fischer
Fixing solutions for logistic & storage systems
A brand and its promise to perform

Customers who choose fischer get more than just a range of secure fixing products. Our goal is to ensure that we always offer our customers the best solutions with real added value.

In addition to innovative and outstanding products, this primarily includes user-oriented advice and benefit-oriented services. fischer is a leading brand in which engineering experts throughout the world place their trust.

Global presence

With more than 40 national subsidiaries and more than 100 importers, fischer has a global network with a strong presence. The advantages for you as a project customer are clear. There’ll always be a competent technical or sales partner in your vicinity and a high level of product availability is also guaranteed.

Customer advice

Our technical support service provides cost-effective, legally compliant advice for all questions relating to fastening systems. Services that you can access include test installations, pull-out tests, individual designs, comparative calculations, and the development of special solutions. Around the world, more than 130 engineers support you with their concentrated fastening expertise. We’re happy to give you advice – at our fischer Academy, at your office or at the construction site itself.

Products

We offer you a wide range of fastening solutions from the fields of chemical resins, steel and plastics. We cover a very broad application spectrum with our standard products as well as project-based solutions and customer-specific special developments. All of these are based on our know-how and experience gleaned during more than 60 years in anchoring technology. You can depend on it.
Services for logistic & storage systems.

Research & development

We have our own research and development teams for chemical resins, steel and plastics. This allows our own research results, market trends and customer requirements to be quickly embraced and converted into market-ready products. In addition to the capability and quality of our products, safe and fast installation is also vital. This pays off by saving you time, money and labour.

Production

With research and development, tool-making, special machine construction and production facilities for chemistry, steel and plastics, the entire production process of our products takes place in-house. Our quality management system is certified in accordance with DIN EN ISO 9001.

Design software

Our new modular design software suite is called „Fixperience“. It offers safe and reliable design along with top processing comfort. The software is based on international design standards (ETAG 001, EC1, EC2, EC3 and EC5), including the national application documents. All common force and measurement units are available. A free „live update“ is available at all times at: www.fischer.de/fixperience

Certifications

We don’t compromise on the safety of our products. We take part in the leading international, standard-setting councils in the fastening technology sector, thus contributing our knowledge to their work. Many of our products are characterised by thorough, up-to-date, international approvals/assessments, technical certifications and expert reports. For you, this means safety that you can rely on.

The environment

We actively consider the aspect of sustainable construction. Our environmental management system is certified in accordance with DIN EN ISO 14001. A growing number of our products have an Environmental Product Declaration (EPD) from the Bauen und Umwelt e.v. (IBU) institute, which constitutes the data basis for an ecological building evaluation. And our greenline product range is already based on more than 50% sustainable raw materials – certified in accordance with DIN CERTCO/TÜV Rheinland.
Solutions for logistic & storage systems.

- Rack systems
- Material handling & conveyor technology
- Protection devices & safety enclosures
- Storage & retrieval machines
- Other applications. Loading docks, mezzanines etc.
Rack systems

Rack-uprights must be fixed to the floor to ensure stability against overturning and sway. The selection and design of the appropriate anchor system depends mainly on the floor base material and the acting load on the rack system.

Protection devices & safety enclosures

Impact damage caused by forklift trucks, trolleys or other moving equipment shall be avoided by appropriate safety measures like collision protectors for racking uprights (column guards), protection for the ends of aisles or demarcation of pedestrian areas. Mesh guards are protecting employees from machinery, robotic cells or dangerous equipment.

Storage & retrieval machines

Automated storage and retrieval material handling systems move horizontally within an aisle, most supported by one or two guide rails or channels which are fixed to the floor and ceiling guided on top to ensure accurate vertical alignment.

Material handling & conveyor technology

Conveyor systems are an economical and highly efficient way to move goods and allow material handling in a facility without the use of manual labor. Conveyor systems like gravity, belt or roller conveyors are available in different shapes and lengths and are capable of moving light or heavy duty goods over long distances, buffering between functions and change vertical or horizontal directions.

Other applications. Loading docks, mezzanines etc.

Loading docks offer a wide range of different applications which must be fixed: sectional gates, bumpers, dock levelers, docking seals, steel stair-cases and electrical facilities. Mezzanines for additional warehouse space, designed as a steel structure for a 2nd or even 3rd floor, must be properly anchored, to the warehouse floor.
Logistic & storage systems are designed to store and move materials on pallets or skids. Although there are many varieties of storage equipment, all systems allow the storage of palletized materials in horizontal rows with multiple levels. Such systems including pallet racking, drive in racking, single or multi-tier shelving and mezzanines have become an essential and widely used element of most modern storage requirements. Due to the scale and size of such storage systems, some reaching a size of up to 45 m. Due to the potential for accidental impact forces when loading and decentering the systems it is essential that correct design and installation of the systems is conducted. The selection of the appropriate fasteners for fixing racking-uprights and protection equipment should be done carefully and depends on the floor base material.

**Design criteria for pallet racking according EN 15512:2009**

The design forces in the floor fixings shall be calculated for the most difficult load combination at the ultimate limit state and the anchorages shall be designed in accordance with ETAG No 001. Each upright to floor connection shall be able to transfer a minimum un-factored force of 3 kN in tension and 5 kN in shear. For anchorages in concrete, the following parameters are important:

a) Thickness of the structural concrete floor (any added screed will not contribute to the strength of the anchorage)
b) Quality of the concrete
c) Percentage of reinforcement in the top of the slab
d) Whether the anchorage is in the tension or compression zone
e) Distance between anchors
f) Distance between anchorage and edge of the concrete slab
g) Difference between size of the hole in the base plate and diameter of the anchorage

When the concrete slab is placed directly on the soil, the tensile stresses in the upper layers of the concrete are generally small and the top of the slab may be considered as being in the compression zone.

**Cracked concrete**

When anchoring in concrete, it is often presumed that tensile cracks are present in the anchoring area that influence the bearing capacity of the fixings. However, it is very complicated, if not impossible, to prove whether the concrete is cracked or non-cracked. For safety reasons, the use of fixings suitable for cracked concrete is recommended. Fixings with an approval/assessment according to ETAG 001 (in future EAD) for cracked concrete have proved their suitability in cracks and may be used without restriction in the tensile and compressive zones of concrete members. Fixings suitable for cracked concrete are also checked and approved according to American standards. These “evaluation reports” are prepared according to ACI 318.

**Load-bearing behaviour of anchors in steel fibre concrete (SFRC)**

Steel Fibre Reinforced Concrete (SFRC) is a modern day composite material in which the concrete’s relatively low tensile strength and ductility are counteracted by the inclusion of steel fiber reinforcement. This inclusion produces a material which exhibits the same load bearing capabilities to traditional reinforced concrete. The use of post installed anchors in SFRC has not been regulated at present, unlike traditional concrete where they follow the guidelines and codes as documented in the ETAG 001 or ACI 318-D for standard grades of concrete from C25 to C50.

Tests with resin systems, expansion anchors and concrete screws have been performed in SFRC with a steel content of 25 and 60 kg/m³ by independent institutes to investigate the load bearing capacity and failure mechanism. The test series did not show any significant difference between SFRC and normal
weight concrete in failure loads. Thus, calculations for applica-
tions can be based on a comparable normal weight concrete in
line with the stipulations of ETAG 001 Appendix C which are
incorporated in Eurocode EN 1992-4 or TR 029. However, as the-
re is no building authority approval/assessment, it is necessary
to get the permission of the authorities or an individual approval/assessment by a qualified engineer. The calculation should be
carried out for the assumption of cracked concrete with suitable
anchor systems. Possible shrinkage cracking is avoided by saw
cutting joints into the surface of the slab. The joints should be
considered as an edge in the design. Special attention should be
paid to the load transfer of the forces applied by the anchor.
Therefore we recommend carrying out additional tests to verify
the load-bearing capacity of the used anchor system.

Impact

Safety equipment – collision protectors
Safety equipment, such as guardrails, low
level barriers, bollards and rack column pro-
tector guards help to prevent damage caused
by lift trucks, roller containers, transport trolleys or pallet trucks.
They protect shelves, cabinets, wall mounted protruding equip-
ment as well as pedestrians against damage from collision. Post
protectors help to extend the life time of pallet racks and building
columns by protecting against vehicle collision. They absorb and
distribute shock from sudden impact, preventing potential
hazardous effects. The protectors are mainly made of steel plates
and are brake-formed to protect posts on exposed sides.

According EN 1991-1-7, design values for accidental
actions due to impact from forklift trucks should be deter-
mined to take into account the dynamic behavior of the forklift
truck as well as the structure. The structural response may
allow for non-linear deformation. As an alternative to a dynamic
analysis, an equivalent static design force F may be applied. DIN
EN 1991-1-7/NA (National Appendix Germany) is providing com-
plementary information for impact loads caused by the impact of
forklifts into shelves. For the load case „forklift collision“ to
authoritative shelf props on the way side a horizontal load of 2.5 kN
must be considered at 0.4 m height in the cross-aisle direction
and 1.25 kN in down aisle direction. For the design of the sup-
ports, the loads are not acting simultaneously; the load cases
must be evaluated separately. Alternatively, the German
BGR 234; 4.2.5 (Trade association rules for safety and health at
work - Storage facilities and equipment) and EN 15512 states: A
collision protector should have a min. height of 400 mm and is
sufficiently designed if it can withstand 400 Nm impact energy.
With the new fischer FIXPERIENCE design software complicated
base plate geometries can be easy designed and calculated
(see picture below). Nevertheless, national codes and guidelines
must be observed when designing the fixings for collision protectors.
Rack systems.

**FAZ II**
- The tried-and-trusted expansion clip makes large load-bearing capacities possible, so fewer fixing points and smaller anchor plates are required.
- The reduced anchorage depths makes considerably shorter drill hole depths possible, so providing a noticeably faster installation.
- Fewer hammer blows and minimal torque slippage ensure safe and easy setting.
- The international approvals/assessments guarantee maximum safety and the best performance. Applications in earthquake regions (Seismic) are also covered by these approvals/assessments.

**FBN II**
- The standard anchorage depth achieves the maximum load-bearing capacity in non-cracked concrete.
- The reduced anchorage depth reduces the drill hole depth. This minimizes the amount of time needed for drilling and enables less wear on the drill.
- Great flexibility throughout the load range.
- Few hammer blows and the minimal torque slippage allow for a noticeably simpler installation.

**ULTRACUT FBS II**
- Top flexibility with regard to load and fixture thickness due to up to three approved embedment depths.
- The special saw tooth geometry enables fast cutting into the concrete.
- No drill hole cleaning is required for installation in ceilings or floors, or use of hollow drills with suction.
- The expansion-free anchorage (undercut) ensures really low edge and axial clearances.
The Highbond system FHB II achieves high load values in cracked concrete. Thus fewer fixing points and smaller anchor plates are required.

The resin capsule FHB II-P/PF can be used in uncleaned drill holes. This makes it an economical and fast solution.

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. This enables you to select the most economical solution based on your requirements.

Superbond (Anchor rod FIS A /RG M)

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. This gives the installer maximum flexibility.

Approved for seismic applications (performance category C1+C2 with injection system and C1 for capsule) as well as in waterfilled and diamond drilled holes (capsule only) ensures safety even under extreme conditions.

Maximum application temperatures of up to +150°C and minimum temperatures of -30°C open up new areas of use for bonded anchors.

More from fischer - Installation systems

See for further information: www.fischer.de
Protection devices & safety enclosures.

**FH II / FH II-I**
- The optimized geometry reduces the setting energy thus ensuring power-saving installation.
- The anchor design enables different head shapes for fixing points with a sophisticated design.
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Approval for seismic application only for threaded rod FIS A/RG M and not for internal threaded anchor RG M I.

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More from fischer - Drill bits

See for further information: www.fischer.de
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More from fischer - Electrical fixings

See for further information: www.fischer.de
Material handling & conveyor technology.

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Other applications.
Loading docks, mezzanines etc.

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**FBN II**

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- The reduced anchorage depth reduces the drill hole depth. This minimizes the amount of time needed for drilling and enables less wear of material.
- Great flexibility concerning the load range.
- Few hammer blows and the minimal torque slippage allow for a noticeably simpler installation.

**DUOPOWER / UX**

**DUOPOWER**

- Two component materials for top load values and intelligent functioning (expansion, folding, knotting), depending on building material - solid, perforated or pannel material.
- Great feedback (feel-good-factor) of the plug. You can feel exactly when the plug is installed perfectly.

**UX**

- 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.

**More from fischer - greenline**

See for further information: www.fischer.de
Accessories for installation.

- Dispensers (e.g. FIS AM or FIS DM S)
- Pneumatic cleaning tool ABP/ pneumatic dispenser FIS AP
- Cleaning brush BS for concrete/ cleaning brush with thread M8/SDS-adapter
- Drills and bits for concrete and masonry
- Blow out pump AGB
- Anchor bolt setting tool FABS (fits with FAZ II & FBN II)
- Setting tool RA-SDS (fits with RG M)
Overview fischer fixing competence.

Chemical fixings
Resin systems, in the form of cartridge or capsule systems, for fixing of high loads. A secure hold in cracked and non-cracked concrete, natural stone, masonry and aircrete – including reinforcement.

General fixings
A wide range of different nylon and metal anchors with and without screws and hooks. For fastening, assembling and installing lightweight objects in very diverse building materials.

Electrical fixings
E-fix plugs, cable and nail clamps, pipe clips, cable clasps and multi-cable supports. Everything you need for quickly laying cables and conduits.

Frame fixings / Stand-off installation
Frame fixings and hammer-in plugs with different head shapes. For fastening substructures, façades, cable trays, gates, etc. Can be used in concrete, solid brick, perforated brick, natural stone, aircrrete and much more.
Foams and sealants
Gun foams and quick assembly foams for filling, insulating, sealing, gluing and fixing. Silicones, acrylic building materials and bitumen sealants for grouting, sealing and gluing in diverse applications inside and outside.

Installation systems
Basis for secure guidance and mounting of pipelines within HVAC business. A clever system of universal channels, cantilevers, connection- and construction elements, pipe clamps and accessories in different material qualities and versions for versatile applications.

High performance steel anchors
Cost-effective, easy-to-install anchor bolts for high loads, undercut anchors, sleeve anchors and hammerset anchors. For a wide range of applications in cracked and non-cracked concrete.
Our service to you

We are available to you at any time as a reliable partner to offer technical support and advice:

- Our products range from chemical resin systems to steel anchors through to nylon 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 if requested.
- Training sessions, some with accreditation, at your premises or at the fischer academy.
- Design and construction software for demanding applications.

This is what fischer stands for

See the extensive main catalogue or visit our website at www.fischer-international.com for information about the complete fischer range