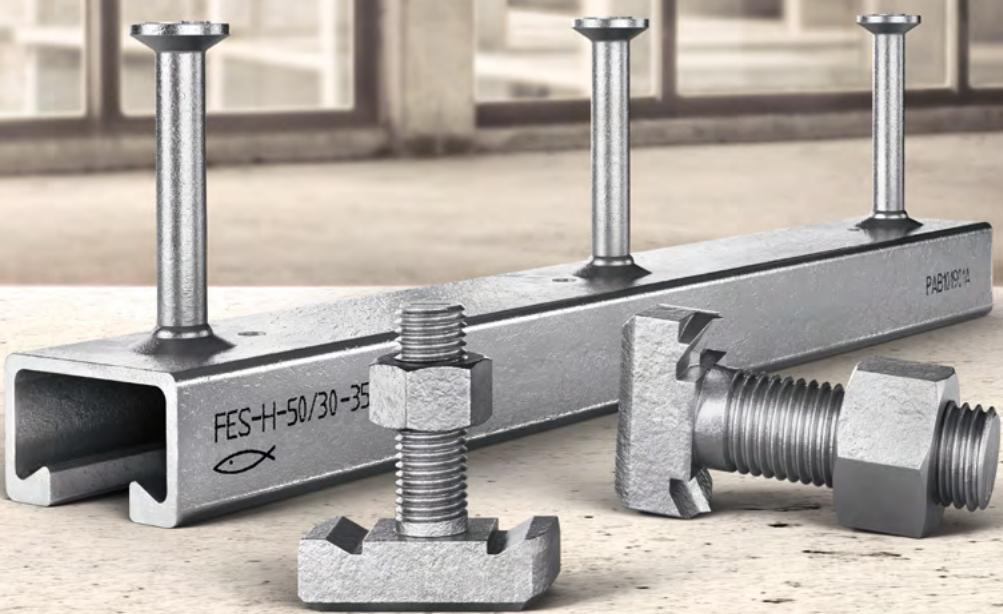


Catalogue

Cast-in Channel Systems



**“Our innovative strength
and technological
know-how strengthen
our position on the
market.”**



Foreword

Dear partners,

As a leading supplier of secure and economic construction fixings, the fischer Group of Companies is shaping the future of the fixings industry. We have developed trends, such as advancing digitalisation or Building Information Modelling, into solutions for the buildings of the future. Increasing demands on planning security are changing the requirements placed on fixing technology.

Our innovative Cast-In Channel Systems provide answers to these new conditions. Our portfolio comprises fischer FES-C cold-formed, FES-H hot-rolled and the new rollshaped InnoLock FES-RS-S channels. We have directly incorporated our Cast-In Channel Systems into the fischer FiXperience design software platform to enable simple calculations. Our holistic approach guarantees the highest level of safety and cost efficiency. Our preinstalled anchor significantly reduces the total operating costs when combined with Building Information Modelling. The fischer Cast-In Channel Systems achieve this thanks to the low follow-on costs with every additional fixing. Its simple installation no

longer requires time- and energy-consuming drilling in challenging circumstances such as heavily reinforced concrete. With no drill dust and without requiring heavy machinery, the fischer Cast-In Channel Systems offers further advantages in terms of health, safety and environmental management – advantages which are noticeable from the very first application.

As the market leader for fixing systems we are shaping the buildings of the future on the construction sites of the present. Discover the advantages of the fischer Cast-In Channel Systems in our catalogue!

Alexander Bässler



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



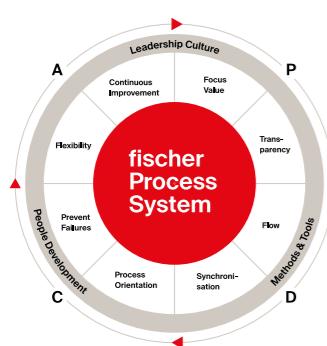
“Whoever chooses fischer receives more than a range of safe products. The aim is to always develop the best solutions for our customers across the globe.”

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.

Continous improvement

The fischer ProzessSystem (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.

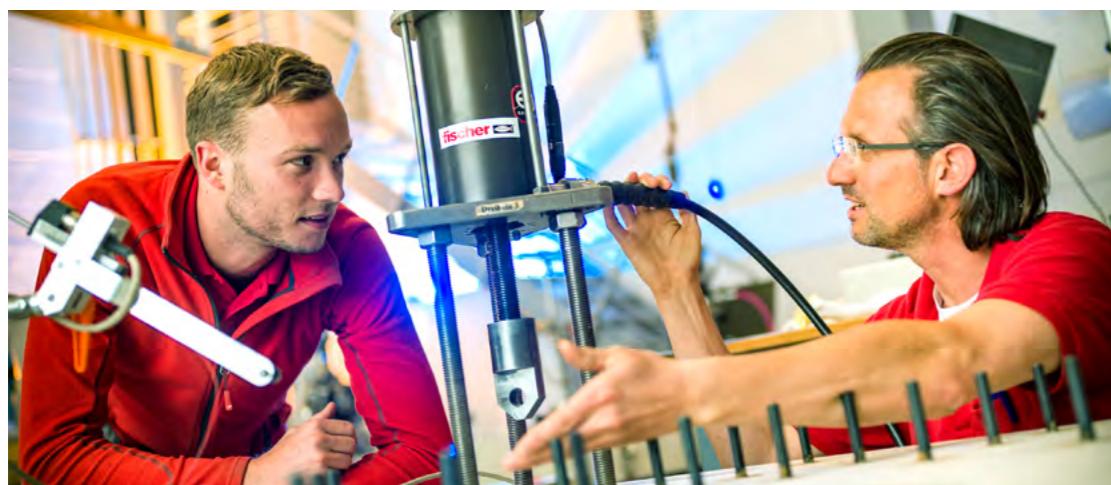


Safety that connects. Decisive quality

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 award-winning quality which continues to impress both professional clients and private customers with equal measure.



International approvals characterise many of our products.



Always on the pulse of time

At fischer, innovation is more than just a 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 market leader in anchor technology and the fixing industry.

Our service to you

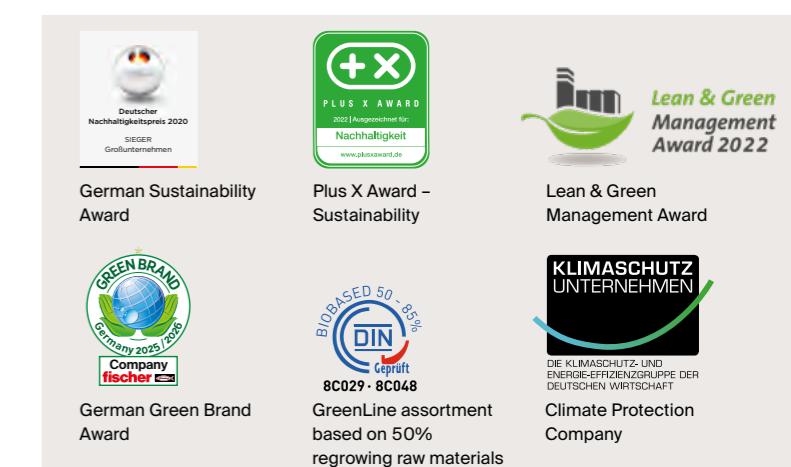
We are a reliable partner, one that will stand at your side and address your individual requirements with advice and action:

- 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%.





Innovations that inspire professionals.

Content

Product overview	9	Chapter	1
Channels	19	Chapter	2
Channel bolts	49	Chapter	3
Accessories	77	Chapter	4
Basics – good to know	81	Chapter	5
Service	91	Chapter	6



Bellavita Shopping Mall · Taipei · Taiwan

1

Product overview

Content

Channel nomenclature	10
Channel bolt nomenclature	12
Detailed overview	14
Typical applications	17

Channel nomenclature

1

1

fischer-Einlege-Schiene
(fischer Cast-in Channel)S - Serrated
(if applicable)
FES-RS is always
serratedP - Plus Version
(if applicable)
Width / Height e.g. 52/34 or
Size Information e.g. 700Coating, e.g.
HDG: > 50 µm
Material, e.g.
A4: Stainless steel

for curved channels only:

ri [mm] stands for 'radius inwards' means channels bent
towards the inner face of the concrete memberro [mm] stands for 'radius outwards' means channels bent
towards the outside face of the concrete member

InnoLock FES-RS-S-I-700 FES-H- S-I-52/34-P

C - Cold-formed
H - Hot-rolled
RS - RollshapedI anchor (if applicable). Note: round anchors
are considered standard and go without
special abbreviation in the product naming.

-L-HDG (-rixxxx)

-L-HDG (-rixxxx)

Length [mm]



Cold-formed Cast-in Channel Systems

Economical cold-formed Cast-in Channels combining high loading capacity and safety.

- Two directional load capacity: tension and shear perpendicular to the channel axis.
- Ideal prepositioned fixing solution, capable of covering on-site tolerances.
- Suitable for applications in cracked and non-cracked concrete.
- Permanently adjustable fixing solution.



Non-serrated hot-rolled Cast-in Channel Systems

Hot-rolled Cast-in Channels combining excellent load capacity with high safety and flexibility.



Serrated hot-rolled Cast-in Channel Systems

Hot-rolled Cast-in Channels combining optimum load capacity with high safety.

- All directional load capacity. Excellent loading capacity in longitudinal direction in combination with FBC-S due to the full serration of the system.
- Ideal prepositioned fixing solution, capable of covering on-site tolerances.
- Suitable for applications in cracked and non-cracked concrete.
- Permanently adjustable fixing solution.

Serrated rollshaped InnoLock Cast-in Channel Systems

Leading-edge rollshaped anchor channels combining maximum load capacity and installation convenience, setting new standards in safety.

- All directional load capacity. Excellent loading capacity in longitudinal direction in combination with InnoLock FBC-S due to the full serration of the system.
- Unrivalled dimensional stability and material strength.
- Ideal pre-positioned fixing solution which can cover on-site tolerances.
- Suitable for applications in cracked and non-cracked concrete.
- Permanently adjustable fixing solution.



Example standard plain channel.

FES-C-49/30-300-HDG for:

- Cold-formed
- Round anchors
- HDG > 50 µm



Example channel InnoLock.

FES-RS-S-700-350-HDG for:

- Rollshaped
- Round anchors
- HDG > 50 µm

Channel bolt nomenclature

Fischer Bolt Channel

Channel profile 50/30, 52/34
fits to FBC-N-50/30;
InnoLock 700 fits to FBC-S-225

Diametre [mm]

InnoLock FBC-S-225- -MddxIII
FBC-N-50/30-MddxIII

S - Serrated (if applicable)
N - Notched (if applicable)Length [mm]
Metric Thread

Steel grade e.g. 8.8

-s.s-A4
-s.s-HDG

Coating, e.g. HDG: > 50 µm
Material, e.g. A4: Stainless steel (A4-70)**Standard channel bolt**

Cast-in Channel System with smooth surface of the channel lips in combination with a smooth surface on the underside of the channel bolt head.

- Two directional load capacity.
- Marked on bolt tip with one groove.
- Steel grade: 8.8 or A4-70

**Notched channel bolt**

Cast-in Channel with smooth surface of the channel lips in combination with a notching channel bolt.

- Only for hot-rolled profiles without teeth.
- All directional load capacity.
- Fundamental load capacity in channel longitudinal direction provided.
- Marked on bolt tip with two parallel grooves.
- Steel grade: 8.8

**Serrated channel bolt**

Cast-in Channel with serrated channel lips in combination with locking channel bolts and matching serrations on the channel bolt head.

- Only for hot-rolled profiles with teeth.
- All directional load capacity.
- Qualified load capacity in channel longitudinal direction to prevent bolt slide risks.
- Marked on bolt tip with two staggered grooves.
- Steel grade: 8.8

**Serrated InnoLock channel bolt**

Channel bolts with unique design and serration, matching the InnoLock Cast-in channels.

- Only for InnoLock FES RS-S channels with serration
- All directional load capacity.
- Qualified load capacity in channel longitudinal direction to prevent bolt slide risks.
- Unique design with form-lock for maximum safety.
- Marked on bolt tip with two staggered grooves.
- Steel grade 8.8

**Example notched channel bolt.**

FBC-N-50/30-M20x80-8.8-HDG for:
 - Notched channel bolt
 - Applicable in combination with FES-H-50/30 and FES-H-52/34 channels
 - Size: M20x80
 - Steel grade: 8.8
 - HDG > 50 µm

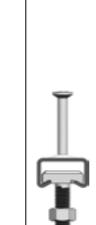
**Example channel bolt InnoLock.**

FBC-S-225-M12x60-8.8-HDG:
 - Serrated channel bolt
 - Applicable in combination with FES-RS-S-600 and FES-RS-S-700
 - Size: M12x60
 - Steel grade: 8.8
 - HDG > 50 µm

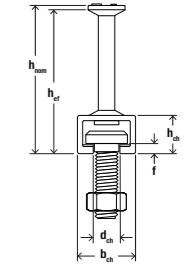
Overview of the suitable products.

1

1

Profile	Non-serrated channels					
	FES-C-54/33	FES-C-49/30	FES-C-40/25	FES-C-38/17	FES-C-28/15	FES-H-I-52/34
						
Type	Cold-formed	Cold-formed	Cold-formed	Cold-formed	Cold-formed	Hot-rolled
Channel bolts	FBC-50/30	FBC-50/30	FBC-40/22	FBC-38/17,	FBC-28/15,	FBC-50/30 FBC-N-50/30
Thread	M10 - M20	M10 - M20	M10 - M16	M10 - M16	M8 - M12	M10-M20 M16-M20
Design resistance for connection between anchor and channel	N _{Rd,s,c} [kN]	30.6	17.2	11.1	10.0	5.0
Design resistance for connection between anchor and channel	V _{Rd,s,c,y} [kN]	30.6	17.2	11.1	10.0	5.0
Design resistance for connection between anchor and channel	V _{Rd,s,c,x} [kN]	-	-	-	-	55.6
Design resistance for lip failure of channel	N _{Rd,s,l} [kN]	30.6	17.2	11.1	10.0	5.0
Design resistance for lip failure of channel	V _{Rd,s,l,y} [kN]	30.6	17.2	11.1	10.0	5.0
Design resistance for lip failure of channel	V _{Rd,s,l,x} [kN] (V _{inst} included)	-	-	-	-	55.6
Dimension of anchor channel	b _{ch} [mm]	53.5	50	40	38	28
Dimension of anchor channel	h _{ch} [mm]	33	30	25	17.3	15.5
Dimension of anchor channel	d _{ch} [mm]	21.5	22	18	18	12
Dimension of anchor channel	f [mm]	7.5	7	6	3	2.3
Dimension of anchor channel	h _{nom,min} [mm]	157.5	96.2	81	78	46.5
Dimension of anchor channel	h _{ef,min} [mm]	155	94	79	76	45
Approvals/assessments	ETA	ETA	ETA	ETA	ETA	ETA

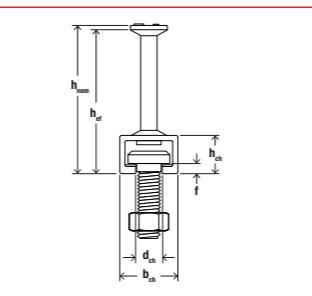
FES-H-52/34	FES-H-I-50/30	FES-H-50/30	FES-H-50/30-P	FES-H-I-40/22	FES-H-40/22	FES-H-40/22-P
						
Hot-rolled	Hot-rolled	Hot-rolled	Hot-rolled	Hot-rolled	Hot-rolled	Hot-rolled
FBC-50/30 FBC-N-50/30	FBC-50/30 FBC-N-50/30	FBC-50/30 FBC-N-50/30	FBC-50/30 FBC-N-50/30	FBC-40/22 FBC-N-40/22	FBC-40/22 FBC-N-40/22	FBC-40/22 FBC-N-40/22
M10 - M20	M10-M20 M16-M20	M10-M20 M16-M20	M10-M20 M16-M20	M10-M16 M16	M10-M16 M16	M10-M16 M16
30.6	22.2	17.2	24.4	19.4	11.1	23.3
55.6	33.3	33.3	48.8	22.2	22.2	28.2
18.3	13.3	10.3	14.6	-	12.6	14
40.0	23.9	23.9	28.8	21.1	21.1	23.3
55.6	33.3	33.3	48.8	22.2	22.2	14
7.4	7.4	7.4	7.4	6.4	6.4	6.4
52.5	50	50	50	40	40	40
34	30	30	30	23.5	23.5	23.5
22.5	22.5	22.5	22.5	18	18	18
11.5	8.1	8.1	8.1	6.2	6.2	6.2
160	99	96.2	108	84	92	93
155	94	94	106	79	90	91
ETA	ETA	ETA	ETA	ETA	ETA	ETA



Overview of the suitable products.

1

Profile	Serrated channels						
	FES-H-S-38/23	FES-H-S-38/23 A4	FES-H-S-29/20	FES-RS-S-600	FES-RS-S-I-600	FES-RS-S-700	FES-RS-S-I-700
Type	Hot rolled	Hot rolled	Hot rolled	Rollshaped	Rollshaped	Rollshaped	Rollshaped
Channel bolts	FBC-S-38/23	FBC-S-38/23	FBC-S-29/20	FBC-S-225	FBC-S-225	FBC-S-225	FBC-S-225
Thread	M12-M16	M12-M16	M12	M12-M20	M12-M20	M12-M20	M12-M20
Design resistance for connection between anchor and channel $N_{Rd,s,c}$ [kN]	16.8	22.2	11.2	30.6	31.6	40.5	44.4
Design resistance for connection between anchor and channel $V_{Rd,s,c,y}$ [kN]	16.8	22.2	11.2	54.7	54.7	66.6	66.6
Design resistance for connection between anchor and channel $V_{Rd,s,c,x}$ [kN]	10.1	8.3	6.7	18.3	19.3	24.3	26.6
Design resistance for lip failure of channel $N_{Rd,s,l}$ [kN]	16.8	25.0	11.2	35.5	35.5	44.4	44.4
Design resistance for lip failure of channel $V_{Rd,s,l,y}$ [kN]	16.8	22.2	11.2	42.7	42.7	51.1	51.1
Design resistance for lip failure of channel $V_{Rd,s,l,x}$ [kN] (V_{inst} included)	12.9	15.0	10.4	12.5-17.6	12.5-17.6	18.7	18.7
Dimension of anchor channel b_{ch} [mm]	38	38	30	50.5	50.5	52.5	52.5
Dimension of anchor channel h_{ch} [mm]	23	23	20	29.0	29.0	34.0	34.0
Dimension of anchor channel d_{ch} [mm]	18	18	14	22.5	22.5	22.5	22.5
Dimension of anchor channel f [mm]	6	6	5.2	6.0	6.0	7.0	7.0
Dimension of anchor channel $h_{nom,min}$ [mm]	99.2	99.2	79.2	153.0	159.0	178.0	159.0
Dimension of anchor channel $h_{ef,min}$ [mm]	97	97	77	150.0	154.0	175.0	154.0
Approvals/assessments	ETA	ETA	ETA	ETA	ETA	ETA	ETA



Typical applications

Commercial and residential buildings



- Façade
- Elevators fastening
- MEP applications

Industrial and power facilities



- Façade
- Machine and shelf fastening
- MEP applications
- Elevators fastening

Subway and railway construction



- MEP applications
- Traffic signs fastening
- Evacuation platform fastening

Road & bridge construction



- MEP applications
- Traffic signs fastening
- Security fence fastening
- Noise & safety barrier fastening

Prefabricated concrete structure



- Various pre-cast elements
- MEP applications
- Facilities fastening

Other applications



- Stadium construction (seat fastening, fastening of precast elements & supply lines)
- Airports



2

Cast-in channels

Cast-in Channel FES-C	20	
Cast-in Channel FES-H	26	
Cast-in Channel FES-H-P	31	
Cast-in Channel FES-H-I	35	
Cast-in Channel FES-H-S	39	
Cast-in Channel InnoLock FES-RS-S	43	

Cast-in Channel FES-C

Cold-formed anchor channel. Strong and safe.

2



Pre-cast elements



Unitized curtain wall

Applications

- Suitable for all types of buildings or structures
- Facades
- Prefabricated Elements
- Railways
- Metro tunnels and stations
- Industrial applications

Advantages

- Ideal prepositioned fixing solution, capable of covering on-site tolerances.
- Suitable for applications in cracked and non-cracked concrete.
- Two directional load capacity: tension and shear perpendicular to the channel axis.
- Permanently adjustable fixing solution.

Certificates / Features



ETA-18/0862, anchor channels FES with channel bolts FBC

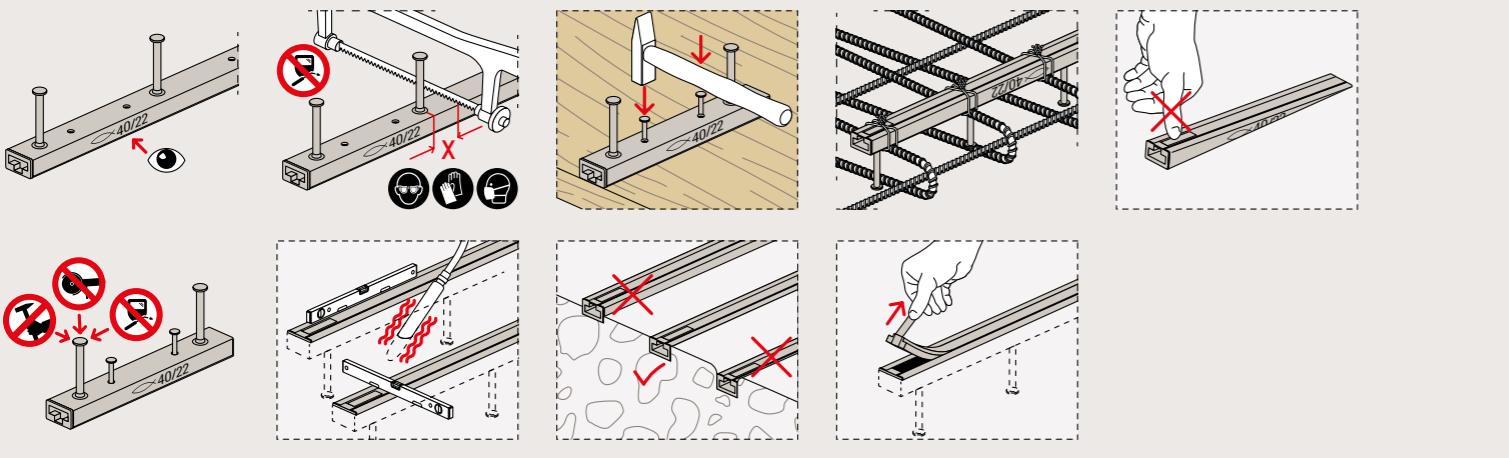
Building materials

- Suitable for use in combination with plain channel bolts FBC.

Functioning

- Suitable for use in combination with plain channel bolts FBC.

Installation Cast-in Channel FES



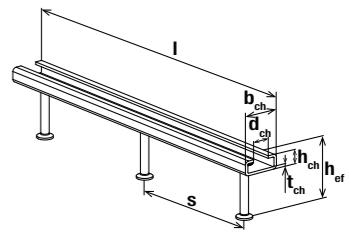
Technical data

Cast-in Channel FES-C-28/15 HDG - hot dip galvanised steel



FES-C

Item	Item no.	Ap-pro-val	Length l [mm]	Width b_ch [mm]	Height h_ch [mm]	Total embedment depth h_nom [mm]	Anchor spacing s [mm]	Number of anchors [pcs]	Match	Piece per carton [pcs]	Sales unit [pcs]
FES-C-28/15-100-HDG	552543	●	100	28	15	46.5	50	2	FBC-28/15, M8-M12	200	1
FES-C-28/15-150-HDG	552544	●	150	28	15	46.5	100	2	FBC-28/15, M8-M12	140	1
FES-C-28/15-200-HDG	552545	●	200	28	15	46.5	150	2	FBC-28/15, M8-M12	100	1
FES-C-28/15-250-HDG	552546	●	250	28	15	46.5	200	2	FBC-28/15, M8-M12	85	1
FES-C-28/15-300-HDG	552547	●	300	28	15	46.5	125	3	FBC-28/15, M8-M12	70	1
FES-C-28/15-350-HDG	552548	●	350	28	15	46.5	150	3	FBC-28/15, M8-M12	60	1
FES-C-28/15-450-HDG	552549	●	450	28	15	46.5	200	3	FBC-28/15, M8-M12	40	1
FES-C-28/15-500-HDG	552550	●	500	28	15	46.5	150	4	FBC-28/15, M8-M12	30	1
FES-C-28/15-850-HDG	552551	●	850	28	15	46.5	200	5	FBC-28/15, M8-M12	120	1
FES-C-28/15-1050-HDG	552552	●	1,050	28	15	46.5	200	6	FBC-28/15, M8-M12	120	1
FES-C-28/15-3050-HDG	552553	●	3,050	28	15	46.5	200	16	FBC-28/15, M8-M12	120	1
FES-C-28/15-6070-HDG	552554	●	6,070	28	15	46.5	200	31	FBC-28/15, M8-M12	120	1



2

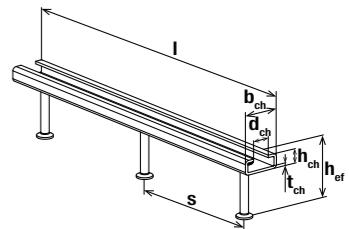
Technical data

Cast-in Channel FES-C-38/17 HDG - hot dip galvanised steel



FES-C

Item	Item no.	Ap-pro-val	Length l [mm]	Width b_ch [mm]	Height h_ch [mm]	Total embedment depth h_nom [mm]	Anchor spacing s [mm]	Number of anchors [pcs]	Match	Piece per carton [pcs]	Sales unit [pcs]
FES-C-38/17-100-HDG	552555	●	100	38	17.3	78.1	50	2	FBC-38/17, M10-M16	105	1
FES-C-38/17-150-HDG	552556	●	150	38	17.3	78.1	100	2	FBC-38/17, M10-M16	70	1
FES-C-38/17-200-HDG	552557	●	200	38	17.3	78.1	150	2	FBC-38/17, M10-M16	45	1
FES-C-38/17-250-HDG	552558	●	250	38	17.3	78.1	200	2	FBC-38/17, M10-M16	40	1
FES-C-38/17-300-HDG	552559	●	300	38	17.3	78.1	125	3	FBC-38/17, M10-M16	35	1
FES-C-38/17-350-HDG	552560	●	350	38	17.3	78.1	150	3	FBC-38/17, M10-M16	30	1
FES-C-38/17-450-HDG	552561	●	450	38	17.3	78.1	200	3	FBC-38/17, M10-M16	20	1
FES-C-38/17-500-HDG	552562	●	500	38	17.3	78.1	150	4	FBC-38/17, M10-M16	15	1
FES-C-38/17-850-HDG	552563	●	850	38	17.3	78.1	200	5	FBC-38/17, M10-M16	104	1
FES-C-38/17-1050-HDG	552564	●	1,050	38	17.3	78.1	200	6	FBC-38/17, M10-M16	104	1

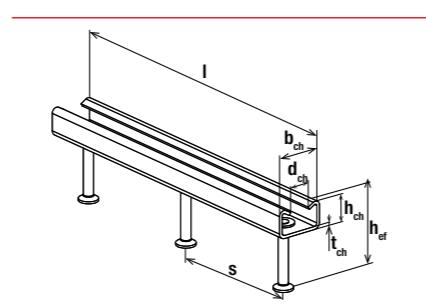


21

Technical data

Cast-in Channel FES-C-54/33 HDG - hot dip galvanised steel

FES-C												
Item	Item no.	Ap-pro-val	ETA	Length	Width	Height	Total embedment depth	Anchor spacing	Number of anchors	Match	Piece per carton	Sales unit
				[mm]	[mm]	[mm]	[mm]	[mm]	[pcs]		[pcs]	[pcs]
FES-C-54/33-1050-HDG	552597	●	1,050	54	33	157.5	250	5	FBC-50/30, M10-M20	60	1	
FES-C-54/33-3050-HDG	552598	●	3,050	54	33	157.5	250	16	FBC-50/30, M10-M20	60	1	
FES-C-54/33-6070-HDG	552599	●	6,070	54	33	157.5	250	25	FBC-50/30, M10-M20	20	1	



Installation instruction – Minimum edge distances and minimum bolt spacing

- For the installation of the Cast-in Channels the required edge distances, anchor and channel bolt spacings must be respected.
- ETA values always have to be considered.
- fischer recommends the design software FiXperience CHANNEL-FIX for a safe and economical evaluation of load and on-site conditions.

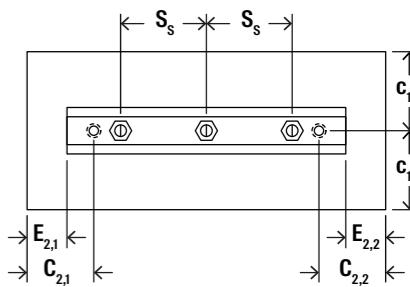
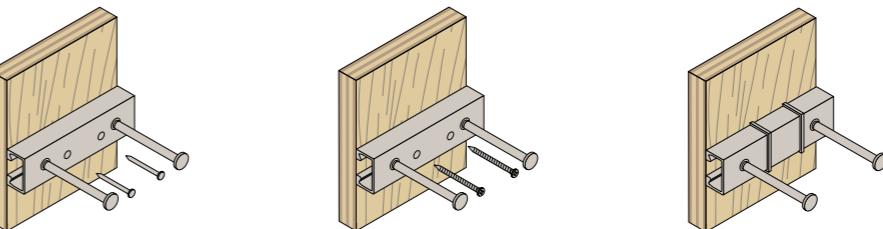


Figure: Minimum edge and bolt spacings

Profile	Thread M	Min. spacing S _{s,min} [mm]	Min. edge spacing C _{1,min} [mm]	Min. edge spacing C _{2,min} [mm]	Min. end spacing E _{min} [mm]
28/15	M8	40	40	40	15
28/15	M10	50	40	40	15
28/15	M12	60	40	40	15
38/17	M10	50	50	50	25
38/17	M12	60	50	50	25
38/17	M16	80	50	50	25
40/25	M10	50	50	50	25
40/25	M12	60	50	50	25
40/25	M16	80	50	50	25
49/30	M10	50	75	75	50
49/30	M12	60	75	75	50
49/30	M16	80	75	75	50
49/30	M20	100	75	75	50
54/33	M10	50	100	100	75
54/33	M12	60	100	100	75
54/33	M16	80	100	100	75
54/33	M20	100	100	100	75

Channel inward installation options.



1. Nail fixing

2. Self-drilling screw fixing

3. Clamp fixing

Cast-in Channel FES-H

Hot-rolled for excellent strength and safety.

2



Railway tunnels

Unitized curtain wall

Applications

- Suitable for all types of buildings or structures
- Facades
- Prefabricated elements
- Railways
- Metro tunnels and stations
- Industrial applications

Certificates / Features



ETA-18/0862, anchor channels FES with channel bolts FBC
CE
R 120

Advantages

- Hot-rolled Cast-in Channels combining excellent load capacity with high safety and flexibility.
- All directional load capacity.
- Fundamental load capacity in longitudinal direction in combination with channel bolts FBC-N.
- Ideal prepositioned fixing solution, capable of covering on-site tolerances.
- Suitable for applications in cracked and non-cracked concrete.
- Permanently adjustable fixing solution.

Building materials

- Concrete C12/15 to C90/105, cracked and non-cracked

Functioning

- Suitable for use in combination with plain channel bolts FBC or notching channel bolts FBC-N.

Technical data

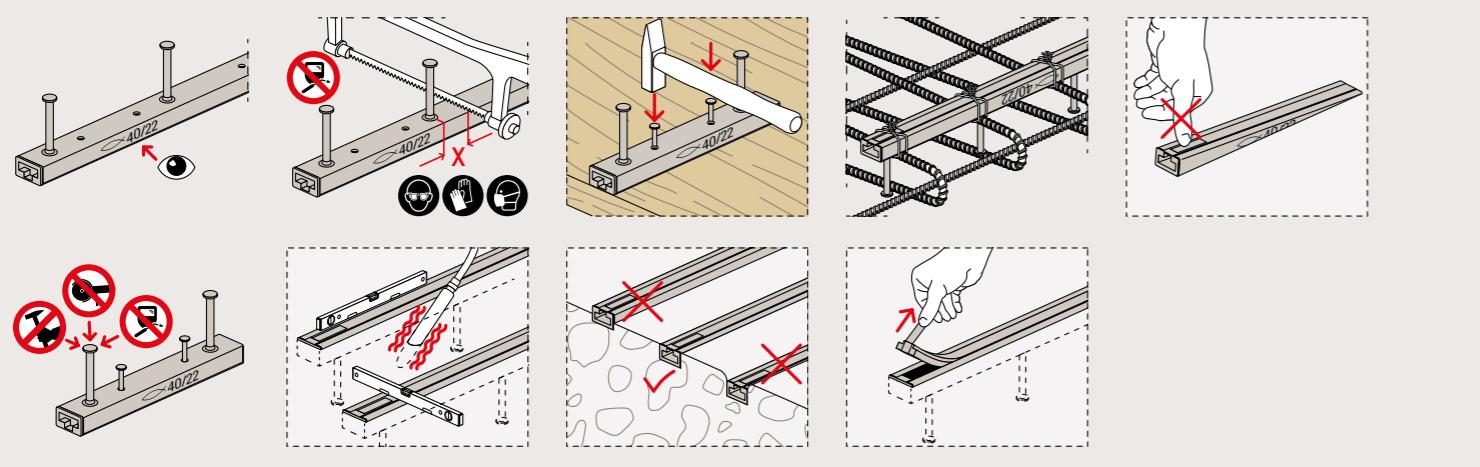
Cast-in Channel FES-H 40/22 HDG - hot dip galvanised steel



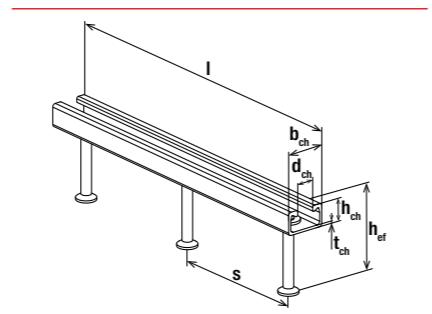
FES-H

Item	Item no.	Ap-pro-val ETA	Length l [mm]	Width b _{ch} [mm]	Height h _{ch} [mm]	Total embedment depth h _{nom} [mm]	Anchor spacing s [mm]	Number of anchors [pcs]	Match	Piece per carton [pcs]	Sales unit [pcs]
FES-H-40/22-150-HDG	569549	●	150	40	23.5	92	100	2	FBC-40/22 M10-M16, FBC-N-40/22 M16	45	1
FES-H-40/22-200-HDG	569550	●	200	40	23.5	92	150	2	FBC-40/22 M10-M16, FBC-N-40/22 M16	30	1
FES-H-40/22-250-HDG	569551	●	250	40	23.5	92	200	2	FBC-40/22 M10-M16, FBC-N-40/22 M16	25	1
FES-H-40/22-300-HDG	569552	●	300	40	23.5	92	250	2	FBC-40/22 M10-M16, FBC-N-40/22 M16	25	1
FES-H-40/22-350-HDG	569553	●	350	40	23.5	92	150	3	FBC-40/22 M10-M16, FBC-N-40/22 M16	20	1
FES-H-40/22-400-HDG	569554	●	400	40	23.5	92	175	3	FBC-40/22 M10-M16, FBC-N-40/22 M16	15	1
FES-H-40/22-550-HDG	569555	●	550	40	23.5	92	250	3	FBC-40/22 M10-M16, FBC-N-40/22 M16	10	1
FES-H-40/22-800-HDG	552475	●	800	40	23.5	92	250	4	FBC-40/22 M10-M16, FBC-N-40/22 M16	10	1
FES-H-40/22-1050-HDG	552476	●	1,050	40	23.5	92	250	5	FBC-40/22 M10-M16, FBC-N-40/22 M16	96	1
FES-H-40/22-1300-HDG	552477	●	1,300	40	23.5	92	250	6	FBC-40/22 M10-M16, FBC-N-40/22 M16	96	1
FES-H-40/22-1550-HDG	552478	●	1,550	40	23.5	92	250	7	FBC-40/22 M10-M16, FBC-N-40/22 M16	96	1
FES-H-40/22-1800-HDG	552479	●	1,800	40	23.5	92	250	8	FBC-40/22 M10-M16, FBC-N-40/22 M16	96	1
FES-H-40/22-2050-HDG	552480	●	2,050	40	23.5	92	250	9	FBC-40/22 M10-M16, FBC-N-40/22 M16	96	1
FES-H-40/22-2300-HDG	552481	●	2,300	40	23.5	92	250	10	FBC-40/22 M10-M16, FBC-N-40/22 M16	96	1
FES-H-40/22-3050-HDG	552482	●	3,050	40	23.5	92	250	13	FBC-40/22 M10-M16, FBC-N-40/22 M16	96	1
FES-H-40/22-6070-HDG	552483	●	6,070	40	23.5	92	250	25	FBC-40/22 M10-M16, FBC-N-40/22 M16	48	1

Installation Cast-in Channel FES



2



Technical data

Cast-in Channel FES-H 50/30 HDG - hot dip galvanised steel



FES-H

Item	Item no.	Ap-pro-val	Length [mm]	Width [mm]	Height [mm]	Total embedment depth h _{nom} [mm]	Anchor spacing s [mm]	Number of anchors [pcs]	Match	Piece per carton [pcs]	Sales unit [pcs]
										ETA	
FES-H-50/30-150-HDG	569560	●	150	50	30	96.2	100	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	40	1
FES-H-50/30-200-HDG	569561	●	200	50	30	96.2	150	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	25	1
FES-H-50/30-250-HDG	569562	●	250	50	30	96.2	200	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	20	1
FES-H-50/30-300-HDG	569563	●	300	50	30	96.2	250	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	20	1
FES-H-50/30-350-HDG	569564	●	350	50	30	96.2	150	3	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	15	1
FES-H-50/30-400-HDG	569565	●	400	50	30	96.2	175	3	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	12	1
FES-H-50/30-550-HDG	569566	●	550	50	30	96.2	250	3	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	8	1
FES-H-50/30-800-HDG	552492	●	800	50	30	96.2	250	4	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	8	1
FES-H-50/30-1050-HDG	552493	●	1,050	50	30	96.2	250	5	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	80	1
FES-H-50/30-3050-HDG	552494	●	3,050	50	30	96.2	250	13	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	80	1
FES-H-50/30-6070-HDG	552495	●	6,070	50	30	96.2	250	25	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	40	1

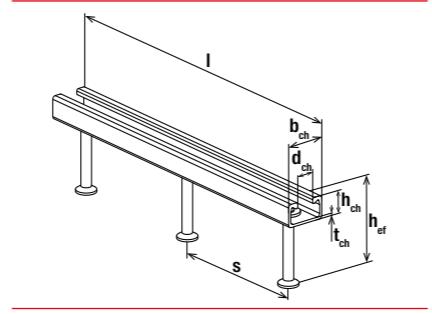
Technical data

Cast-in Channel FES-H 52/34 HDG - hot dip galvanised steel



FES-H

Item	Item no.	Ap-pro-val	Length [mm]	Width [mm]	Height [mm]	Total embedment depth h _{nom} [mm]	Anchor spacing s [mm]	Number of anchors [pcs]	Match	Piece per carton [pcs]	Sales unit [pcs]
										ETA	
FES-H-52/34-550-HDG	572363	●	550	52.5	34	157.5	240	3	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	6	1
FES-H-52/34-800-HDG	552503	●	800	52.5	34	157.5	243	4	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	5	1
FES-H-52/34-1050-HDG	552504	●	1,050	52.5	34	157.5	145	5	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	80	1
FES-H-52/34-3050-HDG	552505	●	3,050	52.5	34	157.5	248	13	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	50	1
FES-H-52/34-6070-HDG	552506	●	6,070	52.5	34	157.5	250	25	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	20	1



Technical data

Cast-in Channel FES-H 52/34 HDG - hot dip galvanised steel



FES-H

Item	Item no.	Ap-pro-val	Length [mm]	Width [mm]	Height [mm]	Total embedment depth h _{nom} [mm]	Anchor spacing s [mm]	Number of anchors [pcs]	Match	Piece per carton [pcs]	Sales unit [pcs]
										ETA	
FES-H-52/34-170-HDG	569571	●	170	52.5	34	157.5	100	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	25	1
FES-H-52/34-200-HDG	569572	●	200	52.5	34	157.5	130	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	15	1
FES-H-52/34-250-HDG	569573	●	250	52.5	34	157.5	180	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	13	1
FES-H-52/34-300-HDG	569574	●	300	52.5	34	157.5	230	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	12	1
FES-H-52/34-350-HDG	569575	●	350	52.5	34	157.5	140	3	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	10	1
FES-H-52/34-400-HDG	569576	●	400	52.5	34	157.5	165	3	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	6	1

Installation instruction – Minimum edge distances and minimum bolt spacing

- For the installation of the Cast-in Channels the required edge distances, anchor and channel bolt spacings must be respected.
- fischer recommends the design software FiXperience CHANNEL-FIX for a safe and economical evaluation of load and on-site conditions.
- ETA values always have to be considered.

2

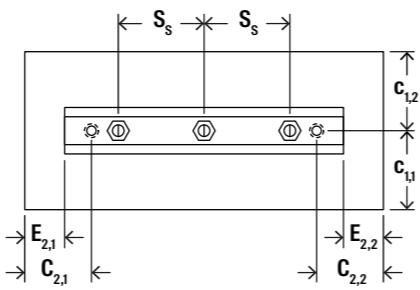
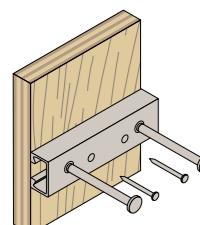


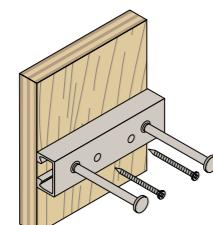
Figure: Minimum edge and bolt spacings

Profile	Thread M	Min. spacing S _{s,min} [mm]	Min. edge spacing C _{1,min} [mm]	Min. edge spacing C _{2,min} [mm]	Min. end spacing E _{min} [mm]
40/22	M10	50	50	50	25
40/22	M12	60	50	50	25
40/22	M16	80	50	50	25
50/30	M10	50	75	75	50
50/30	M12	60	75	75	50
50/30	M16	80	75	75	50
50/30	M20	100	75	75	50
52/34	M10	50	100	100	65
52/34	M12	60	100	100	65
52/34	M16	80	100	100	65
52/34	M20	100	100	100	65

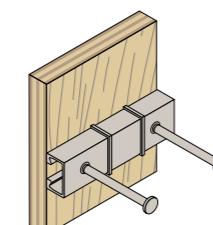
Channel inward installation options.



1. Nail fixing



2. Self-drilling screw fixing



3. Clamp fixing

Cast-in Channel FES-H-P

Hot-rolled for excellent strength and safety.



Railway tunnels



Unitized curtain wall

Applications

- Suitable for all types of buildings or structures
- Facades
- Prefabricated elements
- Railways
- Metro tunnels and stations
- Industrial applications

Advantages

- Hot-rolled Cast-in Channels combining excellent load capacity with high safety and flexibility.
- All directional load capacity.
- Plus anchor for even higher load transfers.
- Fundamental load capacity in longitudinal

direction in combination with channel bolts FBC-N.

- Ideal prepositioned fixing solution, capable of covering on-site tolerances.
- Suitable for applications in cracked and non-cracked concrete.
- Permanently adjustable fixing solution.

Certificates / Features



ETA-18/0862, anchor channels FES with channel bolts FBC
R 120

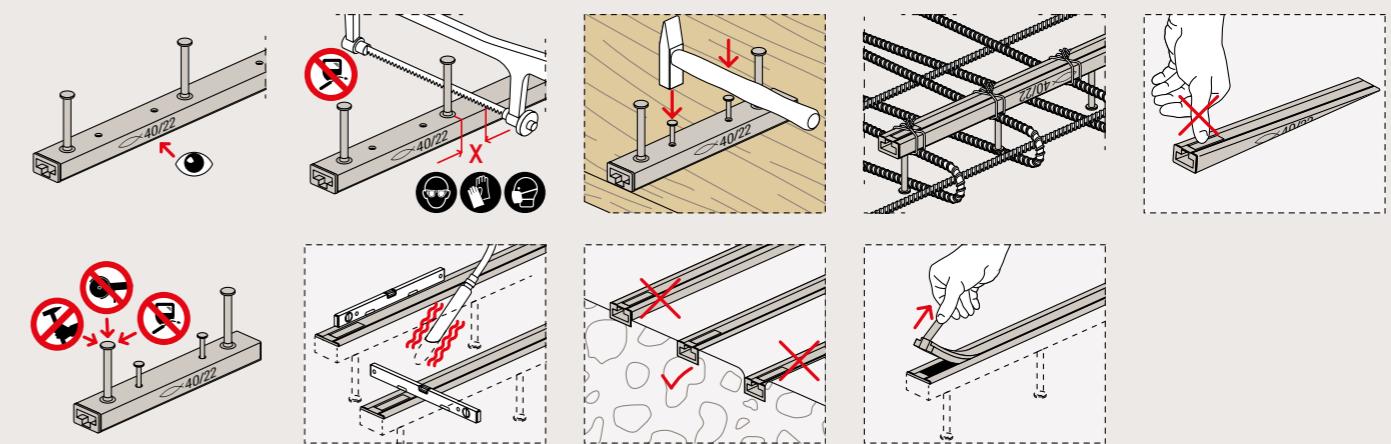
Building materials

- Concrete C12/15 to C90/105, cracked and non-cracked

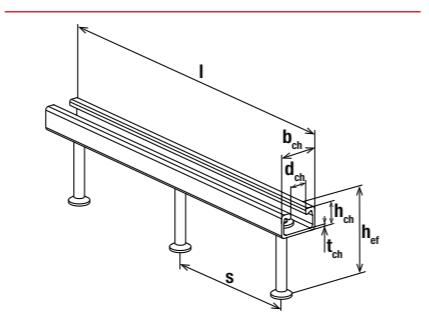
Functioning

- Suitable for use in combination with plain channel bolts FBC or notched channel bolts FBC-N.

Installation Cast-in Channel FES



2



Technical data

Cast-in Channel FES-H 40/22 P HDG - hot dip galvanised steel



FES-H-P

		Ap-pro-val	Length	Width	Height	Total embedment depth	Anchor spacing	Number of anchors	Match	Piece per carton	Sales unit
Item	Item no.	ETA	[mm]	b _{ch} [mm]	h _{ch} [mm]	h _{nom} [mm]	s [mm]	[pcs]		[pcs]	
FES-H-40/22-P-150-HDG	569637	●	150	40	23.5	93.2	100	2	FBC-40/22 M10-M16, FBC-N-40/22 M16	45	1
FES-H-40/22-P-200-HDG	569638	●	200	40	23.5	93.2	150	2	FBC-40/22 M10-M16, FBC-N-40/22 M16	30	1
FES-H-40/22-P-250-HDG	569639	●	250	40	23.5	93.2	200	2	FBC-40/22 M10-M16, FBC-N-40/22 M16	25	1
FES-H-40/22-P-300-HDG	569640	●	300	40	23.5	93.2	250	2	FBC-40/22 M10-M16, FBC-N-40/22 M16	25	1
FES-H-40/22-P-350-HDG	569641	●	350	40	23.5	93.2	150	3	FBC-40/22 M10-M16, FBC-N-40/22 M16	20	1
FES-H-40/22-P-400-HDG	569642	●	400	40	23.5	93.2	175	3	FBC-40/22 M10-M16, FBC-N-40/22 M16	15	1
FES-H-40/22-P-550-HDG	569643	●	550	40	23.5	93.2	250	3	FBC-40/22 M10-M16, FBC-N-40/22 M16	10	1
FES-H-40/22-P-800-HDG	563744	●	800	40	23.5	93.2	250	4	FBC-40/22 M10-M16, FBC-N-40/22 M16	10	1
FES-H-40/22-P-1050-HDG	563745	●	1,050	40	23.5	93.2	250	5	FBC-40/22 M10-M16, FBC-N-40/22 M16	96	1
FES-H-40/22-P-3050-HDG	563746	●	3,050	40	23.5	93.2	250	13	FBC-40/22 M10-M16, FBC-N-40/22 M16	96	1
FES-H-40/22-P-6070-HDG	563747	●	6,070	40	23.5	93.2	250	25	FBC-40/22 M10-M16, FBC-N-40/22 M16	48	1

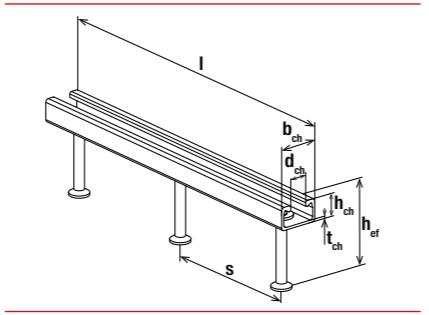
Technical data

Cast-in Channel FES-H 50/30 P HDG - hot dip galvanised steel



FES-H-P

		Ap-pro-val	Length	Width	Height	Total embedment depth	Anchor spacing	Number of anchors	Match	Piece per carton	Sales unit
Item	Item no.	ETA	[mm]	b _{ch} [mm]	h _{ch} [mm]	h _{nom} [mm]	s [mm]	[pcs]		[pcs]	
FES-H-50/30-P-550-HDG	569655	●	550	50	30	108.5	240	3	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	10	1
FES-H-50/30-P-800-HDG	563755	●	800	50	30	108.5	243	4	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	8	1
FES-H-50/30-P-1050-HDG	563756	●	1,050	50	30	108.5	245	5	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	80	1
FES-H-50/30-P-3050-HDG	563757	●	3,050	50	30	108.5	248	13	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	80	1
FES-H-50/30-P-6070-HDG	563758	●	6,070	50	30	108.5	250	25	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	40	1



Technical data

Cast-in Channel FES-H 50/30 P HDG - hot dip galvanised steel



FES-H-P

		Ap-pro-val	Length	Width	Height	Total embedment depth	Anchor spacing	Number of anchors	Match	Piece per carton	Sales unit
Item	Item no.	ETA	[mm]	b _{ch} [mm]	h _{ch} [mm]	h _{nom} [mm]	s [mm]	[pcs]		[pcs]	
FES-H-50/30-P-170-HDG	569649	●	170	50	30	108.5	100	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	30	1
FES-H-50/30-P-200-HDG	569650	●	200	50	30	108.5	130	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	25	1
FES-H-50/30-P-250-HDG	569651	●	250	50	30	108.5	180	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	20	1
FES-H-50/30-P-300-HDG	569652	●	300	50	30	108.5	230	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	20	1
FES-H-50/30-P-350-HDG	569653	●	350	50	30	108.5	140	3	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	15	1
FES-H-50/30-P-400-HDG	569654	●	400	50	30	108.5	165	3	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	12	1

Installation instruction – Minimum edge distances and minimum bolt spacing

- For the installation of the Cast-in Channels the required edge distances, anchor and channel bolt spacings must be respected.
- fischer recommends the design software FiXperience CHANNEL-FIX for a safe and economical evaluation of load and on-site conditions.
- ETA values always have to be considered.

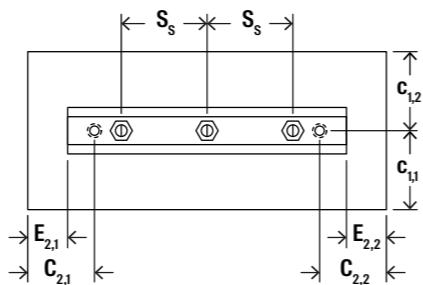
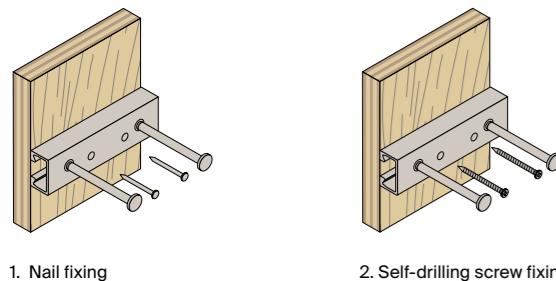


Figure: Minimum edge and bolt spacings

Profile	Thread M	Min. spacing S _{s,min} [mm]	Min. edge spacing C _{1,min} [mm]	Min. edge spacing C _{2,min} [mm]	Min. end spacing E _{min} [mm]
40/22-P	M10	50	50	50	25
40/22-P	M12	60	50	50	25
40/22-P	M16	80	50	50	25
50/30-P	M10	50	75	75	40
50/30-P	M12	60	75	75	40
50/30-P	M16	80	75	75	40
50/30-P	M20	100	75	75	40

Channel inward installation options.



1. Nail fixing

2. Self-drilling screw fixing

3. Clamp fixing

Cast-in Channel FES-H-I

Hot-rolled for excellent strength and safety.



Railway tunnels



Unitized curtain wall

Applications

- Suitable for all types of buildings or structures
- Facades
- Prefabricated elements
- Railways
- Metro tunnels and stations
- Industrial applications

Advantages

- Hot-rolled Cast-in Channels combining excellent load capacity with high safety and flexibility.
- All directional load capacity.
- The welded I-anchor ensures higher pull-out strength in concrete.
- Fundamental load capacity in longitudinal

direction in combination with channel bolts FBC-N.

- Ideal prepositioned fixing solution, capable of covering on-site tolerances.
- Suitable for applications in cracked and non-cracked concrete.
- Permanently adjustable fixing solution.

Certificates / Features



ETA-18/0862, anchor channels FES with channel bolts FBC
CE
R 120

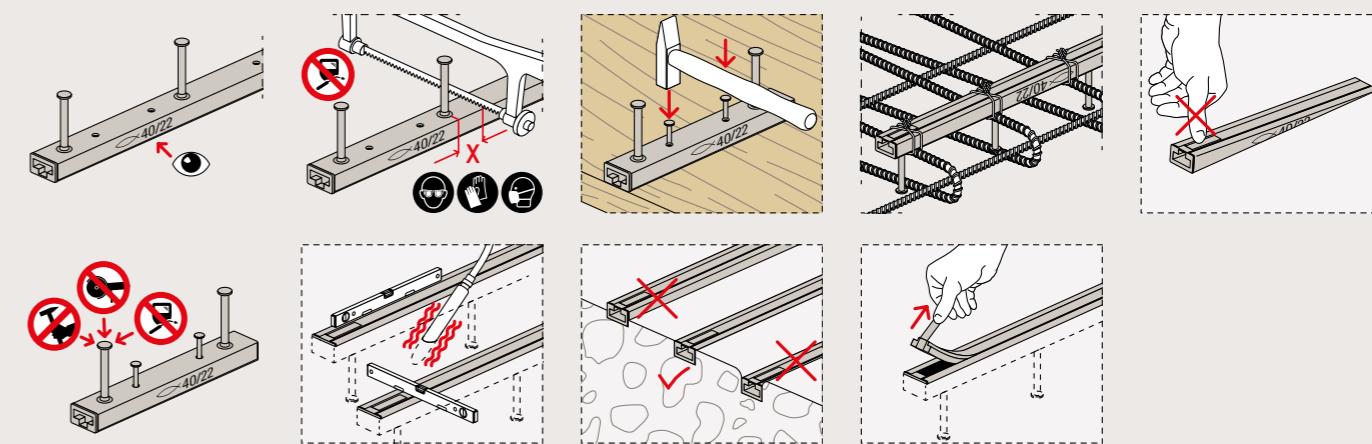
Building materials

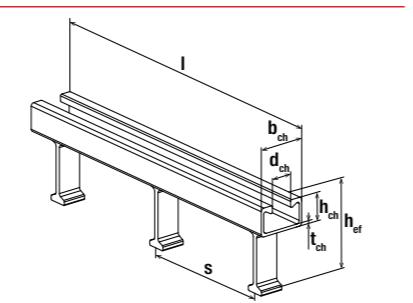
- Concrete C12/15 to C90/105, cracked and non-cracked

Functioning

- Suitable for use in combination with plain channel bolts FBC or notched channel bolts FBC-N.

Installation Cast-in Channel FES





2

Technical data

Cast-in Channel FES-H-I 40/22 HDG - hot dip galvanised steel



FES-H-I

		Ap-pro-val	Length	Width	Height	Total embedment depth	Anchor spacing	Number of anchors	Match	Piece per carton	Sales unit
Item	Item no.	ETA	l [mm]	b _{ch} [mm]	h _{ch} [mm]	h _{nom} [mm]	s [mm]	[pcs]		[pcs]	[pcs]
FES-H-I-40/22-150-HDG	552507	●	150	40	23.5	85.5	100	2	FBC-40/22 M10-M16, FBC-N-40/22 M16	45	1
FES-H-I-40/22-200-HDG	552508	●	200	40	23.5	85.5	150	2	FBC-40/22 M10-M16, FBC-N-40/22 M16	30	1
FES-H-I-40/22-250-HDG	552509	●	250	40	23.5	85.5	200	2	FBC-40/22 M10-M16, FBC-N-40/22 M16	25	1
FES-H-I-40/22-300-HDG	552510	●	300	40	23.5	85.5	250	2	FBC-40/22 M10-M16, FBC-N-40/22 M16	25	1
FES-H-I-40/22-350-HDG	552511	●	350	40	23.5	85.5	150	3	FBC-40/22 M10-M16, FBC-N-40/22 M16	20	1
FES-H-I-40/22-400-HDG	552512	●	400	40	23.5	85.5	175	3	FBC-40/22 M10-M16, FBC-N-40/22 M16	15	1
FES-H-I-40/22-400-HDG	552513	●	550	40	23.5	85.5	250	3	FBC-40/22 M10-M16, FBC-N-40/22 M16	10	1
FES-H-I-40/22-1050-HDG	552514	●	1,050	40	23.5	85.5	250	5	FBC-40/22 M10-M16, FBC-N-40/22 M16	96	1
FES-H-I-40/22-6070-HDG	552515	●	6,070	40	23.5	85.5	250	25	FBC-40/22 M10-M16, FBC-N-40/22 M16	48	1

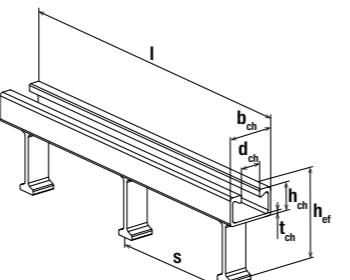
Technical data

Cast-in Channel FES-H-I 52/34 HDG - hot dip galvanised steel



FES-H-I

		Ap-pro-val	Length	Width	Height	Total embedment depth	Anchor spacing	Number of anchors	Match	Piece per carton	Sales unit
Item	Item no.	ETA	l [mm]	b _{ch} [mm]	h _{ch} [mm]	h _{nom} [mm]	s [mm]	[pcs]		[pcs]	[pcs]
FES-H-I-52/34-150-HDG	552525	●	150	52.5	34	160	100	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	15	1
FES-H-I-52/34-200-HDG	552526	●	200	52.5	34	160	150	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	10	1
FES-H-I-52/34-250-HDG	552527	●	250	52.5	34	160	200	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	10	1
FES-H-I-52/34-300-HDG	552528	●	300	52.5	34	160	250	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	10	1
FES-H-I-52/34-350-HDG	552529	●	350	52.5	34	160	150	3	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	7	1
FES-H-I-52/34-400-HDG	552530	●	400	52.5	34	160	175	3	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	6	1
FES-H-I-52/34-550-HDG	552531	●	550	52.5	34	160	250	3	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	6	1
FES-H-I-52/34-1050-HDG	552532	●	1,050	52.5	34	160	250	5	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	80	1
FES-H-I-52/34-6070-HDG	552533	●	6,070	52.5	34	160	250	25	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	20	1



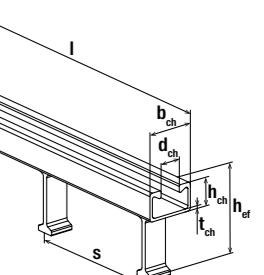
Technical data

Cast-in Channel FES-H-I 50/30 HDG - hot dip galvanised steel



FES-H-I

		Ap-pro-val	Length	Width	Height	Total embedment depth	Anchor spacing	Number of anchors	Match	Piece per carton	Sales unit
Item	Item no.	ETA	l [mm]	b _{ch} [mm]	h _{ch} [mm]	h _{nom} [mm]	s [mm]	[pcs]		[pcs]	[pcs]
FES-H-I-50/30-150-HDG	552516	●	150	50	30	99	100	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	30	1
FES-H-I-50/30-200-HDG	552517	●	200	50	30	99	150	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	25	1
FES-H-I-50/30-250-HDG	552518	●	250	50	30	99	200	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	20	1
FES-H-I-50/30-300-HDG	552519	●	300	50	30	99	250	2	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	20	1
FES-H-I-50/30-350-HDG	552520	●	350	50	30	99	150	3	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	15	1
FES-H-I-50/30-400-HDG	552521	●	400	50	30	99	175	3	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	12	1
FES-H-I-50/30-550-HDG	552522	●	550	50	30	99	250	3	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	8	1
FES-H-I-50/30-1050-HDG	552523	●	1,050	50	30	99	250	5	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	80	1
FES-H-I-50/30-6070-HDG	552524	●	6,070	50	30	99	250	25	FBC-50/30 M10-M20, FBC-N-50/30 M16-M20	40	1



2

Installation instruction – Minimum edge distances and minimum bolt spacing

- For the installation of the Cast-in Channels the required edge distances, anchor and channel bolt spacings must be respected.
- fischer recommends the design software FiXperience CHANNEL-FIX for a safe and economical evaluation of load and on-site conditions.
- ETA values always have to be considered.

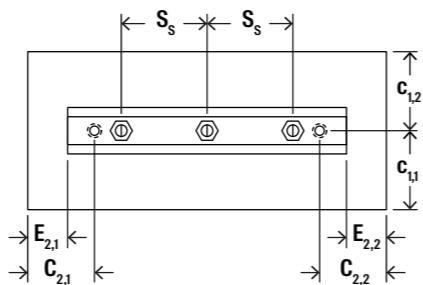
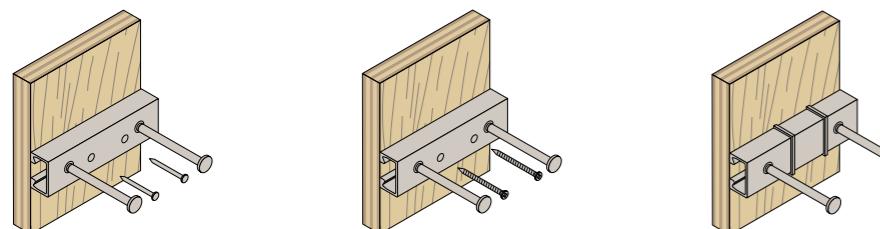


Figure: Minimum edge and bolt spacings

Profile	Thread M	Min. spacing S _{s,min} [mm]	Min. edge spacing C _{1,min} [mm]	Min. edge spacing C _{2,min} [mm]	Min. end spacing E _{min} [mm]
I-40/22	M10	50	50	50	25
I-40/22	M12	60	50	50	25
I-40/22	M16	80	50	50	25
I-50/30	M10	50	75	75	50
I-50/30	M12	60	75	75	50
I-50/30	M16	80	75	75	50
I-50/30	M20	100	75	75	50
I-52/34	M10	50	100	100	75
I-52/34	M12	60	100	100	75
I-52/34	M16	80	100	100	75
I-52/34	M20	100	100	100	75

Channel inward installation options.



1. Nail fixing

2. Self-drilling screw fixing

3. Clamp fixing

Cast-in Channel FES-H-S

Hot-rolled and serrated for optimum strength and safety.



Railway tunnels



Unitized curtain wall

Applications

- Suitable for all types of buildings or structures
- Facades
- Prefabricated elements
- Railways
- Metro tunnels and stations
- Industrial applications

Advantages

- Hot-rolled Cast-in Channels combining optimum load capacity with high safety and flexibility.
- All directional load capacity. Excellent loading capacity in longitudinal direction in combination with FBC-S due to the full serration of the system.
- Ideal prepositioned fixing solution, capable of covering on-site tolerances.
- Suitable for applications in cracked and non-cracked concrete.
- Permanently adjustable fixing solution.

Certificates / Features



ETA-18/0862, anchor channels FES with channel bolts FBC

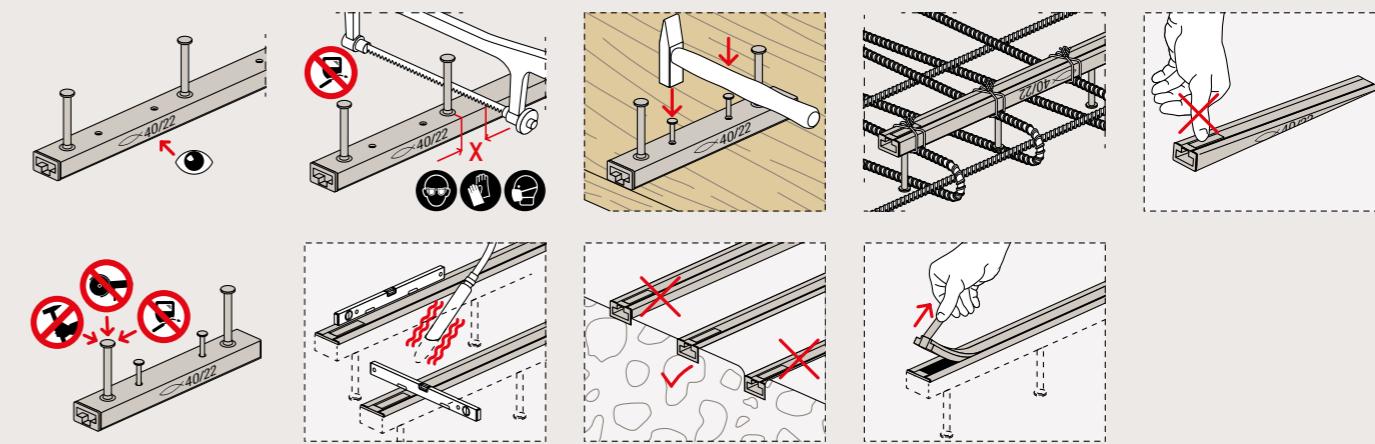
Building materials

- Concrete C12/15 to C90/105, cracked and non-cracked

Functioning

- Suitable for use in combination with serrated channel bolts FBC-S.

Installation Cast-in Channel FES



Installation instruction – Minimum edge distances and minimum bolt spacing

- For the installation of the Cast-in Channels the required edge distances, anchor and channel bolt spacings must be respected.
- fischer recommends the design software FiXperience CHANNEL-FIX for a safe and economical evaluation of load and on-site conditions.
- ETA values always have to be considered.

2

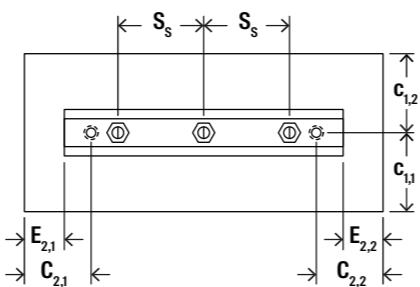
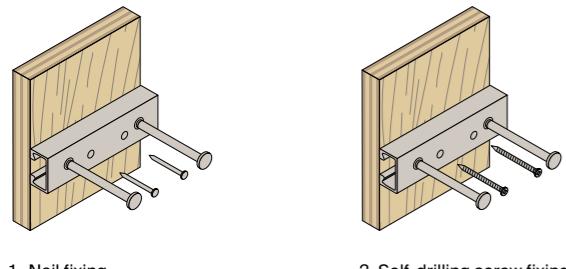


Figure: Minimum edge and bolt spacings

Profile	Thread M	Min. spacing S _{s,min} [mm]	Min. edge spacing C _{1,min} [mm]	Min. edge spacing C _{2,min} [mm]	Min. end spacing E _{min} [mm]
S-29/20	M12	60	50	50	25
S-38/23	M12	60	75	75	50
S-38/23	M16	80	75	75	50

Channel inward installation options.



1. Nail fixing

2. Self-drilling screw fixing

3. Clamp fixing

Cast-in Channel InnoLock FES-RS-S

InnoLock - The new benchmark in anchor channels.



Railway tunnels



Unitized curtain wall

Applications

- Suitable for all types of buildings or structures
- Facades
- Prefabricated elements
- Railways
- Metro tunnels and stations
- Industrial applications

Advantages

- Rollshaped anchor channels combine maximum load capacity and installation convenience, setting new standards in safety.
- All directional load capacity. Excellent loading capacity in longitudinal direction in combination with channel bolt

InnoLock FBC-S due to the full serration of the system.

- Ideal pre-positioned fixing solution which can cover on-site tolerances.
- Suitable for applications in cracked and non-cracked concrete.
- Permanently adjustable fixing solution.

Certificates / Features



ETA-22/0035, FES-RS-S
with special screw InnoLock
FBC-S



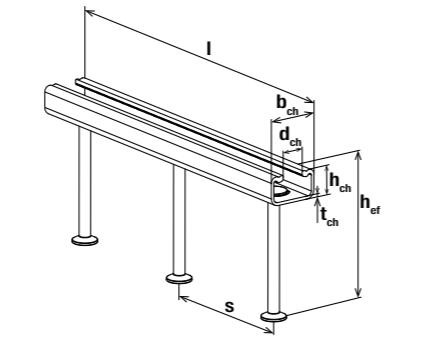
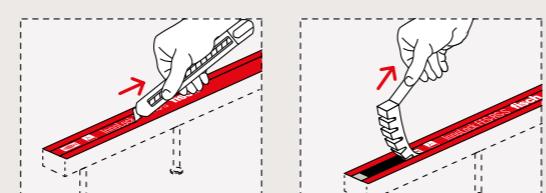
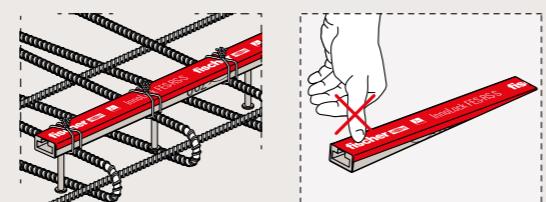
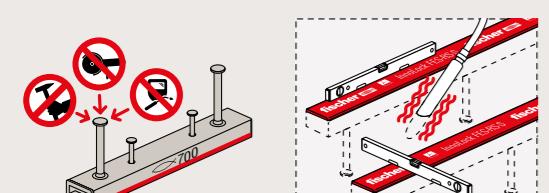
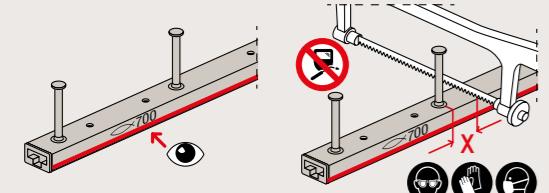
Dynamic

Building materials

- Concrete C12/15 to C90/105, cracked and non-cracked

Functioning

- Suitable for use in combination with serrated channel bolt InnoLock FBC-S.

Installation Cast-in Channel InnoLock FES-RS-S**Technical data**

Cast-in Channel InnoLock FES-RS-S 600 HDG - hot dip galvanised steel



FES-RS-S

Item	Item no.	Ap-pro-val	Length l [mm]	Width b_ch [mm]	Height h_ch [mm]	Total embedment depth h_nom [mm]	Anchor spacing s [mm]	Number of anchors [pcs]	Match	Piece per carton [pcs]	Sales unit [pcs]
InnoLock FES-RS-S-600-150-HDG	571730	●	160	50.5	29	153	80	2	FBC-S-225, M12-M20	18	1
InnoLock FES-RS-S-600-200-HDG	571731	●	210	50.5	29	153	150	2	FBC-S-225, M12-M20	14	1
InnoLock FES-RS-S-600-250-HDG	571732	●	260	50.5	29	153	200	2	FBC-S-225, M12-M20	12	1
InnoLock FES-RS-S-600-300-HDG	571733	●	310	50.5	29	153	250	2	FBC-S-225, M12-M20	12	1
InnoLock FES-RS-S-600-350-HDG	571734	●	360	50.5	29	153	150	3	FBC-S-225, M12-M20	7	1
InnoLock FES-RS-S-600-400-HDG	571735	●	410	50.5	29	153	175	3	FBC-S-225, M12-M20	7	1
InnoLock FES-RS-S-600-550-HDG	571736	●	560	50.5	29	153	250	3	FBC-S-225, M12-M20	6	1

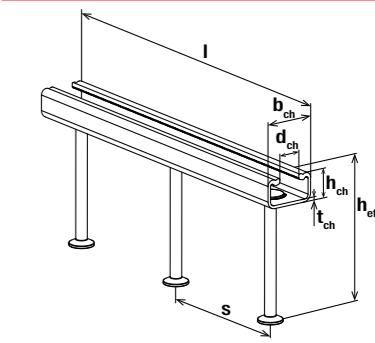
Technical data

Cast-in Channel InnoLock FES-RS-S 700 HDG - hot dip galvanised steel



FES-RS-S

Item	Item no.	Ap-pro-val	Length l [mm]	Width b_ch [mm]	Height h_ch [mm]	Total embedment depth h_nom [mm]	Anchor spacing s [mm]	Match	Piece per carton [pcs]	Sales unit [pcs]
InnoLock FES-RS-S-700-150-HDG	564777	●	160	52.5	34	178	100	FBC-S-225, M12-M20	18	1
InnoLock FES-RS-S-700-200-HDG	564778	●	210	52.5	34	178	150	FBC-S-225, M12-M20	12	1
InnoLock FES-RS-S-700-250-HDG	564779	●	260	52.5	34	178	200	FBC-S-225, M12-M20	9	1
InnoLock FES-RS-S-700-300-HDG	564780	●	310	52.5	34	178	250	FBC-S-225, M12-M20	8	1
InnoLock FES-RS-S-700-350-HDG	564781	●	360	52.5	34	178	150	FBC-S-225, M12-M20	7	1
InnoLock FES-RS-S-700-400-HDG	564782	●	410	52.5	34	178	175	FBC-S-225, M12-M20	6	1
InnoLock FES-RS-S-700-550-HDG	564783	●	560	52.5	34	178	250	FBC-S-225, M12-M20	6	1



2

Installation instruction – Minimum edge distances and minimum bolt spacing

- For the installation of the Cast-in Channels the required edge distances, anchor and channel bolt spacings must be respected.
- fischer recommends the design software FiXperience CHANNEL-FIX for a safe and economical evaluation of load and on-site conditions.
- ETA values always have to be considered.

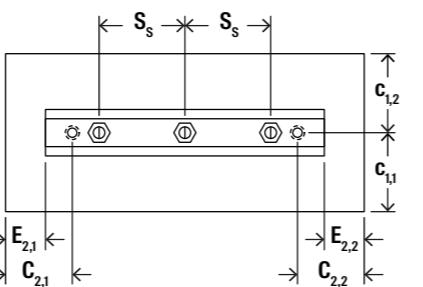
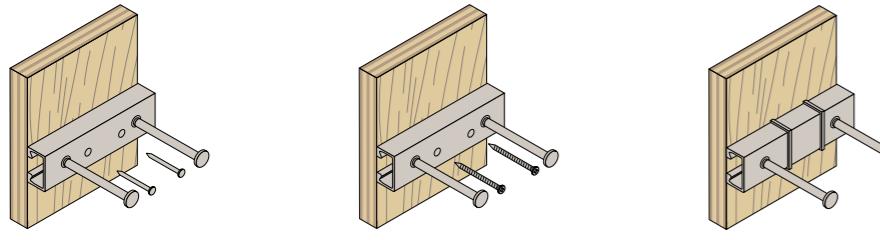


Figure: Minimum edge and bolt spacings

Profile	Thread M	Min. spacing S _{s,min} [mm]	Min. edge spacing C _{1,min} [mm]	Min. edge spacing C _{2,min} [mm]	Min. end spacing E _{min} [mm]
600	M12	60	75	75	45
600	M16	80	75	75	45
600	M20	100	75	75	45
700	M12	60	75	75	45
700	M16	80	75	75	45
700	M20	100	75	75	45

Channel inward installation options.



1. Nail fixing

2. Self-drilling screw fixing

3. Clamp fixing



3

3

3

Channel bolts

Channel bolt plain FBC

50



Channel bolt notched FBC-N

59



Channel bolt serrated FBC-S

63



Channel bolt serrated InnoLock FBC-S

69



Channel bolt plain FBC

Plain channel bolt for excellent strength and safety.



Pre-cast elements



Unitized curtain wall

Applications

- Suitable for all types of buildings or structures
- Façades
- Prefabricated elements
- Railways
- Metro tunnels and stations
- Industrial applications

Certificates / Features



ETA-18/0862, anchor channels FES with channel bolts FBC
R 120

Advantages

- Channel bolts FBC with smooth underside fitting to Cast-in Channels with smooth channel lips.
- High load bearing capacity combined with flexibility.
- Two directional load capacity.
- Ideal prepositioned fixing solution, capable of covering on-site tolerances.
- Suitable for applications in cracked and non-cracked concrete.
- Permanently adjustable fixing solution.

Properties

- Hot-dip galvanised $\geq 50 \mu\text{m}$ acc. to EN ISO 10684:2004 + AC:2009
- Steel grade 8.8 acc. to EN ISO 898-1:2013
- Hexagonal nut acc. to EN ISO 4032:2012

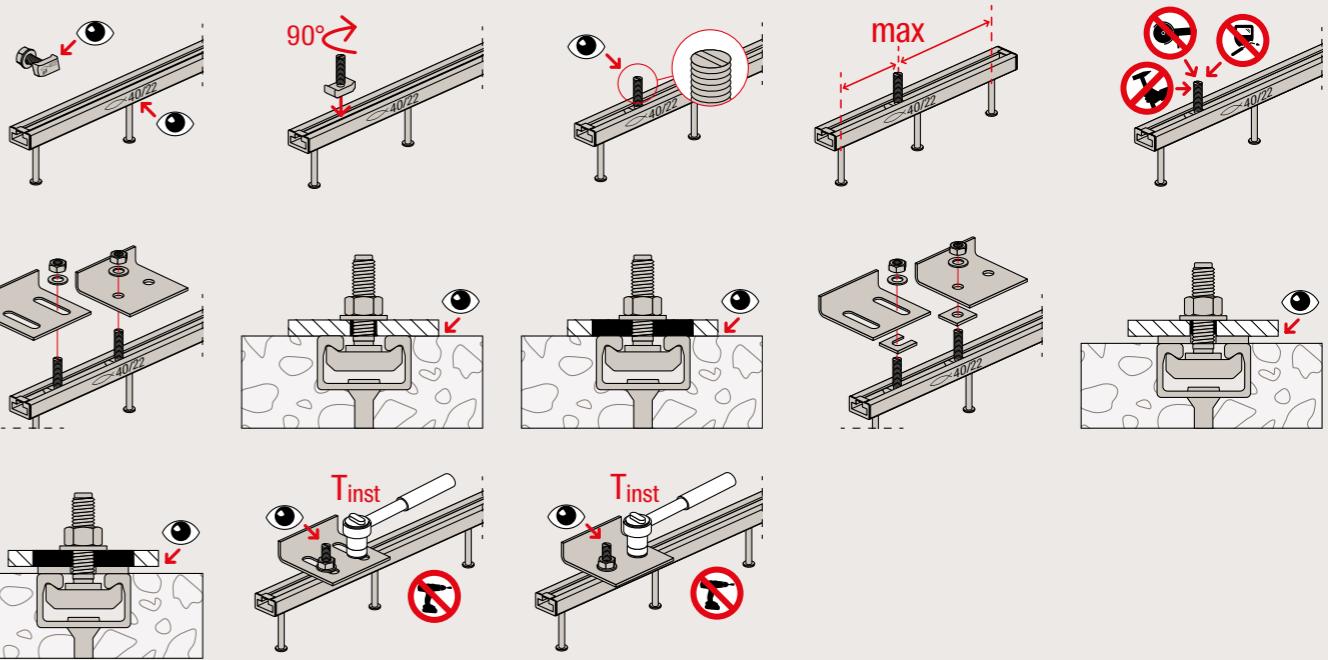
Functioning

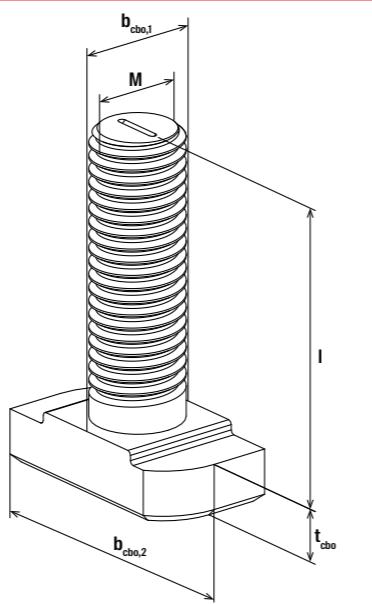
- Channel bolts FBC can be variably set in the planned position of Cast-in Channels.
- They are easily fixed by turning them clockwise and then applying the specified torque moment.
- Suitable for use in combination with hot-rolled and cold-rolled fischer Cast-in Channels FES-C and FES-H

Building materials

- Concrete C12/15 to C90/105, cracked and non-cracked

Installation Channel bolt plain FBC





3

Technical data

Channel bolt plain FBC 28/15 HDG - hot dip galvanised steel



FBC

Item	Item no.	Ap-pro-val	Steel grade	Thread	Length channel bolt head	Width	Height	Length	Diameter	Min. spacing channel bolts	Match	Sales unit
		ETA		M	b_cbo,1 [mm]	b_cbo,2 [mm]	t_cbo [mm]	l [mm]	d [mm]	s_cbo [mm]		[pcs]
FBC-28/15-M8x40-8.8-HDG	572672	●	8.8	M8	11	22.2	5	40	8	40	FES-C-28/15	200
FBC-28/15-M10x40-8.8-HDG	572680	●	8.8	M10	11	22.2	5	40	10	50	FES-C-28/15	200
FBC-28/15-M12x30-8.8-HDG	572687	●	8.8	M12	11	22.2	7	30	12	60	FES-C-28/15	100
FBC-28/15-M12x40-8.8-HDG	572688	●	8.8	M12	11	22.2	7	40	12	60	FES-C-28/15	100
FBC-28/15-M12x60-8.8-HDG	572690	●	8.8	M12	11	22.2	7	60	12	60	FES-C-28/15	100
FBC-28/15-M12x80-8.8-HDG	572692	●	8.8	M12	11	22.2	7	80	12	60	FES-C-28/15	100

Other lengths on request.

Technical data

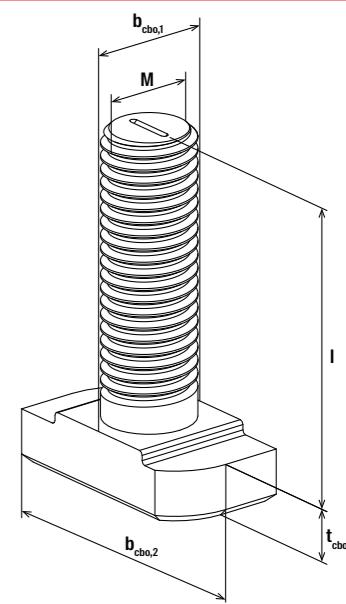
Channel bolt plain FBC 38/17 HDG - hot dip galvanised steel



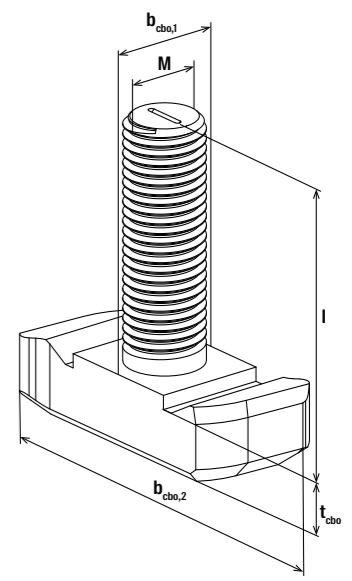
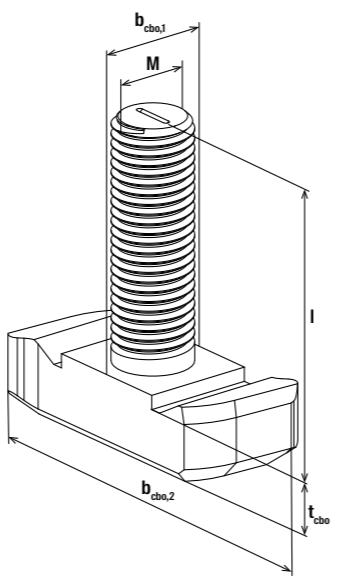
FBC

Item	Item no.	Ap-pro-val	Steel grade	Thread	Length channel bolt head	Width	Height	Length	Diameter	Min. spacing channel bolts	Match	Sales unit
		ETA		M	b_cbo,1 [mm]	b_cbo,2 [mm]	t_cbo [mm]	l [mm]	d [mm]	s_cbo [mm]		[pcs]
FBC-38/17-M10x30-8.8-HDG	572703	●	8.8	M10	16	30	6	30	10	50	FES-C-38/17	75
FBC-38/17-M10x40-8.8-HDG	572704	●	8.8	M10	16	30	6	40	10	50	FES-C-38/17	75
FBC-38/17-M10x60-8.8-HDG	572706	●	8.8	M10	16	30	6	60	10	50	FES-C-38/17	75
FBC-38/17-M10x80-8.8-HDG	572708	●	8.8	M10	16	30	6	80	10	50	FES-C-38/17	75
FBC-38/17-M12x40-8.8-HDG	572712	●	8.8	M12	16	30	7	40	10	60	FES-C-38/17	75
FBC-38/17-M12x60-8.8-HDG	572714	●	8.8	M12	16	30	7	60	10	60	FES-C-38/17	75
FBC-38/17-M12x80-8.8-HDG	572716	●	8.8	M12	16	30	7	80	10	60	FES-C-38/17	75
FBC-38/17-M16x50-8.8-HDG	572721	●	8.8	M16	16	30	7	50	16	80	FES-C-38/17	50
FBC-38/17-M16x60-8.8 HDG	572722	●	8.8	M16	16	30	7	60	16	80	FES-C-38/17	50

Other lengths on request.



3

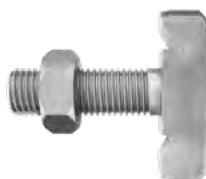


3

3

Technical data

Channel bolt plain FBC 40/22 HDG - hot dip galvanised steel



FBC

Item	Item no.	Ap-pro-val	Steel grade	Thread	Length channel bolt head	Width	Height	Length	Diameter	Min. spacing channel bolts	Match	Sales unit
		ETA		M	b_cbo,1 [mm]	b_cbo,2 [mm]	t_cbo [mm]	I [mm]	d [mm]	s_cbo [mm]		[pcs]
FBC-40/22-M12x40-8.8-HDG	572736	●	8.8	M12	14	32.5	8	40	12	60	FES-H-40/22 / FES-C-40/25	50
FBC-40/22-M12x50-8.8-HDG	572737	●	8.8	M12	14	32.5	8	50	12	60	FES-H-40/22 / FES-C-40/25	50
FBC-40/22-M12x60-8.8-HDG	572738	●	8.8	M12	14	32.5	8	60	12	60	FES-H-40/22 / FES-C-40/25	50
FBC-40/22-M12x80-8.8-HDG	572740	●	8.8	M12	14	32.5	8	80	12	60	FES-H-40/22 / FES-C-40/25	50
FBC-40/22-M12x100-8.8-HDG	572742	●	8.8	M12	14	32.5	8	100	12	60	FES-H-40/22 / FES-C-40/25	25
FBC-40/22-M16x50-8.8-HDG	572745	●	8.8	M16	17	32.5	8	50	16	80	FES-H-40/22 / FES-C-40/25	50
FBC-40/22-M16x60-8.8-HDG	572746	●	8.8	M16	17	32.5	8	60	16	80	FES-H-40/22 / FES-C-40/25	50
FBC-40/22-M16x80-8.8-HDG	572748	●	8.8	M16	17	32.5	8	80	16	80	FES-H-40/22 / FES-C-40/25	25
FBC-40/22-M16x100-8.8-HDG	572750	●	8.8	M16	17	32.5	8	100	16	80	FES-H-40/22 / FES-C-40/25	25

Other lengths on request.

Technical data

Channel bolt plain FBC 40/22 A4 - stainless steel A4



FBC

Item	Item no.	Ap-pro-val	Thread	Length channel bolt head	Width	Height	Length	Diameter	Min. spacing channel bolts	Match	Sales unit
		ETA	M	b_cbo,1 [mm]	b_cbo,2 [mm]	t_cbo [mm]	I [mm]	d [mm]	s_cbo [mm]		[pcs]
FBC-40/22-M12x40-A4-70	568045	●	M12	14	32.5	8	40	12	60	FES-H-40/22 / FES-C-40/25	50
FBC-40/22-M12x50-A4-70	568046	●	M12	14	32.5	8	50	12	60	FES-H-40/22 / FES-C-40/25	50
FBC-40/22-M12x60-A4-70	568047	●	M12	14	32.5	8	60	12	60	FES-H-40/22 / FES-C-40/25	50
FBC-40/22-M12x80-A4-70	568049	●	M12	14	32.5	8	80	12	60	FES-H-40/22 / FES-C-40/25	50
FBC-40/22-M12x100-A4-70	568051	●	M12	14	32.5	8	100	12	60	FES-H-40/22 / FES-C-40/25	25
FBC-40/22-M16x50-A4-70	568054	●	M16	17	32.5	8	50	16	80	FES-H-40/22 / FES-C-40/25	50
FBC-40/22-M16x60-A4-70	568055	●	M16	17	32.5	8	60	16	80	FES-H-40/22 / FES-C-40/25	50
FBC-40/22-M16x80-A4-70	568057	●	M16	17	32.5	8	80	16	80	FES-H-40/22 / FES-C-40/25	25
FBC-40/22-M16x100-A4-70	568059	●	M16	17	32.5	8	100	16	80	FES-H-40/22 / FES-C-40/25	25

Other lengths on request.

Channel bolt design resistance

Profile	Strength class Steel grade	Load capacity M10			Load capacity M12			Load capacity M16			Load capacity M20		
		N _{Rd,s} [kN]	V _{Rd,s} [kN]	M ⁰ _{Rd,s} [Nm]	N _{Rd,s} [kN]	V _{Rd,s} [kN]	M ⁰ _{Rd,s} [Nm]	N _{Rd,s} [kN]	V _{Rd,s} [kN]	M ⁰ _{Rd,s} [Nm]	N _{Rd,s} [kN]	V _{Rd,s} [kN]	M ⁰ _{Rd,s} [Nm]
FBC-28/15	8.8	22.0	18.6	47.8	30.1	27.0	83.8	-	-	-	-	-	-
FBC-38/17	8.8	37.6	18.6	47.8	44.9	27.0	83.8	59.9	50.2	213.1	-	-	-
FBC-40/22	8.8	30.9	18.6	47.8	36.7	27.0	83.8	54.8	50.2	213.1	-	-	-
A4-70	-	-	-	-	29.4	22.7	58.7	55.0	35.2	149.4	-	-	-
FBC-50/30	8.8	30.9	18.6	47.8	44.9	27.0	83.8	64.3	50.2	213.1	84.8	78.8	415.4
A4-70	-	-	-	-	31.6	22.7	58.7	44.3	35.2	149.4	87.2	66.0	291.3

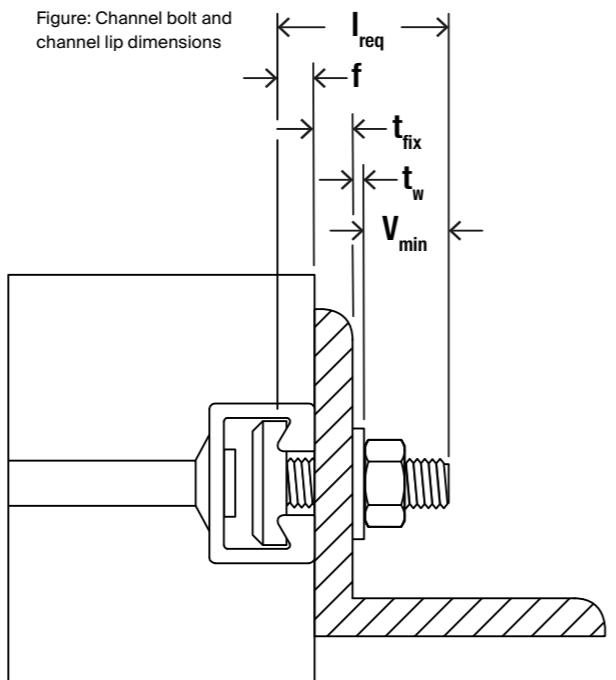
Required installation torque T_{inst}

Standard channel bolt FBC		General (A)		Steel – steel contact (B)	
Profile	Thread M	T _{inst,g} [Nm]	T _{inst,s} [Nm]	Steel grade 8.8	Steel grade A4-70
FBC-28/15	M8	7	-	15	-
	M10	10	-	30	-
	M12	13	-	45	-
FBC-38/17	M10	15	-	30	-
	M12	20	-	45	-
	M16	30	-	100	-
FBC-40/22	M10	15	-	30	-
	M12	24	24	45	45
	M16	32	32	100	100
FBC-50/30	M10	15	-	30	-
	M12	25	25	45	45
	M16	60	60	100	100
	M20	75	75	230	230

Channel bolt installation parameter

V _{min} /size	V _{min} [mm]
Channel bolt thread	V _{min} [mm]
M8	12
M10	14
M12	16
M16	20
M20	25

Cast-in Channel system lip thickness f	Thickness [mm]
Profile	
H-(I)-40/22-(P)	6.2
H-(I)-50/30-(P)	8.1
H-(I)-52/34	11.5
C-28/15	2.3
C-38/17	3.0
C-40/25	6.0
C-49/30	7.0
C-54/33	8.5



l_{req} = required bolt length
 t_{fix} = thickness of clamped component
 f = profile lip thickness
 t_w = washer thickness
 V_{min} = nut height EN ISO 4032 + overhang approximately 5 mm (for M20: 7 mm)

Channel bolt notched FBC-N

Notched channel bolt for excellent strength and safety.



Railway tunnels



Unitized curtain wall

Applications

- Suitable for all types of buildings or structures
- Facades
- Prefabricated elements
- Railways
- Metro tunnels and stations
- Industrial applications

Advantages

- Channel bolts FBC-N with notched underside fitting to smooth, hot-rolled Cast-in Channel lips.
- Thus giving excellent load capacity with high safety.
- All directional load capacity.
- Plus fundamental load capacity in longitudinal direction.
- Ideal prepositioned fixing solution, capable of covering on-site tolerances.
- Suitable for applications in cracked and non-cracked concrete.
- Permanently adjustable fixing solution.

Properties

- Hot-dip galvanised ≥ 50 µm acc. to EN ISO 10684:2004 + AC:2009
- Steel grade 8.8 acc. to EN ISO 898-1:2013
- Hexagonal nut acc. to EN ISO 4032:2012

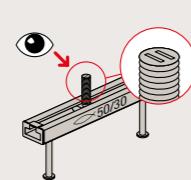
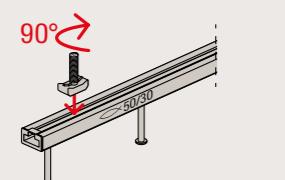
Functioning

- Channel bolts FBC-N can be variably set in the planned position of Cast-in Channels.
- They are easily fixed by turning them clockwise and then applying the specified torque moment.
- Suitable for use in combination with hot rolled Cast-in Channels FES-H.

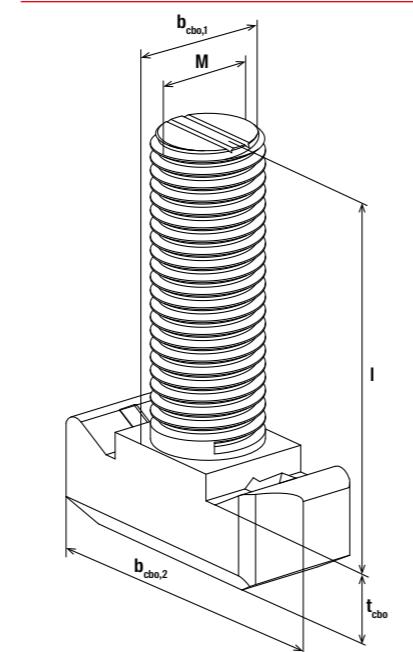
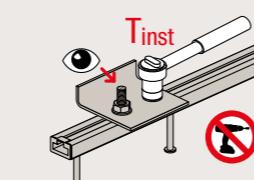
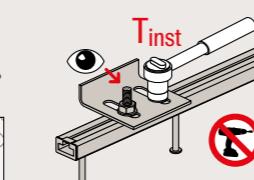
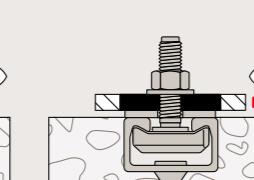
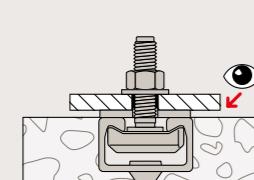
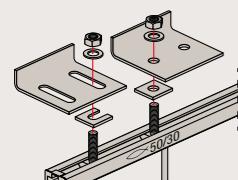
Building materials

- Concrete C12/15 to C90/105, cracked and non-cracked

Installation Channel bolt notched FBC-N



3



Technical data

Channel bolt notched FBC-N 40/22 HDG - hot dip galvanised steel



FBC-N

Item	Item no.	Ap-pro-val	Steel grade	Thread	Length channel bolt head	Width b.cbo.1 [mm]	Width b.cbo.2 [mm]	Height t.cbo. [mm]	Length l [mm]	Diameter d [mm]	Min. spacing channel bolts s.cbo. [mm]	Match	Sales unit
		Item no.	ETA	M	b.cbo.1 [mm]	b.cbo.2 [mm]	t.cbo. [mm]	l [mm]	d [mm]	s.cbo. [mm]		[pcs]	
FBC-N-40/22-M16x40-8.8-HDG	569361	●	8.8	M16	17	33	7.8	40	16	80	FES-H-40/22	50	
FBC-N-40/22-M16x50-8.8-HDG	569362	●	8.8	M16	17	33	7.8	50	16	80	FES-H-40/22	50	
FBC-N-40/22-M16x60-8.8-HDG	569363	●	8.8	M16	17	33	7.8	60	16	80	FES-H-40/22	50	
FBC-N-40/22-M16x80-8.8-HDG	569366	●	8.8	M16	17	33	7.8	80	16	80	FES-H-40/22	25	
FBC-N-40/22-M16x100-8.8-HDG	569368	●	8.8	M16	17	33	7.8	100	16	80	FES-H-40/22	25	

Other lengths on request.

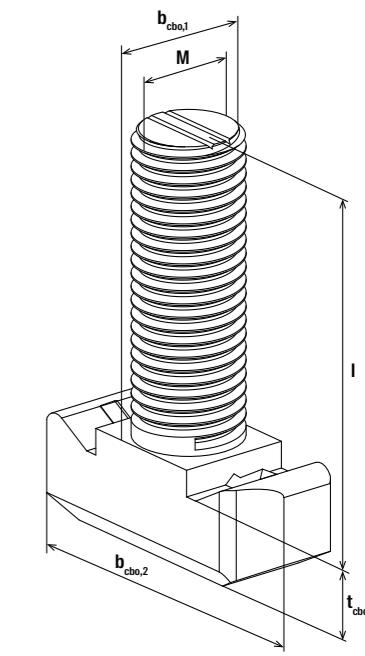
Technical data

Channel bolt notched 50/30 HDG - hot dip galvanised steel



FBC-N

Item	Item no.	Ap-pro-val	Steel grade	Thread	Length channel bolt head	Width b.cbo.1 [mm]	Width b.cbo.2 [mm]	Height t.cbo. [mm]	Length l [mm]	Diameter d [mm]	Min. spacing channel bolts s.cbo. [mm]	Match	Sales unit
		Item no.	ETA	M	b.cbo.1 [mm]	b.cbo.2 [mm]	t.cbo. [mm]	l [mm]	d [mm]	s.cbo. [mm]		[pcs]	
FBC-N-50/30-M16x40-8.8 HDG	559562	●	8.8	M16	17.5	42.2	12	40	16	80	FES-H-50/30 / FES-H-52/34	50	
FBC-N-50/30-M16x50-8.8 HDG	559563	●	8.8	M16	17.5	42.2	12	50	16	80	FES-H-50/30 / FES-H-52/34	50	
FBC-N-50/30-M16x70-8.8 HDG	559564	●	8.8	M16	17.5	42.2	12	70	16	80	FES-H-50/30 / FES-H-52/34	25	
FBC-N-50/30-M16x80-8.8 HDG	559565	●	8.8	M16	17.5	42.2	12	80	16	80	FES-H-50/30 / FES-H-52/34	25	
FBC-N-50/30-M20x40-8.8 HDG	559570	●	8.8	M20	21	40.5	12	40	20	100	FES-H-50/30 / FES-H-52/34	25	
FBC-N-50/30-M20x60-8.8 HDG	558390	●	8.8	M20	21	40.5	12	60	20	100	FES-H-50/30 / FES-H-52/34	25	
FBC-N-50/30-M20x80-8.8 HDG	558392	●	8.8	M20	21	40.5	12	80	20	100	FES-H-50/30 / FES-H-52/34	25	
FBC-N-50/30-M20x100-8.8 HDG	559574	●	8.8	M20	21	40.5	12	100	20	100	FES-H-50/30 / FES-H-52/34	20	
FBC-N-50/30-M20x125-8.8 HDG	559575	●	8.8	M20	21	40.5	12	125	20	100	FES-H-50/30 / FES-H-52/34	20	
FBC-N-50/30-M20x200-8.8 HDG	559576	●	8.8	M20	21	40.5	12	200	20	100	FES-H-50/30 / FES-H-52/34	10	



Channel bolt design resistance

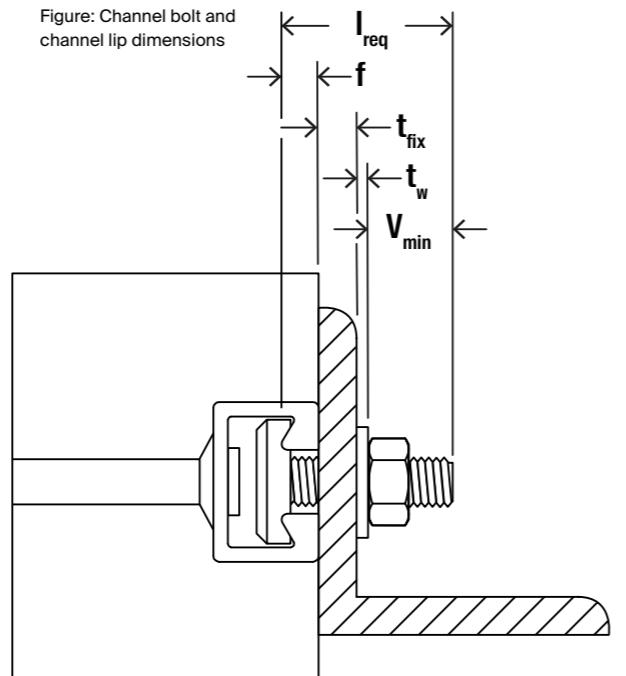
Channel bolt FBC-N													
Profile	Strength class Steel grade	Load capacity M10			Load capacity M12			Load capacity M16			Load capacity M20		
		N _{Rd,s} [kN]	V _{Rd,s} [kN]	M ⁰ _{Rd,s} [Nm]	N _{Rd,s} [kN]	V _{Rd,s} [kN]	M ⁰ _{Rd,s} [Nm]	N _{Rd,s} [kN]	V _{Rd,s} [kN]	M ⁰ _{Rd,s} [Nm]	N _{Rd,s} [kN]	V _{Rd,s} [kN]	M ⁰ _{Rd,s} [Nm]
FBC-N-40/22	8.8	-	-	-	-	-	-	67.3	50.2	213.1	-	-	-
FBC-N-50/30	8.8	-	-	-	-	-	-	75.6	50.2	213.1	95.0	78.4	415.4

Required installation torque T_{inst}

Channel bolt FBC-N												
		Thread M		General (A)			Steel – steel contact (B)					
Profile		T _{inst,g} [Nm]		Steel grade 8.8	Steel grade A4-70	T _{inst,s} [Nm]		Steel grade 8.8	Steel grade A4-70			
FBC-N-40/22		M16	-	-	-	200	-	200	-			
FBC-N-50/30		M16	-	-	-	400	-	200	-			
		M20	-	-	-							

Channel bolt installation parameter

V _{min} /size	V _{min} [mm]
Channel bolt thread	
M12	16
M16	20
M20	25
Cast-in Channel system lip thickness f	Thickness [mm]
Profile	
H-(I)-40/22-(P)	6.2
H-(I)-50/30-(P)	8.1
H-(I)-52/34	11.5



l_{req} = required bolt length
 t_{fix} = thickness of clamped component
 f = profile lip thickness
 t_w = washer thickness
 V_{min} = nut height EN ISO 4032 + overhang approximately 5 mm (for M20: 7 mm)

Channel bolt serrated FBC-S

Serrated channel bolt for optimum strength and safety.



Railway tunnels



Unitized curtain wall

Applications

- Suitable for all types of buildings or structures
- Façades
- Prefabricated elements
- Railways
- Metro tunnels and stations
- Industrial applications

Certificates / Features



ETA-18-0862, anchor
channels FES with channel
bolts FBC

Advantages

- Channel bolts FBC-S with serrated underside perfectly interlock with channels with serrated lips.
- Thus giving optimum load capacity with high safety.
- All directional load capacity.
- Plus optimum load capacity in longitudinal direction in combination with FES-H-S due to the full serration of the system.
- Ideal prepositioned fixing solution, capable of covering on-site tolerances.
- Suitable for applications in cracked and non-cracked concrete.
- Permanently adjustable fixing solution.

Properties

- Hot-dip galvanised ≥ 50 µm acc. to EN ISO 10684:2004 + AC:2009
- Steel grade 8.8 acc. to EN ISO 898-1:2013
- Hexagonal nut acc. to EN ISO 4032:2012

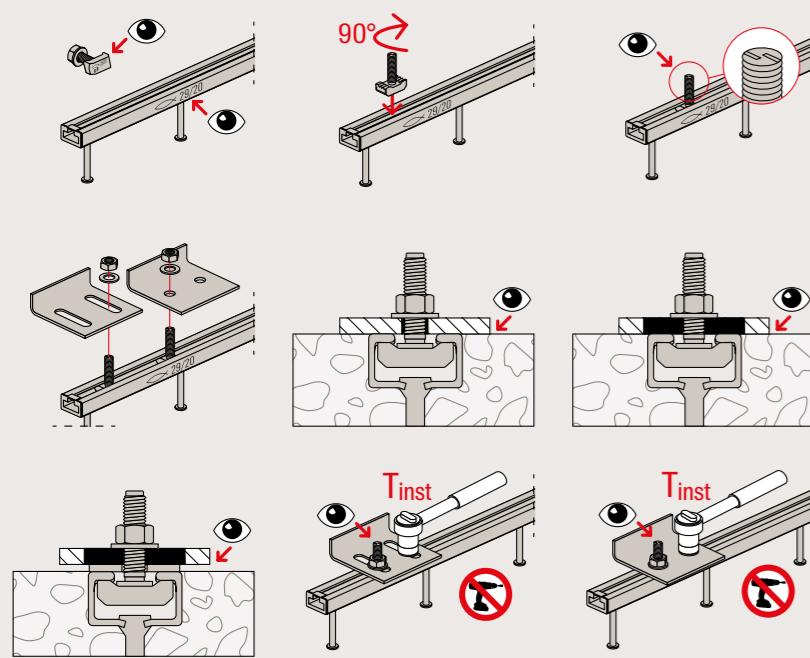
Functioning

- Channel bolts FBC-S can be variably set in the planned position of Cast-in Channels.
- They are easily fixed by turning them clockwise and then applying the specified torque moment.
- Suitable for use in combination with hot-rolled and serrated Cast-in Channels fischer FES-H-S.

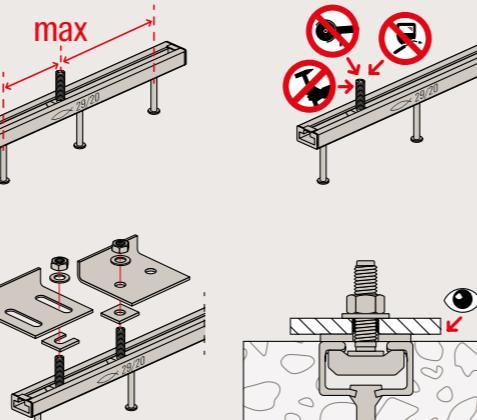
Building materials

- Concrete C12/15 to C90/105, cracked and non-cracked

Installation Channel bolt serrated FBC-S



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Technical data

Channel bolt serrated FBC-S 29/20 HDG - hot dip galvanised steel

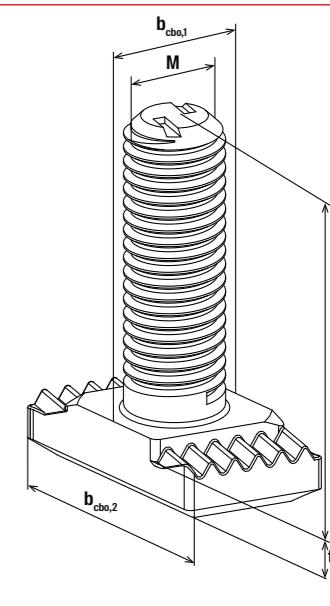
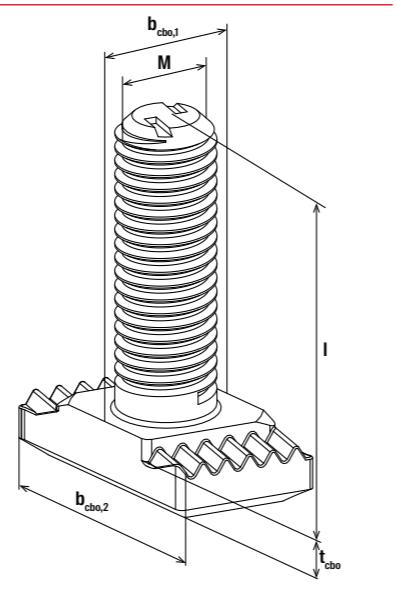


FBC-S

Item	Item no.	Ap-pro-val ETA	Steel grade	Thread M	Length channel bolt head $b_{cbo,1}$ [mm]	Width $b_{cbo,2}$ [mm]	Height t_{cbo} [mm]	Length l [mm]	Diameter d [mm]	Min. spacing channel bolts s_{cbo} [mm]	Match	Sales unit [pcs]
FBC-S-29/20-M12x40-8.8-HDG	572814	●	8.8	M12	13	22	6.5	40	12	60	FES-H-S-29/20	100
FBC-S-29/20-M12x50-8.8-HDG	572815	●	8.8	M12	13	22	6.5	50	12	60	FES-H-S-29/20	100
FBC-S-29/20-M12x60-8.8-HDG	572816	●	8.8	M12	13	22	6.5	60	12	60	FES-H-S-29/20	100
FBC-S-29/20-M12x80-8.8-HDG	572817	●	8.8	M12	13	22	6.5	80	12	60	FES-H-S-29/20	100

Other lengths on request.

3



Technical data

Channel bolt serrated FBC-S 38/23 HDG - hot dip galvanised steel



FBC-S

		Ap-pro-val	Steel grade	Thread	Length channel bolt head	Width	Height	Length	Diameter	Min. spacing channel bolts	Match	Sales unit
Item	Item no.	ETA		M	b_cbo,1 [mm]	b_cbo,2 [mm]	t_cbo [mm]	l [mm]	d [mm]	s_cbo [mm]	[pcs]	
FBC-S-38/23-M12x40-8.8-HDG	572820	●	8.8	M12	16.7	29.1	5.8	40	12	60	FES-H-S-38/23	75
FBC-S-38/23-M12x50-8.8-HDG	572821	●	8.8	M12	16.7	29.1	5.8	50	12	60	FES-H-S-38/23	75
FBC-S-38/23-M12x60-8.8-HDG	572822	●	8.8	M12	16.7	29.1	5.8	60	12	60	FES-H-S-38/23	75
FBC-S-38/23-M12x80-8.8-HDG	572823	●	8.8	M12	16.7	29.1	5.8	80	12	60	FES-H-S-38/23	50
FBC-S-38/23-M16x40-8.8-HDG	572826	●	8.8	M16	16.7	29.1	5.8	40	16	80	FES-H-S-38/23	50
FBC-S-38/23-M16x60-8.8-HDG	572828	●	8.8	M16	16.7	29.1	5.8	60	16	80	FES-H-S-38/23	50
FBC-S-38/23-M16x100-8.8-HDG	572830	●	8.8	M16	16.7	29.1	5.8	100	16	80	FES-H-S-38/23	25

Other lengths on request.

Technical data

Channel bolt serrated FBC-S 38/23 A4 - stainless steel A4



FBC-S A4

		Thread	Length channel bolt head	Width	Height	Length	Diameter	Min. spacing channel bolts	Match	Sales unit
Item	Item no.	M	b_cbo,1 [mm]	b_cbo,2 [mm]	t_cbo [mm]	l [mm]	d [mm]	s_cbo [mm]	[pcs]	
FBC-S-38/23-M12x40-A4-70	575445	M12	16.7	29.1	5.8	40	12	60	FES-H-S-38/23	75
FBC-S-38/23-M12x50-A4-70	575446	M12	16.7	29.1	5.8	50	12	60	FES-H-S-38/23	75
FBC-S-38/23-M12x60-A4-70	575447	M12	16.7	29.1	5.8	60	12	60	FES-H-S-38/23	75
FBC-S-38/23-M12x80-A4-70	575448	M12	16.7	29.1	5.8	80	12	60	FES-H-S-38/23	50
FBC-S-38/23-M16x40-A4-70	575451	M16	16.7	29.1	5.8	40	16	80	FES-H-S-38/23	50
FBC-S-38/23-M16x60-A4-70	575453	M16	16.7	29.1	5.8	60	16	80	FES-H-S-38/23	50
FBC-S-38/23-M16x100-A4-70	575455	M16	16.7	29.1	5.8	100	16	80	FES-H-S-38/23	25

Other lengths on request.

Channel bolt design resistance

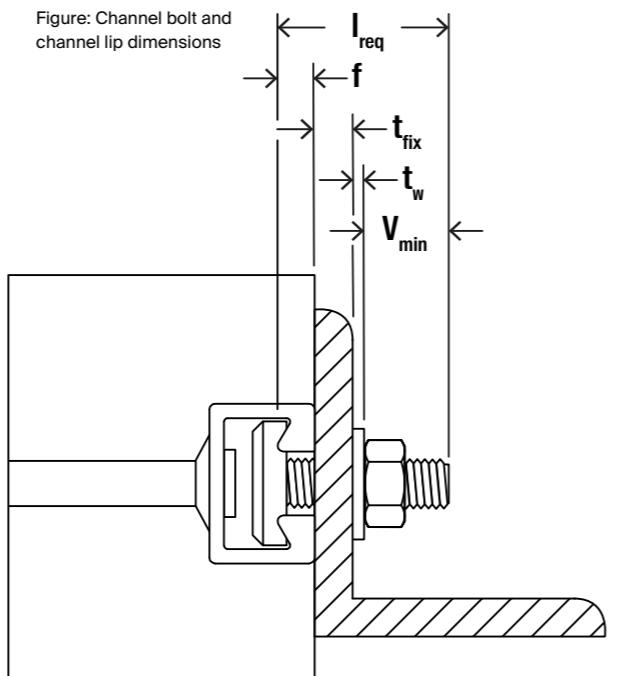
Channel bolt serrated FBC-S													
Profile	Strength class Steel grade	Load capacity M10			Load capacity M12			Load capacity M16			Load capacity M20		
		N _{Rd,s} [kN]	V _{Rd,s} [kN]	M ⁰ _{Rd,s} [Nm]	N _{Rd,s} [kN]	V _{Rd,s} [kN]	M ⁰ _{Rd,s} [Nm]	N _{Rd,s} [kN]	V _{Rd,s} [kN]	M ⁰ _{Rd,s} [Nm]	N _{Rd,s} [kN]	V _{Rd,s} [kN]	M ⁰ _{Rd,s} [Nm]
FBC-S-29/20	8.8	-	-	-	32.3	27.0	83.8	-	-	-	-	-	-
FBC-S-38/23	8.8	-	-	-	44.9	27.0	83.8	47.7	50.2	213.1	-	-	-
	A4-70	-	-	-	31.5	22.6	58.7	38.2	42.2	149.3	-	-	-

3 Required installation torque T_{inst}

Channel bolt serrated FBC-S													
Profile	Thread M	General (A)			Steel – steel contact (B)								
		T _{inst,g} [Nm]	Steel grade 8.8	Steel grade A4-70	T _{inst,s} [Nm]	Steel grade 8.8	Steel grade A4-70						
FBC-S-29/20	M12	80	-	-	80	-	-						
FBC-S-38/23	M12	80	80	80	80	80	80						
	M16	100	100	100	100	100	100						

Channel bolt installation parameter

V _{min} /size	
Channel bolt thread	V _{min} [mm]
M12	16
M16	20
Cast-in Channel system lip thickness f	
Profile	Thickness [mm]
H-S-29/20	5.2
H-S-38/23	6



l_{req} = required bolt length
 t_{fix} = thickness of clamped component
 f = profile lip thickness
 t_w = washer thickness
 V_{min} = nut height EN ISO 4032 + overhang approximately 5 mm (for M20: 7 mm)

Channel bolt serrated InnoLock FBC-S

Serrated channel bolt for optimum strength and safety with InnoLock-geometry.



Railway tunnels



Unitized curtain wall

Applications

- Suitable for all types of buildings or structures
- Façades
- Prefabricated elements
- Railways
- Metro tunnels and stations
- Industrial applications

Certificates / Features



ETA-22/0035, FES-RS-S
with special screw InnoLock
FBC-S



Advantages

- Unique InnoLock FBC-S with specially designed channel bolt geometry that perfectly interlocks in the InnoLock channel with serrated lips.
- Thus giving optimum load capacity with high safety.
- All directional load capacity.
- Plus optimum load capacity in longitudinal direction in combination with InnoLock FES-RS-S due to the full serration of the system.
- Ideal prepositioned fixing solution, capable of covering on-site tolerances.
- Suitable for applications in cracked and non-cracked concrete.
- Permanently adjustable fixing solution.

Properties

- Hot-dip galvanised ≥ 50 µm acc. to EN ISO 10684:2004 + AC:2009
- Steel grade 8.8 acc. to EN ISO 898-1:2013
- Hexagonal nut acc. to EN ISO 4032:2012

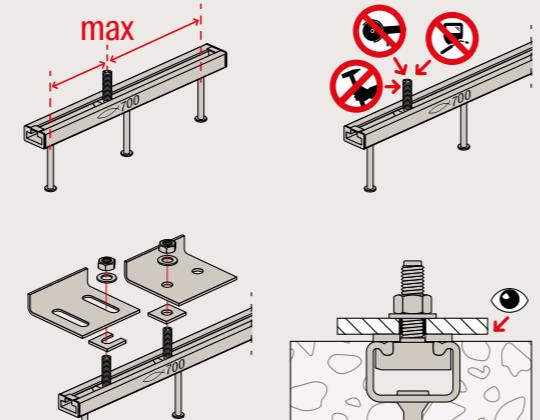
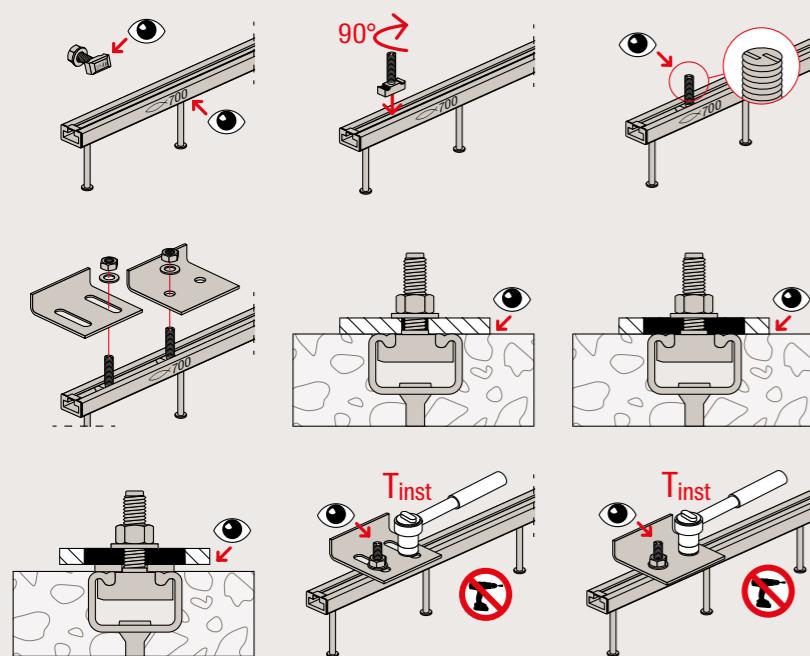
Functioning

- InnoLock FBC-S channel bolts can be variably set in the planned position of InnoLock Cast-In Channel.
- They are easily fixed by turning them clockwise until final position is reached and then applying the specified torque moment.
- Suitable for use in combination with InnoLock Cast-In Channels FES-RS-S.

Building materials

Concrete C12/15 to C90/105, cracked and non-cracked

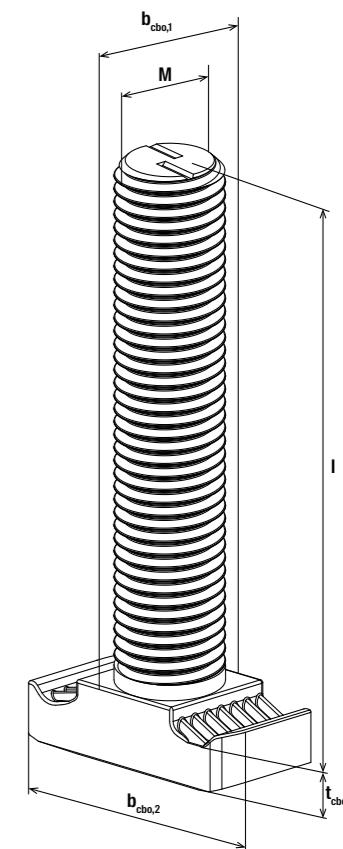
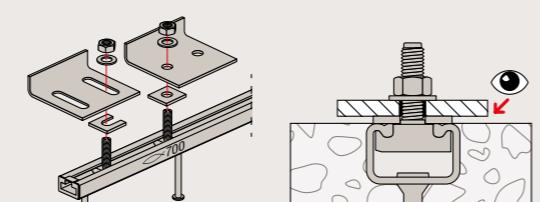
Installation Channel bolt serrated InnoLock FBC-S



max

Tinst

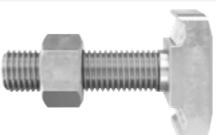
Tinst



3

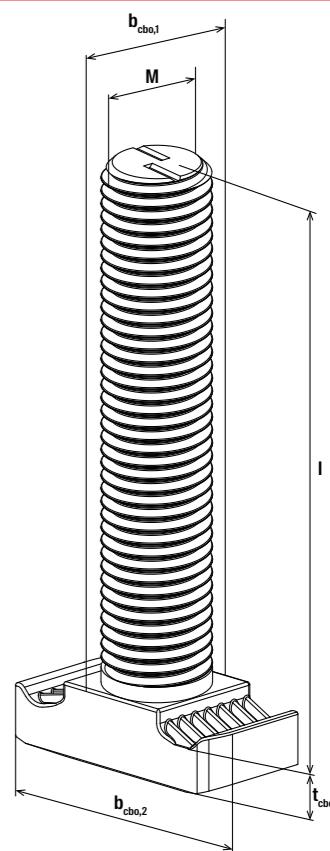
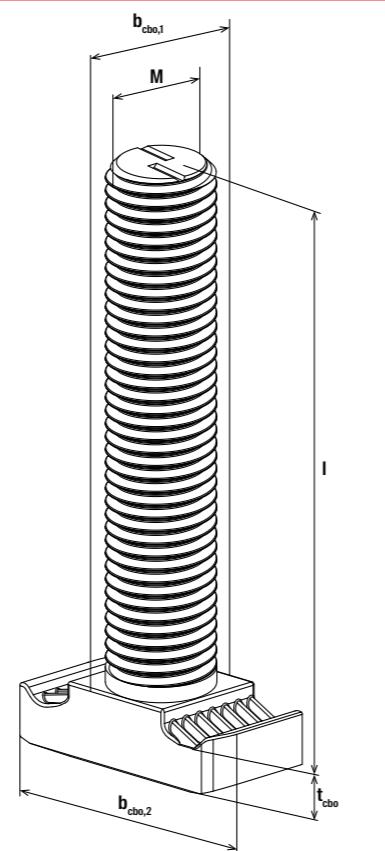
Technical data

Channel bolt serrated InnoLock FBC-S 225 HDG - hot dip galvanised steel



InnoLock FBC-S

Item	Item no.	Ap-pro-val	Steel grade	Thread	Length channel bolt head	Width	Height	Length	Diameter	Min. spacing channel bolts	Match	Sales unit
		ETA		M	b_cbo,1 [mm]	b_cbo,2 [mm]	t_cbo [mm]	l [mm]	d [mm]	s_cbo [mm]		[pcs]
FBC-S-225-M12x40-8.8-HDG	561142	●	8.8	M12	21	43	10.7	40	12	60	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M12x50-8.8-HDG	561143	●	8.8	M12	21	43	10.7	50	12	60	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M12x60-8.8-HDG	561144	●	8.8	M12	21	43	10.7	60	12	60	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M12x70-8.8-HDG	561145	●	8.8	M12	21	43	10.7	70	12	60	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M12x80-8.8-HDG	561146	●	8.8	M12	21	43	10.7	80	12	60	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M12x90-8.8-HDG	561147	●	8.8	M12	21	43	10.7	90	12	60	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M12x100-8.8-HDG	561148	●	8.8	M12	21	43	10.7	100	12	60	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M12x125-8.8-HDG	561149	●	8.8	M12	21	43	10.7	125	12	60	FES-RS-S-600 / FES-RS-S-700	20
FBC-S-225-M16x40-8.8-HDG	561151	●	8.8	M16	21	43	10.7	40	16	80	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M16x50-8.8-HDG	561152	●	8.8	M16	21	43	10.7	50	16	80	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M16x60-8.8-HDG	561153	●	8.8	M16	21	43	10.7	60	16	80	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M16x70-8.8-HDG	561154	●	8.8	M16	21	43	10.7	70	16	80	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M16x80-8.8-HDG	561155	●	8.8	M16	21	43	10.7	80	16	80	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M16x90-8.8-HDG	561156	●	8.8	M16	21	43	10.7	90	16	80	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M16x100-8.8-HDG	561157	●	8.8	M16	21	43	10.7	100	16	80	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M16x125-8.8-HDG	561158	●	8.8	M16	21	43	10.7	125	16	80	FES-RS-S-600 / FES-RS-S-700	20
FBC-S-225-M16x200-8.8-HDG	561159	●	8.8	M16	21	43	10.7	200	16	80	FES-RS-S-600 / FES-RS-S-700	10

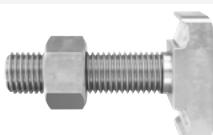


3

3

Technical data

Channel bolt serrated InnoLock FBC-S 225 HDG - hot dip galvanised steel



InnoLock FBC-S

Item	Item no.	Ap-pro-val	Steel grade	Thread	Length channel bolt head	Width	Height	Length	Diameter	Min. spacing channel bolts	Match	Sales unit
		ETA		M	b.cbo,1 [mm]	b.cbo,2 [mm]	t.cbo [mm]	l [mm]	d [mm]	s.cbo [mm]		[pcs]
FBC-S-225-M20x40-8.8-HDG	561160	●	8.8	M20	21	43	10.7	40	20	100	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M20x50-8.8-HDG	561161	●	8.8	M20	21	43	10.7	50	20	100	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M20x60-8.8-HDG	561162	●	8.8	M20	21	43	10.7	60	20	100	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M20x70-8.8-HDG	561163	●	8.8	M20	21	43	10.7	70	20	100	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M20x80-8.8-HDG	561164	●	8.8	M20	21	43	10.7	80	20	100	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M20x90-8.8-HDG	561165	●	8.8	M20	21	43	10.7	90	20	100	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M20x100-8.8-HDG	561166	●	8.8	M20	21	43	10.7	100	20	100	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M20x125-8.8-HDG	561167	●	8.8	M20	21	43	10.7	125	20	100	FES-RS-S-600 / FES-RS-S-700	20
FBC-S-225-M20x200-8.8-HDG	561168	●	8.8	M20	21	43	10.7	200	20	100	FES-RS-S-600 / FES-RS-S-700	10

Other lengths on request.

Technical data

Channel bolt serrated InnoLock FBC-S 225 A4 - stainless steel A4



InnoLock FBC-S A4

Item	Item no.	Thread	Length channel bolt head	Width	Height	Length	Diameter	Min. spacing channel bolts	Match	Sales unit
		M	b.cbo,1 [mm]	b.cbo,2 [mm]	t.cbo [mm]	l [mm]	d [mm]	s.cbo [mm]		[pcs]
FBC-S-225-M16x40-A4-70	575380	M16	21	43	10.7	40	16	80	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M16x50-A4-70	575381	M16	21	43	10.7	50	16	80	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M16x60-A4-70	575382	M16	21	43	10.7	60	16	80	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M16x70-A4-70	575383	M16	21	43	10.7	70	16	80	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M16x80-A4-70	575384	M16	21	43	10.7	80	16	80	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M16x90-A4-70	575385	M16	21	43	10.7	90	16	80	FES-RS-S-600 / FES-RS-S-700	25
FBC-S-225-M16x100-A4-70	575386	M16	21	43	10.7	100	16	80	FES-RS-S-600 / FES-RS-S-700	25

Other lengths on request.

Channel bolt design resistance

Channel bolt InnoLock FBC-S										
Profile	Strength class Steel grade	Load capacity M12			Load capacity M16			Load capacity M20		
		N _{Rd,s} [kN]	V _{Rd,s} [kN]	M ⁰ _{Rd,s} [Nm]	N _{Rd,s} [kN]	V _{Rd,s} [kN]	M ⁰ _{Rd,s} [Nm]	N _{Rd,s} [kN]	V _{Rd,s} [kN]	M ⁰ _{Rd,s} [Nm]
FBC-S-225	8.8	44.9	26.9	83.8	83.7	50.2	213.1	113.3	78.4	415.4
	A4-70	-	-	-	58.7	42.2	149.3	-	-	-

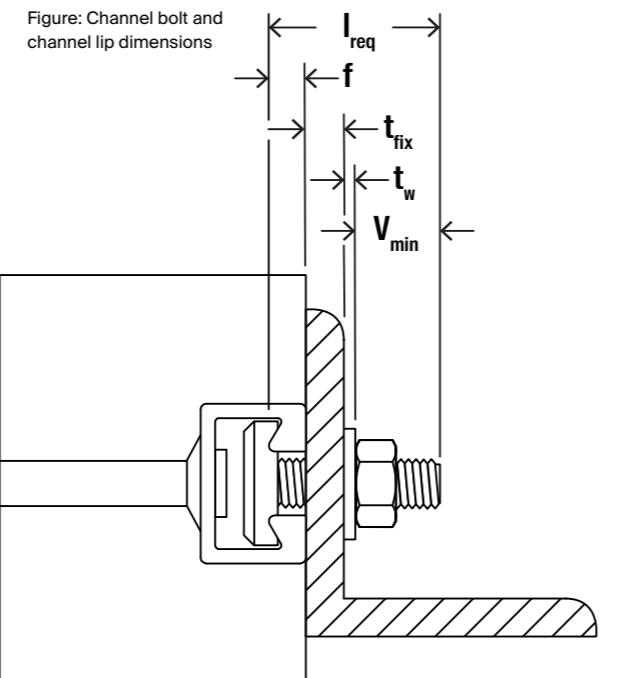
Required installation torque T_{inst}

Channel bolt InnoLock FBC-S										
Profile	Thread M	General (A)			Steel – steel contact (B)			Steel grade 8.8	Steel grade A4-70	Steel grade 8.8
		T _{inst,g} [Nm]	Steel grade 8.8	Steel grade A4-70	T _{inst,s} [Nm]	Steel grade 8.8	Steel grade A4-70			
FBC-S-225	M12	80	-	-	80-100	-	-	Steel grade 8.8	Steel grade A4-70	Steel grade 8.8
	M16	100	120	-	100-200	120-130	-			
	M20	120	-	120-360	-	-				

Channel bolt installation parameter

V _{min} /size	
Channel bolt thread	V _{min} [mm]
M12	16
M16	20
M20	25

Cast-in Channel system lip thickness f	
Profile	Thickness [mm]
RS-S-600	6.0
RS-S-700	7.0



l_{req} = required bolt length

t_{fix} = thickness of clamped component

f = profile lip thickness

t_w = washer thickness

V_{\min} = nut height EN ISO 4032 + overhang approximately 5 mm (for M20: 7 mm)



4

Space Tower · Sofia · Bulgaria

4

Accessories

Washer ISO 7089

78



Washer ISO 7093

79



Washer ISO 7089

Washer for fischer Cast-In Channel System.



4

Applications

- Suitable for all types of buildings or structures in combination with channel bolts
- Façades
- Prefabricated elements
- Railways
- Metro tunnels and stations
- Industrial applications

Properties

- Material: steel acc. to EN ISO 7089:2000
- Hot-dip galvanised $\geq 50 \mu\text{m}$ as per EN ISO 10684:2004+AC:2009
- Mechanical properties: 1.4401, 1.4404, 1.4571, 1.4578 acc. to EN 10088:2009
- Hardness class $\geq A 200$ HV

Technical data

Washer ISO 7089



U

	Hot-dip galvanised steel	Stainless steel A4	Internal diameter D [mm]	External- \varnothing d [mm]	Thickness S [mm]	Sales unit [pcs]
Item	Item no. hdg	Item no. A4				
U 8 x 16	573538	–	8.4	16	1.6	200
U 10 x 20	573539	–	10.5	20	2.0	150
U 12 x 24	573540	573645	13	24	2.5	100
U 16 x 30	573541	573646	17	30	3.0	50
U 20 x 37	573542	573647	21	37	3.0	25

Local versions available. Please contact your local sales organisation.

Washer ISO 7093

Washer for fischer Cast-In Channel System.



4

Applications

- Suitable for all types of buildings or structures in combination with channel bolts
- Façades
- Prefabricated elements
- Railways
- Metro tunnels and stations
- Industrial applications

Properties

- Material: steel acc. to EN ISO 7093-1:2000
- Hot-dip galvanised $\geq 50 \mu\text{m}$ as per EN ISO 10684:2004+AC:2009

Technical data

Washer ISO 7093



U

	Internal diameter D [mm]	External- \varnothing d [mm]	Thickness S [mm]	Sales unit [pcs]
Item	Item no.			
U 16 x 50 HDG	573543	17	50	3.0



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5

Basics – good to know.

Content

Approvals, markings and their importance	82
Customised solutions	83
Failure modes	84
Calculation examples	85
FiXperience	86
References	88

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 whether 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:



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.

European Technical Assessment ETA 18/0862 for FES-H and FES-C anchor channel systems.
European Technical Assessment ETA 22/0035 for InnoLock FES-RS-S anchor channel system.



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.



Hot dip galvanized

Hot-dip galvanised zinc coating:

Dipping the product in molten zinc pool to apply a metal zinc coating. The usual approach of Cast-in Channel for corrosion protection.



Stainless steel A4

A4 stainless steel:

Product is available in highly corrosion resistant steel of corrosion resistance class IV, e.g. 1.4529.



Dynamic

Dynamic:

Product is suitable for applications subjected to dynamic loads.

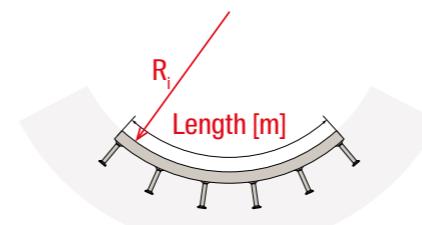
Customised solutions

Curved Cast-in Channel Systems

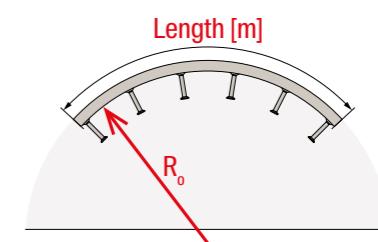
For those high-demanding applications like tunnel construction, reinforced concrete utility tunnels, curved walls or sewage plants, fischer also provides curved Cast-in Channel System products as customised solution to meet your specific requirements, as well

as customised solution to meet you tailored needs in specific applications. These type of special products include curved channel, channel with rebar and others.

Channel inward installation



Channel outward installation



Minimum recommended bending radius for all materials

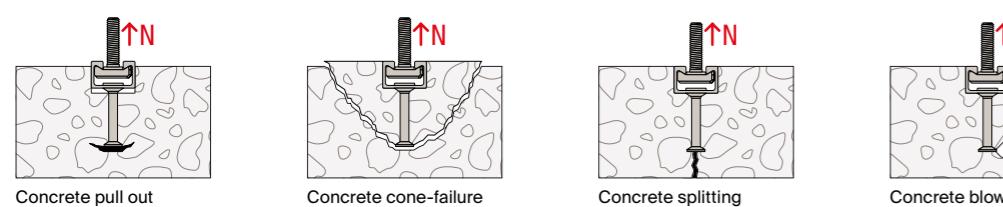
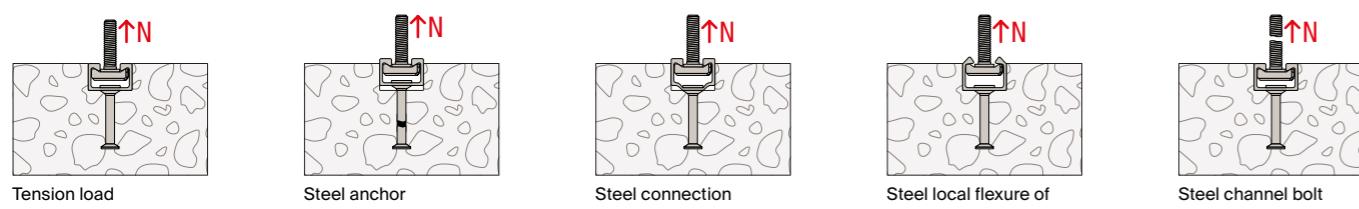
Minimum recommended bending radius for all materials



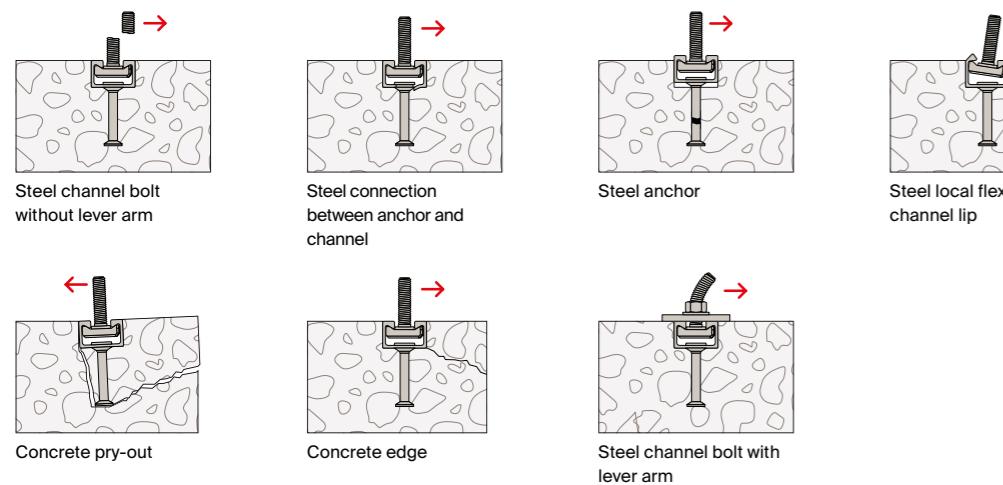
Type	Profile	R _i min [m]	R _o min [m]	Length min [m]	Length max [m]
Non-serrated hot-rolled	40/22	0.80	2.10	1.50	5.80
	50/30	0.80	2.10	1.50	5.80
	52/34	0.80	3.60	1.50	5.80
Serrated hot-rolled	29/20	0.55	1.80	0.50	5.80
	38/23	0.70	2.10	0.50	5.80

Failure modes

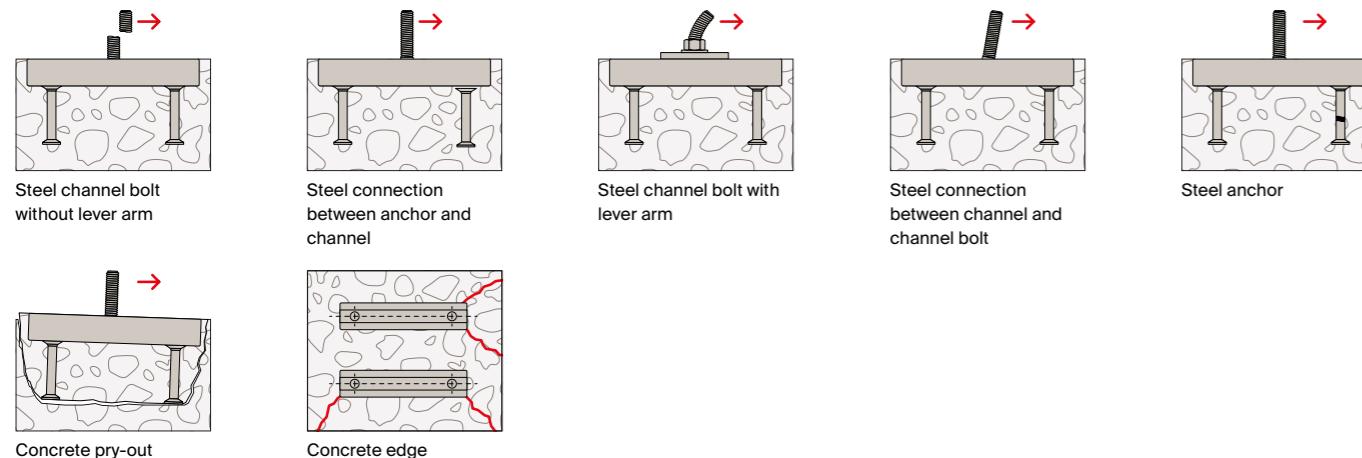
Under tension load



Under shear load acting transverse to the longitudinal channel axis



Under shear load acting parallel to the longitudinal channel axis



Calculation examples for Cast-in Channel Systems in curtain walls.



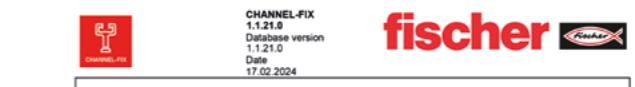
Design specifications

Anchor channel
Anchor channel: FES-H-52-34-300-HDG
Article number: 552499
Channel bolt: FBC-N-50/30-M20x50-8.8-HDG
Article number: Available on request

Design data

Date	ETA-18/0862		
Input data	16.06.2020		
Design method	EN 1992-4 + CEN/TR 17080		
Application	Top of slab		
Concrete	C20/25, Cracked		
Concrete thickness	= 200 mm		
Concrete height	= 25 mm		
hf = 155 mm			
hinst = 158 mm			
Area reinforcement	None		
Tensile reinforcement	None		
Shear reinforcement y	None		
Shear reinforcement x	None		
Reinforcement to control splitting	Yes		
Fixture	L-Shaped Plate Up		
Width	= 200 mm		
Depth	= 300 mm		
Thickness	= 10 mm		
Height	= 50 mm		
Stand-off	Distance = 0 mm		
Stand-off	Distance = 0 mm		
Anchor channel	Distance = 2 mm		
Channel bolts	Degree of restraint = 2		
#	Position x	Y _m	V _{MAXX}
1	50 mm	1.50	6.76 kN
2	150 mm		
None sliding area			

The input values and the design results should be checked.
Please respect the disclaimer of warranty in the license agreement of the software.



Concrete Edge Failure - Channel Installed Parallel to the Edge - Anchor #1

$V_{ED,Y} \leq \frac{V_{Rd,c,x}}{Y_{Mn}} (V_{Rd,c,y})$

$V_{Rd,c,y} = V_{Rd,c} \cdot \psi_{ch,s,V} \cdot \psi_{ch,c,V} \cdot \psi_{ch,h,V} \cdot \psi_{ch,90,V} \cdot \psi_{re,V} = 15,57 \text{ kN} \cdot 0,754 \cdot 1,000 \cdot 0,864 \cdot 1,000 = 10,14 \text{ kN}$

$\psi_{Rd,c} = k_{12} \cdot \sqrt{\frac{1}{c_1} \cdot c_1^{\frac{4}{3}}} = 7,5 \cdot \sqrt{20 \text{ N/mm}^2 \cdot 100 \text{ mm}}^{\frac{4}{3}} = 15,57 \text{ kN}$

$\psi_{ch,s,V} = \min \left(\frac{1}{1 + \sum_{j=1}^{n_{ch,V}} \frac{s_j}{S_{cr,V}}^{1,5} \cdot \frac{V_j}{V_d}^{1,5}}, 1 \right) = \min \left(\frac{1}{1}, 1 \right)$

$\psi_{ch,c,V} = \min \left(\frac{C_{ch,c}}{S_{cr,V}}, 1 \right)^{0,5} = \min \left(\frac{200 \text{ mm}}{253 \text{ mm}}, 1 \right)^{0,5} = 1,0$

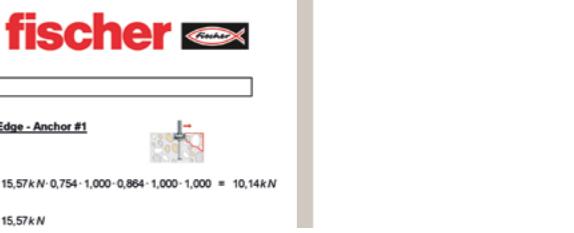
$\psi_{ch,h,V} = \min \left(\frac{h}{S_{cr,V}}, 1 \right)^{0,5} = \min \left(\frac{200 \text{ mm}}{268 \text{ mm}}, 1 \right)^{0,5} = 0,81$

$\psi_{ch,90,V} = 1,000$

$\psi_{re,V} = 1,000$

V _{Rd,c,x}	Y _m	V _{MAXX}
10,14 kN	1,50	6,76 kN

The input values and the design results should be checked.
Please respect the disclaimer of warranty in the license agreement of the software.



Resistance to combined tensile and shear loads

Steel failure of anchor and connection between anchor and channel

$\beta_{Nx} = 30,62\% \text{ Anchor}\#1$
 $\beta_{Ny} = 2,73\% \text{ Anchor}\#1, \#2$
 $\beta_{Ny} = 7,95\% \text{ Anchor}\#1$
 $(\beta_{Ny})^{1,00} + (\beta_{Nx})^{1,00} \leq (1 - \beta_{Nx})^{1,00} : (0,31)^{1,00} + (0,08)^{1,00} = 0,39 \leq (1 - 0,03)^{1,00} = 0,97 \text{ Anchor}\#1$

Concrete failure modes

$\beta_{Nx} = 42,69\% \text{ Anchor}\#1$
 $\beta_{Ny} = 3,00\% \text{ Anchor}\#1$
 $\beta_{Ny} = 65,31\% \text{ Anchor}\#1$
 $(\beta_{Ny})^{1,50} + (\beta_{Nx})^{1,50} = (0,43)^{1,50} + (0,03)^{1,50} + (0,65)^{1,50} = 0,81 \leq 1 \text{ Anchor}\#1$

Steel Failure of Anchor - Anchor #1, #2

$V_{ED,X} \leq \frac{V_{Rd,s,b,x}}{Y_{Mn}} (V_{Rd,s,b,y})$

V _{Rd,s,b,x}	Y _m	V _{MAXX}
23 kN	1,80	18,33 kN

Steel Failure of channel bolts

$\beta_{Nx} = 9,94\% \text{ Channelbolt}\#1$
 $\beta_{Ny} = 7,62\% \text{ Channelbolt}\#1$
 $(\beta_{Ny})^{2,00} + (\beta_{Nx})^{2,00} = (0,10)^{2,00} + (0,08)^{2,00} = 0,02 \leq 1 \text{ Channelbolt}\#1$

Steel failure of channel lips and flexural failure of channel

$\beta_{Nx} = 6,90\% \text{ Channelbolt}\#1, \#2$
 $\beta_{Ny} = 10,97\% \text{ Channelbolt}\#1$
 $(\beta_{Ny})^{1,00} + (\beta_{Nx})^{1,00} \leq (1 - \beta_{Nx})^{1,00} : (0,24)^{1,00} + (0,11)^{1,00} = 0,35 \leq (1 - 0,07)^{1,00} = 0,93 \text{ Channelbolt}\#1$

Proof successful

Technical remarks

All data and information in the software is based on Fischer products and common engineering knowledge. Please check all the proof results against local valid standards and approvals. As Fischer is not the design office, the attached is no guarantee for incorrect input or assumptions. Any recommendations have to be approved by the building-authority or project engineer. Results are valid only for anchor system calculated in the attached. If any part of the system is changed, it will invalidate this report and new calculations would be required.

The transmission of the loads to the supports of the concrete member shall be shown for the ultimate limit state and the serviceability limit state. For the purpose, the normal verifications shall be carried out under due consideration of the actions introduced by the anchors and bolts. For these verifications the additional provisions given in the current design method shall be taken into account.

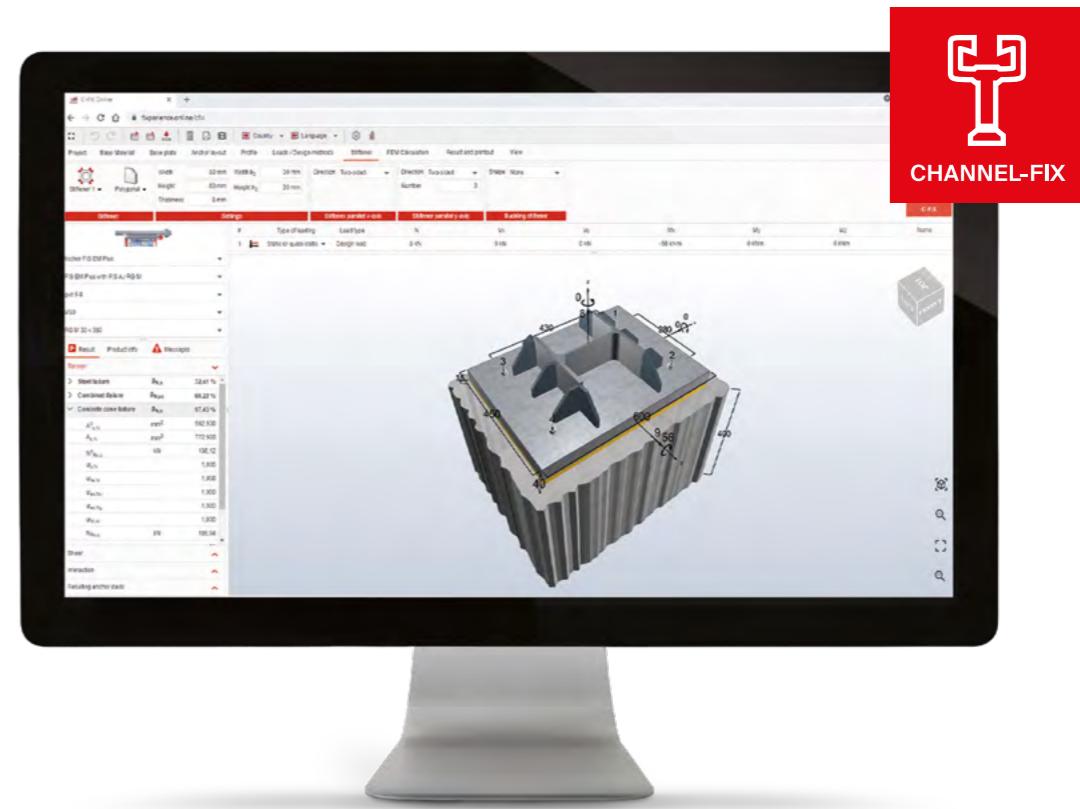
As a pre-condition the anchor plate is assumed to be flat when subjected to the actions. Therefore, the plate must be sufficiently stiff. The proof of the necessary stiffness is not carried out by Channel-Fix.

The design for the shear forces acting parallel to the anchor channel are performed via CEN/TR 17080 as there is absence of any related part in EN1992-4.

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Page 12

Software calculation process CHANNEL-FIX.



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1. Channel system selection

2. Application

- Top of slab
- Front of slab

3. Concrete

- Concrete grade
- Concrete condition
- Concrete thickness
- Concrete cover
- Concrete chamfer

4. Supplementary reinforcement

- Area reinforcement
- Tensile reinforcement
- Shear reinforcement
- Reinforcement to control splitting

5. Fixture:

- Simple fixture
- Rectangular plate
- Round plate
- L-shaped plates
- PI - shaped plate

6. Graphics

The 3D graphical interactive interface helps to simulate according to the parameter inputs. The display function supports rotation, zoom-in/out and other dynamic operation

References



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3. SOBHA Tower · Dubai · U.A.E.
4. Guggenheim Museum · Abu-Dhabi · U.A.E.
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6

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Content

Property and construction site management	92
Planner and structural engineers	93
Portfolio	94
Subsidiaries	98



6



6

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