- Cable bundles can be laid in the cable harness SHA. The seal makes it easy to lay cables at a later date.
- The cable harness SHA can either be affixed with ClipFix plus, installation base MS or with plugs and screws.
- Several SHA cable harnesses can be combined below one another.
- The SHA cable harnesses can also be lined up adjacent to one another with the connection piece SHA KP.
- The maximum installation distance of 80 cm must not be exceeded.
- Temperature resistance once installed from -20 °C to +80 °C.

## Installation SHA






SHA




SF plus MS



## Technical data

**Cable harness SHA**



SHA



SHA MS



SF plus MS



SHA KP

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Dimensions a x b [mm] | Max. number of ducts | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **SHA 15** | **058139** | – | – | 93 x 49 | 15 ducts NYM 3 x 1,5 | 50 |
| **SHA 30** | **058140** | – | – | 128 x 59 | 30 ducts NYM 3 x 1,5 | 25 |
| **SHA MS** | **058141** | – | – | 41 x 27 | – | 50 |
| **SF plus MS** | **048181** | 6 | 35 | – | – | 50 |
| **SHA KP** | **058142** | – | – | – | – | 50 |

# Multi cable support metal SHA M

Metal multi-cable support with high mechanical resistance and approval.





Cable fixing to the ceiling



Cable fixing to the wall



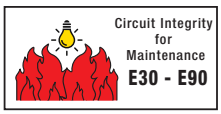
## Applications

- Fixing of cables with circuit integrity maintenance.
- Installation of electrical cables above fire protection ceilings.

## Advantages

- The fischer metal multi cable support SHA M has a high mechanical strength and thus offers a long service life and safety in the event of fire.
- It is approved as a cable-specific variant for circuit integrity maintenance of electric cable systems in accordance with DIN 4102 Part 12.
- This makes it suitable for safe installation above fire protection ceilings.
- Depending on the version, 15, 30 or 70 cables can be fixed.
- The lock, which can be operated without tools, allows easy subsequent cable-laying and thus ensures a high degree of ease of installation.
- The multi cable support is variably suitable for wall and ceiling installation.
- Halogen-free and without fire load.

## Certificates / Features




## Building materials

**Approved for fastening with nail anchor FNA II:**

- Concrete C12/15 to C50/60, cracked, for multiple fixings of non-structural applications

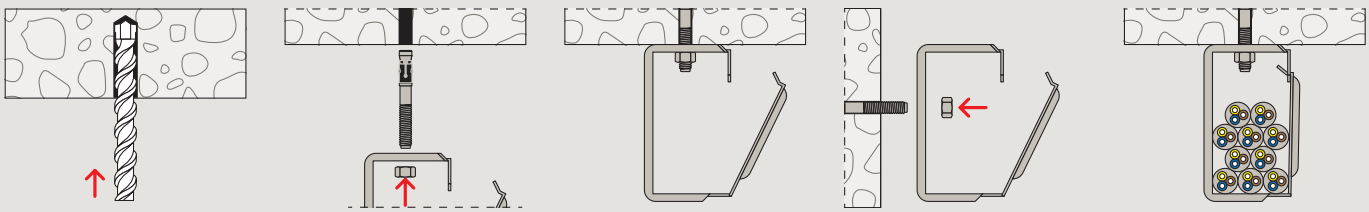
**Also suitable for:**

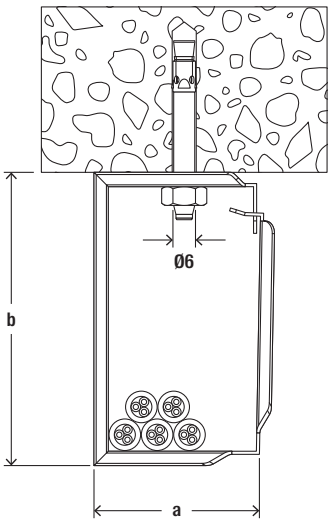
- Solid sand-lime brick
- Natural stone with dense structure
- Prestressed hollow-core concrete slabs

## Functioning

- The multi cable support is fixed to walls or ceilings with plugs and screws or metal anchors suitable for the substrate and application.

## Installation SHA M








## Technical data

**Multi cable support metal SHA M**



SHA M

| Item | Item no. | Mounting pipe ø [mm] | Dimensions [mm] | Max. number of ducts | Sales unit [pcs] |
|---|---|---|---|---|---|
| **SHA M 15** | **544933** | 6 | 66.7 x 41.9 x 30.6 | 15 ducts NYM 3 x 1,5 | 50 |
| **SHA M 30** | **544934** | 6 | 92.8 x 58.1 x 33.6 | 30 ducts NYM 3 x 1,5 | 25 |
| **SHA M 70** | **544935** | 6 | 126.0 x 104.0 x 80.0 | 70 ducts NYM 3 x 1,5 | 10 |

# Wall slot clip FWSC

The quick tool-free cable fixing in wall slots.





Cable fixing in wall slots > 30 mm



Cable fixing in wall slots < 55 mm



## Applications

- Fixing of cables in wall slots of 30 - 55 mm width.

## Advantages

- With the fischer FWSC wall slot clip, cables can be fixed quickly and without tools in wall slots 30 to 55 mm wide.
- This reduces installation time by up to 50%.
- The high expansion power of the wall slot clip guarantees a reliable fixing of the cables.
- Damage to the cables can be excluded due to the expansion principle.
- Thanks to its neutral colour, the wall slot clip does not shine through the plaster.
- The wall slot clip is made of halogen-free material.

## Building materials

- Concrete
- Masonry

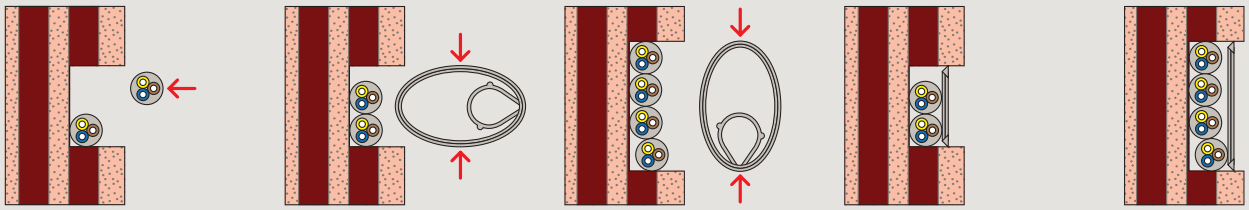
## Versions

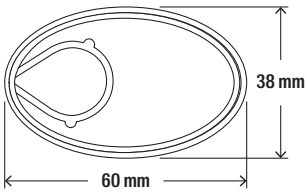
- POM, recyclable

## Functioning

- The cables to be fastened are inserted into the wall slot.
- By pressing together the wall slot clip is compressed and tensed to be ready for installation in the wall slot.
- The wall slot clip can be compressed in length or width as required and thus used for wall slots with a width of 30 to 55 mm.

## Installation FWSC






## Technical data

**Wall slot clip FWSC**



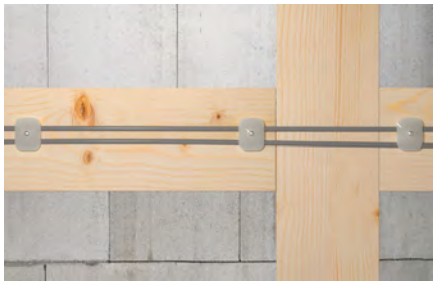
FWSC

| | Item no. | Max. slot width [mm] | Dimensions [mm] | Sales unit [pcs] |
|---|---|---|---|---|
| **Item** | | | | |
| **FWSC 30 - 55** | **545792** | 55 | 38 x 60 x 4 | 50 |

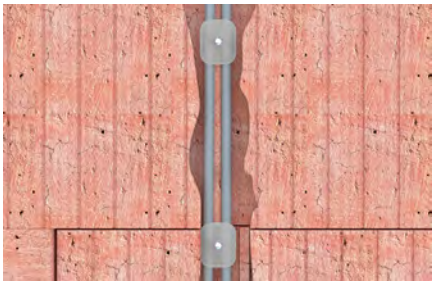
# Nail disc NSB

The secure cable fixing in wall slots.





Cable fixing



Cable fixing in slots



## Applications

- For fixing cables in wall slots

## Advantages

- The nail disc NSB allows for use in two slot widths.
- The vaulted structure of the nail disc ensures an optimal contact pressure and, as such, for a secure hold.
- The flat nail disc only protrudes slightly, and can thus be easily plastered over.
- The nail disc NSB is made from high-strength polypropylene. The nail is made from hardened, galvanised steel. The tried and tested material combination for in-wall installation.

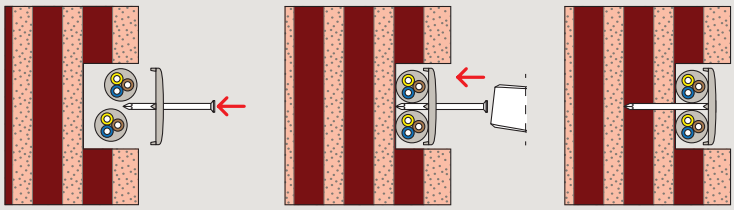
## Building materials

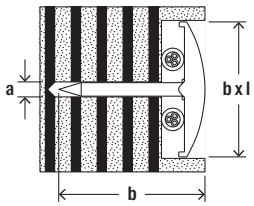
- Vertically perforated brick
- Pumice
- Lightweight aggregate concrete
- Aerated concrete
- Hardboard
- Wood
- Chipboard
- Plywood
- Solid panel made from gypsum

## Functioning

- Pull in cable.
- Align the nail disc with either dimensions 27 mm or 34 mm, depending on the slot width, and hit the nail in with a hammer.
- The cables are fixed in the wall slots by the curved washer.

## Installation NSB






## Technical data

**Nail disc NSB**



NSB

| Item | Item no. | Dimension of nail a x b [mm] | Dimension of disc b x l [mm] | Sales unit [pcs] |
|---|---|---|---|---|
| **NSB 2/40** | **048308** | 2 x 40 | 27 x 34 | 200 |
| **NSB 2/50** | **048309** | 2 x 50 | 27 x 34 | 150 |
| **NSB 2/60** | **048310** | 2 x 60 | 27 x 34 | 100 |
| **NSB 3/40** | **048311** | 3 x 40 | 27 x 34 | 150 |
| **NSB 3/50** | **048312** | 3 x 50 | 27 x 34 | 150 |
| **NSB 3/60** | **048313** | 3 x 60 | 27 x 34 | 100 |

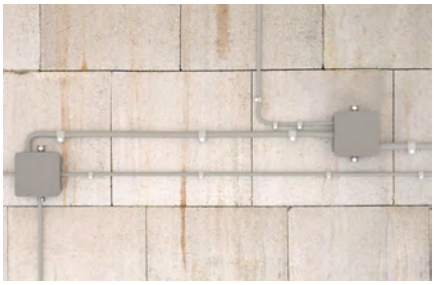
# Nail clip NS/MNS

The fast fixing for electric cables.





Cable fixing



Cable fixing

8

## Applications

- To fix single electric cables with varying diameters

## Advantages

- The nail clip features a pre-assembled zinc-plated nail, allowing for a fast fixing, thus reducing assembly time.
- The small space required for fixing simplifies installation in narrow spaces.
- The nail clip MNS covers cable diameters from 4 mm to 14 mm with just 3 sizes.

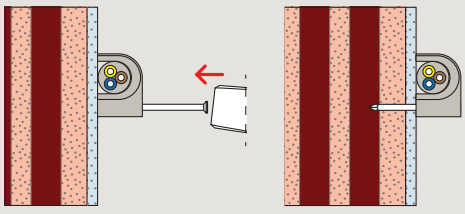
## Building materials

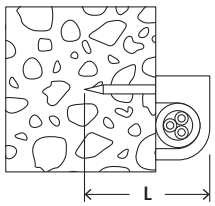
- Hardboard
- Wood
- Aerated concrete
- Chipboard
- Plywood
- Solid gypsum panels and other plastered substrates

## Functioning

- Position the nail clip with the laid cable. Hammer in the pre-assembled nail with a hammer.

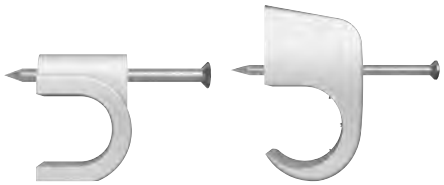
## Installation NS, MNS






## Technical data

**Nail clip NS/MNS**



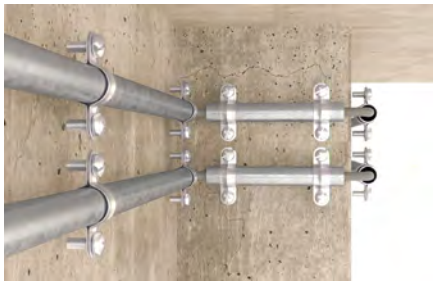
NS MNS

| Item | Item no. | For cable [mm] | Length of nail L [mm] | Sales unit [pcs] |
|---|---|---|---|---|
| **NS 7** | **058173** | 7 | 25 | 100 |
| **NS 8** | **058174** | 8 | 25 | 100 |
| **NS 9** | **058175** | 9 | 25 | 100 |
| **NS 10** | **058176** | 10 | 30 | 100 |
| **NS 12** | **058177** | 12 | 35 | 100 |
| **MNS 4-7** | **094673** | 4 - 7 | 25 | 100 |
| **MNS 7-11** | **094674** | 7 - 11 | 25 | 100 |
| **MNS 10-14** | **094675** | 10 - 14 | 30 | 100 |

# Spacer pipe clamp AM

The installation-friendly metal spacing disc for cables and pipes.





Fixing steel armoured conduits



Fixing conduits



## Applications

- Steel conduits
- Electric cables
- Copper and metal pipes

## Advantages

- The fast-locking latch ensures easy opening and closing without completely removing the screw, and allows for a simple and fast installation.
- The pre-fitted combination screw with conventional slotted or recessed screw head allows for the use of different screwdrivers, thus allowing for a simple installation.

## Building materials

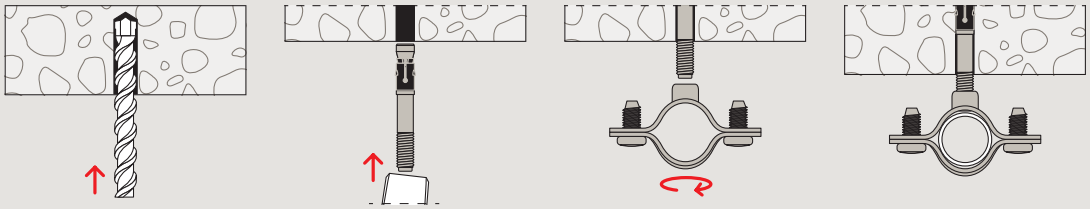
**When using nail anchor FNA II:**
- Concrete
- Solid sand-lime brick
- Natural stone with dense structure
- Pre-stressed concrete hollow slabs

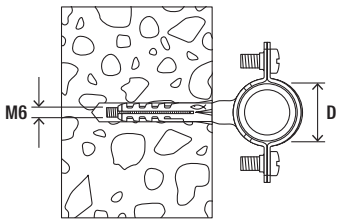
**When using Hammerfix N:**
- Concrete
- Solid sand-lime brick
- Building brick
- Natural stone
- Solid brick made from lightweight concrete

## Functioning

- The spacer pipe clamp AM with M6 thread can be secured with the fischer nail anchor FNA II 6x30 M6x41, stud screw STST 6x60 and STST 6x80, or Hammerfix N 6x40/10 M6 as desired.

## Installation AM






## Technical data

**Spacer pipe clamp AM**



AM

| Item | Item no. | Dimension IEC | Clamping range D [mm] | Sales unit [pcs] |
|---|---|---|---|---|
| **AM 8** | **060185** | – | 8 - 10 | 50 |
| **AM 10** | **060186** | – | 10 - 11 | 50 |
| **AM 12** | **060187** | 12 | 12 - 13 | 50 |
| **AM 14** | **060188** | – | 14 - 15 | 50 |
| **AM 16** | **060189** | 16 | 15 - 17 | 50 |
| **AM 18** | **060190** | – | 18 - 19 | 50 |
| **AM 20** | **060191** | 20 | 20 - 21 | 50 |
| **AM 22** | **060192** | – | 22 - 23 | 50 |
| **AM 24** | **060193** | – | 24 - 25 | 50 |
| **AM 26** | **060194** | 25 | 26 - 27 | 50 |
| **AM 28** | **060195** | – | 28 - 29 | 50 |
| **AM 32** | **060209** | 32 | 32 - 33 | 25 |
| **AM 30** | **060196** | – | 30 - 31 | 50 |
| **AM 34** | **060210** | – | 34 - 35 | 25 |
| **AM 37** | **060211** | 37 | 37 - 39 | 20 |
| **AM 40** | **090849** | 40 | 40 - 42 | 15 |
| **AM 50** | **090850** | 50 | 50 - 52 | 10 |
| **AM 63** | **090851** | 63 | 63 - 65 | 10 |

# Conduit clip BSM/BSMD/BSMZ

The flat metal clip for cables and pipes.





Fixing armoured conduits



## Applications

- Electrical conduits
- Flexible and rigid plastic insulating pipes
- Steel conduits

## Advantages

- The open conduit clip BSM is ideal for the post-installation fixing of conduits.
- The conduit clip allows for a direct fixing with impact nails and is, therefore, quick and easy to install.
- Two conduits or pipes can be fixed with just one fixing point with the twin clamp BSMZ.

## Building materials

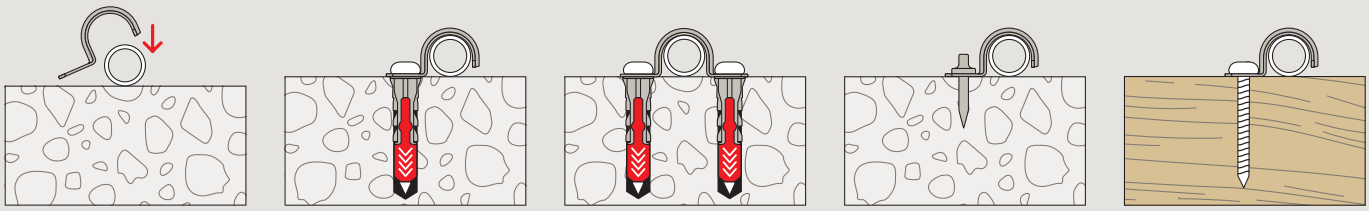
**When using impact nail ED:**

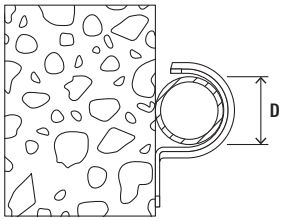
- Concrete

## Functioning

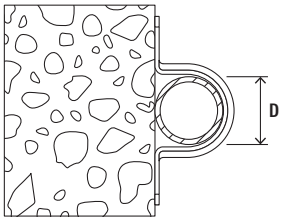
- Depending on your requirements, use a conduit clip with 1 or 2 fixing points, or a twin clamp.
- The conduits or pipes are laid in the conduit clip. Assembling the clip fixes the conduits / pipes.
- Our recommendation for fixtures on concrete: Impact nail.

## Installation BSM

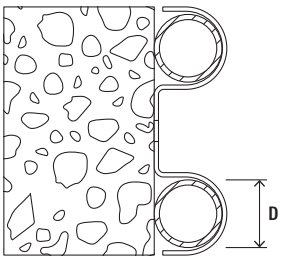





BSM




BSMD




BSMZ

## Technical data

**Conduit clip BSM**



BSM BSMD BSMZ

| Item | BSM Item no. | BSMD Item no. | BSMZ Item no. | Dimension IEC | Clamping range D [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| 6 | 015014 | 015066 | – | – | 6 | 100 |
| 8 | 015015 | – | – | – | 8 | 100 |
| 8 | – | 015067 | – | – | 8 | 50 |
| 10 | 015016 | – | – | – | 10 | 100 |
| 10 | – | 015068 | – | – | 10 | 50 |
| 12 | 015017 | 015069 | – | – | 12 | 50 |
| 14 | 015018 | 015070 | – | – | 14 | 50 |
| 15 | 015093 | – | – | 15 | 15 | 50 |
| 16 | 060149 | 060169 | – | 16 | 16 | 50 |
| 18 | 060150 | 060170 | – | – | 18 | 50 |
| 20 | 060151 | 060171 | 079535 | 20 | 20 | 50 |
| 22 | 060152 | 060172 | – | – | 22 | 50 |
| 24 | 060153 | 015075 | 079536 | – | 24 | 50 |
| 25 | 090839 | 090844 | – | 25 | 25 | 50 |
| 26 | 096958 | 015076 | – | – | 26 | 50 |
| 28 | 060155 | – | 079537 | – | 28 | 50 |
| 28 | – | 060175 | – | – | 28 | 25 |
| 30 | 015019 | – | – | – | 30 | 50 |
| 30 | – | 015078 | – | – | 30 | 25 |
| 32 | 090840 | – | – | 32 | 32 | 50 |
| 32 | – | 090845 | – | 32 | 32 | 25 |
| 37 | 060158 | 060178 | – | – | 37 | 25 |
| 40 | 090841 | 090846 | – | 40 | 40 | 25 |
| 42 | 015021 | – | – | – | 42 | 25 |
| 42 | – | 015081 | – | – | 42 | 20 |
| 47 | – | 015082 | – | – | 47 | 20 |
| 50 | 090842 | – | – | 50 | 50 | 20 |
| 50 | – | 090847 | – | 50 | 50 | 15 |
| 63 | 090843 | – | – | 63 | 63 | 15 |
| 63 | – | 090848 | – | 63 | 63 | 10 |

# Textile web strapping GWB

Textile web strapping GWB for cost-effective, easy pipe fixings.





Flexible and rigid plastic insulation pipes



## Applications

- Pipe fixing to the substrate e.g. to the raw floor.

## Advantages

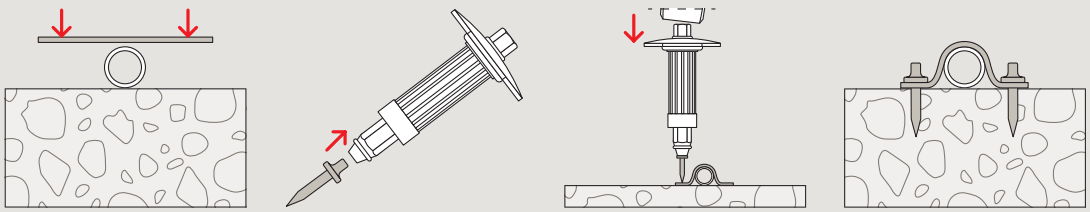
- Pipe fixing using textile tape allows cheap and simple installation.
- The textile tape roll allows the correct tape length to be chosen to suit the diameter in question.
- Hangings with textile tape are a fast solution for temporary fixings.

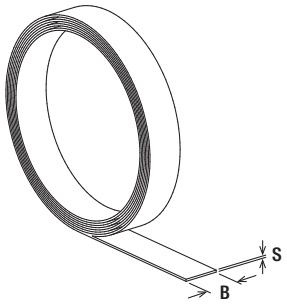
## Building materials

**When using impact nail ED:**

- Concrete

## Installation GWB






## Technical data

**Textile web strapping GWB**



GWB

| Item | Item no. | Width B [mm] | Thickness S [mm] | Sales unit [pcs] |
|---|---|---|---|---|
| **GWB** | **020959** | 15 | 1.1 | 10 |

# Perforated steel banding LBV/LBK

Perforated steel banding LBV/LBK for the fast fixing of pipelines.





Plastic pipes



## Applications

- Steel tape with stamped holes for simple installation of pipes on the substrate, e. g. on unfinished floor.
- Available as zinc-plated LBV or plastic-covered LBK.
- The fischer nail anchor FNA II is suitable for ceiling fixing in concrete.
- Use fischer thread hanger RAH for fastening to threaded rods.
- For use in dry interior areas.

## Advantages

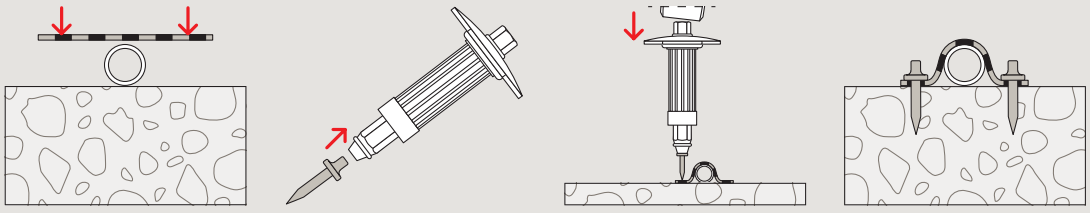
- The perforated tape‘s material thicknesses and plastic covering allow the tapes to be easily cut to size using metal shears.
- The perforated tape‘s hole geometry enables concrete fixing using the fischer impact nail ED.

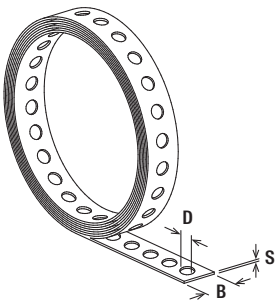
## Building materials

**When using impact nail ED:**

- Concrete

## Installation LBV, LBK






LBV / LBK

## Technical data

**Perforated steel banding LBV/LBK**



LBV



LBK

| Item | Item no. | Total length [mm] | Width B [mm] | Thickness S [mm] | Hole-ø D [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **LBV 12** | **079549** | 10,000 | 12 | 0.8 | 5.0 | 10 |
| **LBV 17** | **079550** | 10,000 | 17 | 0.8 | 6.5 | 10 |
| **LBV 25** | **079551** | 10,000 | 25 | 0.9 | 8.5 | 8 |
| **LBK 14** | **079553** | 10,000 | 14 | 2.6 | 5.0 | 10 |
| **LBK 19** | **079554** | 10,000 | 19 | 2.4 | 6.5 | 8 |
| **LBK 27** | **079555** | 10,000 | 27 | 2.4 | 8.5 | 5 |

# Impact nail ED

Fixing in concrete without pre-drilling.





Fixing armoured conduits



Fixing perforated tapes



## Applications

- Conduit clips such as BSM, BSMD, BSMZ
- Perforated band such as LBK, LBV

## Advantages

- The stable impact nail ED can be set in concrete with the impact nail setting tool SZE without pre-drilling. This allows for a fast installation.
- The setting tool SZE impact protection provides the best protection for your hand, thus ensuring a safe installation.

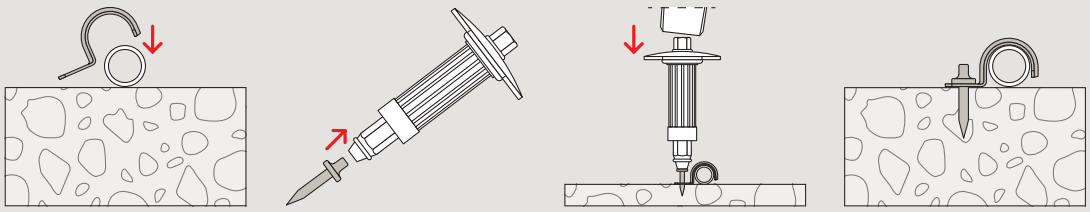
## Building materials

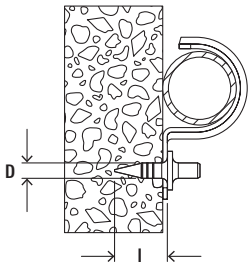
- Concrete

## Functioning

- The impact nail ED is set in the setting tool SZE.
- The bracket in the setting tool holds the nail securely in place during the installation procedure.
- Pre-positioning of the element to be fixed.
- The nail can be hammered through the fixing element directly into the concrete.

## Installation ED






## Technical data

**Impact nail ED**



ED

| Item | Item no. | Length l [mm] | Diameter d [mm] | Sales unit [pcs] |
|---|---|---|---|---|
| **ED 15** | **048212** | 15 | 4.0 | 200 |
| **ED 18** | **079815** | 18 | 4.0 | 200 |
| **ED 22** | **014570** | 22 | 4.0 | 200 |

## Accessories Impact nail ED

**Accessories Impact nail ED**



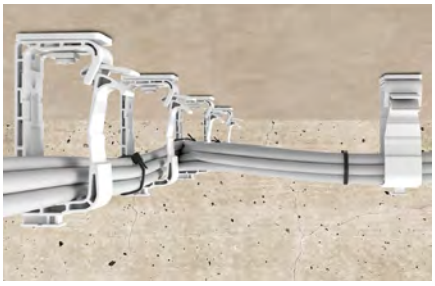
SZE Toolset for SZE

| Item | Item no. | | Sales unit [pcs] |
|---|---|---|---|
| **SZE** | **552149** | | 1 |
| **Toolset for SZE** | **552150** | | 3 |

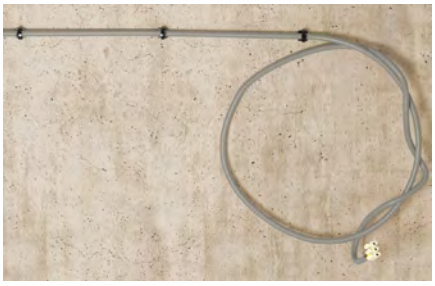
# Cable tie BN/UBN/GBN

For the simple bundling of cables and pipes.





Bundling electric cables



Electric cables



## Applications

**For bundling of:**
- Electric cables
- Flexible and rigid plastic insulating pipes
- Steel conduits

## Advantages

- The long-lasting nylon material is halogen- and silicone-free.
- The cable tie UBN (black) is made from UV-stabilised material.

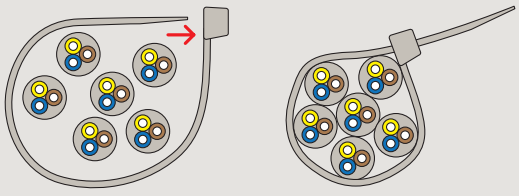
## Certificates / Features

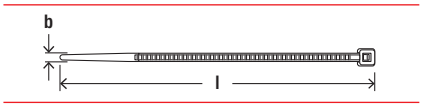
★★★★★
Nylon
Quality

## Functioning

- Lie the cable tie around the object to be fixed, and pull the band through the head of the cable tie. The cable tie can no longer be opened due to the latching of the tab in the teeth.
- Temperature resistance once installed from -10 °C to +85 °C.
- Recommended installation temperature from -10 °C to +85 °C.
- Flammability material UL 94-V2.

## Installation BN, UBN






## Technical data

**Cable tie BN/UBN**



BN UBN GBN

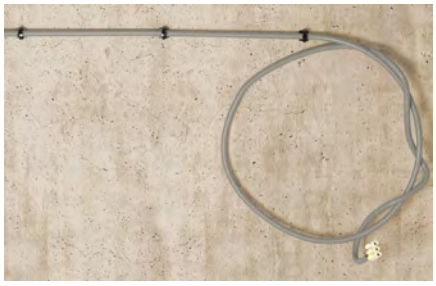
| Item | transpa-rent<br>Item no. | black<br>Item no. | green<br>Item no. | Dimensions<br>b x l<br>[mm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|
| BN/UBN/GBN 2,5 x 100 | 087478 | 087488 | 543924 | 2.5 x 100 | 100 |
| BN/UBN 2,5 x 120 | 087479 | 087489 | – | 2.5 x 120 | 100 |
| GBN 2.5 x 150 | – | – | 543925 | 2.5 x 150 | 100 |
| BN/UBN 2,5 x 160 | 037489 | 069363 | – | 2.5 x 160 | 100 |
| BN/UBN/GBN 2,5 x 200 | 087480 | 087490 | 543926 | 2.5 x 200 | 100 |
| BN/UBN/GBN 3,6 x 150 | 087481 | 087491 | 543927 | 3.6 x 150 | 100 |
| BN/UBN 3,6 x 200 | 019802 | 037573 | – | 3.6 x 200 | 100 |
| BN/UBN 3,6 x 300 | 037490 | 069364 | – | 3.6 x 300 | 100 |
| BN/UBN 4,6 x 160 | 037501 | 069365 | – | 4.6 x 160 | 100 |
| BN/UBN 4,6 x 190 | 037581 | 069366 | – | 4.6 x 190 | 100 |
| BN/UBN/GBN 4,6 x 200 | 087484 | 087494 | 543928 | 4.6 x 200 | 100 |
| BN/UBN 4,8 x 250 | 037582 | 069367 | – | 4.8 x 250 | 100 |
| BN/UBN 4,8 x 350 | 037653 | 069368 | – | 4.8 x 350 | 100 |
| BN/UBN 4,8 x 370 | 037583 | 069369 | – | 4.8 x 370 | 100 |
| BN/UBN 4,8 x 430 | 037708 | 069370 | – | 4.8 x 430 | 100 |
| BN/UBN/GBN 4,8 x 280 | 087485 | 087495 | 543929 | 4.8 x 280 | 100 |
| BN/UBN 7,6 x 200 | 037945 | 069372 | – | 7.6 x 200 | 100 |
| BN/UBN 7,8 x 300 | 037949 | 069373 | – | 7.6 x 300 | 100 |
| BN/UBN 7,6 x 350 | 087487 | 087497 | – | 7.6 x 350 | 100 |
| BN/UBN 7,6 x 450 | 037996 | 069374 | – | 7.6 x 450 | 100 |
| BN/UBN 7,6 x 550 | 037997 | 069375 | – | 7.6 x 550 | 100 |
| BN/UBN 8,8 x 760 | 037998 | 069376 | – | 8.8 x 760 | 100 |
| BN/UBN 8,8 x 810 | 038000 | 069377 | – | 8.8 x 810 | 100 |
| BN/UBN 8,8 x 1168 | 038002 | 069379 | – | 8.8 x 1168 | 100 |

# Cable tie plug FCTP

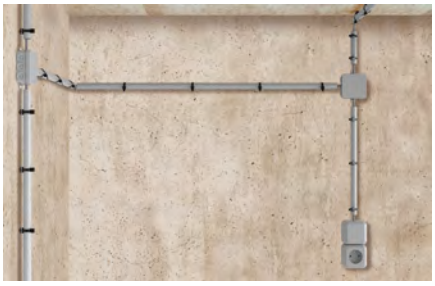
The universal fixing point for cable ties.







Electric cables



Flexible and rigid plastic pipes



## Applications

- Universal fixing point for fixing of cables and pipes using cable ties

## Advantages

- The FCTP cable tie plug combines the function of a plug and an eyelet to which cable ties up to 9.5 mm width can be attached (e.g. fischer BN or UBN).
- It offers a universal fixing point to which various cables and pipes can be attached.
- Installation is simple and time-saving by driving the plug into the drill hole.
- The lamellas of the plug ensure a secure hold in the building material and thus fix the cable tie in the intended position.

## Building materials

- Concrete
- Solid brick
- Solid sand-lime brick

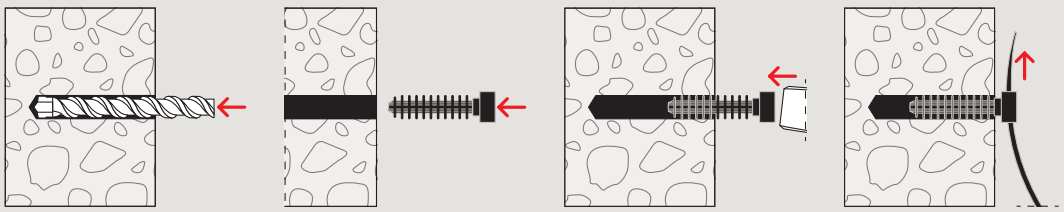
## Versions

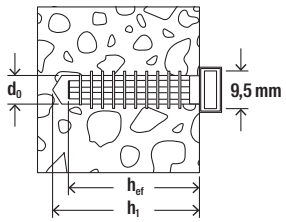
- Nylon, halogen-free

## Functioning

- The cable tie plug can be hammer set.
- A cable tie is inserted through the eyelet and the object to be fastened is fixed in the intended position.
- The eyelet with a width of 9.5 mm and a height of 3 mm is suitable for all fischer cable ties.

## Installation FTCP






## Technical data

**Cable tie plug FCTP**



FCTP-W FCTP-B

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchorage depth $h_{ef}$ [mm] | Total length l [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FCTP-W** | **545786** | 8 | 40 | 35 | 45 | 100 |
| **FCTP-B** | **545787** | 8 | 40 | 35 | 45 | 100 |

# Wireclip WIC

Infinitely variable fixing of wire suspensions.





Suspension of signs




Suspensions for trade show exhibits



## Applications

**For suspension of:**

- Lighting strips
- Cable trays
- Ventilation ducts
- Pipes
- Signs
- Chilled ceilings

## Advantages

- The simple system guarantees ease of use.
- The Wireclip's simple closing mechanism means that no tools are needed. This allows for a cost-effective installation.
- The reclosable Wireclips make it possible to adjust the length at any time. This guarantees the greatest flexibility.

## Functioning

- Loops are formed from the wire, which can be threaded through the wireclip. This allows objects to be hung. The wireclips can be adjusted at any time.
- The FNA II 6x25 OE is suitable for fixing the wire.

Note:

- Do not apply paint or any other coating.
- Do not apply lubricant.
- Do not use for lifting loads.
- Remove damaged wire ends using the wire cutter WIZ prior to introducing wires into the wire clip.

## Installation WIC



## Technical data

**Wireclip WIC**



WIC 2



WIC 3




WIC 4

| Item | Item no. | Wire-ø [mm] | Sales unit [pcs] |
|---|---|---|---|
| **WIC 2 VE20** | **044559** | 2,0 - 2,5 | 20 |
| **WIC 2 VE100** | **044560** | 2,0 - 2,5 | 100 |
| **WIC 3 VE20** | **044561** | 2.5 - 3.5 | 20 |
| **WIC 4 VE50** | **044564** | 3.0 - 4.5 | 50 |

8

## Accessories Wireclip WIC

**Accessories Wireclip WIC**



WIS



WIZ

| Item | Item no. | Cable length [m] | Wire-ø [mm] | Sales unit [pcs] |
|---|---|---|---|---|
| **WIS 2/1** | **045956** | 1 | 2.0 | 10 |
| **WIS 2/2** | **045957** | 2 | 2.0 | 10 |
| **WIS 2/3** | **045958** | 3 | 2.0 | 10 |
| **WIS 2/5** | **045959** | 5 | 2.0 | 10 |
| **WI Ø 2 mm** | **044565**[1)] | 200 | 2.0 | 1 |
| **WIZ** | **044721** | – | – | 1 |

[1)] On a roll.



# 9
# Sanitary fixings


| | | |
|---|---|---|
| Sanitary fixings for board materials | 570 |  |
| Ceramic fixings | 572 |  |
| Wash basin and urinal fixings | 575 |  |
| Wash basin fixing WST II | 579 |  |

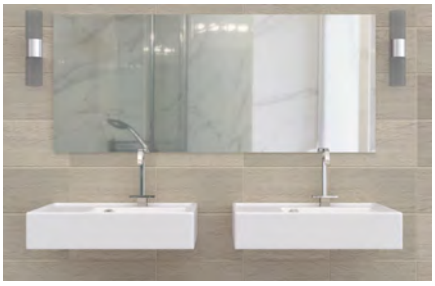
# Sanitary fixings for board materials

Complete fixing sets for wash basins and urinals in board building materials and plumbing walls.





Urinals



Wash basins



## Applications

- Wash basins
- Urinals

## Advantages

- With their special geometries, KM and WDP are the specialists for fixings in plumbing and hollow walls.
- The wide transition beams of the KM and the large base plate of the WDP ensure a good load distribution, thus allowing for a high load-bearing capacity.

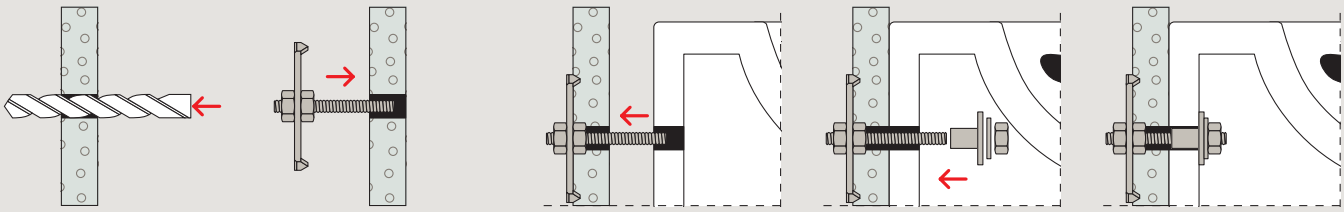
## Building materials

- Gypsum plasterboard and gypsum fibreboards
- Chipboard

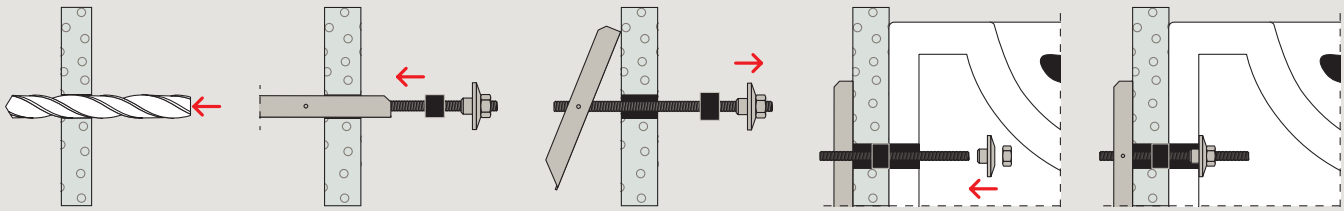
## Functioning

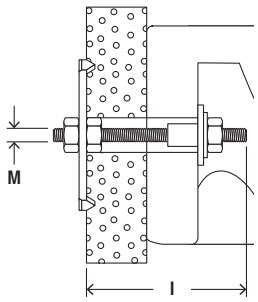
- KM is suitable for push-through installation.
- When placed in the drill hole, the wide transition beam of the KM independently swings open behind the board.
- WDP is set into the plumbing walls during wall installation.

## Installation WDP



## Installation KM





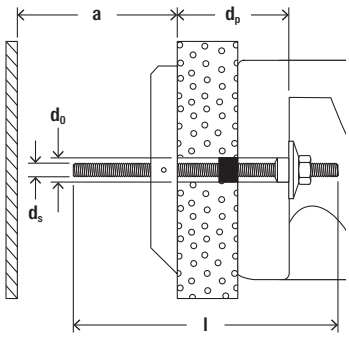

## Technical data

**Wash basin and urinal fixing WDP**



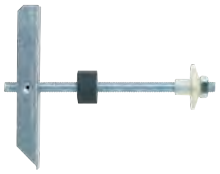
WDP

| | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **Item** | | | |
| **WDP 10 x 170** | **014320** | 2 x Threaded rod M10 x 170 with base plate 60 x 60 x 3<br>2 x Flanged bushe BDH M10<br>2 x Hexagon nut M10 zinc-plated | 10 |




## Technical data

**Gravity toggle KM 10**



KM 10

| | Item no. | Drill diameter $d_0$ [mm] | Anchor length l [mm] | Min. cavity depth a [mm] | Max. panel thickness $d_p$ [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | |
| **KM 10** | **050326** | 30 | 180 | 140 | 90 | M10 x 180 | 25 |

# Ceramic fixings

Complete fixing sets for free-standing toilets and bidets.





Free-standing toilets



Bidets



## Applications

- Free-standing toilets
- Bidets
- Ceramic shelves
- Mirrors

## Advantages

- Complete fixing sets including brass screws allow for quick and easy installation.
- A pronounced rim prevents contact between the screw and ceramics, thus ensuring nothing gets damaged during fixing.
- The WB5N's assembly bracket with predrilled rows of holes allows for a flexible fixing with two directions.
- The WCN is also suitable for fixing ceramic shelves and mirrors, and can thus be used for a wide range of applications.

## Certificates / Features

★★★★★
Nylon
Quality

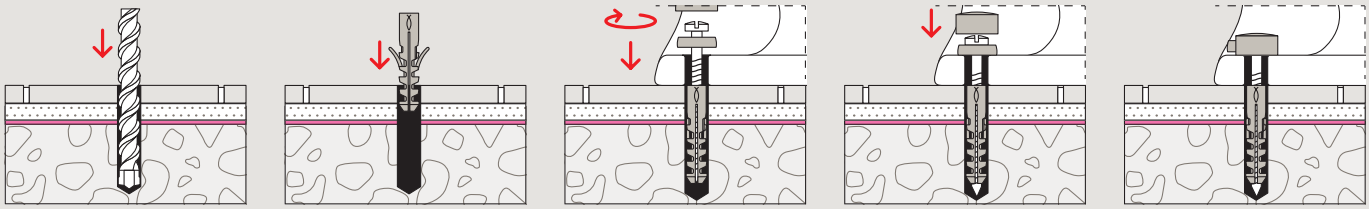
## Building materials

- Concrete
- Solid sand-lime brick
- Natural stone with dense structure
- Solid brick made from lightweight concrete
- Solid brick

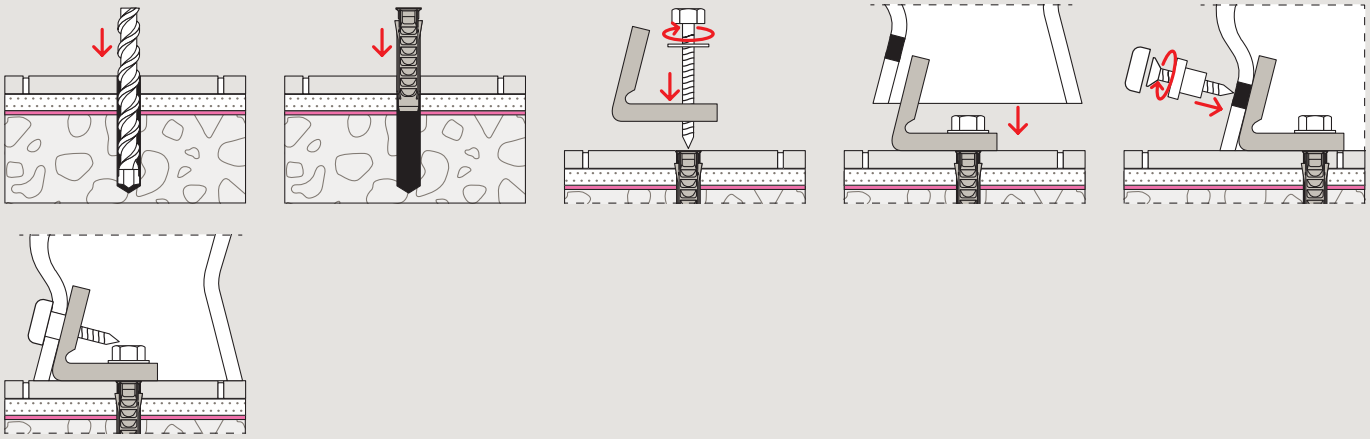
## Functioning

- S 8 RD is suitable for push-through installation.
- WCN and S 8 D are suitable for both pre-positioned and push-through installation.
- The WB5N's assembly bracket is flexibly positioned on the base using the long hole. The ceramics are then fixed to the bracket via the rows of holes. These counterbalance any height differences in the ceramic assembly holes.

## Installation WCN / S 8 D 70 WCR / S 8 RD WCR



## Installation WB 5N





## Technical data

**Sanitary fixing set WCN**



WCN

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **WCN 1** | **060561** | 2 x Expansion plug S 8<br>2 x Hexagon head screw 6.0 x 70 stainless steel<br>2 x Cover cap white<br>2 x Snap-fit sleeve | 1 |
| **WCN 2** | **060562** | 2 x Expansion plug S 8<br>2 x Hexagon head screw 6.0 x 70 stainless steel<br>2 x Cover cap chrome-coloured<br>2 x Snap-fit sleeve | 1 |

## Technical data

**Sanitary fixing set S 8 D 70 WCR**



S 8 D WCR

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **S 8 D 70 WCR** | **060564** | 2 x Expansion plug S 8<br>2 x Hexagon head screw 6.0 x 70 stainless steel<br>2 x Cover cap chrome-coloured<br>2 x Cover cap white<br>2 x Snap-fit sleeve | 1 |

## Technical data

**Sanitary fixing set S 8 RD WCR**



S 8 RD WCR

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **S 8 RD 60 WCR** | **060570** | 2 x Plug S 8 RD 60<br>2 x Hexagon head screw 6.0 x 65 stainless steel<br>2 x Cover cap white<br>2 x Cover cap chrome-coloured | 1 |
| **S 8 RD 80 WCR** | **060568** | 2 x Plug S 8 RD 80<br>2 x Hexagon head screw 6.0 x 85 stainless steel<br>2 x cover cap white<br>2 x cover cap chrome-coloured | 1 |

## Technical data

9

**WC fixing WB 5N**



WB 5N

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **WB 5N** | **018652** | 2 x Expansion plug SX Plus 10 x 50<br>2 x Screw 7.0 x 60 zinc-plated<br>2 x Nylon angle<br>2 x Washer 8 mm<br>2 x Screw A2 stainless steel<br>2 x Flanged sleeve<br>2 x Cover cap chrom | 1 |

# Wash basin and urinal fixings

Complete fixing sets for wash basins, urinals and sanitary installations.





Urinals



Wash basins



## Applications

- Wash basins
- Urinals
- Built-in toilets
- Boilers
- Gas heaters
- Cisterns
- Consoles

## Advantages

- Complete fixing sets allow for quick and easy installation.
- The universal plug UX can be used in solid and hollow materials, thus offering a high level of flexibility.
- Flanged nuts and collar sleeves made of high-strength nylon are resistant to ageing and chemicals, and guarantee a long-lasting fixing that will not damage the ceramics.
- Cover caps with a high-quality chrome finish ensure the fixture remains visually attractive for a long period of time.

## Certificates / Features

★★★★★
Nylon
Quality

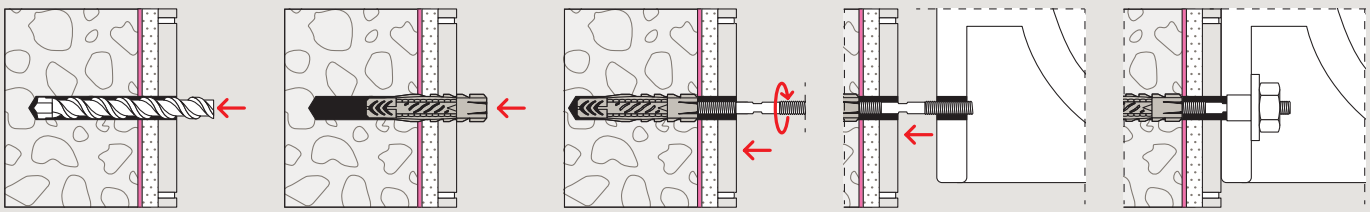
## Building materials

- Concrete
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Natural stone
- Aerated concrete
- Solid panel made from gypsum
- Solid brick made from lightweight concrete
- Solid brick

## Functioning

- The rimless UX is suitable for pre-positioned and push-through installation.
- Screwing in the screw causes the UX to expand in solid and hollow building materials.
- Maximum load-bearing capacity is achieved only if the minimum screw-in depth is reached.
- Tiles and plaster are not classed as load-bearing base materials.

## Installation WD/BO/WST/UST



## Technical data

**Wash basin and urinal fixing WD**



WD

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **WD 8 x 90** | **080659** | 2 x Universal plug UX 10 x 60<br>2 x Stud screw M8 x 90 zinc-plated<br>2 x Flanged nut BU M8 | 1 |
| **WD 8 x 110** | **080658** | 2 x Universal plug UX 10 x 60<br>2 x Stud screw M8 x 110 zinc-plated<br>2 x Flanged nut BU M8 | 1 |
| **WD 10 x 120** | **080655** | 2 x Universal plug UX 14 x 75<br>2 x Stud screw M10 x 120 zinc-plated<br>2 x Flanged nut BU M10 MH | 1 |
| **WD 10 x 140** | **080656** | 2 x Universal plug UX 14 x 75<br>2 x Stud screw M10 x 140 zinc-plated<br>2 x Flanged nut BU M10 MH | 1 |

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## Technical data

**Boiler fixing BO**



BO

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **BO 120** | **080654** | 4 x Universal plug UX 14 x 75<br>4 x Stud screw M10 x 120 zinc-plated<br>4 x Flanged nut BU M10 | 1 |

## Technical data

**Wash basin fixing WST**



WST

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **WST 12 x 150** | **080661** | 2 x Universal plug UX 14 x 75<br>2 x Stud screw M12 x 150 zinc-plated<br>2 x Flanged bush BDH M12<br>2 x Hexagon nut M12 zinc-plated | 1 |
| **WST 12 x 180** | **080662** | 2 x Universal plug UX 14 x 75<br>2 x Stud screw M12 x 180 zinc-plated<br>2 x Flanged bush BDH M12<br>2 x Hexagon nut M12 zinc-plated | 1 |

## Technical data

**Wash basin fixing WST Klik Plus**



WST Klik Plus

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Max. fixture thickness $t_{fix}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **WST Klik Plus 120** | **567591** | 12 | 80 | 60 | M10 x 127 | 40 | 1 |
| **WST Klik Plus 140** | **567592** | 14 | 90 | 70 | M10 x 140 | 40 | 1 |

## Technical data

**Urinal fixing UST**



UST 8 x 110



UST 10 x 120

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **UST 8 x 110** | **083578** | 2 x Universal plug UX 10 x 60<br>2 x Stud screw M8 x 110<br>2 x Washer B 8.4 DIN 125<br>2 x Plastic washer 8,4 x 16 x 1,6<br>2 x Cap nut FA 8<br>2 x Cover cap chrome-coloured | 1 |
| **UST 10 x 120** | **080668** | 2 x Universal plug UX 14 x 75<br>2 x Stud screw M10 x 120<br>2 x Flanged nut BU M10<br>2 x Cover cap AKM 10 CR | 1 |

## Technical data

**WC and sanitary fixing WL**



WL

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **WL 7 x 60** | **080651** | 2 x Plug S 10<br>2 x screw 7.0 x 60 hex. head zinc-plated<br>2 x washer zinc-plated | 1 |
| **WL 8 x 70** | **080652** | 2 x Plug S 10<br>2 x screw 8.0 x 70 hex. DIN 571 zinc-plated<br>2 x washer zinc-plated | 1 |
| **WL 10 x 80** | **080650** | 2 x Plug S 12<br>2 x screw 10.0 x 80 hex. DIN 571 zinc-plated<br>2 x washer zinc-plated | 1 |

## Loads

**Washbasin and urinal fixings**

Recommended loads[1] for a single anchor.
The given loads are valid for stud screws with the specified diameter.

| Type | | | WD 8x90<br>WD 8x110 | WD 10x120<br>WD 10x140 | WST 10x140<br>BO 120 | WST 12x150<br>WST 12x180 | UST 8x110 | UST 10x120 | WL 7x60 | WL 8x70 | WL 10x80 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Screw diameter** | | [mm] | 8 | 10 | 10 | 12 | 8 | 10 | 7 | 8 | 10 |
| **Recommended loads in the respective base material $F_{rec}$** [2] | | | | | | | | | | | |
| **Concrete** | ≥ C20/25 | [kN] | 0.90 | 0.90 | 0.90 | 1.80 | 0.90 | 0.90 | 1.10 | 1.10 | 1.50 |
| **Solid brick** | ≥ Mz 12 | [kN] | 0.50 | 0.50 | 0.50 | 0.80 | 0.50 | 0.50 | - [3] | - [3] | - [3] |
| **Perforated sand-lime brick** | ≥ KSL 12 | [kN] | 0.40 | 0.40 | 0.40 | 0.80 | 0.40 | 0.40 | - | - | - |
| **Vertically perforated brick** | ≥ HLz 12 | [kN] | 0.20 | 0.30 | 0.30 | 0.40 | 0.20 | 0.30 | - | - | - |
| **Aerated concrete** | ≥ AAC 4 | [kN] | 0.30 | 0.30 | 0.30 | 0.70 | 0.30 | 0.30 | 0.16 | 0.16 | 0.28 |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
[2] Valid for shear load and 10° inclined pull.
[3] Due to that the failure of the substrate varies too much no reproducible values can be given.

## Loads

**Washbasin fixing WST Klik Plus in combination with expansion plug SX Plus**

Recommended loads[1) 2)] for a single anchor.

| Type | | | WST 120 KLIK Plus | WST 140 KLIK Plus |
|---|---|---|---|---|
| **Expansion plug SX Plus** | | **[mm]** | **12 x 60** | **14 x 70** |
| **Recommended load in the respective base material $F_{rec}$** | | | | |
| **Concrete** | ≥ C20/25 | **[kN]** | 1.70 | 1.90 |
| **Vertically perforated brick** | ≥ HLz 12 | **[kN]** | 0.26 | 0.50 |
| **Solid brick** | ≥ Mz 12 | **[kN]** | 0.70 | 1.90 |
| **Solid sand-lime brick** | ≥ KS 12 | **[kN]** | 1.70 | 1.90 |
| **Aerated concrete** | ≥ AAC 2 | **[kN]** | 0.14 | 0.29 |
| **Aerated concrete** | ≥ AAC 4 | **[kN]** | 0.45 | 0.73 |

[1)] Required safety factors are considered. Load values are valid for using the supplied plug and the stud screws with the specified diameter.
[2)] Valid for tension load, shear load and oblique load under any angle. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).

## Flanged nut BU M



**Flanged nut BU M**



| Item | Item no. | Thread M | Width across nut SW [mm] | Washer [mm] | Match | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **BU M 8 MH** | **060200**[1)] | M8 | 17 | 40 | STS M8 | 25 |
| **BU M10 MH** | **060201** | M10 | 17 | 40 | STS M10 | 25 |
| **BU M12 MH** | **060204** | M12 | 19 | 40 | STS M12 | 25 |

[1)] Delivery time on request.

## Cover cap AKM

**Cover cap AKM**

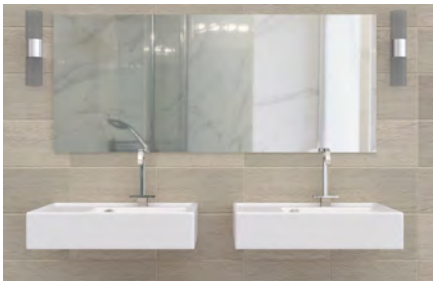


| Item | Item no. | Colour | Match | Sales unit [pcs] |
|---|---|---|---|---|
| **AKM 10 W** | **080972** | white | BU M10 MH | 20 |
| **AKM 10 CR** | **080951** | chrome | BU M10 MH | 100 |
| **AKM 12 CR** | **080952** | chrome | BU M12 MH | 100 |

# Wash basin fixing WST II

Complete fixing set for wash basins.





Wash basins



Urinals



## Applications

- Wash basins
- Urinals
- Buiot-in toilets
- Cisterns

## Advantages

- Complete fixing set ensures a fast and easy installation.
- The new collar nut enabels the prefixing of the wash basin and is therefore suitable for an easy one man installation.
- The white collar nut fitts to all established ceramics and offers therefore an optical attractive fixing solution.
- The usage of the DuoPower allows a wide range of applications with one plug.
- The usage of a diameter 12 plug reduces the drilling depth and safes time.
- The stud screw with integrated torx simplifies the installation and provides a comfortable installation.

## Certificates / Features

2K Technology

DuoLine

## Building materials

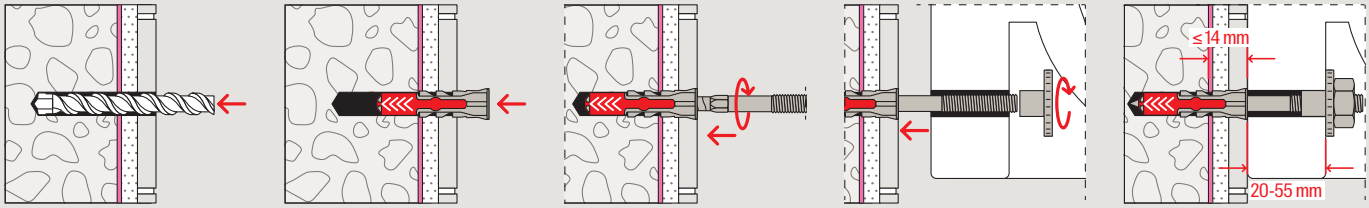
**Suitable for:**

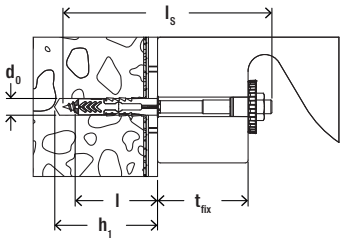
- Concrete
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Natural stone
- Aerated concrete
- Solid panel made from gypsum
- Solid brick made from lightweight concrete
- Solid brick

## Functioning

- The enclosed DuoPower made of two materials, expands, folds or knots depending on the building material and ensures thereby always the optimum product function.
- The stud screw can be installed with the inner torx in the head of the screw. This enables a fast and easy installation without the need of an additional tool.
- By turning on the white collar nut the wash basin is already prefixed and remains in his position. In the next step the metall nut is turned on the stud screw for the final installation of the wash basin.
- Maximum load-bearing capacity is achieved only if the minimum screw-in depth is reached.
- Tiles and plaster are not classed as load-bearing base materials.

## Installation WST II




9

## Technical data

**Wash basin fixing WST II**



WST II with DuoPower

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Anchor length l [mm] | Screw dimension $d_s$ x $l_s$ [mm] | Fixture thickness $t_{fix}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **WST II 10x140** | **567430** | 12 | 80 | 60 | 10.0 x 140 | 20 - 55 | 1 |

## Loads

**Washbasin WST II in combination with DuoPower**

Recommended loads[1) 2)] for a single anchor.

| Type | | | WST II |
|---|---|---|---|
| **Screw** | | [mm] | **10 x 140** |
| **DuoPower plug** | | [mm] | **12 x 60** |
| **Recommended load in the respective base material $F_{rec}$** | | | |
| **Concrete** | ≥ C20/25 | [kN] | 2.20 |
| **Solid brick** | ≥ Mz 12 | [kN] | 1.30 |
| **Solid sand-lime brick** | ≥ KS 12 | [kN] | 2.20 |
| **Aerated concrete** | ≥ AAC 2 | [kN] | 0.20 |
| **Aerated concrete** | ≥ AAC 4 | [kN] | 0.80 |
| **Vertically perforated brick** | ≥ HLz 12; ρ ≥ 0.9 kg/dm³ | [kN] | 0.35 |
| **Perforated sand-lime brick** | ≥ KSL 12; ρ ≥ 1.6 kg/dm³ | [kN] | 0.75 |
| **Hollow lightweight concrete blocks** | ≥ Hbl 2 | [kN] | 0.20 |

1) Required safety factor are considered. Load values apply when using the supplied plug, the stud screws and considering a total ceramic tile thickness (tile + tile adhesive + bonded sealant) of maximum 14 mm.
2) Valid for tension load, shear load and oblique load under any angle. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).



# 10
# Scaffold and eye screw fixings


| | | |
|---|---|---|
| Scaffold eye screw GS 12 + plug | 584 |  |
| Scaffold eyebolt FI G 12 | 586 |  |
| Eye screw GS | 588 |  |
| Ring nut RI | 590 |  |

# Scaffold eye screw GS 12 + plug

The standard scaffold anchoring.





Scaffold anchoring



Façade scaffolds



## Applications

- Façade scaffolds
- Ropes
- Chains
- Trellises
- Lighting
- Clothes lines
- Hanging baskets

## Advantages

- The ideal interaction of the scaffold eye screw and plug allows for a high load-bearing capacity, thus providing increased safety.
- The high-quality weld stops the eye from opening.
- The large diameter of the cover caps (available separately) covers drill holes completely and discreetly, even those with slightly broken edges.

## Certificates / Features

★★★★★
Nylon
Quality

## Building materials

**GS 12 + S 14 ROE suitable for:**

- Concrete
- Solid sand-lime brick
- Natural stone with dense structure
- Solid brick
- Solid brick made from lightweight concrete

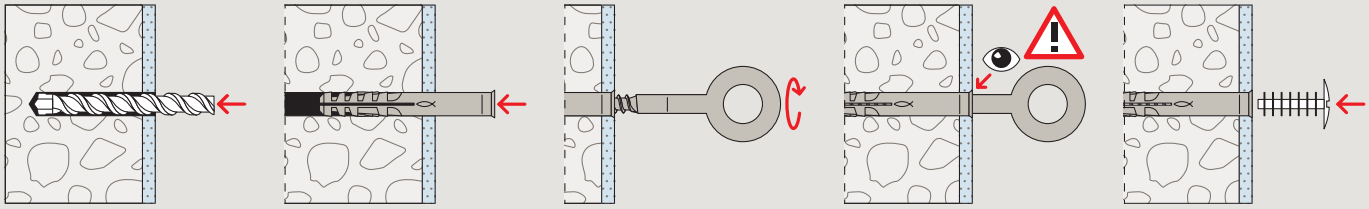
**GS 12 + S 16 H R suitable for:**

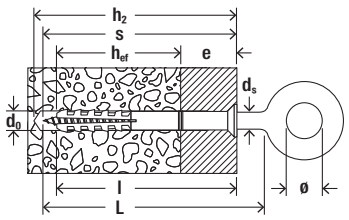
- Vertically perforated brick
- Perforated sand-lime brick
- Aerated concrete

## Functioning

- In order to achieve the maximum load-bearing capacity, nylon plugs should only be used once.
- In perforated brick and aerated concrete, we recommend combination with the plug S 16 H R.
- The screw-in markings provide a visual control during assembly, and thus allow for a simple and problem-free installation.
- Pre-drill into wood when not using plugs. The drill bit diameter should correspond to the core diameter of the screw.
- Suitable cover caps AD 12x40 for closing off residual drill holes for S 14 ROE.
- Not suitable for swings, hammocks etc.

## Installation GS 12






## Technical data

**Scaffold eye screw GS 12**



GS 12

| Item | Item no. | Shaft diameter $d_s$ [mm] | Shaft length L [mm] | Max. thickness of non-bearing layer e [mm] | Eye-ø [mm] | Match | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **GS 12 x 90** | **080925** | 12 | 90 | – | 23 | S 14 ROE 70 | 25 |
| **GS 12 x 120** | **080926** | 12 | 120 | 30 / 10 | 23 | S 14 ROE 100 / S 16 H 100 R | 25 |
| **GS 12 x 160** | **080927** | 12 | 160 | 65 / 45 | 23 | S 14 ROE 135 / S 16 H 135 R | 25 |
| **GS 12 x 190** | **080960** | 12 | 190 | 115 / 70 | 23 | S 14 ROE 185 / S 16 H 160 R | 25 |
| **GS 12 x 230** | **080961** | 12 | 230 | 115 / 70 | 23 | S 14 ROE 185 / S 16 H 160 R | 25 |
| **GS 12 x 300** | **081269** | 12 | 300 | 115 / 70 | 23 | S 14 ROE 185 / S 16 H 160 R | 25 |
| **GS 12 x 350** | **080962** | 12 | 350 | 115 / 70 | 23 | S 14 ROE 185 / S 16 H 160 R | 25 |

## Technical data

**Plug S 14 ROE / S 16 H R**



S 14 ROE



S 16 H R

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Effect. anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Max. thickness of non-bearing layer e [mm] | Min. bolt penetration $l_{E,min}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **S 14 ROE 70** | **052160** | 14 | 95 | 70 | 70 | – | 75 | 25 |
| **S 14 ROE 100** | **052161** | 14 | 125 | 70 | 100 | 30 | 105 | 25 |
| **S 14 ROE 135** | **052162** | 14 | 165 | 70 | 135 | 65 | 140 | 25 |
| **S 14 ROE 185** | **052164** | 14 | 195 | 70 | 185 | 115 | 190 | 25 |
| **S 16 H 100 R** | **059187**[1)] | 16 | 125 | 90 | 100 | 10 | 105 | 50 |
| **S 16 H 135 R** | **059188**[1)] | 16 | 165 | 90 | 135 | 45 | 140 | 50 |
| **S 16 H 160 R** | **059189**[1)] | 16 | 195 | 90 | 160 | 70 | 165 | 50 |

[1)] Also suitable for screws with metric thread M12.

## Loads

**Scaffold anchoring S 14 ROE + GS 12 / S 16 H R + GS 12**

Mean ultimate loads[1)] for tension of a single anchor.

| Type | | | S 14 ROE + GS 12 | S 16 H R + GS 12 |
|---|---|---|---|---|
| **Mean ultimate loads for tension in the respective base material $N_u$** | | | | |
| **Concrete** | ≥ C20/25 | **[kN]** | 14.5 | - |
| **Solid brick** | ≥ Mz 12 | **[kN]** | 13.0 | - |
| **Solid sand-lime brick** | ≥ KS 12 | **[kN]** | 14.5 | - |
| **Solid brick of lightweight aggregate concrete** | ≥ V 2 | **[kN]** | 3.0 | - |
| **Perforated sand-lime brick** | ≥ KSL 12 | **[kN]** | - | 5.0 |
| **Vertically perforated brick** | ≥ HLz 12 | **[kN]** | - | 3.5 |
| **Aerated concrete** | ≥ AAC 4 | **[kN]** | 3.0 | 3.0 |

[1)] On these values an appropriate safety factor has to be considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).

# Scaffold eyebolt FI G 12

The scaffold anchoring with metric thread M 12.





Scaffold anchoring



Façade scaffolds



## Applications

- Façade scaffolds
- Trellises
- Tensioning ropes
- Chains
- Lighting
- Clothes lines
- Hanging baskets

## Advantages

- When used together with an internal threaded anchor or a steel fixture with internal thread M 12, the scaffold screw FI G allows for repeated installation and removal using the same fixing point.
- The high-quality weld stops the eye from opening, thus providing increased safety.

## Building materials

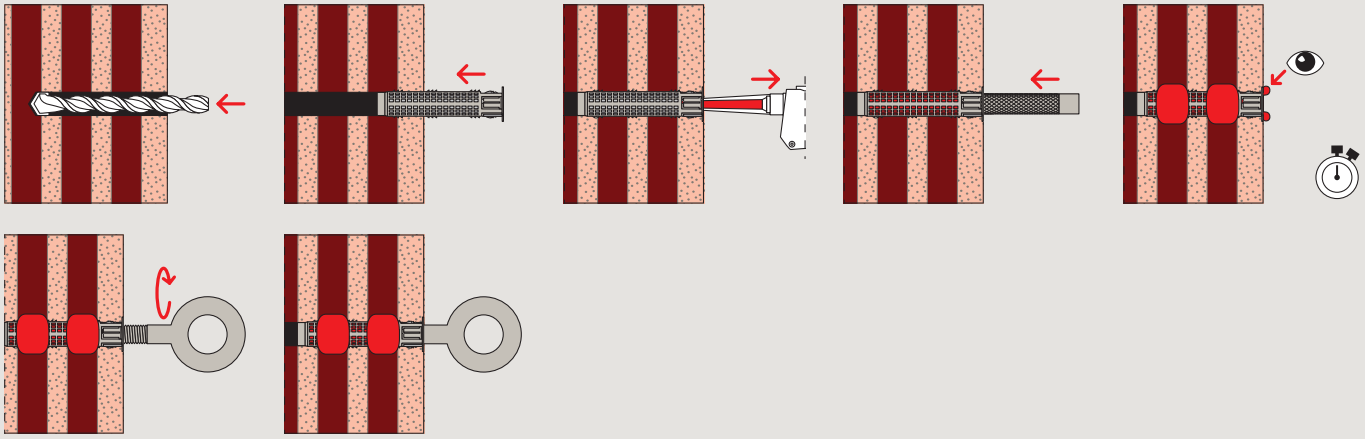
**When combined with internal threaded anchor:**

- Concrete C20/25 - C50/60:
  Injection mortar FIS EM Plus / FIS V Plus
  Internal threaded anchor
  RG 18x125 M12 I, Art.-No. 50562
  ZYKON undercut anchor FZA-I
  FZA 22x100 M12 I, Art.-No. 060763
- Masonry:
  Injection mortar FIS V Plus 360 S
  Perforated sleeve FIS H 20x85 K, Art.-No. 41904
  Internal threaded socket
  FIS E 15x85 M12, Art.-No. 43634

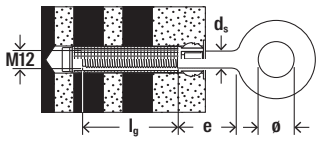
## Functioning

- The scaffold anchoring FI G should be used with an internal threaded anchor. Detailed information about its functioning can be found in the „Chemical fixings“ chapter.
- Not suitable for swings, hammocks etc.

## Installation FI G








## Technical data

**Scaffold eyebolt FI G 12**



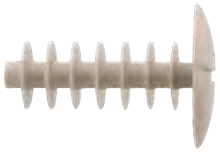
FI G 12

| Item | Item no. | Thread<br>M | Thread length<br>$l_g$<br>[mm] | Shaft diameter<br>$d_s$<br>[mm] | Max. thickness of non-bearing layer<br>e<br>[mm] | Eye-ø<br>[mm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|
| **FI G 12 x 40** | **080933**[1)] | M12 | 30 | 12 | 35 | 23 | 20 |
| **FI G 12 x 80** | **080934** | M12 | 30 | 12 | 75 | 23 | 20 |

[1)] Anchorage depth in the substrate is defined by the fixing used.

## Accessories

**Cover cap AD**



AD 12 x 40

| Item | Item no. | Colour | Length<br>l<br>[mm] | Cap height<br>[mm] | Match | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|
| **AD 12 x 40 W** | **060259** | white | 40 | 3 | Plug-Ø 14 mm | 100 |
| **AD 12 x 40 G** | **060260** | grey | 40 | 3 | Plug-Ø 14 mm | 100 |

# Eye screw GS

The universal eye screw for use with fischer plugs or for direct use in wood.





Hanging baskets



Trellis



## Applications

- Ropes
- Chains
- Trellises
- Lighting
- Clothes lines
- Hanging baskets

## Advantages

- The ideal interaction of the eye screw and plug allows for a high load-bearing capacity, thus providing increased safety.
- The high-quality weld stops the eye from opening.

## Certificates / Features

★★★★★
Nylon
Quality

## Building materials

**GS 8 + SX Plus 10 or GS 10 + SX Plus 12 suitable for:**
- Concrete
- Solid brick
- Perforated brick
- Aerated concrete

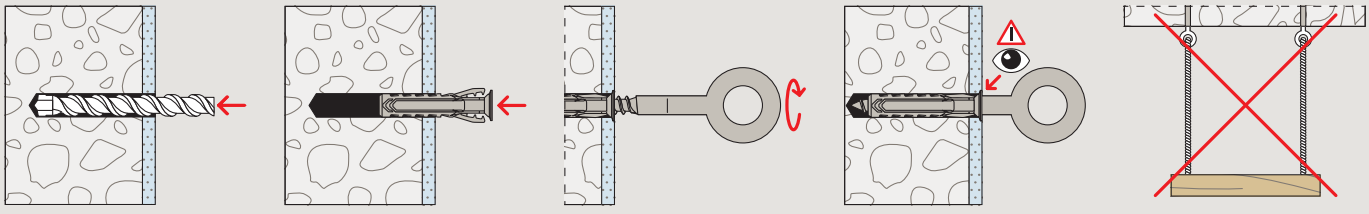
**GS 10 + S 14 H R suitable for:**
- Perforated brick

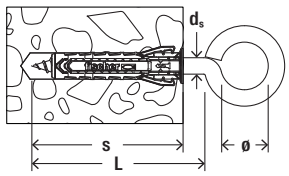
**GS 8 or GS 10 without plug suitable for:**
- Wood

## Functioning

- Pre-drill when using with wood. The drill bit diameter should equal the core diameter of the screw.
- The maximum load-bearing capacity is achieved when combined with the plugs recommended by fischer. The nylon plug must only be used once.
- Not suitable for swings, hammocks etc.

## Installation eye screw GS






## Technical data

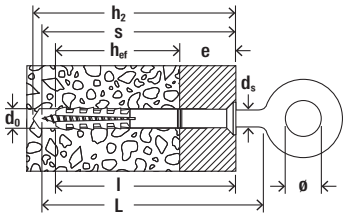
**Eye screw GS**



GS

| Item | Item no. | Shaft diameter $d_s$ [mm] | Shaft length L [mm] | Bolt penetration s [mm] | Match | Eye-ø [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **GS 8 x 50 Ø15** | **502620** | 8 | 50 | 50 | SX Plus 10 | 15 | 20 |
| **GS 8 x 80 Ø22** | **080918** | 8 | 80 | 58 | SX Plus 10 | 22 | 20 |
| **GS 8 x 100 Ø22** | **080919** | 8 | 100 | 58 | SX Plus 10 | 22 | 20 |
| **GS 8 x 120 Ø22** | **080920** | 8 | 120 | 58 | SX Plus 10 | 22 | 20 |
| **GS 10 x 160 Ø30** | **080929** | 10 | 160 | 70 | SX Plus 12, S 14 H R | 30 | 20 |






## Technical data

**Plug S 14 H R**



S 14 H R

| Item | Item no. | Drill diameter $d_0$ [mm] | Min. drill hole depth for through fixings $h_2$ [mm] | Bolt penetration s [mm] | Effect. anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Max. thickness of non-bearing layer e [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **S 14 H 100 R** | **059179** | 14 | 120 | 110 | 90 | 100 | 10 | 50 |
| **S 14 H 135 R** | **059180** | 14 | 155 | 145 | 90 | 135 | 45 | 50 |

## Loads

**Eye screw GS**

Recommended tensile loads[1] for a single anchor.
The given loads are valid for the eye screw GS with the specified fischer plugs.

| Type | | | SX Plus 10x50 + GS 8 | SX Plus 12 + GS 10 | S 14 H R + GS 10 |
|---|---|---|---|---|---|
| **Recommended tensile loads in the respective base material $N_{rec}$** | | | | | |
| **Concrete** | ≥ C12/15 | **[kN]** | 1.40 | 2.40 | - |
| **Solid brick** | ≥ Mz 12 | **[kN]** | 1.00 | 1.25 | - |
| **Solid sand-lime brick** | ≥ KS 12 | **[kN]** | 1.40 | 2.40 | - |
| **Solid brick of lightweight aggregate concrete** | ≥ V 4 | **[kN]** | - | - | 0.43 |
| **Perforated sand-lime brick** | ≥ KSL 12 | **[kN]** | 0.45 | 0.70 | 0.34 |
| **Vertically perforated brick** | ≥ HLz 12; $\rho \geq 1$ kg/dm$^3$ | **[kN]** | - | - | 0.50 |
| **Aerated concrete** | ≥ AAC 2 | **[kN]** | 0.18 | 0.22 | - |
| **Aerated concrete** | ≥ AAC 4 | **[kN]** | 0.50 | 0.80 | - |

[1] Required safety factors are considered. Valid for installation and use in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).

# Ring nut RI

The ring nut for all fixings with threaded studs.





Transmission of loads



## Applications

- Ropes
- Chains
- Trellises
- Lighting
- Clothes lines
- Hanging baskets

## Advantages

- The metric internal thread gives the ring nut RI flexibility and means it can be used with a range of steel anchors or threaded rods; e.g. FH II, FHB II-A, RG M, FZA, FAZ II Plus, FIS A.

## Building materials

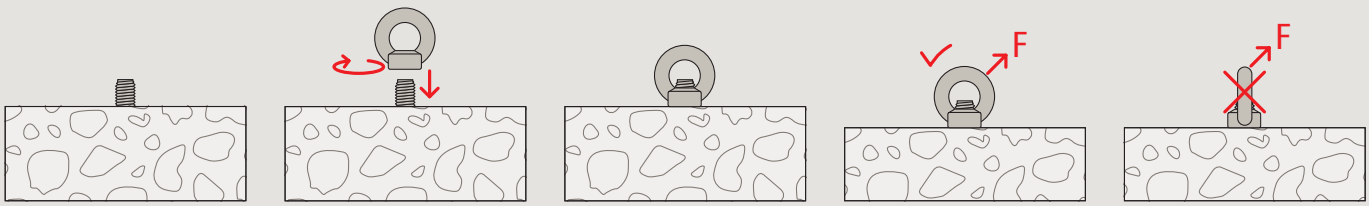
**In line with the anchor used:**

- Concrete, cracked and non-cracked
- Solid and perforated brick

## Functioning

- The ring nut is to be used with an anchor with threaded studs.
  Detailed information about its functioning can be found in the „High performance steel anchors“ and „Chemical fixings“ chapters. The following anchors, for example, can be used: FHB II, RG M, FZA, FAZ II Plus, FIS A.
- Not suitable for swings, hammocks etc.

## Installation RI



## Technical data

**Ring nut RI**



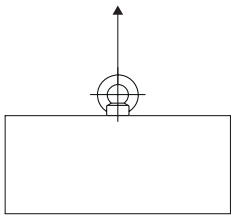
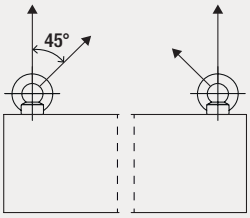
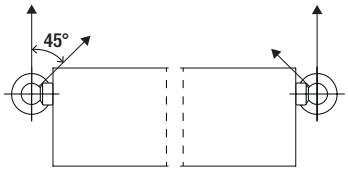
RI

| Item | Item no. | Eye-ø [mm] | Total height [mm] | Sales unit [pcs] |
|---|---|---|---|---|
| **RI M 8** | **080840** | 20 | 36 | 20 |
| **RI M 10** | **080842** | 25 | 45 | 10 |
| **RI M 12** | **080844** | 30 | 53 | 10 |

## Loads

**Ring nut RI**

Recommended loads[1] for ring nuts.
The given loads apply for the use of ring nuts as permanent anchorage. For varying use of different components to be lifted ring nuts with next larger thread diameter has to be use (see DIN 582).

| Type | | | RI M8 | RI M10 | RI M12 |
|---|---|---|---|---|---|
| **Thread size** | | | **M8** | **M10** | **M12** |
| **Recommended load per ring nut for respective set-up $F_{rec}$** | | | | | |
| **Axial tension on single ring nut** |  | **[kN]** | 1.40 | 2.30 | 3.40 |
| **Axial or oblique tension up to 45° on a group of two ring nuts** |  | **[kN]** | 1.00 | 1.70 | 2.40 |
| **Shear or oblique tension up to 45° on a group of two ring nuts for lateral arrangement** |  | **[kN]** | 0.70 | 1.15 | 1.70 |

[1] Required safety factors are considered.



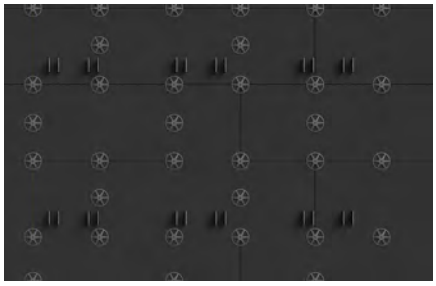
# 11
# Insulation fixings


| | | |
|---|---|---|
| Insulation support DHK / DHK 45 | 594 |  |
| Insulation support DHM | 596 |  |
| Render fixing DIPK | 599 |  |
| Render fixing FIF-PN 8 | 601 |  |
| Render fixing FIF-CN II 8 | 604 |  |
| Render fixing FIF-CS 8 | 607 |  |
| Insulation discs DT | 609 |  |
| Insulation discs | 610 |  |
| TermoFix H | 612 |  |
| Retaining disc with screw DHT S | 613 |  |
| TermoFix B | 615 |  |
| Insulation plug FID II | 617 |  |
| Insulation plug FID II Plus | 619 |  |
| Insulation screw FID-Z | 622 |  |
| Insulation fixing FID-R | 624 |  |
| Holding clamp DVN | 626 |  |

# Insulation support DHK / DHK 45

The cost-effective plastic insulation support for all conventional insulating boards.





Insulation fixing in the ventilated facade



Insulating materials in ventilated façades



## Applications

**To fix soft and pressure-resistant insulating materials in rear-ventilated façades, such as:**

- Mineral wool
- PU panels
- Light building boards made of wood wool
- Cork boards / coir matting
- Polystyrene
- Foam glass tiles

## Advantages

- The optimised geometry of the expansion section ensures a low anchorage depth and reduces the amount of drilling required.
- The flexible DHK plate adapt to the insulating material, and ensures a sustained contact pressure.
- The simple hammerset installation allows for a quick installation process and thus reduces workload.
- The colouring of the DHK means that it does not stand out on black clad insulating material in rear-ventilated façades.

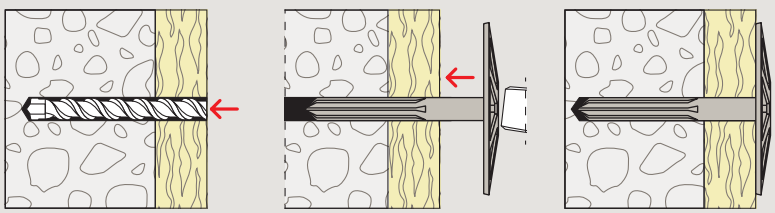
## Building materials

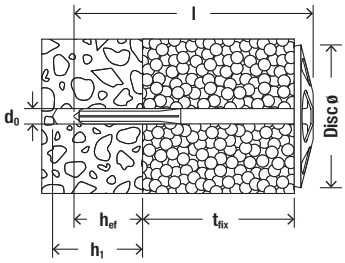
- Concrete
- Hollow blocks made from lightweight concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Solid sand-lime brick
- Natural stone with dense structure
- Aerated concrete
- Solid brick made from lightweight concrete
- Solid brick

## Functioning

- The DHK is set in push-through installation by using a hammer.
- The plate size of the insulation support is to be selected in line with the compressive strength of the insulating material: DHK 45 for pressure-resistant; DHK for soft insulating materials.
- The expansion of the ribs in the drill hole gives the DHK an ideal contact pressure.
- Temperature range when installed: -40 °C to +80 °C.

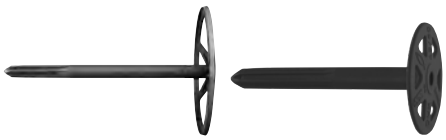
## Installation DHK / DHK 45






## Technical data

**Insulation support DHK**



DHK DHK 45

| Item | Item no. | Drill diameter $d_0$ [mm] | Disc ø [mm] | Min. drill hole depth $h_1$ [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **DHK 40** | **080937** | 8 | 90 | 30 | 20 | 65 | 40 | 250 |
| **DHK 60** | **080938** | 8 | 90 | 30 | 20 | 85 | 60 | 250 |
| **DHK 80** | **080939** | 8 | 90 | 30 | 20 | 105 | 80 | 250 |
| **DHK 100** | **080940** | 8 | 90 | 30 | 20 | 125 | 100 | 250 |
| **DHK 120** | **080941** | 8 | 90 | 30 | 20 | 145 | 120 | 200 |
| **DHK 140** | **080949** | 8 | 90 | 30 | 20 | 165 | 140 | 200 |
| **DHK 160** | **512150** | 8 | 90 | 30 | 20 | 185 | 160 | 100 |
| **DHK 180** | **512151** | 8 | 90 | 30 | 20 | 205 | 180 | 100 |
| **DHK 200** | **512153** | 8 | 90 | 30 | 20 | 225 | 200 | 100 |
| **DHK 220** | **512154** | 8 | 90 | 30 | 20 | 245 | 220 | 100 |
| **DHK 45/40** | **080892** | 8 | 45 | 30 | 20 | 65 | 40 | 250 |
| **DHK 45/60** | **080893** | 8 | 45 | 30 | 20 | 85 | 60 | 250 |
| **DHK 45/80** | **080894** | 8 | 45 | 30 | 20 | 105 | 80 | 250 |
| **DHK 45/100** | **080895** | 8 | 45 | 30 | 20 | 125 | 100 | 250 |

## Loads

**Insulation support DHK / DHK 45**

Recommended loads[1] for a single anchor.

| Type | | | DHK |
|---|---|---|---|
| **Recommended loads in the respective base material $F_{rec}$[2]** | | | |
| **Concrete** | ≥ C12/15 | **[kN]** | 0.03 |
| **Solid brick** | Mz 12 | **[kN]** | 0.03 |
| **Solid sand-lime brick** | KS 12 | **[kN]** | 0.03 |
| **Perforated sand-lime brick** | KSL 6 | **[kN]** | 0.03 |
| **Vertically perforated brick** | Hlz 12 | **[kN]** | 0.02 |
| **Aerated concrete** | ≥ AAC 2 (G2) | **[kN]** | 0.02 |

[1] Required safety factors are considered.
[2] Valid for tensile load.

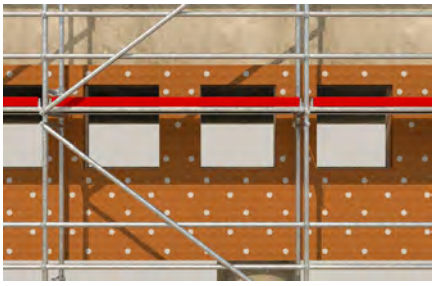
# Insulation support DHM

The fire-protection-tested metal insulation support for fire-resistant insulating boards.





Fire resistant wood wool panels on ceilings



Pressure-resistant insulation boards in ventilated facades



## Applications

**To fix fire-resistant soft or pressure-resistant insulating materials, such as:**

- Mineral wool
- Light building boards made of wood wool
- Foam glass tiles

**Also suitable for:**

- Polystyrene boards
- Coir matting

## Advantages

- The metal insulation support achieves fire resistance F 120. This means that it can be used where there are fire resistance requirements.
- The DTM 80 plate for soft insulating materials (available separately) simplifies storage and minimises costs.
- The simple hammerset installation allows a quick installation process and thus reduces workload.
- The shaft geometry allows setting in aerated concrete without pre-drilling, thus saving a stage of installation.
- Stainless steel version DHM A2 (1.4301) for wet and exterior applications.
- The DHM can be combined with coloured cover caps, which complete the design of the surface.

## Certificates / Features

aBG
Z-21.8-2057

R 120

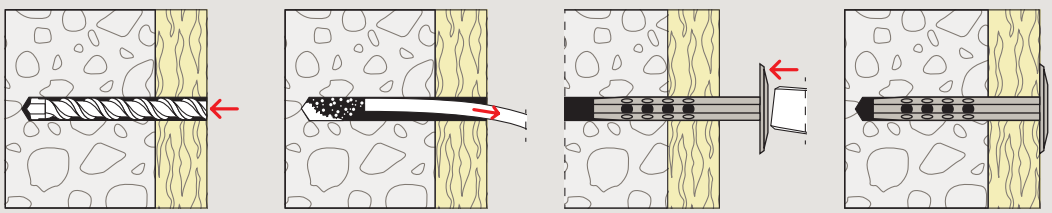
## Building materials

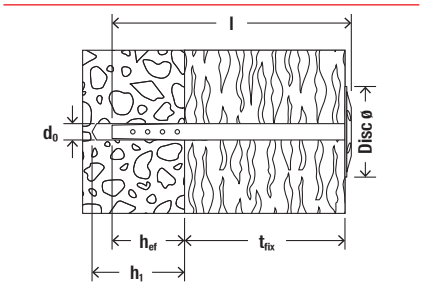
- Concrete
- Hollow blocks made from lightweight concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Solid sand-lime brick
- Natural stone with dense structure
- Aerated concrete
- Solid brick made from lightweight concrete
- Solid brick

## Functioning

- The insulation support is set in push-through installation by using a hammer.
- When hammered in, the expansion part tightens like a spring with the substrate.
- Use the DTM 80 plate (available separately) to fix soft insulating materials.
- Optionally, the DHM can be set with a hammer drill and the EMS M6 setting tool

## Installation DHM






## Technical data

**Insulation support DHM**



DHM

| | Hot-dip galvanised steel | Stainless steel A2 | Approval | Drill diameter | Disc ø | Min. drill hole depth | Min. effect. anchorage depth | Anchor length | Usable length | Sales unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | Item no. | Item no. | DIBt | $d_0$ [mm] | [mm] | $h_1$ [mm] | $h_{ef}$ [mm] | l [mm] | $t_{fix}$ [mm] | [pcs] |
| Item | hdg | A2 | | | | | | | | |
| DHM 40 | 536253 | 536262 | ● | 8 | 45 | 50 | 40 | 80 | 10 - 40 | 250 |
| DHM 70 | 536254 | 536264 | ● | 8 | 45 | 50 | 40 | 110 | 40 - 70 | 250 |
| DHM 100 | 536256 | 536265 | ● | 8 | 45 | 50 | 40 | 140 | 70 - 100 | 250 |
| DHM 130 | 536257 | 536266 | ● | 8 | 45 | 50 | 40 | 170 | 100 - 130 | 250 |
| DHM 160 | 536258 | 536267 | ● | 8 | 45 | 50 | 40 | 200 | 130 - 160 | 250 |
| DHM 210 | 536259 | 536268 | ● | 8 | 45 | 50 | 40 | 250 | 170 - 210 | 125 |
| DHM 260 | 536260 | 536269 | ● | 8 | 45 | 50 | 40 | 300 | 220 - 260 | 125 |

## Accessories

**Insulation disc DTM**



DTM 80

| | Item no. | Approval DIBt | Disc ø [mm] | Through hole $d_f$ [mm] | Steel sheet thickness s [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| Item | | | | | | |
| DTM 80 | 536261 | ● | 80 | 11 | 0.5 | 250 |
| DTM 80 A2 | 536271 | ● | 80 | 11 | 0.5 | 250 |

## Technical data

**Cover cap DHM ADK**



DHM ADK-W



DHM ADK-GR



DHM ADK-BG

| Item | Item no. | Diameter d [mm] | Colour | Sales unit [pcs] |
|---|---|---|---|---|
| **DHM ADK-W** | **013330** | 37.0 | white | 250 |
| **DHM ADK-GR** | **046843** | 37.0 | grey | 250 |
| **DHM ADK-BG** | **046844** | 37.0 | beige | 250 |

## Loads

**Insulation support DHM**

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Recommended loads[1] for a single anchor.

| Type | | | DHM |
|---|---|---|---|
| **Recommended loads in the respective base material $F_{rec}$** [2] | | | |
| **Concrete**[3] | ≥ C12/15 | **[kN]** | 0.25 |
| **Solid brick** | Mz 12 | **[kN]** | 0.25 |
| **Solid sand-lime brick** | KS 12 | **[kN]** | 0.25 |
| **Aerated concrete (without pre-drilling)** | ≥ AAC 2 | **[kN]** | 0.10 |

[1] Required safety factors are considered.
[2] Valid for tensile load.
[3] Acc. to DIBt approval $F_{Rd}$ = 0.10 kN in cracked and uncracked concrete ≥ C20/25. For the design the complete current DIBt approval Z-21.8-2057 has to be considered.

# Render fixing DIPK

The cost-effective anchor with plastic nail.





EPS insulation boards in ETICS



## Applications

**To fix pressure-resistant insulating materials in façades, such as:**

- Polystyrene boards
- Light building boards made of wood wool
- Cork boards / coir matting
- PU panels

## Advantages

- The glass-fibre-reinforced plastic nail (GRP nail) reduces the heat transmission and prevents marks on the plaster surface.
- The simple hammerset installation allows a quick installation process and thus reduces workload.
- The well-proven design with low anchorage depth reduces the amount of drilling required, thus achieving a high level of efficiency.
- The DIPK can be used universally in rear-ventilated curtain façades, as well as in plaster façades.
- The surface of the anchor plate is suitable to use as a plaster base.

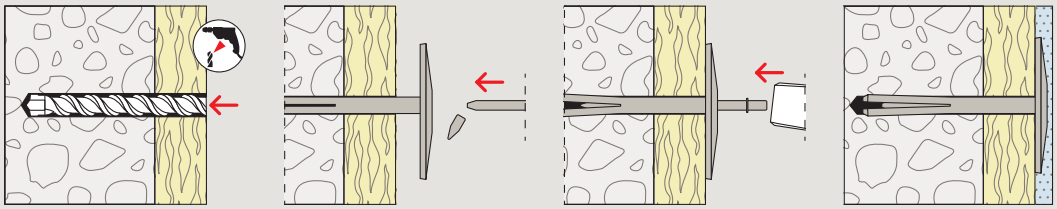
## Building materials

- Concrete
- Hollow blocks made from lightweight concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Solid sand-lime brick
- Natural stone with dense structure
- Solid brick

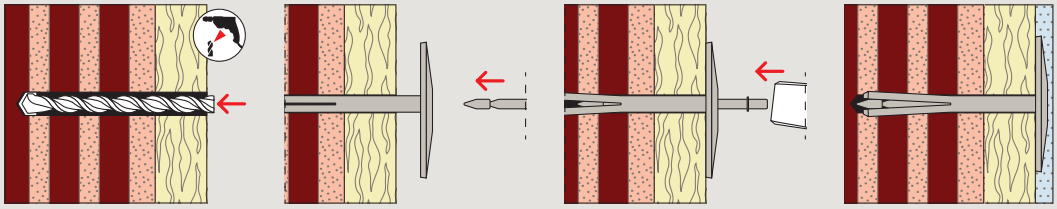
## Functioning

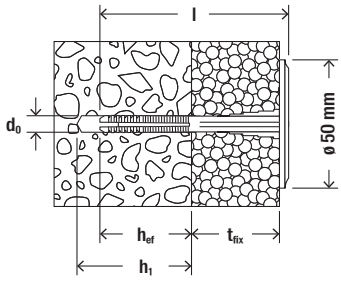
- Non-bearing layers, such as adhesive and/or old render, are to be included in the anchor‘s useful length.
- The DIPK is set in push-through installation by using a hammer.
- In solid materials the GRP nail needs to be shortened at the predetermined breaking point.
- Driving the nail into the anchor shaft causes the DIPK to expand in the base material.

## Installation DIPK in concrete



## Installation DIPK in masonry






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## Technical data

**Render fixing DIPK**



DIPK

| Item | Item no. | Drill diameter $d_0$ [mm] | Usable length $t_{fix}$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **DIPK 8/20-40** | **041865** | 8 | 20 - 40 | 40 | 30 | 70 | 200 |
| **DIPK 8/40-60** | **041866** | 8 | 40 - 60 | 40 | 30 | 90 | 200 |
| **DIPK 8/60-80** | **041867** | 8 | 60 - 80 | 40 | 30 | 110 | 200 |
| **DIPK 8/80-100** | **041868** | 8 | 80 - 100 | 40 | 30 | 130 | 200 |
| **DIPK 8/100-120** | **041869** | 8 | 110 - 120 | 40 | 30 | 150 | 200 |
| **DIPK 10/10-30** | **043966** | 10 | 10 - 30 | 40 | 30 | 60 | 200 |
| **DIPK 10/40-60** | **043967** | 10 | 40 - 60 | 40 | 30 | 90 | 200 |
| **DIPK 10/60-80** | **043968** | 10 | 60 - 80 | 40 | 30 | 110 | 200 |
| **DIPK 10/80-100** | **043969** | 10 | 80 - 100 | 40 | 30 | 130 | 200 |
| **DIPK 10/100-120** | **043970** | 10 | 110 - 120 | 40 | 30 | 150 | 200 |
| **DIPK 10/120-140** | **043971**[1)] | 10 | 120 - 140 | 40 | 30 | 170 | 200 |
| **DIPK 10/140-160** | **043972**[1)] | 10 | 140 - 160 | 40 | 30 | 190 | 200 |

[1)] Installation with setting tool, included in each package.

# Render fixing FIF-PN 8

The pre-assembled hammerset anchor with reinforced plastic nail.





Application in EPS boards



Setting the hammerset fixing on EPS boards



## Applications

- Fixing of ETICS insulation boards on concrete and masonry
- Flush-to-surface installation in ETICS insulating materials e.g. polystyrene

## Advantages

- To set with few hammer blows.
- The disc fits tight into the insulation thanks to its thickness of only 2.7 mm. Thus allows the application of low-cost, thin reinforcement layers.
- Optimised retention forces thanks to the glass fibre reinforced plastic nail (GRP).
- Small anchoring depth of 35 mm saves on drilling times.
- Thanks to the GRP nail, the fixing is free of thermal bridging with the Chi value 0.000 [W/K].
- The compression zone in the shank allows the disc to be drawn precisely into the insulation.
- For insulating material thicknesses up to 180 mm.

## Certificates / Features

ETA-18/0253, in concrete and masonry

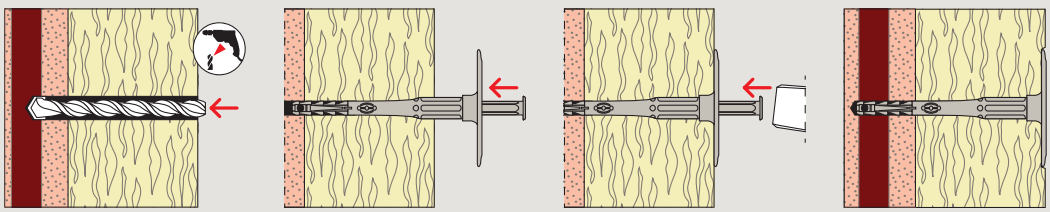
## Building materials

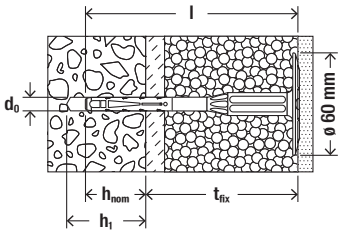
- Building material classes A, B, C, D, E
- Concrete
- Building brick
- Solid sand-lime brick
- Hollow blocks made from lightweight concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Lightweight aggregate concrete
- Aerated concrete

## Functioning

- The fixing is set in push-through installation.
- Simple, fast setting by driving the GRP nail in using a standard hammer.
- Non load bearing layers such as adhesive and old plaster are included in the maximum useful length.

## Installation FIF-PN 8






## Technical data FIF-PN 8 for building material categories A, B, C

**Render fixing FIF-PN 8**



FIF-PN

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. anchorage depth $h_{nom}$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Disc ø [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| FIF-PN 8/60 | 546803 | ● | 8 | 45 | 35 | 108 | 70 | 60 | 100 |
| FIF-PN 8/80 | 546804 | ● | 8 | 45 | 35 | 128 | 90 | 60 | 100 |
| FIF-PN 8/100 | 546805 | ● | 8 | 45 | 35 | 148 | 110 | 60 | 100 |
| FIF-PN 8/120 | 546806 | ● | 8 | 45 | 35 | 168 | 130 | 60 | 100 |
| FIF-PN 8/140 | 546807 | ● | 8 | 45 | 35 | 188 | 150 | 60 | 100 |
| FIF-PN 8/160 | 546808 | ● | 8 | 45 | 35 | 208 | 170 | 60 | 100 |
| FIF-PN 8/180 | 546809 | ● | 8 | 45 | 35 | 228 | 190 | 60 | 100 |

## Building material categories D, E

**Render fixing FIF-PN 8**



FIF-PN

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. anchorage depth $h_{nom}$ [mm] | Anchor length l [mm] | Max. usable length $t_{fix}$ [mm] | Disc ø [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| FIF-PN 8/60 | 546803 | ● | 8 | 65 | 55 | 108 | 50 | 60 | 100 |
| FIF-PN 8/80 | 546804 | ● | 8 | 65 | 55 | 128 | 70 | 60 | 100 |
| FIF-PN 8/100 | 546805 | ● | 8 | 65 | 55 | 148 | 90 | 60 | 100 |
| FIF-PN 8/120 | 546806 | ● | 8 | 65 | 55 | 168 | 110 | 60 | 100 |
| FIF-PN 8/140 | 546807 | ● | 8 | 65 | 55 | 188 | 130 | 60 | 100 |
| FIF-PN 8/160 | 546808 | ● | 8 | 65 | 55 | 208 | 150 | 60 | 100 |
| FIF-PN 8/180 | 546809 | ● | 8 | 65 | 55 | 228 | 170 | 60 | 100 |

## Loads

**Render fixing FIF-PN**

Permissible loads for a single anchor[1)2)] for fixing of external thermal insulation composite systems with rendering.
For the design the complete assessment ETA-18/0253 of 29.05.2018 has to be considered.

| | | | | | Concrete and masonry[5)] | | |
|---|---|---|---|---|---|---|---|
| Base material | Brick raw density<br>$\rho$<br>[kg/dm³] | Minimum compressive brick strength<br>$f_b$<br>[N/mm²] | Minimum embedment depth[3)]<br>$h_{nom}$<br>[mm] | Minimum member thickness<br>$h_{min}$<br>[mm] | Permissible tensile load[1)2)]<br>$N_{perm}$<br>[kN] | Minimum-spacing[4)]<br>$s_{min}$<br>[mm] | Minimum edge distance[4)]<br>$c_{min}$<br>[mm] |
| **Concrete** | - | C12/15 – C50/60 | 35 | 100 | 0.15 | 100 | 100 |
| **Solid clay bricks acc. to EN 771-1:2011, Mz** | ≥ 2.0 | 12 | 35 | 100 | 0.15 | 100 | 100 |
| **Vertically perforated clay bricks acc. to EN 771-1:2011, HLz** | ≥ 1.0 | 12 | 35[6)] | 100 | 0.13 | 100 | 100 |
| **Lightweight aggregate concrete acc. to EN 1520:2011, LAC** | ≥ 0.8 | 6 | 55 | 100 | 0.10 | 100 | 100 |
| **Autoclaved aerated concrete blocks acc. to EN 771-4:2011, AAC** | ≥ 0.5 | 6 | 55[6)] | 100 | 0.10 | 100 | 100 |

1) Plastic anchor for fixing of external thermal insulation composite systems with rendering acc. to ETA data. Only tension wind loads are permitted. The partial safety factors for material resistance as regulated in the assessment as well as a partial safety factor for load actions of $\gamma_L$ = 1.5 are considered.
2) The given loads are valid for installation and use of fixations in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to 40 °C).
3) Drilling method hammer drilling. For details on installation data, see ETA.
4) Minimum possible axial spacing and edge distances acc. to ETA.
5) Restrictions concerning the manufacturer and the permissible hole patterns as well as the web thickness see ETA.
6) Rotary drilling.

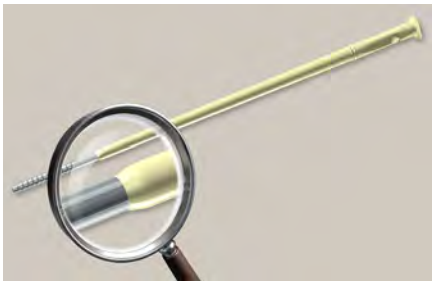
# Render fixing FIF-CN II 8

The pre-assembled anchor with innovative steel-plastic nail.





ETICS on old render



Detail: innovative steel-plastic combination



## Applications

- Fixing of ETICS insulation boards on concrete and masonry
- Flush-to-surface installation in ETICS insulating materials like mineral wool or polystyrene

## Advantages

- To set with few hammer blows.
- The plate fits tight into the insulation thanks to its thickness of only 2.7 mm. Thus allows the application of low-cost, thin reinforcement layers.
- High retention forces thanks to the steel tip of the compound nail.
- Small anchoring depth of 35 mm saves on drilling times.
- The compression zone in the shank allows the plate to be drawn in precisely.
- For insulating material thicknesses up to 340 mm.

## Certificates / Features

CE

**ETA-18/0393, in concrete and masonry**

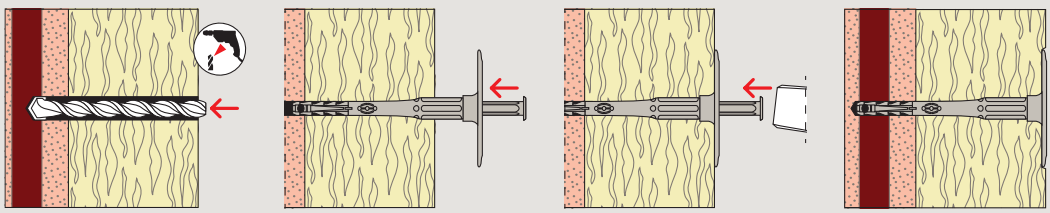
## Building materials

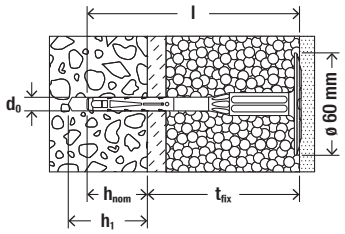
- Building material classes A, B, C, D, E
- Concrete
- Full blocks made from concrete
- Building brick
- Solid sand-lime brick
- Hollow blocks made from lightweight concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Lightweight aggregate concrete
- Aerated concrete

## Functioning

- The fixing is set in push- through installation.
- Simple, fast setting by driving the compound nail in using a standard hammer.
- Non load bearing layers such as adhesive and old plaster are included in the maximum useful length.

## Installation FIF-CN II 8






## Technical data FIF-CN II 8 for building material categories A, B, C

**Render fixing FIF-CN II 8**



FIF-CN II

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. anchorage depth $h_{nom}$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Disc ø [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| FIF-CN II 8/60 | 546443 | ● | 8 | 45 | 35 | 108 | 70 | 60 | 100 |
| FIF-CN II 8/80 | 546444 | ● | 8 | 45 | 35 | 128 | 90 | 60 | 100 |
| FIF-CN II 8/100 | 546445 | ● | 8 | 45 | 35 | 148 | 110 | 60 | 100 |
| FIF-CN II 8/120 | 546446 | ● | 8 | 45 | 35 | 168 | 130 | 60 | 100 |
| FIF-CN II 8/140 | 546447 | ● | 8 | 45 | 35 | 188 | 150 | 60 | 100 |
| FIF-CN II 8/160 | 546448 | ● | 8 | 45 | 35 | 208 | 170 | 60 | 100 |
| FIF-CN II 8/180 | 546449 | ● | 8 | 45 | 35 | 228 | 190 | 60 | 100 |
| FIF-CN II 8/200 | 546450 | ● | 8 | 45 | 35 | 248 | 210 | 60 | 100 |
| FIF-CN II 8/220 | 546451 | ● | 8 | 45 | 35 | 268 | 230 | 60 | 100 |
| FIF-CN II 8/240 | 546452 | ● | 8 | 45 | 35 | 288 | 250 | 60 | 100 |
| FIF-CN II 8/260 | 546453 | ● | 8 | 45 | 35 | 308 | 270 | 60 | 100 |
| FIF-CN II 8/280 | 546454 | ● | 8 | 45 | 35 | 328 | 290 | 60 | 100 |
| FIF-CN II 8/300 | 546455 | ● | 8 | 45 | 35 | 348 | 310 | 60 | 100 |
| FIF-CN II 8/320 | 546456 | ● | 8 | 45 | 35 | 368 | 330 | 60 | 100 |
| FIF-CN II 8/340 | 546457 | ● | 8 | 45 | 35 | 388 | 350 | 60 | 100 |

## Technical data Building for material categories D, E

**Render fixing FIF-CN II 8**



FIF-CN II

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. anchorage depth $h_{nom}$ [mm] | Anchor length l [mm] | Max. usable length $t_{fix}$ [mm] | Disc ø [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| FIF-CN II 8/60 | 546443 | ● | 8 | 65 | 55 | 108 | 50 | 60 | 100 |
| FIF-CN II 8/80 | 546444 | ● | 8 | 65 | 55 | 128 | 70 | 60 | 100 |
| FIF-CN II 8/100 | 546445 | ● | 8 | 65 | 55 | 148 | 90 | 60 | 100 |
| FIF-CN II 8/120 | 546446 | ● | 8 | 65 | 55 | 168 | 110 | 60 | 100 |
| FIF-CN II 8/140 | 546447 | ● | 8 | 65 | 55 | 188 | 130 | 60 | 100 |
| FIF-CN II 8/160 | 546448 | ● | 8 | 65 | 55 | 208 | 150 | 60 | 100 |
| FIF-CN II 8/180 | 546449 | ● | 8 | 65 | 55 | 228 | 170 | 60 | 100 |
| FIF-CN II 8/200 | 546450 | ● | 8 | 65 | 55 | 248 | 190 | 60 | 100 |
| FIF-CN II 8/220 | 546451 | ● | 8 | 65 | 55 | 268 | 210 | 60 | 100 |
| FIF-CN II 8/240 | 546452 | ● | 8 | 65 | 55 | 288 | 230 | 60 | 100 |
| FIF-CN II 8/260 | 546453 | ● | 8 | 65 | 55 | 308 | 250 | 60 | 100 |
| FIF-CN II 8/280 | 546454 | ● | 8 | 65 | 55 | 328 | 270 | 60 | 100 |
| FIF-CN II 8/300 | 546455 | ● | 8 | 65 | 55 | 348 | 290 | 60 | 100 |
| FIF-CN II 8/320 | 546456 | ● | 8 | 65 | 55 | 368 | 310 | 60 | 100 |

# Technical data Building for material categories D, E

**Render fixing FIF-CN II 8**



FIF-CN II

| | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. anchorage depth $h_{nom}$ [mm] | Anchor length l [mm] | Max. usable length $t_{fix}$ [mm] | Disc ø [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | | | |
| **FIF-CN II 8/340** | **546457** | ● | 8 | 65 | 55 | 388 | 330 | 60 | 100 |

## Loads

**Render fixing FIF-CN II**

Permissible loads for a single anchor[1)2)3)] for fixing of external thermal insulation composite systems with rendering.
For the design the complete assessment ETA-18/0393 has to be considered.

| | | | | | Concrete and masonry[4)] | | |
|---|---|---|---|---|---|---|---|
| **Type FIF-CN II** | **Brick raw density** ρ [kg/dm³] | **Minimum compressive brick strength** $f_b$ [N/mm²] | **Minimum embedment depth** $h_{nom}$ [mm] | **Minimum member thickness** $h_{min}$ [mm] | **Permissible tensile load** $N_{perm}$ [kN] | **Minimum spacing[5)]** $s_{min}$ [mm] | **Minimum edge distance[5)]** $c_{min}$ [mm] |
| **Concrete acc. to EN 206-1:2000** | - | C12/15 – C50/60 | 35[6)] | 100 | 0.25 | 100 | 100 |
| **Solid clay bricks Mz according to EN 771-1:2011** | ≥ 2.0 | 12 | 35[6)] | 100 | 0.25 | 100 | 100 |
| **Vertically perforated clay bricks HLz according to EN 771-1:2011** | ≥ 1.0 | 12 | 35[7)] | 100 | 0.17 | 100 | 100 |
| **Lightweight aggregate concrete LAC according to EN 1520:2011** | ≥ 0.8 | 6 | 55[6)] | 100 | 0.17 | 100 | 100 |
| **Autoclaved aerated concrete blocks AAC according to EN 771-4:2011** | ≥ 0.4 | 4 | 55[7)] | 100 | 0.10 | 100 | 100 |

1) Plastic anchor for fixing of external thermal insulation composite systems with rendering acc. to ETA data. Only tensile wind loads are permitted.
2) The partial safety factors for material resistance as regulated in the assessment as well as a partial safety factor for load actions of $\gamma_L = 1.5$ are considered.
3) The given loads are valid for installation and use of fixations in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to +40 °C).
4) Restrictions concerning the manufacturer and the permissible hole patterns as well as the web thickness see assessment.
5) Possible minimum spacing resp. edge distance according to assessment.
6) Drill method hammer drilling.
7) Rotary drilling.

# Render fixing FIF-CS 8

The economic screw fixing for all ETICS insulation materials.





Screwed fixing of insulation boards



EPS boards on perforated sand-lime brick



## Applications

- Fixing of ETICS insulation boards on concrete and masonry
- Flush installation in all conventional insulation materials

## Advantages

- Compound screw minimises the thermal bridge, thus there are no fixing marks on the façade.
- Less drill wear and drill time due to minimum installation depth of 35 mm in the substrate.
- With flush installation, the disc tapers to a very thin edge, thus providing for optimal retaining of the insulation panel and for application of thin render.
- For insulation material thicknesses up to 340 mm.
- Standard embedment depth for all building materials.

## Certificates / Features

CE

ETA-15/0006, in concrete and masonry

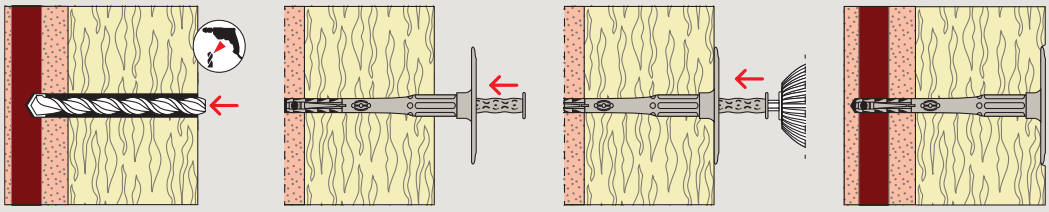
## Building materials

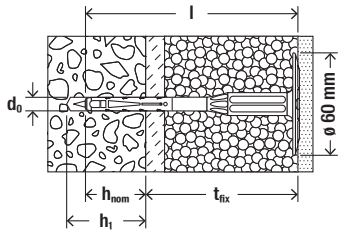
- Building material classes A, B, C, D, E
- Concrete
- Concrete (weather shell)
- Building brick
- Solid sand-lime brick
- Hollow blocks made from lightweight concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Lightweight aggregate concrete
- Aerated concrete

## Functioning

- The fixing is pushed through the insulation into the drilled hole and is screwed tight.
- For lengths from 250 mm, at least 180 mm long TX25 bits are required. These are not included in the delivery assortment.

## Surface-flush installation






## Technical data

**Render fixingl FIF-CS 8**



FIF-CS 8

| Item | Item no. | Approval ETA | Drill diameter $d_0$ [mm] | Min. drill hole depth $h_1$ [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Anchor length l [mm] | Max. fixture thickness $t_{fix}$ [mm] | Disc ø [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **FIF-CS 8/60** | **534157** | ● | 8 | 45 | 35 | 108 | 70 | 60 | 100 |
| **FIF-CS 8/80** | **534158** | ● | 8 | 45 | 35 | 128 | 90 | 60 | 100 |
| **FIF-CS 8/100** | **534159** | ● | 8 | 45 | 35 | 148 | 110 | 60 | 100 |
| **FIF-CS 8/120** | **534160** | ● | 8 | 45 | 35 | 168 | 130 | 60 | 100 |
| **FIF-CS 8/140** | **534161** | ● | 8 | 45 | 35 | 188 | 150 | 60 | 100 |
| **FIF-CS 8/160** | **534162** | ● | 8 | 45 | 35 | 208 | 170 | 60 | 100 |
| **FIF-CS 8/180** | **534163** | ● | 8 | 45 | 35 | 228 | 190 | 60 | 100 |
| **FIF-CS 8/200** | **534164** | ● | 8 | 45 | 35 | 248 | 210 | 60 | 100 |
| **FIF-CS 8/220** | **534165** | ● | 8 | 45 | 35 | 268 | 230 | 60 | 100 |
| **FIF-CS 8/240** | **534166** | ● | 8 | 45 | 35 | 288 | 250 | 60 | 100 |
| **FIF-CS 8/260** | **534167** | ● | 8 | 45 | 35 | 308 | 270 | 60 | 100 |
| **FIF-CS 8/280** | **534168** | ● | 8 | 45 | 35 | 328 | 290 | 60 | 100 |
| **FIF-CS 8/300** | **534169** | ● | 8 | 45 | 35 | 348 | 310 | 60 | 100 |
| **FIF-CS 8/320** | **534170** | ● | 8 | 45 | 35 | 368 | 330 | 60 | 100 |
| **FIF-CS 8/340** | **534171** | ● | 8 | 45 | 35 | 388 | 350 | 60 | 100 |

## Loads

**Render fixing FIF-CS**

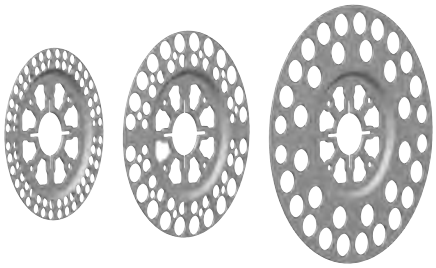
Permissible loads for a single anchor[1)2)] for fixing of external thermal insulation composite systems with rendering.
For the design the complete assessment ETA-15/0006 of 31.05.2018 has to be considered.

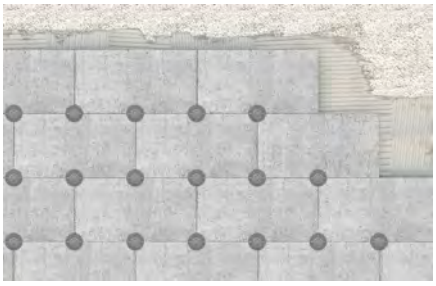
| | | | | | Concrete and masonry[5)] | | |
|---|---|---|---|---|---|---|---|
| Base material | Brick raw density ρ [kg/dm³] | Brick raw density $f_b$ [N/mm²] | Minimum embedment depth[3)] $h_{nom}$ [mm] | Minimum member thickness $h_{min}$ [mm] | Permissible tensile load[1)2)] $N_{perm}$ [kN] | Minimum spacing[4)] $s_{min}$ [mm] | Minimum edge distance[4)] $c_{min}$ [mm] |
| **Concrete** | - | C12/15 – C50/60 | 35 | 100 | 0.40 | 100 | 100 |
| **Solid clay bricks acc. to EN 771-1:2011, Mz** | ≥ 1.8 | 20 | 35 | 100 | 0.40 | 100 | 100 |
| **Vertically perforated clay bricks acc. to EN 771-1:2011, HLz** | ≥ 1.0 | 12 | 25[6)] | 100 | 0.20 | 100 | 100 |
| **Lightweight aggregate concrete acc. to EN 1520:2011, LAC** | ≥ 0.9 | 6 | 35 | 100 | 0.20 | 100 | 100 |
| **Autoclaved aerated concrete blocks acc. to EN 771-4:2011, AAC** | ≥ 0.5 | 4 | 35[6)] | 100 | 0.10 | 100 | 100 |

[1)] Plastic anchor for fixing of external thermal insulation composite systems with rendering acc. to ETA data. Only tension wind loads are permitted. The partial safety factors for material resistance as regulated in the assessment as well as a partial safety factor for load actions of $\gamma_L = 1.5$ are considered.
[2)] The given loads are valid for installation and use of fixations in dry base material for temperatures in the substrate up to +24 °C (resp. short term up to 40 °C).
[3)] Drilling method hammer drilling. For details on installation data, see ETA.
[4)] Minimum possible axial spacing and edge distances acc. to ETA.
[5)] Restrictions concerning the manufacturer and the permissible hole patterns as well as the web thickness see ETA.
[6)] Rotary drilling.

# Insulation discs DT

The insulation discs for combination with TermoZ, FIF and TermoFix fixings.





Flush installed ETICS fixings in combination DT plates on mineral wool boards.



## Applications

- Used in combination with TermoZ, FIF and TermoFix anchors to fix ETICS insulating boards with low compressive strength.
- Flush surface installation in ETICS insulating materials e.g. mineral wool.

## Advantages

- The various disc diameters allow for individual adaptation to various insulation materials and requirements and offer the greatest flexibility with wide-ranging applications.

## Functioning

- The discs are set in push-through installation.
- Push the selected DT insulating disc onto the TermoZ, FIF or TermoFix anchor and fit.

## Technical data

**Insulation discs DT**

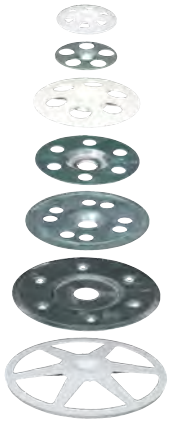


DT 90, DT 110, DT 140

| Item | Item no. | Through hole $d_f$ [mm] | Sales unit [pcs] |
|---|---|---|---|
| **DT 90** | **008889** | 16 | 100 |
| **DT 140** | **008690** | 16 | 100 |
| **DT 110** | **090745** | 16 | 100 |

# Insulation discs

Discs for combination with nail and frame fixings, as well as screws.





Insulating materials in double- shell facades



## Applications

- To fix soft and pressure-resistant insulation materials.
- DT90/4 on 4 mm remedial wall tie
- DT60/10, DTM60/10 and DTM70/10 in combination with 10 mm frame fixing
- DT90/8 and insulation washer 8/60 in combination with 8 mm frame or nail fixings
- HV and HK 36 with 5 mm screws

## Advantages

- The various disc diameters allow for individual adaptation to various insulation materials and requirements and offer the greatest flexibility with wide-ranging applications.
- The flexible pins in the DT 90 ensure sustained pressure on the insulation, thus providing a secure hold.
- The DTM 60 made of stainless steel A4 makes it possible to use a frame fixing and allows for a secure fixing of the insulation material in façade construction in cases of high requirements.

## Functioning

- The disc size is to be selected in line with the compressive strength of the insulating material.
- To be combined with anchors, screws or nails corresponding to the available base material.

## Technical data

**Insusltion discs**


HK 36 plastic


HV 36


ISO-Disc 8/60


DT 60/10


DTM 60/10 A4


DTM 70/10

| Item | Item no. | Disc ø [mm] | Disc height [mm] | Through hole $d_f$ [mm] | Steel sheet thickness s [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **HK 36 plastic** | **004283** | 36 | 4.5 | 5 | – | 100 |
| **HV 36 zinc** | **004286** | 36 | 3.5 | 5 | 0.7 | 100 |
| **ISO-disk 8/60** | **001680** | 60 | 7.0 | 8 | – | 100 |
| **DT 60/10** | **044317** | 60 | 7.0 | 10 | – | 50 |
| **DTM 60/10 A4** | **088805** | 60 | 3.0 | 10.5 | 0.5 | 100 |
| **DTM 70/10 zinc** | **044318** | 70 | 5.0 | 11 | 0.8 | 50 |

## Technical data

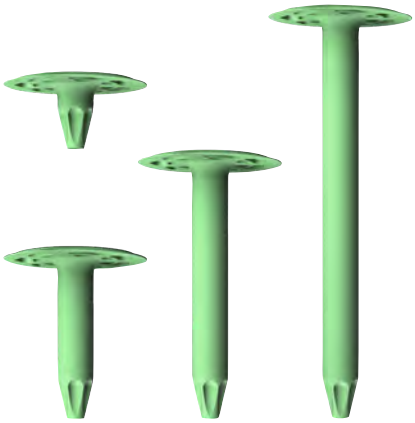

DT 90

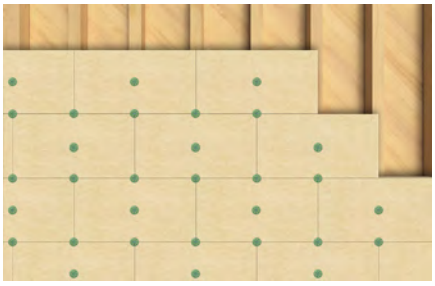
| Item | Item no. | Disc ø [mm] | Disc height [mm] | Through hole $d_f$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|
| **DT 90/4** | **080957**[1)] | 90 | 9.3 | 4 | 250 |
| **DT 90/8** | **080958** | 90 | 9.3 | 8.5 | 250 |

[1)] The central hole is adapted in such a way that the disc fits onto the 4 mm wire of a remedial wall tie

# TermoFix H

The plate element for use with standard screws.





Wood fibre boards on wooden constructions



## Applications

- Fixing of ETICS insulation boards with standard screws

## Advantages

- Closing plugs for the bit hole in the TermoFix H10 plate are included.
- The plate elements TermoFix H 50, 90 and 150 are sealed by using the sealing cap moulded on.
- An air column is produced between the screw head and sealing cap. This reduces thermal-transmission losses.
- Extremely economical thanks to different shank lengths. This allows the screw length to be reduced if necessary.
- Can be combined with the insulating discs DT 90, DT 110 and DT 140.

## Building materials

- Panel building materials
- Solid wood

## Functioning

- The fixing (disc and screw) is set in push-through installation.
- Non-load-bearing layers such as adhesive and old plaster should not serve as an anchoring base.

## Technical data

**TermoFix H**



TermoFix H 10



TermoFix H 50



TermoFix H 90



TermoFix H 150

| Item | Item no. | Shaft length L [mm] | Disc ø [mm] | Sealing [dN·m] | Colour | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **TermoFix H 10** | **514288** | 29 | 60 | PS plug (included) | green | 200 |
| **TermoFix H 50** | **514289** | 69 | 60 | Sealing cap (moulded on) | green | 200 |
| **TermoFix H 90** | **514290** | 109 | 60 | Sealing cap (moulded on) | green | 200 |
| **TermoFix H 150** | **514291** | 169 | 60 | Sealing cap (moulded on) | green | 200 |

# Retaining disc with screw DHT S

The installation-friendly polyamide retaining disc for panel building materials.





Pressure-resistant insulation boards on timber constructions



Pressure-resistant insulation boards on timber constructions



## Applications

**To fix pressure-resistant insulating materials in plaster façades, such as:**

- Polystyrene
- PU panels
- Light building boards made of wood wool
- Cork boards / coir matting

## Advantages

- The DHT-S screw allows setting without pre-drilling, thus saving a stage of installation.
- The plug reduces the heat transmission and prevents marks on the plaster surface.
- The extremely thin disc construction allows the use with thin layers of plaster and reinforcements and offers maximum flexibility.

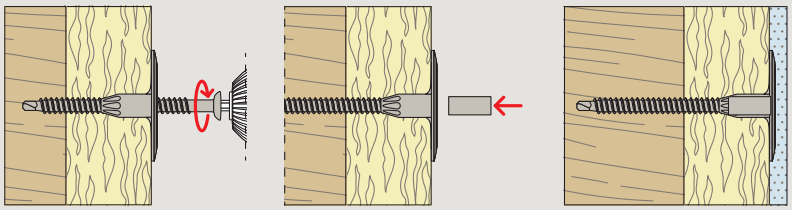
## Building materials

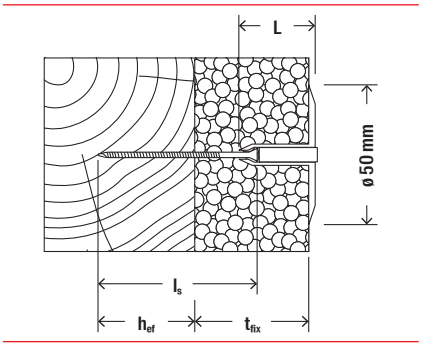
- Wood and wooden materials
- Board thickness up to 0.8 mm

## Functioning

- Non-bearing layers, such as adhesive, are to be included in the useful length.
- The retaining disc with screw is set in push-through installation with a cordless screwdriver.
- A PH2 bit is required for installation.
- After installation, seal the screw hole with the enclosed plug.

## Installation DHT S






## Technical data

**Retaining disc with screw DHT S**



DHT 50



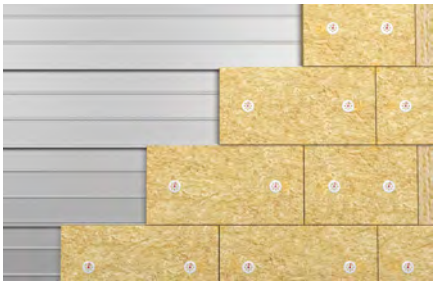
DHT S

| Item | Item no. | Colour | Usable length $t_{fix}$ [mm] | Shaft length L [mm] | Screw length $l_s$ [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Disc ø [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **DHT 50/20 W** | **044490** | white | – | 20 | – | – | 50 | 500 |
| **DHT 50/40 W** | **044491** | white | – | 40 | – | – | 50 | 500 |
| **DHT S 30 W** | **044390** | white | 30 | 20 | 45 | 25 | 50 | 500 |
| **DHT S 50 W** | **044392** | white | 40 - 50 | 20 | 65 | 25 | 50 | 500 |
| **DHT S 70 W** | **044394** | white | 60 - 70 | 40 | 65 | 25 | 50 | 500 |
| **DHT S 80 W** | **044395** | white | 70 - 80 | 40 | 75 | 25 | 50 | 500 |
| **DHT S 100 W** | **044388** | white | 90 - 105 | 40 | 100 | 25 | 50 | 500 |
| **DHT S 120 W** | **044389** | white | 110 - 125 | 40 | 120 | 25 | 50 | 500 |
| **DHT S 150 W** | **516154** | white | 140 - 155 | 40 | 150 | 25 | 50 | 500 |

# TermoFix B

The ETICS screw fixing with Delta Seal-coated drill screw for sheet metal subsurfaces.





Mineral wool insulation boards on metal sheet



## Applications

- Attachment of ETICS insulating boards to metal substructures
- Flush-to-surface installation in ETICS insulating materials e.g. polystyrene

## Advantages

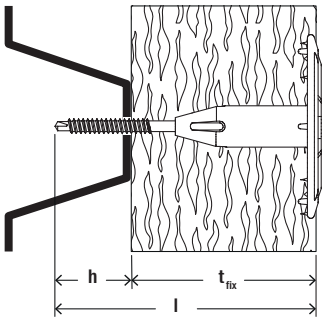
- The prefitted screw shortens the processing time.
- Higher corrosion protection for the screw thanks to the Delta-Seal coating. This means security for years to come.
- An air column is created above the head by the locking ball. This reduces heat transmission.
- The flexible head offsets the thermally induced tensions and prevents damage.
- For very soft insulation materials the TermoFix B can be combined with the insulation discs DT 90, DT 110, DT 140.

## Building materials

- Metal sheet / trapezoidal metal sheet up to 1.5 mm

## Functioning

- The fixing fixing is set in push-through installation.
- A standard PH2 bit is required for installation.
- Simple, quick setting by screwing in the Delta Seal-coated screw with a standard screwdriver.
- Non-load bearing layers, such as adhesive are included in the maximum useful length.




## Technical data

**Screw fixing TermoFix B**



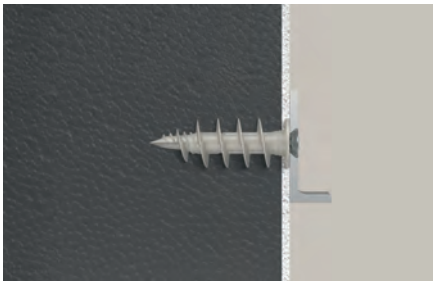
TermoFix B

| Item | Item no. | Anchor length l [mm] | Min. effect. anchorage depth $h_{ef}$ [mm] | Max. fixture thickness $t_{fix}$ [mm] | Disc ø [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **TermoFix B 70** | **008691** | 70 | 20 | 50 | 60 | 100 |
| **TermoFix B 90** | **008692** | 90 | 20 | 70 | 60 | 100 |
| **TermoFix B 110** | **008693** | 110 | 20 | 90 | 60 | 100 |
| **TermoFix B 130** | **008694** | 130 | 20 | 110 | 60 | 100 |
| **TermoFix B 160** | **008695** | 160 | 20 | 140 | 60 | 100 |
| **TermoFix B 180** | **008696** | 180 | 20 | 160 | 60 | 100 |

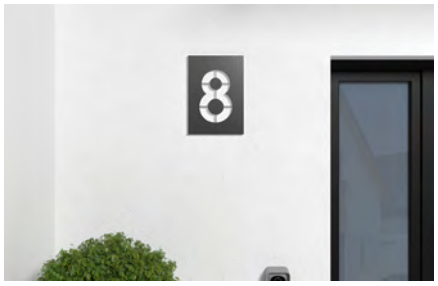
# Insulation plug FID II

The insulation plug for lightweight attachments to the ETICS.





FID II in plastered polystyrene



Fixings of house numbers on plastered facade



## Applications

- Outdoor lighting
- Motion detector
- House number
- Doorbell

## Advantages

- The use of standard screws with a diameter of 3.5 - 4.5 mm allows flexible use.
- Due to the minimal head diameter, the plug edge is not visible even with narrow attachments.
- Maximum stability due to glass-fibre reinforced plastic.
- Due to the special tip geometry, the plug screws through plaster thicknesses of up to 10 mm without pre-drilling, which enables a fast processing.
- The FID II is easily set with a standard TX 40 bit.
- The fischer insulation plug enables an universal use in all common insulation materials.

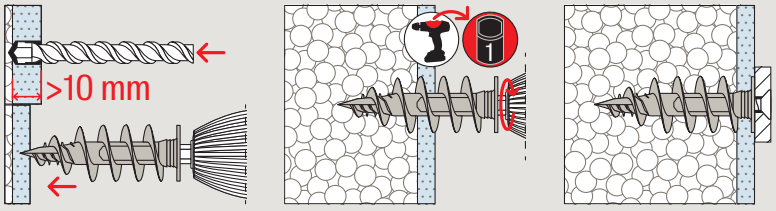
## Building materials

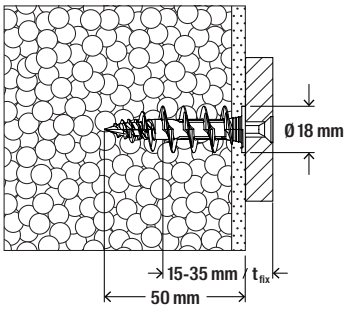
- Mineral wool
- Expanded polystyrene (EPS)
- Extruded polystyrene (XPS)
- Wood fibre
- Polyurethane rigid foam (PU)

## Functioning

- The FID II is placed in the plastered facade with a cordless screwdriver.
- For thick layers of plaster from 10 mm pre-drilling is recommended.
- The insulation plug anchors itself firmly in the insulation material without destroying the plaster.
- After successful pre-positioned installation, the FID II can be additionally sealed with a sealing compound.

## Installation FID II






## Technical data

**Insulation plug FID II**



FID II

| | Item no. | Anchor length<br>l<br>[mm] | Anchor head diameter<br>D<br>[mm] | Min. bolt penetration<br>$l_{E,min}$<br>[mm] | Max. bolt penetration<br>$l_{E,max}$<br>[mm] | Drive | Wood and chipboard screws<br>$d_s$<br>[mm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | | |
| **FID II** | **570347** | 50 | 18 | 15 | 35 | TX40 | 3.5 - 4.5 | 50 |
| **FID II K (4)** | **570348** | 50 | 18 | 15 | 35 | TX40 | 3.5 - 4.5 | 1 |

## Loads

**Insulation plug FID II & FID II Plus**

Recommended loads[1] of a single anchor.
The given loads are valid for chipboard screws with specified diameter and only for the specified insulation types with plaster thicknesses.

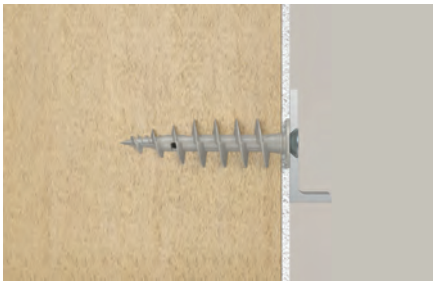
| Type | | | FID II | FID II Plus | FID II Plus Fill&Fix[3] | FID II Plus 1C PU foam[4] |
|---|---|---|---|---|---|---|
| **Diameter chipboard screw** | | **[mm]** | 4 | 5 | 5 | 5 |
| **Recommended load in the respective insulation material $N_{rec}$[2]** | | | | | | |
| EPS with plaster | Plaster thickness 8 mm | **[kN]** | 0.15 | 0.20 | 0.40 | 0.40[5] |
| Mineral wool with plaster | Plaster thickness 8 mm | **[kN]** | 0.05 | 0.10 | 0.20 | 0.20[6] |
| Wood fibre with plaster | Plaster thickness 13 mm | **[kN]** | 0.15 | 0.20 | 0.40 | - |

[1] Required safety factors are considered.
[2] Valid for tensile load, transverse load and diagonal pull.
[3] Injection with fischer Fill&Fix injection fixing, injection quantity in EPS: 35 scale parts, in mineral wool & wood fibre: 60 scale parts, curing time: 2 min.
[4] Injection with fischer 1C PU foam.
[5] Three short sprays (observe absorption capacity of insulation material, adjust interval), curing time: 14-24 h. Protection of the plaster façade from chemical residues is recommended.
[6] Five short sprays (observe absorption capacity of insulation material, adjust interval), curing time: 14-24 h. Protection of the plaster façade from chemical residues is recommended.

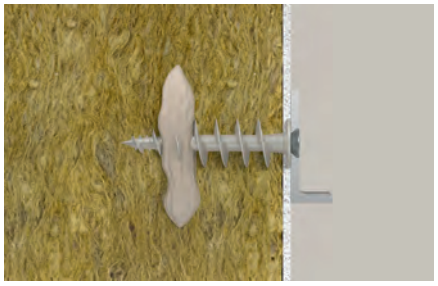
# Insulation plug FID II Plus

The strong insulation plug for medium heavy attachments on ETICS.





FID II Plus in plastered wood fibreboard



FID II Plus in mineral wool with chemical component



## Applications

- Letterbox
- Window shutter holder
- Wallbox

## Advantages

- The use of standard screws with a diameter of 4.5 - 6 mm allows flexible use.
- Due to the special tip geometry, the plug screws through plaster thicknesses of up to 10 mm without pre-drilling, which enables a fast processing.
- Maximum stability due to glass-fibre reinforced plastic.
- The additional use of a chemical component, such as the fischer Fill&Fix or fischer 1c PU foam, can significantly increase the loads.
- The FID II Plus is easily set with a standard TX 40 drive.
- The fischer insulation plug enables an universal use in all common insulation materials.

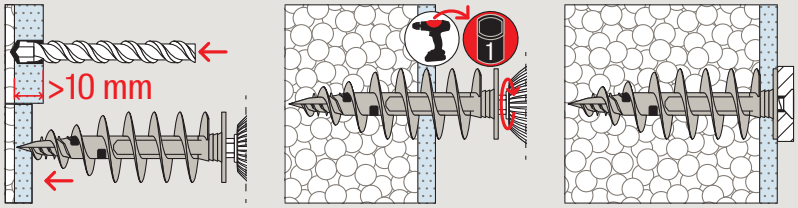
## Building materials

- Mineral wool
- Expanded polystyrene (EPS)
- Extruded polystyrene (XPS)
- Wood fibre
- Polyurethane rigid foam (PU)

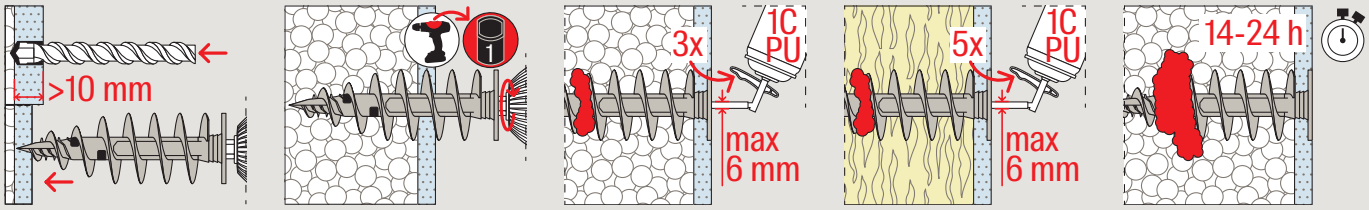
## Functioning

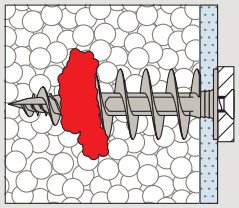
- The FID II Plus is placed in the plastered facade with a cordless screwdriver. For thick layers of plaster starting from 10 mm pre-drilling is recommended.
- The insulation plug anchors itself firmly in the insulation material without destroying the plaster.
- For a load increase, 1c PU foam or the fischer Fill&Fix can be inserted into the FID II Plus. For an exact application guideline of the chemical component, please refer to the load table.
- After curing time of the chemical component (1c PU foam: 14 - 24 h, Fill&Fix: 2 min) the screw can be installed.
- After successful pre-positioned installation, the FID II Plus can be additionally sealed with a sealing compound.

## Installation FID II Plus

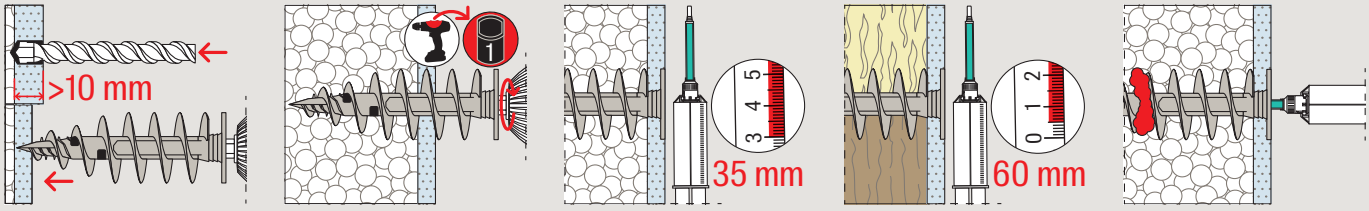


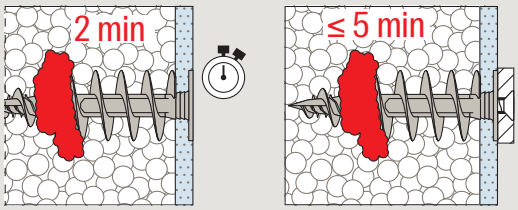

## Installation FID II Plus with 1c PU foam

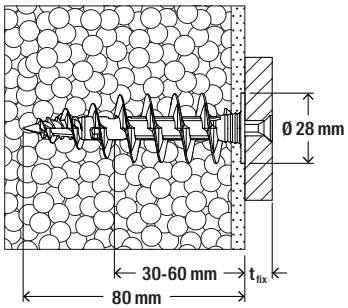


## Installation FID II Plus with fischer Fill&Fix






## Technical data

**Insulation plug FID II Plus**



FID II Plus

| | Item no. | Anchor length<br>l<br>[mm] | Anchor head diameter<br>D<br>[mm] | Min. bolt penetration<br>$l_{E,min}$<br>[mm] | Max. bolt penetration<br>$l_{E,max}$<br>[mm] | Drive | Wood and chipboard screws<br>$d_s$<br>[mm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | | |
| **FID II Plus** | **570349** | 80 | 28 | 30 | 60 | TX40 | 4.5 - 6.0 | 25 |

## Loads

**Insulation plug FID II & FID II Plus**

Recommended loads[1] of a single anchor.
The given loads are valid for chipboard screws with specified diameter and only for the specified insulation types with plaster thicknesses.

| Type | | | FID II | FID II Plus | FID II Plus Fill&Fix[3] | FID II Plus 1C PU foam[4] |
|---|---|---|---|---|---|---|
| **Diameter chipboard screw** | | [mm] | 4 | 5 | 5 | 5 |
| **Recommended load in the respective insulation material $N_{rec}$[2]** | | | | | | |
| EPS with plaster | Plaster thickness 8 mm | [kN] | 0.15 | 0.20 | 0.40 | 0.40[5] |
| Mineral wool with plaster | Plaster thickness 8 mm | [kN] | 0.05 | 0.10 | 0.20 | 0.20[6] |
| Wood fibre with plaster | Plaster thickness 13 mm | [kN] | 0.15 | 0.20 | 0.40 | - |

[1] Required safety factors are considered.
[2] Valid for tensile load, transverse load and diagonal pull.
[3] Injection with fischer Fill&Fix injection fixing, injection quantity in EPS: 35 scale parts, in mineral wool & wood fibre: 60 scale parts, curing time: 2 min.
[4] Injection with fischer 1C PU foam.
[5] Three short sprays (observe absorption capacity of insulation material, adjust interval), curing time: 14-24 h. Protection of the plaster façade from chemical residues is recommended.
[6] Five short sprays (observe absorption capacity of insulation material, adjust interval), curing time: 14-24 h. Protection of the plaster façade from chemical residues is recommended.

# Insulation screw FID-Z

The self-drilling insulation screw for thin metal sheets on ETICS.





Fixing of metal sheets using the FID-Z



Direct fastening of thin metal sheets on ETICS facades



## Applications

- Direct fastening of thin metal sheets on ETICS façades
- Cross-cutting strips
- Splash guards
- Metal sheets
- Custodies

## Advantages

- The special tip geometry of the FID-Z enables direct mounting of common, thin sheets (<0,8mm) without pre-drilling on the ETICS for time-saving installation.
- The sealing disc of the FID-Z prevents water from penetrating the façade. This prevents structural damage.
- The optimized thread geometry guarantees uniform screw insertion for a clean setting result.

## Building materials

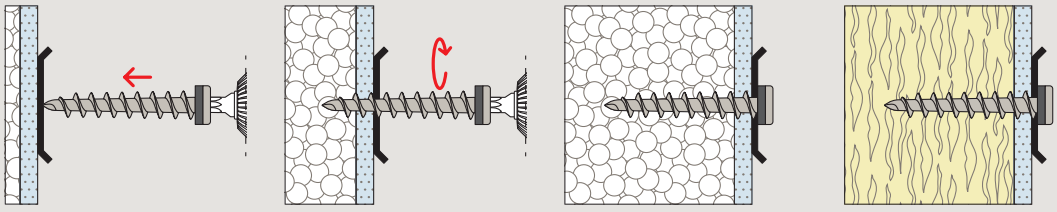
ETICS with:

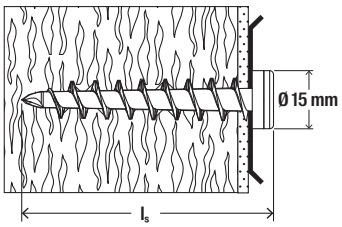
- Mineral wool
- Polystyrene
- Polyurethane
- Wood fibre

## Functioning

- The FID-Z is suitable for direct mounting of thin metal sheets (<0,8 mm) on ETICS without pre-drilling.
- When screwing in, the tip drills directly through the metal sheet.
- By tightening the screw, the sealing washer is pressed against the attachment part and seals.

## Installation FID-Z






## Technical data

**Insulation fixing FID**



FID-Z

| | Item no. | Screw length $l_s$ [mm] | Max. fixture thickness $t_{fix}$ [mm] | Drill hole diameter in fixture $d_f$ [mm] | Drive | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Item** | | | | | | |
| **FID-Z** | **563537** | 65 | 3 | 10 | TX30 | 50 |

## Loads

**Insulation screw FID-Z**

Recommended loads[1] for a single anchor.

| **Type** | | **FID-Z** |
|---|---|---|
| **Recommended loads in the respective base material $N_{rec}$** [2] | | |
| ETICS with EPS | **[kN]** | 0.05 |
| ETICS with mineral wool | **[kN]** | 0.03 |
| ETICS with wood fibre | **[kN]** | 0.08 |
| ETICS with XPS | **[kN]** | 0.06 |

[1] Required safety factors are considered.
[2] Valid for tensile loads when fixing to plastered insulation materials.

# Insulation fixing FID-R

Thermal bridge-free installation of rainwater downpipes on ETICS.





Fastening of a rainwater downpipe with the FID-R



## Applications

- Thermal bridge-free installation of rainwater downpipes

## Advantages

- Since the anchor is set exclusively in the insulation itself, fixtures can be installed without thermal bridges. The anchor offers an energy-optimised fixing.
- The hard-centering tip cuts its own way through the plaster, without the need for pre-drilling, thus saving a stage of installation.
- The TX-drive allows a setting with standard tools, thus allowing for a fast and economic installation.

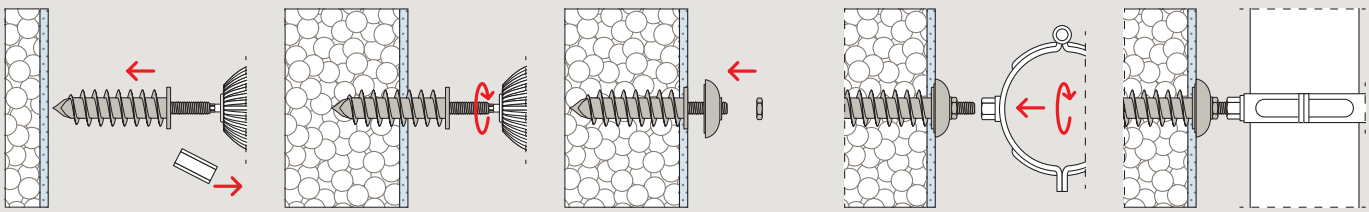
## Building materials

- Polystyrene insulating boards
- Wood fibre insulating boards
- External thermal insulation composite system (ETICS)

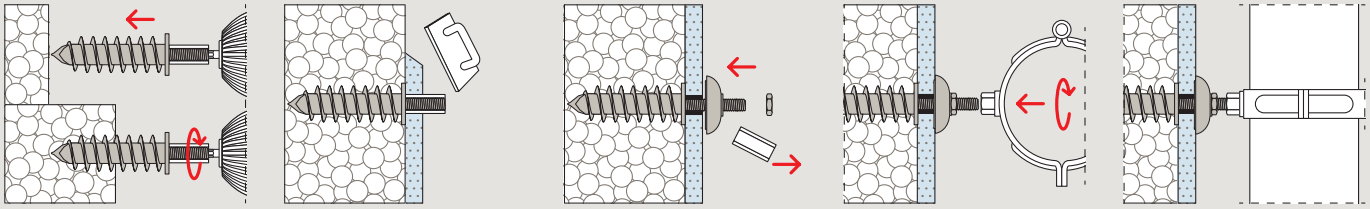
## Functioning

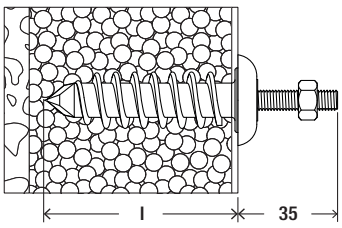
- The installation is carried out without any special tools.
- The spiral thread taps itself in the insulation board.
- For the installation in wood fibre insulating boards a pre-drilling of the insulating board with 16 mm is necessary.
- For the installation before plastering the threaded rod is protected by a tube sleeve.
- The included white covering rosette with glued on PE sealing disc protects again humidity.

## Installation in plastered insulating boards



## Installation in non-plastered insulating boards






## Technical data



**Insulation fixing FID-R**



FID-R

| Item | Item no. | Anchor length l [mm] | Bolt penetration s [mm] | Drive | Thread A | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FID-R zl** | **548404** | 95 | 95 | TX25 | M10 | 25 |
| **FID-R zl B** | **548405** | 95 | – | TX25 | M10 | 1 |

## Loads

**Insulation fixing FID-R**

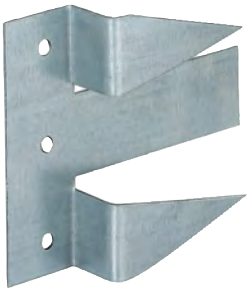
Recommended loads[1] for a single anchor.

| Type | | | FID-R |
|---|---|---|---|
| **Recommended loads in the respective base material $N_{rec}$[2]** | | | |
| Polystyrene | PS 15 | **[kN]** | 0.17 |
| Polystyrene | PS 20 | **[kN]** | 0.20 |

[1] Required safety factors are considered.
[2] Valid for tensile loads.

# Holding clamp DVN

The installation-friendly insulation clamp.





Pressure-resistant insulation boards on timber constructions



Pressure-resistant insulation boards on ceiling undersides



## Applications

- To fix pressure-resistant insulation materials (e.g. polystyrene, PU panels, glass foam boards) onto timber sub-structures, predominantly in the ceiling area

## Advantages

- The holding clamp DVN allows for a hidden installation for a homogeneous surface.
- The complete fixing system, comprising the clamp and zinc-plated nails, allows an immediate installation in line with building requirements.
- The Sendzimir-galvanised steel claw allows a durable use for the secure anchoring of pressure-resistant insulation materials.

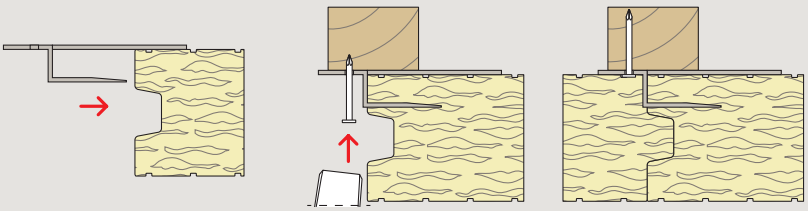
## Building materials

- Wooden materials
- Wooden panel materials

## Functioning

- The holding clamp is fixed with the supplied nails on the wooden substrate with a hammer.
- The points of the holding clamp DVN are pushed into the slot side of the insulating board until it is held securely.

## Installation DVN



## Technical data

**Holding clamp DVN**



DVN

| Item | Item no. | For insulation thickness [mm] | Sales unit [pcs] |
|---|---|---|---|
| **DVN 15** | **047240** | up to 60 | 250 |
| **DVN 30** | **047243** | From 80 | 250 |



# 12
# Foams and Sealants


FOAMS

| | | |
|---|---|---|
| Low monomer PU foam | 630 |  |
| Premium quick assembly & well foam | 631 |  |
| Fast bonding foam | 632 |  |
| Flexible gun foam | 633 |  |
| Premium gun foam | 635 |  |
| Gun foam | 636 |  |
| Gun foam hardly flammable | 637 |  |
| Well foam | 638 |  |
| Perimeter adhesive foam | 639 |  |
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| Rapid foam door frame & tray | 642 |  |
| PU foam dispenser PUP K2 Plus | 643 |  |
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| PU foam dispenser PUP M4 BLACK | 645 |  |
| PU-cleaner | 646 |  |
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SEALANTS

| | | |
|---|---|---|
| Sanitary Pro SI (DSSA) | 652 |  |
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| | | |
|---|---|---|
| Multi SI (DMS) | 655 |  |
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| Paint AC (DMA) | 662 |  |
| Texture AC (DSA) | 663 |  |
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| Dispenser KPM 3 | 669 |  |
| Dispenser KPM 2 Plus | 670 |  |
| Foil bag dispenser KPM 600 | 671 |  |

ZINC SPRAY

| | | |
|---|---|---|
| Zinc-alu spray FTC-ZA | 672 |  |
| Zinc spray FTC-ZS | 673 |  |

# Low monomer PU foam

The low-monomer PU foam is a perfect combination of high performance and high safety.










## Applications

- Insulating and filling window connection joints, window sills and roller shutter boxes
- Insulating and filling in roof extensions and drywall construction
- Insulating and filling prefabricated elements such as wall connections, wall openings and cavities
- Insulating and filling pipe openings and ventilation ducts

## Advantages

- No safety training requirement due to low-hazard formulation.
- High safety standards are met thanks to the very low content of monomeric isocyanates of < 0.1%.
- The EMICODE® EC1PLUS is the premium class in terms of the emission behavior of volatile organic compounds.
- The very fine-pored cell structure and high flexibility guarantee the best sound and thermal insulation properties.
- No time-consuming reworking thanks to its excellent dimensional stability of ± 5%.
- The Pageris safety valve prevents sticking and guarantees a shelf life of 18 months.

## Building materials

- Concrete
- Anodized layer
- Metals
- Masonry
- Concrete
- Wood
- Sand-lime brick
- Plaster
- Plasterboard
- Stone
- Aerated concrete
- Plastics (not on PP, PE, Teflon, silicone)

## Certificates / Features

- General building authority test certificate DIN 4102-1: B2
- Tested joint sound insulation ≥ 62 (-1; -5) dB
- Tested air permeability a < 0.1
- Tested thermal conductivity $\lambda_{10}$ = 0.036
- Determined water vapor permeability factor μ = 21
- EMICODE® EC1 Plus - very low emission
- French VOC emission class A+

## Functioning

- 1c PU-low monomer foam
- Processing temperature ambient: +5 °C to +35 °C (can temperature: +5 °C to +30 °C)
- Tack-free in 20 to 25 minutes
- Can be cut after approx. 100 minutes
- Fully cured after approx. 24 hours
- Dimensional stability ±5 %
- Temperature resistant from -40 °C to +80 °C
- Joint sound insulation ≥ 62 (-1; -5) dB
- Thermal conductivity of 36 mW/mK
- Yield up to 35 liters (EN 17333-1)

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Max. foam yield (EN 17333-1) [l] | Adapter system | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| PU-P EVO 750 B2 | 563227 | DE | 750 | 35 | Combi adapter | white | 12 | 1 |
| PU-P EVO 750 B2 | 573804 | FR, IT | 750 | 35 | – | white | 12 | 1 |

Dangerous goods – no express shipping possible.

# Premium quick assembly & well foam

The assembly foam, which can be used several times with the FixAdapter and can be precisely dosed with one hand.






Window connection joints



Sealing concrete manhole rings



## Applications

- Bonding and sealing manhole rings
- Insulating and filling in roofing work and dry construction
- Insulating and filling door and window connection joints, around window sills and shutter boxes
- Insulating and filling finished elements, wall connections and wall penetrations

## Advantages

- The fischer FixAdapter allows for immediate use and for the reuse of opened cans, thus guaranteeing long-lasting functionality.
- The used safty valve prevents adhesion when being stored horizontally and premature gas loss.
- The premium quick assembly & well foam has been approved as watertight by an external inspection and is thus suitable for use in wet conditions. It fulfils the requirements of a well foam.
- The ergonomic handle sits perfectly in the hand and allows for easy use.

## Building materials

**Bonds to all standard building materials such as:**

- Concrete
- Anodised layer
- Gypsum plasterboard
- Wood
- Sand-lime brick
- Plastics (not on PE, PP, Teflon, silicone)
- Masonry
- Metals with priming coat
- Plaster

## Certificates / Features

- Proven joint soundproofing: R(ST,w)=61 (-1; -3) dB in line with ISO EN 717-1
- Tested thermal insulation: 0.0317 W/(m * K) according to EN 12667:2001-05 in conjunction with EN 17333-5:2020-07
- Test for watertightness for the adhesion of manhole rings up to 0.5 bar
- EMICODE® EC 1 Plus - very low emissi-ons</li></ul>

## Functioning

- 1-component PU foam
- Processing temperature environment: +5 °C to +35 °C (can temperature: +5 °C to +25 °C)
- Non-tacky within approx. 20 minutes
- Can be cut within approx. 40 minutes
- Cures within 5 to 8 hours
- Temperature resistant from -40 °C to +90 °C
- Layer thicknesses > 50 mm: foam in several layers and then dampen.
- Fresh foam stains can be removed immediately with fischer PU cleaner.

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Max. foam yield (EN 17333-1) [l] | Adapter system | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **PU Pro 500 B3** | **053140** | BG, DE, HR | 500 | 24 | fischer FixAdapter | beige | 12 | 1 |
| **PU Pro 500 B3** | **058500** | EN, FR | 500 | 24 | fischer FixAdapter | beige | 12 | 1 |
| **PU Pro 750 B3** | **053141** | BG, DE, HR | 750 | 35 | fischer FixAdapter | beige | 12 | 1 |
| **PU Pro 750 B3** | **050427** | EN, FR | 750 | 35 | fischer FixAdapter | beige | 12 | 1 |
| **PU 1/750 B3 HandHeld (EN/FR)** | **098011** | EN, FR | 750 | 35 | Standard Adapter | beige | 12 | 1 |

Dangerous goods - no express shipping possible.

# Fast bonding foam

The high-quality rapid installation foam with proven sound insulation and resistance of water pressure.






Window connection joints



Sealing concrete manhole rings



## Applications

- Insulating and filling window connection joints, around window sills and shutter boxes
- Bonding and sealing manhole rings
- Insulating and filling in roofing work and dry construction
- Insulating and filling finished elements, wall connections, wall penetrations and cavities

## Advantages

- The adapter foam has been approved as watertight by an external inspection and is thus suitable for use in wet conditions. It fulfils the requirements of a well foam.
- The fast screwed adapter allows immediate use and is thus uncomplicated to use without need for additional processing equipment.
- The new non-sticking safety valve guarantees long-lasting functionality.

## Building materials

**Bonds to all standard building materials such as:**

- Concrete
- Anodised layer
- Gypsum plasterboard
- Wood
- Sand-lime brick
- Plastics (not on PE, PP, Teflon, silicone)
- Masonry
- Metals with priming coat
- Plaster

## Certificates / Features

- General test certificate from Building authorities DIN 4102: B2
- Test for watertightness for the adhesion of manhole rings
- EMICODE® EC 1 Plus - very low emmission
- French VOC-emission class A+

## Functioning

- 1-component PU foam
- Processing temperature environment: +5 °C to +30 °C (can temperature: +5 °C to +25 °C)
- Non-tacky within approx. 15 minutes
- Can be cut within approx. 45 minutes
- Hardened within approx. 24 hours
- Temperature resistant from -40 °C to +90 °C
- Layer thicknesses > 50 mm foam in several layers and then dampen.

## Technical data

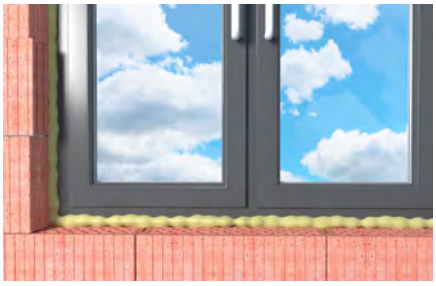
| | Item no. | Language on label | Contents [ml] | Max. foam yield (EN 17333-1) [l] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | |
| **PU S 500 B2** | **040300**[1)2)] | DE | 500 | 30 | beige | 12 | 1 |
| **PU S 750 B2** | **040301**[1)2)] | DE | 750 | 45 | beige | 12 | 1 |

[1)] Dangerous goods - no express shipping possible.
[2)] Without protective gloves, for commercial users only.

# Flexible gun foam

The flexible gun foam for all-season use with high sound and heat insulation.



Window connection joints



Connection joints around shutter boxes



## Applications

- For elastic insulation and filling of window connections, roller shutter boxes, window sills and external doors
- For elastic insulation and filling of areas with higher component movement due to thermal or static loads, e.g. in the old-building renovation, in steel construction, in timber-frame construction
- Permanent, elastic foaming of connection joints and cavities in wooden structures and roof extensions
- Permanently elastic filling of pipe penetrations, wall penetrations, wall connections and cavities

## Advantages

- The high elasticity enables the absorption of component movements. This permanently prevents the formation of cracks and thermal bridges and maintains the airtightness.
- The excellent dimensional stability of < 5% guarantees reliable operation under the temperature and humidity conditions that occur. This avoids time-consuming reworking.
- Thanks to its winter suitability, the large processing range from -10 °C to +35 °C enables reliable processing even at minus temperatures. These important requirements are combined in one product.
- The high joint sound insulation of 62 dB meets the standards of modern sound insulation and significantly reduces noise pollution.

## Building materials

**Bonds to all standard building materials such as:**

- Concrete
- Anodised layer
- Gypsum plasterboard
- Wood
- Sand-lime brick
- Plastics (not on PE, PP, Teflon, silicone)
- Masonry
- Metals
- Plaster
- Stone

## Certificates / Features

- General test certificate from building authorities DIN 4102: B2
- Tested joint sound insulation: 10 mm joint: Rs,w (C; Ctr) ≥ 63 (-2;-5) dB 20 mm joint: Rs,w (C; Ctr) ≥ 62 (-1;-4) dB
- Tested air permeability < 0.1 m3/[h*m*(daPa)2/3]
- Tested dimensional stability ≤5 %
- EMICODE® EC 1 Plus - Very low emissions
- French VOC-emission class A+

## Functioning

- 1-component PU foam
- Fine-cell and homogeneous foam structure
- Very high elasticity (3 times more flexible)
- Excellent dimensional stability < 5%
- Processing temperature ambient -10 °C to +35 °C (can +5 °C to +35 °C)
- Tack-free within approx. 10 min.
- Can be cut within approx. 30 min.
- Fully cured within approx. 24 h.
- Temperature resistant from -40 °C to +90 °C
- Layer thicknesses > 50 mm: foam in several layers and then dampen.

## Technical data

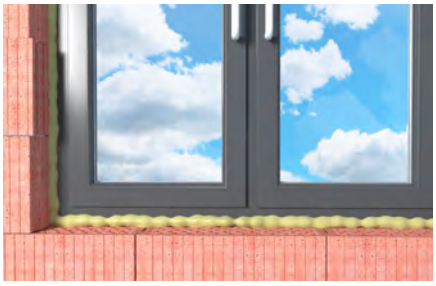
| Item | Item no. | Language on label | Contents [ml] | Max. foam yield (EN 17333-1) [l] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **PUP FLEX 750 B2** | **543453**[1)] | DE | 750 | 48 | cream | 12 | 1 |

[1)] Dangerous goods - no express shipping possible.

# Premium gun foam

The one-component gun foam with proven sound and thermal insulation as well as increased foam yield.



Window connection joints



Connection joints around shutter boxes



## Applications

- Insulating and filling window connection joints, around window sills and shutter boxes
- Insulating and filling in roofing work and dry construction
- Insulating and filling finished elements, wall connections, wall penetrations and cavities
- Insulating and filling pipe penetrations and ventilation ducts

## Advantages

- The thermal protection and proven reduction of air permeability fulfil the high standards for modern thermal protection.
- The proven 61dB sound insulation fulfils the standards of modern sound insulation and helps to reduce noise.
- The high yield of up to 50 l reduces the number of cans needed, thus ensuring maximum economic efficiency.
- The low level of foam expansion during the curing period avoids reworking, thus guaranteeing a simple and time-saving application.
- The new safety valve prevents adhesion when being stored horizontally or during long interruptions of work, thus guaranteeing long-lasting functionality.

## Building materials

**Bonds to all standard building materials such as:**

- Concrete
- Anodised layer
- Gypsum plasterboard
- Wood
- Sand-lime brick
- Plastics (not on PE, PP, Teflon, silicone)
- Masonry
- Metals with priming coat
- Plaster

## Certificates / Features

- General test certificate from building authorities P-NDS04-137
- Proven joint soundproofing R(ST,w)=61 (-1;-3) dB in line with ISO EN 717-1
- Proven thermal conductivity 0.0345 W/(m*K)
- Based on DIN 18542, proven airtightness of a<0.1 $m^3/[h*m*(daPa)^2/3]$
- EMICODE® EC 1 Plus - very low emission
- French VOC-emission class A+

## Functioning

- 1-component PU foam
- Processing temperature environment: +5 °C to +35 °C (can temperature: +10 °C to +30 °C)
- Non-tacky within 8 - 12 minutes
- Can be cut within 40 - 60 min
- Hardened within 80 - 100 min
- Temperature resistant from -40 °C to +90 °C
- Layer thicknesses > 50 mm: foam in several layers and then dampen.
- Fresh foam stains can be removed immediately with fischer PU cleaner.

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Max. foam yield (EN 17333-1) [l] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **PUP Pro 825 B2** | **053084**[1)] | DE | 825 | 55 | beige | 12 | 1 |
| **PUP Pro 500 B2** | **503259**[1)] | DE | 500 | 35 | concrete grey | 12 | 1 |

[1)] Dangerous goods - no express shipping possible.

# Gun foam

The gun foam with proven joint sound-proofing, thermal insulation and water pressure resistance.






Window connection joints



Filling pipe penetrations



## Applications

- Insulating and filling window connection joints, around window sills and shutter boxes
- To insulate and fill wall penetrations, cavities, wall connections and finished elements
- To seal and bind well shafts, manhole shafts, domestic sewage treatment plants and cisterns

## Advantages

- The high level of thermal insulation enables compliance with the energy saving requirements of the EnEV and thus effectively underpins the reduction of heat loss.
- The low level foam expansion during the curing period avoids reworking, thus guaranteeing a simple and time-saving application.
- The new non-sticking safety valve guarantees long-lasting functionality.

## Building materials

**Bonds to all standard building materials such as:**

- Concrete
- Anodised layer
- Fibre cement
- Gypsum plasterboard
- Wood
- Sand-lime brick
- Plastics (not on PE, PP, Teflon, silicone)
- Masonry
- Metals
- Plaster
- Stone

## Certificates / Features

- General test certificate from building authorities DIN 4102: B2
- EMICODE® EC 1 Plus - very low emmission
- French VOC-emission class A+

## Functioning

- 1-component PU foam
- Processing temperature environment: +5 °C to +35 °C (can temperature: +10 °C to +30 °C)
- Non-tacky within 8 - 12 minutes
- Cutting time within 40 - 60 minutes
- Hardened within 80 - 100 minutes
- Temperature resistant from -40 °C to +90 °C
- Layer thicknesses > 50 mm foam in several layers and then dampen.
- Fresh foam stains can be removed immediately with fischer PU cleaner.

## Technical data

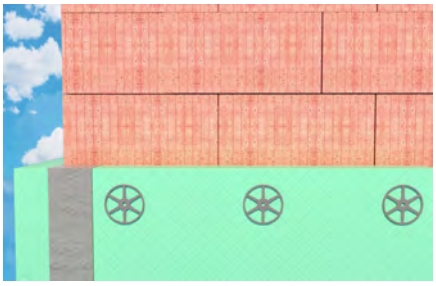
| Item | Item no. | Language on label | Contents [ml] | Max. foam yield (EN 17333-1) [l] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| PUP S 500 B2 | 539163[1)2)] | DE | 500 | 35 | beige | 12 | 1 |
| PUP S 750 B2 | 539197[1)2)] | DE | 750 | 45 | beige | 12 | 1 |
| PUP S 750 B2 | 040302[1)] | DE | 750 | 45 | beige | 12 | 1 |

[1)] Dangerous goods - no express shipping possible.
[2)] Without protective gloves, for commercial users only.

# Gun foam hardly flammable

The hardly flammable B1 one-component gun foam.



Filling cavities in the insulation



Foaming steel door frames



## Applications

- High-efficiency thermal insulation on façades
- Insulating and filling in roofing work
- Insulating and filling window connection joints, around window sills and shutter boxes
- Insulating and filling finished elements, wall connections, wall penetrations and cavities

## Advantages

- The fischer gun foam hardly flammable is hardly flammable in line with the B1 test and can therefore be used between solid, mineral or metal building materials. Thus it provides the highest level of safety.
- The new high-quality safety valve prevents adhesion when being stored horizontally or during long interruptions of work, thus guaranteeing long-lasting functionality.
- The easy dosage allows for a controlled filling and sealing, and ensures that the correct amount is used.

## Building materials

Bonds to all standard building materials such as:

- Concrete
- Anodised layer
- Gypsum plasterboard
- Wood
- Sand-lime brick
- Plastics (not on PE, PP, Teflon, silicone)
- Masonry
- Metals
- Plaster
- Fiber cement
- Aerated concrete

## Certificates / Features

- General test certificate from building authorities P-NDS04-620: B1
- Tested joint sound insulation Rs,w (C; Ctr) ≥ 63 (-1;-5) dB (10 mm joint) Rs,w (C; Ctr) ≥ 62 (-1;-4) dB (20 mm joint)
- EMICODE® EC 1 Plus - very low emmission
- French VOC-emission class A+

## Functioning

- 1-component PU foam
- Foam yield of extruded foam 45 l
- Processing temperature environment: +10 °C to +25 °C (can temperature: +10 °C to +25 °C)
- Non-tacky within approx. 10 minutes
- Can be cut within approx. 40 minutes
- Cures within 5 to 8 hours
- Temperature resistant from -40 °C to +90 °C
- Layer thicknesses > 50 mm: foam in several layers and then dampen.
- Fresh foam stains can be removed immediately with fischer PU cleaner.

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Max. foam yield (EN 17333-1) [l] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| PUP HF 750 B1 | 045300[1)2)] | DE, EN | 750 | 45 | concrete grey | 12 | 1 |

[1)] Without protective gloves, for commercial users only.
[2)] Dangerous goods - no express shipping possible.

# Well foam

The gun foam with proven resistance to water pressure.






Sealing concrete manhole rings



Filling pipe penetrations



## Applications

- To quickly fill joints between hinged manhole rings
- To seal and bind well shafts, manhole shafts, domestic sewage treatment plants and cisterns
- To insulate and fill wall penetrations, cavities, wall connections and finished elements

## Advantages

- External testing of watertightness when used in connection with hinged manhole rings fulfils the requirements for a well foam.
- The special foam is ready and easy to use, and replaces the time- and work-intensive application of mortar.
- The high resistance to dilute chemicals and mineral oil, the resistance to acids and bacteria found in soil, and the resistance to rot all guarantee a lasting function.
- The easy dosage allows for a con-trolled filling and sealing, and ensures that the correct amount is used.
- The new non-sticking safety valve guarantees long-lasting functionality.

## Building materials

**Bonds to all standard building materials such as:**

- Concrete
- Anodised layer
- Fibre cement
- Gypsum plasterboard
- Wood
- Sand-lime brick
- Plastics (not on PE, PP, Teflon, silicone)
- Masonry
- Metals with priming coat
- Plaster
- Stone

## Certificates / Features

- General test certificate from building authorities DIN 4102: B2
- Test for watertightness up to 0.5bar for the adhesion of manhole rings
- EMICODE® EC 1 Plus - very low emmission
- French VOC-emission class A+

## Functioning

- 1-component PU foam
- Processing temperature environment: +5 °C to +35 °C (can temperature: +10 °C to +30 °C)
- Non-tacky within 8 - 12 minutes
- Bind manholes together before skin formation.
- Hardened within 80 - 100 minutes
- Temperature resistant from -40 °C to +90 °C
- Layer thicknesses > 50 mm foam in several layers and then dampen.

## Technical data

| | Item no. | Language on label | Contents [ml] | Max. foam yield (EN 17333-1) [l] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | |
| **PUP BS 750 B2** | **513763**[1)] | DE, EN | 750 | 45 | beige | 12 | 1 |

[1)] Dangerous goods - no express shipping possible.

# Perimeter adhesive foam

The economic adhesive foam for perimeter insulation boards.






Bonding perimeter insulation boards



Filling pipe penetrations



## Applications

- Bonding expanded polystyrene panels
- Insulating and filling wall penetrations
- Foaming in electrical installations
- Filling joints and cavities in all internal constructions
- Fixing and sealing walls and ceilings

## Advantages

- The high foam yield allows for the bonding of approx. 13 m² of wall space, and is therefore especially economical.
- The use of the can/gun system provides a time saving of approx. 30% and thus guarantees efficient work.
- The special PU foam formulation ensures the best adhesion to concrete and bituminous substrates, and allows for the long-term fixing of insulation boards.
- The very low level of post-expansion avoids the formation of cavities and guarantees a long-lasting insulation.
- The new non-sticking safety valve guarantees long-lasting functionality.

## Building materials

- Concrete
- Bitumen coatings
- Anodised layer
- Gypsum plasterboard
- Wood
- Cold bitumen sheeting
- Plastics (not on PE, PP, Teflon, silicone)
- Masonry
- Metals with priming coat
- Plaster

## Certificates / Features

- General test certificate from building authorities P-NDS04-772: B2
- EMICODE® EC 1 Plus - very low emission
- French VOC-emission class A+

## Functioning

- 1-component PU foam
- Sufficient for approx. 13 m² wall area
- Processing temperature environment: +10 °C to +25 °C (can temperature: +5 °C to +25 °C)
- Non-tacky within approx. 10 minutes
- Can be cut within approx. 40 minutes
- Temperature resistant from -40 °C to +90 °C
- Apply a min. of 3 end-to-end stripes per board, vertically from bottom to top on the external wall (spacing approx. 30 cm). The bottom board should be on fixed ground as protection from later slipping. After approx. 10 minutes apply the boards onto the holding surface and press hard.

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Max. foam yield (EN 17333-1) [l] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **PUP P 750 B2** | **506671**[1)] | DE | 750 | 45 | concrete grey | 12 | 1 |

[1)] Dangerous goods - no express shipping possible.

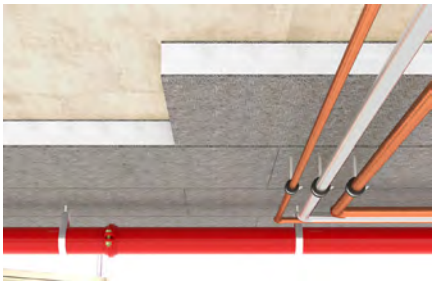
# ETICS adhesive foam

The adhesive foam for ETIC systems with general technical approval.






Wall insulation



Insulation of cellar ceiling



## Applications

- Bonding of insulating boards in accordance with ETAG Guideline 004/2013
- Fixing of external wall insulation, internal wall insulation and attic insulation
- Fixing of basement ceiling insulation
- Bonding of perimeter insulation panels

## Advantages

- The special recipe guarantees high adhesive tensile strength for secure fixing.
- The high foam yield allows for the bonding of up to 12 m² of wall space and is therefore especially economical.
- Really low post-expansion avoids the formation of cavities between the wall and insulation panel and guarantees a secure connection.
- The use of the can/gun system provides a time saving of approx. 30% and thus guarantees efficient work.
- The new non-sticking safety valve guarantees long-lasting functionality.

## Building materials

- EPS- / XPS-insulation panels
- Concrete
- Thick Bitumen Coating
- Anodised layer
- Gypsum plasterboard
- Wood
- Thick bitumen coating
- Plastics (not on PE, PP, Teflon, silicone)
- Masonry
- Plaster
- Sand-lime brick
- Fibre cement
- Galvanized sheet metal
- Aerated concrete

## Certificates / Features

- Building approval for bonding EPS boards in ETIC systems
- Adhesive tensile strength values (based on ETAG guideline 004/2013, section 5.1.4.1.2)
- French VOC-emission class A+
- EMICODE® EC 1 Plus - very low emission

## Functioning

- 1-component PU foam
- Foam yield sufficient for up to 12 m² wall area
- Processing temperature environment: +5 °C to +25 °C (can temperature: +10 °C to +25 °C)
- Open Time approx. 10 minutes
- Can be cut within approx. 20 minutes
- Temperature resistant from -40 °C to +90 °C
- Extremely high heat insulation properties
- Shear resistance (EN 12090) 38,7 kPa
- When pressed on, an adhesive surface percentage of at least 40% must be achieved.
- Do not knock the insulation panels against the wall (this damages the foam structure).

## Technical data

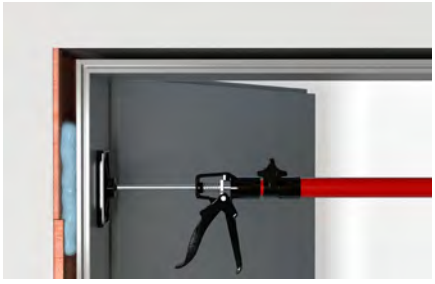
| Item | Item no. | Approval DIBt | Language on label | Contents [ml] | Max. foam yield [m²] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **PUP 750 ETICS** | **543448**[1)] | ● | EN | 750 | approx. 12 | light green | 12 | 1 |
| **PUP WDVS 750 B1** | **539164**[1)] | ● | DE | 750 | approx. 12 | light green | 12 | 1 |

[1)] Dangerous goods - no express shipping possible.

# Rapid foam door frame & tray

The high-quality 2c rapid foam for secure fastening with optimized activation system.



Foaming door frames



Foaming below bath tubs



## Applications

- For mounting door frames made of wood, plastic and steel (DIN 18111 T4) and window frames
- Filling and insulating of cavities in walls and ceilings with insufficient moisture access
- Assembly of foamed PS moulded parts, shower trays and bathtubs (tub support assembly foam)
- Fixing insulating elements, wooden panels etc.

## Advantages

- Moisture-independent system guarantees controlled setting and thus ensures safe and fast curing.
- High-quality valve prevents sticking during horizontal storage or longer interruptions to work, thus guaranteeing permanent function.
- Optimized activation system guarantees safe activation of the components and ensures reliable function.
- The high dimensional stability certified by the independent ift Rosenheim Institute provides security and saves additional costs, as time-consuming reworking of door frames is avoided.
- The very high sound insulation value of 63 dB contributes significantly to effective noise protection and leads to an increase in well-being.

## Building materials

**Bonds to all standard building materials such as:**

- Concrete
- Anodised layer
- Gypsum plasterboard
- Wood
- Sand-lime brick
- Plastics (not on PE, PP, Teflon, silicone)
- Masonry
- Metals
- Plaster

## Certificates / Features

- General test certificate from building authorities P-NDS04-666 for B2
- Evidence of dimensional stability certified by the ift Rosenheim
- Proven joint soundproofing for 10 and 20 mm joints: Rs,w (C; Ctr) ≥ 63 (-2;-5) dB
- French VOC emission class A+
- EMICODE® EC 1 Plus - very low emission

## Functioning

- 2-component PU foam
- Foam yield of extruded foam 10l
- Can and processing temperature: +15 °C to +25 °C (optimal: +20 °C; substrate temperature: min. +10 °C)
- Non-tacky within approx. 6 minutes
- Can be cut within approx. 10 minutes
- Cures within approx. 30 minutes
- Can be despresded after 60 minutes (+20 °C)
- Temperature resistant from -40 °C to +90 °C

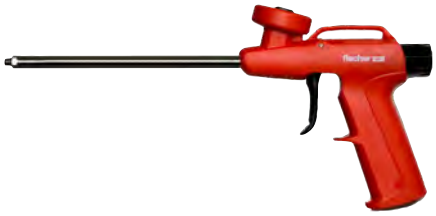
## Technical data

| Item | Item no. | Language on label | Contents [ml] | Max. foam yield (EN 17333-1) [l] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **PU 2K 400 B2** | **053081**[1)] | DE | 400 | 10 | light blue | 12 | 1 |

[1)] Dangerous goods - no express shipping possible.

# PU foam dispenser PUP K2 Plus

Easy and precisely dosed usage of fischer gun foams.





## Applications

- PU foam gun for controlled filling of joints and cavities with gun foam.
- For simple and efficient processing of all commercially available gun foams.

## Advantages

- The light construction facilitates use on construction sites and allows for fatigue-free work.
- Back screw secured against unscrewing protects against loss and is therefore particularly user-friendly.
- The gun adapter is suitable for all standard systems and enables universal application.
- Opened cans can remain screwed onto the gun during interruptions of work without curing.

## Technical data

| | Item no. | | Sales unit [pcs] |
|---|---|---|---|
| Item | | | |
| PUP K2 | 062400 | | 1 |

# PU foam dispenser PUP M3

Metal foam gun for 1K gun foam.





## Applications

- PU foam gun for controlled filling of joints and cavities with gun foam.
- For simple and efficient application of all commercially available gun foams.

## Advantages

- The PUP M3 meets the tough requirements of a construction site and thus offers a long lifespan.
- The ergonomic handle allows for an ideal position of centre of gravity, and therefore precise handling.
- The infinitely variable control of the foam expulsion allows for a controlled filling and insulating, and enables application-orientated work.
- Back screw secured against unscrewing protects against loss.
- Opened cans can remain screwed onto the gun during interruptions of work without curing.

## Functioning

- Professional foam gun with PTFE-coated basket.
- Robust and lightweight cast aluminum with nickel coating.
- Trigger lever made of sturdy bent sheet metal.
- All guns are piece-tested for absolute tightness.
- Folding box contents 2 conical plastic tips.

## Technical data

| | Item no. | | Sales unit [pcs] |
|---|---|---|---|
| Item | | | |
| PUP M3 | 033208 | | 1 |

# PU foam dispenser PUP M4 BLACK

The foam gun with PTFE layering.





## Applications

- PU foam gun for controlled filling of joints and cavities with gun foam.
- For simple and efficient application of all commercially available gun foams.

## Advantages

- The complete PTFE coating reduces cleaning to a minimum.
- Non-return ball and basket are coated with PTFE. This prevents bonding and guarantees a long-lasting function.
- The perfect combination of the ergonomically shaped handle and trigger makes handling particularly user-friendly.
- The tubes included with the 19 cm long, tapered pistol pipe mean that it can be individually lengthened for use in the narrowest joints, thus offering a high degree of flexibility.

## Functioning

- High-quality professional foam gun.
- Fully equipped with PTFE non-stick coating.
- Extremely robust construction.
- All guns are piece-tested for absolute tightness.
- Folding box contains 2 conical and 2 cylindrical plastic tips.

## Technical data

| | Item no. | | Sales unit [pcs] |
|---|---|---|---|
| Item | | | |
| PUP M4 BLACK | 513429 | | 1 |

# PU cleaner

The universal cleaner for fresh PU foam and the degreasing of non-absorbent surfaces.






## Applications

- Universal cleaning spray for versatile use thanks to the spray head supplied.
- Highly active cold cleaner for removing fresh polyurethane foam inside assembly guns and on surfaces soiled with PU foam.
- For cleaning and pre-treatment of structural bonding.
- Dissolves oils, greases, resinated lubricants, etc.

## Advantages

- The active components ensure a high cleaning effect, making the cleaner ideal for the safe removal of fresh PU foam.
- The gun adapter is suitable for all standard systems and enables universal application.
- The separate spray head allows for the cleaning of external surfaces, making the product extremely versatile.
- The highly active cleaner can etch sensitive surfaces (paint, dye, textiles, plastics). Thus you should always conduct preliminary tests.

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|
| **PUR 150** | **053083**[1)] | DE | 150 | 12 | 1 |
| **PUR 500** | **053085**[1)] | DE, EN | 500 | 12 | 1 |

[1)] Dangerous goods - no express shipping possible.

# Cleaning Wipes Xtreme

Powerful wipes to scrub and clean for daily use in the workplace.










## Applications

Ideal for daily use in the workplace for easy cleaning of uncured:

- Sealants and adhesives
- Resins
- Oils and lubricants
- Paints and inks
- Tars, coals and graphite

## Advantages

- Strong, powerful and grease-dissolving cleaning wipes.
- Reliable cleaning of stubborn dirt.
- Practical 2-in-1 function: rough side to loosen the stain and smooth side to remove the dirt.
- Time-saving thanks to quick cleaning without water and soap.
- Safe and gentle on hands, tough on dirt.
- Dermatologically tested.
- Easy to use thanks to the practical dispenser box with single wipe dispenser.

## Functioning

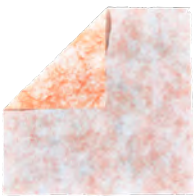
- Before use, remove the lid and peel off the protective foil.
- Pull out a piece of the innermost wipe from the roll and thread it through the hole in the lid.
- Replace the lid and open it.
- Pull up the cleaning wipe (tear it off at the perforation).
- Clean (always test on a hidden spot before use).
- Reseal the tub tightly to maintain moisture.
- Dispose in the garbage can.

## Technical data

**Cleaning wipes Xtreme**



Xtreme



Xtreme

| | Item no. | Length l [mm] | Width B [mm] | Grammage [g/m²] | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Item** | | | | | | |
| **Cleaning Wipes Xtreme** | **567456** | 200 | 200 | 45 | 100 x Cleaning Wipes | 1 |

# Example of use for sealants




1 Sanitary Pro SI (DSSA)
2 High Temp SI (DHS)
3 Construction Pro SI (DBSA)
4 Construction SI (DBSI)
5 Paint AC (DMA)
6 Multi AC (DA)
7 Grainy AC (DSA)
8 All-Weather AC (DDK)
9 Roof BI (DD)

# Sealant selection matrix

| Sealant selection matrix<br>● suitable<br>T requires test<br>– not suitable | Chem. basis | ABS/ Polysty-rene | Acrylic glass (Macro-lon, perspex etc.) | Acrylic tubs (sanitary acrylic) | Alumi-nium | Concrete | Concrete block | Bitumen | Non ferrous heavy metal (copper, brass) | Stain-less steel | Sand-blasted iron | Enamel |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sanitary Pro SI (DSSA)** | Silicone acetate | ● | – | ● | ● | – | – | – | – | ● | – | ● |
| **Construction Pro SI (DSSI)** | Silicone acetate | – | – | ● | ● | – | – | – | – | ● | – | ● |
| **Multi SI (DMS)** | Silicone acetate | ● | – | T | ● | – | – | – | – | ● | – | ● |
| **High Temp SI (DHS)** | Silicone acetate | ● | – | – | ● | T | – | – | T | ● | – | ● |
| **Construction Pro SI (DBSA)** | Silicone alkoxy | ● | ● | T | ● | ● | – | – | ● | ● | ● | ● |
| **Construction SI (DBSI)** | Silicone oxime | ● | – | ● | ● | ● | – | – | ● | ● | ● | ● |
| **Natural Stone SI (DNS)** | Silicone oxime | ● | – | ● | ● | ● | ● | – | ● | ● | ● | ● |
| **Flex MS** | Hybride | T | ●[1)] | ● | ● | ● | – | – | ● | ● | ● | ● |
| **Paint AC (DMA)** | Dispersion acrylic | – | – | – | ● | ● | – | – | ● | ● | – | ● |
| **Texture AC (DSA)** | Dispersion acrylic | – | – | – | ● | ● | – | – | – | ● | – | – |
| **Multi AC (DA)** | Dispersion acrylic | – | – | – | ● | ● | – | – | – | ● | – | – |
| **All-Weather AC (DDK)** | Synthetic rubber | ● | – | – | ● | ● | – | ● | ● | ● | ● | – |
| **Roof BI (DD)** | Bitumen | – | – | – | ● | ● | – | ● | ● | ● | ● | – |

[1)] perspex not

Note: Avoid direct contact between the silicone and bituminous or plasticiser materials (e.g. EPDM, butyl, neoprene). The written and spoken information contained in this technical datasheet and our practical support is provided to the best of our knowledge and does not represent binding information or guarantees as described in § 443 of the German Civil Code.
We recommend that you test the suitability of our products for the intended application prior to use. Due to the diverse range of applications of the individual product and the unpredictable conditions on site, we also recommend testing the adhesion prior to use.

# Sealant colour board

### Sanitary Pro SI (DSSA)



Art.-No. **53100** transparent
Art.-No. **53101** white
Art.-No. **53103** bahama beige
Art.-No. **58530** silver grey
Art.-No. **512208** joint grey
Art.-No. **53102** grey
Art.-No. **512209** sanitary grey
Art.-No. **512210** manhattan
Art.-No. **53105** dark grey
Art.-No. **512211** anthracite
Art.-No. **53120** black

### Construction Pro SI (DBSA)



Art.-No. **53090** transparent
Art.-No. **53091** white
Art.-No. **53095** beige
Art.-No. **53092** concrete grey
Art.-No. **53093** brown
Art.-No. **512213** slate grey
Art.-No. **53094** black

### High Temp SI (DHS)



Art.-No. **53125** reddish brown

### Multi AC (DA)



Art.-No. **53110** white
Art.-No. **53111** grey
Art.-No. **53112** brown

| Tiles | Gypsum/ gypsum plaster-board | Glass | Hard PVC | Wood | Ceramics | Natural stone/ marble | Polyester | Aircrete | Plaster | Resopal | Stoneware | Brick/ clinker brick | Zinc/gal-vanizing |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | – | ● | ● | ● | ● | – | ● | – | – | ● | ● | – | – |
| ● | – | ● | ● | ● | ● | – | ● | – | – | ● | ● | – | – |
| ● | – | ● | – | ● | ● | – | ● | – | – | ● | ● | – | – |
| ● | T | ● | – | ● | ● | – | ● | T | T | ● | ● | T | T |
| ● | ● | ● | ● | ● | ● | – | ● | ● | ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● | ● | – | ● | ● | ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● | ● | – | ● | ● | ● | ● | ● | ● | ● |
| ● | ● | – | ● | ● | ● | – | ● | ● | ● | ● | ● | ● | ● |
| ● | ● | – | T | ● | T | – | ● | ● | ● | ● | ● | ● | ● |
| ● | T | – | – | ● | T | – | ● | ● | ● | ● | ● | ● | T |
| ● | – | – | ● | ● | ● | – | ● | ● | ● | ● | ● | ● | ● |
| ● | – | – | – | ● | ● | – | ● | – | T | – | ● | ● | ● |

# Sanitary Pro SI (DSSA)

The high-quality premium sanitary silicone.






Joints in sanitary areas



Sealings in the kitchen

12

## Applications

- Corner, movement and connection joints in sanitary areas (sinks, showers, bath tubs, expansion joints between tiles etc.)
- Connection joints in the kitchen
- Window and glass sealings
- Seal welds for display cabinets and glass blocks
- Small-scale adhesions (e.g. window bars)

## Advantages

- The high-quality formulation allows for easy application and smoothing, and ensures efficient work.
- The outstanding movement capacity means that DSSA is ideal for high-stress expansion joints. This guarantees long-lasting jointing.
- The very good hold on smooth surfaces prevents damp from forming in the substrate and guarantees reliable functioning.
- The high wear resistance gives the surface a high level of protection when cleaning. Together with the long-term mold protection an ideal jointing can be achieved that will last over the long term.

## Building materials

- Chrome
- Stainless steel
- Anodised layer
- Enamel, Tiles
- Glass, glazed surfaces
- Wood (with primer)
- H-PVC
- Ceramics
- Polyester
- Sanitary acrylic

## Certificates / Features

- EN 15651 - Part 1: F-EXT-INT-CC (25LM)
- EN 15651 - Part 2: G-CC (25LM)
- EN 15651 - Part 3: S (XS1)
- French VOC-emission class A+

## Functioning

- Chemical base: 1-component silicone acetate
- Permanently elastic
- With fungicide
- Skin formation time: approx. 10 minutes
- Processing temperature: +5 °C to +40 °C
- Temperature resistance: -40 °C to +180 °C
- Good chemical resistance
- Very good resistance to weather, ageing and UV
- Compatible with paint
- Not paintable
- Free of MDI and solvents
- Selection table for substrates - refer to page Sealant selection matrix

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Sanitary Pro SI (DSSA) anthracite 310 ml** | **512211** | DE, EN, FR | 310 | anthracite | 12 | 1 |
| **Sanitary Pro SI (DSSA) bahama-beige 310 ml** | **053103** | DE, EN, FR | 310 | bahama beige | 12 | 1 |
| **Sanitary Pro SI (DSSA) dark grey 310 ml** | **053105** | DE, EN, FR | 310 | dark grey | 12 | 1 |
| **Sanitary Pro SI (DSSA) joint grey 310 ml** | **512208** | DE, EN, FR | 310 | joint grey | 12 | 1 |
| **Sanitary Pro SI (DSSA) grey 310 ml** | **053102** | DE, EN, FR | 310 | grey | 12 | 1 |
| **Sanitary Pro SI (DSSA) manhattan 310 ml** | **512210** | DE, EN, FR | 310 | manhattan | 12 | 1 |
| **Sanitary Pro SI (DSSA) sanitary grey 310 ml** | **512209** | DE, EN, FR | 310 | sanitary grey | 12 | 1 |
| **Sanitary Pro SI (DSSA) silver grey 310 ml** | **058530** | DE, EN, FR | 310 | grey | 12 | 1 |
| **Sanitary Pro SI (DSSA) black 310 ml** | **053120** | DE, EN, FR | 310 | black | 12 | 1 |
| **Sanitary Pro SI (DSSA) transparent 310 ml** | **053100** | DE, EN, FR | 310 | transparent | 12 | 1 |
| **Sanitary Pro SI (DSSA) white 310 ml** | **053101** | DE, EN, FR | 310 | white | 12 | 1 |

# Sanitary SI (DSSI)

The standard sanitary silicone.






Joints in sanitary areas



Wash basins



## Applications

- Joints in sinks and toilets
- Expansion joints between floor and wall tiles
- Joints around enamel and plastic showers and bath tubs
- Connection joints in the kitchen
- Seal welds for display cabinets and glass blocks

## Advantages

- The 20% elasticity means that DSSI is ideal for expansion and connection joints. This guarantees long-lasting jointing.
- The very good hold on smooth surfaces, e.g. tiles, prevents damp forming in the substrate and guarantees reliable functioning.
- The fungicidal properties ensure a clean look over the long term.

## Building materials

- Stainless steel
- Anodised layer
- Epoxy
- Tiles
- Glazed surfaces
- Glass
- H-PVC
- Ceramics
- Painted wood
- Polyester

## Certificates / Features

- EN 15651 - Part 1: F EXT-INT-CC
- EN 15651 - Part 3: S

## Functioning

- Chemical base: 1-component silicone acetate
- Permanently elastic
- With fungicide
- Skin formation time: approx. 10 - 15 minutes
- Processing temperature: +5 °C to +40 °C
- Temperature resistance: -40 °C to +150 °C
- Shore-A hardness 25
- 100% Modulus 0.4 N/mm²
- Elongation at break 450%
- Good chemical resistance
- Not paintable
- Very good resistance to weather, ageing and UV
- Selection table for substrates - refer to page Sealant selection matrix

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Sanitary SI (DSSI) transparent 280 ml** | **058515** | DE, EN, FR | 280 | transparent | 12 | 1 |
| **Sanitary SI (DSSI) white 280 ml** | **058516** | DE, EN, FR | 280 | white | 12 | 1 |

# Multi SI (DMS)

The silicone sealant with an acetate base for internal and external applications.






Joints in sanitary areas



Sealings in the kitchen



## Applications

- Bathrooms, showers and toilets
- Connection joints to sinks
- Expansion joints between tiles
- Connection joints in the kitchen
- Joints between timber and tiles
- Seal welds for display cabinets and glass blocks

## Advantages

- Thanks to the practical elasticity of 20%, DMS is ideally suited to connection joints with expansion. This guarantees long-lasting jointing.
- The fungicidal properties ensure a clean look over the long term.
- The very good hold on smooth surfaces.

## Building materials

- Stainless steel
- Anodised layer
- Epoxy
- Tiles
- Glazed surfaces
- Glass
- H-PVC
- Ceramics
- Painted wood
- Polyester

## Certificates / Features

- EN 15651 - Part 1: F EXT-INT-CC
- EN 15651 - Part 3: S

## Functioning

- Chemical base: 1-component silicone acetate
- Permanently elastic
- With fungicide
- Skin formation time: approx. 10 to 15 minutes
- Processing temperature: +5 °C to +40 °C
- Temperature resistance: -40 °C to +150 °C
- Shore-A hardness 25
- 100% Modulus 0.4 N/mm²
- Elongation at break 450%
- Very good resistance to weather, ageing and UV
- Not paintable
- Selection table for substrates - refer to page Sealant selection matrix

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Multi SI (DMS) black 280 ml** | **504413** | EN, FR, ES | 280 | black | 12 | 1 |
| **Multi SI (DMS) grey 280 ml** | **040389** | EN, FR, ES | 280 | grey | 12 | 1 |
| **Multi SI (DMS) transparent 280 ml** | **040385** | EN, FR, ES | 280 | transparent | 12 | 1 |
| **Multi SI (DMS) grey 280 ml** | **040389** | EN, FR, ES | 280 | grey | 12 | 1 |

# High Temp SI (DHS)

The silicone sealant for high temperature requirements.






Sealing fireplaces



Sealing cookers

12

## Applications

- Sealing of joints around cookers, ovens and fireplaces
- Sealing of joints around boilers and industrial furnaces
- Sealing of joints around pipes and channels subjected to high temperatures
- Sealing of ventilation grilles
- Sealing of air conditioning units

## Advantages

- The high temperature resistance of up to +300 °C means that DHS can be used for joints with increased thermal load.
- Meanwhile, the high resistance to chemicals also allows for use in areas subjected to chemical loads, thus offering a high level of application safety.
- The very good adhesion to smooth surfaces allows for the components to be completely sealed. This allows for reliable functioning.
- DHS is easy to apply and smooth out. This allows for efficient work, and helps to guarantee a simple and time-saving application.

## Building materials

- Aluminium (with primer)
- Chrome
- Stainless steel
- Anodised layer
- Enamel
- Tiles
- Glass
- Glazed surfaces
- Ceramics
- Not for corrosive adhesive surfaces such as non ferrous heavy metal, sheet zinc etc.

## Functioning

- Chemical base: 1-component silicone acetate
- Permanently elastic
- Skin formation time: approx. 10 - 15 minutes
- Processing temperature: +5 °C to +40 °C
- Temperature resistance: -40 °C to +300 °C
- Shore-A hardness 25
- Very good resistance to chemicals
- Very good resistance to weather, ageing and UV
- Not paintable
- Free of MDI and solvents
- Selection table for substrates - refer to page Sealant selection matrix

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **High Temp SI red 310 ml** | **053125** | DE, EN, FR | 310 | reddish brown | 12 | 1 |

# Flex MS

The permanently elastic sealant for expansion joints.






Sealing joints of façade panels



Exterior movement joints



## Applications

- Joints in the façade area
- Movement and connection joints in interior and exterior areas
- Sealing of connection joints on wooden, plastic and metal windows and doors
- Connection joints inside the building between windows, doors, stairs, ceiling and wall
- Expansion joints between tiles on floors and walls
- Floor joints

## Advantages

- The large movement absorption and the low E-module enable the safe absorption of large component movements in the joint.
- The suitability as façade and floor joint sealant according to EN 15651 part 1 and part 4 allows the application in interior and exterior areas.
- The 100% bubble-free curing guarantees a perfect joint appearance in all weather conditions.
- The good adhesion, even on damp substrates, allows the product to be applied outdoors regardless of the weather conditions.
- Compatibility with water-based paints and synthetic varnishes allows the sealant to be painted over.
- Very good weathering, aging and UV resistance for permanently safe application indoors and outdoors.

## Building materials

- Concrete
- Masonry, Clinker
- Hard PVC
- Glass, glazed surfaces
- Copper, brass
- Wood and wood-based materials
- Plaster
- Brick
- Steel
- Zinc
- Eloxal
- Enamel, tiles, ceramic

## Certificates / Features

- EN 15651-1:2012 F-EXT-INT-CC (25 LM)
- EN 15651-4:2012 PW-EXT-INT-CC (25 LM)
- EMICODE EC 1 Plus - very low emission
- French VOC emission class A+

## Functioning

- Chemical base: 1K Hybrid MS-Polymer
- High elasticity of 25%
- Processing temperature: +5 °C to +40 °C
- Curing time 2 - 3 mm/24h
- Temperature resistance: -30 °C to +70 °C
- E-module at 100% elasticity 0.45 N/mm²
- Shore A 25
- Adheres even to damp substrates
- Can be painted over
- Solvent-, isocyanate- and silicone-free
- Very good weathering, aging and UV resistance

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Packaging | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **Flex MS white 290 ml** | **558830** | DE, EN, FR | 290 | Cartridge | white | 12 | 1 |
| **Flex MS grey 290 ml** | **558831** | DE, EN, FR | 290 | Cartridge | grey | 12 | 1 |

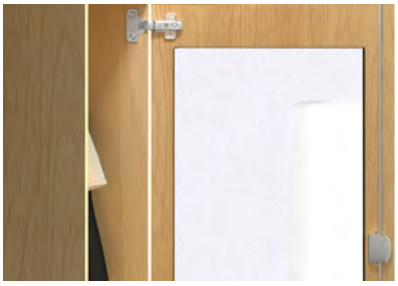
# Construction Pro SI (DBSA)

The low-odour premium construction silicone with high adhesive spectrum.






External connection joints



Fixing mirrors



## Applications

- Connection and expansion joints in the construction industry (e.g. windows, doors, façades, light domes)
- Window glazing
- Movement and connection joints in kitchens, sanitary areas and installations
- Fixing mirrors (transparent version)
- Sealing machines, containers and building apparatus

## Advantages

- The high-quality, neutral silicone sealant with a very low volume shrinkage is suitable for demanding applications in construction and the industrial sector, and guarantees a high degree of functional safety.
- DBSA is low-odour and is therefore ideal for use in confined spaces.
- The silicone is easy to apply and smooth out, thus allowing for fast work progress and easy, time-saving joining.
- The high wear resistance provides the surface with a high level of protection during cleaning and ensures perfect optics over a long period of time.

## Building materials

- Concrete
- Chrome
- Stainless steel
- Anodised layer
- Enamel, Tiles, Ceramics
- Glass, glazed surfaces
- Wood (with primer)
- H-PVC
- Copper, brass
- Masonry
- PMMA, PC, Polyester
- Steel
- Zinc

## Certificates / Features

- EN 15651 - Part 1: F-EXT-INT-CC (25LM)
- EN 15651 - Part 2: G-CC (25LM)
- EN 15651 - Part 3: S (XS1)
- French VOC-emission class A+

## Functioning

- Chemical base: 1-component silicone neutral alkoxy
- Fulfils DIN EN ISO 11600 F+G 25
- Permanently elastic
- Low-odour
- With fungicide
- Skin formation time: 10 to 15 min
- Processing temperature: +5 °C to +40 °C
- Temperature resistance: -40 °C to +150 °C
- Shore-A hardness approx. 25
- Permitted overall deformation: 25%
- Non-corrosive
- Very good resistance to weather, ageing and UV
- Compatible with paint
- Not paintable
- Resistant to wear and streak-free
- Selection table for substrates - refer to page Sealant selection matrix

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Construction Pro SI (DBSA) beige 310 ml** | **053095** | DE, EN, FR | 310 | beige | 12 | 1 |
| **Construction Pro SI (DBSA) black 310 ml** | **053094** | DE, EN, FR | 310 | black | 12 | 1 |
| **Construction Pro SI (DBSA) brown 310 ml** | **053093** | DE, EN, FR | 310 | brown | 12 | 1 |
| **Construction Pro SI (DBSA) concrete grey 310 ml** | **053092** | DE, EN, FR | 310 | concrete grey | 12 | 1 |
| **Construction Pro SI (DBSA) slate grey 310 ml** | **512213** | DE, EN, FR | 310 | slate grey | 12 | 1 |
| **Construction Pro SI (DBSA) transparent 310 ml** | **053090** | DE, EN, FR | 310 | transparent | 12 | 1 |
| **Construction Pro SI (DBSA) white 310 ml** | **053091** | DE, EN, FR | 310 | white | 12 | 1 |

# Construction SI (DBSI)

The versatile construction silicone.






External connection joints



Joints between buildings



## Applications

- Connection and expansion joints in the construction industry (e.g. windows, doors, façades, light domes)
- Connection joints on windows and doors
- Sealing façades, curtain walling panels and metal structures
- Movement and connection joints in kitchens, sanitary areas and installations

## Advantages

- The neutral silicone sealant is suitable for various applications in construction and the industrial sector, and thus offers a high level of flexibility.
- The high movement capacity means that DBSI is ideal for expansion joints. This guarantees long-lasting jointing.
- DBSI is non-corrosive and is therefore well suited to copper and zinc-plated surfaces. Thus it can be used without problems in the metal processing industry.

## Building materials

- Concrete
- Chrome
- Stainless steel
- Enamel
- Epoxy
- Tiles
- Glass, glazed surfaces
- Wood (with primer)
- H-PVC
- Ceramics
- Copper
- Masonry
- Brass
- Steel
- Zinc

## Certificates / Features

- EN 15651 - Part 1: F-EXT-INT-CC
- EN 15651 - Part 2: G-CC
- EN 15651 - Part 3: S

## Functioning

- Chemical base: 1-component silicone neutral oxime
- Permanently elastic
- With fungicide
- Skin formation time: 10 to 15 minutes
- Processing temperature: +5 °C to +40 °C
- Temperature resistance: -40 °C to +180 °C
- Shore-A hardness 18±3
- Non-corrosive
- Very good resistance to weather, ageing and UV
- Compatible with paint
- Not paintable
- Selection table for substrates - refer to page Sealant selection matrix

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Construction SI (DBSI) transparent 280 ml** | **094417** | DE, EN, FR | 280 | transparent | 12 | 1 |
| **Construction SI (DBSI) white 280 ml** | **094416** | DE, EN, FR | 280 | white | 12 | 1 |

# Natural Stone SI (DNS)

The high performance silicone even for marble and natural stone.






Joints on natural stone panels



Joints on tiles and natural stone and marble panels



## Applications

- Sealing and jointing marble and natural stone for internal and external use
- Joints in sanitary areas
- Joints in façade construction
- Joints in the glacing
- Joints in the flooring
- Corner joints in floors and walls
- Movement-compensating adhesion of natural stone onto metal structures (e.g. stair treads)

## Advantages

- The specially adapted formulation prevents edge soiling and gives a lasting clean look, particularly for natural stone and marble.
- With 10 years warranty on UV-, weather- and aging resistance for maximum durability.
- The outstanding movement capacity means that DNS is ideal for highstress expansion joints. This guarantees long-lasting jointing.
- Fungicidal agent prevents mildew formation and ensures a clean look over the long term.

## Building materials

Marble
- Natural stone (e.g. granite, porphyry, quartzite, sandstone)
- Concrete
- Stainless steel
- Tiles, ceramics
- Glass
- Wood (with primer)
- H-PVC
- Copper
- Masonry
- PC
- Sanitary acrylic
- Steel
- Zinc

## Certificates / Features

- EN 15651 - Part 1: F-EXT-INT-CC (25LM)
- EN 15651 - Part 2: G-CC (25LM)
- EN 15651 - Part 3: S (XS1)
- EN 15651 - Part 4: PW-EXT-INT-CC (25LM)
- French VOC-emission class A+

## Functioning

- Chemical base: 1-component silicone neutral curing
- Permanently elastic
- Low-odour
- With fungicide
- Skin formation time approx. 15minutes
- Processing temperature: +5 °C to +40 °C
- Temperature resistance: -40 °C to +180 °C
- Shore-A hardness 25
- Non-corrosive
- Good chemical resistance
- Very good resistance to weather, ageing and UV
- Not paintable
- Selection table for substrates - refer to page Sealant selection matrix

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Natural stone SI (DNS) transparent 310 ml** | **053121** | DE, EN, FR | 310 | transparent | 12 | 1 |

# Paint AC (DMA)

Quick paintable sealant with maximum security against cracks and discolourations.








Internal expansion joints

12

## Applications

- For internal and external application
- For sealing joints between wooden and metal window frames and concrete/ masonry
- Joints between walls and ceilings, steps and walls, concrete and ceiling elements and skirting
- Connection joints for shutter boxes and window sills
- Joints in dry and internal construction
- Renovation work (split jointing)

## Advantages

- The sealant can be painted after already one hour allowing subsequent painting work to start more quickly.
- The further-developed DMA formulation suppresses paint cracking, thus eliminating the need for time-consuming rework.
- The really good paint compatibility ensures the great adhesion of commercially available paints to the sealant and prevents the discolouration of the paint layer. This guarantees a good, even appearance.
- The water-based acrylate sealant has a neutral odour and is free from phthalate plasticisers, making it ideal for use in confined spaces.

## Building materials

- Concrete
- Anodised layer
- Gypsum
- Gypsum plasterboard
- Wood
- H-PVC
- Sand-lime brick
- Clinker brick
- Masonry
- Polystyrene
- Aerated concrete
- Plaster
- Brick

## Certificates / Features

- EN 15651-1:2012: Type F -EXT-INT (class 7,5P)
- GEV-EMICODE EC1 PLUS - very low emission
- French VOC-emission class A+

## Functioning

- Chemical base: 1-component dispersion acrylic
- Elasto-plastic
- Low-odour
- Skin formation time: approx. 10 minutes
- Processing temperature: +5 °C to +40 °C
- Practically no shrinkage
- Temperature resistance: -20 °C to +75 °C
- Non-corrosive
- Very good resistance to weather, ageing and UV
- Compatible with paint
- Can be painted and plastered
- Free of silicone, MDI and solvents

## Technical data

| Item | Item no. | Language on label | Content per box [pcs.] | Colour | Sales unit [pcs] |
|---|---|---|---|---|---|
| **Paint AC (DMA) white 310 ml** | **512186** | DE, EN, FR | 12 | white | 1 |

# Texture AC (DSA)

The structured premium acrylic sealant for plastered walls.






Joints in the roof area



Closing external masonry cracks



## Applications

- Filler paste to repair coarse surfaces on internal and external walls
- Connection joints with low movement
- Joints in dry and internal construction
- Joints between walls and ceilings
- Joints on window and shutter connections

## Advantages

- The pitted structure is ideal for coarse surfaces, and ensures a perfect appearance, e.g. on rough plaster.
- The sealant can be painted and plastered and allows for an outstanding hold of standard paints/plasters on the sealant, thus guaranteeing a non-critical post-treatment.
- The good resistance to UV, weather and ageing allows for use both indoors and outdoors. This guarantees versatile and long-lasting jointing.

## Building materials

- Concrete
- Anodised layer
- Gypsum
- Gypsum plasterboard
- Wood
- H-PVC
- Sand-lime brick
- Clinker brick
- Masonry
- Polystyrene
- Aerated concrete
- Plaster
- Brick

## Certificates / Features

- EN 15651 - Part 1: F-EXT-INT

## Functioning

- Chemical base: 1-component dispersion acrylic
- Elasto-plastic
- Low-odour
- Skin formation time: approx. 5 minutes
- Processing temperature: +5 °C to +40 °C
- Temperature resistance: -20 °C to +75 °C (rain-resistant once cured)
- Non-corrosive
- Very good resistance to weather, ageing and UV
- Compatible with paint
- Paintable
- Frost-protected in the cartridge
- Free of silicone, MDI and solvents
- Selection table for substrates - refer to page Sealant selection matrix

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Texture AC (DSA) white 310 ml** | **512185** | DE, EN, FR | 310 | white | 12 | 1 |

# Multi AC (DA)

The acrylic sealant for internal joints.






Sealing door frames



Closing internal masonry cracks



## Applications

- Fractures in masonry and other solid building materials in internal areas
- Connection joints with low movement
- Joints in window sill connections
- Connection joints inside buildings between windows, doors, stairs, ceilings and walls

## Advantages

- The good hold on absorbent substrates guarantees a secure sealing and thus allows for a reliable and economic application.
- The sealant can be painted and plastered and allows for a good hold of standard paints/plasters on the sealant, thus guaranteeing a non-critical post-treatment.
- The water-based acrylate sealant has a neutral odour and is therefore ideal for use in confined spaces.

## Building materials

- Concrete
- Anodised layer
- Gypsum
- Gypsum plasterboard
- Wood
- H-PVC
- Sand-lime brick
- Clinker brick
- Masonry
- Aerated concrete
- Plaster
- Brick

## Certificates / Features

- EN 15651 - Part 1: F-EXT-INT

## Functioning

- Chemical base: 1-component dispersion acrylic
- Elasto-plastic
- Low-odour
- Skin formation time: approx. 20 minutes
- Processing temperature: +5 °C to +40 °C
- Temperature resistance: -20 °C to +75 °C
- Non-corrosive
- Compatible with paint
- Can be painted and plastered
- Frost-protected in the cartridge
- Free of silicone, MDI and solvents
- Selection table for substrates - refer to page Sealant selection matrix

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Multi AC (DA) brown 310 ml** | **053112** | DE, EN, FR | 310 | brown | 12 | 1 |
| **Multi AC (DA) grey 310 ml** | **053111** | DE, EN, FR | 310 | grey | 12 | 1 |
| **Multi AC (DA) white 310 ml** | **053110** | DE, EN, FR | 310 | white | 12 | 1 |

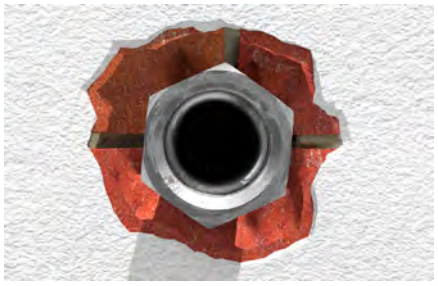
# Repair AC (DEC)

The ready-to-use, extrudable joint mortar for the long-lasting closing of masonry joints.






Masonry joints



Wall breakthrough



## Applications

- Repairing masonry joints
- Closing masonry cracks
- Repairing chipped edges
- Closing drill holes in facing masonry during repair work
- General repair work (e.g. drill holes with cracked edges)
- For a better reusability, to close opened cartridges with adhesive tape

## Advantages

- The ready-to-use, sprayable joint mortar means that there is no need to add water or carry out time-consuming pre-mixing work. It enables clean, purposeful work. This means that you avoid dirtying surrounding areas and wasting material.
- Good adhesion even on slightly damp substrates practically allows for all-weather work and prevents forced interruptions.
- The structure of the high-quality water-based polymer has been perfectly designed with the visual appearance of the mortar in mind. This ensures a discreet joint and perfect appearance.

## Building materials

- Concrete
- Pumice
- Fibre cement
- Gypsum
- Wooden materials
- Sand-lime brick
- Ceramics
- Clinker brick
- Masonry
- Aerated concrete
- Plaster
- Cement
- Brick

## Functioning

- Chemical base: 1C polymer dispersion
- Consistency: Firm
- Skin formation time: Approx. 10 minutes.
- Processing temperature: +5 °C to +40 °C (not below +5 °C)
- Temperature resistance up to -30 °C (fully cured)
- Weather-proof after approx. 24 hours.
- Very good resistance to UV, weather and ageing
- Paintable
- Frost-protected in the cartridge
- We recommend our KMP 3 or KPM 2 Plus

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|
| **Repair AC (DEC) cement grey 310 ml** | **534474** | DE, EN, FR | 310 | 12 | 1 |
| **V-Nozzle Express Cement** | **524315** | – | – | 5 | 1 |

# All-Weather AC (DDK)

The permanently elastic joint sealant with a strong hold on all substrates.






Chimney flashings



Sealing gutters

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## Applications

- Sealing of roofing membranes
- Grouting roof penetrations such as chimneys or light domes, as well as edge connections
- Sealing of metal and plastic gutters
- Sealings around antennas and ventilation ducts
- Sealing of chimney flashings
- Sealant for metal structures

## Advantages

- Thanks to the high elasticity of 25%, DDK is ideally suited to high-stress joints. This guarantees long-lasting jointing.
- DDK holds without a base coat, including on moist and bituminous substrates, and is therefore suitable for all applications in the roofing area. For a high degree of economy.
- The immediate rain resistance allows for external application in all weather conditions, thus avoiding interruption of work.
- DDK is non-corrosive, and thus can be used on aluminium, copper and zinc-plated surfaces. This offers maximum flexibility.

## Building materials

- Concrete
- Bitumen sheeting
- Roofing felt
- Stainless steel
- Wood
- Clinker brick
- Copper
- Masonry
- Metal
- Brick
- Zinc

## Functioning

- Chemical base: 1-component synthetic rubber
- Permanently elastic
- Highly transparent formulation
- Skin formation time: 15 - 20 minutes
- Processing temperature: +5 °C to +40 °C
- Temperature resistance: -25 °C to +100 °C
- Permitted overall deformation: 25%
- Allows for emergency roof repairs
- Non-corrosive
- Very good resistance to weather, ageing and UV
- Compatible with paint
- Paintable
- Frost-protected in the cartridge

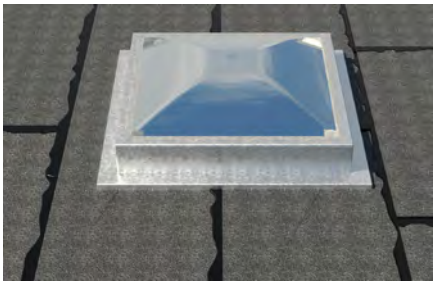
## Technical data

| Item | Item no. | Language on label | Contents [ml] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **All-Weather AC (DDK) transparent 310 ml** | **049103** | DE, EN, FR | 310 | transparent | 12 | 1 |

# Roof BI (DD)

The special bitumen sealant to fill joints between bitumen sheeting.



Sealings around skylights



Sealings around roofs with bitumen sheeting



## Applications

- Sealing roofing membranes and roofing felt
- Bonding bitumen shingle
- Grouting roof penetrations such as chimneys or light domes, as well as edge connections
- Sealing of metal and plastic gutters
- Sealings around antennas and ventilation ducts
- Suitable for emergency repairs

## Advantages

- The special bitumen-based formulation seals roofing membranes and roofing felt securely. This guarantees long-lasting functionality.
- DD also holds to moist substrates without a base layer. This makes application largely independent of the weather and thus helps to avoid interruption of work.
- DD is non-corrosive, and thus can be used on aluminium, copper, zinc-plated surfaces and polystyrene. This offers maximum flexibility.

## Building materials

- Concrete
- Bitumen sheeting
- Roofing felt
- Stainless steel
- Wood
- Clinker brick
- Copper
- Plastics
- Masonry
- Metal
- Brick
- Zinc

## Functioning

- Chemical base: 1-component bitumen
- Skin formation time: approx. 30 minutes
- Processing temperature: +5 °C to +45 °C
- Temperature resistance: -20 °C to +80 °C
- Hardening time: 1 to 2 mm
- Max. movement absorption 5%
- Non-corrosive
- Selection table for substrates - refer to page Sealant selection matrix

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Roof BI (DD) black 310 ml** | **053127**[1)] | DE, EN, FR | 310 | black | 12 | 1 |

[1)] Dangerous good - no express shipping possible.

# Dispenser KPM 1

Easy and precisely dosed usage of fischer gun foams.



12

## Applications

- For low-viscosity sealants and adhesives.
- For one-component plastic and aluminum cartridges up to 310 ml.

## Advantages

- The handy, robust solid metal construction for standard cartridges up to 310 ml bears up against requirements on the construction site and, as such, is also suitable for professional use.
- The robust design is characterized by the fact that the trigger lever cannot bend and the drive rod has a high resistance to notch formation.
- Despite the focus on rapid squeezing, the continuous feed enables precise dosing and thus makes the application easy.
- The slim shape of the device allows for an exact application, even in difficult to reach spots, thus offering a high level of flexibility.

## Functioning

- Slim cartridge gun in professional quality made of metal for tough continuous use.
- Hex rod with ladder hook.
- Easy handling and with 7:1 fast feed rate.
- With thumb release lever. Pressure resistance 1,250 N. Weight 355 g.

## Technical data

| | Item no. | | Sales unit [pcs] |
|---|---|---|---|
| Item | | | |
| KPM 1 | 053115 | | 1 |

# Dispenser KPM 3

The high-quality application gun for silicone cartridges.





## Applications

- For low to high viscosity sealants and adhesives.
- For one-component plastic and aluminum cartridges up to 310 ml.

## Advantages

- The 18:1 transmission ratio makes extrusion rapid and energy-efficient even in the case of highly viscous materials, thus guaranteeing stressfree work.
- The robust design of the drive block and the push rod meets the tough requirements of a construction site and thus offers a long lifespan.
- Due to the freely rotatable cartridge shell and the accessible cartridge, it is possible to align the extrusion nozzle perfectly in place and guarantee application-orientated work.
- The equipment with a ladder hook facilitates the retraction of the push rod and offers a convenient possibility of depositing during work interruptions.

## Functioning

- Robust and semi-open manual gun with rotatable metal housing.
- Excellent power transmission of 18:1, making it easier to work with. Manual overrun lock.
- Steel frame with 3 welding points. Smooth rod with ladder hook for stepless feed.
- Increased pressure resistance of the pressure mechanism up to 6,000 N. Weight 690 g.

## Technical data

| | Item no. | | Sales unit [pcs] |
|---|---|---|---|
| Item | | | |
| KPM 3 | 541441 | | 1 |

# Dispenser KPM 2 Plus

The robust dispenser for cartridges with up to 310 ml volume.



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## Applications

- For squeezing out 1-component sealant and adhesive cartridges up to 310 ml content
- For squeezing out fischer injection mortars up to 300 ml content

## Advantages

- The dispenser can be used for all common 1-component sealant and adhesive cartridges up to 310 ml as well as fischer injection mortars up to 300 ml content.
- The 18:1 transmission ratio enables rapid and gentle squeezing of even highly viscous compounds for maximum application comfort.
- The robust housing with specially hardened push block guarantees reliable and long-lasting processing under demanding construction site conditions.
- The freely accessible and rotatable cartridge insert allows the cartridge to be optimally aligned and reaches even hard-to-reach places.
- The adjustable overrun stop prevents dripping, especially of low-viscosity compounds.
- The push rod that is rounded at the back makes it easy to pull back and also convenient to hang the device.

## Functioning

- Metal housing with robust paint finish and corrosion-resistant sliding elements.
- Front groove width for inserting the cartridge approx. 26 mm.
- Diameter of the slide plate of 41.5 mm ± 0.1 mm.
- Compressive strength of 6,000 N.
- Weight approx. 770 g.

## Technical data

| | Item no. | | Sales unit [pcs] |
|---|---|---|---|
| Item | | | |
| KPM 2 Plus | 053117 | | 1 |

# Foil bag dispenser KPM 600

Easy and fast processing of sealant and adhesive cartridges.



## Applications

- For low to high viscosity sealants and adhesives.
- For one-component aluminum foil bags up to 600 ml.
- Also suitable for single-component 310 ml cartridges.

## Advantages

- The 18:1 transmission ratio makes extrusion rapid and energy-efficient even in the case of highly viscous materials, thus guaranteeing stressfree work.
- The robust design with the hardened push rod with anti-slip effect withstands the tough requirements of a construction site and thus offers a long lifespan.
- The equipment with a ladder hook facilitates the retraction of the push rod and offers a convenient possibility of depositing during work interruptions.
- Automatic tension remove (with on / off function) prevents run after.
- 2 different pusher plates (plastic for tubular bags & metal for cartridges) enable flexible use.



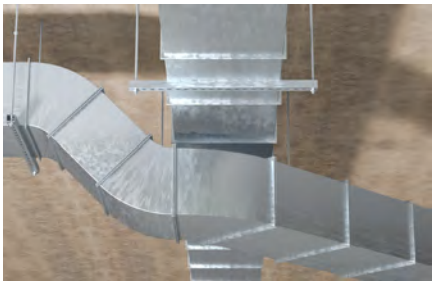
## Technical data

| | Item no. | | Sales unit [pcs] |
|---|---|---|---|
| Item | | | |
| KPM 600 | 540941 | | 1 |

# Zinc-alu spray FTC-ZA

Ideal for repairing damaged zinc coatings using colour-matching corrosion protection.



Ventilation systems



Ladders



## Applications

- For post-galvanising and repairing damaged areas of galvanised parts, drilling and cutting points and welded joints
- Repairing damaged zinc coatings
- Climate control and ventilation technology
- Guard rails
- Metal constructions
- Sheet metal coverings

## Advantages

- Zinc-alu spray represents a subtle repair to damaged hot-dip galvanised areas thanks to its colour matching with the hot-dip galvanisation.
- Thanks to the excellent holding properties on blank metal, it guarantees a lasting connection to the base material.
- The fast-drying Zinc-alu spray guarantees good, weatherproof corrosion protection and, as such, is suitable for use both indoors and out.

## Building materials

- All iron and steel surfaces
- Hot-dip galvanised surfaces following drilling, ironwork or welding
- Non-ferrous heavy metal

## Functioning

- Silver-grey colour (similar to RAL 9006) with high gloss level
- Shake can well for approx. 2 minutes
- Apply at a distance of 25–30 cm in a cross coat
- Surface dust-dry after just approx. 8 minutes
- Touch-dry after 20–25 minutes
- Fully hardened within 24 hours
- Smooth, non-porous film
- High abrasion resistance
- Long-term heat resistance up to approx. +200 °C (briefly up to +300 °C)
- Ideal processing temperature of +16 °C to +25 °C

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|
| FTC-ZA spray 400 ml | 509241[1)] | EN, FR, ES, PT | 400 | 12 | 1 |

[1)] Dangerous goods - no express shipping possible.

# Zinc spray FTC-ZS

Fast-drying surface and corrosion protection with outstanding long-term effect for metals.






Column bases



Metal stairs



## Applications

- For all metals that need corrosion protection
- Rust protection base layer for surfaces threatened by water and weather
- For the coating of drilling and cutting points as well as welded joints
- Conductive interlayer for spot welding
- Repairing damaged zinc coatings

## Advantages

- In the salt spray test in line with DIN 50021, coated metal parts displayed no corrosion, even after 500 hours.
- The high proportion of zinc in the dry film provides secure protection to all metal surfaces that are permanently exposed to the elements.
- Thanks to the adhesive layer of corrosion protection and the fact that it can be painted over, it is also ideal as a high-quality base layer.
- The high resistance to cracking and flaking of a metal base material was confirmed by the mandrel flex test in line with DIN EN ISO 1519 (without damage).

## Building materials

- All iron and steel surfaces
- Blank laminations

## Functioning

- Dark-grey colour (similar to RAL 7042)
- Metal proportion of over 92% in dry film
- Shake can well for approx. 3 minutes
- Apply at a distance of 20–30 cm in a cross coat
- Surface dust-dry after just approx. 8 minutes
- Fully hardened within 24 hours
- Smooth, non-porous film
- Abrasion-resistant
- Excellent corrosion protection with long-term effect
- Heat-resistant up to approx. +500 °C
- Electroconductive and suitable for spot welding
- Ideal processing temperature of +16 °C to +25 °C

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|
| **FTC-ZS spray 400 ml** | **509242**[1)] | EN, FR, ES, PT | 400 | 12 | 1 |

[1)] Dangerous goods - no express shipping possible.



# 13
# Adhesives


| | | |
|---|---|---|
| Sealant and adhesive Multi MS | 676 |  |
| Sealant and adhesive Chrystal MS | 677 |  |
| Hybrid adhesive High Tack MS | 678 |  |
| Hybrid adhesive Express MS | 679 |  |
| Adhesive Express PU | 680 |  |
| Assembly adhesive High Tack AC | 681 |  |

# Sealant and adhesive Multi MS

The universal sealant and adhesive.






Window sills



Sanitary joints at washbasins



## Applications

- Connection and floor joints (interior & exterior)
- Movement and connection joints in kitchen, sanitary and installation areas
- Stress-compensating bonding of different materials
- Standard mirrors
- Bonding and jointing of moldings and tiles

## Advantages

- The high elasticity of 25% enables tension-compensating adhesive joints as well as elastic joint seals and thus compensates for unevenness in the substrate.
- The CE marking according to DIN EN 15651 confirms the application for façade, sanitary and floor joints in interior and exterior areas for universal use.
- The virtually odourless adhesive prevents odour formation in occupied areas for a pleasant indoor climate.
- The external test reports, such as EC 1 PLUS, M1 and ISEGA, as well as the classification according to French VOC class A+, confirm the health benefits of the product. VOC class A+ confirms the health-protective application.
- The special formulation allows simultaneous fixing and sealing of mirrors, thus time-saving.

## Building materials

- Concrete
- Steel, metals
- Wood and wood-based materials
- Hard PVC
- Masonry, clinker
- Glass, glazed surfaces
- Enamel, tiles, ceramics
- Brick
- Mirror
- Plasterboard and gypsum fibreboard

## Certificates / Features

- EN 15651 - Part 1: F EXT-INT-CC (25HM)
- EN 15651 - Part 3: S (XS3)
- EN 15651 - Part 4: PW-EXT-INT-CC (25HM)
- EMICODE® EC 1 Plus - very low emission
- French VOC-emission class A+
- ISEGA
- M1 (Emission class for building materials)

## Functioning

- Chemical basis: 1K Hybrid MS Polymer
- Working temperature: +5 °C to +40 °C
- Curing time approx. 3 mm/24h
- High elasticity of 25%
- Shore A 52
- Temperature resistance: -40 °C to +90 °C
- Solvent-, isocyanate- and silicone-free
- Waterproof and seawater resistant

## Multi MS (Print)

| Item | Item no. | Language on label | Contents [ml] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Multi MS white 80 ml Tube** | **563232** | DE, EN | 80 | white | 12 | 1 |
| **Multi MS white 290 ml** | **059389** | DE, EN, FR | 290 | white | 12 | 1 |
| **Multi MS grey 290 ml** | **503318** | DE, EN, FR | 290 | grey | 12 | 1 |
| **Multi MS black 290 ml** | **503319** | DE, EN, FR | 290 | black | 12 | 1 |
| **Multi MS white 290 ml** | **558977** | CS, SK | 290 | white | 12 | 1 |

# Sealant and adhesive Crystal MS

The transparent sealant and adhesive for interior and exterior use.






Bonding glass elements




For invisible adhesive joints

## Applications

- Bonding in the bathroom
- Glass and other transparent materials
- Bonding and jointing of tiles and slabs, also from natural stone
- Exterior bonding and sealing
- Connection joints

## Advantages

- The transparent material enables almost invisible bonding and sealing.
- Due to the high-quality ingredients, Crystal MS avoids discolourations even on sensitive building materials such as natural stone.
- The high initial adhesive strength of ca. 180 kg/m² on all common building materials enables easy handling without additional pre-fixation.
- The high elasticity ensures tension-compensating adhesive joints as well as elastic joint seals and thus compensates for unevenness in the substrate.
- The CE marking according to DIN EN 15651 confirms the application for façade and sanitary joints indoors and outdoors for permanent use.
- The virtually odourless adhesive prevents odour formation in occupied areas for a pleasant indoor climate.

## Building materials

- Natural stone
- Steel, Metals
- Glass, glazed surfaces
- Wood and wood-based material
- Plaster
- Hard PVC
- Enamel, tiles, ceramics
- Masonry, clinker
- Concrete
- Brick

## Certificates / Features

- EN 15651 - Part 1: F-EXT-INT (12,5P)
- EN 15651 - Part 3: S (S1)
- EMICODE® EC 1 Plus - very low emission
- French VOC-emission class A+

## Functioning

- Chemical basis: 1K Hybrid MS-Polymer
- Working temperature: +5 °C to +40 °C
- Curing time: approx. 4.5 mm/24h
- High elasticity of 12,5%
- Temperature resistance: -40 °C to +110 °C
- Solvent-, isocyanate- and silicone-free
- Waterproof and seawater resistant

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Crystal MS transparent 290 ml** | **503317** | DE, EN, FR | 290 | transparent | 12 | 1 |
| **Crystal MS transparent 290 ml** | **558610** | CS, SK | 290 | crystal clear | 12 | 1 |

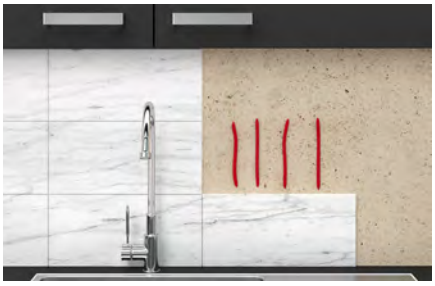
# Hybrid adhesive High Tack MS

The elastic adhesive with extremely high initial tack.






Bonding of Insulation panels



Bonding of natural tiles



## Applications

- Fixing of tiles and slabs, including natural stone
- Bonding of skirting boards, panels, cladding
- Fixing of mirrors
- Substructures made of wood and metal
- Insulation panels
- Outdoor fixings

## Advantages

- The extremely high initial tack allows attachment of add-on parts without additional pre-fixing.
- The elasticity of the adhesive compensates component movements, vibrations and unevenness in the substrate.
- The high-quality raw materials allow use on sensitive substrates such as natural stone or mirror coatings.
- The position of bonded attachments can be corrected within the first 10 minutes.
- The High Tack MS can also be applied to damp substrates outdoors and allows for weather-independent application.
- On smooth and non-absorbent surfaces, the adhesive can be removed without leaving any residue.

## Building materials

- Natural stone
- Metals
- Glass
- Enamel, tiles, ceramics
- Mirrors
- Hard PVC
- Wood and wood-based material
- Masonry, clinker
- Concrete
- Brick

## Certificates / Features

- EMICODE EC 1 Plus - very low emission
- French VOC emission class A+

## Functioning

- Chemical base: 1K Hybrid MS-Polymer
- Application temperature: +5 °C to +40 °C
- Extremely high initial adhesive strength of approx. 500 kg/m²
- Curing time 2 to 3 mm/24h
- Stress-equalizing
- Temperature resistance: -40 °C to +90 °C
- Solvent-, isocyanate- and silicone-free
- Waterproof and seawater resistant

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Packaging | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **High Tack MS white 290 ml** | **541712** | DE, EN, FR | 290 | – | white | 12 | 1 |
| **V-Nozzle Express Cement** | **524315** | – | – | Polybag | – | 5 | 1 |

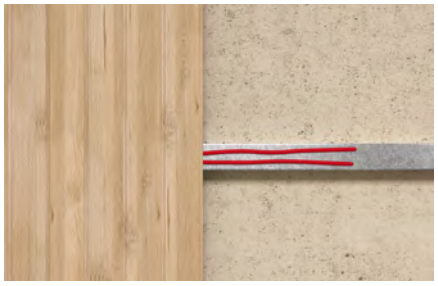
# Hybrid adhesive Express MS

The adhesive with fast strength build-up.






Fixing of electrical installations



Bonding wall cladding



## Applications

- Cable ducts
- Bonding of skirting boards, panels, cladding or insulation material
- Staircase construction
- Bonding of tiles and stones
- General repair and assembly bonding
- Fastening of electrical installations
- Wooden structures
- Vehicle bonding

## Advantages

- The very fast curing results in a hand-tight adhesive bond after only approx. 20 minutes.
- The high final strength allows secure fastening even of higher loads.
- Adhesion to many different materials and damp substrates indoors and outdoors, enables universal use.
- Mounting without drilling or nailing allows attachments to be securely fastened even in hard-to-reach places.
- The position of the bonded elements can be flexibly aligned within the first 5 minutes.

## Building materials

- Concrete
- Metals
- Wood and wood-based material
- Hard PVC
- Masonry, clinker
- Enamel, tiles, ceramics
- Plasterboard and gypsum fibreboard
- Plaster
- Glass, glazed surfaces
- Brick

## Certificates / Features

- EMICODE® EC 2 - low emission
- French VOC emission class A+
- M1 (emission class for building materials)

## Functioning

- Chemical base: 1K Hybrid MS-Polymer
- Processing temperature: +5 °C to +30 °C
- Processing time: approx. 5 minutes
- Very fast strength build-up
- Hand-tight after approx. 20 minutes, functional strength after approx. 30 minutes
- Shore A 70 ± 5
- High final strength up to 36 kg/cm² (after aprox. 24 h)
- Temperature resistance: -30 °C to +90 °C

## Technical data

| | Item no. | Language on label | Contents [ml] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Item** | | | | | | |
| **Express MS white 290 ml** | **558829** | CS, DE, EN | 290 | white | 12 | 1 |

# Adhesive Express PU

The adhesive with fast strength build-up and highest final adhesion.






Wall head cover



Bonding in staircase construction



## Applications

- Gluing timber sub-structures
- Stair construction and stair renovations
- Laminate cladding
- Skirting boards
- Décorative, acoustic and insulation panels
- Professional modelling
- Door signs
- Cable ducts
- General repair and mounting applications

## Advantages

- The extremely high final strength of up to 100 kg/cm² ensures the secure fastening of heavy attachments.
- The fast curing allows the adhesive joint to be loaded after only approx. 10 minutes.
- The Express PU is heat resistant up to 110°C and therefore suitable for applications with extreme temperature exposure.
- The water resistance according to DIN EN 204 D4 allows indoor and outdoor applications.
- The high-quality raw materials allow the use on sensitive substrates, such as natural stone, without discoloration.
- The special formulation ensures good compatibility with foamed polystyrene, such as Styropor®.

## Building materials

- Concrete
- Gypsum
- Wood-based material
- Hard PVC
- Ceramics
- Masonry
- Metals
- Natural stone
- Polystrene foam
- Plaster

## Certificates / Features

- EMICODE® EC 1 Plus - very low emission
- French VOC emission class A+
- M1 (emission class for building materials)

## Functioning

- Chemical base: 1K PUR adhesive
- Processing temperature: 0 °C to +35 °C
- Processing time: approx. 3 minutes
- Functional strength after approx. 10 minutes (with zero joint)
- Temperature resistance: -40 °C to +110 °C
- Press parts until functional strength is achieved
- Solvent and silicone free

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Express PU beige 310 ml** | **059014** | DE, EN | 310 | beige | 12 | 1 |

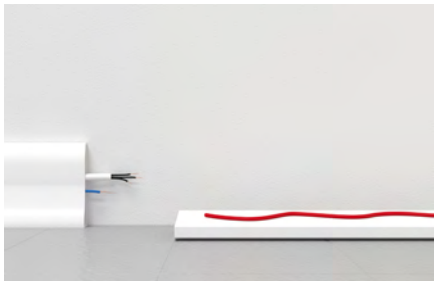
# Assembly adhesive High Tack AC

The water-based assembly adhesive with high initial adhesion.






Bonding of Insulation panels



Fixing skirting boards

## Applications

- Skirting
- Timber sub-structures
- Décorative, acoustic and insulation panels
- Cable ducts
- Window sills
- Tiles
- Door signs

## Advantages

- The very high initial adhesion as well as final strength ensures the secure fixing of add-on parts without additional aids.
- Mounting without drilling or nailing allows attachments to be securely fastened even in hard-to-reach places.
- The high-quality raw materials also allow use on sensitive substrates such as natural stone.
- The components can still be readjusted within a few minutes for flexible assembly.
- The water-based acrylic adhesive is odorless and therefore particularly suitable for indoor processing.
- The special formulation ensures good compatibility with foamed polystyrene, such as Styropor®.

## Building materials

- Concrete
- Plaster
- Wood
- Clinker
- Masonry
- Metal
- Natural stone
- Brick

## Certificates / Features

- EMICODE® EC 1 Plus - very low emission
- French VOC-emission class A+

## Functioning

- Chemical base: 1K acrylic dispersion (water-based)
- For interior use
- Processing temperature: +10 °C to +30 °C
- Very high initial adhesive strength of up to 345 kg/m²
- Temperature resistance: -20 °C to +60 °C
- Min. one substrate must be absorbent
- Solvent-, silicone- and MDI-free

## Technical data

| Item | Item no. | Language on label | Contents [ml] | Colour | Content per box [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **High Tack AC white 310 ml** | **053128** | DE, EN, FR | 310 | creamwhite | 12 | 1 |

# 14
# Drills and bits


CONCRETE DRILL BITS

| | | |
|---|---|---|
| Hammer drill bit Quattric II S / Quattric II | 684 |  |
| Hammer drill bit SDS Plus II Pointer | 687 |  |
| Hammer drill bit SDS Max IV S / SDS Max IV | 690 |  |
| Hollow drill bit FHD | 692 |  |

MASONRY DRILL BITS

| | | |
|---|---|---|
| Masonry drill bit Pointer U | 694 |  |

STONE DRILL BITS

| | | |
|---|---|---|
| Stone drill bit D-SDX | 696 |  |
| Stone drill bit D-S | 698 |  |

METAL DRILL BITS

| | | |
|---|---|---|
| Metal drill bit D-HSS-Co | 700 |  |
| Metal drill bit D-HSS-G | 702 |  |
| Metal drill bit D-HSS-R | 704 |  |

UNIVERSAL DRILL BITS

| | | |
|---|---|---|
| Universal drill bit D-U Hex | 706 |  |

CHISEL

| | | |
|---|---|---|
| Premium chisel FCP | 708 |  |
| Standard chisel | 709 |  |

BITS

| | | |
|---|---|---|
| ProfiBit FPB | 711 |  |
| Bit FMB II | 713 |  |
| BitHolder FBH | 714 |  |
| BitSets | 715 |  |
| Socket | 716 |  |

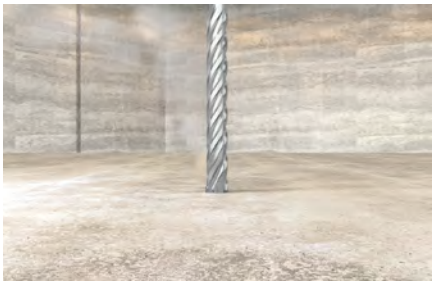
# Hammer drill bit Quattric II S / Quattric II

The expert for the best performance in reinforced concrete.





Drilling in concrete wall



Drilling in floor plate

## Applications

**To create approval-compliant drill holes in:**
- Reinforced concrete
- Concrete
- Solid brick
- Sand-lime brick

**Also suitable for:**
- Natural stone

## Advantages

- Robust solid carbide head (up to ø 20 mm) for a long service life.
- Massive main cutting edges in combination with the improved break-up performance of the Power Shoulders enable fast drilling progress.
- Integrated reinforcement chamfers prevent jamming in reinforcement.
- Special spiral geometry combines quick drilling progress and increased service life.
- Centering tip for a simple and accurate spot drilling, prevents running on smooth surfaces.
- Wear mark for easy recognition of the wear limit according to PGM.

## Certificates / Features

PGM®

SDS Plus

## Functioning

- Four-cutter hammer drill bit with SDS Plus shank enables higher durability in reinforced concrete.

## Technical data

**Hammer drill bit Quattric II S / Quattric II**



Quattric II S / Quattric II

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| Quattric II 5/50/115 S | 549973 | 5 | 50 | 115 | Plastic clip | 1 | 1 |
| Quattric II 5/100/165 S | 549974 | 5 | 100 | 165 | Plastic clip | 1 | 1 |
| Quattric II 5/150/215 S | 544214 | 5 | 150 | 215 | Plastic clip | 1 | 1 |
| Quattric II 5.5/50/115 S | 549971 | 5.5 | 50 | 115 | Plastic clip | 1 | 1 |
| Quattric II 5.5/100/165 S | 549972 | 5.5 | 100 | 165 | Plastic clip | 1 | 1 |
| Quattric II 6/50/115 S | 549983 | 6 | 50 | 115 | Plastic clip | 1 | 1 |
| Quattric II 6/100/165 S | 549979 | 6 | 100 | 165 | Plastic clip | 1 | 1 |
| Quattric II 6/150/215 S | 549981 | 6 | 150 | 215 | Plastic clip | 1 | 1 |
| Quattric II 6/200/265 S | 549985 | 6 | 200 | 265 | Plastic clip | 1 | 1 |
| Quattric II 6/250/315 S | 549986 | 6 | 250 | 315 | Plastic clip | 1 | 1 |

## Technical data

**Hammer drill bit Quattric II S / Quattric II**



Quattric II S / Quattric II

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **Quattric II 6.5/100/165 S** | **549975** | 6.5 | 100 | 165 | Plastic clip | 1 | 1 |
| **Quattric II 6.5/150/215 S** | **549976** | 6.5 | 150 | 215 | Plastic clip | 1 | 1 |
| **Quattric II 6.5/200/265 S** | **549977** | 6.5 | 200 | 265 | Plastic clip | 1 | 1 |
| **Quattric II 6.5/250/315 S** | **549978** | 6.5 | 250 | 315 | Plastic clip | 1 | 1 |
| **Quattric II 7/100/165 S** | **549987** | 7 | 100 | 165 | Plastic clip | 1 | 1 |
| **Quattric II 8/50/115 S** | **549993** | 8 | 50 | 115 | Plastic clip | 1 | 1 |
| **Quattric II 8/100/165 S** | **549988** | 8 | 100 | 165 | Plastic clip | 1 | 1 |
| **Quattric II 8/150/215 S** | **549990** | 8 | 150 | 215 | Plastic clip | 1 | 1 |
| **Quattric II 8/200/265 S** | **549994** | 8 | 200 | 265 | Plastic clip | 1 | 1 |
| **Quattric II 8/250/315 S** | **549992** | 8 | 250 | 315 | Plastic clip | 1 | 1 |
| **Quattric II 8/300/365 S** | **549995** | 8 | 300 | 365 | Plastic clip | 1 | 1 |
| **Quattric II 8/400/465 S** | **549996** | 8 | 400 | 465 | Plastic clip | 1 | 1 |
| **Quattric II 10/50/115 S** | **549928** | 10 | 50 | 115 | Plastic clip | 1 | 1 |
| **Quattric II 10/100/165 S** | **549922** | 10 | 100 | 165 | Plastic clip | 1 | 1 |
| **Quattric II 10/150/215 S** | **549925** | 10 | 150 | 215 | Plastic clip | 1 | 1 |
| **Quattric II 10/200/265 S** | **549929** | 10 | 200 | 265 | Plastic clip | 1 | 1 |
| **Quattric II 10/250/315 S** | **549927** | 10 | 250 | 315 | Plastic clip | 1 | 1 |
| **Quattric II 10/300/365 S** | **544224** | 10 | 300 | 365 | Plastic clip | 1 | 1 |
| **Quattric II 10/390/455 S** | **549930** | 10 | 390 | 455 | Plastic clip | 1 | 1 |
| **Quattric II 10/540/600 S** | **544222** | 10 | 540 | 600 | Plastic clip | 1 | 1 |
| **Quattric II 12/110/165 S** | **549932** | 12 | 110 | 165 | Plastic clip | 1 | 1 |
| **Quattric II 12/160/215 S** | **549936** | 12 | 160 | 215 | Plastic clip | 1 | 1 |
| **Quattric II 12/210/265 S** | **549934** | 12 | 210 | 265 | Plastic clip | 1 | 1 |
| **Quattric II 12/260/315 S** | **549939** | 12 | 260 | 315 | Plastic clip | 1 | 1 |
| **Quattric II 12/400/455 S** | **549935** | 12 | 400 | 455 | Plastic clip | 1 | 1 |
| **Quattric II 12/550/600 S** | **544213** | 12 | 550 | 600 | Plastic clip | 1 | 1 |
| **Quattric II 12/950/1000 S** | **549931** | 12 | 950 | 1,000 | Plastic clip | 1 | 1 |
| **Quattric II 14/110/165 S** | **549941** | 14 | 110 | 165 | Plastic clip | 1 | 1 |
| **Quattric II 14/160/215 S** | **549944** | 14 | 160 | 215 | Plastic clip | 1 | 1 |
| **Quattric II 14/210/265 S** | **549942** | 14 | 210 | 265 | Plastic clip | 1 | 1 |
| **Quattric II 14/260/315 S** | **549945** | 14 | 260 | 315 | Plastic clip | 1 | 1 |
| **Quattric II 14/400/455 S** | **549943** | 14 | 400 | 455 | Plastic clip | 1 | 1 |
| **Quattric II 14/550/600 S** | **544223** | 14 | 550 | 600 | Plastic clip | 1 | 1 |
| **Quattric II 14/950/1000 S** | **549940** | 14 | 950 | 1,000 | Plastic clip | 1 | 1 |
| **Quattric II 15/110/165 S** | **549946** | 15 | 110 | 165 | Plastic clip | 1 | 1 |
| **Quattric II 15/160/215 S** | **549947** | 15 | 160 | 215 | Plastic clip | 1 | 1 |
| **Quattric II 15/210/265 S** | **544215** | 15 | 210 | 265 | Plastic clip | 1 | 1 |
| **Quattric II 16/110/165 S** | **549950** | 16 | 110 | 165 | Plastic clip | 1 | 1 |
| **Quattric II 16/160/215 S** | **549951** | 16 | 160 | 215 | Plastic clip | 1 | 1 |
| **Quattric II 16/210/265 S** | **549952** | 16 | 210 | 265 | Plastic clip | 1 | 1 |
| **Quattric II 16/260/315 S** | **549953** | 16 | 260 | 315 | Plastic clip | 1 | 1 |
| **Quattric II 16/400/455 S** | **549954** | 16 | 400 | 455 | Plastic clip | 1 | 1 |
| **Quattric II 16/550/600 S** | **549955** | 16 | 550 | 600 | Plastic clip | 1 | 1 |
| **Quattric II 16/950/1000 S** | **549948** | 16 | 950 | 1,000 | Plastic clip | 1 | 1 |
| **Quattric II 18/200/250 S** | **549956** | 18 | 200 | 250 | Plastic tube | 1 | 1 |
| **Quattric II 18/400/450 S** | **549957** | 18 | 400 | 450 | Plastic tube | 1 | 1 |
| **Quattric II 20/200/250 S** | **549958** | 20 | 200 | 250 | Plastic tube | 1 | 1 |
| **Quattric II 20/400/450 S** | **549959** | 20 | 400 | 450 | Plastic tube | 1 | 1 |
| **Quattric II 22/200/250** | **549960** | 22 | 200 | 250 | Plastic tube | 1 | 1 |
| **Quattric II 22/400/450** | **549961** | 22 | 400 | 450 | Plastic tube | 1 | 1 |
| **Quattric II 24/200/250** | **549962** | 24 | 200 | 250 | Plastic tube | 1 | 1 |
| **Quattric II 24/400/450** | **549963** | 24 | 400 | 450 | Plastic tube | 1 | 1 |
| **Quattric II 25/200/250** | **549964** | 25 | 200 | 250 | Plastic tube | 1 | 1 |
| **Quattric II 25/400/450** | **549965** | 25 | 400 | 450 | Plastic tube | 1 | 1 |
| **Quattric II 28/200/250** | **549966** | 28 | 200 | 250 | Plastic tube | 1 | 1 |
| **Quattric II 28/400/450** | **549967** | 28 | 400 | 450 | Plastic tube | 1 | 1 |

## Technical data

**Hammer drill bit Quattric II S / Quattric II**



Quattric II S / Quattric II

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **Quattric II 30/200/250** | **549968** | 30 | 200 | 250 | Plastic tube | 1 | 1 |
| **Quattric II 30/400/450** | **549969** | 30 | 400 | 450 | Plastic tube | 1 | 1 |
| **Quattric II 32/400/450** | **549970** | 32 | 400 | 450 | Plastic tube | 1 | 1 |
| **Quattric II 6/50/115 S XP5** | **549984** | 6 | 50 | 115 | X-Pack | 5 | 1 |
| **Quattric II 6/100/165 S XP5** | **544225** | 6 | 100 | 165 | X-Pack | 5 | 1 |
| **Quattric II 6/150/215 S XP5** | **549982** | 6 | 150 | 215 | X-Pack | 5 | 1 |
| **Quattric II 6/200/265 S XP5** | **552131** | 6 | 200 | 265 | X-Pack | 5 | 1 |
| **Quattric II 6.5/100/165 S XP5** | **544217** | 6.5 | 100 | 165 | Plastic tube | 5 | 1 |
| **Quattric II 8/100/165 S XP5** | **549989** | 8 | 100 | 165 | X-Pack | 5 | 1 |
| **Quattric II 8/150/21 S XP5** | **549991** | 8 | 150 | 215 | X-Pack | 5 | 1 |
| **Quattric II 8/200/265 S XP5** | **552132** | 8 | 200 | 265 | X-Pack | 5 | 1 |
| **Quattric II 10/100/165 S XP5** | **549924** | 10 | 100 | 165 | X-Pack | 5 | 1 |
| **Quattric II 10/150/215 S XP5** | **549926** | 10 | 150 | 215 | X-Pack | 5 | 1 |
| **Quattric II 10/200/265 S XP5** | **552133** | 10 | 200 | 265 | X-Pack | 5 | 1 |
| **Quattric II 12/110/165 S XP5** | **549933** | 12 | 110 | 165 | X-Pack | 5 | 1 |
| **Quattric II 12/160/215 S XP5** | **549937** | 12 | 160 | 215 | X-Pack | 5 | 1 |
| **Quattric II 12/210/265 S XP5** | **549938** | 12 | 210 | 265 | X-Pack | 5 | 1 |
| **Quattric II 14/110/165 S XP5** | **544220** | 14 | 110 | 165 | X-Pack | 5 | 1 |
| **Quattric II 14/160/215 S XP5** | **544221** | 14 | 160 | 215 | X-Pack | 5 | 1 |
| **Quattric II 6/100/165 S XP10** | **549980** | 6 | 100 | 165 | X-Pack | 10 | 1 |
| **Quattric II 6/150/215 S XP10** | **544185** | 6 | 150 | 215 | X-Pack | 10 | 1 |
| **Quattric II 8/100/165 S XP10** | **544216** | 8 | 100 | 165 | X-Pack | 10 | 1 |
| **Quattric II 8/150/215 S XP10** | **544186** | 8 | 150 | 215 | X-Pack | 10 | 1 |
| **Quattric II 10/100/165 S XP10** | **549923** | 10 | 100 | 165 | X-Pack | 10 | 1 |
| **Quattric II 10/150/215 S XP10** | **544187** | 10 | 150 | 215 | X-Pack | 10 | 1 |
| **Quattric II 12/110/165 S XP10** | **552129** | 12 | 110 | 165 | X-Pack | 10 | 1 |
| **Quattric II 12/160/215 S XP10** | **544188** | 12 | 160 | 215 | X-Pack | 10 | 1 |
| **Quattric II 12/210/265 S XP10** | **552130** | 12 | 210 | 265 | X-Pack | 10 | 1 |
| **Quattric II 14/160/215 S XP10** | **544189** | 14 | 160 | 215 | Plastic tube | 10 | 1 |

## Technical data

**Hammer drill bit Quattric II S / Quattric II**



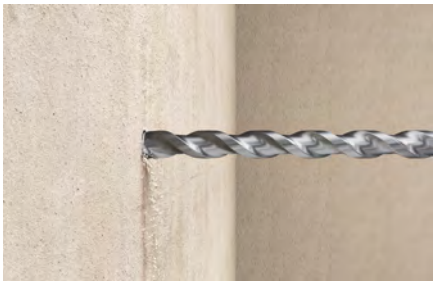
Quattric II S Set

| Item | Item no. | Packaging | Contents | Sales unit [pcs] |
|---|---|---|---|---|
| **Quattric II S Set 5-12 mm (7)** | **553210** | Assortment box | 7 pcs: 5/50/115, 6/50/115, 6/100/165, 8/50/115, 8/100/165, 10/100/165, 12/110/165 | 1 |

# Hammer drill bit SDS Plus II Pointer

The two-cutter with high drilling speed.





Drilling in concrete wall



Drilling in floor plate

## Applications

**To create approval-compliant drill holes in:**
- Concrete
- Solid brick
- Sand-lime brick

**Also suitable for:**
- Natural stone

## Advantages

- Optimised drill bit geometry enables fast drilling progress while reducing wear and effort.
- Robust Power Breaker breaks up the concrete for a noticeably higher drilling speed.
- Larger reinforcement chamfers reduce jamming in reinforcement.
- Two-flute spiral geometry for optimum dust removal and long service life.
- Centering tip for a simple and accurate spot drilling, prevents running on smooth surfaces.
- PGM certification is guaranteed a precise hole creation for a secure application of the fixing.

## Certificates / Features

PGM

SDS Plus

## Functioning

- Two-cutter hammer drill bit with SDS Plus shank enables fast and safe drilling and has been optimized for cordless drills.

## Technical data

**Hammer drill bit SDS Plus II Pointer**



SDS Plus II Pointer

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| SDS Plus II 4/50/110 | 531753 | 4 | 50 | 110 | Plastic clip | 1 | 1 |
| SDS Plus II 4/100/160 | 531754 | 4 | 100 | 160 | Plastic clip | 1 | 1 |
| SDS Plus II 5/50/110 | 531755 | 5 | 50 | 110 | Plastic clip | 1 | 1 |
| SDS Plus II 5/100/160 | 531756 | 5 | 100 | 160 | Plastic clip | 1 | 1 |
| SDS Plus II 5/150/210 | 531757 | 5 | 150 | 210 | Plastic clip | 1 | 1 |
| SDS Plus II 5/250/310 | 531759 | 5 | 250 | 310 | Plastic clip | 1 | 1 |
| SDS Plus II 5,5/100/160 | 531761 | 5.5 | 100 | 160 | Plastic clip | 1 | 1 |
| SDS Plus II 5,5/150/210 | 531762 | 5.5 | 150 | 210 | Plastic clip | 1 | 1 |
| SDS Plus II 5,5/250/310 | 531763 | 5.5 | 250 | 310 | Plastic clip | 1 | 1 |
| SDS Plus II 6/50/110 | 531765 | 6 | 50 | 110 | Plastic clip | 1 | 1 |

## Technical data

**Hammer drill bit SDS Plus II Pointer**



SDS Plus II Pointer

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| SDS Plus II 6/100/160 | 531766 | 6 | 100 | 160 | Plastic clip | 1 | 1 |
| SDS Plus II 6/150/210 | 531767 | 6 | 150 | 210 | Plastic clip | 1 | 1 |
| SDS Plus II 6/200/260 | 531768 | 6 | 200 | 260 | Plastic clip | 1 | 1 |
| SDS Plus II 6/250/310 | 531769 | 6 | 250 | 310 | Plastic clip | 1 | 1 |
| SDS Plus II 6,5/50/110 | 531770 | 6.5 | 50 | 110 | Plastic clip | 1 | 1 |
| SDS Plus II 6,5/100/160 | 531771 | 6.5 | 100 | 160 | Plastic clip | 1 | 1 |
| SDS Plus II 6,5/150/210 | 531772 | 6.5 | 150 | 210 | Plastic clip | 1 | 1 |
| SDS Plus II 6,5/200/260 | 531773 | 6.5 | 200 | 260 | Plastic clip | 1 | 1 |
| SDS Plus II 6,5/250/310 | 531774 | 6.5 | 250 | 310 | Plastic clip | 1 | 1 |
| SDS Plus II 7/50/110 | 531775 | 7 | 50 | 110 | Plastic clip | 1 | 1 |
| SDS Plus II 7/100/160 | 531776 | 7 | 100 | 160 | Plastic clip | 1 | 1 |
| SDS Plus II 7/150/210 | 531777 | 7 | 150 | 210 | Plastic clip | 1 | 1 |
| SDS Plus II 8/50/110 | 531779 | 8 | 50 | 110 | Plastic clip | 1 | 1 |
| SDS Plus II 8/100/160 | 531780 | 8 | 100 | 160 | Plastic clip | 1 | 1 |
| SDS Plus IV 8/100/400 | 517689 | 8 | 100 | 400 | Plastic clip | 1 | 1 |
| SDS Plus II 8/150/210 | 531781 | 8 | 150 | 210 | Plastic clip | 1 | 1 |
| SDS Plus II 8/200/260 | 531782 | 8 | 200 | 260 | Plastic clip | 1 | 1 |
| SDS Plus II 8/250/310 | 531783 | 8 | 250 | 310 | Plastic clip | 1 | 1 |
| SDS Plus II 8/340/400 | 531784 | 8 | 340 | 400 | Plastic clip | 1 | 1 |
| SDS Plus II 8/400/460 | 531785 | 8 | 400 | 460 | Plastic clip | 1 | 1 |
| SDS Plus II 8/540/600 | 531786 | 8 | 540 | 600 | Plastic clip | 1 | 1 |
| SDS Plus II 9/100/160 | 531788 | 9 | 100 | 160 | Plastic clip | 1 | 1 |
| SDS Plus II 9/150/210 | 531789 | 9 | 150 | 210 | Plastic clip | 1 | 1 |
| SDS Plus II 9,5/100/160 | 531790 | 9.5 | 100 | 160 | Plastic clip | 1 | 1 |
| SDS Plus II 10/50/110 | 531791 | 10 | 50 | 110 | Plastic clip | 1 | 1 |
| SDS Plus II 10/100/160 | 531792 | 10 | 100 | 160 | Plastic clip | 1 | 1 |
| SDS Plus II 10/150/210 | 531793 | 10 | 150 | 210 | Plastic clip | 1 | 1 |
| SDS Plus II 10/200/260 | 531794 | 10 | 200 | 260 | Plastic clip | 1 | 1 |
| SDS Plus II 10/250/310 | 531795 | 10 | 250 | 310 | Plastic clip | 1 | 1 |
| SDS Plus II 10/290/350 | 531796 | 10 | 290 | 350 | Plastic clip | 1 | 1 |
| SDS Plus II 10/390/450 | 531797 | 10 | 390 | 450 | Plastic clip | 1 | 1 |
| SDS Plus II 10/540/600 | 531798 | 10 | 540 | 600 | Plastic clip | 1 | 1 |
| SDS Plus II 10/740/800 | 531799 | 10 | 740 | 800 | Plastic clip | 1 | 1 |
| SDS Plus II 10/940/1000 | 531800 | 10 | 940 | 1,000 | Plastic clip | 1 | 1 |
| SDS Plus II 11/100/160 | 531801 | 11 | 100 | 160 | Plastic clip | 1 | 1 |
| SDS Plus II 11/260/310 | 531802 | 11 | 260 | 310 | Plastic clip | 1 | 1 |
| SDS Plus II 12/110/160 | 531803 | 12 | 110 | 160 | Plastic clip | 1 | 1 |
| SDS Plus II 12/160/210 | 531804 | 12 | 160 | 210 | Plastic clip | 1 | 1 |
| SDS Plus II 12/210/260 | 531805 | 12 | 210 | 260 | Plastic clip | 1 | 1 |
| SDS Plus II 12/260/310 | 531806 | 12 | 260 | 310 | Plastic clip | 1 | 1 |
| SDS Plus II 12/310/360 | 531807 | 12 | 310 | 360 | Plastic clip | 1 | 1 |
| SDS Plus II 12/400/450 | 531808 | 12 | 400 | 450 | Plastic clip | 1 | 1 |
| SDS Plus II 12/550/600 | 531809 | 12 | 550 | 600 | Plastic clip | 1 | 1 |
| SDS Plus II 12/950/1000 | 531810 | 12 | 950 | 1,000 | Plastic clip | 1 | 1 |
| SDS Plus II 13/100/160 | 531811 | 13 | 100 | 160 | Plastic clip | 1 | 1 |
| SDS Plus II 13/160/210 | 531812 | 13 | 160 | 210 | Plastic clip | 1 | 1 |
| SDS Plus II 13/210/260 | 531813 | 13 | 210 | 260 | Plastic clip | 1 | 1 |
| SDS Plus II 13/260/310 | 531814 | 13 | 260 | 310 | Plastic clip | 1 | 1 |
| SDS Plus II 14/110/160 | 531815 | 14 | 110 | 160 | Plastic clip | 1 | 1 |
| SDS Plus II 14/160/210 | 531816 | 14 | 160 | 210 | Plastic clip | 1 | 1 |
| SDS Plus II 14/210/260 | 531817 | 14 | 210 | 260 | Plastic clip | 1 | 1 |
| SDS Plus II 14/260/310 | 531818 | 14 | 260 | 310 | Plastic clip | 1 | 1 |
| SDS Plus II 14/400/450 | 531819 | 14 | 400 | 450 | Plastic clip | 1 | 1 |
| SDS Plus II 14/550/600 | 531820 | 14 | 550 | 600 | Plastic clip | 1 | 1 |
| SDS Plus II 14/950/1000 | 531821 | 14 | 950 | 1,000 | Plastic clip | 1 | 1 |
| SDS Plus II 15/110/160 | 531822 | 15 | 110 | 160 | Plastic clip | 1 | 1 |

## Technical data

**Hammer drill bit SDS Plus II Pointer**



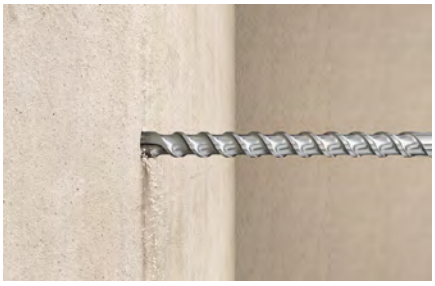
SDS Plus II Pointer

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **SDS Plus II 15/160/210** | **531823** | 15 | 160 | 210 | Plastic clip | 1 | 1 |
| **SDS Plus II 15/210/260** | **531824** | 15 | 210 | 260 | Plastic clip | 1 | 1 |
| **SDS Plus II 16/110/160** | **531826** | 16 | 110 | 160 | Plastic clip | 1 | 1 |
| **SDS Plus II 16/160/210** | **531827** | 16 | 160 | 210 | Plastic clip | 1 | 1 |
| **SDS Plus II 16/210/260** | **531828** | 16 | 210 | 260 | Plastic clip | 1 | 1 |
| **SDS Plus II 16/260/310** | **531829** | 16 | 260 | 310 | Plastic clip | 1 | 1 |
| **SDS Plus II 16/400/450** | **531830** | 16 | 400 | 450 | Plastic clip | 1 | 1 |
| **SDS Plus II 16/550/600** | **531831** | 16 | 550 | 600 | Plastic clip | 1 | 1 |
| **SDS Plus II 16/750/800** | **531832** | 16 | 750 | 800 | Plastic clip | 1 | 1 |
| **SDS Plus II 16/950/1000** | **531833** | 16 | 950 | 1,000 | Plastic clip | 1 | 1 |
| **SDS Plus II 17/160/210** | **531834** | 17 | 160 | 210 | Plastic clip | 1 | 1 |
| **SDS Plus II 17/400/450** | **531835** | 17 | 400 | 450 | Plastic clip | 1 | 1 |
| **SDS Plus II 18/150/200** | **531836** | 18 | 150 | 200 | Plastic clip | 1 | 1 |
| **SDS Plus II 18/250/300** | **531837** | 18 | 250 | 300 | Plastic clip | 1 | 1 |
| **SDS Plus II 18/400/450** | **531838** | 18 | 400 | 450 | Plastic clip | 1 | 1 |
| **SDS Plus II 18/550/600** | **531839** | 18 | 550 | 600 | Plastic clip | 1 | 1 |
| **SDS Plus II 18/950/1000** | **531840** | 18 | 950 | 1,000 | Plastic clip | 1 | 1 |
| **SDS Plus II 19/150/200** | **531841** | 19 | 150 | 200 | Plastic clip | 1 | 1 |
| **SDS Plus II 19/400/450** | **531842** | 19 | 400 | 450 | Plastic clip | 1 | 1 |
| **SDS Plus II 20/150/200** | **531843** | 20 | 150 | 200 | Plastic clip | 1 | 1 |
| **SDS Plus II 20/250/300** | **531844** | 20 | 250 | 300 | Plastic clip | 1 | 1 |
| **SDS Plus II 20/400/450** | **531845** | 20 | 400 | 450 | Plastic clip | 1 | 1 |
| **SDS Plus II 20/550/600** | **531846** | 20 | 550 | 600 | Plastic clip | 1 | 1 |
| **SDS Plus II 20/950/1000** | **531847** | 20 | 950 | 1,000 | Plastic clip | 1 | 1 |
| **SDS Plus II 22/200/250** | **531849** | 22 | 200 | 250 | Plastic clip | 1 | 1 |
| **SDS Plus II 22/400/450** | **531850** | 22 | 400 | 450 | Plastic clip | 1 | 1 |
| **SDS Plus II 22/550/600** | **531851** | 22 | 550 | 600 | Plastic clip | 1 | 1 |
| **SDS Plus II 22/950/1000** | **531852** | 22 | 950 | 1,000 | Plastic clip | 1 | 1 |
| **SDS Plus II 24/200/250** | **531853** | 24 | 200 | 250 | Plastic clip | 1 | 1 |
| **SDS Plus II 24/400/450** | **531854** | 24 | 400 | 450 | Plastic clip | 1 | 1 |
| **SDS Plus II 25/200/250** | **531855** | 25 | 200 | 250 | Plastic clip | 1 | 1 |
| **SDS Plus II 25/400/450** | **531856** | 25 | 400 | 450 | Plastic clip | 1 | 1 |
| **SDS Plus II 25/550/600** | **531857** | 25 | 550 | 600 | Plastic clip | 1 | 1 |
| **SDS Plus II 26/200/250** | **531858** | 26 | 200 | 250 | Plastic clip | 1 | 1 |
| **SDS Plus II 26/400/450** | **531859** | 26 | 400 | 450 | Plastic clip | 1 | 1 |
| **SDS Plus II 6/50/110 XP10** | **531860** | 6 | 50 | 110 | X-Pack | 10 | 1 |
| **SDS Plus II 6/100/160 XP10** | **531861** | 6 | 100 | 160 | X-Pack | 10 | 1 |
| **SDS Plus II 8/100/160 XP10** | **531862** | 8 | 100 | 160 | X-Pack | 10 | 1 |
| **SDS Plus II 10/100/160 XP10** | **531864** | 10 | 100 | 160 | X-Pack | 10 | 1 |
| **SDS Plus II 10/150/210 XP10** | **531865** | 10 | 150 | 210 | X-Pack | 10 | 1 |
| **SDS Plus II 12/110/160 XP10** | **531868** | 12 | 110 | 160 | X-Pack | 10 | 1 |
| **SDS Plus II 12/160/210 XP10** | **531869** | 12 | 160 | 210 | X-Pack | 10 | 1 |
| **SDS Plus II 12/210/260 XP10** | **531870** | 12 | 210 | 260 | X-Pack | 10 | 1 |

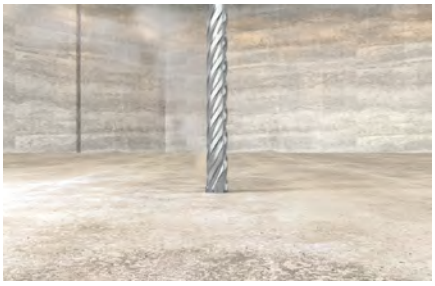
# Hammer drill bit SDS Max IV S/ SDS Max IV

The hammer drill bit with SDS Max shank.





Drilling in concrete wall



Drilling in floor plate



## Applications

**To create approval-compliant drill holes in:**

- Reinforced concrete
- Concrete
- Solid brick
- Sand-lime brick

**Also suitable for:**

- Natural stone

## Advantages

- Robust solid carbide head (up to ø 20mm) with four cutting edges for a long service life.
- Centering tip for a simple and accurate spot drilling, prevents running on smooth surfaces.
- Robust main cutting edges in combination with improved break-up performance due to the head geometry enable fast drilling progress.
- Special spiral geometry combines quick drilling progress and increased service life.
- PGM certification for a secure application of the fixing.

## Certificates / Features

PGM

SDS Max

## Functioning

- Hammer drill bit with SDS Max shank for drilling deep holes with professional hammer drills.

## Technical data

**Hammer drill bit SDS Max IV**



SDS Max IV S and IV

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| SDS Max IV 12/200/340 S | 572301 | 12 | 200 | 340 | Tube | 1 | 1 |
| SDS Max IV 12/400/540 S | 572302 | 12 | 400 | 540 | Tube | 1 | 1 |
| SDS Max IV 14/200/340 S | 572303 | 14 | 200 | 340 | Tube | 1 | 1 |
| SDS Max IV 14/400/540 S | 572304 | 14 | 400 | 540 | Tube | 1 | 1 |
| SDS Max IV 16/200/340 S | 572305 | 16 | 200 | 340 | Tube | 1 | 1 |
| SDS Max IV 16/400/540 S | 572306 | 16 | 400 | 540 | Tube | 1 | 1 |
| SDS Max IV 16/800/940 S | 572307 | 16 | 800 | 940 | Tube | 1 | 1 |
| SDS Max IV 16/1200/1320 | 504206 | 16 | 1,200 | 1,320 | Flexipack | 1 | 1 |
| SDS Max IV 18/200/340 S | 572308 | 18 | 200 | 340 | Tube | 1 | 1 |
| SDS Max IV 18/400/540 S | 572309 | 18 | 400 | 540 | Tube | 1 | 1 |

## Technical data

**Hammer drill bit SDS Max IV**



SDS Max IV S and IV

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **SDS Max IV 18/800/940 S** | **572310** | 18 | 800 | 940 | Tube | 1 | 1 |
| **SDS Max IV 18/1200/1320** | **504213** | 18 | 1,200 | 1,320 | Flexipack | 1 | 1 |
| **SDS Max IV 18/1400/1520** | **540046** | 18 | 1,400 | 1,520 | Flexipack | 1 | 1 |
| **SDS Max IV 18/1880/2000** | **540467** | 18 | 1,880 | 2,000 | Flexipack | 1 | 1 |
| **SDS Max IV 18/2500/2620** | **540470** | 18 | 2,500 | 2,620 | Flexipack | 1 | 1 |
| **SDS Max IV 20/200/320 S** | **572311** | 20 | 200 | 320 | Tube | 1 | 1 |
| **SDS Max IV 20/400/520 S** | **572312** | 20 | 400 | 520 | Tube | 1 | 1 |
| **SDS Max IV 20/800/920 S** | **572313** | 20 | 800 | 920 | Tube | 1 | 1 |
| **SDS Max IV 20/1200/1320** | **504223** | 20 | 1,200 | 1,320 | Flexipack | 1 | 1 |
| **SDS Max IV 20/1880/2000** | **540471** | 20 | 1,880 | 2,000 | Flexipack | 1 | 1 |
| **SDS Max IV 22/200/320** | **504224** | 22 | 200 | 320 | Plastic tube | 1 | 1 |
| **SDS Max IV 22/400/520** | **504225** | 22 | 400 | 520 | Plastic tube | 1 | 1 |
| **SDS Max IV 22/800/920** | **504226** | 22 | 800 | 920 | Plastic tube | 1 | 1 |
| **SDS Max IV 22/1200/1320** | **504227** | 22 | 1,200 | 1,320 | Flexipack | 1 | 1 |
| **SDS Max IV 24/200/320** | **504228** | 24 | 200 | 320 | Plastic tube | 1 | 1 |
| **SDS Max IV 24/400/520** | **504229** | 24 | 400 | 520 | Plastic tube | 1 | 1 |
| **SDS Max IV 25/200/320** | **504235** | 25 | 200 | 320 | Plastic tube | 1 | 1 |
| **SDS Max IV 25/400/520** | **504236** | 25 | 400 | 520 | Plastic tube | 1 | 1 |
| **SDS Max IV 25/800/920** | **504237** | 25 | 800 | 920 | Plastic tube | 1 | 1 |
| **SDS Max IV 25/1200/1320** | **504238** | 25 | 1,200 | 1,320 | Flexipack | 1 | 1 |
| **SDS Max IV 25/2000/2120** | **098287** | 25 | 2,000 | 2,120 | Flexipack | 1 | 1 |
| **SDS Max IV 26/400/520** | **504239** | 26 | 400 | 520 | Plastic tube | 1 | 1 |
| **SDS Max IV 28/250/370** | **504240** | 28 | 250 | 370 | Plastic tube | 1 | 1 |
| **SDS Max IV 28/450/570** | **504241** | 28 | 450 | 570 | Plastic tube | 1 | 1 |
| **SDS Max IV 28/550/670** | **504242** | 28 | 550 | 670 | Plastic tube | 1 | 1 |
| **SDS Max IV 28/800/920** | **504243** | 28 | 800 | 920 | Plastic tube | 1 | 1 |
| **SDS Max IV 30/250/370** | **504245** | 30 | 250 | 370 | Plastic tube | 1 | 1 |
| **SDS Max IV 30/450/570** | **504246** | 30 | 450 | 570 | Plastic tube | 1 | 1 |
| **SDS Max IV 30/800/920** | **057779** | 30 | 800 | 920 | Plastic tube | 1 | 1 |
| **SDS Max IV 32/450/570** | **504248** | 32 | 450 | 570 | Plastic tube | 1 | 1 |
| **SDS Max IV 32/800/920** | **504249** | 32 | 800 | 920 | Plastic tube | 1 | 1 |
| **SDS Max IV 32/1200/1320** | **504250** | 32 | 1,200 | 1,320 | Flexipack | 1 | 1 |
| **SDS Max IV 35/250/370** | **504251** | 35 | 250 | 370 | Plastic tube | 1 | 1 |
| **SDS Max IV 35/450/570** | **504256** | 35 | 450 | 570 | Plastic tube | 1 | 1 |
| **SDS Max IV 35/550/670** | **504257** | 35 | 550 | 670 | Plastic tube | 1 | 1 |
| **SDS Max IV 35/800/920** | **504258** | 35 | 800 | 920 | Plastic tube | 1 | 1 |
| **SDS Max IV 35/1200/1320** | **504259** | 35 | 1,200 | 1,320 | Flexipack | 1 | 1 |
| **SDS Max IV 35/1620/1740** | **040191** | 35 | 1,620 | 1,740 | Flexipack | 1 | 1 |
| **SDS Max IV 37/800/920** | **504266** | 37 | 800 | 920 | Plastic tube | 1 | 1 |
| **SDS Max IV 38/450/570** | **504268** | 38 | 450 | 570 | Plastic tube | 1 | 1 |
| **SDS Max IV 40/250/370** | **504269** | 40 | 250 | 370 | Plastic tube | 1 | 1 |
| **SDS Max IV 40/450/570** | **504270** | 40 | 450 | 570 | Plastic tube | 1 | 1 |
| **SDS Max IV 40/800/920** | **504271** | 40 | 800 | 920 | Plastic tube | 1 | 1 |
| **SDS Max IV 40/1200/1320** | **504272** | 40 | 1,200 | 1,320 | Flexipack | 1 | 1 |
| **SDS Max IV 45/450/570** | **504274** | 45 | 450 | 570 | Plastic tube | 1 | 1 |
| **SDS Max IV 45/800/920** | **504275** | 45 | 800 | 920 | Plastic tube | 1 | 1 |
| **SDS Max IV 52/450/570** | **504276** | 52 | 450 | 570 | Plastic tube | 1 | 1 |

# Hollow drill bit FHD

Hollow drill bit for drilling with low dust as well as for efficient and approved anchoring.





Hollow drilling in concrete



Cross section hollow drill bit

## Applications

**To create approval-compliant drill holes in:**
- Reinforced concrete
- Concrete

**Also suitable for:**
- Solid brick
- Solid-lime brick
- Natural stone

## Advantages

- Drilling and drill hole cleaning in one single step saves conventional cleaning of chemical and mechanical anchoring (with corresponding ETA approval).
- Time savings of 55% for the complete drill hole creation process.
- Reducing the drill dust prevents jamming when drilling which provides a faster and frictionless drilling progress.
- Immediate extraction of the drill dust for a clean and healthy working environment.
- Centering tip for a simple and accurate spot drilling, prevents running on smooth surfaces.

## Certificates / Features

SDS Plus

SDS Max

PGM®

## Functioning

- Direct drill dust suction at the drill bit head due to vacuum drill system and the hollow cylindrical shaft.
- To be used in combination with a vacuum cleaner of the dust class M.
- To be used with common SDS drills.

## Technical data

**Hollow drill bit FHD**



FHD

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FHD 8/100/230** | **559942** | 8 | 100 | 230 | Plastic clip | 1 | 1 |
| **FHD 10/100/230** | **559943** | 10 | 100 | 230 | Plastic clip | 1 | 1 |
| **FHD 12/200/330** | **546597** | 12 | 200 | 330 | Plastic clip | 1 | 1 |
| **FHD 14/250/380** | **546598** | 14 | 250 | 380 | Plastic clip | 1 | 1 |
| **FHD 16/250/380** | **546599** | 16 | 250 | 380 | Plastic clip | 1 | 1 |
| **FHD 18/320/450** | **546600** | 18 | 320 | 450 | Plastic clip | 1 | 1 |
| **FHD Max 16/400/620** | **546601** | 16 | 400 | 620 | Plastic clip | 1 | 1 |
| **FHD Max 18/400/620** | **546602** | 18 | 400 | 620 | Plastic clip | 1 | 1 |
| **FHD Max 20/400/620** | **546603** | 20 | 400 | 620 | Plastic clip | 1 | 1 |
| **FHD Max 24/400/620** | **546604** | 24 | 400 | 620 | Plastic clip | 1 | 1 |
| **FHD Max 28/600/820** | **546605** | 28 | 600 | 820 | Plastic clip | 1 | 1 |
| **FHD Max 30/600/820** | **546606** | 30 | 600 | 820 | Plastic clip | 1 | 1 |
| **FHD Max 35/650/870** | **546607** | 35 | 650 | 870 | Plastic clip | 1 | 1 |

# Masonry drill bit Pointer U

The specialist for masonry with SDS Plus shank.





Drilling in perforated brick



Drilling in material combinations

## Applications

- Particularly suitable for drilling into vertically perforated brick without cracking
- Ideal for drilling in material combinations

## Advantages

- Robust and diamond sharpened carbide tip ensures precise and fast drilling progress in different materials.
- The shortened SDS Plus shank reduces the impact force on the drill bit and thus avoids fractures in building material webs for best load-bearing capacity in all types of vertically perforated bricks.
- A large-volume drill flute guarantees fast removal of the drill dust.
- Universal use in different materials saves time and costs.
- PGM certification guarantees precise hold of fixings in the drill hole.

## Certificates / Features

PGM

SDS Plus Short

## Building materials

**To create drill holes in:**

- Concrete
- Hollow bricks
- Aerated concrete
- Perforated sand-lime bricks
- Tiles
- Wood
- Metal sheets

**Ideal for the following anchoring of:**

- Frame or ETICS fixings, e.g. SXRL, FIS HK, fischer TherMax as well as VBS-M

## Functioning

- Shortened SDS Plus shank reduces the impact force of the machine on the drill bit and prevents damage to the substrate.
- Drilling without impact is recommended.

## Versions

- Shortened SDS Plus shank

## Technical data

**Masonry drill bit Pointer U**



Pointer U

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **Pointer U 6/200/260** | **568179** | 6 | 200 | 260 | Plastic clip | 1 | 1 |
| **Pointer U 8/50/110** | **568180** | 8 | 50 | 110 | Plastic clip | 1 | 1 |
| **Pointer U 8/100/160** | **568181** | 8 | 100 | 160 | Plastic clip | 1 | 1 |
| **Pointer U 8/150/210** | **568182** | 8 | 150 | 210 | Plastic clip | 1 | 1 |
| **Pointer U 8/200/260** | **568183** | 8 | 200 | 260 | Plastic clip | 1 | 1 |
| **Pointer U 8/400/450** | **568184** | 8 | 400 | 450 | Plastic clip | 1 | 1 |
| **Pointer U 10/100/160** | **568185** | 10 | 100 | 160 | Plastic clip | 1 | 1 |
| **Pointer U 10/150/210** | **568186** | 10 | 150 | 210 | Plastic clip | 1 | 1 |
| **Pointer U 10/200/260** | **568187** | 10 | 200 | 260 | Plastic clip | 1 | 1 |
| **Pointer U 12/100/160** | **568188** | 12 | 100 | 160 | Plastic clip | 1 | 1 |
| **Pointer U 12/150/210** | **568189** | 12 | 150 | 210 | Plastic clip | 1 | 1 |
| **Pointer U 12/200/260** | **568190** | 12 | 200 | 260 | Plastic clip | 1 | 1 |
| **Pointer U 14/200/260** | **568191** | 14 | 200 | 260 | Plastic clip | 1 | 1 |
| **Pointer U 16/200/260** | **568192** | 16 | 200 | 260 | Plastic clip | 1 | 1 |
| **Pointer U 16/400/450** | **568193** | 16 | 400 | 450 | Plastic clip | 1 | 1 |
| **Pointer U 18/400/450** | **568194** | 18 | 400 | 450 | Plastic clip | 1 | 1 |
| **Pointer U 20/400/450** | **568195** | 20 | 400 | 450 | Plastic clip | 1 | 1 |

# Stone drill bit D-SDX

Powerful masonry drill bit with 4 cutting edges.





Drilling in masonry

## Applications

**For drilling in:**
- Masonry
- Hollow brick
- Sand-lime brick
- Gypsum plasterboard
- Aerated concrete

## Advantages

- Four carbide cutting edges ensure a higher breakup performance.
- Extremely heat-resistant carbide cutting edge ensures a long service life.
- Special spiral geometry for optimum dust removal.
- Centering tip for a simple and accurate spot drilling, prevents running on smooth surfaces.

## Certificates / Features

HM

## Functioning

- Especially suitable for the use with cordless impact drills.

## Technical data

**Stone drill bit D-SDX**



D-SDX

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| D-SDX 5,0 x 50/85 BC | 545049 | 5 | 50 | 85 | Blister card | 1 | 1 |
| D-SDX 6,0 x 60/100 BC | 545051 | 6 | 60 | 100 | Blister card | 1 | 1 |
| D-SDX 8,0 x 80/120 BC | 545052 | 8 | 80 | 120 | Blister card | 1 | 1 |
| D-SDX 10,0 x 80/120 BC | 545053 | 10 | 80 | 120 | Blister card | 1 | 1 |
| D-SDX 12,0 x 90/150 BC | 545054 | 12 | 90 | 150 | Blister card | 1 | 1 |
| D-SDX 5,0 x 50/85 PE | 545141 | 5 | 50 | 85 | Pouch | 1 | 1 |
| D-SDX 6,0 x 60/100 PE | 545144 | 6 | 60 | 100 | Pouch | 1 | 1 |
| D-SDX 8,0 x 80/120 PE | 545145 | 8 | 80 | 120 | Pouch | 1 | 1 |
| D-SDX 10,0 x 70/120 PE | 545146 | 10 | 80 | 120 | Pouch | 1 | 1 |
| D-SDX 12,0 x 90/150 PE | 545148 | 12 | 90 | 150 | Pouch | 1 | 1 |

## Technical data

**Stone drill bit D-SDX**



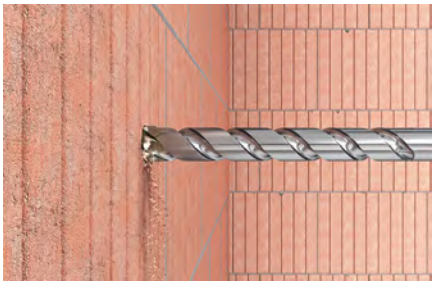
D-SDX Set

| | Item no. | Packaging | Contents | Sales unit [pcs] |
|---|---|---|---|---|
| **Item** | | | | |
| **D-SDX Set 5-12 mm** | **545507** | Assortment box | 5 pcs: 5/50/85, 6/60/100, 8/80/120, 10/80/120, 12/90/150 | 1 |

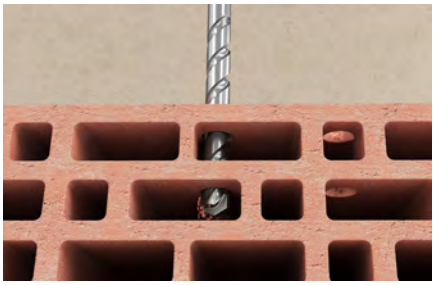
# Stone drill bit D-S

Universal masonry drill bit for impact and rotary drilling in masonry and natural stone.





Drilling in hollow brick



Cross section of hollow brick drilling

## Applications

**For drilling in:**
- Stone
- Sand-lime brick
- Masonry
- Natural stone
- Gypsum plasterboard
- Aerated concrete

## Advantages

- Extremely heat-resistant carbide cutting edge ensures a long service life.
- High quality steel with a high breaking resistance.
- Special spiral geometry for optimum dust removal.

## Certificates / Features

HM

## Functioning

- Suitable for rotary and impact drilling.

## Technical data

**Stone drill bit D-S**



D-S HM

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| D-S HM 4.0 x 38/75 PE | 542977 | 4 | 38 | 75 | Pouch | 1 | 1 |
| D-S HM 5.0 x 44/85 PE | 542978 | 5 | 44 | 85 | Pouch | 1 | 1 |
| D-S HM 6.0 x 54/100 PE | 542979 | 6 | 54 | 100 | Pouch | 1 | 1 |
| D-S HM 7.0 x 54/100 PE | 542980 | 7 | 54 | 100 | Pouch | 1 | 1 |
| D-S HM 8.0 x 67/120 PE | 542981 | 8 | 67 | 120 | Pouch | 1 | 1 |
| D-S HM 8.0 x 135/200 PE | 542991 | 8 | 135 | 200 | Pouch | 1 | 1 |
| D-S HM 10.0 x 67/120 PE | 542982 | 10 | 67 | 120 | Pouch | 1 | 1 |
| D-S HM 10.0 x 135/200 PE | 542992 | 10 | 135 | 200 | Pouch | 1 | 1 |
| D-S HM 12.0 x 85/150 PE | 542983 | 12 | 85 | 150 | Pouch | 1 | 1 |
| D-S HM 12.0 x 135/200 PE | 542993 | 12 | 135 | 200 | Pouch | 1 | 1 |
| D-S HM 14.0 x 85/150 PE | 542985 | 14 | 85 | 150 | Pouch | 1 | 1 |
| D-S HM 16.0 x 85/150 PE | 542987 | 16 | 85 | 150 | Pouch | 1 | 1 |
| D-S HM 18.0 x 100/160 PE | 542988 | 18 | 100 | 160 | Pouch | 1 | 1 |

## Technical data

**Stone drill bit D-S**



D-S HM

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **D-S HM 20.0 x 100/160 PE** | **542989** | 20 | 100 | 160 | Pouch | 1 | 1 |
| **D-S HM 6.0 x 135/200** | **551390** | 6 | 135 | 200 | Pouch | 1 | 1 |

## Technical data

**Stone drill bit D-S**



D-S Set 4-10 mm



D-S Set 3 - 10 mm

| Item | Item no. | Packaging | Contents | Sales unit [pcs] |
|---|---|---|---|---|
| **D-S Set 3-10 mm** | **543027** | Assortment box | 8 pcs: 3/30/60, 4/38/75, 5/44/85, 6/54/100, 7/54/100, 8/67/120, 9/67/120, 10/67/120 | 1 |
| **D-S Set 4-10 mm** | **543025** | Assortment box | 5 pcs: 4/38/75, 5/44/85, 6/54/100, 8/67/120, 10/67/120 | 1 |

# Metal drill bit D-HSS-Co

Precision ground metal twist drill bit.





Drilling in metal

## Applications

**For drilling in tough and hard metals:**

- Steel up to 1000 N/mm² alloyed and unalloyed
- Stainless steel
- Heat-treatable and case-hardened steel
- Rolling bearing steel
- Non-ferrous heavy metal

## Advantages

- Special steel in combination with the production according to DIN 338, provides a high breaking resistance.
- Cobalt alloy makes the drill bit highly heat-resistant and suitable for tough and hard materials.
- Split point for optimum centering and reduced feed force effort.
- 135° tip angle for quick drilling progress.
- Type N spiral for optimum chip removal.

## Certificates / Features

135°

DIN

Inox Stainless Steel

## Technical data

**Metal drill bit D-HSS-Co Pouch**



D-HSS-Co

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| HSS-Co DIN338 2.0 x 24/49 PE (2) | 536552 | 2.0 | 24 | 49 | Pouch | 2 | 1 |
| HSS-Co DIN338 3.0 x 33/61 PE | 536553 | 3.0 | 33 | 61 | Pouch | 2 | 1 |
| HSS-Co DIN338 4.0 x 43/75 PE | 536554 | 4.0 | 43 | 75 | Pouch | 1 | 1 |
| HSS-Co DIN338 4.5 x 47/80 PE | 536555 | 4.5 | 47 | 80 | Pouch | 1 | 1 |
| HSS-Co DIN338 5.0 x 52/86 PE | 536556 | 5.0 | 52 | 86 | Pouch | 1 | 1 |
| HSS-Co DIN338 5.5 x 57/93 PE | 536557 | 5.5 | 57 | 93 | Pouch | 1 | 1 |
| HSS-Co DIN338 6.0 x 57/93 PE | 536558 | 6.0 | 57 | 93 | Pouch | 1 | 1 |
| HSS-Co DIN338 6.5 x 63/101 PE | 536559 | 6.5 | 63 | 101 | Pouch | 1 | 1 |

## Technical data

**Metal drill bit D-HSS-Co Pouch**



D-HSS-Co

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **HSS-Co DIN338 7.0 x 69/109 PE** | **536560** | 7.0 | 69 | 109 | Pouch | 1 | 1 |
| **HSS-Co DIN338 8.0 x 75/117 PE** | **536561** | 8.0 | 75 | 117 | Pouch | 1 | 1 |
| **HSS-Co DIN338 10.0 x 87/133 PE** | **536562** | 10.0 | 87 | 133 | Pouch | 1 | 1 |

## Technical data

**Metal drill bit D-HSS-Co Set**



HSS-Co Set 1-10 mm



HSS-Co Set 1-13 mm

| Item | Item no. | Packaging | Contents | Sales unit [pcs] |
|---|---|---|---|---|
| **HSS-Co Set 1-10 mm (19)** | **543329** | Assortment box | 19 pcs: 1/12/34, 1,5/18/40, 2/24/49, 2,5/30/57, 3/33/61, 3,5/39/70, 4/43/75, 4,5/47/80, 5/52/86, 5,5/57/93, 6/57/93, 6,5/63/101, 7/69/109, 7,5/69/109, 8/75/117, 8,5/75/117, 9/81/125, 9,5/81/125, 10/87/133 | 1 |
| **HSS-Co Set 1-13 mm (25)** | **543330** | Assortment box | 25 pcs: 1/12/34, 1,5/18/40, 2/24/49, 2,5/30/57, 3/33/61, 3,5/39/70, 4/43/75, 4,5/47/80, 5/52/86, 5,5/57/93, 6/57/93, 6,5/63/101, 7/69/109, 7,5/69/109, 8/75/117, 8,5/75/117, 9/81/125, 9,5/81/125, 10/87/133, 10,5/87/133, 11/94/142, 11,5/94/142, 12/101/151, 12,5/101/151, 13/101/151 | 1 |

# Metal drill bit D-HSS-G

High-quality metal twist drill bit.





Drilling in metal

## Applications

**For drilling in steel and other metals:**

- Brass
- Steel 900 N/mm²
- Cast steel alloyed and unalloyed
- Grey cast iron
- Malleable cast iron
- Sinter iron
- Spheroidal graphite iron
- Graphite
- Bronze
- Aluminium short chipping
- Hard plastics

## Advantages

- Robust HSS steel in combination with the production according to DIN 338, provides a high breaking resistance.
- Precision ground solid for long service life and high precision.
- Split point for optimum centering and reduced feed force effort.
- 135° tip angle for quick drilling progress.
- Type N spiral for optimum chip removal.

## Certificates / Features

135°

DIN

## Technical data

**Metal drill bit D-HSS-G Pouch**



D-HSS-G

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| HSS-G DIN338 1.0 x 12/34 (5) | 536516 | 1.0 | 12 | 34 | Pouch | 5 | 1 |
| HSS-G DIN338 1.5 x 18/40 (5) | 536517 | 1.5 | 18 | 40 | Pouch | 5 | 1 |
| HSS-G DIN338 2.0 x 24/49 (2) | 536518 | 2.0 | 24 | 49 | Pouch | 2 | 1 |
| HSS-G DIN338 2.5 x 30/57 (2) | 536519 | 2.5 | 30 | 57 | Pouch | 2 | 1 |
| HSS-G DIN338 3.0 x 33/61 (2) | 536524 | 3.0 | 33 | 61 | Pouch | 2 | 1 |
| HSS-G DIN338 3.2 x 36/65 (2) | 536529 | 3.2 | 36 | 65 | Pouch | 2 | 1 |
| HSS-G DIN338 3.5 x 39/70 (2) | 536531 | 3.5 | 39 | 70 | Pouch | 2 | 1 |

## Technical data

**Metal drill bit D-HSS-G Pouch**



D-HSS-G

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **HSS-G DIN338 4.0 x 43/75 (2)** | **536532** | 4.0 | 43 | 75 | Pouch | 2 | 1 |
| **HSS-G DIN338 4.2 x 43/75** | **536533** | 4.2 | 43 | 75 | Pouch | 1 | 1 |
| **HSS-G DIN338 4.5 x 47/80** | **536534** | 4.5 | 47 | 80 | Pouch | 1 | 1 |
| **HSS-G DIN338 5.0 x 52/86** | **536535** | 5.0 | 52 | 86 | Pouch | 1 | 1 |
| **HSS-G DIN338 5.5 x 57/93** | **536536** | 5.5 | 57 | 93 | Pouch | 1 | 1 |
| **HSS-G DIN338 6.0 x 57/93** | **536537** | 6.0 | 57 | 93 | Pouch | 1 | 1 |
| **HSS-G DIN338 6.5 x 63/101** | **536538** | 6.5 | 63 | 101 | Pouch | 1 | 1 |
| **HSS-G DIN338 7.0 x 69/109** | **536539** | 7.0 | 69 | 109 | Pouch | 1 | 1 |
| **HSS-G DIN338 7.5 x 69/109** | **536540** | 7.5 | 69 | 109 | Pouch | 1 | 1 |
| **HSS-G DIN338 8.0 x 75/117** | **536541** | 8.0 | 75 | 117 | Pouch | 1 | 1 |
| **HSS-G DIN338 8.5 x 75/117** | **536542** | 8.5 | 75 | 117 | Pouch | 1 | 1 |
| **HSS-G DIN338 9.0 x 81/125** | **536543** | 9.0 | 81 | 125 | Pouch | 1 | 1 |
| **HSS-G DIN338 9.5 x 81/125** | **536544** | 9.5 | 81 | 125 | Pouch | 1 | 1 |
| **HSS-G DIN338 10.0 x 87/133** | **536545** | 10.0 | 87 | 133 | Pouch | 1 | 1 |
| **HSS-G DIN338 10.5 x 87/133** | **536546** | 10.5 | 87 | 133 | Pouch | 1 | 1 |
| **HSS-G DIN338 11.0 x 94/142** | **536547** | 11.0 | 94 | 142 | Pouch | 1 | 1 |
| **HSS-G DIN338 11.5 x 94/142** | **536548** | 11.5 | 94 | 142 | Pouch | 1 | 1 |
| **HSS-G DIN338 12.0 x 101/151** | **536549** | 12.0 | 101 | 151 | Pouch | 1 | 1 |
| **HSS-G DIN338 12.5 x 101/151** | **536550** | 12.5 | 101 | 151 | Pouch | 1 | 1 |
| **HSS-G DIN338 13.0 x 101/151** | **536551** | 13.0 | 101 | 151 | Pouch | 1 | 1 |

## Technical data

**Metal drill bit D-HSS-G Set**



HSS-G Set 2-8 mm



HSS-G Set 1-10 mm



HSS-G Set 1-10 mm



HSS-G Set 1-13 mm

| Item | Item no. | Packaging | Contents | Sales unit [pcs] |
|---|---|---|---|---|
| **HSS-G Set 2-8 mm** | **536602** | Assortment box | 6 pcs: 2/24/49, 3/33/61, 5/52/88, 6/57/93, 7/69/109, 8/75/117 | 1 |
| **HSS-G Set 1-10 mm** | **536603** | Assortment box | 10 pcs: 1/12/34, 2/24/49, 3/33/61, 4/43/75, 5/52/88, 6/57/93, 7/69/109, 8/75/117, 9/81/125, 10/87/133 | 1 |
| **HSS-G Set 1-10 mm** | **536604** | Assortment box | 19 pcs: 1/12/34, 1,5/18/40, 2/24/49, 2,5/30/57, 3/33/61, 3,5/39/70, 4/43/75, 4,5/47/80, 5/52/88, 5,5/57/93, 6/57/93, 6,5/63/101, 7/69/109, 7,5/69/109, 8/75/117, 8,5/75/117, 9/81/125, 9,5/81/125, 10/87/133 | 1 |
| **HSS-G Set 1-13 mm** | **536605** | Assortment box | 25 pcs: 1/12/34, 1,5/18/40, 2/24/49, 2,5/30/57, 3/33/61, 3,5/39/70, 4/43/75, 4,5/47/80, 5/52/88, 5,5/57/93, 6/57/93, 6,5/63/101, 7/69/109, 7,5/69/109, 8/75/117, 8,5/75/117, 9/81/125, 9,5/81/125, 10/87/133, 10,5/87/133, 11/94/142, 11,5/94/142, 12/101/151, 12,5/101/151, 13/101/151 | 1 |

# Metal drill bit D-HSS-R

High-performance metal twist drill bit.





Drilling in metal

## Applications

**For drilling in steel and other metals:**

- Brass
- Steel 900 N/mm²
- Cast steel alloyed and unalloyed
- Grey cast iron
- Malleable cast iron
- Sinter iron
- Spheroidal graphite iron
- Graphite
- Bronze
- Aluminium short chipping

## Advantages

- Robust HSS steel in combination with the production according to DIN 338, provides a high breaking resistance.
- Chisel edge with strong side edges, insensitive to lateral forces.
- 118° tip angle for better heat removal and precise pilot drilling.
- Type N spiral for optimum chip removal.

## Certificates / Features

135°

DIN

Inox Stainless Steel

## Technical data

**Metal drill bit D-HSS-R Pouch**



D-HSS-R

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| HSS-R DIN338 1.0 x 12/34 NV (2) | 544414 | 1.0 | 12 | 34 | Pouch | 2 | 1 |
| HSS-R DIN338 1.5 x 18/40 NV (2) | 544415 | 1.5 | 18 | 40 | Pouch | 2 | 1 |
| HSS-R DIN338 2.0 x 24/49 NV (2) | 544416 | 2.0 | 24 | 49 | Pouch | 2 | 1 |
| HSS-R DIN338 2.5 x 30/57 NV (2) | 544417 | 2.5 | 30 | 57 | Pouch | 2 | 1 |

## Technical data

**Metal drill bit D-HSS-R Pouch**



D-HSS-R

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| HSS-R DIN338 3.0 x 33/61 NV (2) | 544418 | 3.0 | 33 | 61 | Pouch | 2 | 1 |
| HSS-R DIN338 3,2/36/65 | 544419 | 3.2 | 36 | 65 | Pouch | 2 | 1 |
| HSS-R DIN338 3.5 x 39/70 NV (2) | 544420 | 3.5 | 39 | 70 | Pouch | 2 | 1 |
| HSS-R DIN338 4.0 x 43/75 NV (2) | 544421 | 4.0 | 43 | 75 | Pouch | 2 | 1 |
| HSS-R DIN338 4,2/43/75 | 544422 | 4.2 | 43 | 75 | Pouch | 1 | 1 |
| HSS-R DIN338 4,5/47/80 | 544423 | 4.5 | 47 | 80 | Pouch | 1 | 1 |
| HSS-R DIN338 4,8/47/80 | 544424 | 4.8 | 47 | 80 | Pouch | 1 | 1 |
| HSS-R DIN338 5.0 x 52/86 NV | 544425 | 5.0 | 52 | 86 | Pouch | 1 | 1 |
| HSS-R DIN338 5,5/57/93 | 544426 | 5.5 | 57 | 93 | Pouch | 1 | 1 |
| HSS-R DIN338 6.0 x 57/93 NV | 544427 | 6.0 | 57 | 93 | Pouch | 1 | 1 |
| HSS-R DIN338 6.5 x 63/101 NV | 544428 | 6.5 | 63 | 101 | Pouch | 1 | 1 |
| HSS-R DIN338 7/69/109 | 544429 | 7.0 | 69 | 109 | Pouch | 1 | 1 |
| HSS-R DIN338 7,5/69/109 | 544430 | 7.5 | 69 | 109 | Pouch | 1 | 1 |
| HSS-R DIN338 8.0 x 75/117 NV | 544431 | 8.0 | 75 | 117 | Pouch | 1 | 1 |
| HSS-R DIN338 8.5 x 75/117 NV | 544432 | 8.5 | 75 | 117 | Pouch | 1 | 1 |
| HSS-R DIN338 9/81/125 | 544433 | 9.0 | 81 | 125 | Pouch | 1 | 1 |
| HSS-R DIN338 9,5/81/125 | 544434 | 9.5 | 81 | 125 | Pouch | 1 | 1 |
| HSS-R DIN338 10.0 x 87/133 NV | 544435 | 10.0 | 87 | 133 | Pouch | 1 | 1 |
| HSS-R DIN338 10,5/87/133 | 544436 | 10.5 | 87 | 133 | Pouch | 1 | 1 |
| HSS-R DIN338 11/94/142 | 544437 | 11.0 | 94 | 142 | Pouch | 1 | 1 |
| HSS-R DIN338 11,5/94/142 | 544438 | 11.5 | 94 | 142 | Pouch | 1 | 1 |
| HSS-R DIN338 12.0 x 101/151 NV | 544440 | 12.0 | 101 | 151 | Pouch | 1 | 1 |
| HSS-R DIN338 12,5/101/151 | 544441 | 12.5 | 101 | 151 | Pouch | 1 | 1 |
| HSS-R DIN338 13/101/151 | 544442 | 13.0 | 101 | 151 | Pouch | 1 | 1 |



## Technical data

**Metal drill bit D-HSS-R Set**



HSS-R Set 1-10 mm



HSS-R Set 1-13 mm

| Item | Item no. | Packaging | Contents | Sales unit [pcs] |
|---|---|---|---|---|
| HSS-R Set 1-10 mm (19) | 543327 | Assortment box | 19 pcs: 1/12/34, 1,5/18/40, 2/24/49, 2,5/30/57, 3/33/61, 3,5/39/70, 4/43/75, 4,5/47/80, 5/52/86, 5,5/57/93, 6/57/93, 6,5/63/101, 7/69/109, 7,5/69/109, 8/75/117, 8,5/75/117, 9/81/125, 9,5/81/125, 10/87/133 | 1 |
| HSS-R Set 1-13 mm (25) | 543328 | Assortment box | 25 pcs: 1/12/34, 1,5/18/40, 2/24/49, 2,5/30/57, 3/33/61, 3,5/39/70, 4/43/75, 4,5/47/80, 5/52/86, 5,5/57/93, 6/57/93, 6,5/63/101, 7/69/109, 7,5/69/109, 8/75/117, 8,5/75/117, 9/81/125, 9,5/81/125, 10/87/133, 10,5/87/133, 11/94/142, 11,5/94/142, 12/101/151, 12,5/101/151, 13/101/151 | 1 |

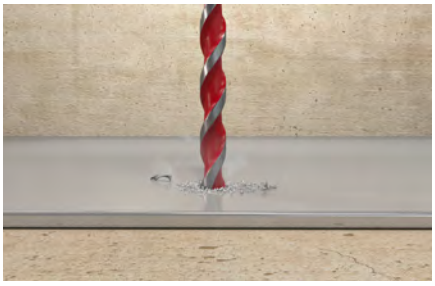
# Universal drill bit D-U Hex

Universal drill bit with long lifetime in all materials.





Drilling the material combination of wood and masonry



Drilling the material combination of metal and concrete

## Applications

Ideal for drilling in different materials as well as material combinations.

**For rotary drilling in:**

- Solid brick
- Hollow brick
- Wood
- Tiles
- Plastics
- Aluminium
- Steel

**For impact drilling in:**

- Concrete
- Sand-lime brick

## Advantages

- Carbide tip with diamond-ground cutting edges ideally suited for drilling in material combinations.
- Wear-resistant tip is particularly suitable for drilling into harder materials, such as concrete.
- Universal use in different materials with only one drill bit saves time and costs.
- Special spiral geometry for optimum dust removal and long service life.
- Hexagonal shank enables high power transmission for rotary and impact drilling and is particularly suited for the use with cordless impact wrenches.
- PGM certification is guaranteed a precise hole creation for a secure application of the fixing.

## Certificates / Features

HM

PGM®

## Functioning

- For rotary and impact drilling.

## Technical data

**Universal drill bit D-U Hex**



D-U Hex

| Item | Item no. | Drill diameter $d_0$ [mm] | Working length [mm] | Total length l [mm] | Packaging | Contents [pcs.] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **D-U Hex 3.0 x 45/90** | **561640** | 3 | 45 | 90 | Blister card | 1 | 1 |
| **D-U Hex 4.0 x 45/90** | **561641** | 4 | 45 | 90 | Blister card | 1 | 1 |
| **D-U Hex 5.0 x 50/100** | **561642** | 5 | 50 | 100 | Blister card | 1 | 1 |
| **D-U Hex 6.0 x 60/100** | **561643** | 6 | 60 | 100 | Blister card | 1 | 1 |
| **D-U Hex 6.5 x 60/100** | **561644** | 6.5 | 60 | 100 | Blister card | 1 | 1 |
| **D-U Hex 7.0 x 60/100** | **561645** | 7 | 60 | 100 | Blister card | 1 | 1 |
| **D-U Hex 8.0 x 50/100** | **561646** | 8 | 50 | 100 | Blister card | 1 | 1 |
| **D-U Hex 10.0 x 90/150** | **561647** | 10 | 90 | 150 | Blister card | 1 | 1 |
| **D-U Hex 12.0 x 90/150** | **561648** | 12 | 90 | 150 | Blister card | 1 | 1 |

## Technical data

**Universal drill bit D-U Hex Set**



D-U Hex-Set

| Item | Item no. | Packaging | Contents | Sales unit [pcs] |
|---|---|---|---|---|
| **D-U Hex Set 5-12 mm** | **561649** | Assortment box | 5 pcs: 5/50/100, 6/60/100, 8/50/100, 10/90/150, 12/90/150 | 1 |

# Premium chisel FCP

Premium Chisel with SDS Plus and SDS Max shank for maximum performance and lifetime.





Chiseling in concrete wall

## Applications

**Suitable for creating holes, slots and installation paths as well as break-throughs in:**

- Concrete
- Masonry
- Natural stone

## Advantages

- Extended working tip in comparison to the standard chisel for an increased lifetime.
- Self-sharpening design for economical working and reducing downtime.
- Advanced 'jam protection' for reduced friction.
- Specially designed working tip increases the performance and ensures a high removal of material.

## Certificates / Features

SDS Plus

SDS Max

## Functioning

Chisel for use in hammer drills with SDS Plus or SDS Max holder.

## Technical data

**Premium chisel FCP**



FCP Pointed | FCP Flat | FCP Spade | FCP Max Pointed | FCP Max Flat | FCP Max Spade

| Item | Item no. | Type | Length l [mm] | Width B [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|
| **FCP Pointed 250** | **546314** | Pointed | 250 | – | 1 |
| **FCP Flat 20/250** | **546315** | Flat | 250 | 20 | 1 |
| **FCP Spade 40/250** | **546316** | Spade | 250 | 40 | 1 |
| **FCP Max Pointed 400** | **546317** | Pointed | 400 | – | 1 |
| **FCP Max Flat 25/400** | **546318** | Flat | 400 | 25 | 1 |
| **FCP Max Spade 50/380** | **546319** | Spade | 380 | 50 | 1 |

# Standard chisel

High-performance Standard chisel with SDS Plus and SDS Max drill chuck.





Chiseling in concrete wall

## Applications

Suitable for creating holes, slots and installation paths in:
- Concrete
- Masonry
- Natural stone

## Advantages

- The SDS Plus and SDS Max drill chuck for the chisel enable the use with professional hammer drilling machines and ensure proven and safe transfer of force.
- The use of a high quality, specially hardened steel with surface protection increases the life span of the tools.
- The high oscillation endurance allows for high work comfort and contributes to the achievement of clean results.



## Certificates / Features

SDS Plus

SDS Max

## Functioning

- Chisel for use in hammer drills with SDS Plus or SDS Max holder.

## Technical data

**Standard chisel**



SDS Max Pointed | SDS Max Flat | SDS Max Spade | SDS Plus Hollow | SDS Max Tiles

| Item | Item no. | Type | Length l [mm] | Width B [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|
| **SDS Plus Pointed 250** | **504277** | Pointed | 250 | 12 | 1 |
| **SDS Max Pointed 280** | **504281** | Pointed | 280 | 16 | 1 |
| **SDS Max Pointed 400** | **504282** | Pointed | 400 | 20 | 1 |
| **SDS Max Pointed 600** | **504283** | Pointed | 600 | 27 | 1 |
| **SDS Plus Flat 20/250** | **504278** | Flat | 250 | 20 | 1 |
| **SDS Max Flat 25/280** | **504284** | Flat | 280 | 25 | 1 |
| **SDS Max Flat 25/400** | **504286** | Flat | 400 | 25 | 1 |
| **SDS Max Flat 25/600** | **504287** | Flat | 600 | 25 | 1 |
| **SDS Plus Scaling 40/250** | **504279** | Spade | 250 | 40 | 1 |
| **SDS Max Scaling 50/400** | **504288** | Spade | 400 | 50 | 1 |
| **SDS Max Scaling 80/300** | **504290** | Spade | 300 | 80 | 1 |
| **SDS Max Scaling 115/350** | **504291** | Spade | 350 | 115 | 1 |
| **SDS Plus Hollow 22/250** | **504280** | Hollow | 250 | 22 | 1 |
| **SDS Plus Tile scaling 40/250** | **531437** | Tiles | 250 | 40 | 1 |

## Technical data

**Standard chisel**


SDS Max Pointed


SDS Max Flat


SDS Max Spade


SDS Plus Hollow


SDS Max Tiles

| Item | Item no. | Type | Length l [mm] | Width B [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|
| **SDS Max Tile Scaling 50/400** | **504295** | Tiles | 400 | 50 | 1 |
| **SDS Max Stocker 45/240** | **001253** | Stocker | 240 | 45 | 1 |

# ProfiBit FPB

The all-rounding bit within convincing quality.



## Applications

Number of internal drives in various profile sizes, such as:

- PH, PZ cross-slot
- TX star recess
- Suitable for ¼“ drives

## Advantages

- The bits manufactured from special steel with high hardness degree are suitable for both hand driven and machine guided applications.
- The perfect fitting inside screws ensures working with low-wear of the product and consequently long lifetime and clean working results.
- The profile guarantees an ideal connection for an optimal power and torque transmission that prevents damages of the surface or the screw-heads.
- Also available as clearly arranged BitSets with 10 or 32 pcs including bit holder.



## Technical data

**ProfiBit FPB**



FPB TX | FPB PH | FPB PZ | FPB PH2 Drywall | FPB ProfiBit TX 50 5/16“

| Item | Item no. | Drive | Length l [mm] | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|
| FPB TX10 ProfiBit | 557845 | TX10 | 25 | 10 | 1 |
| FPB TX15 ProfiBit | 557846 | TX15 | 25 | 10 | 1 |
| FPB TX20 ProfiBit | 557847 | TX20 | 25 | 10 | 1 |
| FPB TX25 ProfiBit | 517693 | TX25 | 50 | 5 | 1 |
| FPB TX25 ProfiBit | 557848 | TX25 | 25 | 10 | 1 |
| FPB TX30 ProfiBit | 557849 | TX30 | 25 | 10 | 1 |
| FPB TX40 ProfiBit | 557850 | TX40 | 25 | 10 | 1 |
| FPB TX50 ProfiBit | 557839 | TX50 | 25 | 1 | 1 |
| FPB PH1 ProfiBit | 557851 | PH1 | 25 | 10 | 1 |
| FPB PH2 ProfiBit | 557852 | PH2 | 25 | 10 | 1 |
| FPB PH3 ProfiBit | 557853 | PH3 | 25 | 10 | 1 |
| FPB PZ1 ProfiBit | 557854 | PZ1 | 25 | 10 | 1 |
| FPB PZ2 50 mm ProfiBit | 557842 | PZ2 | 50 | 1 | 1 |

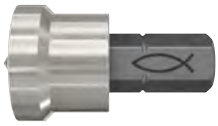
## Technical data

**ProfiBit FPB**


FPB TX


FPB PH


FPB PZ


FPB PH2 Drywall


FPB ProfiBit TX 50 5/16“

| Item | Item no. | Drive | Length l [mm] | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|
| **FPB PZ2 ProfiBit** | **557855** | PZ2 | 25 | 10 | 1 |
| **FPB PZ3 ProfiBit** | **557856** | PZ3 | 25 | 10 | 1 |
| **FPB PZ4 ProfiBit** | **557843** | PZ4 | 38 | 1 | 1 |
| **FPB PH2 ProfiBit Drywall** | **557840** | PH2 | 25 | 1 | 1 |
| **FPB ProfiBit TX50 5/16“** | **557844** | TX50 | 35 | 1 | 1 |

# Bit FMB II

Bit for the ultimate power transmission.



## Applications

Number of internal drives in various profile sizes, such as:
- TX star recess
- Suitable for ¼“ drives

## Advantages

- The ultimate solution for high torques. Ideal for use in powerful drill and impact wrenches.
- The elastic torsion zone releases at extreme loads to ensure a gentle working and maximum operating efficiency.
- Optimal profile geometry ensures unparalleled performance and durability for demanding applications.
- Flared profile neck for improved fixation in screws allows rotation-free assembly for clean work results and longer service life.



## Technical data

**Bit FMB II**



FMB II TX

| Item | Item no. | Drive | Length l [mm] | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|
| **FMB II TX20 Bit** | **564312** | TX20 | 30 | 5 | 1 |
| **FMB II TX25 Bit** | **564313** | TX25 | 30 | 5 | 1 |
| **FMB II TX30 Bit** | **564314** | TX30 | 30 | 5 | 1 |
| **FMB II TX40 Bit** | **564315** | TX40 | 30 | 5 | 1 |

# BitHolder FBH

The bit holder for rapid bit exchange.



## Applications

- The bit holders for use in cylinder drill chucks

## Advantages

- The bit holder for ¼“ bits with magnetic insert hold the bit securely in the drill chuck and offers a smooth installation procedure.
- Robust and slim bit holder for an easy bit exchange.
- Ideal for direct machine connection or enlargement of the bits to reach difficult areas.

## Functioning

- Suitable for ¼“ drives

## Technical data

**BitHolder FBH**



FBH Bit Holder

| Item | Item no. | Drive | Length l [mm] | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|
| **FBH BitHolder** | **558178** | 1/4“ | 58 | 1 | 1 |

# BitSets

Useful BitSets for a multitude of applications.



## Applications

- The ideal bit sets for quick and efficient working
- For a high variation of applications

## Advantages

- Universal use with most common bits as well as one bit holder per set.
- Compact bit set with easy handling.
- Safe and clearly arranged keeping of the content assuring a reliable usage.
- Robust and durable construction fulfilling even hardest requirements.

## Functioning

- Case for the orderly and practical storage of bits and bit holder.



## Technical data

**BitSet**



FPB ProfiBitSet W10



Bit Set FPB Profi W32

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **FPB BitSet Profi W10** | **558179** | Each 1 x PZ1, PZ2, PZ3, TX10, TX15, TX20, TX25, TX30, TX40, 1 x Bit holder | 1 |
| **FPB BitSet Profi W32** | **559121** | 2 x PZ1, 4 x PZ2, 2 x PZ3<br>1 x TX8, 2 x TX10, 1 x TX15, 2 x TX20, 2 x TX25, 1 x TX27, 1 x TX30, 1 x TX40<br>2 x PH1, 4 x PH2, 2 x PH3, 1 x PH2 D<br>1 x SL4.5, 1 x SL5.5, 1 x SL6<br>1 x Bit holder | 1 |

# Socket

Sockets for the use with cordless impact wrenches.






## Advantages

- Optimal geometry of the profile guarantees unique performance and durability for complex applications and users.
- The high dimensional accuracy allows for an ideal fit. For clean results and a long lifetime.



## Sockets for the cordless impact wrenches

**Accessories for impact driver**



Socket SW



Socket 1/2“




Socket 1/2“ - 1/4“




Socket TX50

| Item | Item no. | Drive | Total length l [mm] | Sales unit [pcs] |
|---|---|---|---|---|
| **Socket 1/2“ size 10** | **538577** | 1/2“ / SW10 | 78 | 1 |
| **Socket 1/2“ size 13** | **538578** | 1/2“ / SW13 | 38 | 1 |
| **Socket 1/2“ size 15** | **538579** | 1/2“ / SW15 | 38 | 1 |
| **Socket 1/2“ size 17** | **538580** | 1/2“ / SW17 | 38 | 1 |
| **Socket 1/2“ size 21** | **538581** | 1/2“ / SW21 | 38 | 1 |
| **Socket 1/2“- 1/4“** | **553928** | 1/2“ / 1/4“ | 55 | 1 |
| **Socket 1/2“ - TX50** | **553929** | 1/2“ / TX50 | 55 | 1 |



# 15
# Power tools


| | | |
|---|---|---|
| Cordless impact wrench FSS 18V 600 | 720 |  |
| Gas actuated fastening tool FGC 100 | 723 |  |
| Battery-actuated setting tool FXC 85 | 728 |  |
| Perforated steel banding direct fastening LBV/LBK DF | 732 |  |
| Fastening tie direct fastening FF DF | 734 |  |
| Pipe clip direct fastening RC DF | 737 |  |
| Cable clasp direct fastening KB DF | 740 |  |
| Cable harness direct fastening SHA II | 742 |  |
| Gas actuated fastening tool FGW 90F | 745 |  |

# Cordless impact wrench FSS 18V

The specialist for concrete screws in diameter 12-14.





Balcony railings

## Applications

- Anchoring of railings
- Column bases
- Pipeline routes
- Canopies
- Shelving systems
- Steel-steel connections
- Tyre changes

## Advantages

- The fischer cordless impact wrench FSS is compatible with all Cordless Alliance System (CAS) chargers and rechargeable batteries worldwide.
- The accessories supplied free of charge, sockets and checking gauges, enable smooth assembly and testing for reusability of the concrete screws.
- The versatile fischer service concept offers a seamless repair process worldwide as well as the immediate procurement of a replacement unit.
- The tools are delivered in the compatible L-Boxx, which can be connected by the Sortimo click system.

## Certificates / Features

## Functioning

- The fischer cordless impact wrench is suitable for the installation of concrete screws in all diameters.
- Depending on the head shape of the concrete screw, either an appropriate socket or a special TX bit is recommended for the installation.
- For optimum installation, the machine must be positioned horizontally to the screw.
- Due to the impact mechanism of the impact wrench no torque needs to be countered by the user.
- If the screw head is in contact with the attachment part, correct assembly of the concrete screw with the cordless impact screwdriver is guaranteed (optical setting check).

## Technical data

**Cordless impact wrenches FSS 18V**



FSS 18V 600 - Set

| | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **Item** | | | |
| **FSS 18V 600 - Set 1** | **552923** | Belt hook FSS BH,<br>Sockets: 15 / 17 / 21,<br>Test sleeves FUP for concrete screw diameter: 12 / 14,<br>Packaging L-Boxx, stackable | 1 |
| **FSS 18V 600 - Set 3** | **552927** | Belt hook FSS BH,<br>Sockets: 15 / 17 / 21,<br>Test sleeves FUP for concrete screw diameter: 12 / 14,<br>2 x Battery pack 4.0 Ah<br>Charger Type EU<br>Packaging L-Boxx, stackable | 1 |

## Technical data

**Cordless impact wrenches FSS 18V**



FSS 18V 600

| | Item no. | Battery voltage [V] | Max. Idling speed [min] | Max. Stroke rate [min] | Max. Torque [Nm] | Torque-Levels | Tool holder | Vibration Impact screws [m/s] | Sound power level (LwA) [dB] | Noise emission sound pressure level [dB] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | | | | | |
| **FSS 18V 600 - Set 1** | **552923** | 18 | 0 - 1600 | 2,200 | 600 | 1 | outer square 1/2“ (12.7 mm) | 5.9 | 107 | 96 | 1 |
| **FSS 18V 600 - Set 3** | **552927** | 18 | 0 - 1600 | 2,200 | 600 | 1 | outer square 1/2“ (12.7 mm) | 5.9 | 107 | 96 | 1 |

## FSS-B and FSS-BC

**FSS-B and FSS-BC**



FSS-B 18V 2.0 Ah



FSS-B 18V 4.0 Ah



FSS-BC

| Item | Item no. | CAS compatible | Type of battery pack | Battery capacity [Ah] | Battery voltage [V] | Storage and processing [°C] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **FSS-B 18V 2.0Ah** | **563787**[1)] | Yes | Li-Ion | 2.0 | 18 | -20 - +80 | 1 |
| **FSS-BC 12-36V EU** | **552931** | Yes | – | – | – | – | 1 |
| **FSS-BC 12-36V UK** | **552932** | Yes | – | – | – | – | 1 |

[1)] Battery may only be charged with fischer or CAS chargers.

## Accessories Cordless impact wrenches FSS 18V

**Accessories Cordless impact wrenches FSS 18V**



FUP



Socket 1/2“




Socket 1/2“ - 1/4“




Socket TX50



FMB II TX



FPB ProfiBit TX 50 5/16“

| Item | Item no. | Approval DIBt | Internal diameter D [mm] | Drive | Match | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FUP 8** | **537200** | – | 9.9 | – | FBS II 8 | 1 |
| **FUP 10** | **537201** | ● | 12 | – | FBS II 10 | 1 |
| **FUP 12** | **537202** | ● | 13.9 | – | FBS II 12 | 1 |
| **FUP 14** | **537203** | ● | 15.6 | – | FBS II 14 | 1 |
| **Socket 1/2“ size 10** | **538577** | – | – | 1/2“ / SW10 | FBS II 6 | 1 |
| **Socket 1/2“ size 13** | **538578** | – | – | 1/2“ / SW13 | FBS II 8 | 1 |
| **Socket 1/2“ size 15** | **538579** | – | – | 1/2“ / SW15 | FBS II 10 | 1 |
| **Socket 1/2“ size 17** | **538580** | – | – | 1/2“ / SW17 | FBS II 12 | 1 |
| **Socket 1/2“ size 21** | **538581** | – | – | 1/2“ / SW21 | FBS II 14 | 1 |
| **Socket 1/2“- 1/4“** | **553928** | – | – | 1/2“ / 1/4“ | FBS II 6 / FBS II 8 / FBS II 8 SK | 1 |
| **Socket 1/2“ - TX50** | **553929** | – | – | 1/2“ / TX50 | FBS II 10 SK | 1 |
| **FMB II TX30 Bit** | **564314** | – | – | TX30 | FBS II 6 | 1 |
| **FMB II TX40 Bit** | **564315** | – | – | TX40 | FBS II 8 / FBS II 8 SK | 1 |

# Gas actuated fastening tool FGC 100

Quick and easy fastening in concrete and steel.






Drywall tracks



Electrical installations

## Applications

- Drywall tracks
- Electrical installations
- Composite decks
- Insulation systems
- Light duty building construction applications

## Advantages

- The 100 joules power ensures correct penetration into the working surface even for steel to steel applications.
- Easy nail depth adjustment switch to choose how to set the nails.
- Long lifetime with service intervals after every 20,000 fixings under standard conditions.
- Quick release system for a fast disassembling of the magazine and clearing of jammed nails.
- Rechargeable battery with Li-Ion power: 8,000 fixings with one charge.
- Battery-LED status.
- A 10 minutes charge allows you to fix at least another 300 nails.
- The FGC 100 is delivered in the practical XL-BOXX, which is fully compatible with the L-BOXX.

## Certificates / Features

CE UKCA

## Building materials

- Concrete
- Sand-lime brick
- Solid brick
- Steel

## Functioning

- The fischer gas actuated fastening tool FGC 100 is suitable for a fast and reliable installation of e. g. drywall tracks and electrical connections in all directions - on floors, walls and ceilings.
- For optimum installation, the tool must be positioned perpendicularly to the working surface.
- The attached stand gives support but can also be removed to drive nails in narrow areas.
- The tool will operate within the temperature range of -7°C to +50°C.
- The tool has a weight of 4.1 kg and the following dimensions:
  L 336 mm x W 121 mm x H 404 mm.

## Technical data

**Set Gas actuated fastening tool FGC 100**



Tool FGC 100



Battery charger BC 7.2 V



Li-Ion battery B 7.2 V



Set FGC 100 in XL-BOXX

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **Set FGC 100 (EU)** | **553411**[1)] | 1 x fischer gas actuated fastening tool FGC 100<br>1 x Magazine FGC 100 – M26<br>1 x Battery charger BC 7.2V incl. charging plug for EU<br>2 x Li-Ion battery B 7.2V – at least 2.5Ah<br>1 x Push bar<br>2 x Hex wrench<br>1 x XL-BOXX | 1 |
| **Set FGC 100 (UK)** | **553585**[1)] | 1 x fischer gas actuated fastening tool FGC 100<br>1 x Magazine FGC 100 – M26<br>1 x Battery charger BC 7.2V incl. charging plug for UK<br>2 x Li-Ion battery B 7.2V – at least 2.5Ah<br>1 x Push bar<br>2 x Hex wrench<br>1 x XL-BOXX | 1 |
| **Set FGC 100 (US)** | **553586**[1)] | 1 x fischer gas actuated fastening tool FGC 100<br>1 x Magazine FGC 100 – M26<br>1 x Battery charger BC 7.2V incl. charging plug for US<br>2 x Li-Ion battery B 7.2V – at least 2.5Ah<br>1 x Push bar<br>2 x Hex wrench<br>1 x XL-BOXX | 1 |
| **Set FGC 100 (AUS)** | **553587**[1)] | 1 x fischer gas actuated fastening tool FGC 100<br>1 x Magazine FGC 100 – M26<br>1 x Battery charger BC 7.2V incl. charging plug for AUS<br>2 x Li-Ion battery B 7.2V – at least 2.5Ah<br>1 x Push bar<br>2 x Hex wrench<br>1 x XL-BOXX | 1 |
| **Set FGC 100 (AR)** | **560091**[1)] | 1 x fischer gas actuated fastening tool FGC 100<br>1 x Magazine FGC 100 – M26<br>1 x Battery charger BC 7.2V incl. charging plug for AR<br>2 x Li-Ion battery B 7.2V – at least 2.5Ah<br>1 x Push bar<br>2 x Hex wrench<br>1 x XL-BOXX | 1 |
| **Set FGC 100-M50 (EU-Schuko)** | **560038**[1)] | 1 x fischer gas actuated fastening tool FGC 100<br>1 x Magazine FGC 100 – M50<br>1 x Battery charger BC 7.2V incl. Schuko charging plug<br>2 x Li-Ion battery B 7.2V – at least 2.5Ah<br>1 x Push bar<br>2 x Hex wrench<br>1 x XL-BOXX | 1 |

[1)] Possibly further variants.

## Accessories for the fastening tool

**Accessories for the fastening tool**



Magazine standard FGC 100-M26



Magazine extended FGC 100-M50



Battery charger BC 7.2 V



Li-Ion battery B 7.2 V

| Item | Item no. | Features | Sales unit [pcs] |
|---|---|---|---|
| **Magazine standard FGC 100-M26** | **553412** | Capacity of 26 nails, curved | 1 |
| **Magazine extended FGC 100-M50** | **553717** | Capacity of 50 nails, curved | 1 |
| **Battery charger BC 7.2V (EU)** | **553414**[1)] | Input 100-240 V, Output 8.4 V – 2 A | 1 |
| **Battery charger BC 7.2V (UK)** | **553588**[1)] | Input 100-240 V, Output 8.4 V – 2 A | 1 |
| **Battery charger BC 7.2V (US)** | **553589**[1)] | Input 100-240 V, Output 8.4 V – 2 A | 1 |
| **Battery charger BC 7.2V (AUS)** | **553590**[1)] | Input 100-240 V, Output 8.4 V – 2 A | 1 |
| **Battery charger BC 7.2V (AR)** | **560092**[1)] | Input 100-240 V, Output 8.4 V – 2 A | 1 |
| **Battery charger BC 7.2V (EU-Schuko)** | **560039**[1)] | Input 100-240 V, Output 8.4 V – 2 A | 1 |
| **Li-Ion battery B 7.2V** | **553415** | > 8,000 fixings per charge – at least 2.5 Ah | 1 |

[1)] Country specific charging plug. Possibly further variants.

## Accessories for fixings

**Accessories for fixings**



Fuel cell FC 165



TFD



E-Fix nose FGC 100-N E-Fix

| Item | Item no. | Features | Sales unit [pcs] |
|---|---|---|---|
| **Fuel cell FC 165** | **553416** | For more than 1,100 fixings | 1 |
| **TFD 30** | **554928** | To fix insulation material with a thickness of 30 mm, on soft concrete < C30/37 with DFN 40 | 504 |
| **TFD 50** | **554929** | To fix insulation material with a thickness of 50 mm, on soft concrete < C30/37 with DFN 40 | 504 |
| **FGC 100-N E-Fix** | **554869** | For the use of fischer ETICS plugs TFD 30 and 50 and fischer electrical fixings (plastic) for direct fastening | 1 |
| **DF-N magnetic** | **553715** | For the use with fischer metal fixings, set of 2 pcs | 1 |
| **FGC 100 Cleaning kit** | **553718** | 150 ml Cleaner, 100 ml Lubricating Oil and tool rubber sealing rings | 1 |

# Accessories for fixings

**Accessories for fixings**



Standard nail DFN



High performance nail DFNH



FGC 100-metal washer



U-P DF

| Item | Item no. | Features | Sales unit [pcs] |
|---|---|---|---|
| **Standard nail DFN 17 NP** | **567321** | Zinc-plated with 5 µm coating thickness, for soft concrete < C30/37, shaft diameter 2.6 mm, nail length 17 mm | 1,008 |
| **Standard nail DFN 20 NP** | **567322** | Zinc-plated with 5 µm coating thickness, for soft concrete < C30/37, shaft diameter 2.6 mm, nail length 20 mm | 1,008 |
| **Standard nail DFN 22 NP** | **567323** | Zinc-plated with 5 µm coating thickness, for soft concrete < C30/37, shaft diameter 2.6 mm, nail length 22 mm | 1,008 |
| **Standard nail DFN 25 NP** | **567324** | Zinc-plated with 5 µm coating thickness, for soft concrete < C30/37, shaft diameter 2.6 mm, nail length 25 mm | 1,008 |
| **Standard nail DFN 30 NP** | **567325** | Zinc-plated with 5 µm coating thickness, for soft concrete < C30/37, shaft diameter 2.6 mm, nail length 30 mm | 1,008 |
| **Standard nail DFN 35 NP** | **567326** | Zinc-plated with 5 µm coating thickness, for soft concrete < C30/37, shaft diameter 2.6 mm, nail length 35 mm | 1,008 |
| **Standard nail DFN 40 NP** | **567327** | Zinc-plated with 5 µm coating thickness, for soft concrete < C30/37, shaft diameter 2.6 mm, nail length 40 mm | 1,008 |
| **High performance nail DFNH 15 NP** | **567328** | Zinc-plated with 5 µm coating thickness, for hard concrete ≥ C30/37 and steel, shaft diameter 3.0 mm, nail length 15 mm | 1,008 |
| **High performance nail DFNH 17 NP** | **567329** | Zinc-plated with 5 µm coating thickness, for hard concrete ≥ C30/37 and steel, shaft diameter 3.0 mm, nail length 17 mm | 1,008 |
| **High performance nail DFNH 22 NP** | **567330** | Zinc-plated with 5 µm coating thickness, for hard concrete ≥ C30/37 and steel, shaft diameter 3.0 mm, nail length 22 mm | 1,008 |
| **High performance nail DFNH 27 NP** | **567331** | Zinc-plated with 5 µm coating thickness, for hard concrete ≥ C30/37 and steel, shaft diameter 3.0 mm, nail length 27 mm | 1,008 |
| **High performance nail DFNH 32 NP** | **567332** | Zinc-plated with 5 µm coating thickness, for hard concrete ≥ C30/37 and steel, shaft diameter 3.0 mm, nail length 32 mm | 1,008 |
| **FGC 100 U metal washer** | **554935** | Zinc-plated with 5 µm coating thickness, diameter of 25mm, for the use with the magnetic clip DF-N magnetic | 1,008 |
| **U-P 20 DF** | **562323** | Plastic washer, diameter 20 mm, for use with the E-Fix nose | 100 |

## Loads

**Standard nails DFN and high-performance nails DFNH**

Recommended loads[1] of a single nail in the respective building material as multiple use with at least 6 nails per attachment part.

| Building material | Setting depth $h_{ef}$ [mm] | Recommended tension load [1] $F_{rec}$ [kN] | |
|---|---|---|---|
| | | DFN | DFNH |
| Concrete C20/25[2] | ≥ 14 | 0.10 | - |
| | ≥ 16 | 0.18 | - |
| | ≥ 18 | 0.20 | 0.22 |
| | ≥ 20 | 0.20 | 0.50 |
| Concrete C50/60[2] | ≥ 14 | - | 0.12 |
| | ≥ 17 | - | 0.18 |
| | ≥ 18 | - | 0.22 |
| Solid sand-lime brick KS<br>DIN EN 771-2 / KS 16<br>998 x 200 x 623 mm | ≥ 20 | 0.50 | - |
| | ≥ 25 | 0.68 | - |
| | ≥ 27 | 0.80 | - |
| | ≥ 29 | 0.95 | - |
| Solid brick Mz<br>DIN EN 771-1 / Mz 20, DF | ≥ 14 | 0.10 | - |
| | ≥ 16 | 0.16 | - |
| | ≥ 18 | 0.19 | - |
| | ≥ 20 | 0.19 | - |
| Steel S235JR acc. to EN 10025-2 | ≥ 8 | - | 0.96 |
| **Member thickness and edge distance for concrete** | | | |
| Minimum member thickness | $h_{min}$ [mm] | 60 | 60 |
| Minimum edge distance | $c_{min}$ [mm] | 70 | 70 |
| **Member thickness and edge distance for steel** | | | |
| Minimum member thickness | $h_{min}$ [mm] | - | 4 |
| Minimum edge distance | $c_{min}$ [mm] | - | 14 |
| **Maximum fixture thickness** | | | |
| Wood | $t_{fix}$ [mm] | 25 | 25 |
| Metal sheet | $t_{fix}$ [mm] | 2.5 | 2.5 |

[1] Required safety factors are considered. Not for safety relevant single point fixings. All visible setting errors must be corrected. Use only in dry areas. To confirm the technical data, setting and load tests are recommended.

[2] The load values in concrete are valid for tension and shear load.

# Battery-actuated setting tool FXC 85

Battery-actuated setting tool for quick fastening in concrete and steel.





Electrical installations on floors



Electrical clips on the wall

## Applications

- Drywall tracks
- Electrical installations
- Composite decks
- Light duty building construction applications

## Advantages

- With a power of ca. 85 joules, the setting tool has sufficient energy for fixing in concrete and steel.
- The tool is operated by the powerful 18V battery of the AMPShare alliance from Bosch and is therefore compatible with all AMPShare tools.
- The elimination of the fuel cell saves on consumption and maintenance costs and also reduces noise.
- The setting depth of the nails can be quickly and easily adjusted to the respective application.
- With service intervals after every 15,000 fixings under standard conditions, the tool has a long service life.
- Working light on the tool to assist the setting process.

## Certificates / Features

CE

AMPShare Powered by BOSCH

## Building materials

- Concrete < C30/37
- Hard concrete ≥ C30/37
- Sand-lime brick
- Solid brick
- Steel

## Functioning

- The fischer battery-actuated setting tool FXC 85 is suitable for a fast and reliable installation of e. g. drywall tracks and electrical connections in all directions on floors, walls and ceilings made of concrete or steel.
- For optimum installation, the tool must be positioned perpendicularly to the working surface.
- The attached stand gives additional grip but can also be removed to drive nails in narrow areas.
- Quick and easy release of the magazine for the removal of jammed nails.
- The tool will operate within the temperature range of -5 °C to +50 °C.

## Technical data

**Battery-actuated setting tool FXC 85**



Setting tool FXC 85



Setting tool FXC 85 in XL-BOXX (single tool)



Setting tool FXC 85 in XL-BOXX incl. battery and charger

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **FXC 85 (Single tool in box)** | **567476** | 1 x fischer battery-actuated setting tool FXC 85<br>1 x Standard magazine FXC 85-M26<br>1 x Belt hook<br>1 x Push bar | 1 |
| **FXC 85 (Single tool in XL-BOXX)** | **567477** | 1 x fischer battery-actuated setting tool FXC 85<br>1 x Standard magazine FXC 85-M26<br>1 x Belt hook<br>1 x Push bar<br>1 x XL-BOXX | 1 |
| **Set FXC 85 (EU)** | **567478** | 1 x fischer battery-actuated setting tool FXC 85<br>1 x Standard magazine FXC 85-M26<br>1 x GAL 18V-40 charger<br>2 x ProCORE 18V 4.0Ah Lithium-ion battery<br>1 x Belt hook<br>1 x Push bar<br>1 x XL-BOXX | 1 |
| **Set FXC 85 (US)** | **571025** | 1 x fischer battery-actuated setting tool FXC 85<br>1 x Standard magazine FXC 85-M26<br>1 x GAL 18V-40 charger<br>2 x GBA 18V 4.0Ah Lithium-ion battery<br>1 x Belt hook<br>1 x Push bar<br>1 x XL-BOXX | 1 |
| **Set FXC 85 (ES)** | **571026** | 1 x fischer battery-operated setting tool FXC 85<br>1 x Standard magazine FXC 85-M26<br>1 x GAL 18V-40 charger<br>2 x ProCORE 18V 4.0Ah Lithium-ion battery<br>1 x Belt hook<br>1 x Push bar<br>1 x XL-BOXX | 1 |

## Accessories

**Accessories for the setting tool**



Standard magazine



Charger



ProCORE 18V 4.0Ah



FXC 85 E-Fix nose



DF-N

| Item | Item no. | Features | Sales unit [pcs] |
|---|---|---|---|
| **FXC 85 - M26 standard magazine** | **568995** | Capacity of 26 nails | 1 |
| **Battery charger GAL 18V-40 (EU)** | **568512** | Input 230 V, max. charging current 4 A | 1 |
| **ProCORE 18V 4.0Ah (EU-battery)** | **568511** | 500 fixings per charge, 4.0 Ah | 1 |
| **FXC 85-N E-Fix** | **571029** | For the use of fischer electrical fixings (plastic) for direct fixing | 1 |
| **DF-N magnetic** | **553715** | For the use with fischer metal fixings, set of 2 pcs | 1 |

## Nails for fixings

**Nails for fixings**



Standard nail DFN



High performance nail DFNH



FGC 100-metal washer



U-P DF

| Item | Item no. | Features | Sales unit [pcs] |
|---|---|---|---|
| **Standard nail DFN 17 NP** | **567321** | Zinc-plated with 5 µm coating thickness, for soft concrete < C30/37, shaft diameter 2.6 mm, nail length 17 mm | 1,008 |
| **Standard nail DFN 20 NP** | **567322** | Zinc-plated with 5 µm coating thickness, for soft concrete < C30/37, shaft diameter 2.6 mm, nail length 20 mm | 1,008 |
| **Standard nail DFN 22 NP** | **567323** | Zinc-plated with 5 µm coating thickness, for soft concrete < C30/37, shaft diameter 2.6 mm, nail length 22 mm | 1,008 |
| **Standard nail DFN 25 NP** | **567324** | Zinc-plated with 5 µm coating thickness, for soft concrete < C30/37, shaft diameter 2.6 mm, nail length 25 mm | 1,008 |
| **Standard nail DFN 30 NP** | **567325** | Zinc-plated with 5 µm coating thickness, for soft concrete < C30/37, shaft diameter 2.6 mm, nail length 30 mm | 1,008 |
| **Standard nail DFN 35 NP** | **567326** | Zinc-plated with 5 µm coating thickness, for soft concrete < C30/37, shaft diameter 2.6 mm, nail length 35 mm | 1,008 |
| **Standard nail DFN 40 NP** | **567327** | Zinc-plated with 5 µm coating thickness, for soft concrete < C30/37, shaft diameter 2.6 mm, nail length 40 mm | 1,008 |
| **High performance nail DFNH 15 NP** | **567328** | Zinc-plated with 5 µm coating thickness, for hard concrete ≥ C30/37 and steel, shaft diameter 3.0 mm, nail length 15 mm | 1,008 |
| **High performance nail DFNH 17 NP** | **567329** | Zinc-plated with 5 µm coating thickness, for hard concrete ≥ C30/37 and steel, shaft diameter 3.0 mm, nail length 17 mm | 1,008 |
| **High performance nail DFNH 22 NP** | **567330** | Zinc-plated with 5 µm coating thickness, for hard concrete ≥ C30/37 and steel, shaft diameter 3.0 mm, nail length 22 mm | 1,008 |
| **High performance nail DFNH 27 NP** | **567331** | Zinc-plated with 5 µm coating thickness, for hard concrete ≥ C30/37 and steel, shaft diameter 3.0 mm, nail length 27 mm | 1,008 |
| **High performance nail DFNH 32 NP** | **567332** | Zinc-plated with 5 µm coating thickness, for hard concrete ≥ C30/37 and steel, shaft diameter 3.0 mm, nail length 32 mm | 1,008 |
| **FGC 100 U metal washer** | **554935** | Zinc-plated with 5 µm coating thickness, diameter of 25mm, for the use with the magnetic clip DF-N magnetic | 1,008 |
| **U-P 20 DF** | **562323** | Plastic washer, diameter 20 mm, for use with the E-Fix nose | 100 |

## Loads

**Standard nails DFN and high-performance nails DFNH**

Recommended loads[1] of a single nail in the respective building material as multiple use with at least 6 nails per attachment part.

| Building material | Setting depth $h_{ef}$ [mm] | Recommended tension load [1] $F_{rec}$ [kN] | |
|---|---|---|---|
| | | DFN | DFNH |
| Concrete C20/25[2] | ≥ 14 | 0.10 | - |
| | ≥ 16 | 0.18 | - |
| | ≥ 18 | 0.20 | 0.22 |
| | ≥ 20 | 0.20 | 0.50 |
| Concrete C50/60[2] | ≥ 14 | - | 0.12 |
| | ≥ 17 | - | 0.18 |
| | ≥ 18 | - | 0.22 |
| Solid sand-lime brick KS<br>DIN EN 771-2 / KS 16<br>998 x 200 x 623 mm | ≥ 20 | 0.50 | - |
| | ≥ 25 | 0.68 | - |
| | ≥ 27 | 0.80 | - |
| | ≥ 29 | 0.95 | - |
| Solid brick Mz<br>DIN EN 771-1 / Mz 20, DF | ≥ 14 | 0.10 | - |
| | ≥ 16 | 0.16 | - |
| | ≥ 18 | 0.19 | - |
| | ≥ 20 | 0.19 | - |
| Steel S235JR acc. to EN 10025-2 | ≥ 8 | - | 0.96 |
| **Member thickness and edge distance for concrete** | | | |
| Minimum member thickness | $h_{min}$ [mm] | 60 | 60 |
| Minimum edge distance | $c_{min}$ [mm] | 70 | 70 |
| **Member thickness and edge distance for steel** | | | |
| Minimum member thickness | $h_{min}$ [mm] | - | 4 |
| Minimum edge distance | $c_{min}$ [mm] | - | 14 |
| **Maximum fixture thickness** | | | |
| Wood | $t_{fix}$ [mm] | 25 | 25 |
| Metal sheet | $t_{fix}$ [mm] | 2.5 | 2.5 |

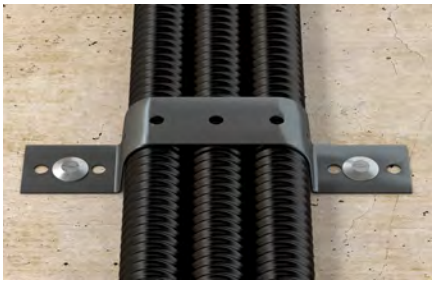
[1] Required safety factors are considered. Not for safety relevant single point fixings. All visible setting errors must be corrected. Use only in dry areas. To confirm the technical data, setting and load tests are recommended.

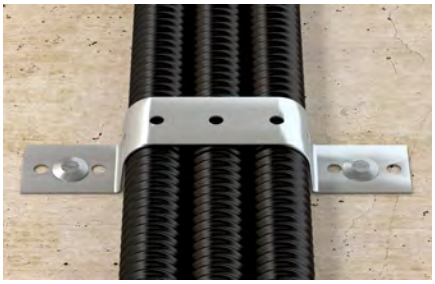
[2] The load values in concrete are valid for tension and shear load.

# Perforated steel banding direct fastening LBV/LBK DF

High-quality steel banding with holes for simple installation with the fischer direct fastening tools.









## Applications

- Steel banding with stamped holes for simple installation of pipes on the substrate, e. g. on unfinished floor.
- In two versions: galvenized (LBV) and with plastic-cover (LBK).
- For use in dry interior areas.

## Advantages

- The sheet thicknesses and plastic coating of the perforated steel banding allow easy cutting to length using sheet metal shears.
- The combination of perforated steel banding LBV/LBK DF and fischer direct fastening tool enables a quick installation.
- The plastic-coated design prevents the attachment parts from being scratched.
- Enlarged hole spacing makes it easier to place the nails between the holes with direct fastening.

## Building materials

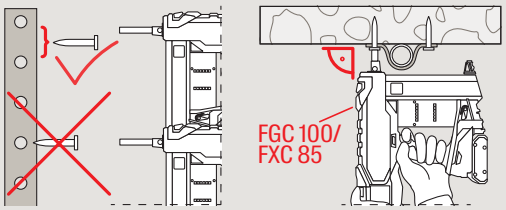
**When using the DFN nails:**
- soft concrete <C 30/37
- Solid brick
- sand-lime brick

**When using the DFNH nails:**
- hard concrete > 30/37
- steel

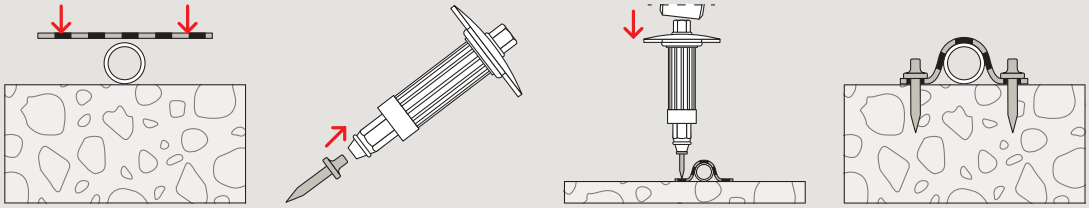
## Functioning

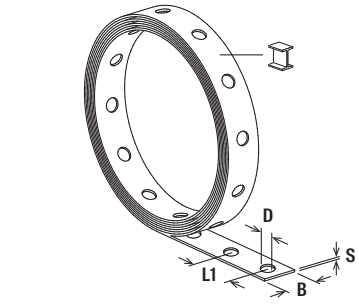
- Flexible installation with direct fastening, with screw and plug or impact nail ED.
- For Fixing with plug and screw or impact nail ED the cut-out holes are used.
- The perforated steel banding LBK/LBV DF is harmonised for the fastening with the fischer seeting tools FGC 100 and FXC 85. Therefore the DFN/DFNH nails are set between the cut-out holes.
- To be used with the standard nose piece for direct fastening applications.

## Installation perforated steel banding LBV / LBK DF with Direct fastening

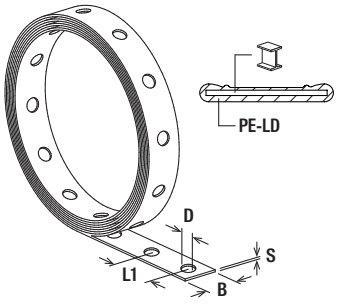


## Installation perforated steel banding LBV / LBK with impact nail ED






LBV DF




LBK DF

## Technical data

**Perforated steel banding LBV / LBK DF**



LBK DF



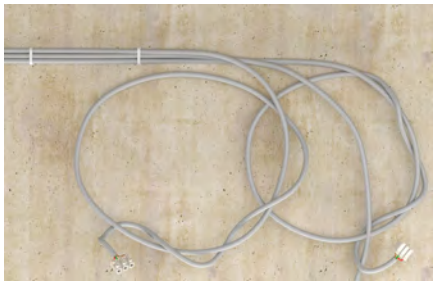
LBV DF

| Item | Item no. | Length L [mm] | Width B [mm] | Thickness S [mm] | Hole-ø D [mm] | Hole spacing L1 [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|
| **LBK 19 DF** | **572468** | 10,000 | 19 | 2.6 | 6.5 | 21.5 | 1 |
| **LBV 17 DF** | **572467** | 10,000 | 17 | 0.6 | 6.5 | 21.5 | 1 |

# Fastening tie direct fastening FF DF

Fastening ties for bundling and fixing cables and pipes to the substrate with fischer direct fastening tools.





## Applications

- Electric cables
- Flexible and rigid electrical conduits
- Armored steel conduits

## Advantages

- The base of the fastening tie FF DF is fixed to the substrate using the fischer direct fastening tool FGC 100/FXC 85 or screw and plug.
- The combination of fastening tie FF DF and fischer direct fixing tool enables one-hand installation and therefore allows faster installation than with standard dowel installation
- Several cables or pipes can be bundled and fastened with the fastening tie FF DF.
- Variably adjustable diameter of the tie loop.

## Certificates / Features

Halogen

RAL 7035

★★★★★ Nylon Quality

## Building materials

**When using the DFN nails**
- Soft concrete <C 30/37
- Solid brick
- Sand-lime brick

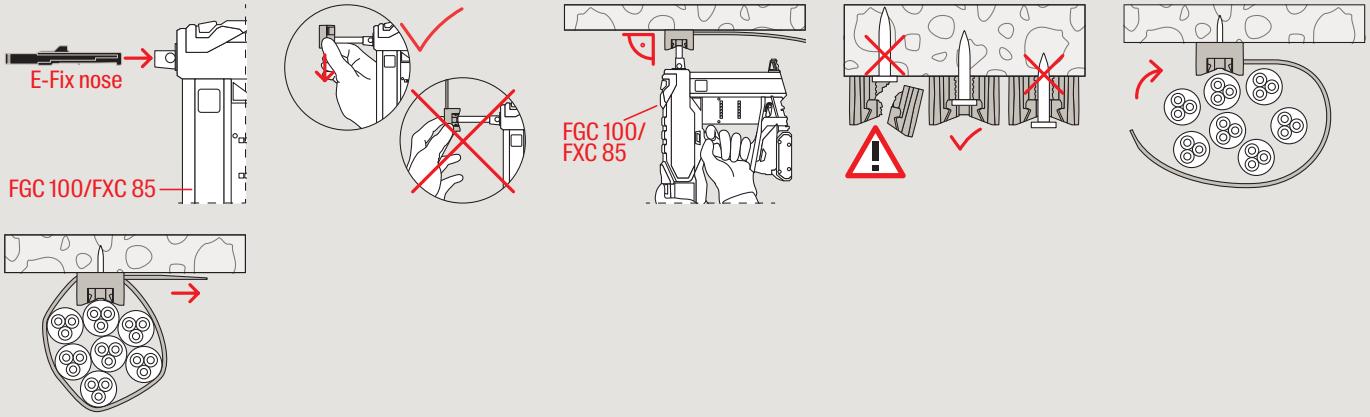
**When using DFNH nails**
- Hard concrete >C 30/37
- Steel

**When using screws and plugs**
- Concrete
- Solid brick
- Solid sand-lime brick
- Other substrates depending on the fastener used

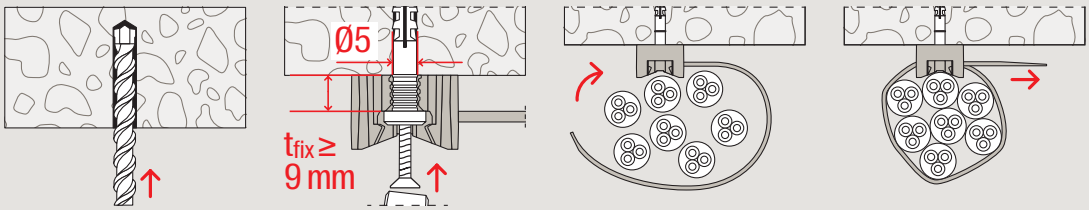
## Functioning

- The fixing base of the fastening tie FF DF can be fixed to the substrate either with direct fastening or with plugs and screws.
- The fastening tie is designed for fixing with the fischer direct fastening tools FGC 100 and FXC 85.
- The fastening tie is placed lateral to the e-fix nose.
- Variable bundling of cables and pipes thanks to the adjustable diameter range of the loop from 16-63 mm.

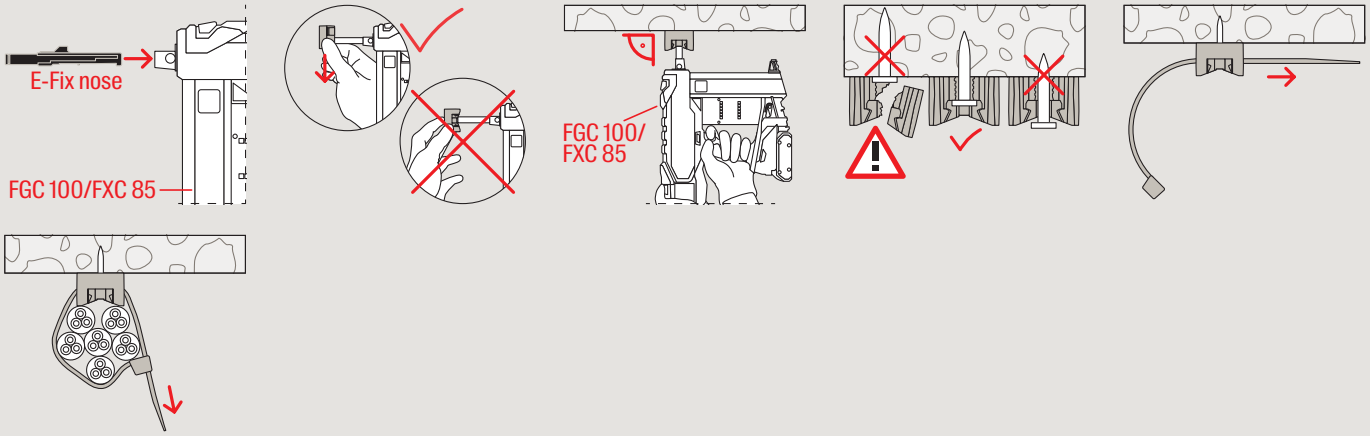
## Installation fastening tie FF DF with direct fastening



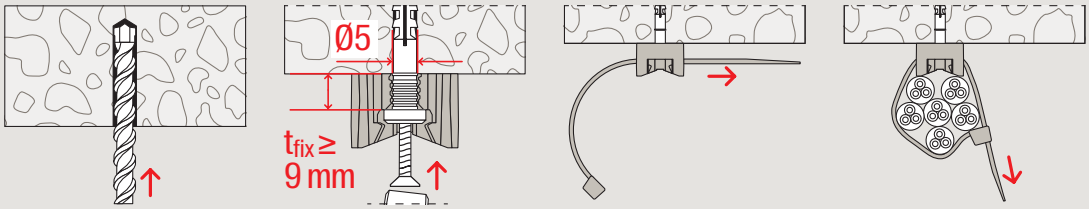

## Installation fastening tie FF DF with plug

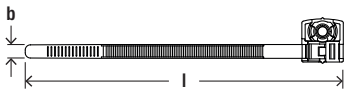


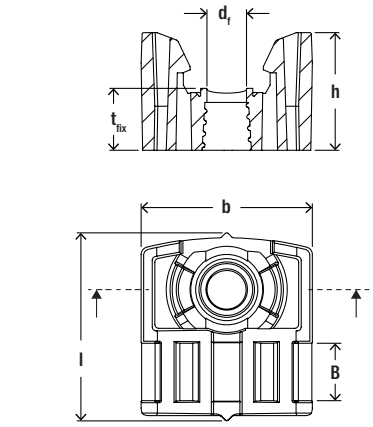

## Installation fastening tie base FF base DF with direct fastening

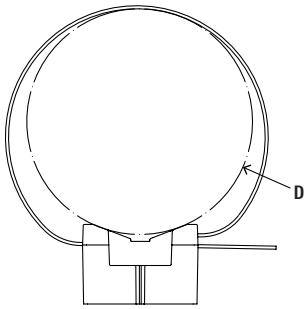



## Installation fastening tie base FF base DF with plug



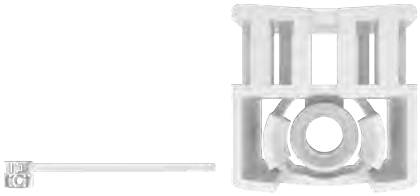



## Technical data

**Fastening tie FF DF**

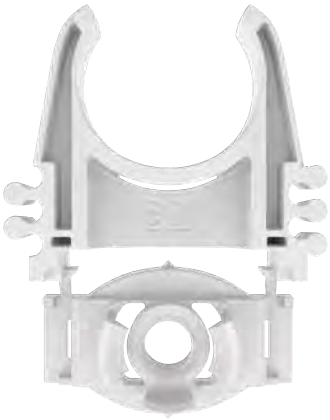


FF DF FF base DF

| | Item no. | Length<br>l<br>[mm] | Width<br>b<br>[mm] | Height<br>h<br>[mm] | Clamping range<br>D<br>[mm] | Max. nail shank diameter Direct fastening<br>$d_{DF}$<br>[mm] | Hole-ø<br>D<br>[mm] | Height mounting part<br>$t_{fix}$<br>[mm] | Sales unit<br>[pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **Item** | | | | | | | | | |
| **FF 16-32 DF** | **572465** | 245 | – | – | 16 - 32 | 3 | 5.2 | 9 | 100 |
| **FF 32-63 DF** | **572466** | 245.7 | – | – | 32 - 63 | 3 | 5.2 | 9 | 50 |
| **FF base DF** | **572464** | 24.5 | 22.5 | 15.5 | – | 3 | 5.2 | 9 | 100 |

# Pipe clip direct fastening RC DF

The convenient pipe fixing with fischer direct fastening tools.





Fixing plastic insulating conduits



Fixing plastic insulating conduits

## Applications

- Flexible and rigid plastic insulating pipes

## Advantages

- Flexible fixing with the fischer direct fastening tools FGC 100/FXC 85 or with nail plugs, screws and plugs or ClipFix.
- Coupling several RC DF pipe clips allows economical pipe fixing at just one fixing point.
- The combination of the RC DF pipe clip and the fischer direct fastening tool enables one-hand installation and thus ensures significantly faster installation compared to conventional dowel installation.

## Certificates / Features

Halogen

RAL 7035

★★★★★ Nylon Quality

## Building materials

**When using the DFN nails**
- Soft concrete <C 30/37
- Solid brick
- sand-lime brick

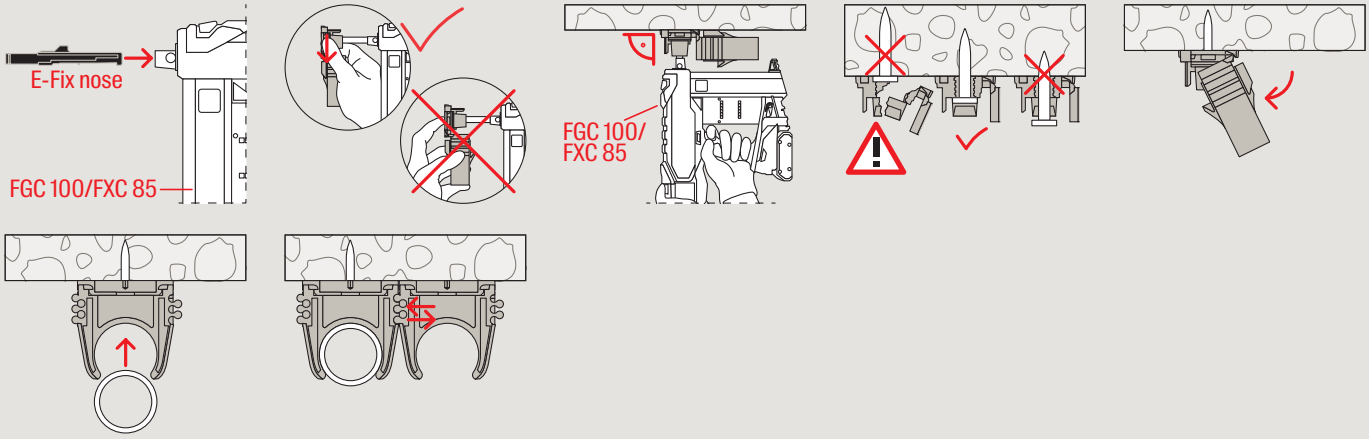
**When using DFNH nails**
- Hard concrete >C 30/37
- steel

**When using nail plug, plug and screw or ClipFix:**
- Concrete
- Solid sand-lime brick
- Solid brick made of lightweight concrete
- Other substrates depending on the fastener used

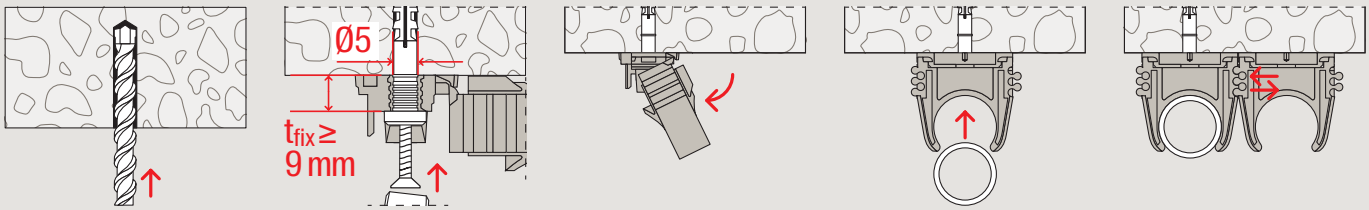
## Functioning

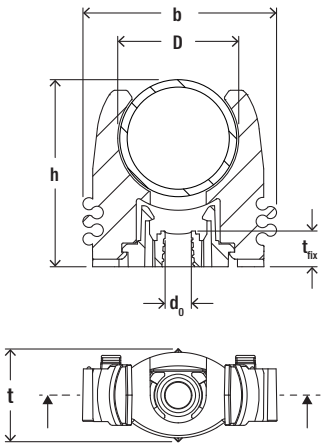
- The base of the pipe clip can be fastened either with direct fastening (DFN/DFNH nails) or with conventional fastening options (e.g. nail plugs: N-F Ø6).
- For direct fastening, the pipe clip RC DF is placed lateral to the e-fix nose.
- The direct fastening sets the DFN/DFNH nail and the pipe clip into the substrate in a single step.

## Installation pipe clip RC DF with direct fastening



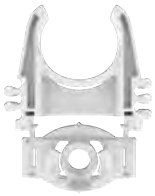

## Installation pipe clip RC DF with plug






## Technical data

**Pipe clip Direct fastening RC DF**

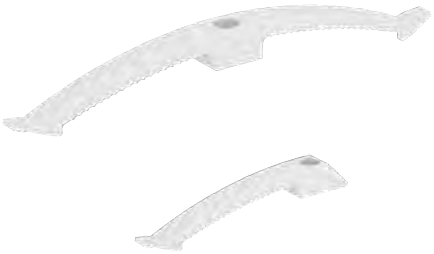


RC DF

| Item | Item no. | Width b [mm] | Height h [mm] | Depth t [mm] | Clamping range D [mm] | Max. nail shank diameter Direct fastening $d_{DF}$ [mm] | Through hole $d_f$ [mm] | Height mounting part $t_{fix}$ [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|
| **RC 16 DF** | **572457** | 29 | 34 | 18.5 | 16 | 3 | 5.2 | 9 | 100 |
| **RC 20 DF** | **572458** | 33 | 34 | 18.5 | 20 | 3 | 5.2 | 9 | 100 |
| **RC 25 DF** | **572459** | 38 | 39 | 18.5 | 25 | 3 | 5.2 | 9 | 100 |
| **RC 32 DF** | **572460** | 45 | 45 | 18.5 | 32 | 3 | 5.2 | 9 | 50 |
| **RC 40 DF** | **572461** | 53 | 55 | 18.5 | 40 | 3 | 5.2 | 9 | 50 |

# Cable clasp direct fastening KB DF

The flat cable clasp for space-saving cable fixing with fischer direct fastening tools.





Fixing cable harnesses



Fixing cable harnesses



## Applications

- Several individual cables with limited installation space.
- Several individual cables in suspended ceilings.

## Advantages

- The combination of cable clasp KB DF and fischer direct fastening tools enables one-hand installation and therefore allows faster installation compared to conventional dowel installation.
- The durable nylon material is halogen-free and can be used all year round, even in frosty conditions, thus ensuring a high level of safety.
- The angled flap of the cable clasp KB DF enables space-saving cable fixing and a quick reassignment.
- The fischer direct fastening tools and fischer DFN/DFNH nails are used to fix the cable clasp securely to the substrate.

## Certificates / Features

Halogen

RAL 7035

★★★★★ Nylon Quality

## Building materials

**When using the DFN nails**

- Soft concrete <C 30/37
- Solid brick
- Sand-lime brick

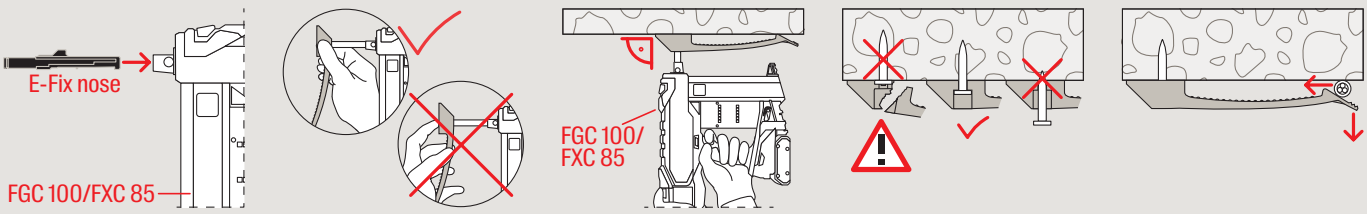
**When using DFNH nails**

- Hard concrete >C 30/37
- Steel

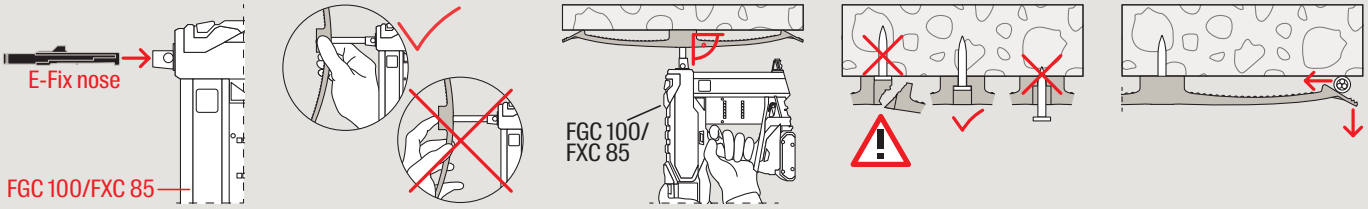
## Functioning

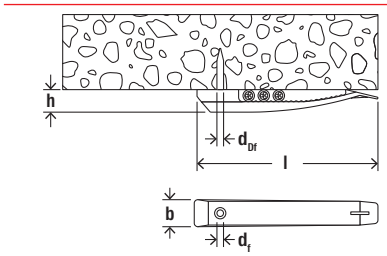
- The cable clasp KB DF is designed for fixing with the fischer FGC 100 and FXC 85 direct fastening tools.
- The cable clasp KB DF is placed on the e-fix nose.
- The direct fastening sets the DFN/DFNH nail and the cable clasp into the substrate in a single step.
- After installation, the cables are pulled under the clasp. Additional cables can be easily laid after installation too.

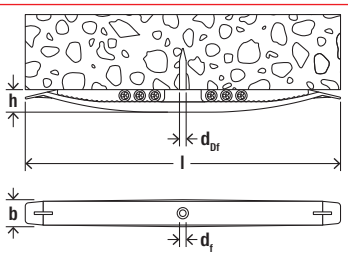
## Installation cable bow KB 8 DF



## Installation Cable bow KB 16 DF




## Technical data

**Cable clasp KB DF**



KB 8 DF

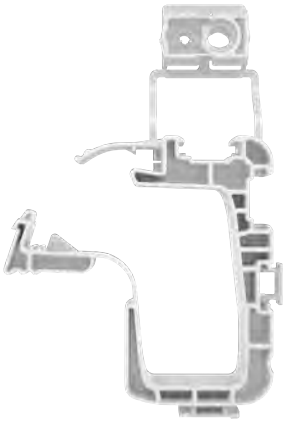


KB 16 DF

| Item | Item no. | Length l [mm] | Width b [mm] | Height h [mm] | Max. nail shank diameter Direct fastening $d_{DF}$ [mm] | Through hole $d_f$ [mm] | Max. number of ducts | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|
| **KB 8 DF** | **572462** | 135 | 20 | 17 | 3 | 3.7 | 8 ducts NYM 3 x 1,5 | 100 |
| **KB 16 DF** | **572463** | 227 | 20 | 17 | 3 | 3.7 | 16 ducts NYM 3 x 1,5 | 50 |

# Cable harness direct fastening SHA II

The cable harness with flexible mounting options.







## Applications

- Electrical cables, loose and bundled

## Advantages

- Flexible installation with the fischer direct fastening tool FGC 100/FXC 85 or with nail plug, screw and plug or ClipFix.
- Simple bundling and economical laying of multiple electric cables.
- The seal of the cable harness SHA makes it easy to lay cables at a later date, thus ensuring high user-friendliness.
- Combining several SHA cable harnesses allows for a cost-effective fixing of cables to just one attachement point.

## Certificates / Features

Halogen

RAL 7035

PP

## Building materials

**When using the DFN nails:**
- soft concrete <C 30/37
- Solid brick
- sand-lime brick

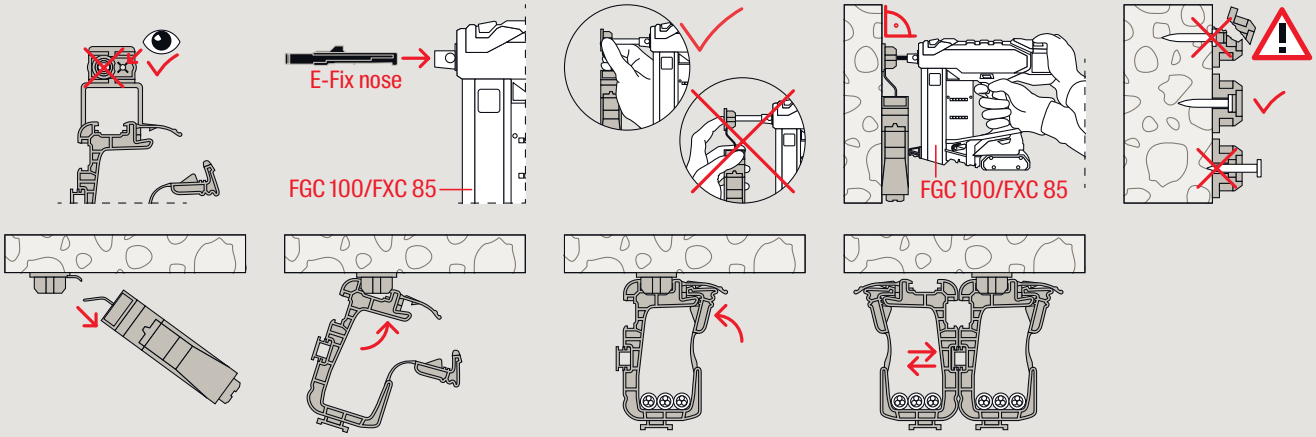
**When using the DFNH nails:**
- hard concrete > 30/37
- steel

**When using nail plug, srew and plug or ClipFix:**
- Concrete
- Solid pumice block
- Solid sand-lime brick
- Natural stone with dense structure
- Solid brick
- Other substrates depending on the fastener used

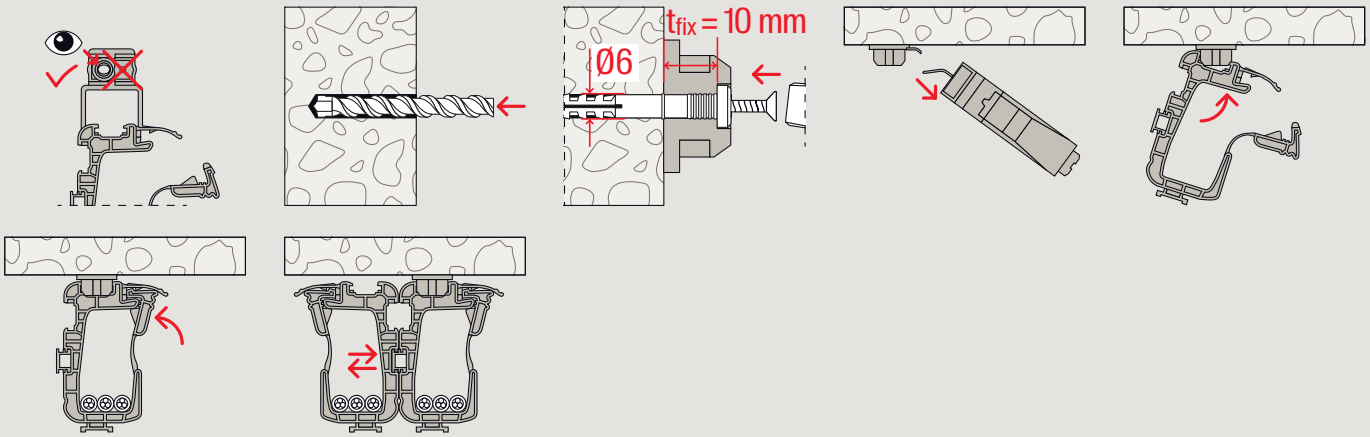
## Functioning

- The base of the cable harness SHA can be fastened either with direct fastening (DFN/DFNH nails) or with conventional fastening options (e.g. nail plugs: N-F Ø6).
- After installation, pull the cable harness SHA off the base using the tear-off flap and attach it to the base.
- The electrical cables are then inserted into the SHA. The lock allows easy opening and quick reassignment.
- The cable harness SHA can be arranged in rows.
- The recommended mounting distance is 25-40 cm when fully occupied.

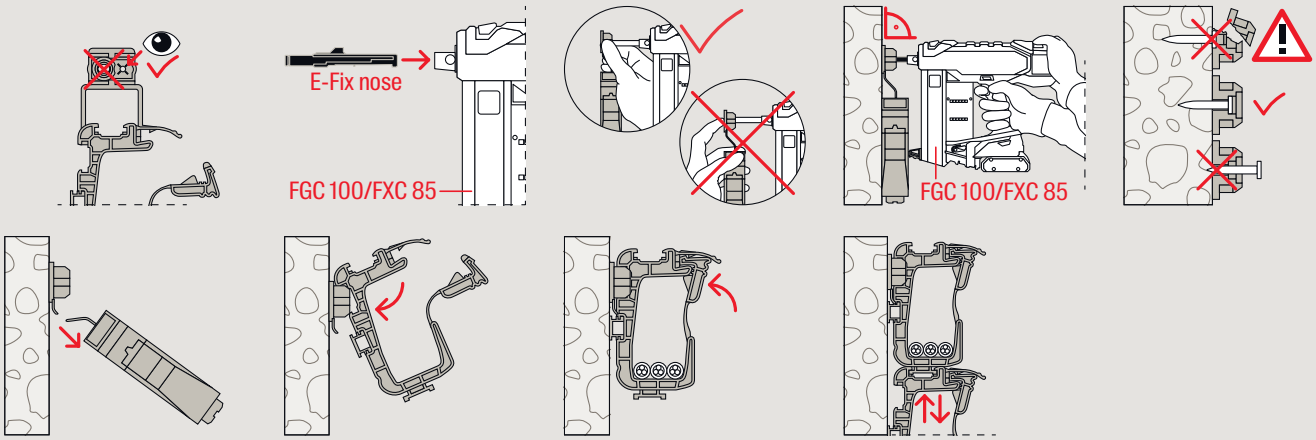
## Installation cable harness SHA II with Direct fastening on ceiling



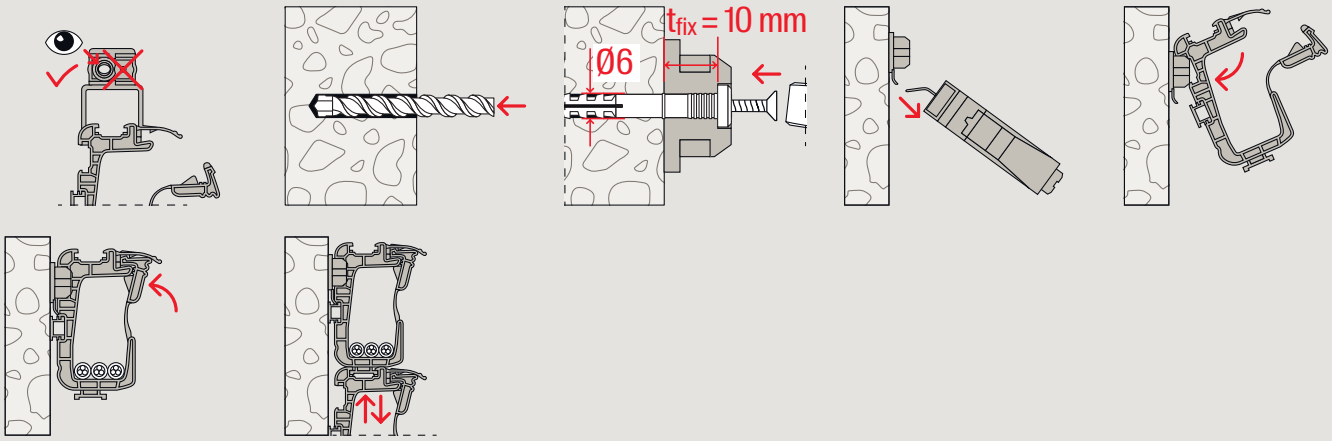

## Installation cable harness SHA II with plug on ceiling



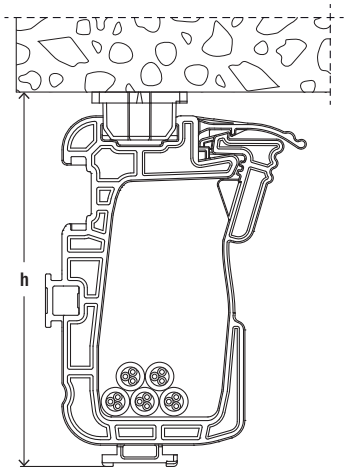

## Installation cable harness SHA II with Direct fastening on wall



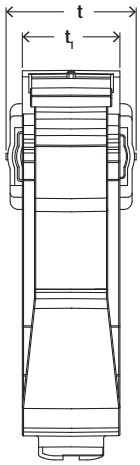
## Installation cable harness SHA II with plug on wall



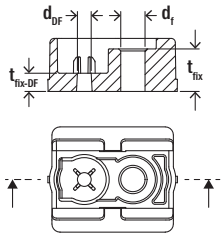



SHA II ceiling




SHA II front




SHA II detail

## Technical data

**Cable harness SHA II**



SHA II

| Item | Item no. | Height h [mm] | Width b [mm] | Depth t [mm] | Depth $t_1$ [mm] | Height mounting part $t_{fix}$ [mm] | Height mounting part Direct fastening $t_{fix-DF}$ [mm] | Max. nail shank diameter Direct fastening $d_{DF}$ [mm] | Max. number of ducts | Sales unit [pcs] |
|---|---|---|---|---|---|---|---|---|---|---|
| **SHA 20 II** | **574612** | 102.5 | 73.5 | 32 | 24 | 10 | 4.5 | 3 | 20 ducts NYM 3 x 1,5 | 100 |
| **SHA 40 II** | **574613** | 132.5 | 83.5 | 32 | 24 | 10 | 4.5 | 3 | 40 ducts NYM 3 x 1,5 | 50 |

# Gas actuated fastening tool FGW 90F

Quick and easy fastening in wood.






Flooring



Wood frame construction

## Applications

- Wood frame construction
- Roof battens
- External cladding
- Stud work
- Fencing
- Over boarding
- Truss work
- Flooring
- Packaging

## Advantages

- The 90 joules power ensures correct penetration into the working surface with up to three fixings per second.
- The embedment depth of the nails can be easily adjusted to the application.
- Maintenance intervals after every 20,000 fixings, under standard conditions, ensure a long service life.
- Ring and smooth shank nails in different lengths allow universal use.
- The powerful rechargeable battery with Li-Ion power can be used for more than 8,000 fixings per charge. It is also suitable for the fastening tool FGC 100.
- The FGW 90F is supplied in the practical XL-BOXX, which is compatible with the L-BOXX.

## Certificates / Features

CE UKCA

## Building materials

- Solid wood
- Laminated timber
- Plywood
- Chipboard
- Fiberboard
- Veneer materials

## Functioning

- The FGW 90F is suitable for a fast and reliable installation with up to three fixings per second and more than 1,100 fixings per fuel cell.
- For optimum installation, the nose piece of the tool must be positioned correctly on the working surface.
- The LED display indicates the status of the battery, which is fully charged after 90 minutes (under standard conditions). After a charging time of only 10 minutes, 300 more nails can be fixed.
- The FGW 90F will operate within the temperature range of -7°C to +50°C.
- The tool can be easily transported and stored with the adjustable hook.
- The tool has a weight of 3.8 kg and the following dimensions:
  L 390 mm x W 108 mm x H 381 mm.

## Technical data

**Gas actuated fastening tool FGW 90F**



Tool FGW 90F



Battery charger BC 7.2 V



Li-Ion battery B 7.2 V



Set FGW 90F in XL-BOXX

| Item | Item no. | Contents | Sales unit [pcs] |
|---|---|---|---|
| **Set FGW 90F (EU)** | **560040** | 1 x fischer gas actuated fastening tool FGW 90F<br>1 x Protective cap<br>1 x Battery charger BC 7.2V incl. charging plug for EU<br>1 x Li-Ion battery B 7.2V - at least 2.5Ah<br>2 x Hex wrench<br>1 x XL-BOXX | 1 |
| **Set FGW 90F (UK)** | **560041** | 1 x fischer gas actuated fastening tool FGW 90F<br>1 x Protective cap<br>1 x Battery charger BC 7.2V incl. charging plug for UK<br>1 x Li-Ion battery B 7.2V - at least 2.5Ah<br>2 x Hex wrench<br>1 x XL-BOXX | 1 |
| **Set FGW 90F (US)** | **560042** | 1 x fischer gas actuated fastening tool FGW 90F<br>1 x Protective cap<br>1 x Battery charger BC 7.2V incl. charging plug for US<br>1 x Li-Ion battery B 7.2V - at least 2.5Ah<br>2 x Hex wrench<br>1 x XL-BOXX | 1 |
| **Set FGW 90F (AUS)** | **560043** | 1 x fischer gas actuated fastening tool FGW 90F<br>1 x Protective cap<br>1 x Battery charger BC 7.2V incl. charging plug for AUS<br>1 x Li-Ion battery B 7.2V - at least 2.5Ah<br>2 x Hex wrench<br>1 x XL-BOXX | 1 |
| **Set FGW 90F (AR)** | **567397** | 1 x fischer gas actuated fastening tool FGW 90F<br>1 x Protective cap<br>1 x Battery charger BC 7.2 V incl. charging plug for AR<br>1 x Li-Ion battery B 7.2 V - at least 2.5 Ah<br>2 x Hex wrench<br>1 x XL-BOXX | 1 |

## Accessories for the fastening tool

**Accessories for the fastening tool**



Battery charger BC 7.2 V



Li-Ion battery B 7.2 V

| Item | Item no. | Features | Sales unit [pcs] |
|---|---|---|---|
| **Battery charger BC 7.2V (EU)** | **553414**[1)] | Input 100-240 V, Output 8.4 V – 2 A | 1 |
| **Battery charger BC 7.2V (UK)** | **553588**[1)] | Input 100-240 V, Output 8.4 V – 2 A | 1 |
| **Battery charger BC 7.2V (US)** | **553589**[1)] | Input 100-240 V, Output 8.4 V – 2 A | 1 |
| **Battery charger BC 7.2V (AUS)** | **553590**[1)] | Input 100-240 V, Output 8.4 V – 2 A | 1 |
| **Battery charger BC 7.2V (AR)** | **560092**[1)] | Input 100-240 V, Output 8.4 V – 2 A | 1 |
| **Li-Ion battery B 7.2V** | **553415** | > 8,000 fixings per charge – at least 2.5 Ah | 1 |

[1)] Country specific charging plug. Possibly further variants.

## Accessories for the setting tool

**Accessories for the setting tool**



Fuel cell FC 165



Cleaning kit

| Item | Item no. | Features | Sales unit [pcs] |
|---|---|---|---|
| **Fuel cell FC 165** | **553416** | For more than 1,100 fixings | 1 |
| **Fuel cell FC 165 x2** | **538211** | For more than 1,100 fixings | 1 |
| **FGC 100 Cleaning kit** | **553718** | 150 ml Cleaner, 100 ml Lubricating Oil and tool rubber sealing rings | 1 |

## Nails for fixings

**Nails for fixings**




Smooth-shank nails




Ring-shank nails

| Item | Item no. | Length l [mm] | Features | Sales unit [pcs] |
|---|---|---|---|---|
| **FF NFP 51x2.8 mm RD bri** | **534693** | 51 | Bright nails with ring shank, including 3 fuel cells | 3,300 |
| **FF NFP 63x2.8 mm RD bri** | **534694** | 63 | Bright nails with ring shank, including 3 fuel cells | 3,300 |
| **FF NFP 75x2.8 mm RD bri** | **534695** | 75 | Bright nails with ring shank, including 2 fuel cells | 2,200 |
| **FF NFP 75x3.1 mm RD bri** | **534699** | 75 | Bright nails with ring shank, including 2 fuel cells | 2,200 |
| **FF NFP 90x3.1 mm SD bri** | **534700** | 90 | Bright nails with smooth shank, including 3 fuel cells | 2,200 |
| **FF NFP 51x2.8 mm RD gvz** | **534703** | 51 | Gvz nails with ring shank, including 3 fuel cells | 3,300 |
| **FF NFP 63x2.8 mm RD gvz** | **534704** | 63 | Gvz nails with ring shank, including 3 fuel cells | 3,300 |
| **FF NFP 63x3.1 mm RD gvz** | **534705** | 63 | Gvz nails with ring shank, including 2 fuel cells | 2,200 |
| **FF NFP 75x2.8 mm RD gvz** | **534706** | 75 | Gvz nails with ring shank, including 2 fuel cells | 2,200 |
| **FF NFP 75x3.1 mm RD gvz** | **534707** | 75 | Gvz nails with ring shank, including 2 fuel cells | 2,200 |
| **FF NFP 90x3.1 mm RD gvz** | **534701** | 90 | Gvz nails with ring shank, including 2 fuel cells | 2,200 |
| **FF NFP 90x3.1 mm SD gvz** | **534702** | 90 | Gvz nails with smooth shank, including 2 fuel cells | 2,200 |
| **FF NFP 51x2.8 mm RD hdg** | **558077** | 51 | Hdg nails with ring shank, including 3 fuel cells | 3,300 |
| **FF NFP 63x2.8 mm RD hdg** | **558075** | 63 | Hdg nails with ring shank, including 3 fuel cells | 3,300 |
| **FF NFP 63x3.1 mm RD hdg** | **558076** | 63 | Hdg nails with ring shank, including 2 fuel cells | 2,200 |
| **FF NFP 75x2.8 mm RD hdg** | **534710** | 75 | Hdg nails with ring shank, including 2 fuel cells | 2,200 |
| **FF NFP 90x3.1 mm SD hdg** | **558078** | 90 | Hdg nails with smooth shank, including 2 fuel cells | 2,200 |
| **FF NFP 51x2.8 mm RD R** | **534713** | 51 | Stainless steel nails (304/1.4301) with ring shank, including 1 fuel cell | 1,100 |
| **FF NFP 63x2.8 mm RD R** | **534714** | 63 | Stainless steel nails (304/1.4301) with ring shank, including 1 fuel cell | 1,100 |
| **FF NFP 63x3.1 mm RD R** | **534779** | 63 | Stainless steel nails (304/1.4301) with ring shank, including 1 fuel cell | 1,100 |
| **FF NFP 75x3.1 mm RD R** | **534716** | 75 | Stainless steel nails (304/1.4301) with ring shank, including 1 fuel cell | 1,100 |
| **FF NFP 90x3.1 mm SD R** | **534717** | 90 | Stainless steel nails (304/1.4301) with ring shank, including 1 fuel cell | 1,100 |
| **FF NP 51x2.8 mm RD gvz** | **558081** | 51 | Gvz nails with ring shank | 3,300 |
| **FF NP 63x2.8 mm RD gvz** | **558082** | 63 | Gvz nails with ring shank | 3,300 |
| **FF NP 63x3.1 mm RD gvz** | **558083** | 63 | Gvz nails with ring shank | 2,200 |
| **FF NP 75x2.8 mm RD gvz** | **558084** | 75 | Gvz nails with ring shank | 2,200 |
| **FF NP 75x3.1 mm RD gvz** | **558085** | 75 | Gvz nails with ring shank | 2,200 |
| **FF NP 90x3.1 mm RD gvz** | **558079** | 90 | Gvz nails with ring shank | 2,200 |
| **FF NP 90x3.1 mm SD gvz** | **558080** | 90 | Gvz nails with smooth shank | 2,200 |



# 16 Basics – good to know


| | |
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# Building material – concrete

## The substrate's quality is crucial when selecting the correct fixing:



Concrete

A differentiation is made between concrete, masonry and panel building materials.
Concrete is made from a mixture of cement, aggregates and water.

### Concrete's main properties are:

- High level of compressive strength, but only low tensile strength (≈ 10 % of the compressive strength).
- Inserting individual rebars and or mats will increase tensile strength (steel + concrete = reinforced concrete).
- Structure easily reproducible as it is regulated by standards, therefore it is an ideal anchor base.

### Concrete is mainly split into two categories:

- **Standard concrete and lightweight concrete.** While standard concrete contains gravel; lightweight concrete contains additives such as pumice, expanded clay or polystyrene® usually with a lower compressive strength or bulk density. This leads to unfavourable conditions for anchor fixings.
- **The load bearing capacity of heavy duty fixings depends on the concrete's compressive and tensile strength.** This is indicated by the numbers in the abbreviations: e. g. the most commonly used concrete compressive strength is C20/25 with a cylindrical compressive strength of 20 N/mm².

### Expert tip

**Standard concrete qualities:**
C12/15 to C50/60, even higher grades are also available for special applications. The majority of anchors approved for concrete may only be used from concrete quality from C20/25 up to a max. of C50/60.
C = concrete
20 = compressive strength $f_{ck}$ or $f_{ck,\ cyl}$ of a concrete test cylinder (Ø 150 mm, height 300 mm) in N/mm²
25 = compressive strength $f_{ck,cube}$ of a concrete test cube (edge length 150 mm) in N/mm²

**Normal concrete:** without accelerating additives reaches its nominal strength after 28 days. Only then can the fixing be installed in compliance with the approval /assessment.
**Fresh concrete:** still workable up to approx. one hour after pouring.
**Green concrete:** starts to harden after four hours, no longer workable.
**New concrete:** more than 4 hours up to 28 days, however minimum compressive strength not yet reached.
**Hard concrete:** more than 28 days old, nominal strength reached.

## Compressive strength classes in different countries [2)]

| Country | Specimen | Dimensions [1)] [cm] | Concrete strength class | Unit | Standard |
|---|---|---|---|---|---|
| China | Cube | 15x15x15 | C15, C20, C25, C30, C35, C40, C45, C50, C55, C60 | $N/mm^2$ | GB50010-2010 |
| Denmark | Cube | 15x15x15 | C12/15, C16/20, C20/25, C25/30, C30/37, C40/50, C45/55, C50/60 | $N/mm^2$ | DS/EN 206 |
| Germany | Cube | 15x15x15 | C12/15, C16/20, C20/25, C25/30, C30/37, C40/50, C45/55, C50/60 | $N/mm^2$ | EN 206 |
| France | Cylinder | 16x32 | B20, B25, B30, B35, B40, B45, B50 | $N/mm^2$ | BAEL 91 |
| Great Britain | Cube | 15x15x15 | C20, C25, C30, C37, C40, C45, C55, C60 | $N/mm^2$ | BS EN 12390-3:2009 |
| Italy | Cube | 15x15x15 | C 8/10, C12/15, C16/20, C20/25, C25/30, C28/35, C30/37, C32/40, C35/45, C40/50, C45/55, C50/60 | $N/mm^2$ | UNI EN 206 |
| Japan | Cylinder | 10x20 | ≥ 15 | $N/mm^2$ | JIS A 1108 |
| Korea | Cylinder | 10x20, 15x30 | 18, 21, 24, 27, 30 | $N/mm^2$ | KS F 2405 |
| The Netherlands | Cylinder | 15x30 | C 8/10, C12/15, C16/20, C20/25, C25/30, C30/37, C35/45, C40/50, C45/55, C50/60 | $N/mm^2$ | NEN-EN 206-1 |
| Austria | Cube | 15x15x15 | C 8/10, C12/15, C16/20, C20/25, C25/30, C30/37, C35/45, C40/50, C45/55, C50/60 | $N/mm^2$ | ÖNORM B 4710-1 |
| Sweden | Cube | 15x15x15 | C12/15, C16/20, C20/25, C25/30, C30/37, C40/50, C45/55, C50/60 | $N/mm^2$ | SS-EN206 |
| Switzerland | Cube | 15x15x15 | C12/15, C16/20, C20/25, C25/30, C30/37, C40/50, C45/55, C50/60 | $N/mm^2$ | SIA 262 |
| Spain | Cylinder | 15x30 | Unreinforced concrete: HM-20, HM-25, HM-30, HM-35, HM-40, HM-45, HM-50<br>Reinforced concrete:HA-25, HA-30, HA-35, HA-40, HA-45, HA-50<br>Pre-stressed concrete:HP-25, HP-30, HP-35, HP-40, HP-45, HP-50 | $N/mm^2$ | EHE-08 |
| USA | Cylinder | 15x30 | 2000, 2500, 3000, 3500, 4000, 5000, 6000, 7000, 8000 | Psi | ACI 318 |

[1)] Conversion: $f_{Cylinder} = 0.85 \times f_{Cube}$, 20x20x20; $f_{Cube}$, 15x15x15 = 1.05 x $f_{Cube}$, 20x20x20

[2)] In the EU countries, the harmonised standards for the consideration of concrete test specimens apply. The test specimens shown in the table may also relate to withdrawn material standards.



## Expert tip

- **Anchors** used in **new concrete** must **be suitable** for this purpose, or may only bear loads after reaching the minimum compressive strength.
- **Concrete** always shows **cracks** (shrinkage during hardening, loading).
- **In cracked concrete**, anchors which are tested in cracked concrete must be used. These anchors must be able to **expand** when concrete starts to crack e. g, expansion anchors (e. g. FAZ II Plus), form locking anchors or undercut anchors (e. g. FSU), or bonded anchors (e. g. FIS SB).
- **Cutting** through **reinforcement steel** while making **drill holes** is **not permitted**. In special cases, non load-bearing steels can be cut after consultation with the responsible engineer.
- The load bearing capacity of the concrete along the entire drill hole must be guaranteed (no honeycombing in the concrete, no voids and pockets).
- **Pre-stressed concrete**: A certain drilling distance must be maintained from the tensioning strands as stated in the approval/assessment (e. g. FHY, FBS 6 or EA II).

# Building material – masonry

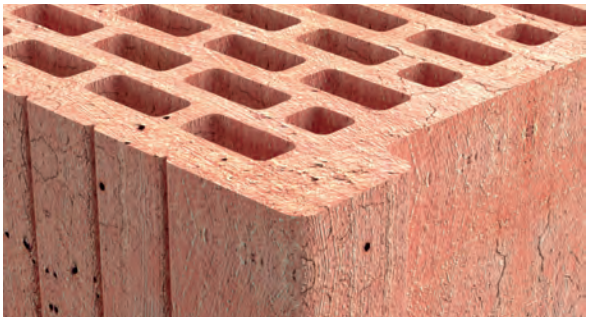
**The range of different masonry blocks that can be joined together using different mortars or adhesives to form a masonry bond is very large.**



Solid brick



Solid sand-lime brick



Vertically perforated brick



Porous sand brick



## Masonry can be classified according to:

- brick type used (e. g. natural stone, lime stone or aerated concrete).
- wall type (e. g. single or double layer).
- brick strength class and gross density.

## Generally, masonry is classified into four groups:

**1** Solid bricks with a dense structure are a highly compression resistant building material, without cavities or low hole surface percentage (up to a max. 15 % e. g. as grip holes). This type is very well suited for anchor fixings.

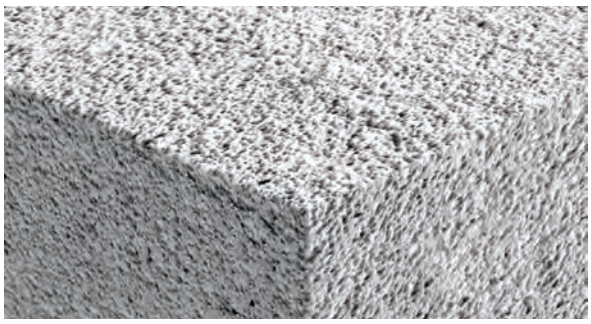
**2** Solid bricks with porous structure usually have a very large number of pores and low compressive strength. Therefore, special fixings should be used, e. g. fixings with a longer expansion zone or bonded anchors.

**3** Perforated bricks with a compact structure (perforated and hollow bricks) are mostly manufactured from the same compressive strength materials as solid blocks but with cavities. If higher loads are transferred to these building materials, special fixings should be used (e. g. bonded anchors, FIS V), which bridge or fill the cavities.

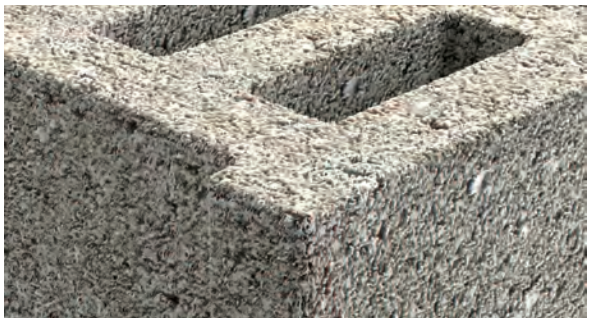
**4** Perforated bricks with porous structure have many cavities and pores and thus generally a low compressive strength. In this case, special care is required when selecting the fixing. Suitable fixings include those with a long expansion zone or form locking injection anchors.



Lightweight concrete solid block



Aerated concrete



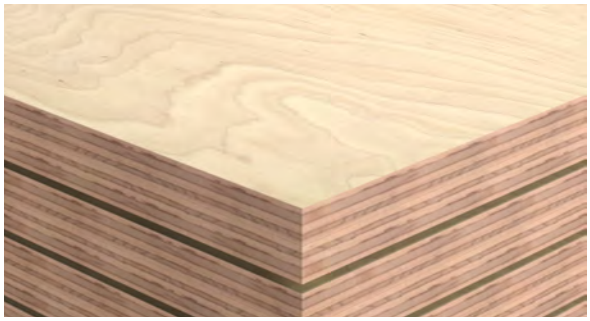
Lightweight concrete hollow block



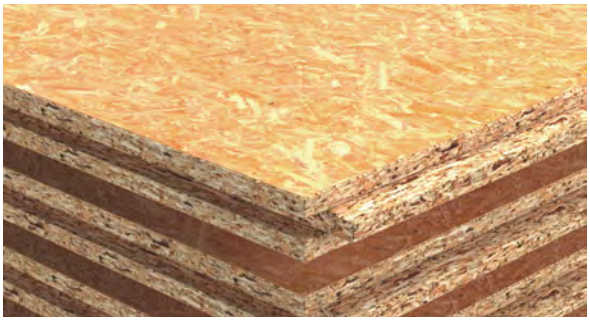
## Expert tip

- Before fixing in masonry, determine which brick type (designation, size, compressive strength) and mortar type (mortar group) has been used.
- For safety anchoring in unknown or old masonry, pull out tests must be carried out on-site to determine the anchor load bearing capacity.
- For fixings close to the edge, it is important to know if the wall is a load bearing wall as this prevents the risk of brick pull out.
- Even solid brick can have holes (e. g. MZ, KS). The holes are mostly larger grip-holes in the centre of the brick (up to max. 15 % cavity proportion per brick).
- Always drill without hammer function in perforated and hollow bricks. Here, special, sharply ground drills with hard metal tips are suitable.
- Plaster or other non load-bearing layers may not be added to the load-bearing base and are not to be used in calculating the anchorage depth.
- Avoid anchoring into masonry joints as much as possible due to joint inhomogeneity. If anchoring into a joint cannot be avoided (e. g. plaster on masonry) loads should be reduced.
- For systems approved by building authorities, anchoring in joints (vertical or horizontal joints) is regulated in the approval.
- For anchoring high loads in performated bricks, the anchorage depth should be increased.
- Expansion fixings (e. g. FAZ II Plus or FBN II) are not suitable for use in masonry due to its high expansion forces which may lead to cracks in the brick. Frame fixings are suitable due to its longer expansion part.
- Bonded anchors achieve the highest possible loads in masonry

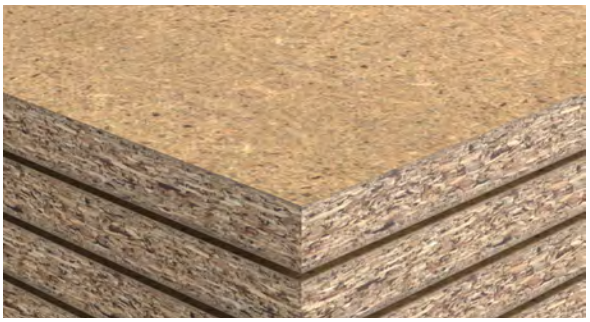
# Building material – drywall panels



Laminated wood panel



OSB boards



Chipboard



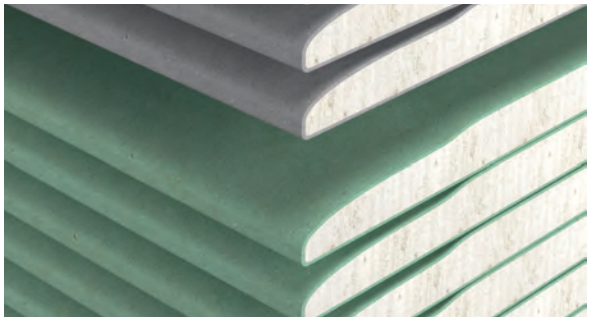
Panel building materials are thin-walled materials that often have limited strength – e. g. plasterboard like “Rigips”, “Knauf”, “LaGyp”, “Norgips”; Gypsum fibreboard like “Fermacell”, “Rigicell” or chip board, hard fibre boards, plywood and others.

## The main characteristics of panel building materials are:

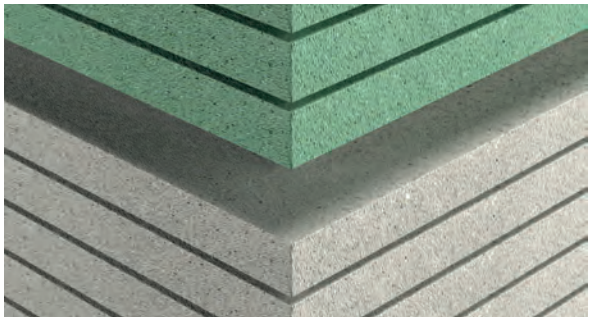
- Often thin-walled materials, mainly with limited strength.
- Easy-to-process materials for non load-bearing walls and also used as cladding material (e. g. walls, roofs or ceilings).
- A wide range of different building materials.

## Special fixing elements must be used:

- **Cavity fixings** are fixings made of plastic or metal, which anchor by form locking into the material, e. g. by knotting or a snap on mechanism (e. g. toggles).



Plasterboard



Gypsum fibre board



## Expert tip

- In **lightweight building materials, slabs or prestressed concrete hollow slab ceilings,** only use anchors that are approved or labelled as suitable for these substrates.
- Contact your fischer consultant on site before anchoring **heavy or safety-relevant loads** in the above-mentioned substrates

# Drilling

**The building material determines the drilling method. Five methods are possible:**

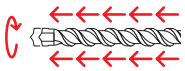




## Rotary drilling

Rotary drilling without impact, uses a sharply ground carbide drill bit. When this method is used, the drill hole does not become too large and the perforated brick's webs do not break.

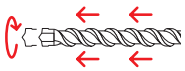




## Impact drilling (mechanical)

Impact drill with rotation and a high number of light strokes, is suitable for dense structured building materials.

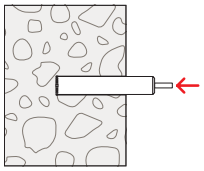




## Hammer drilling (pneumatic)

Hammer drill uses rotation and a low number of strokes with high impact energy, also suitable for dense structured solid building materials.

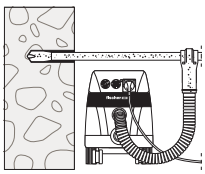




## Diamond or core drilling process

Mainly used for larger drill hole diameters or for highly reinforced components and/or if noise or vibration must be reduced.





## Hollow drilling

Special drill with a hollow core, which is connected to a vacuum cleaner. Cleans the drilled hole during the drilling operation. No further brushing or blowing is required. Can be used in concrete and masonry with dense structure.



## Expert tip

- The drilling method for approved anchors is specified in the **approval / assessment.**
- Drill bits with **excessively worn cutting** edges should **not be used** (see approval /assessment).
- For certain fixings, **special drills** are required (e. g. a stop drill) as per approval /assessment.
- **Drill holes** must be **carefully cleaned** (blown out and brushed). See the respective approval /assessment or manufacturer's specifications.
- The **drill hole depth** is always exacly specified and relates to a given anchoring base thickness. For general applications without an approval /assessment the following applies: the drill hole depth + 30 mm should not exceed the anchoring base thickness.
- In case of **incorrect drilled** holes (hitting reinforcements or wrong location), the location for the new drill hole depends on the applicable fixing). Usually, the distance for the new drill hole must be twice the depth of the incorrect drill hole. The wrong drill hole must be filled with injection mortar (e. g. FIS V).
- **Diamond core drilling** is only permitted if stated in the approval/assessment or according to manufacturer's guidelines (e. g. RSB, FIS EM Plus, FAZ II, FBS II...).
- **The load bearing capacity is reduced** by water filled holes or wet substrates especially for chemical or plastic fixings.
- **Cutting** through a reinforcement must be avoided.
- **The drill hole** must be drilled perpendicular to the anchor base (an inclinement of up to 5° is permited). Exceptional cases are regulated in the anchor approval /assessment and or according to manufacturer's guidelines.

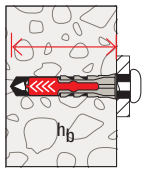
# Installation

**In general, the following aspects must be taken into consideration during installation.**

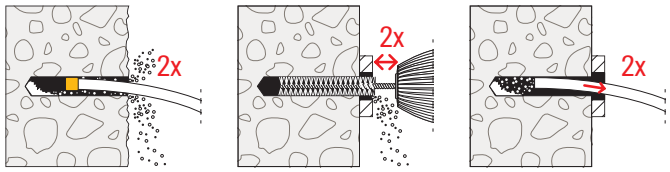
**The edge distance c and centre distance s,** as well as the component thickness and width , must be carefully observed to ensure that the fixing can take the required load. Otherwise, it may lead to spalling of the construction material or cracks. For fixings without approval, e. g. nylon fixings, a minimum edge distance of $c = 1.5 \times h_{ef}$ ($h_{ef}$ = anchorage depth) and a minimum spacing of $s = 1.5 \times h_{ef}$ must be adhered to for concrete. When using non approved metal anchors, a minimum edge distance of $c = 1.5 \times h_{ef}$ and a minimum spacing of $s = 3 \times h_{ef}$ is recommended. When using hammerset anchors, spacing and edge distance can increase due to higher expansion forces.




**The drill hole depth $h_b$** must be larger than the anchorage depth (exception chemical anchor systems), to ensure that the screw has enough room at the end of the fixing element to penetrate at least one time the screw's diameter.




**Drill hole cleaning** after drilling, e. g. by blowing out, brushing or suction, is generally necessary. The load bearing capacity will be reduced, if the hole is not cleaned.
Exceptions: approved anchor systems where no hole cleaning is required, e. g. FHB II + PF - High speed capsule.

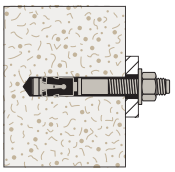



## Expert tip

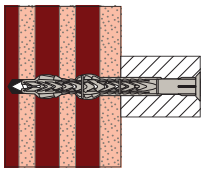
- **Strictly adhere to specifications** for component geometry, edges and spacings distances. If this is not taken into account, the component will be damaged or the anchor capacity will be reduced.
- **Drill hole cleaning is essential.** The specifications in the approvals and the manufacturer's specifications must be observed.

# Installation types

**There are three different types of installation.**



Anchor bolt
FAZ II Plus

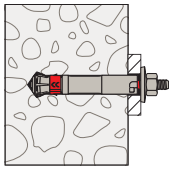


Frame fixing SXRL

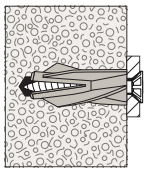
## Push-through installation

In particular for simplifying installation for series installations or for attachments with two or more fixing points:

- If the attachment's hole diameter is larger than the drill bit diameter, then the attachment can be used as a template. Please note: The drill bit tip is generally larger than the nominal diameter of the drill.
- In addition to facilitating a simple installation, an exact fit is also achieved.
- The fixing is inserted into the drill hole through the attachment and then tightened (e. g. FAZ II Plus, FBN II, FH II).



Strong undercut anchor
FSU

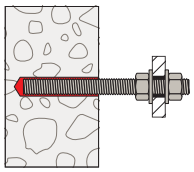


Aircrete anchor GB

## Pre-positioned installation

The anchor is installed before fastening the attachment. If drilling is not done precisely, then the holes in the attachment will not match up. This could mean that the anchors cannot be installed or could cause damage to the anchors.
The installation sequence:

- Transfer the hole pattern of the fixture to the anchor base.
- Drill and clean the holes, install the attachment and then fix the attachment (e. g plastic fixings: S, SX, UX; metal fixings: FSU, EA II).



Threaded rod FIS A

## Stand-off installation

This allows attachments to be compression and tension resistant at a certain distance from the anchor base. For this purpose, external threaded metal anchors (e. g. FAZ II, FBN II) or internal threaded anchors (e. g. EA II) with screws or threaded rods are clamped against the anchor base surface while using a bearing washer and nut. When using chemical systems with threaded rods (e. g. FIS SB, FIS V, FIS V Plus, FIS EM Plus, and FIS A), the installation can be done without using a bearing washer and nut. A stand-off installation is absolutely not recommended in seismic regions.

## Expert tip

- **Clearance holes in the attachment** are specified for the respective anchor size in the assessments and manufacturer's guidelines.
- **For stand - off installations** with shear loads on the anchor, additional bending moment occurs and this must be considered.
- **The attachment must lie** fully flush on the surface base or it must have either a compression resistant levelling layer of max. 3 mm or half the anchor's diameter, otherwise the anchor must be checked for bending.
- **The attachment shall be in contact with the anchor** over its entire thickness, otherwise the anchor must be checked for bending.
- **Usable length is the maximum fixing height** $t_{fix}$ which takes into account the attachment's thickness plus additional non-bearing layers (e. g. plaster, air, insulation etc.).
- Post-installed anchors must be tightened with a prescribed installation torque. A calibrated torque wrench must be used to ensure the correct pre-stressing force and the correct installation of the anchor. **For chemical anchors, the prescribed hardening time must be adhered** to before tightening torque or service load can be applied.
- Anchors must be mounted as a standard unit as delivered. The exchange or removal of parts is not permitted.

# Load types and loads

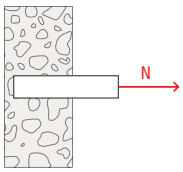
**When selecting an anchor, it is necessary to know the load on the total construction and the resulting action forces.**

## Action forces can differ based on:

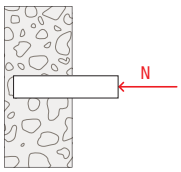
Dimension · Direction · Type of load · Point of application

- There are various types of loads:
  Approvals generally give characteristic resistance. In the manufacturer's guidelines, **"permissible loads"** are specified for products with approvals. For anchors without an approval, **"recommended loads"** are given by the manufacturer.
- **Determine the size, direction and point of application** of the load. These parameters determine which anchor should be used.
- **Characteristic resistance** ($N_{Rk}$ or $V_{Rk}$) denote those loads that are reached or exceeded in 95% of all failure cases (i.e. in 5% of cases these loads are not reached).
- **Permissible loads** are working loads that already include an appropriate safety factor. These only apply if the approval conditions are complied with ($N_{perm}$ or $V_{perm}$).
- **Recommended loads or maximum working loads** include an adequate safety factor. These only apply if the manufacturer's specifications are complied with ($F_{rec}$ – valid for all load directions, $N_{rec}$ - for compressive or tensile load or $V_{rec}$ for shear load).
- **The calculation** is carried out by dividing the respective failure load or characteristic loads by a safety factor.
- **Recommended safety factors compared to the average failure load:**
  Steel and bonded anchors γ ≥ 4
  Plastic anchors γ ≥ 7
  Hammerfix anchors N γ ≥ 4
- **Recommended safety factors compared to the characteristic failure loads:**
  Steel and bonded anchors γ ≥ 3
  Plastic anchors γ ≥ 5
  For deviations to the regulation, see load tables. For certain products, the safety factors may deviate. In general, the global safety factor is calculated using the scatter of the faillure load, the failure probability and the reliability index of a product.
- **The specified loads** apply to individual anchors that are installed away from the edge, i. e. there is no influence from edges or other anchors.
- **The characteristic spacing and edge distances**, marked with $c_{cr,N}$ and $c_{cr,V}$, give the distances at which an anchor achieves its max. characteristic load.
- **The specified minimum spacing and edge distance**, marked with $s_{min}$ and $c_{min}$, indicates the distance at which no failure of the building material will occur when installing the anchor (cracks). These distances are mandatory and must be complied with. The characteristic centre and edge distances may be be undercut up to the minimum distances - with simultaneous reduction of the loads.
- When combined loads occur, loads are determined separately for tensile and shear load and the total utilisation is determined with the help of an interaction equation. As a rule, the sum of the ratio values of the applied load divided by the resistance from tensile and shear loads is less than or equal to one point two.

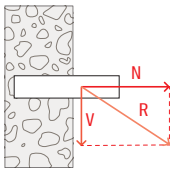
## Load directions



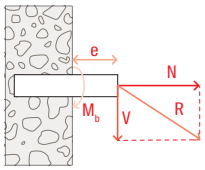
Tensile load



Compression load

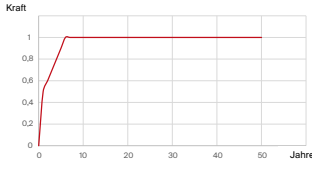


Oblique load
(tension and shear load)

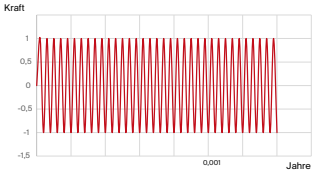


Oblique load at distance e
(Bend + tension + shear load)

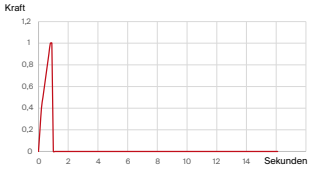
## Load types



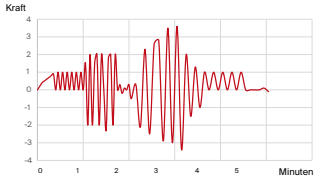
static and quasi-static



dynamic



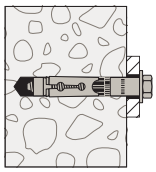
shock



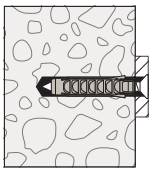
seismic activity

# Working principles

**There are different load transfer mechanisms which induce forces acting on the anchor in a building material.**

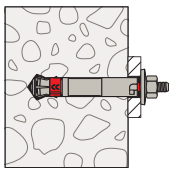


Sleeve anchor (e. g. FH II)

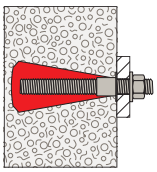


Nylon anchor (e. g. SX)

**For frictional locking,** the expanding part of the anchor is pressed against the drill hole wall.

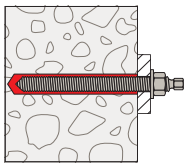


Strong undercut anchor FSU

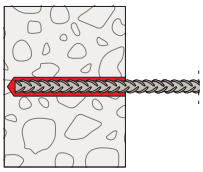


Injection anchor (e. g. FIS V with cone drill PBB)

**For form locking,** the anchor geometry adapts to the subtrate's form or drill hole shape (e. g. conical drill hole).



Resin anchor (e. g. Superbond RSB)



Subsequent reinforcement connector with concrete reinforcing bars (e. g. FIS EM Plus)

**For adhesive bonding,** the mortar connects the anchor with the base material based on its bond strength.

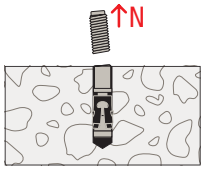
16

## Expert tip

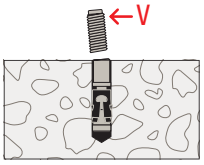
**For many fixings, a combination of working principles** occurs (e. g. in soft base material a combination of friction and form locking takes place).

# Failure modes

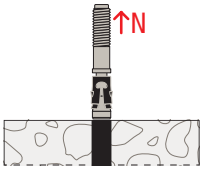
**If there is excessive stress, incorrect installation or a substrate with inadequate load bearing capacity, the following types of failure can occur.**



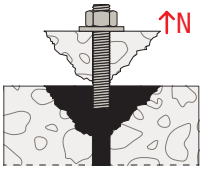

Steel failure tension




Steel failure shear




Pull out




Combined failure

## Steel failure:

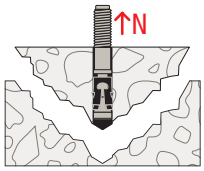
Insufficient steel stength for the applied load

## Pull out failure:

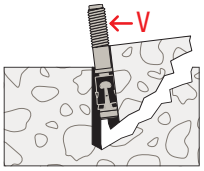
Failure of the frictional and / or material connection due to excessive load or incorrect assembly

## Combined failure:

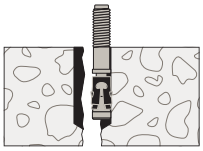
- Pull out
- Concrete failure near the surface



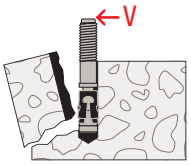

Concrete cone failure




Pry-out failure



Concrete splitting failure




Concrete edge failure

## Breakage of the anchor base:

- Tensile load “N” or shear load “V” too high
- Inadequate strength of anchor base
- Insufficient embedment depth

## Anchor base splitting:

- Insufficient component dimensions
- Deviation from the spacing and edge distances
- Excessive expansion pressure

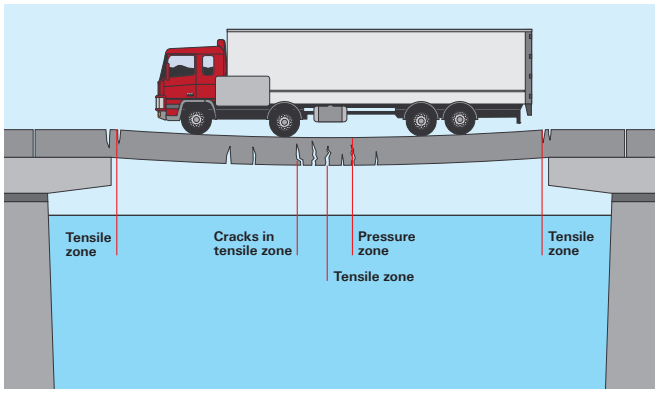
## Expert tip

- In most anchor assessments, the anchoring of predominately static loads is regulated. However, there are also approvals which regulate non-static loads (fatigue loads, e. g. FHB dyn).
- Seismic loads for post-installed anchors are regulated in Europe according to the Eurocode 1992-4 and the testing of the product for the seismic services is carried out with a European Technical Assessment ETA. The seismic performance of an anchor system is described according to performance categories in C1 and C2. In the American methods according to ACI-318-19 these categories do not exist for the seismic case, the testing of the product is always carried out according to an ICC-ESR report in concrete for the earthquake case. The performance category and the characteristic values are highlighted in the respective ETA (e. g. FAZ II Plus, FH II, FIS SB, FIS EM Plus...).
- **The main causes for anchor failure are overloading, incorrect installation or an insufficient load bearing anchoring base.**

# Cracks in concrete components

## Cracks can occur anywhere in concrete at any time:

Factors involved in this are loads such as dead loads, traffic or wind loads, concrete shrinkage and creeping or external influences such as seismic activity or ground motion result in stresses and deformations thus leading to cracks.




## Example

If a bridge designed as a single-span beam is loaded, the bridge will buckle. Due to this buckling, cracks occur in the element's tensile area.

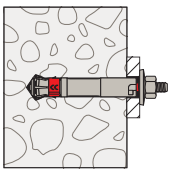
Concrete is not able to support tensile loads, therefore, reinforcements are placed in the element to take the tensile load area numerous cracks are formed that are barely visible to the naked eye. This is called the cracked tensile zone.



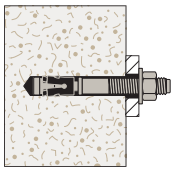
## Suitable anchor systems for cracked concrete

When fixing in concrete, **cracks** are always **expected in the anchoring area which will have an impact on the load bearing capacity** of the anchor system. However, it is very complicated, if not impossible, to prove whether the concrete is cracked or not cracked.

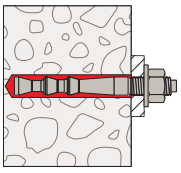
**For safety reasons**, designers and craftsmen should **always use fixings which are suitable for cracked concrete**. Fixings with an assessment according to EN 1992-4 for cracked concrete have proven their suitability in cracks, therefore they can be used without any restrictions in tensile and compression zones of a concrete member.



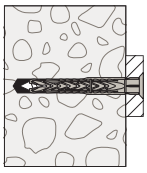
Strong undercut anchor FSU



Bolt anchor FAZ II Plus



Coned rod FHB II



Frame fixing SXRL

Due to safety reasons, always use crack-suitable anchor systems such as FAZ II Plus, FH II, FHB II, FIS SB, FIS EM Plus or FIS V Plus.

# Fire protection – fundamentals

**General requirements of building structures for fire protection.**

## Structural systems

They must be arranged, erected, modified and maintained in such a way that:

- The emergence of a fire is prevented from breaking out.
- The spread of fire and smoke is prevented.
- In the event of a fire, the rescue of people and animals is possible.
- Effective fire-fighting operations are possible.

## German regulation

In Germany, the procedure for construction and operational fire protection are specified by the fire protection standard DIN 4102, the Model Building Ordinance (MBO), Regional Construction Ordinances (LBO) and various trade-specific regulations from professional associations.

**The following applies as per Section 1 and 2 of DIN 4102:**

**Building materials** such as **concrete, wood, stone, metal** etc., are classified according to their behaviour **into flammable or non-flammable building material classes.**

However, **components composed** of different **flammable and non-flammable materials** are not classified into fire classes in building construction but they are evaluated as a complete system according to their fire resistance duration. The fire resistance duration R is indicated in minutes and classified according to two categories:

- **Components with a fire resistance duration of R30 and R60 are fire-inhibiting.**
- **Fire-resistant**, are all components with a fire resistance duration of R90, R120 and R180.

Tested systems such as cable, ventilation or duct systems are not only tested for fire resistance, but also for functional capability in the event of fire (e. g. supply lines to sprinkler systems). The fire resistance duration of these systems is e. g. E30 to E120 for electrical cable systems or L30 to L120 for specified ventilation ducts. The anchors that are used to fasten these systems must have at least the same fire resistance duration.

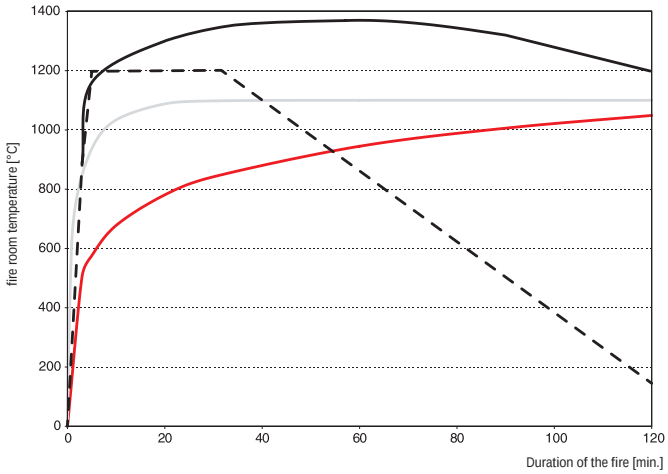
## European standardisation

**In accordance with the European Norm EN 13501-1, the classification of fire** behaviour of building materials/products is similar to that of DIN 4102. The classifications are, however, much more precise.

In addition to, the main classification criteria concerning flammability, flame spread and heat released, e. g. smoke development and dropping behaviour is tested.

Fire resistance of components has been tested in Germany in accordance with the European Norm EN 1363 or EN 1365 since the year 2000. The fire resistance duration is then labelled with the letter R for “Resistance”.

The standard temperature-time curve (ETK) of DIN 4102 and ISO 834 is based on a simulation of real fire conditions and forms the evaluation basis that is used worldwide to determine the fire resistance duration. In addition, there are other temperature curves for special fire exposures, e. g. the hydrocarbon curve for destructive fires caused by flammable liquids or the RAB/ZTV tunnel curve (Germany) or the Rijkswaterstaat tunnel curve (the Netherlands), which describe tunnel fires.




Temperature curves: (ETC), Hydrocarbon curve, RABT/ZTV tunnel curve Rijkswaterstaat tunnel curve

# Fire protection in fastening technology.

**The fastening technology has a decisive importance in fire protection. To ensure the functional capability and stability of railings, pipe systems, fire safety doors or ceiling elements.**



Before the fire test



During the fire test



After the fire test

**Assessing fixings for fire is carried out in accordance with the EN 1992-4 and the specifications in the technical assessments of the products.**

The labelling and classification of anchors and fixings is classified in:
1 Fire behaviour (e. g. non-flammable)
2 Fire resistance duration (e. g. R90)

For this purpose, the legal regulations set down in the final draft of the Delegated Act "Fire Behaviour" must be observed.

EN 1992-4 only allows verifications of anchors that have an **ETA for cracked concrete**!
A partial safety factor of $\gamma_M$ = 1.0 on the load side is used in the event of fire.

The fire resistances only refer to fixings that are directly exposed to flames.

Alternatively, anchors can be protected from direct exposure to fire by using fire protection panels or fire protecting coatings.

For fixing cladding systems, it is assumed that the load bearing capacity of specified plastic screw anchors in concrete with an external diameter of 10 mm and a metal screw diameter of 7 mm and an anchoring depth of $h_{ef}$ = 50 mm with a polyamide PA6 plastic sleeve has a sufficient fire resistance of at least 90 minutes (R90), if the permissible load (no permanent centric tensile load) is ≤ 0.8 kN.

# Corrosion

## Corrosion is a chemical reaction which degrades metal.

The less noble the metal ("electrochemical potential"), the more severe the material damage is, resulting in metal loss or corrosion flakes. For this reason, different appearance patterns have been determined. **The most common types of corrosion in fixings and anchors are:**

**Surface corrosion:** In this case, the metal corrodes relatively uniformly over the entire surface or over a part of the surface.
An example of this is the invisible rusting of a screw in the transition area from anchor plate to hole due to condensation. The result: A connection that appears completely intact from the outside, but suddenly fails.
**Contact corrosion:** If metals with a different nobility are in contact with each other in a conductive medium, the less noble metal always corrodes (the anode). Whereas stainless steel is not affected. A decisive factor is the surface ratios of the two types of metal:

The greater the surface area of the most noble metal in comparison with the less noble, the greater the corrosion. For example, if larger stainless steel attachments are mounted with galvanised fixings, the fixings will be agressively attacked within a very short time. Whereas using stainless fixings in galvinised attachment poses no problems.

**Stress corrosion cracking:** Permanent internal or external tensile stresses lead to metal strain or corrosion. In this process, a crack develops due to mechanical stresses, which grows under increasing loads and thus creates a path for progressive corrosion. For example, this occurs with stainless steel of corrosion resistance Class III e. g. R-Steel, in an atmosphere containing chlorine (swimming pools). Generally, stress corrosion cracking is not visible with fixings and usually leads to sudden failure of the anchoring.

## There are different ways to protect fastenings from corrosion. The most important are:

**Galvinised zinc coating** (or also electrolytic zinc coating) followed by passivation is the most common corrosion protection used in metal finishing. A zinc coating thickness of 3 – 10 µm only offers sufficient corrosion protection in dry indoor areas.

**Hot-dip galvanising** is the application of a metal zinc coating by dipping it in molten zinc (at approx. 450 °C). Zinc layer thickness's of 45 – 80 µm offer an excellent corrosion protection for moist rooms and outdoor use. As hot-dip galvanising is removed in some areas where, for example, the thread is recut, it only offers sufficient corrosion protection in dry indoor areas if the application instructions are strictly adhered to.

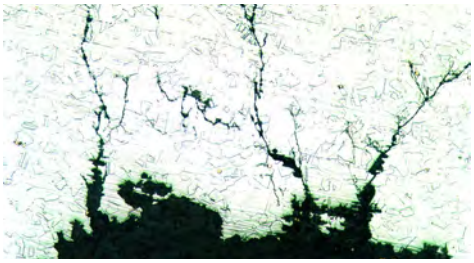
**Stainless steel fixings of corrosion resistance class III e. g.** R, material no. 1.4401, 1.4404 and 1.4571 as well as two phased duplex steel (austenitic and ferritic structure / magnetic) are suitable for anchoring in damp rooms, in open air, in industrial atmospheres or near the sea (but not directly in sea water).

**Stainless steel anchors made from high corrosion-resistant steel of the corrosion resistance class V** e. g. HCR material no. 1.4529 are used in high aggressive environments e. g. in atmospheres containing chlorine (swimming pools), in road tunnels or with direct sea water contact. Due to their high molybdenum content they are resistant in such aggressive enviroments. That means that steel type 1.4529 – containing chrome, molybdenum and nickel – has an alloy content of 58 %. The rest consists of iron and carbon. Due to this very high alloy content, the production for this steel type is very expensive, but on the other hand the conection is safe and maintenance – free in terms of corrosion.





In 1985, the suspended concrete ceiling of an indoor swimming pool collapsed in Uster, Switzerland. The stainless steel ceiling attachments exhibited no external defects, but were completely destroyed internally in some cases due to stress corrosion cracking.



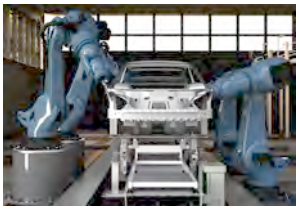
Example of trans-crystalline stress corrosion cracking on stainless steel 1.4401 with high chloride concentration

# Dynamics

## For fatigue relevant loads.



Elevator guide rails



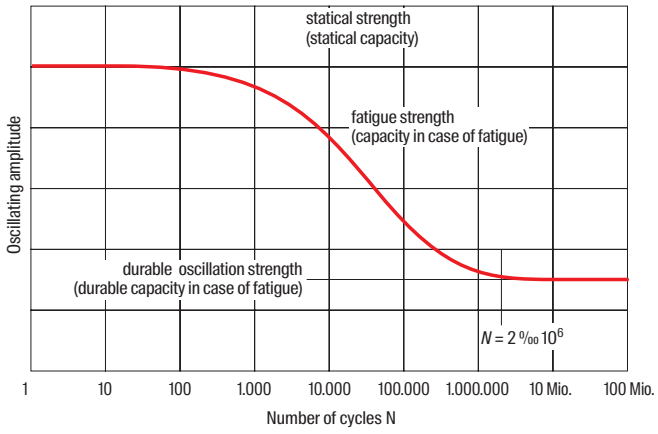
Industrial robots



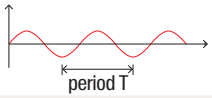
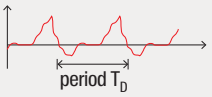
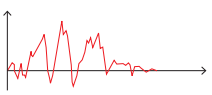
Jet fans



Antenna and masts




Wöhler curve

| Action | Run of the oscillation | | Possible cause |
|---|---|---|---|
| harmonic |   | sinusoidal | Unbalances, tumbling machines |
| periodic |   | optional, periodical | Regularly abutting parts (e.g. punching machines), rail- and road traffic |
| transient |  | optional, nonperiodical | Earthquakes |
| impulsive |  | optional, with very short time of influence | Impact, explosion |

The general building approvals issued by the **German Institute of Construction Engineering (DiBt) and the European Technical Assessments (ETA)** are mainly valid for predominately static loads. However, there are certain applications e. g. swinging cranes, crane rails, jib cranes, elevator guide rails, machines, industrial robots and jet fans in tunnels including antenna and masts which are subjeted to dynamic effects.

In general, the anchoring of components with more than > 1000 load cycles must be carried out using fastening elements that have been tested and approved for this purpose. Until recently, the design for post-installed anchors for such dynamically loaded applications was nearly impossible. Time consuming and costly expert reports and or approvals for individual applications were required.

The fischer Highbond anchor **FHB dyn, FDA, FSB dyn and FAZ II Plus are approved for dynamic loads.** In the approval, only fatigue loads are considered as dynamic loads and not loads by shock or seismic activity.

The approvals apply to the anchoring of dynamic loads with unlimited numbers of load cycles, for tension and for shear loads.

The fischer portfolio includes fischer Superbond FSB with threaded rods in steel grades 1.4401, 1.4571 and 1.4362 to provide adequate corrosion protection for corrosion resistance class III. The FAZ II Plus dyn in R version can also be used for this resistance class.

In corrosion resistance class V, the fischer Highbond anchor FHB dyn in HCR steel grade 1.4529 is available.

# Legal basis

**The European Union (EU) determines the legal bases for assessing, CE labelling and placing building products into the European Economic Area (EEA).**

**The aim is to reduce trade barriers by harmonising the requirements of building products.**

REGULATION (EU) No 305/2011 (Construction Products Regulations) OF THE EUROPEAN PARLIAMENT AND COUNCIL fully came into force on 1st July 2013. The Construction Products Regulation is law in all EU countries. However, the Construction Product Directive 89/106 / EEC is not law in all EU countries.
Construction products are products, or parts which are permanently incorporated into buildings. Their performance influences the structure's basic requirements (e. g. mechanical strength). Therefore, construction products and materials for safetly relevant applications are affected.

**Important building requirements include:**
1. Mechanical strength and stability
2. Fire protection
3. Hygiene, health and environmental protection
4. Safety and accessibility during use
5. Sound protection
6. Energy saving and heat protection
7. Sustainable use of natural resources

When a construction product is covered by a harmonised standard (hEN), or a European Technical Assessment has been issued for this product, the manufacturer is obligated to draw up a Declaration of Performance (DoP) for this product and affix the CE marking on the product. The application for an ETA for a construction product by the manufacturer is voluntary. National approvals may only be issued if a construction product is not marked with a CE label.

The reference number of the DoP is part of the CE marking and must be determined by the manufacturer. The Declarations of Performance (DoP) are available on the fischer website under "Approvals/Assessments": http://www.fischer.de/sdb.

The CE mark is the only means to certify whether the manufacturer has conformed to the applicable harmonised requirements of construction products. The CE label allows the construction product to be freely traded without trade barriers in the European Economic Area.

Each Member State determines the essential characteristics for use of the construction product and its performance in its territory. The unrestricted use of a construction product in a Member State depends on whether performance values exist in the DoP for the essential characteristics determined by the Member State. If one characteristic is declared with "NPD" (No Performance Determined), this can lead to a ban on use in a Member State. Therefore, each member State must establish Product Contact Points, which will provide information on these regulations. In Germany, this is the Federal Institute for Material Research and Testing (BAM: see www.pcp.bam.de).

# Assessment procedure

**Fasteners which are not covered by a harmonised standard (hEN) can apply for an ETA (European Technical Assessment) on the basis of a European Assessment Document (EAD).**

The EADs can be downloaded from the EOTA website: http://www.eota.eu
The assessment document for mechanical anchors (EAD 330232) and the assessment document for bonded anchors (EAD 330499) provide 12 options for the assessment of the products.

Options 1-6 are for use in cracked and non-cracked concrete, options 7-12 are only for use in non-cracked concrete. Anchors of Option 1 offer the largest range of flexibility for assessment, since performance values for concrete of the strength classes C20/25 to C50/60, as well as the minimum spacing and edge distances are available (see table below).

EAD 330747 regulates the assessment of metal fixings in cracked and non-cracked concrete for multiple use for non-structural systems. Non-load bearing systems include components which do not contribute to the stability of the building construction, they only transmit their dead and/or wind load. These are, for instance, simple suspended ceilings and false ceilings, pipelines and façade claddings. When using fixings for multiple use, it is assumed that if excessive slippage or failure of a fixing point occurs, the load will be transferred to neighbouring fixing points. A fixing point can be defined as a single anchor or a group of anchors.
This is known as a redundant system, where stability is not affected by an individual anchor failure.

## Possible assessment options according to EAD

| Options | Cracked concrete | Non-cracked concrete | One value for all concrete strengths | Different values for C20/25 to C50/60 | One value for load direction | Separate values for tensile and shear capacity | $C_{cr}/S_{cr}$ | $C_{min} < C_{cr}/S_{min} < S_{cr}$ | Design method as per EN 1992-4 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | ● | – | – | ● | – | ● | ● | ● | A |
| 2 | ● | – | ● | – | – | ● | ● | ● | A |
| 3 | ● | – | – | ● | ● | – | ● | ● | B |
| 4 | ● | – | ● | – | ● | – | ● | ● | B |
| 5 | ● | – | – | ● | ● | – | ● | – | C |
| 6 | ● | – | ● | – | ● | – | ● | – | C |
| 7 | – | ● | – | ● | – | ● | ● | ● | A |
| 8 | – | ● | ● | – | – | ● | ● | ● | A |
| 9 | – | ● | – | ● | ● | – | ● | ● | B |
| 10 | – | ● | ● | – | ● | – | ● | ● | B |
| 11 | – | ● | – | ● | ● | – | ● | – | C |
| 12 | – | ● | ● | – | ● | – | ● | – | C |

# Design of fastenings

**Two different anchor designs are differentiated.**

## Method with global safety factors

**Permissible loads are determined from the average failure load or from the 5 % fractile load and compared with the action load.**

The safety factor depends on the fixing system, the type of installation and external influences such as temperature and or humidity. Global safety factors are in generally $\gamma = 3$ for steel and bonded anchors and $\gamma = 5$ for plastic anchors.

**Methods with partial safety factors**

**According to this method, it is shown that the value of the design actions $S_d$ does not exceed the value of the design resistance $R_d$ ($S_d \leq R_d$).**

The design action is determined in accordance with EN 1990 (Eurocode 0) with national annex.

The design resistance is determined by using the characteristic resistance and the partial safety factor of the material ($\gamma_M$ ), which takes into account the scatter of the material. The values can be taken directly form the ETA. Safety is national law. The design method as well as the related partial safety factors are determined by the Member State.

Only the product-specific values for installation are specified in the ETA, which is used to calculate the partial factor $\gamma_M$. The design standard EN 1992-4, contains the national determined partial safety factors (observe the respective national appendex). fischer has developed a simple yet powerful design software for daily use: the fischer FiXperience-Module C-FIX. The software enables engineers to carry out anchor designs according to different design methods. Complex anchor arrangements can be calculated quickly and easily. The feature “multple design” makes it possible to select the best technical and cost saving solution.

The CE mark is the only means to certify whether the manufacturer has conformed to the applicable harmonised requirements of construction products. The CE label allows the construction product to be freely traded without trade barriers in the European Economic Area.

# Approvals, markings and their importance.

In the following, excerpts of approvals that are currently issued in Europe and their symbols will be given with their corresponding importance. Please check wether your application is safety relevant. An application is safety relevant when failure of anchorages would cause risk to human life or serious injuries and/or lead to considerable economic consequences. In this case please use anchors with a European Technical Assessment (ETA).
You may recognise these anchors by:

ETA-05/0069, for cracked concrete

**European Technical Assessment**
Issued by a European assessment authority (e. g. DIBt) on the basis of the guidelines for European technical assessment (EAD). ETA: European Technical Assessment. CE: The CE marks the conformity of the product to all applicable legal provisions in which their installation is intended. This means that the CE mark only certifies that the requirements determined in the relevant harmonisation legal provisions of the union have been complied with.
Products with the CE mark can be freely traded in the European Economic Area.

ICC ESR-2948

**ICC = International Code Council, formed from BOCA, ICBO & SBCCI**
ICC Evaluation Service Inc. (ICC ES) issues reports, e. g. for subsequent anchoring on the basis of the International Building Code® and the related standards in the United States of America.

From M10

**FM Certificate**
Recognised for use in local water-based fire extinguisher systems (Factory Mutual Research Corporation for Property Conservation, American insurance company).

**General Building Authority Approval**
German approval, issued by the DIBt, Berlin with the accompanying certificate of conformity for construction products with the general building authority approval. Confirmed by a material testing institute.

Fire resistance classification R120

**Fire-tested fixing**
The anchor was fire tested. A ‘Fire behaviour test report’ is available. Tests under fire exposure are not required if the simplified verification procedure according to EN 1992-4 is applied - then the values can be directly transferred to the ETA.

Product is available in highly corrosion resistant steel of corrosion resistance class IV, e.g. 1.4529.




**Dynamically loadable anchors**
The anchor is suitable and approved for anchoring of fatigue (i.e. dynamic) loads.




**General construction-related test certificate**




The fixing is suitable for anchoring under **seismic actions.**
Please note: The ICC-ESRs also allow seismic stress (see Category C1 and C2 in accordance with the EN 1992-4).



Label that confirm compliance of the product with the VDS-CEA guidelines for planning and installing sprinkler systems.
Fixings labelled as such may be used for fixing pipes for extinguishing systems.




**Tested for flammability in accordance with VDE**.




**Fixings suitable for tensile zones**
The fixing is suitable and approved for anchoring in cracked concrete (tensile zone) and in uncracked concrete (compression zone).




Fixing made of high-quality, ageing-resistant **nylon** (polyamide).




Component test with window frame screws in accordance with ift guideline M0-01/1; Testing structural connections on windows.

The term “approvals” used in the catalogue consists of documents that are available and can be used as evidence of the usability of building products for which the documents were issued. These are (fire) reports, general construction-related approvals issued by the German Institute for Construction technology Berlin (e. g. Z-21...) or European Technical Assessments (ETA). In general, the usability of construction products in an EU Member State is given, if the performance of the significant characteristics required in each Member State has been clarified/ confirmed by the manufacturer. Information on the significant necessary characteristics in a country can be found at the national Product Information Contact (Link: http://ec.europa.eu/Docs- Room/documents/4170/attachments/1/translations/en/renditions/native).



# 17 Services

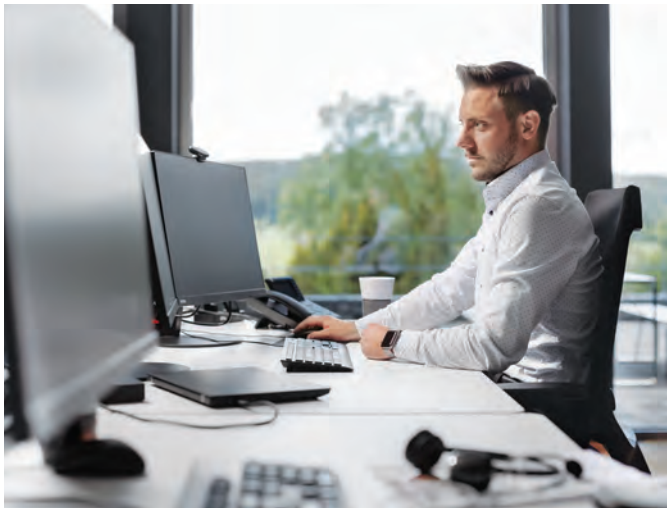

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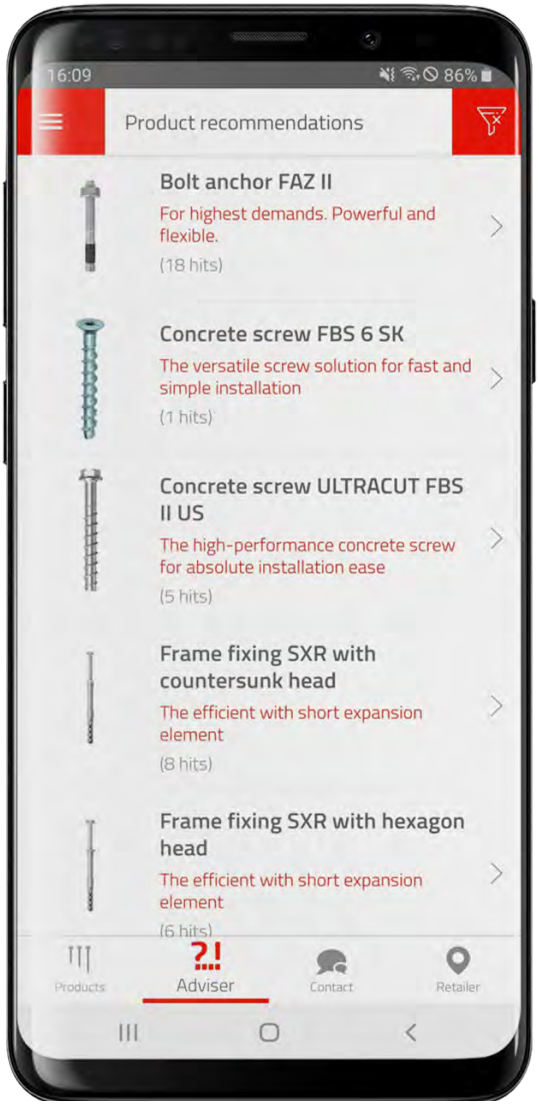


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## Bosnia and Herzegovina
**fischer Austria GmbH**
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## Armenia
**Siscoam OOO**
5/1,deghatan 10
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P +374 10531063

## Barbados
**Maxwell Trading Inc**
Salters Warehouse Complex
Salters, St George
P +246 4293731
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maxwelltrading@caribsurf.com

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## Chile
**COMERCIAL SERVIPER LTDA**
AV 10 DE JULIO 214 8320000
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P +56 228896361

## Côte d'Ivoire
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## Canada
**ShaRa Fixing & Tools Solutions Inc**
14 Leswyn Road, North York, Toronto, ON.
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Afshin@sharafixing.ca
**www.sharafixing.ca**

## Colombia
**MUNDIAL DE TORNILLOS**
CR 22 N 19 - 63
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P +57 601 3608066

## Croatia
**fischer Austria GmbH**
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## Canada
**Ancrages Canadiens Hegedus**
2260 Rue Michelin
Laval, QC H7L 5C3
P +1 514-381-3431

## Costa Rica
**Distribuidora Arsa S.A.**
Guadalupe , de Clinica Jerusalem 400 Este y 75 Sur
2110-2100 San Jose
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F +506 2285-4224
lartavia@disarsa.com
**www.disarsa.com**

## Curacao
**Caribbean Fasteners Group**
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purchase@cfh-group.com

## Canada
**Wm. P. Somerville Ltd.**
3964 Kitchener Street
BC V5C 3M2 Burnaby
P +1 604 298 36 22
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## Costa Rica
**Industria Ceramica Costarricense S.A.**
1.5 Km Oeste de Aviacion Civil, La Uruca
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Marietta.melendez@incesastd.com
**www.americanstandardca.com**

## Cyprus
**Unicol chemicals Ltd**
10.P.Demetrakopoulos street, P. O. Box 25606
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## Chile
**American Screw de Chile Ltda.**
Cno. A Melipilla 10338-C.1844
8320000 Santiago
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## Costa Rica
**TORCASA (TORNILLOS CENTROAMERICANOS S.A.)**
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# Importers

## Ecuador
**Pino Aristata Sociedad Anonima**
Luis Urdaneta Nr. 1909 y Tulcan
AP.09-04-500 Guayaquil
P +593 42288000

## Ecuador
**TESCO S.A.S.**
L.TEJADA OE15-173
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P +59 3998523445

## Egypt
**Modern Machines & Materials Co.**
23 El Madina El Monawara Street
Gouvernement Al-Qahira
P +20 2 3 03 02 51
enayatazab@gmail.com

## Estonia
**fischerpolska Sp.z o.o**
ul. Albatrosow 2
30-716 Kraków
P +372 524 0313
F +48 12 2 90 08 88
priit.siimu@fischerpolska.pl
**www.fischerfixing.ee**

## Ethiopia
**Aram Sarafian Trading P.L.C.**
PO Box 174, Lideta, Woreda 09, House 537
Addis Ababa, Ethiopia
P +251 115 515 257
info@sarafiantrading.com
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## French Polynesia
**fischer S. A. S.**
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## Gabon
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## Georgia
**GS Group Ltd.**
3, Kavsadze Str, 0179
Tbilisi

## Ghana
**C. WOERMANN (GHANA) LIMITED**
C362/1 Nsawam Road / Avenor Junction
P. O. Box GP 1779 ACCRA
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info@woermann-ghana.com
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## Guatemala
**Compañía Comercial e Industrial Electro Diesel de Guatemala, S. A (EDISA)**
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01004 Guatemala
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## Honduras
**Importadora Ferretera S.A**
BO Las Palmas Calle 17 CLL 5-6
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P +504 2554 1848
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dinora.rodriguez@imferra.com
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## Honduras
**Industrial Ferretera, S.A. de C.V.**
Calle Principal 401, San Jose del Pedregal
Comayaguela
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tmanueles@indufesa.com
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## Honduras
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yonysierra@larachycia.com
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## Iceland
**Byko Ltd**
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andres@byko.is
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## Ireland
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## Iraq
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## Jordanien
**Germania Building Solution**
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## Kuwait
**ZAINCO UNITED COMPANY**
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## Ireland
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# Importers

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## Mauritius
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dema@intnet.mu

## Mayotte
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## Mozambique
**Nova Vida Lda**
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Sultanate of Oman
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oman@fischer.ae
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## Peru
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P +51 1 7156901

## Nepal
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## Pakistan
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## Paraguay
**PETERSEN INDUSTRIA & HOGAR S.A**
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1645 Asuncion
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## Saint Pierre and Miquelon
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**Anchormark Pty.Ltd**
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marcus@anchormark.com.au
**www.anchormark.com.au**

## Paraguay
**LINCOLN S.A.**
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P +595 21654500/59521654666

## Saudi Arabia
**Brooq Al-Amaan Trading Co. BAT**
Prince Mansour Street, P.O. Box 6611 Building No. 5582, Al Bassam Tower, 9th Floor, Office No. 901 · 32241 Dammam
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info@batksa.com
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## Nigeria
**C. Woermann (Nigeria) Ltd.**
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## Paraguay
**PSB PARAGUAY S.A.**
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rita.dallal@hotmail.com

## Thailand
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1 Empire Tower Fl 47th Unit 4703 (River38)
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Bangkok 10120 Thailand
P +66 27473752
F +66 2 7473754
info@growvertex.co.th
**www.growvertex.co.th**

## South Africa
**Upat S.A. (Pty.) Ltd.**
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P +27 11 6 24 67 15 ·
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ideas@upat.co.za
**www.upat.co.za**

## Taiwan
**Perfect Link Co. Ltd.**
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F +886 2 22 19 9939
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## Togo
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kumar.rodrigo@dimolanka.com
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## Turkmenistan
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## Tajikistan
**fischer Metal Sanayi Ve Ticaret Ltd Sti**
Cevizli Mahallesi, Mustafa Kemal Paşa Cad.
Seyit Gazi Sok. No 66, Hukukçular Towers A
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## Uruguay
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## Uruguay
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## Venezuela
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## Vietnam
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## Vietnam
**VietTech Technology Development and Service Joint Stock Company**
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admin@viet-tech.vn
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| Battery charger BC 7.2V (AUS) | 553590 | 725 |
| Battery charger BC 7.2V (EU) | 553414 | 725 |
| Battery charger BC 7.2V (EU-Schuko) | 560039 | 725 |
| Battery charger BC 7.2V (UK) | 553588 | 725 |
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| BN/UBN 3,6 x 200 | 019802 | 563 |
| BN/UBN 3,6 x 200 | 037573 | 563 |
| BN/UBN 3,6 x 300 | 037490 | 563 |
| BN/UBN 3,6 x 300 | 069364 | 563 |
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| BN/UBN 4,6 x 160 | 069365 | 563 |
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