PRESTATIEVERKLARING

DoP 0336

voor fischer ankerkanaal InnoLock FES-RS-S met fischer kanaalbouten FBC-S (ankerkanalen voor gebruik in beton) NL

1. Unieke identificatiecode van het producttype: **DoP 0336**

2. Beoogd(e) gebruik(en): **Ankerkanaal voor gebruik in gescheurd of ongescheurd beton, zie bijlage, met name de bijlagen B1- B6.**

3. Fabrikant: **fischerwerke GmbH & Co. KG, Klaus-Fischer-Str. 1, 72178 Waldachtal, Duitsland**

4. Gemachtigde: **–**

5. Het systeem of de systemen voor de beoordeling en verificatie van de prestatiebestendigheid: **1**

6. Europees beoordelingsdocument: **EAD 330008-03-0601, Edition 06/2021**
   Europese technische beoordeling: **ETA-22/0035; 2022-08-01**
   Technische beoordelingsinstantie: **DIBt- Deutsches Institut für Bautechnik**
   Aangemelde instantie(s): **2873 TU Darmstadt**

7. Aangegeven prestatie(s):

Mechanische weerstand en stabiliteit (BWR 1)

Kenmerkende weerstand tegen spanningsbelasting (statische en quasi-statische belasting):

1) Weerstand tegen staalbreuk van ankers: Bijlage C1
2) Weerstand tegen staalbreuk van de verbinding tussen ankers en goot: Bijlage C1
3) Weerstand tegen staalbreuk van de gootlippen en vervolgens uittrekken van de gootbout: Bijlage C1
4) Weerstand tegen staalbreuk van kanaalbout: Bijlage C6
5) Weerstand tegen staalbreuk door overschrijding van de buigsterkte van het kanaal: Bijlages A5, C1
6) Maximaal installatiemoment om schade tijdens de installatie te voorkomen: Bijlage B4
7) Weerstand tegen uittrekken: Bijlage C2
8) Weerstand tegen betonnen kegelbreuk: Bijlages B3, C2
9) Minimale afstand tussen de randen, tussenruimte en dikte van de elementen om te voorkomen dat het beton splijt tijdens de installatie: Bijlages A5, B3
10) Randafstand om spleetbreuk onder belasting te voorkomen: Bijlage C2
11) Weerstand tegen doorslaan - dragend gebied van de kop: Bijlage A4

Kenmerkende weerstand tegen schuifbelasting (statische en quasi-statische belasting):

12) Weerstand tegen staalbreuk van kanaalbout onder afschuifbelasting zonder hefboomarm: Bijlage C6
13) Weerstand tegen staalbreuk door buiging van de kanaalbout onder afschuifbelasting met hefboomarm: Bijlage C7
14) Weerstand tegen staalbreuk van de gootlippen, staalbreuk van de verbinding tussen het anker en de goot of staalbreuk van het anker (afschuifbelasting in dwarsrichting): Bijlages C4
15) Weerstand tegen staalbreuk van de verbinding tussen kanaallippen en kanaalbout (afschuifbelasting in de lengterichting van het kanaal): Bijlage C5
16) Factor voor installatiegevoeligheid: Bijlage C5
17) Weerstand tegen staalbreuk van het anker: Bijlage C4
18) Weerstand tegen staalbreuk van de verbinding tussen anker en kanaal: Bijlage C4
19) Weerstand tegen uitbreken (pryout): Bijlage C5
20) Weerstand tegen bezwijken van betonranden: Bijlage C5

Karakteristieke weerstand onder gecombineerde statische en quasi-statische trek- en schuifbelasting

21) Weerstand tegen staalbreuk van het ankerkanaal: Bijlage C6

Karakteristieke weerstand onder vermoeiings trekbelasting:

22) Vermoeiingsweerstand tegen staalbreuk van het hele systeem (continue of tri-lineaire functie) NPD
23) Vermoeiingsgrens weerstand tegen staalbreuk van het hele systeem NPD
24) Weerstand tegen vermoeiing door betongerelateerd falen (exponentiële functie) NPD
25) Vermoeiingsgrens weerstand tegen betongerelateerd falen NPD
26) Verplaatsingen: Bijlages C3, C6

Veiligheid in geval van brand (BWR 2)

27) Reactie op brand: Klasse (A1)
28) Weerstand tegen vuur: NPD

Duurzaamheid:

29) Duurzaamheid: Bijlages A7, B1

8. Geëigende technische documentatie en/of specifieke technische documentatie: --

De prestaties van het hierboven omschreven product zijn conform de aangegeven prestaties. Deze prestatieverklaring wordt in overeenstemming met Verordening (EU) nr. 305/2011 onder de exclusieve verantwoordelijkheid van de hierboven vermelde fabrikant verstrekt.

Ondertekend voor en namens de fabrikant door:

Dr.-Ing. Oliver Geibig, Directeur Business Units & Engineering

Jürgen Grün, Directeur Chemie & Kwaliteit

Tumlingen, 2023-07-25

Deze DoP is opgesteld in meerdere talen. In het geval van geschillen over de interpretatie zal de Engelse tekst altijd prevaleren.

Het aanhangsel bevat vrijwillige en aanvullende informatie in het Engels die de (taal-neutraal gespecificeerde) wettelijke vereisten overschrijdt.

Translation guidance Essential Characteristics and Performance Parameters for Annexes

Vertaal assistent van de essentiële kenmerken en eigenschappen voor bijlagen

Mechanical resistance and stability (BWR 1) **Mechanische weerstand en stabiliteit (BWR 1)**		
Characteristic resistance to tension load (static and quasi-static loading): **Kenmerkende weerstand tegen spanningsbelasting (statische en quasi-statische belasting):**		
1	Resistance to steel failure of anchors: **Weerstand tegen staalbreuk van ankers:**	$N_{Rk,s,a}$
2	Resistance to steel failure of the connection between anchors and channel: **Weerstand tegen staalbreuk van de verbinding tussen ankers en goot:**	$N_{Rk,s,c}$
3	Resistance to steel failure of channel lips and sunsequently pullout of channel bolt: **Weerstand tegen staalbreuk van de gootlippen en vervolgens uittrekken van de gootbout:**	$N^0_{Rk,s,l}$; $s_{l,N}$
4	Resistance to steel failure of channel bolt: **Weerstand tegen staalbreuk van kanaalbout:**	$N_{Rk,s}$
5	Resistance to steel failure by exceeding the bending strength of the channel: **Weerstand tegen staalbreuk door overschrijding van de buigsterkte van het kanaal:**	$M_{Rk,s,flex}$; s_{max}
6	Maximum installation torque moment to avoid damage during installation: **Maximaal installatiemoment om schade tijdens de installatie te voorkomen:**	$T_{inst,g}$; ($T_{inst,s}$)
7	Resistance to pull-out failure of the anchor: **Weerstand tegen uittrekken:**	$N_{Rk,p}$
8	Resistance to concrete cone failure: **Weerstand tegen betonnen kegelbreuk:**	$k_{cr,N}$; $k_{ucr,N}$; h_{ef}
9	Minimum edge distance, spacing, member thickness to prevent concrete splitting during installation: **Minimale afstand tussen de randen, tussenruimte en dikte van de elementen om te voorkomen dat het beton splijt tijdens de installatie:**	s_{min}; c_{min}; h_{min}
10	Characteristic edge distance and spacing to avoid splitting of concrete under load: **Randafstand om spleetbreuk onder belasting te voorkomen:**	$s_{cr,sp}$; $c_{cr,sp}$
11	Resistance to blowout failure- bearing area of head: **Weerstand tegen doorslaan - dragend gebied van de kop:**	A_h
Characteristic resistance to shear load (static and quasi-static loading): **Kenmerkende weerstand tegen schuifbelasting (statische en quasi-statische belasting):**		
12	Resistance to steel failure of channel bolt under shear loading without lever arm: **Weerstand tegen staalbreuk van kanaalbout onder afschuifbelasting zonder hefboomarm:**	$V_{Rk,s}$
13	Resistance to steel failure by bending of the channel bolt under shear load with lever arm: **Weerstand tegen staalbreuk door buiging van de kanaalbout onder afschuifbelasting met hefboomarm:**	$M^0_{Rk,s}$
14	Resistance to steel failure of channel lips, steel failure of connection between anchor and channel or steel failure of anchor (shear load in transverse direction): **Weerstand tegen staalbreuk van de gootlippen, staalbreuk van de verbinding tussen het anker en de goot of staalbreuk van het anker (afschuifbelasting in dwarsrichting):**	$V^0_{Rk,s,l,y}$; $s_{l,V}$; $V_{Rk,s,c,y}$; $V_{Rk,s,a,y}$
15	Resistance to steel failure of connection between channel lips and channel bolt (shear load in longitudinal channel axis): **Weerstand tegen staalbreuk van de verbinding tussen kanaallippen en kanaalbout (afschuifbelasting in de lengterichting van het kanaal):**	$V_{Rk,s,l,x}$
16	Factor for sensistivity to installation: **Factor voor installatiegevoeligheid:**	γ_{inst}
17	Resistance to steel failure of the anchor: **Weerstand tegen staalbreuk van het anker:**	$V_{Rk,s,a,x}$
18	Resistance to steel failure of connection between anchor and channel: **Weerstand tegen staalbreuk van de verbinding tussen anker en kanaal:**	$V_{Rk,s,c,x}$
19	Resistance to concrete pry-out failure: **Weerstand tegen uitbreken (pryout):**	k_8
20	Resistance to concrete edge failure: **Weerstand tegen bezwijken van betonranden:**	$k_{cr,V}$; $k_{ucr,V}$
Characteristic resistance under combined static and quasi-static tension and shear loading **Karakteristieke weerstand onder gecombineerde statische en quasi-statische trek- en schuifbelasting**		
21	Resistance to steel failure of the anchor channel: **Weerstand tegen staalbreuk van het ankerkanaal:**	k_{13}, k_{14}
Characteristic resistance under fatigue tension loading: **Karakteristieke weerstand onder vermoeiings trekbelasting:**		
22	Fatigue resistance to steel failure of the whole system (continuous or tri-linear function): **Vermoeiingsweerstand tegen staalbreuk van het hele systeem (continue of tri-lineaire functie)**	$\Delta N_{Rk,s,0,n}$ (n=1 to n=∞)
23	Fatigue limit resistance to steel failure of the whole system: **Vermoeiingsgrens weerstand tegen staalbreuk van het hele systeem**	$\Delta N_{Rk,s,0,\infty}$
24	Fatigue resistance to concrete related failure (exponential function): **Weerstand tegen vermoeiing door betongerelateerd falen (exponentiële functie)**	$\Delta N_{Rk,c,0,n}$; $\Delta N_{Rk,p,0,n}$ (n=1 to n=∞)
25	Fatigue limit resistance to concrete related failure: **Vermoeiingsgrens weerstand tegen betongerelateerd falen**	$\Delta N_{Rk,c,0,\infty}$; $\Delta N_{Rk,p,0,\infty}$
26	Displacements: **Verplaatsingen:**	δ_{N0}; $\delta_{N\infty}$; $\delta_{V,y,0}$; $\delta_{V,y,\infty}$ $\delta_{V,x,0}$; $\delta_{V,x,\infty}$
Safety in case of fire (BWR 2) **Veiligheid in geval van brand (BWR 2)**		
27	Reaction to fire: **Reactie op brand:**	Class
28	Resistance to fire: **Weerstand tegen vuur:**	$N_{Rk,s,fi}$; $V_{Rk,s,fi}$
Durability: **Duurzaamheid:**		
29	Durability: **Duurzaamheid:**	Descritpion

Specific Part

1 Technical description of the product

The fischer Serrated Anchor Channel InnoLock FES-RS-S with fischer Serrated Channel Bolts FBC-S is a system consisting of a C-shaped channel profile of steel and at least two metal anchors non-detachably fixed on the channel back and fischer Serrated Channel Bolts.

The anchor channel is embedded surface-flush in the concrete. fischer Serrated Channel Bolts with appropriate hexagonal nuts and washers are fixed to the channel.

The product description is given in Annex A.

2 Specification of the intended use in accordance with the applicable European Assessment Document

The performances given in Section 3 are only valid if the anchor channel is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchor channel of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance under tension load (static and quasi-static loading)	
- Resistance to steel failure of anchors	$N_{Rk,s,a}$ see Annex C1
- Resistance to steel failure of the connection between anchors and channel	$N_{Rk,s,c}$ see Annex C1
- Resistance to steel failure of channel lips and subsequently pull-out of channel bolt	$N^0_{Rk,s,l}$; $s_{l,N}$ see Annex C1
- Resistance to steel failure of channel bolt	$N_{Rk,s}$ see Annex C6
- Resistance to steel failure by exceeding the bending strength of the channel	s_{max} see Annex A5 $M_{Rk,s,flex}$ see Annex C1
- Maximum installation torque to avoid damage during installation	$T_{inst,g}$; $T_{inst,s}$ see Annex B4
- Resistance to pull-out failure of the anchor	$N_{Rk,p}$ see Annex C2
- Resistance to concrete cone failure	h_{ef} see Annex B3 $k_{cr,N}$; $k_{ucr,N}$ see Annex C2
- Minimum edge distances, spacing and member thickness to avoid concrete splitting during installation	s_{min} see Annex A5 c_{min} ; h_{min} see Annex B3
- Characteristic edge distance and spacing to avoid splitting of concrete under load	$s_{cr,sp}$; $c_{cr,sp}$ see Annex C2
- Resistance to blowout failure - bearing area of anchor head	A_h see Annex A4

Essential characteristic	**Performance**
Characteristic resistance under shear load (static and quasi-static loading)	
- Resistance to steel failure of channel bolt under shear loading without lever arm	$V_{Rk,s}$ see Annex C6
- Resistance to steel failure by bending of the channel bolt under shear load with lever arm	$M^0_{Rk,s}$ see Annex C7
- Resistance to steel failure of channel lips, steel failure of connection between anchor and channel and steel failure of anchor (shear load in transverse direction)	$V^0_{Rk,s,l,y}$; $s_{l,V}$; $V_{Rk,s,c,y}$; $V_{Rk,s,a,y}$ see Annex C4
- Resistance to steel failure of connection between channel lips and channel bolt (shear load in longitudinal channel axis)	$V_{Rk,s,l,x}$ see Annex C5
- Factor for sensitivity to installation (longitudinal shear)	γ_{inst} see Annex C5
- Resistance to steel failure of the anchor (longitudinal shear)	$V_{Rk,s,a,x}$ see Annex C4
- Resistance to steel failure of connection between anchor and channel (longitudinal shear)	$V_{Rk,s,c,x}$ see Annex C4
- Resistance to concrete pry-out failure	k_8 see Annex C5
- Resistance to concrete edge failure	$k_{cr,V}$; $k_{ucr,V}$ see Annex C5
Characteristic resistance under combined tension and shear load (static and quasi-static load)	
- Resistance to steel failure of the anchor channel	k_{13} ; k_{14} see Annex C6
Characteristic resistance under fatigue tension loading	
- Fatigue resistance to steel failure of the whole system (continuous or tri-linear function, test method A1, A2)	No Performance assessed
- Fatigue limit resistance to steel failure of the whole system (test method B)	No Performance assessed
- Fatigue resistance to concrete related failure (exponential function, test method A1, A2)	No Performance assessed
- Fatigue limit resistance to concrete related failure (test method B)	No Performance assessed
Displacements (static and quasi-static load)	δ_{N0} ; $\delta_{N\infty}$ see Annex C3 $\delta_{V,y,0}$; $\delta_{V,y,\infty}$; $\delta_{V,x,0}$; $\delta_{V,x,\infty}$ see Annex C6

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Characteristic resistance to fire	No performance assessed

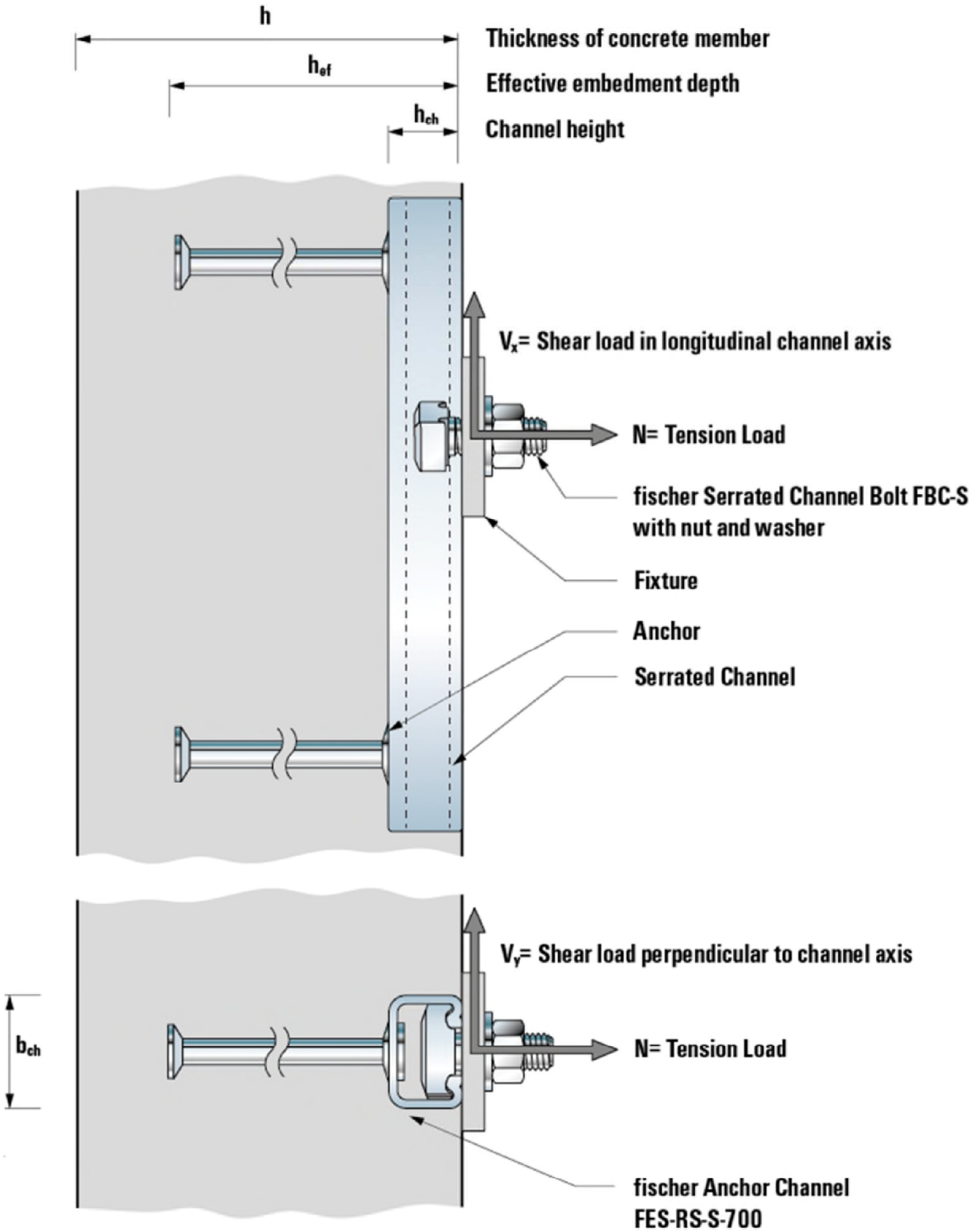
3.3 Aspects of durability linked with the Basic Works Requirements

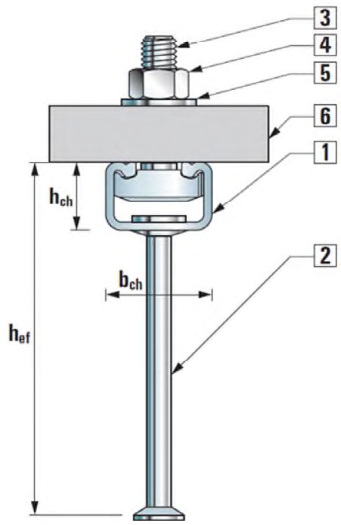
Essential characteristic	Performance
Durability	See Annex B1

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

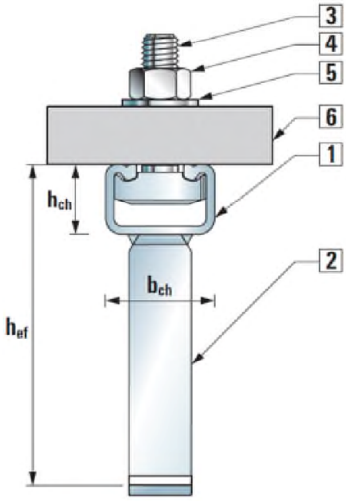
In accordance with EAD No. 330008-03-0601, the applicable European legal act is: [2000/273/EC].

The system to be applied is: 1


h
Thickness of concrete member
h_{ef}
Effective embedment depth
h_{ch}
Channel height
V_x= Shear load in longitudinal channel axis
N= Tension Load
fischer Serrated Channel Bolt FBC-S
with nut and washer
Fixture
Anchor
Serrated Channel
V_y= Shear load perpendicular to channel axis
b_{ch}
N= Tension Load
fischer Anchor Channel
FES-RS-S-700



Round anchor



I-anchor

fischer Anchor Channel
FES-RS-S
1 Serrated channel profile
2 Anchor
3 Serrated channel bolt
4 Hexagonal nut
5 Washer
6 Fixture

Marking of the fischer anchor channel FES-RS-S:

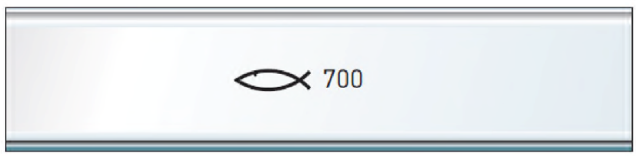
e. g.: 700

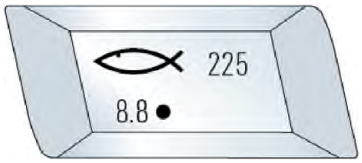
	= Identifying mark of the manufacturer
I	= Additional marking for I-anchors No marking for round anchors

Marking of the fischer channel bolt FBC-S:

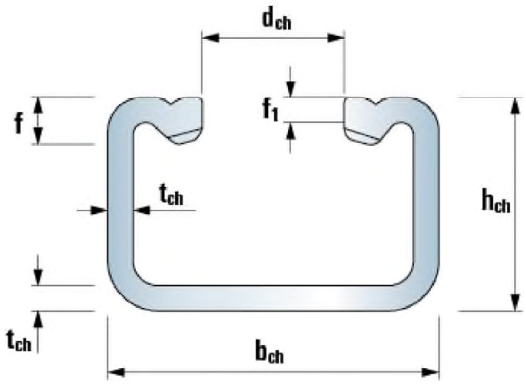
e. g.: 8.8 225

	= Identifying mark of the manufacturer
8.8	= Strength grade
225	= Width of anchor channel opening d_{ch}
*	= Coating electro-plated No marking for hot dip galvanized





Stamped into back of channel
Optional: printed on channel web or channel lips
RS = Roll-shaped, S = Serrated
No marking for material acc. A7 Table 6 (Channel profile)



Serrated FES-RS-S-(I)-700

Table 1: Dimensions of channel profile

Anchor Channel FES-RS-S-(I)-	b_{ch} [mm]	h_{ch} [mm]	t_{ch} [mm]	d_{ch} [mm]	f [mm]	f_1 [mm]	I_y [mm^4]
700	52,5	34,0	4,0	22,5	7,0	4,0	79168

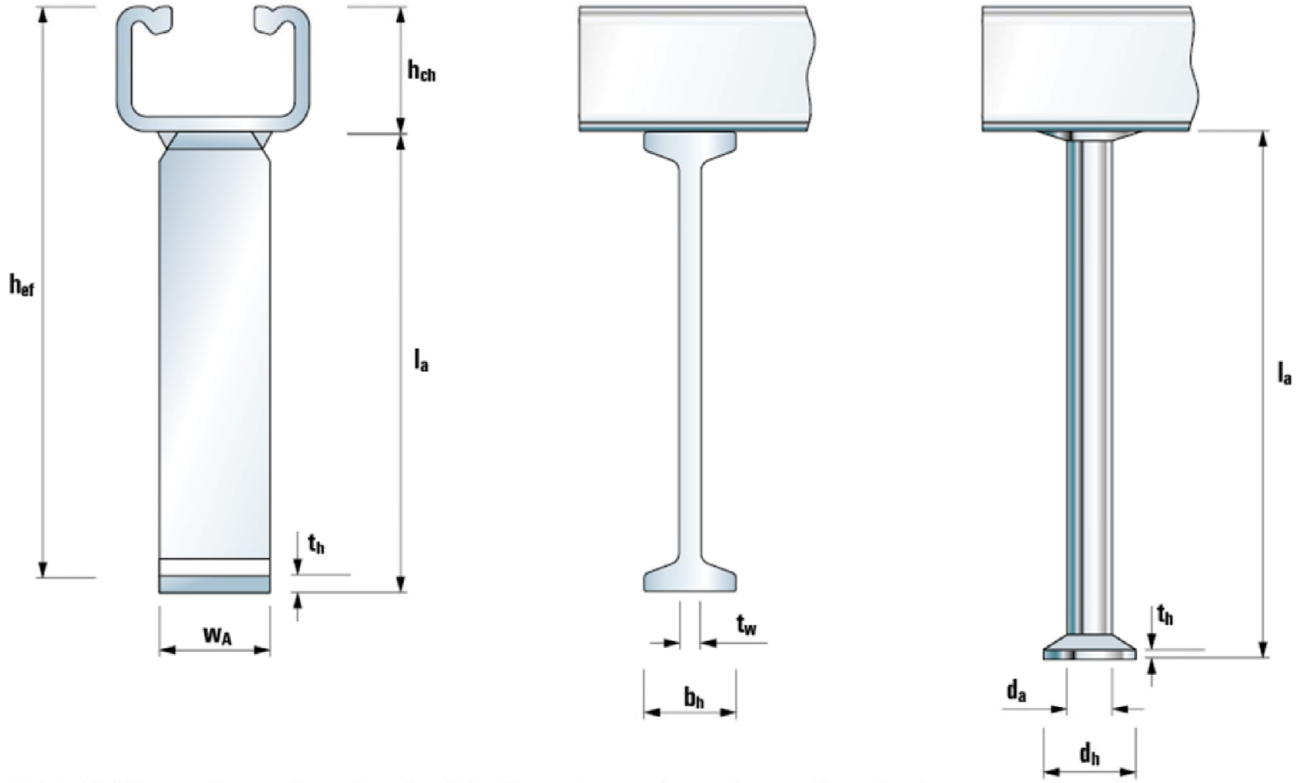


Table 2: Dimensions of anchor (welded I-anchor or forged round anchor)

Anchor Channel FES-RS-S-(I)-	I-anchor						Round anchor				
	$l_{a,min}$ [mm]	$t_{w,min}$ [mm]	$b_{h,min}$ [mm]	t_h [mm]	$w_{A,min}$ [mm]	$A_{h,min}$ [mm²]	$l_{a,min}$ [mm]	d_a [mm]	d_h [mm]	t_h [mm]	A_h [mm²]
700	125	6	25	5	30	570	144	12,8	26,0	3,0	402

Table 3: Anchor position

Anchor channel FES-RS-S-(l-)	Anchor type	s_{min} [mm]	s_{max} [mm]	x_{min} [mm]	x_{max} [mm]	l_{min} [mm]	l_{max} [mm]
700	round or I	100	250	30	35	160	6.070

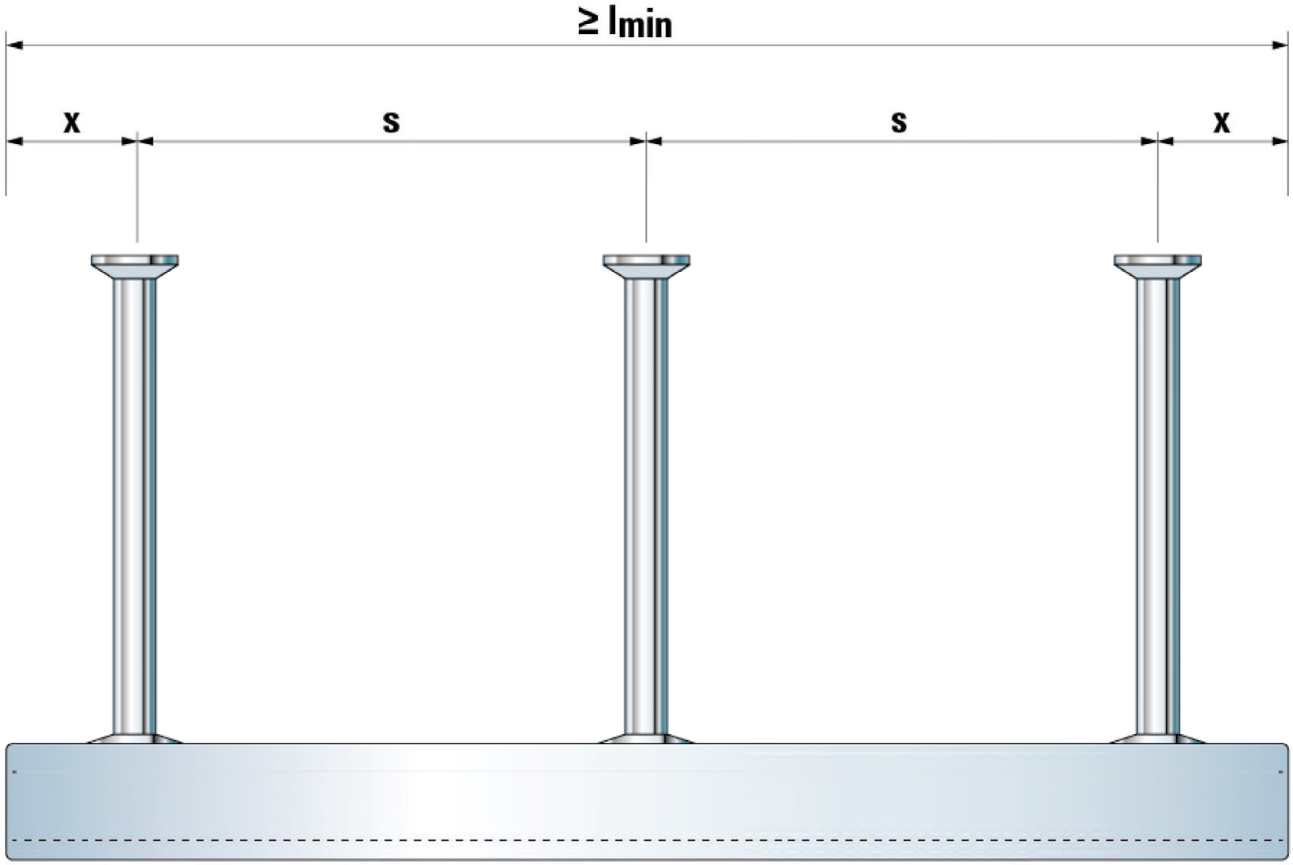
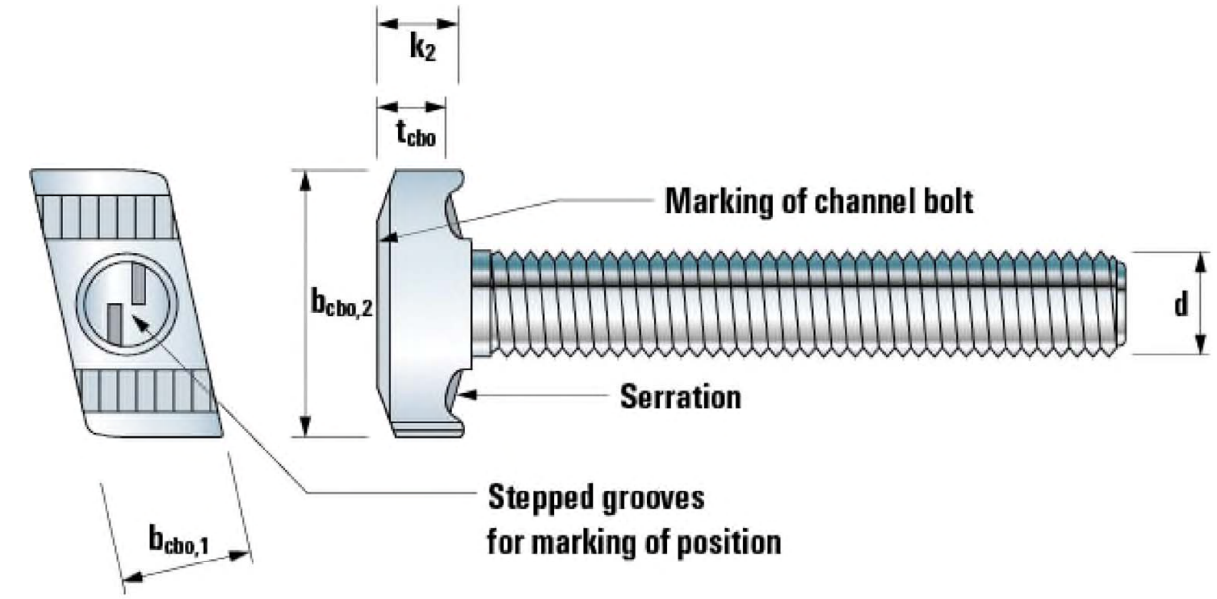


Table 4: Strength grade and corrosion class

Channel Bolt	Carbon steel [1]
Strength grade	8.8
f_{uk} [N/mm²]	800 / 830
f_{yk} [N/mm²]	640 / 660 [2]
Corrosion protection	F [3] or Electroplated

[1] Material properties according to Annex A7
[2] Material properties according to EN ISO 898-1: 2013
[3] Hot-dip galvanized



Serrated Channel Bolt FBC-S-225

Table 5: Dimensions of fischer Channel Bolts FBC and matching fischer Anchor Channels FES

Anchor Channel FES-RS-S-(I)-	Channel Bolt FBC-S-	Dimensions				
		d [mm]	$b_{cbo,1}$ [mm]	$b_{cbo,2}$ [mm]	t_{cbo} [mm]	k_2 [mm]
700	225	12 16 20	21,0	43,0	10,7	15,0

Table 6: Materials and properties

Component	Carbon steel		
	Mechanical properties	Coating	Coating
1	2	2a	2b
Channel profile	1.0976 acc. to EN 10149:2004	Hot dip galvanized ≥ 50 µm acc. to EN ISO 10684:2004 + AC:2009	Hot dip galvanized ≥ 50 µm acc. to EN ISO 10684:2004 + AC:2009
Round anchor	1.5525 acc. to EN 10263:2017	Hot dip galvanized ≥ 50 µm acc. to EN ISO 10684:2004 + AC:2009	Hot dip galvanized ≥ 50 µm acc. to EN ISO 10684:2004 + AC:2009
I-anchor	1.0976 acc. to EN 10149:2004	Hot dip galvanized ≥ 50 µm acc. to EN ISO 10684:2004 + AC:2009	Hot dip galvanized ≥ 50 µm acc. to EN ISO 10684:2004 + AC:2009
Channel bolt	Strength grade 8.8 acc. to EN ISO 898-1:2013	Electroplated acc. to EN ISO 4042:2018	Hot dip galvanized ≥ 50 µm acc. to EN ISO 10684:2004 + AC:2009
Plain washer [1)] acc. to EN ISO 7089:2000 and EN ISO 7093- 1:2000	Hardness class A ≥ 200 HV	Electroplated acc. to EN ISO 4042:2018	Hot dip galvanized ≥ 50 µm acc. to EN ISO 10684:2004 + AC:2009
Hexagonal nut acc. to EN ISO 4032:2012	Property class 8 acc. to EN ISO 898-2:2012	Electroplated acc. to EN ISO 4042:2018	Hot dip galvanized ≥ 50 µm acc. to EN ISO 10684:2004 + AC:2009

[1)] Not in the scope of delivery

Specification for intended use

Anchor channels and channel bolts subject to:

- Static and quasi-static tension, shear perpendicular to the longitudinal axis of the channel and shear in the direction of the longitudinal axis of the channel

Base materials:

- Reinforced or unreinforced normal weight concrete according to EN 206-1:2000.
- Strength classes C12/15 to C90/105 according to EN 206-1:2000
- Cracked or uncracked concrete.

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions
  (anchor channels and channel bolts according to Annex A7, Table 6, column 2a and 2b).
- Structures subject to internal conditions with usual humidity (e.g. kitchens, bathrooms and laundries in residential buildings, exceptional permanent damp conditions and application under water)
  (anchor channels and channel bolts according to Annex A7, Table 6, column 2b.

Design:

- Anchor channels are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor channel and channel bolts are indicated on the design drawings (e.g. position of the anchor channel relative to the reinforcement or to supports).
- For static and quasi-static loading as well as fire exposure the anchor channels have to be designed in accordance with EOTA TR 047 “Design of Anchor Channels”, March 2018 or EN 1992-4:2018.
- The characteristic resistances are calculated with the minimum effective embedment depth.

Installation:

- The installation of anchor channels is carried out by appropriately qualified personnel under the supervision of the person responsible for the technical matters on site.
- Use of the anchor channels only as supplied by the manufacturer - without any manipulations, repositioning or exchanging of channel components.
- Cutting of anchor channels is allowed only if pieces according to Annex A5, Table 3 are generated including end spacing x and minimum channel length l_{min} and only to be used in dry internal conditions.
- Installation in accordance with the installation instruction given in Annexes B5 and B6.
- The anchor channels are fixed on the formwork, reinforcement or auxiliary construction such that no movement of the channels will occur during the time of laying the reinforcement and of placing and compacting the concrete.
- The concrete around the head of the anchors is properly compacted. The channels are protected from penetration of concrete into the internal space of the channels.
- Washers may be chosen according to Annex A7 and provided separately by the user.
- Orientating the channel bolt (groove according to Annex B6, B7 and B8) rectangular to the channel axis.
- The required installation torque given in Annex B4 must be applied and must not be exceeded.

Table 7: Installation parameters

Anchor Channel FES-RS-S-			700	I-700
Minimum effective embedment depth	$h_{ef,min}$	[mm]	175	154
Minimum edge distance	c_{min}		75	75
Minimum thickness of concrete member	h_{min}		178	178

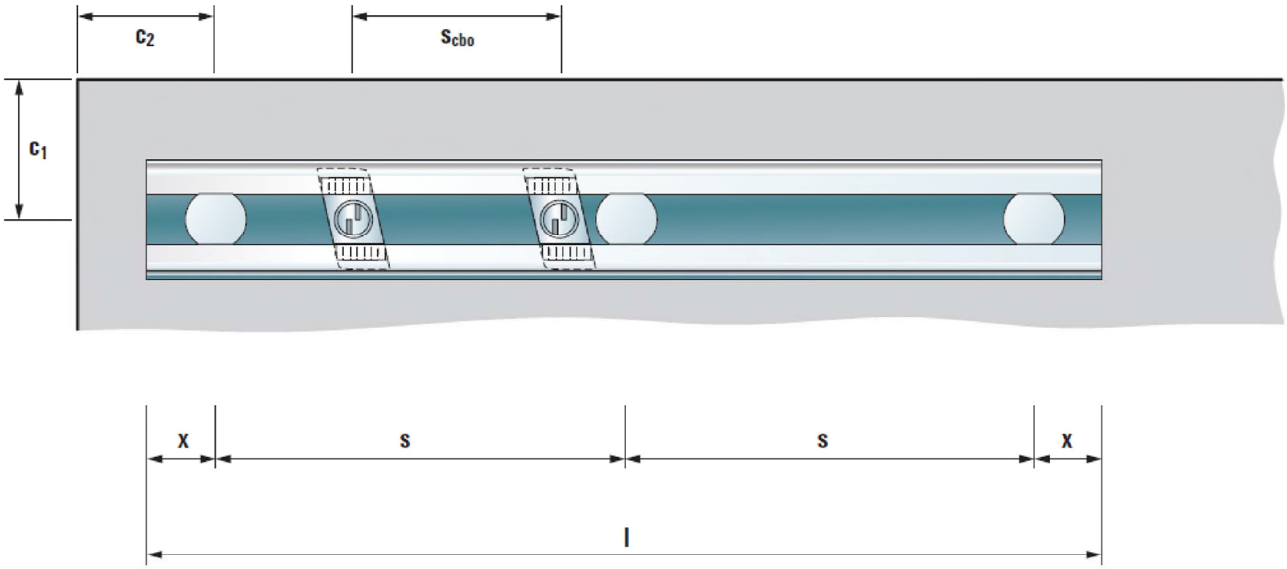


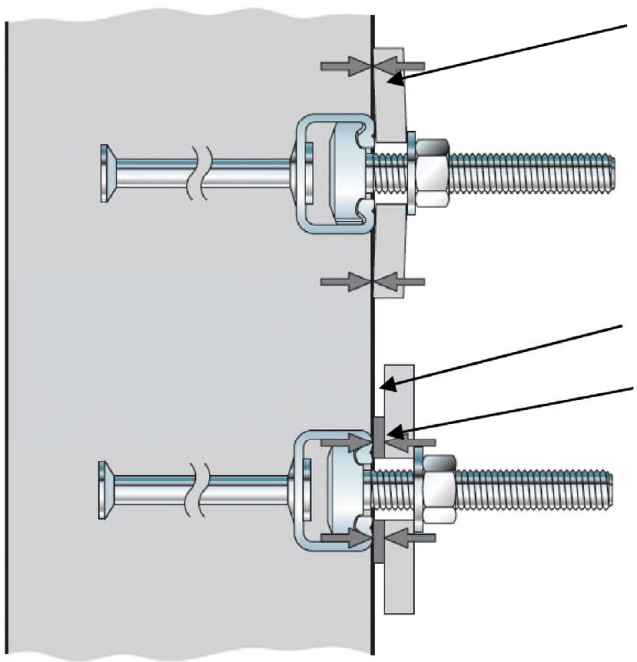
Table 8: Minimum spacing for channel bolts

Channel bolt			M12	M16	M20
Minimum spacing between channel bolts	$s_{cbo,min}$	[mm]	60	80	100

Table 9: Installation torque T_{inst}

fischer Anchor channel FES-RS-S-(I)-	fischer Channel Bolt FBC-S-	Thread diameter	T_{inst} [1] [Nm]	
			General $T_{inst,g}$	Steel - steel contact $T_{inst,s}$
			8.8	8.8
700	225	M12	80	100
		M16	100	200
		M20	120	360

[1] T_{inst} must not be exceeded

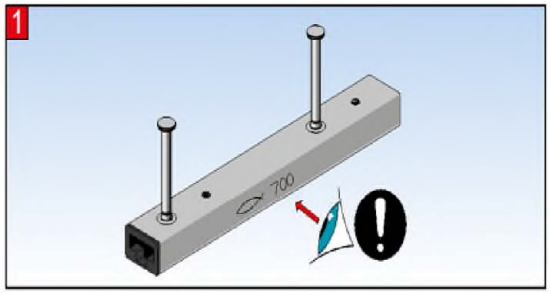


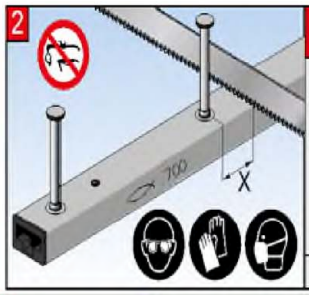
General:
The fixture is in contact with the channel profile and the concrete surface by tightening with $T_{inst,g}$.

Gap

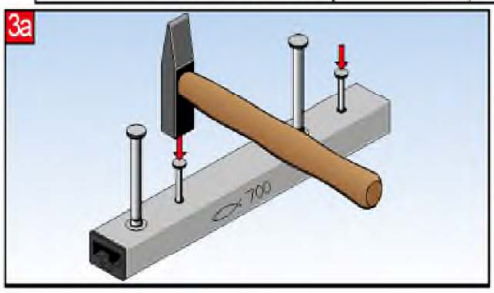
Steel-to-steel contact:
The fixture is not in contact with the concrete surface. The fixture is fastened to the anchor channel by a suitable steel part (e.g. washer) by tightening with $T_{inst,s}$.
($T_{inst,s} \geq T_{inst,g}$)

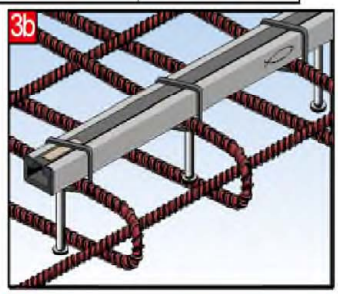
Anchor Channel FES-RS-S

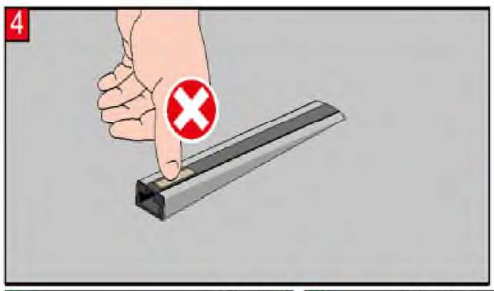


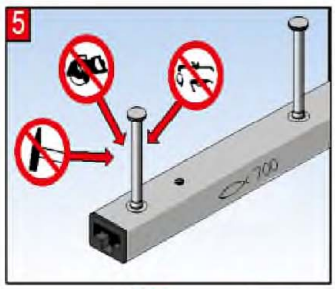


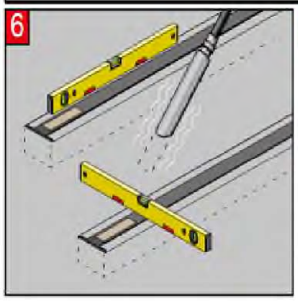
X	FES-RS-S
30-35mm	700

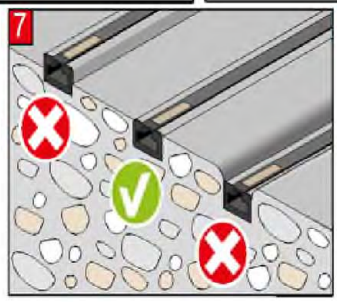


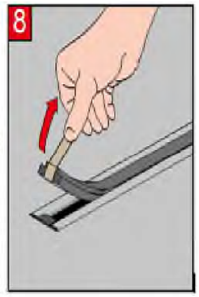




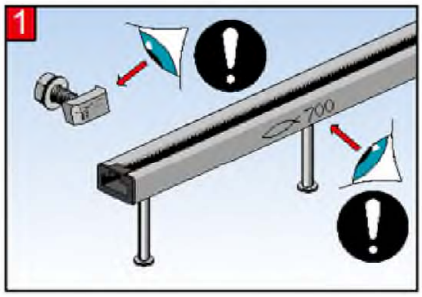




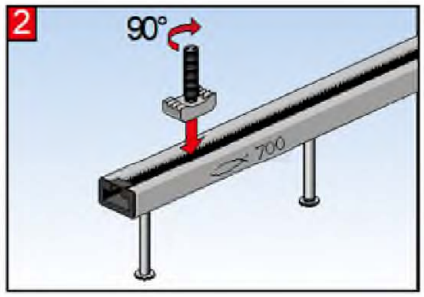


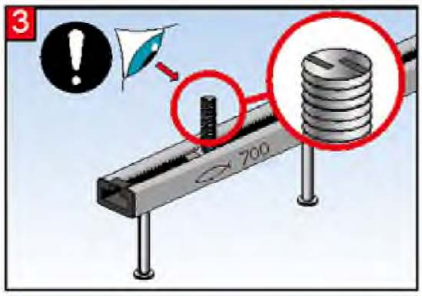


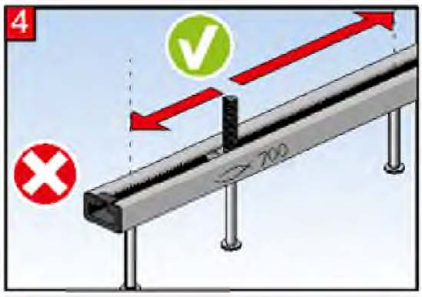
Serrated Channel Bolts FBC-S

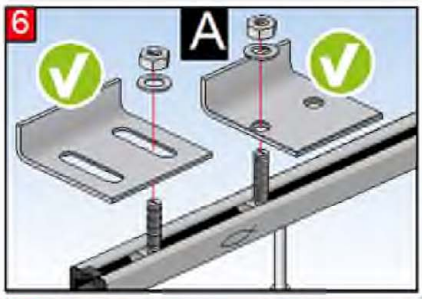


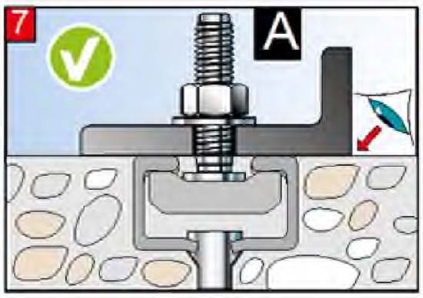
FBC-S-	FES-RS-S
225	700

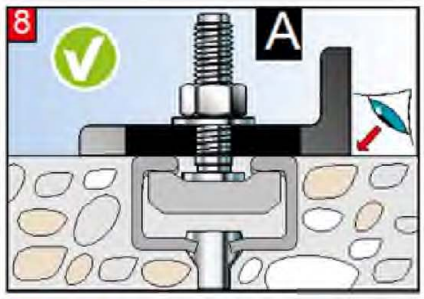


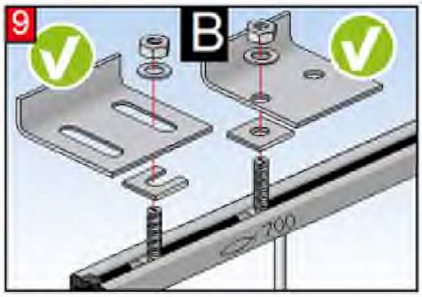


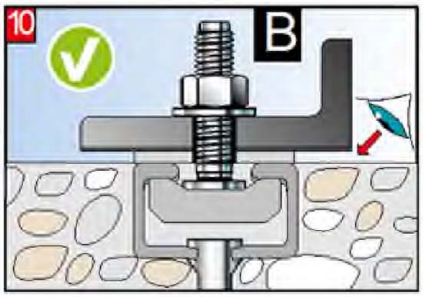


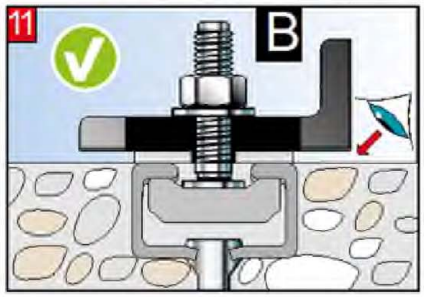


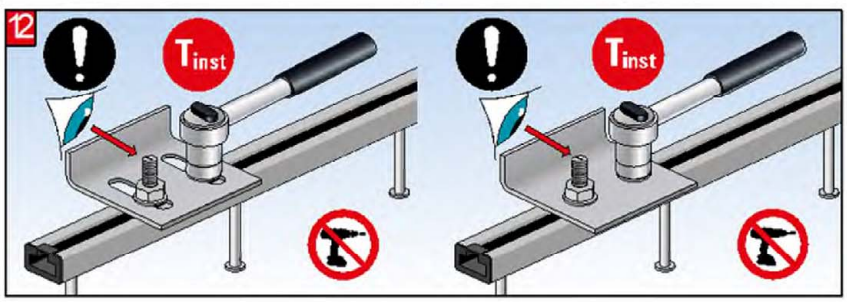












FBC-S-	FES-RS-S-	T_{inst} [Nm]	M12	M16	M20
225	700	A	80	100	120
		B	100	200	360

T_{inst} must not be exceeded.

fischer Serrated Anchor Channel InnoLock FES-RS-S with fischer Serrated Channel Bolts FBC-S

Intended Use
Installation instruction for Serrated fischer Channel Bolts FBC-S

Annex B6

Table 10: Characteristic resistances under tension load – steel failure of anchor channels

Anchor Channel FES-RS-S-			**700**	**I-700**
Steel failure: Anchor				
Characteristic resistance	$N_{Rk,s,a}$	[kN]	73,3	81,0
Partial factor	γ_{Ms} [1)]	[-]	1,8	
Steel failure: Connection between anchor and channel				
Characteristic resistance	$N_{Rk,s,c}$	[kN]	73,0	80,0
Partial factor	γ_{Ms} [1)]	[-]	1,8	
Steel failure: Local flexure of channel lips				
Characteristic spacing of channel bolts for $N_{Rk,s,l}$	$s_{l,N}$	[mm]	105	
Characteristic resistance	$N^0_{Rk,s,l}$	[kN]	80	
Partial factor	γ_{Ms} [1)]	[-]	1,8	

[1)] In absence of other national regulations

Table 11: Characteristic flexural resistance of channel

Anchor Channel FES-RS-S-(I)-			**700**
Steel failure: Flexure of channel			
Characteristic flexural resistance of channel	$M_{Rk,s,flex}$	[Nm]	3749
Partial factor	$\gamma_{Ms,flex}$ [1)]	[-]	1,15

[1)] In absence of other national regulations

Table 12: Characteristic resistances under tension load – concrete failure

Anchor Channel FES-RS-S-			**700**	**I-700**
Concrete failure: Pull-out failure				
Characteristic resistance in cracked concrete C12/15	$N_{Rk,p}$	[kN]	36,2	51,3
Characteristic resistance in uncracked concrete C12/15	$N_{Rk,p}$	[kN]	50,7	71,8
Increasing factor of $N_{Rk,p} = N_{Rk,p}\,(C12/15)^{*}\psi_c$	C16/20 C20/25 C25/30 C30/37 C35/45 C40/50 C45/55 C50/60 C55/67 ≥C60/75	ψ_c [-]	1,33 1,67 2,08 2,50 2,92 3,33 3,75 4,17 4,58 5,00	
Partial factor	$\gamma_{Mp}=\gamma_{Mc}$ [1)]	[-]	1,5	
Concrete failure: Concrete cone failure				
Product factor k_1	$k_{cr,N}$ $k_{ucr,N}$	[-] [-]	8,9 12,6	8,7 12,5
Partial factor	γ_{Mc} [1)]	[-]	1,5	
Concrete failure: Concrete splitting failure				
Characteristic edge distance	$c_{cr,sp}$	[mm]	525	477
Characteristic spacing	$s_{cr,sp}$	[mm]	1050	954
Partial factor	$\gamma_{Msp}=\gamma_{Mc}$ [1)]	[-]	1,5	

[1)] In absence of other national regulations

Table 13: Displacements under tension load

Anchor Channel FES-RS-S-(I)-			**700**
Tension load	N	[kN]	31,7
Short-term displacement [1)]	δ_{N0}	[mm]	2,1
Long-term displacement [1)]	$\delta_{N\infty}$	[mm]	4,2

[1)] Displacements in midspan of the anchor channel, including slip of channel bolt, deformation of channel lips, bending of the channel and slip of the anchor channel in concrete

Table 14: Characteristic resistances under shear load – steel failure of anchor channels

Anchor Channel FES-RS-S-			**700**	**I-700**
Steel failure: Anchor				
Characteristic resistance	$V_{Rk,s,a,y}$	[kN]	120,0	120,0
	$V_{Rk,s,a,x}$	[kN]	44,0	48,6
Partial factor	γ_{Ms} [1)]	[-]	1,8	
Steel failure of connection between anchor and channel				
Characteristic resistance	$V_{Rk,s,c,y}$	[kN]	120,0	120,0
	$V_{Rk,s,c,x}$	[kN]	43,8	48,0
Partial factor	γ_{Ms} [1)]	[-]	1,8	
Steel failure: Local flexure of channel lips				
Characteristic spacing of channel bolts for $V_{Rk,s,l}$	$s_{l,V}$	[mm]	105	
Characteristic resistance	$V^0_{Rk,s,l,y}$	[kN]	92,0	
Partial factor	γ_{Ms} [1)]	[-]	1,8	

[1)] In absence of other national regulations

Table 15: Characteristic resistance for shear load in direction of the longitudinal axis of the channel – steel failure

Anchor Channel FES-RS-S-(I)-				700
Steel failure: Connection between channel lips and serrated channel bolt				
Characteristic resistance	$V_{Rk,s,l,x}$	[kN]	FBC-S-225-M12-8.8	-[2)]
			FBC-S-225-M16-8.8	22,5
			FBC-S-225-M20-8.8	22,5
Installation factor	γ_{inst} [1)]	[-]		1,2

1) In absence of other national regulations
2) No performance assessed.

Table 16: Characteristic resistances of the anchor channel under shear load – concrete failure

Anchor Channel FES-RS-S-(I)-				700
Concrete failure: Pry-out failure				
Product factor		k_8	[-]	2,0
Partial factor		γ_{Mc} [1)]	[-]	1,5
Concrete failure: Concrete edge failure				
Product factor k_{12}	Cracked concrete	$k_{cr,V}$	[-]	7,5
	Uncracked concrete	$k_{ucr,V}$	[-]	10,5
Partial factor		γ_{Mc} [1)]	[-]	1,5

1) In absence of other national regulations

Table 17: Displacements under shear load

Anchor Channel FES-RS-S-(I)-			**700**
Shear load perpendicular to the longitudinal axis of the channel	V_y	[kN]	36,5
Short-term displacement [1]	$\delta_{V,y,0}$	[mm]	2,9
Long-term displacement [1]	$\delta_{V,y,\infty}$	[mm]	4,4
Shear load in direction of the longitudinal axis of the channel	V_x	[kN]	6,6
Short-term displacement [2]	$\delta_{V,x,0}$	[mm]	1,2
Long-term displacement [2]	$\delta_{V,x,\infty}$	[mm]	1,8

[1] Displacements in midspan of the anchor channel, including slip of channel bolt, deformation of channel lips and slip of the anchor channel in concrete

[2] Displacements of the anchor channel, including slip of channel bolt, deformation of channel lips and slip of the anchor channel in concrete.

Table 18: Characteristic resistances under tension and shear load – steel failure of channel bolts

Channel bolt FBC-S-225			**M12**	**M16**	**M20**
Steel failure:			Steel grade 8.8		
Characteristic resistance	$N_{Rk,s}$	[kN]	67,4	125,6	170,0
Partial factor	γ_{Ms} [1]	[-]	1,5		
Characteristic resistance	$V_{Rk,s}$	[kN]	33,7	62,8	98,0
Partial factor	γ_{Ms} [1]	[-]	1,25		

[1] In absence of other national regulations

Table 19: Characteristic resistances under combined tension and shear load

Anchor Channel FES-RS-S-(I)-			**700**
Steel failure: Local flexure of channel lips and flexure of channel			
Product factor	k_{13}	[-]	according to EN 1992-4:2018, 7.4.3.1
Steel failure: Anchor and connection between anchor and channel			
Product factor	k_{14}	[-]	according to EN 1992-4:2018, 7.4.3.1

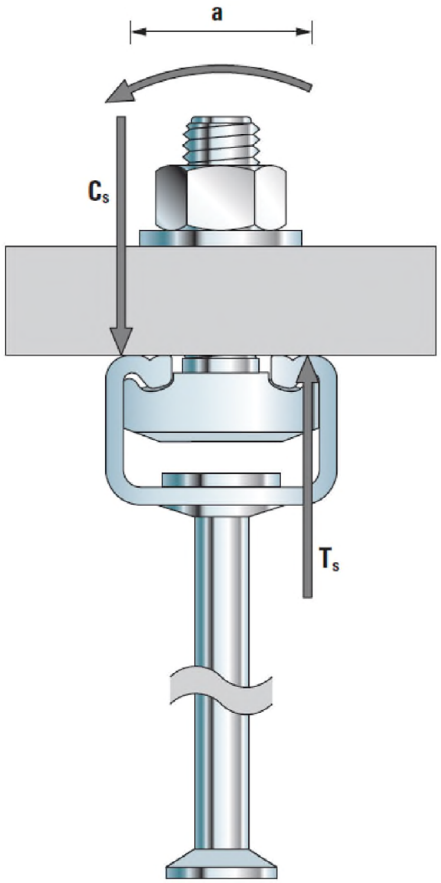
Table 20: Characteristic resistances under shear load with lever arm – steel failure of channel bolts

Channel bolt thread diameter[2]				M12	M16	M20
Steel failure						
Characteristic flexural resistance	$M^0_{Rk,s}$	[Nm]	FBC-S-225	104,8	266,4	519,3
Partial factor	γ_{Ms} [1]	[-]	FBC-S-225	1,25		
Internal lever arm	a	[mm]	FBC-S-225	29,8	31,8	34,2

[1] In absence of other national regulations

[2] Materials according to Annex A7, Table 6

The characteristic flexure resistance according to Table 19 is limited as follows:



$M^0_{Rk,s} \leq 0{,}5 \cdot N^0_{Rk,s,l} \cdot a$ ($N^0_{Rk,s,l}$ according to Annex C1, Table 10)

$M^0_{Rk,s} \leq 0{,}5 \cdot N_{Rk,s} \cdot a$ ($N_{Rk,s}$ according to Annex C5, Table 18)

a = Internal lever arm according to Table 19

T_s = Tension force acting on the channel lips

C_s = Compression force acting on the channel lips