

## PRESTATIEVERKLARING

### DoP 0348

voor de getande ankerrail fischer InnoLock FES-RS-S met fischer getande kanaalbouten FBC-S (ankerkanalen voor gebruik in beton)

NL

- |                                                                                                        |                                                                                                              |
|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| 1. <u>Unieke identificatiecode van het producttype:</u>                                                | <b>DoP 0348</b>                                                                                              |
| 2. <u>Beoogd(e) gebruik(en):</u>                                                                       | <b>Ankerkanaal voor gebruik in gescheurd of ongescheurd beton, zie bijlage, met name de bijlagen B1- B6.</b> |
| 3. <u>Fabrikant:</u>                                                                                   | <b>fischerwerke GmbH &amp; Co. KG, Klaus-Fischer-Str. 1, 72178 Waldachtal, Duitsland</b>                     |
| 4. <u>Gemachtigde:</u>                                                                                 | <b>–</b>                                                                                                     |
| 5. <u>Het systeem of de systemen voor de beoordeling en verificatie van de prestatiebestendigheid:</u> | <b>1</b>                                                                                                     |
| 6. <u>Europees beoordelingsdocument:</u>                                                               | <b>EAD 330008-04-0601, Edition 02/2023</b>                                                                   |
| Europese technische beoordeling:                                                                       | <b>ETA-22/0035; 2023-12-01</b>                                                                               |
| Technische beoordelingsinstantie:                                                                      | <b>DIBt- Deutsches Institut für Bautechnik</b>                                                               |
| Aangemelde instantie(s):                                                                               | <b>2873 TU Darmstadt</b>                                                                                     |

### 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): Bijlage 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 (afschuifbelasting in de lengterichting van het 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, Beoordelingsmethode A1, A2): NPD
- 23) Vermoeiingsgrens weerstand tegen staalbreuk van het hele systeem (Beoordelingsmethode B): NPD
- 24) Vermoeiingsweerstand tegen staalbreuk van het hele systeem (Gelineariseerde functie, Beoordelingsmethode C): NPD
- 25) Weerstand tegen vermoeiing door betongereleerd falen (exponentiële functie, Beoordelingsmethode A1, A2): NPD
- 26) Vermoeiingsgrens weerstand tegen betongereleerd falen (Beoordelingsmethode B): NPD
- 27) Weerstand tegen vermoeiing door betongereleerd falen (Gelineariseerde functie, Beoordelingsmethode C): NPD

#### **Karakteristieke weerstand onder seismische belasting (seismische prestatiecategorie C1)**

- 28) Weerstand tegen staalfalen onder seismische trekbelasting (seismische prestatiecategorie C1): NPD
- 29) Weerstand tegen staalfalen onder seismische afschuifbelasting voor afschuifkracht in dwarsrichting (seismische prestatiecategorie C1): NPD
- 30) Weerstand tegen staalfalen onder seismische afschuifbelasting voor afschuifkracht in de lengterichting van het kanaal (seismische prestatiecategorie C1): NPD

**Karakteristieke weerstand onder statische en quasi-statische trek- en/of afschuifbelasting**

31) Verplaatsingen: Bijlages C3, C6

**Veiligheid in geval van brand (BWR 2)**

32) Reactie op brand: Klasse (A1)

33) Weerstand tegen vuur: Bijlage C8, C9

**Duurzaamheid:**

34) Duurzaamheid: Bijlages A7, B1

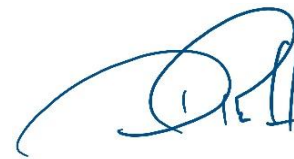
8. Geëigende technische documentatie en/of specifieke technische documentatie: --

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. Ronald Mihala, Algemeen directeur Onderzoek en Ontwikkeling  
Tumlingen, 2025-05-30



Dieter Pfaff, Hoofd van de Internationale Productiefederatie en Kwaliteitsbeheer

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.

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:<br>Weerstand tegen staalbreuk van ankers:                                                                                                                                                                                                                                                                | $N_{Rk,s,a}$                                                       |
| 2                                                                                                   | Resistance to steel failure of the connection between anchors and channel:<br>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:<br>Weerstand tegen staalbreuk van de gootlippen en vervolgens uittrekken van de gootbout:                                                                                                                                                                  | $N_{Rk,s,l}^0 ; S_{l,N}$                                           |
| 4                                                                                                   | Resistance to steel failure of channel bolt:<br>Weerstand tegen staalbreuk van kanaalbout:                                                                                                                                                                                                                                                       | $N_{Rk,s}$                                                         |
| 5                                                                                                   | Resistance to steel failure by exceeding the bending strength of the channel:<br>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:<br>Maximaal installatiemoment om schade tijdens de installatie te voorkomen:                                                                                                                                                                                             | $T_{inst,g} ; (T_{inst,s})$                                        |
| 7                                                                                                   | Resistance to pull-out failure of the anchor:<br>Weerstand tegen uittrekken:                                                                                                                                                                                                                                                                     | $N_{Rk,p}$                                                         |
| 8                                                                                                   | Resistance to concrete cone failure:<br>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:<br>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:<br>Randafstand om spleetbreuk onder belasting te voorkomen:                                                                                                                                                                                                  | $S_{cr,sp} ; c_{cr,sp}$                                            |
| 11                                                                                                  | Resistance to blowout failure- bearing area of head:<br>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:<br>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:<br>Weerstand tegen staalbreuk door buiging van de kanaalbout onder afschuifbelasting met hefboomarm:                                                                                                                                                 | $M_{Rk,s}^0$                                                       |
| 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):<br>Weerstand tegen staalbreuk van de gootlippen, staalbreuk van de verbinding tussen het anker en de goot of staalbreuk van het anker (afschuifbelasting in dwarsrichting): | $V_{Rk,s,l,y}^0 ; S_{l,V} ; V_{Rk,s,c,y} ; V_{Rk,s,a,y}$           |
| 15                                                                                                  | Resistance to steel failure of connection between channel lips and channel bolt (shear load in longitudinal channel axis):<br>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:<br>Factor voor installatiegevoeligheid:                                                                                                                                                                                                                                                                 | $\gamma_{inst}$                                                    |
| 17                                                                                                  | Resistance to steel failure of the anchor:<br>Weerstand tegen staalbreuk van het anker:                                                                                                                                                                                                                                                          | $V_{Rk,s,a,x}$                                                     |
| 18                                                                                                  | Resistance to steel failure of connection between anchor and channel:<br>Weerstand tegen staalbreuk van de verbinding tussen anker en kanaal (afschuifbelasting in de lengterichting van het kanaal):                                                                                                                                            | $V_{Rk,s,c,x}$                                                     |
| 19                                                                                                  | Resistance to concrete pry-out failure:<br>Weerstand tegen uitbreken (pryout):                                                                                                                                                                                                                                                                   | $k_g$                                                              |
| 20                                                                                                  | Resistance to concrete edge failure:<br>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:<br>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):<br>Vermoeiingsweerstand tegen staalbreuk van het hele systeem (continue of tri-lineaire functie,Beoordelingsmethode A1, A2):                                                                                                                        | $\Delta N_{Rk,s,0,n}$<br>(n=1 to n=∞)                              |
| 23                                                                                                  | Fatigue limit resistance to steel failure of the whole system:<br>Vermoeiingsgrens weerstand tegen staalbreuk van het hele systeem (Beoordelingsmethode B):                                                                                                                                                                                      | $\Delta N_{Rk,s,0,\infty}$                                         |
| 24                                                                                                  | Fatigue resistance to steel failure of the whole system (linearized function,assessment method C): NPD<br>Vermoeiingsweerstand tegen staalbreuk van het hele systeem (Gelineariseerde functie,Beoordelingsmethode C):                                                                                                                            | $\Delta N_{Rk,s,l0,n} ; N_{lok,s,n}$<br>(n=10 <sup>4</sup> to n=∞) |
| 25                                                                                                  | Fatigue resistance to concrete related failure (exponential function):<br>Weerstand tegen vermoeiing door betongerelateerd falen (exponentiële functie, Beoordelingsmethode A1, A2):                                                                                                                                                             | $\Delta N_{Rk,c,0,n} ; \Delta N_{Rk,p,0,n}$<br>(n=1 to n=∞)        |
| 26                                                                                                  | Fatigue limit resistance to concrete related failure:<br>Vermoeiingsgrens weerstand tegen betongerelateerd falen (Beoordelingsmethode B):                                                                                                                                                                                                        | $\Delta N_{Rk,c,0,\infty} ; \Delta N_{Rk,p,0,\infty}$              |
| 27                                                                                                  | Fatigue resistance to concrete related failure (linearized function, assessment method C):<br>Weerstand tegen vermoeiing door betongerelateerd falen (Gelineariseerde functie, Beoordelingsmethode C):                                                                                                                                           | $\Delta N_{Rk,c,E,n} ; N_{Rk,p,E,n}$<br>(n=10 <sup>4</sup> to n=∞) |

|                                                                                            |                                                                                                                                                                                                                                                                                                         |                                                                                                               |
|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Characteristic resistance under seismic loading (seismic performance category C1)          |                                                                                                                                                                                                                                                                                                         |                                                                                                               |
| Karakteristieke weerstand onder seismische belasting (seismische prestatiecategorie C1)    |                                                                                                                                                                                                                                                                                                         |                                                                                                               |
| 28                                                                                         | Resistance to steel failure under seismic tension loading (seismic performance category C1):<br><br>Weerstand tegen staalfalen onder seismische trekbelasting (seismische prestatiecategorie C1):                                                                                                       | $N_{Rk,s,a,eq}; N_{Rk,s,c,eq};$<br>$N^0_{Rk,s,l,eq}; N_{Rk,s,eq};$<br>$M_{Rk,s,flex,eq}$                      |
| 29                                                                                         | Resistance to steel failure under seismic shear loading for shear load in transverse direction (seismic performance category C1):<br><br>Weerstand tegen staalfalen onder seismische afschuifbelasting voor afschuifkracht in dwarsrichting (seismische prestatiecategorie C1):                         | $V_{Rk,s,eq}; V^0_{Rk,s,l,y,eq};$<br>$V_{Rk,s,c,y,eq}; V_{Rk,s,a,y,eq}$                                       |
| 30                                                                                         | Resistance to steel failure under seismic shear loading for shear load in longitudinal channel axis (seismic performance category C1):<br><br>Weerstand tegen staalfalen onder seismische afschuifbelasting voor afschuifkracht in de lengterichting van het kanaal (seismische prestatiecategorie C1): | $V_{Rk,s,l,x,eq}; V_{Rk,s,a,x,eq};$<br>$V_{Rk,s,c,x,eq}$                                                      |
| Characteristic resistance under seismic loading (seismic performance category C1)          |                                                                                                                                                                                                                                                                                                         |                                                                                                               |
| Karakteristieke weerstand onder statische en quasi-statische trek- en/of afschuifbelasting |                                                                                                                                                                                                                                                                                                         |                                                                                                               |
| 31                                                                                         | Displacements:<br>Verplaatsingen:                                                                                                                                                                                                                                                                       | $\delta_{N0}; \delta_{N\infty}; \delta_{V,y,0}; \delta_{V,y,\infty}$<br>$\delta_{V,x,0}; \delta_{V,x,\infty}$ |
| Safety in case of fire (BWR 2)                                                             |                                                                                                                                                                                                                                                                                                         |                                                                                                               |
| Veiligheid in geval van brand (BWR 2)                                                      |                                                                                                                                                                                                                                                                                                         |                                                                                                               |
| 32                                                                                         | Reaction to fire:<br>Reactie op brand:                                                                                                                                                                                                                                                                  | Class                                                                                                         |
| 33                                                                                         | Resistance to fire:<br>Weerstand tegen vuur:                                                                                                                                                                                                                                                            | $N_{Rk,s,fi}; V_{Rk,s,fi}; c_{min,fi};$<br>$S_{min,fi}$                                                       |
| Durability:                                                                                |                                                                                                                                                                                                                                                                                                         |                                                                                                               |
| Duurzaamheid:                                                                              |                                                                                                                                                                                                                                                                                                         |                                                                                                               |
| 34                                                                                         | Durability:<br>Duurzaamheid:                                                                                                                                                                                                                                                                            | Description                                                                                                   |

## 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 static and quasi-static tension 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                | $N_{Rk,s,l}^0 ; s_{l,N}$ 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<br>$M_{Rk,s,flex}$ 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<br>$k_{cr,N} ; k_{ucr,N}$ see Annex C2 |
| - Minimum edge distances, spacing and member thickness to avoid concrete splitting during installation | $s_{min}$ see Annex A5<br>$c_{min} ; h_{min}$ 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                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Characteristic resistance under static and quasi-static shear loading</p> <ul style="list-style-type: none"> <li>- Resistance to steel failure of channel bolt under shear loading without lever arm</li> <li>- Resistance to steel failure by bending of the channel bolt under shear load with lever arm</li> <li>- 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)</li> <li>- Resistance to steel failure of connection between channel lips and channel bolt (shear load in longitudinal channel axis)</li> <li>- Factor for sensitivity to installation (longitudinal shear)</li> <li>- Resistance to steel failure of the anchor (longitudinal shear)</li> <li>- Resistance to steel failure of connection between anchor and channel (longitudinal shear)</li> <li>- Resistance to concrete pry-out failure</li> <li>- Resistance to concrete edge failure</li> </ul> | <p><math>V_{Rk,s}</math> see Annex C6</p> <p><math>M_{Rk,s}^0</math> see Annex C7</p> <p><math>V_{Rk,s,l,y}^0 ; S_{l,v} ; V_{Rk,s,c,y} ; V_{Rk,s,a,y}</math> see Annex C4</p> <p><math>V_{Rk,s,l,x}</math> see Annex C5</p> <p><math>\gamma_{inst}</math> see Annex C5</p> <p><math>V_{Rk,s,a,x}</math> see Annex C4</p> <p><math>V_{Rk,s,c,x}</math> see Annex C4</p> <p><math>k_8</math> see Annex C5</p> <p><math>k_{cr,v} ; k_{ucr,v}</math> see Annex C5</p> |
| <p>Characteristic resistance under combined static and quasi-static tension and shear loading</p> <ul style="list-style-type: none"> <li>- Resistance to steel failure of the anchor channel</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p><math>k_{13} ; k_{14}</math> see Annex C6</p>                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <p>Characteristic resistance under fatigue tension loading</p> <ul style="list-style-type: none"> <li>- Fatigue resistance to steel failure of the whole system (continuous or tri-linear function, test method A1, A2)</li> <li>- Fatigue limit resistance to steel failure of the whole system (test method B)</li> <li>- Fatigue resistance to steel failure of the whole system (linearized function, test method C)</li> <li>- Fatigue resistance to concrete related failure (exponential function, test method A1, A2)</li> <li>- Fatigue limit resistance to concrete related failure (test method B)</li> <li>- Fatigue resistance to concrete related failure (linearized function, test method C)</li> </ul>                                                                                                                                                                                                                                                                              | <p>No Performance assessed</p> <p>No Performance assessed</p> <p>No Performance assessed</p> <p>No Performance assessed</p> <p>No Performance assessed</p> <p>No Performance assessed</p>                                                                                                                                                                                                                                                                         |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Characteristic resistance under seismic loading (seismic performance category C1)<br>- Resistance to steel failure under seismic tension loading (seismic performance category C1)<br>- Resistance to steel failure under seismic shear loading for shear load in transverse direction (seismic performance category C1)<br>- Resistance to steel failure under seismic shear loading for shear load in longitudinal channel axis (seismic performance category C1) | No Performance assessed<br><br>No Performance assessed<br><br>No Performance assessed                                                                  |
| Characteristic resistance under static and quasi-static tension and/or shear loading<br>- Displacements                                                                                                                                                                                                                                                                                                                                                             | $\delta_{N0}$ ; $\delta_{N\infty}$ see Annex C3<br>$\delta_{V,y,0}$ ; $\delta_{V,y,\infty}$ ; $\delta_{V,x,0}$ ; $\delta_{V,x,\infty}$<br>see Annex C6 |

### 3.2 Safety in case of fire (BWR 2)

| Essential characteristic          | Performance         |
|-----------------------------------|---------------------|
| Reaction to fire                  | Class A1            |
| Characteristic resistance to fire | See Annex C8 and C9 |

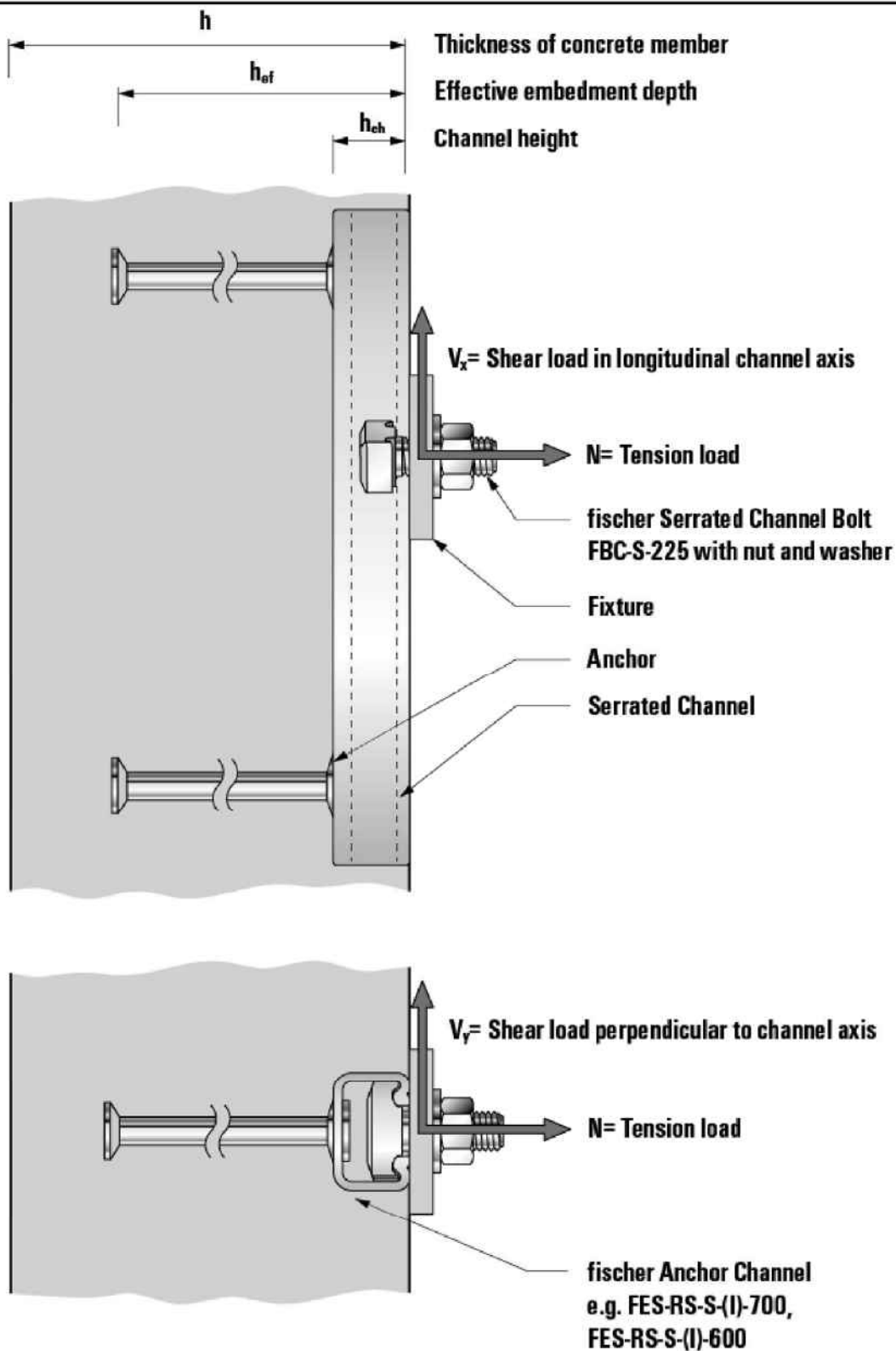
### 3.3 Aspects of durability linked with the Basic Works Requirements

| 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. 330008-04-0601, the applicable European legal act is: [2000/273/EC].

The system to be applied is: 1

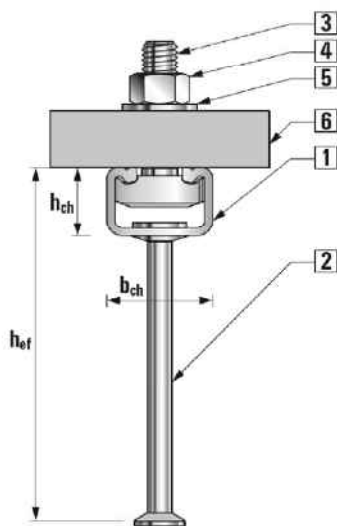


**fischer Serrated Anchor Channel InnoLock FES-RS-S with fischer Serrated Channel Bolts FBC-S**

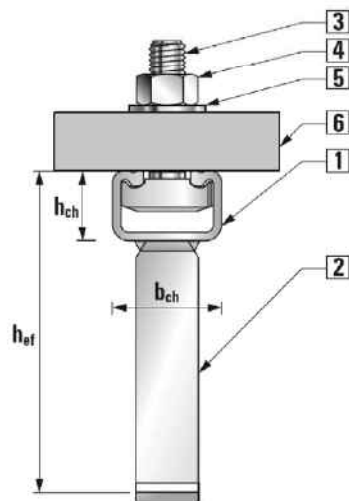
**Product description**  
Installed conditions

**Annex A 1**

Appendix 4 / 25



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

700 = Size of the anchor channel (700, 600)



Stamped into back of channel

Optional: printed on channel web or channel lips

RS = Roll-shaped, S = Serrated

No marking for material acc. Table A7.1 (Channel profile)

### Marking of the fischer channel bolt FBC-S:

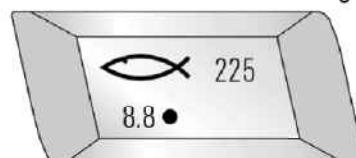
e. g.:  8.8 225

 = 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

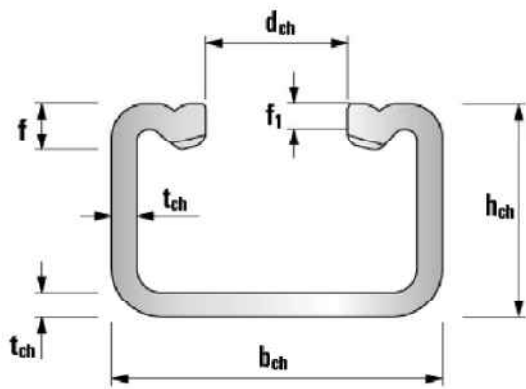


## fischer Serrated Anchor Channel InnoLock FES-RS-S with fischer Serrated Channel Bolts FBC-S

**Product description**  
Product and marking

## Annex A 2

Appendix 5 / 25



Serrated anchor channel FES-RS-S-(I)-

**Table A3.1:** Dimensions of channel profile

| Anchor channel<br>FES-RS-S-(I)- | b <sub>ch</sub><br>[mm] | h <sub>ch</sub><br>[mm] | t <sub>ch</sub><br>[mm] | d <sub>ch</sub><br>[mm] | f<br>[mm] | f <sub>1</sub><br>[mm] | I <sub>y</sub><br>[mm <sup>4</sup> ] |
|---------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-----------|------------------------|--------------------------------------|
| 600                             | 50,5                    | 29,0                    | 3,0                     | 22,5                    | 6,0       | 3,0                    | 41.862                               |
| 700                             | 52,5                    | 34,0                    | 4,0                     | 22,5                    | 7,0       | 4,0                    | 79.168                               |

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

**Product description**  
Dimensions of channels

**Annex A 3**

Appendix 6 / 25

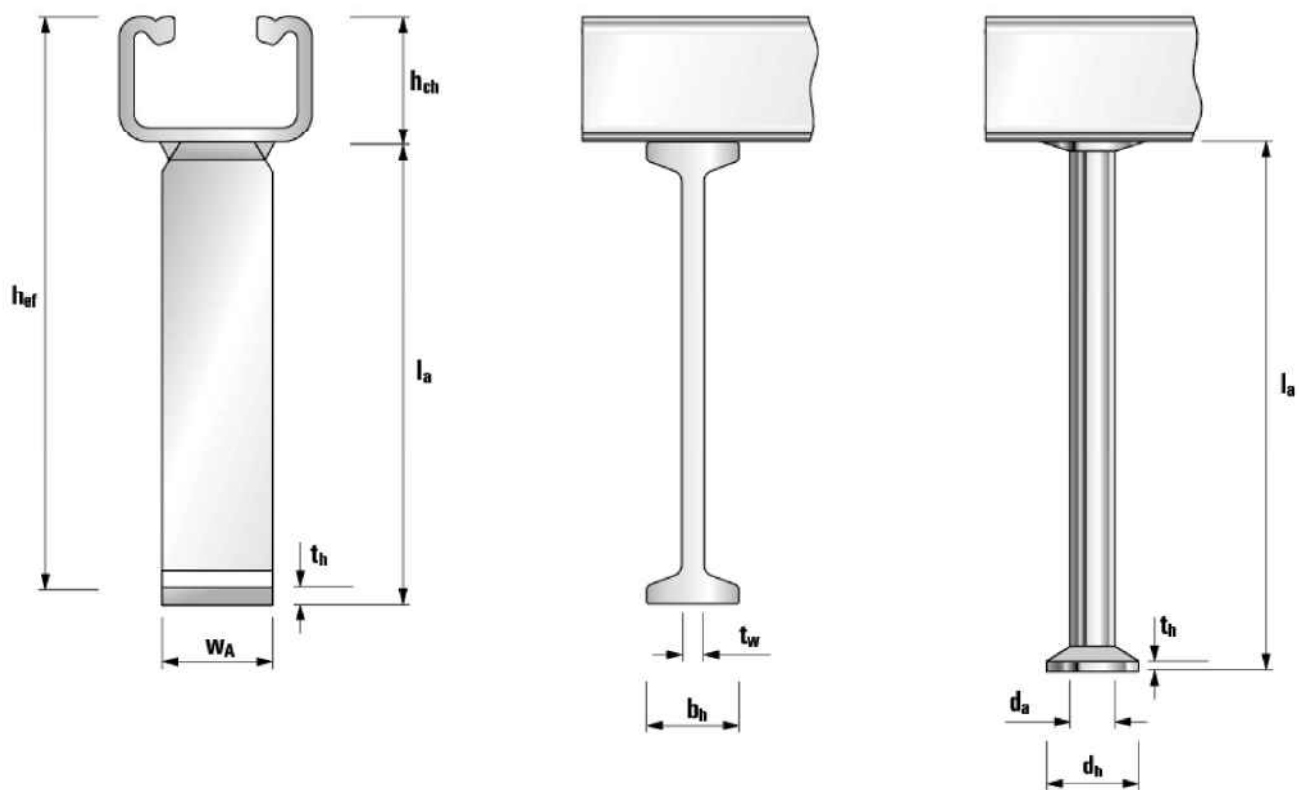


**Table A4.1:** Dimensions of anchor (welded I-anchor or forged round anchor)

| Anchor channel<br>FES-RS-S-(I)- | I-anchor            |                     |                     |               |                     |                                   | Round anchor        |               |               |               |                             |
|---------------------------------|---------------------|---------------------|---------------------|---------------|---------------------|-----------------------------------|---------------------|---------------|---------------|---------------|-----------------------------|
|                                 | $l_{a,min}$<br>[mm] | $t_{w,min}$<br>[mm] | $b_{h,min}$<br>[mm] | $t_h$<br>[mm] | $w_{A,min}$<br>[mm] | $A_{h,min}$<br>[mm <sup>2</sup> ] | $l_{a,min}$<br>[mm] | $d_a$<br>[mm] | $d_h$<br>[mm] | $t_h$<br>[mm] | $A_h$<br>[mm <sup>2</sup> ] |
| 600                             | 125                 | 6                   | 25                  | 5             | 30                  | 570                               | 123,5               | 11,0          | 24,3          | 2,5           | 368                         |
| 700                             | 125                 | 6                   | 25                  | 5             | 30                  | 570                               | 144,0               | 12,8          | 26,0          | 3,0           | 402                         |

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

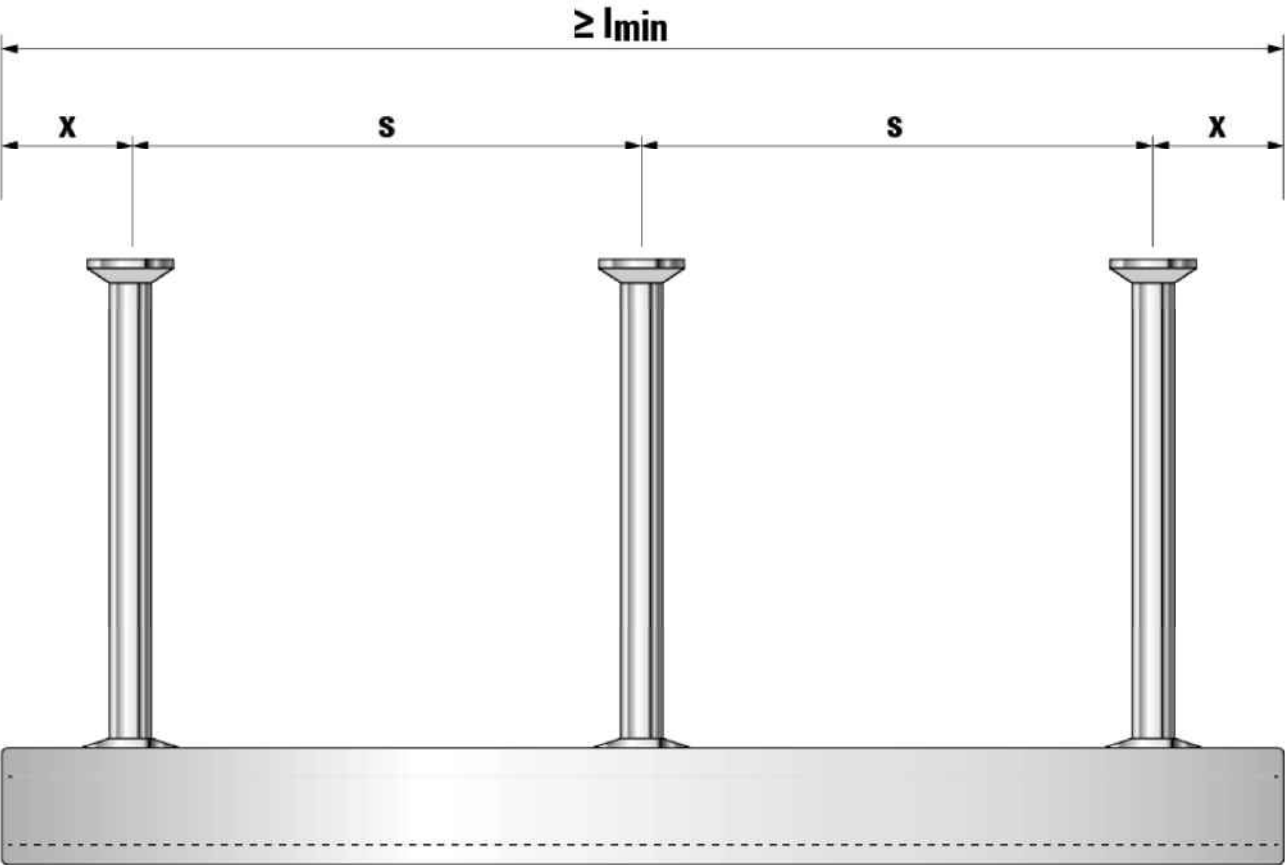
**Product description**  
Dimensions of anchors

**Annex A 4**

Appendix 7 / 25

**Table A5.1:**    Anchor position

| Anchor channel FES-RS-S-(I)- | Anchor type   | S <sub>min</sub><br>[mm] | S <sub>max</sub><br>[mm] | X <sub>min</sub><br>[mm] | X <sub>max</sub><br>[mm] | l <sub>min</sub><br>[mm] | l <sub>max</sub><br>[mm] |
|------------------------------|---------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 600                          | Round<br>or I | 80                       | 250                      | 30                       | 35                       | 140                      | 6.070                    |
| 700                          |               |                          |                          |                          |                          |                          |                          |



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

**Product description**  
Anchor position and channel length

**Annex A 5**

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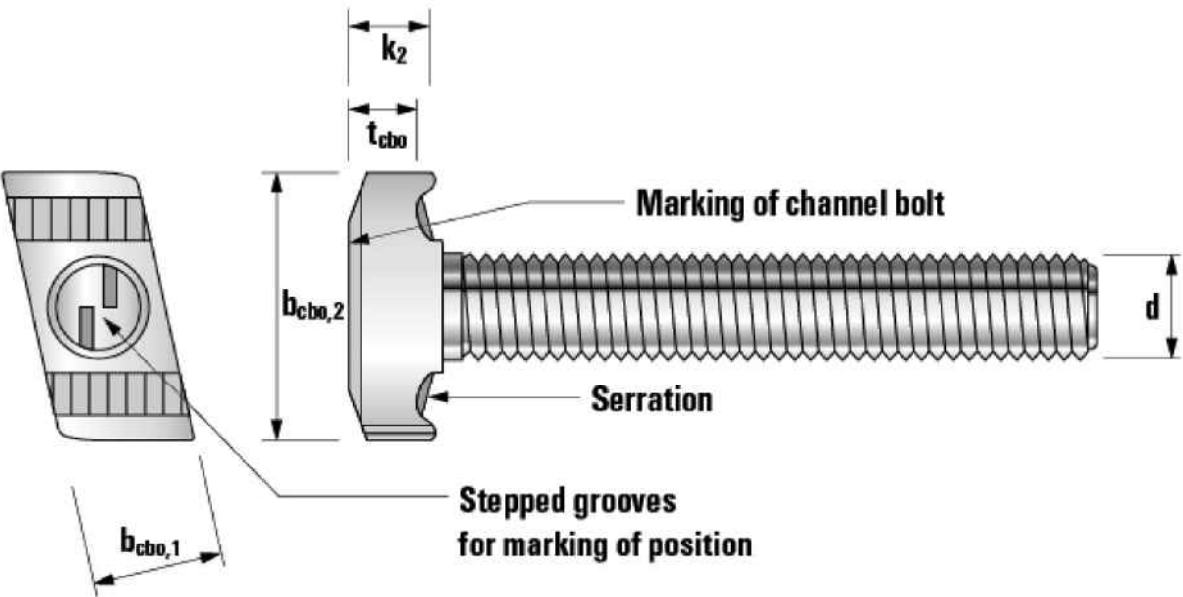
**Table A6.1:**    Strength grade and corrosion class

|                               |                                  |
|-------------------------------|----------------------------------|
| Channel bolt                  | Carbon steel <sup>1)</sup>       |
| Strength grade                | 8.8                              |
| $f_{uk}$ [N/mm <sup>2</sup> ] | 800 / 830                        |
| $f_{yk}$ [N/mm <sup>2</sup> ] | 640 / 660 <sup>2)</sup>          |
| Corrosion protection          | F <sup>3)</sup> or Electroplated |

<sup>1)</sup> Material properties according to Annex A7.

<sup>2)</sup> Material properties according to EN ISO 898-1:2013.

<sup>3)</sup> Hot-dip galvanized.



Serrated channel bolt FBC-S-225

**Table A6.2:**    Dimensions of fischer channel bolt FBC and matching fischer anchor channels FES

| Anchor channel FES-RS-S-(I)- | Channel bolt FBC-S | $d$ [mm] | $b_{cbo,1}$ [mm] | $b_{cbo,2}$ [mm] | $t_{cbo}$ [mm] | $k_2$ [mm] |
|------------------------------|--------------------|----------|------------------|------------------|----------------|------------|
| 600                          | 225                | 12       | 21,0             | 43,0             | 10,7           | 15,0       |
| 700                          |                    | 16<br>20 |                  |                  |                |            |

|                                                                                             |                                         |
|---------------------------------------------------------------------------------------------|-----------------------------------------|
| fischer Serrated Anchor Channel InnoLock FES-RS-S with fischer Serrated Channel Bolts FBC-S | <b>Annex A 6</b><br><br>Appendix 9 / 25 |
| Product description<br>Serrated channel bolts                                               |                                         |

**Table A7.1:** Materials and properties

| Component                                                                           | Carbon steel                                        |                                                           |                                                                         |
|-------------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------------------|
|                                                                                     | Mechanical properties                               | Coating                                                   | Coating                                                                 |
| 1                                                                                   | 2                                                   | 2a                                                        | 2b                                                                      |
| Channel profile                                                                     | 1.0976<br>acc. to EN 10149:2013                     | Hot dip galvanized<br>≥ 55 µm acc. to<br>EN ISO 1461:2022 | Hot dip galvanized<br>≥ 55 µm acc. to<br>EN ISO 1461:2022               |
| Round anchor                                                                        | 1.5525<br>acc. to EN 10263:2017                     | Hot dip galvanized<br>≥ 55 µm acc. to<br>EN ISO 1461:2022 | Hot dip galvanized<br>≥ 55 µm acc. to<br>EN ISO 1461:2022               |
| I-anchor                                                                            | 1.0045, 1.0976<br>acc. to EN 10149:2013             | Hot dip galvanized<br>≥ 55 µm acc. to<br>EN ISO 1461:2022 | Hot dip galvanized<br>≥ 55 µm acc. to<br>EN ISO 1461:2022               |
| Serrated channel bolt                                                               | Strength grade 8.8<br>acc. to EN ISO 898-<br>1:2013 | Electroplated<br>acc. to<br>EN ISO 4042:2022              | Hot dip galvanized<br>≥ 50 µm acc. to<br>EN ISO 10684:2004<br>+ AC:2009 |
| Plain washer <sup>1)</sup><br>acc. to EN ISO 7089:2000<br>and<br>EN ISO 7093-1:2000 | Hardness class<br>A ≥ 200 HV                        | Electroplated acc. to<br>EN ISO 4042:2022                 | Hot dip galvanized<br>≥ 50 µm acc. to<br>EN ISO 10684:2004<br>+ AC:2009 |
| Hexagonal nut<br>acc. to EN ISO 4032:2012                                           | Property class 8<br>acc. to EN ISO 898-<br>2:2022   | Electroplated acc. to<br>EN ISO 4042:2022                 | Hot dip galvanized<br>≥ 50 µm acc. to<br>EN ISO 10684:2004<br>+ AC:2009 |

<sup>1)</sup> Not in the scope of delivery.

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

**Product description**  
Materials

**Annex A 7**

Appendix 10 / 25

## Specifications of intended use

### Anchor channels and serrated 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.
- Fire exposure: Only for concrete class C20/25 to C50/60.

### Base materials:

- Reinforced or unreinforced compacted normal weight concrete without fibres according to EN 206:2013+A2:2021.
- Strength classes C12/15 to C90/105 according to EN 206:2013+A2:2021.
- Cracked or uncracked concrete.

### Use conditions (Environmental conditions):

- Structures subject to dry internal conditions (anchor channels and channel bolts according to Annex A7, Table A7.1, 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 A7.1, 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 are designed in accordance with EN 1992-4:2018 and EOTA TR 047 "Design of Anchor Channels", May 2021.
- The characteristic resistances are calculated with the minimum effective embedment depth.

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

**Intended Use**  
Specifications

**Annex B 1**

Appendix 11 / 25

**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 5, Table A5.1 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.
- Washer may be chosen according to Annex A7 and provided separately by the user.
- Orientating the **serrated** channel bolt (groove according to Annex B6) rectangular to the channel axis.
- The required installation torque given in Annex B4 must be applied and must not be exceeded.

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

**Intended Use**  
Specifications

**Annex B 2**

Appendix 12 / 25

Installation parameters

Table B3.1: Installation parameters

| Anchor channel FES-RS-S-             |              |      | 600 | I-600 | 700 | I-700 |
|--------------------------------------|--------------|------|-----|-------|-----|-------|
| Minimum effective embedment depth    | $h_{ef,min}$ | [mm] | 150 | 154   | 175 | 154   |
| Minimum edge distance                | $c_{min}$    |      | 75  | 75    | 75  | 75    |
| Minimum thickness of concrete member | $h_{min}$    |      | 153 | 159   | 178 | 178   |

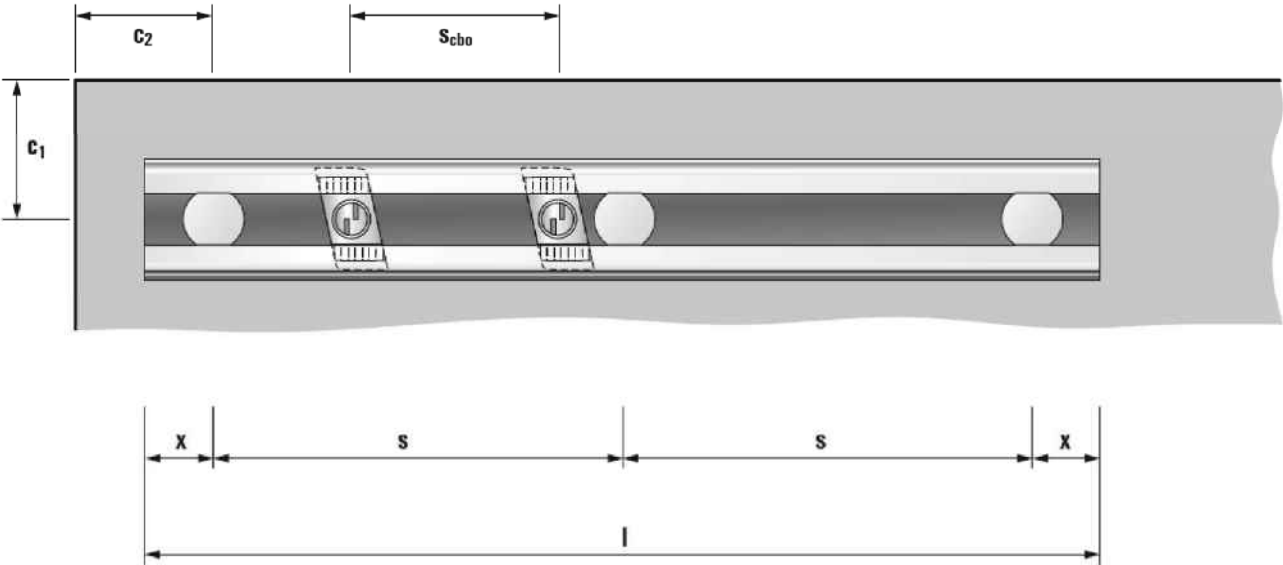


Table B3.2: Minimum spacing for serrated channel bolts

|                                       |               |      |     |     |     |
|---------------------------------------|---------------|------|-----|-----|-----|
| Serrated channel bolt                 |               |      | M12 | M16 | M20 |
| Minimum spacing between channel bolts | $S_{cbo,min}$ | [mm] | 60  | 80  | 100 |

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

Intended Use  
Installation parameters for fischer anchor channels FES-RS-S

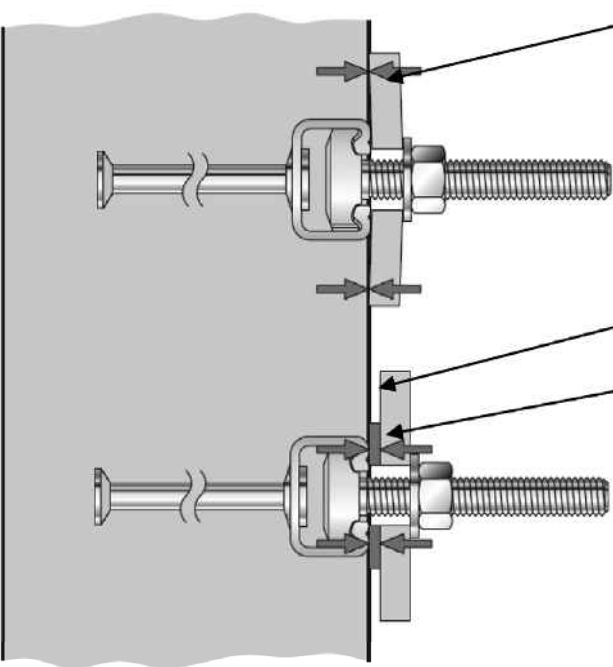
Annex B 3

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**Table B4.1:** Installation torque  $T_{inst}$

| fischer anchor<br>channel<br>FES-RS-S-(I)- | fischer serrated<br>channel bolt<br>FBC-S | Thread diameter | T <sub>inst</sub> <sup>1)</sup> [Nm] |                                              |
|--------------------------------------------|-------------------------------------------|-----------------|--------------------------------------|----------------------------------------------|
|                                            |                                           |                 | General<br>T <sub>inst,g</sub>       | Steel – steel contact<br>T <sub>inst,s</sub> |
|                                            |                                           |                 | 8.8                                  | 8.8                                          |
| 600                                        | 225                                       | M12             | 80                                   | 100                                          |
| 700                                        |                                           | M16             | 100                                  | 200                                          |
|                                            |                                           | M20             | 120                                  | 360                                          |

<sup>1)</sup>  $T_{inst}$  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  $T_{inst,s}$ .  
( $T_{inst,s} \geq T_{inst,g}$ )

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

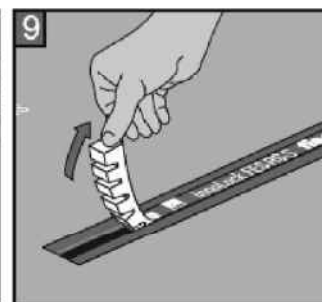
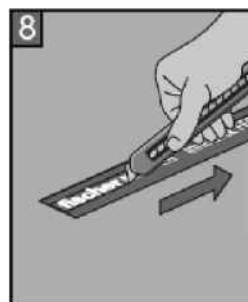
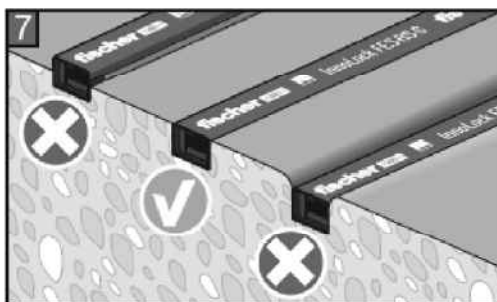
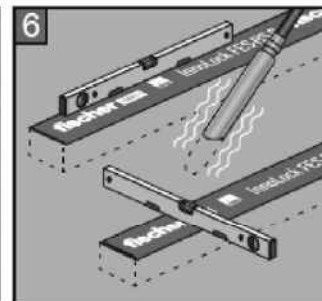
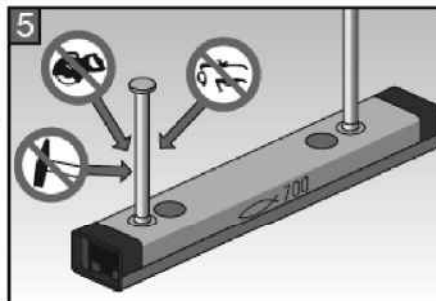
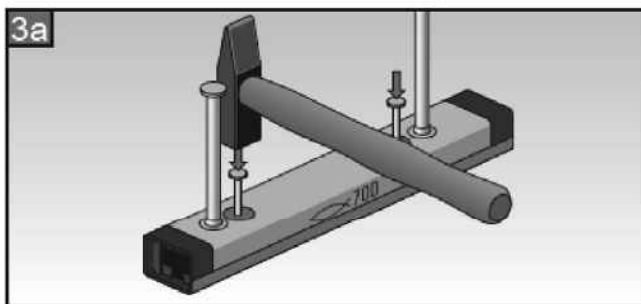
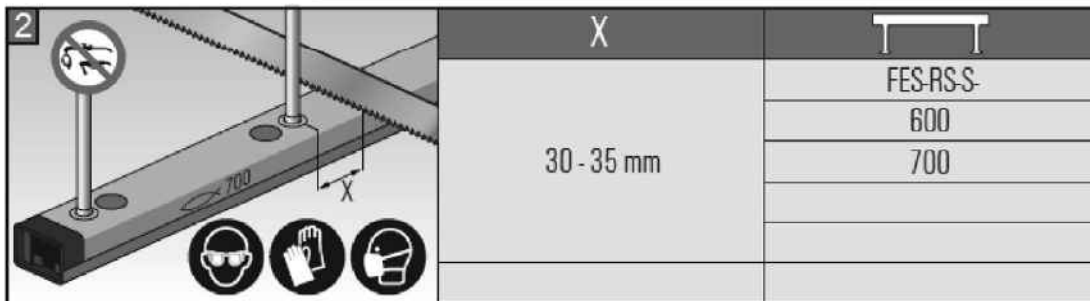
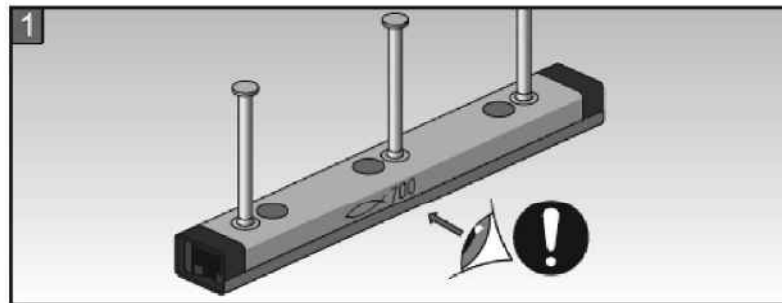
**Intended Use**

Installation parameters for fischer serrated channel bolts FBC-S

**Annex B 4**

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# Anchor channel FES-RS-S



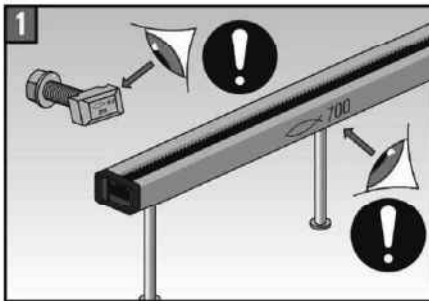
**fischer Serrated Anchor Channel InnoLock FES-RS-S with fischer Serrated Channel Bolts FBC-S**

## Intended Use

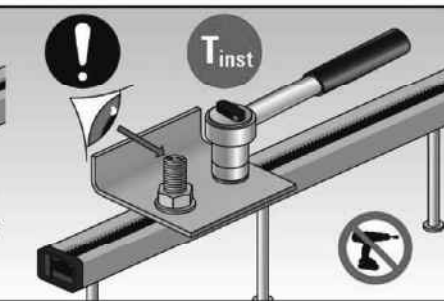
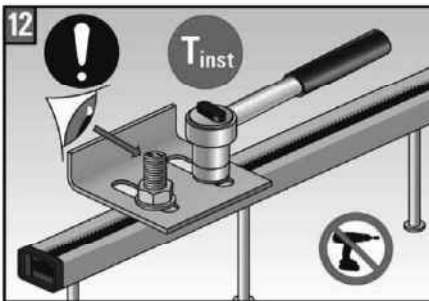
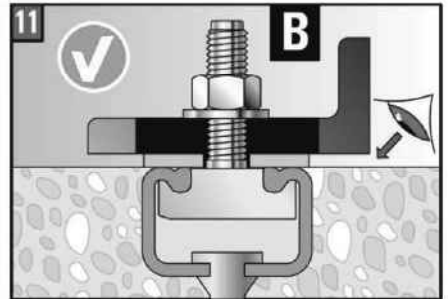
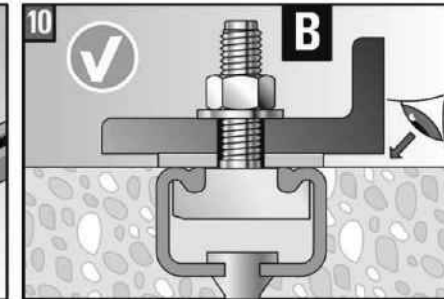
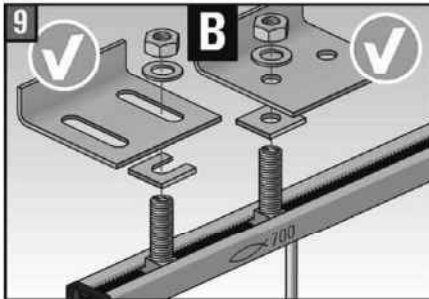
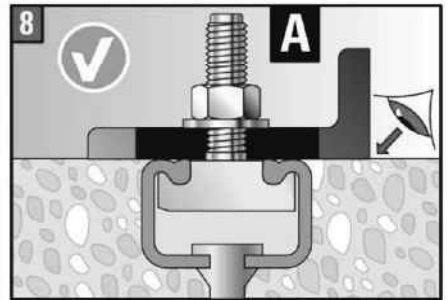
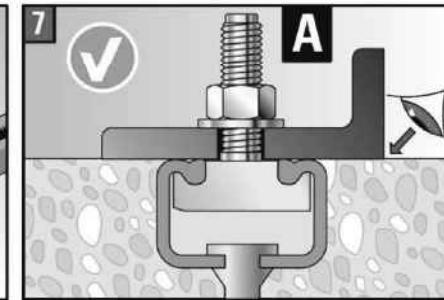
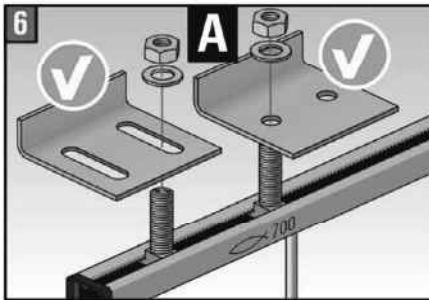
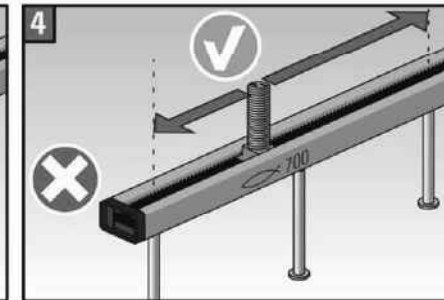
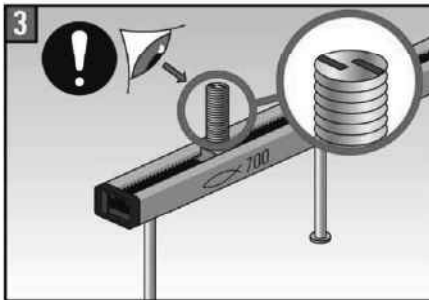
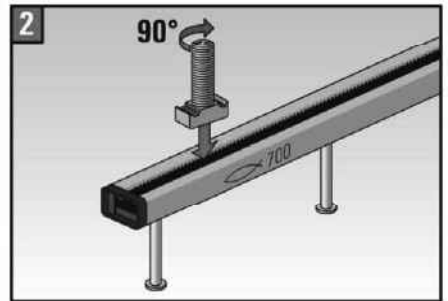
Installation instruction for fischer anchor channel FES-RS-S

## Annex B 5

# Serrated Channel bolt FBC-S



|     | FBC-S | FES-RS-S |
|-----|-------|----------|
| 225 | 600   |          |
| 225 | 700   |          |



| FBC-S | FES-RS-S | T <sub>inst</sub> Nm | M12 | M16 | M20 |
|-------|----------|----------------------|-----|-----|-----|
| 225   | 600      | A                    | 80  | 100 | 120 |
|       |          | B                    | 100 | 200 | 360 |
| 225   | 700      | A                    | 80  | 100 | 120 |
|       |          | B                    | 100 | 200 | 360 |

T<sub>inst</sub> must not be exceeded.

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

## Intended Use

Installation instruction for fischer serrated channel bolt FBC-S

## Annex B 6

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**Table C1.1:** Characteristic resistances under tension load – steel failure of anchor channels

| Anchor channel FES-RS-S-                                        |                                  |      | 600  | I-600 | 700  | I-700 |
|-----------------------------------------------------------------|----------------------------------|------|------|-------|------|-------|
| Steel failure: Anchor                                           |                                  |      |      |       |      |       |
| Characteristic resistance                                       | N <sub>Rk,s,a</sub>              | [kN] | 55,2 | 57,0  | 73,3 | 81,0  |
| Partial factor                                                  | γ <sub>Ms</sub> <sup>1)</sup>    | [-]  | 1,8  |       |      |       |
| Steel failure: Connection between anchor and channel            |                                  |      |      |       |      |       |
| Characteristic resistance                                       | N <sub>Rk,s,c</sub>              | [kN] | 55,2 | 57,0  | 73,0 | 80,0  |
| Partial factor                                                  | γ <sub>Ms</sub> <sup>1)</sup>    | [-]  | 1,8  |       |      |       |
| Steel failure: Local flexure of the channel lips                |                                  |      |      |       |      |       |
| Characteristic spacing of channel bolts for N <sub>Rk,s,l</sub> | S <sub>l,N</sub>                 | [mm] | 101  |       | 105  |       |
| Characteristic resistance                                       | N <sup>0</sup> <sub>Rk,s,l</sub> | [kN] | 64,0 |       | 80,0 |       |
| Partial factor                                                  | γ <sub>Ms</sub> <sup>1)</sup>    | [-]  | 1,8  |       |      |       |

<sup>1)</sup> In absence of other national regulations.

**Table C1.2:** Characteristic flexural resistance of the channel

| Anchor channel FES-RS-S-                      |                         |      | 600  | 700  |
|-----------------------------------------------|-------------------------|------|------|------|
| <b>Steel failure: Flexure of channel</b>      |                         |      |      |      |
| Characteristic flexural resistance of channel | $M_{Rk,s,flex}$         | [Nm] | 2581 | 3749 |
| Partial factor                                | $\gamma_{Ms,flex}^{1)}$ | [-]  | 1,15 |      |

<sup>1)</sup> In absence of other national regulations.

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

**Performances**

Characteristic resistances of anchor channels under tension load – steel failure of anchor channel

**Annex C 1**

Appendix 17 / 25

**Table C2.1:** Characteristic resistances under tension load – concrete failure

| Anchor channel FES-RS-S-                                                           |                                                  |                    | 600  | I-600 | 700  | I-700 |
|------------------------------------------------------------------------------------|--------------------------------------------------|--------------------|------|-------|------|-------|
| Concrete failure: Pull-out failure                                                 |                                                  |                    |      |       |      |       |
| Characteristic resistance in cracked concrete C12/15                               | N <sub>Rk,p</sub>                                | [kN]               | 33,1 | 51,3  | 36,2 | 51,3  |
| Characteristic resistance in uncracked concrete C12/15                             | N <sub>Rk,p</sub>                                | [kN]               | 46,4 | 71,8  | 50,7 | 71,8  |
| Increasing factor of N <sub>Rk,p</sub> = N <sub>Rk,p</sub> (C12/15)*ψ <sub>c</sub> | C16/20                                           | ψ <sub>c</sub> [-] | 1,33 |       |      |       |
|                                                                                    | C20/25                                           |                    | 1,67 |       |      |       |
|                                                                                    | C25/30                                           |                    | 2,08 |       |      |       |
|                                                                                    | C30/37                                           |                    | 2,50 |       |      |       |
|                                                                                    | C35/45                                           |                    | 2,92 |       |      |       |
|                                                                                    | C40/50                                           |                    | 3,33 |       |      |       |
|                                                                                    | C45/55                                           |                    | 3,75 |       |      |       |
|                                                                                    | C50/60                                           |                    | 4,17 |       |      |       |
|                                                                                    | C55/67                                           |                    | 4,58 |       |      |       |
| ≥C60/75                                                                            |                                                  | 5,00               |      |       |      |       |
| Partial factor                                                                     | γ <sub>Mp</sub> = γ <sub>Mc</sub> <sup>1)</sup>  | [-]                | 1,5  |       |      |       |
| Concrete failure: Concrete cone failure                                            |                                                  |                    |      |       |      |       |
| Product factor k <sub>1</sub>                                                      | k <sub>cr,N</sub>                                | [-]                | 8,6  | 8,6   | 8,9  | 8,7   |
|                                                                                    | k <sub>ucr,N</sub>                               | [-]                | 12,3 | 12,4  | 12,6 | 12,5  |
| Partial factor                                                                     | γ <sub>Mc</sub> <sup>1)</sup>                    | [-]                | 1,5  |       |      |       |
| Concrete failure: Concrete splitting failure                                       |                                                  |                    |      |       |      |       |
| Characteristic edge distance                                                       | C <sub>cr,sp</sub>                               | [mm]               | 450  | 462   | 525  | 462   |
| Characteristic spacing                                                             | S <sub>cr,sp</sub>                               | [mm]               | 900  | 942   | 1050 | 942   |
| Partial factor                                                                     | γ <sub>MSp</sub> = γ <sub>Mc</sub> <sup>1)</sup> | [-]                | 1,5  |       |      |       |

<sup>1)</sup> In absence of other national regulations.

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

#### Performances

Characteristic resistances under tension load – concrete failure

## Annex C 2

**Table C3.1:** Displacements under tension load

| Anchor channel FES-RS-S-(I)-          |                    |      | 600  | 700  |
|---------------------------------------|--------------------|------|------|------|
| Tension load                          | N                  | [kN] | 21,4 | 31,4 |
| Short-term displacement <sup>1)</sup> | $\delta_{N0}$      | [mm] | 2,1  | 2,1  |
| Long-term displacement <sup>1)</sup>  | $\delta_{N\infty}$ | [mm] | 4,2  | 4,2  |

<sup>1)</sup> 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 C4.1:** Characteristic resistances under shear load – steel failure of anchor channels

| Anchor channel FES-RS-S-                                        |                                    |      | 600  | I-600 | 700   | I-700 |
|-----------------------------------------------------------------|------------------------------------|------|------|-------|-------|-------|
| Steel failure: Anchor                                           |                                    |      |      |       |       |       |
| Characteristic resistance                                       | V <sub>Rk,s,a,y</sub>              | [kN] | 98,5 | 98,5  | 120,0 | 120,0 |
|                                                                 | V <sub>Rk,s,a,x</sub>              |      | 34,2 | 50,7  | 44,0  | 48,6  |
| Partial factor                                                  | γ <sub>Ms</sub> <sup>1)</sup>      | [-]  | 1,8  |       |       |       |
| Steel failure: Connection between anchor and channel            |                                    |      |      |       |       |       |
| Characteristic resistance                                       | V <sub>Rk,s,c,y</sub>              | [kN] | 98,5 | 98,5  | 120,0 | 120,0 |
|                                                                 | V <sub>Rk,s,c,x</sub>              |      | 33,1 | 34,9  | 43,8  | 48,0  |
| Partial factor                                                  | γ <sub>Ms</sub> <sup>1)</sup>      | [-]  | 1,8  |       |       |       |
| Steel failure: Local flexure of the channel lips                |                                    |      |      |       |       |       |
| Characteristic spacing of channel bolts for V <sub>Rk,s,l</sub> | S <sub>i,v</sub>                   | [mm] | 101  |       | 105   |       |
| Characteristic resistance                                       | V <sup>0</sup> <sub>Rk,s,l,y</sub> | [kN] | 77,7 |       | 92,0  |       |
| Partial factor                                                  | γ <sub>Ms</sub> <sup>1)</sup>      | [-]  | 1,8  |       |       |       |

<sup>1)</sup> In absence of other national regulations.

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

**Performances**

Characteristic resistance of anchor channel under shear load – steel failure of anchor channel

**Annex C 4**

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**Table C5.1:** Characteristic resistance for shear load in direction of the longitudinal axis of the channel – steel failure

| Anchor channel FES-RS-S-(I)-                                             |                      |      | 600                       | 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         | 17,6 |
|                                                                          |                      |      | FBC-S-225-M16-8.8         | 17,6 |
|                                                                          |                      |      | FBC-S-225-M20-8.8         | 17,6 |
| Installation factor                                                      | $\gamma_{Inst}^{1)}$ | [-]  | M12: 1,4<br>M16, M20: 1,0 | 1,2  |

<sup>1)</sup> In absence of other national regulations.

<sup>2)</sup> No performance assessed.

**Table C5.2:** Characteristic resistance of the anchor channel under shear load – concrete failure

| Anchor channel FES-RS-S-(I)-            |                               |                    | 600  | 700  |
|-----------------------------------------|-------------------------------|--------------------|------|------|
| Concrete failure: Pry-out failure       |                               |                    |      |      |
| Product factor                          | k <sub>8</sub>                | [-]                | 2,0  | 2,0  |
| Partial factor                          | γ <sub>Mc</sub> <sup>1)</sup> | [-]                | 1,5  |      |
| Concrete failure: Concrete edge failure |                               |                    |      |      |
| Product factor<br>k <sub>12</sub>       | Cracked concrete              | k <sub>cr,V</sub>  | 7,5  | 7,5  |
|                                         | Uncracked concrete            | k <sub>ucr,V</sub> | 10,5 | 10,5 |
| Partial factor                          | γ <sub>Mc</sub> <sup>1)</sup> | [-]                | 1,5  |      |

<sup>1)</sup> In absence of other national regulations.

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

**Performances**

Characteristic resistance under shear load

**Annex C 5**

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**Table C6.1:** Displacements under shear load

| Anchor channel FES-RS-S-(I)-                                     |                       |      | 600  | 700  |
|------------------------------------------------------------------|-----------------------|------|------|------|
| Shear load perpendicular to the longitudinal axis of the channel | $V_y$                 | [kN] | 30,5 | 36,5 |
| Short-term displacement <sup>1)</sup>                            | $\delta_{V,y,0}$      | [mm] | 2,5  | 2,9  |
| Long-term displacement <sup>1)</sup>                             | $\delta_{V,y,\infty}$ | [mm] | 3,7  | 4,4  |
| Shear load in direction of the longitudinal axis of the channel  | $V_x$                 | [kN] | 7,0  | 6,6  |
| Short-term displacement <sup>2)</sup>                            | $\delta_{V,x,0}$      | [mm] | 0,9  | 1,2  |
| Long-term displacement <sup>2)</sup>                             | $\delta_{V,x,\infty}$ | [mm] | 1,3  | 1,8  |

<sup>1)</sup> 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.

<sup>2)</sup> Displacements of the anchor channel, including slip of channel bolt, deformation of channel lips and slip of the anchor channel in concrete.

**Table C6.2:** Characteristic resistances under tension and shear load – steel failure of serrated channel bolts

| Serrated 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                  | $\gamma_{Ms}^{1)}$ | [-]  | 1,5             |       |       |
| Characteristic resistance       | $V_{Rk,s}$         | [kN] | 33,7            | 62,8  | 98,0  |
| Partial factor                  | $\gamma_{Ms}^{1)}$ | [-]  | 1,25            |       |       |

<sup>1)</sup> In absence of other national regulations.

**Table C6.3:** Characteristic resistances under combined tension and shear load

| Anchor channel FES-RS-S-(I)-                                        |                 |     | 600                                  | 700 |
|---------------------------------------------------------------------|-----------------|-----|--------------------------------------|-----|
| Steel failure: Local flexure of channel lips and flexure of channel |                 |     |                                      |     |
| Product factor                                                      | k <sub>13</sub> | [-] | according to EN 1992-4:2018, 7.4.3.1 |     |
| Steel failure: Anchor and connection between anchor and channel     |                 |     |                                      |     |
| Product factor                                                      | k <sub>14</sub> | [-] | according to EN 1992-4:2018, 7.4.3.1 |     |

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

#### Performances

Characteristic resistance of channel bolts under tension and shear load, displacements under shear load, combined tension and shear load

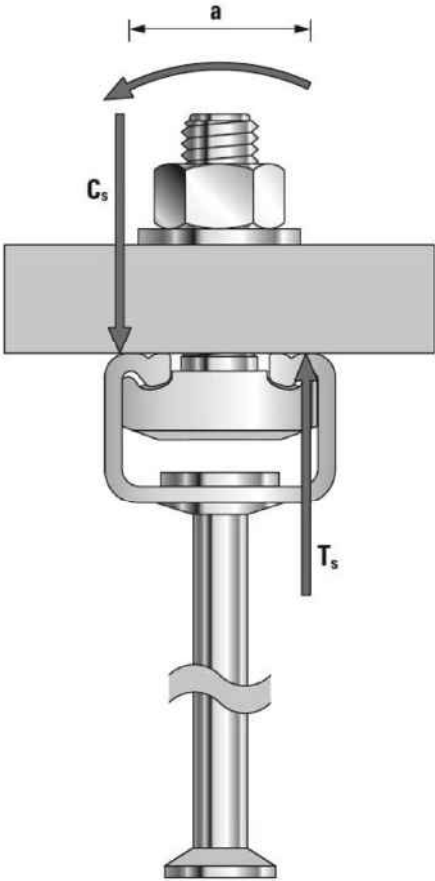
## Annex C 6

**Table C7.1:** Characteristic resistances under shear load with lever arm – steel failure of serrated channel bolts

| Thread diameter of serrated channel bolt <sup>2)</sup> |                                |      |           | M12   | M16   | M20   |
|--------------------------------------------------------|--------------------------------|------|-----------|-------|-------|-------|
| Steel failure:                                         |                                |      |           |       |       |       |
| Characteristic flexural resistance                     | M <sup>0</sup> <sub>Rk,s</sub> | [Nm] | FBC-S-225 | 104,8 | 266,4 | 519,3 |
| Partial factor                                         | γ <sub>Ms</sub> <sup>1)</sup>  | [-]  | FBC-S-225 | 1,25  |       |       |
| Internal lever arm                                     | a                              | [kN] | FBC-S-225 | 29,8  | 31,8  | 34,2  |

1) In absence of other national regulations.  
2) Materials according to Annex A7, Table A7.1.

The characteristic flexure resistance according to Table C7.1 is limited as follows:



$M_{Rk,s}^0 \leq 0,5 \cdot N_{Rk,s,l}^0 \cdot a$  ( $N_{Rk,s,l}^0$  according to Table C1.1)

$M_{Rk,s}^0 \leq 0,5 \cdot N_{Rk,s} \cdot a$  ( $N_{Rk,s}$  according to Table C6.2)

a = Internal lever arm according to Table C7.1

T<sub>s</sub> = Tension force acting on the channel lips

C<sub>s</sub> = Compression force acting on the channel lips

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

**Performances**  
Characteristic flexural resistances under shear load of serrated channel bolts

**Table C8.1:** Characteristic resistances under fire exposure – steel failure

| Channel bolt                                                                               |                                   |      |                  | M12  | M16 | M20 |      |
|--------------------------------------------------------------------------------------------|-----------------------------------|------|------------------|------|-----|-----|------|
| Steel failure: Anchor, connection between anchor and channel, local bending of channel lip |                                   |      |                  |      |     |     |      |
| Characteristic resistance                                                                  | $N_{Rk,s,fi}$<br>$=V_{Rk,s,y,fi}$ | [kN] | FES-RS-S-(I)-600 | R30  | 2,5 | 4,8 | 12,0 |
|                                                                                            |                                   |      |                  | R60  | 2,0 | 4,2 | 8,7  |
|                                                                                            |                                   |      |                  | R90  | 1,4 | 3,5 | 5,2  |
|                                                                                            |                                   |      |                  | R120 | 1,2 | 3,1 | 3,4  |
|                                                                                            |                                   |      | FES-RS-S-(I)-700 | R30  | 2,5 | 4,8 | 12,0 |
|                                                                                            |                                   |      |                  | R60  | 2,0 | 4,2 | 8,7  |
|                                                                                            |                                   |      |                  | R90  | 1,4 | 3,5 | 5,2  |
|                                                                                            |                                   |      |                  | R120 | 1,2 | 3,1 | 3,4  |
| Partial factor                                                                             | $\gamma_{Ms,fi}^{1)}$             | [-]  | 1,0              |      |     |     |      |

<sup>1)</sup> In absence of other national regulations.

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

#### Performances

Characteristic resistance under fire exposure

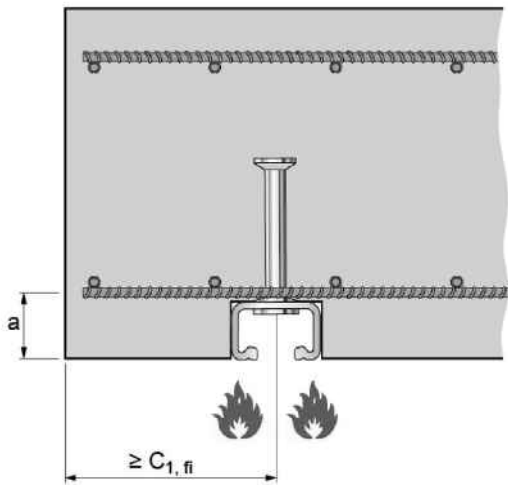
**Annex C 8**

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**Table C9.1:** Minimum axis distance of reinforcement

| Anchor channel FES-RS-S-(I)- |      |        | 600 | 700 |
|------------------------------|------|--------|-----|-----|
| Min. axis distance           | R30  | a [mm] | 35  | 50  |
|                              | R60  |        | 35  | 50  |
|                              | R90  |        | 45  | 50  |
|                              | R120 |        | 60  | 65  |

Fire exposure from one side only



Fire exposure from more than one side

