



## DECLARAȚIA DE PERFORMANȚĂ



DoP: 0127

pentru fischer High-Performance Anchor FH II, FH II-I (Ancore din metal pentru utilizare la beton (pentru sarcini mari)) – RO

1. Cod unic de identificare al produsului-tip: **DoP: 0127**
2. Utilizare (utilizări) preconizată (preconizate): **Prindere cu instalare ulterioară în beton fisurat sau nefisurat, consultați suplimentul, în special anexele B 1 - B 6**
3. Fabricant: **fischerwerke GmbH & Co. KG, Klaus-Fischer-Straße 1, 72178 Waldachtal, Germany**
4. Reprezentant autorizat: --
5. Sistemul (sistemele) de evaluare și de verificare a constanței performanței: **1**
6. Documentul de evaluare european: **EAD 330232-00-0601**

Evaluarea tehnică europeană: **ETA-07/0025; 2018-08-28**

Organismul de evaluare tehnică: **DIBt**

Organism (organisme) notificat(e): **1343 – MPA Darmstadt**

7. Performanța (performanțe) declarată (declarate):

### Rezistență mecanică și stabilitate (BWR 1),

- **Rezistența caracteristică pentru tensiune (pentru procese statice și cvasistatice):**  
Consultați suplimentul, în special anexele C 1 și C 2
- **Rezistența caracteristică la forfecare (pentru procese statice și cvasistatice):**  
Consultați suplimentul, în special anexele C 3 și C 4
- **Deplasări (pentru procese statice și cvasistatice):** Consultați suplimentul, în special anexele C 9 și C 10
- **Rezistență caracteristică și deplasări pentru categorii de performanță seismică C 1 și C 2:**  
Consultați suplimentul, în special anexele C 7, C 8 și C 10

### Siguranța în caz de incendiu (BWR 2)

- **Reacție la foc:** Ancorările satisfac cerințele pentru Clasa A 1
- **Rezistența la incendiu:** Consultați suplimentul, în special anexele C 5 și C 6

8. Documentație tehnică adecvată și/sau documentație tehnică specifică: ---

Performanța produsului identificat mai sus este în conformitate cu setul de performanțe declarate. Această declarație de performanță este eliberată în conformitate cu Regulamentul (UE) nr. 305/2011, pe răspunderea exclusivă a fabricantului identificat mai sus.

Semnată pentru și în numele fabricantului de către:

Andreas Bucher, Dipl.-Ing.

Wolfgang Hengesbach, Dipl.-Ing., Dipl.-Wirtsch.-Ing.

Tumlingen, 2018-09-11

- Această declarație de performanță a fost întocmită în mai multe limbi. În cazul unei divergențe de interpretare, versiunea în limba engleză prevalează întotdeauna.
- Suplimentul include informații voluntare și complementare în limba engleză, în afara cerințelor legale (specificate neutru din punct de vedere al limbii).

**Specific Part****1 Technical description of the product**

The fischer High-Performance Anchor FH II, FH II-I is an anchor made of galvanised steel (sizes with external diameter 10, 12, 15, 18, 24, 28 and 32, sizes with internal thread 12/M6 I, 12/M8 I, 15/M10 I and 15/M12 I) or stainless steel (sizes with external diameter 10, 12, 15, 18 and 24, sizes with internal thread 12/M6 I, 12/M8 I, 15/M10 I and 15/M12 I) which is placed into a drilled hole and anchored by torque-controlled expansion.

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 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 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 to tension load (static and quasi-static loading)              | See Annex C 1 and C 2       |
| Characteristic resistance to shear load (static and quasi-static loading)                | See Annex C 3 and C 4       |
| Displacements (static and quasi-static loading)                                          | See Annex C 9 and C 10      |
| Characteristic resistance and displacements for seismic performance categories C1 and C2 | See Annex C 7, C 8 and C 10 |

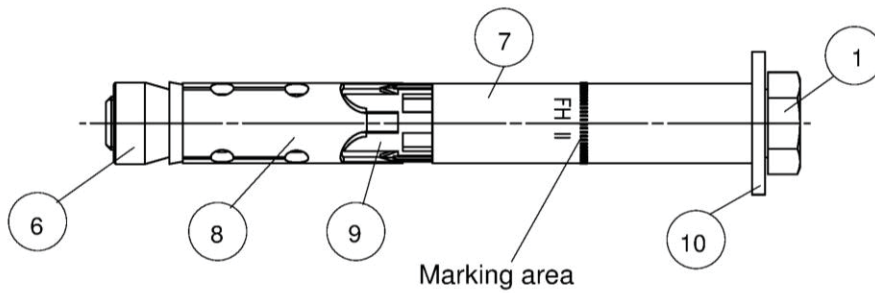
**3.2 Safety in case of fire (BWR 2)**

| Essential characteristics | Performance           |
|---------------------------|-----------------------|
| Reaction to fire          | Class A1              |
| Resistance to fire        | See Annex C 5 and C 6 |

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

In accordance with the European Assessment Document EAD 330232-00-0601 the applicable European legal act is: [96/582/EC].

The system to be applied is: 1



Type hexagon screw **S**

FH II 10 - 32 S

FH II 10 - 24 S A4

Product label, example:



FH II

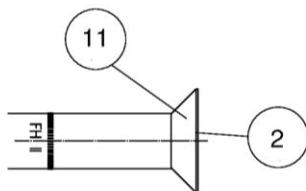
15/25 A4

Brand

Identification A4

Type of fastener

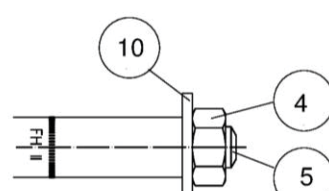
Nominal drill hole diameter/max. thickness of fixture ( $t_{fix}$ )



Type countersunk screw **SK**

FH II 10 - 18 SK

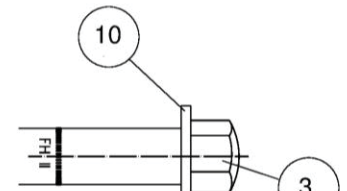
FH II 10 - 18 SK A4



Type hexagon nut **B**

FH II 10 - 32 B

FH II 10 - 24 B A4

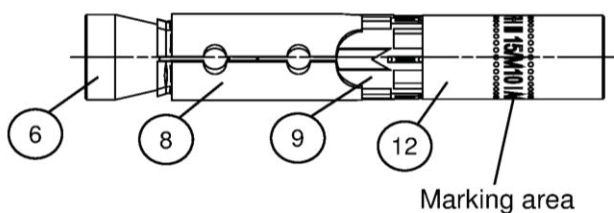


Type cap nut **H**

FH II 10 - 24 H

FH II 10 - 24 H A4

- |                     |                    |                           |
|---------------------|--------------------|---------------------------|
| 1 Hexagon screw     | 5 Threaded rod     | 9 Plastic sleeve          |
| 2 Countersunk screw | 6 Cone nut         | 10 Washer                 |
| 3 Cap nut           | 7 Distance sleeve  | 11 Conical washer         |
| 4 Hexagon nut       | 8 Expansion sleeve | 12 Internal thread socket |



Type internal threaded anchor **I**

FH II 12 M6-I or M8-I

FH II 15 M10-I or M12-I

Product label, example:



FH II

12/M8-I A4

Brand

Identification A4

Type of fastener

Nominal drill hole diameter / size of internal thread

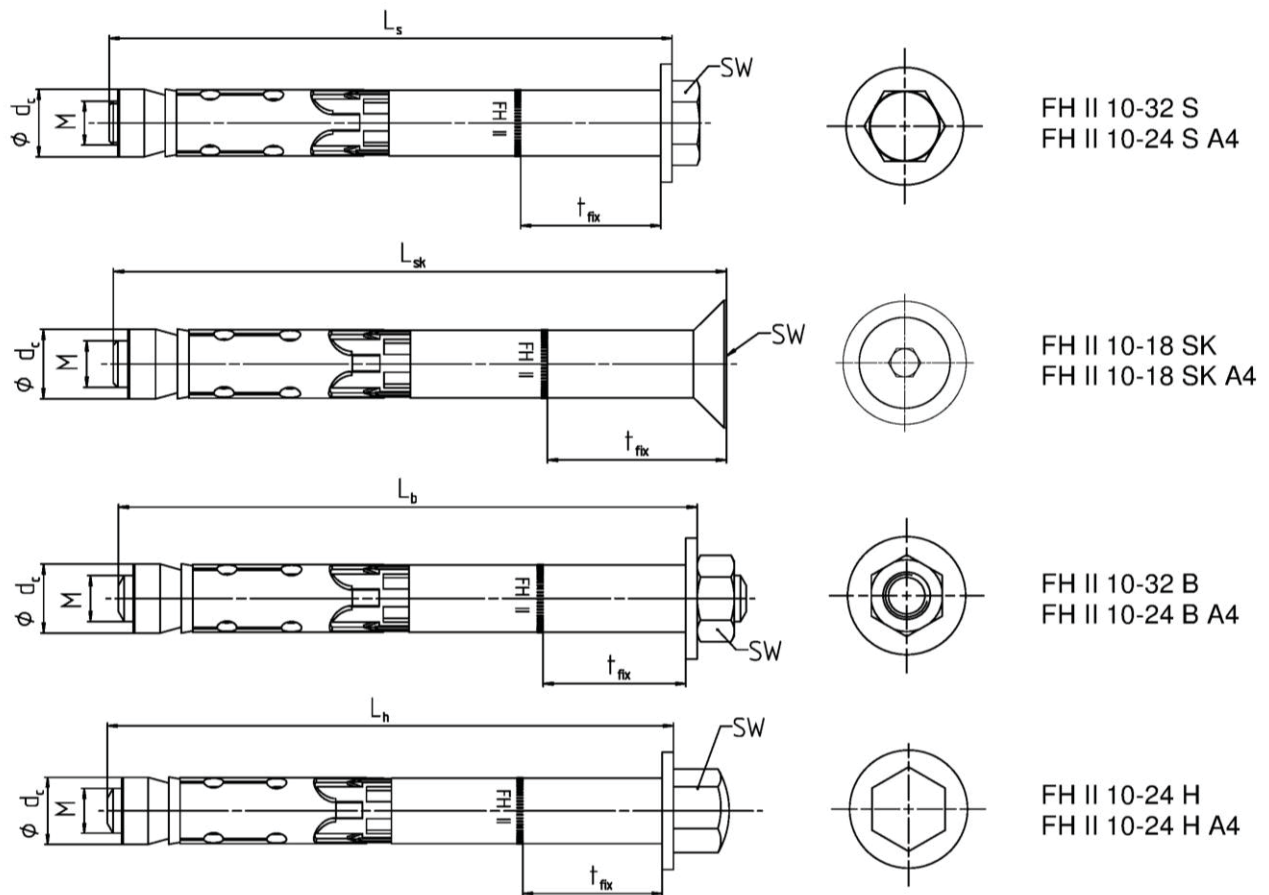
(Fig. not to scaled)

fischer High-Performance Anchor FH II, FH II-I

**Product description**

Anchor types FH II, FH II A4, FH II-I, FH II-I A4

**Annex A 1**


**Table A2.1: Dimensions [mm] FH II and FH II A4**

| Anchor type                                                 |                                                                        | FH II<br>10 | FH II<br>12 | FH II<br>15 | FH II<br>18 | FH II<br>24 | FH II<br>28 | FH II<br>32 |
|-------------------------------------------------------------|------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Thread                                                      | M                                                                      | 6           | 8           | 10          | 12          | 16          | 20          | 24          |
| Diameter cone nut                                           | d <sub>c</sub>                                                         | 10          | 12          | 14,8        | 17,8        | 23,7        | 27,5        | 31,5        |
| Wrench size SW                                              | FH II-S, -B                                                            | 10          | 13          | 17          | 19          | 24          | 30          | 36          |
|                                                             | FH II-SK <sup>1)</sup>                                                 | 4           | 5           | 6           | 8           | -           |             |             |
|                                                             | FH II-S, -B                                                            | 13          | 17          | 17          | 19          | 24          | -           |             |
|                                                             | FH II-S A4, -B A4, -H A4                                               | 10          | 13          | 17          | 19          | 24          | -           |             |
|                                                             | FH II-SK A4 <sup>1)</sup>                                              | 4           | 5           | 6           | 8           | -           |             |             |
| t <sub>fix</sub> FH II-S, -B, -H + FH II-S A4, -B A4, -H A4 | min                                                                    | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| t <sub>fix</sub> FH II-SK + FH II-SK A4 <sup>2)</sup>       | min                                                                    | 5           | 6           | 6           | 8           | -           | -           | -           |
| Length of screw / bolt                                      | L <sub>s</sub> , L <sub>h</sub> , L <sub>b</sub> (- t <sub>fix</sub> ) | ≥ 49        | 74          | 89          | 99          | 124         | 149         | 174         |
| Length of countersunk screw                                 | L <sub>sk</sub> (- t <sub>fix</sub> )                                  | ≥ 54        | 79          | 95          | 107         | -           |             |             |

<sup>1)</sup> Internal hexagon

<sup>2)</sup> The influence of the thickness of fixture to the characteristic resistance for shear loads, steel failure without lever arm is taken into account, see tables C3.1, C7.1 and C8.1

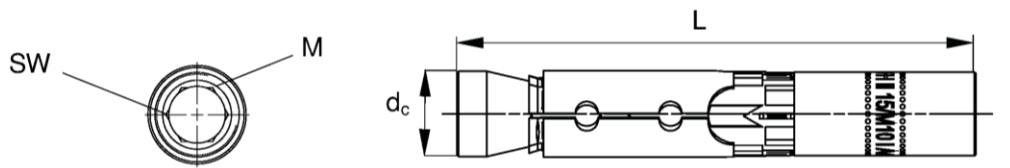
*(Fig. not to scaled)*

fischer High-Performance Anchor FH II, FH II-I

**Product description**

Anchor types and dimensions FH II, FH II A4

**Annex A 2**

**Table A3.1:** Anchor Dimensions [mm] FH II-I and FH II-I A4

| Anchor type FH II-I, FH II-I A4 |                | <b>FH II<br/>12/M6 I</b> | <b>FH II<br/>12/M8 I</b> | <b>FH II<br/>15/M10 I</b> | <b>FH II<br/>15/M12 I</b> |
|---------------------------------|----------------|--------------------------|--------------------------|---------------------------|---------------------------|
| Thread                          | M              | 6                        | 8                        | 10                        | 12                        |
| Diameter cone nut               | d <sub>c</sub> | 12                       | 12                       | 14,8                      | 14,8                      |
| Wrench size internal hexagon    | SW             | 6                        | 8                        | 6                         | 8                         |
| Anchor length                   | L              | 77,5                     | 77,5                     | 90                        | 90                        |

**Table A3.2:** Material FH II and FH II A4

| No. | Designation       | FH II                                                                                                 | FH II A4                                                                                |
|-----|-------------------|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1   | Hexagon screw     | Steel class 8.8; EN ISO 898-1:2013 <sup>1)</sup>                                                      | Class 80<br>EN ISO 3506:2010                                                            |
| 2   | Countersunk screw | Steel class 8.8; EN ISO 898-1:2013 <sup>1)</sup>                                                      |                                                                                         |
| 3   | Cap nut           | Steel class 8 <sup>1)</sup>                                                                           |                                                                                         |
| 4   | Hexagon nut       | Steel class 8 <sup>1)</sup>                                                                           |                                                                                         |
| 5   | Threaded rod      | Steel f <sub>uk</sub> ≥ 800 N/mm <sup>2</sup> ; f <sub>yk</sub> ≥ 640 N/mm <sup>2</sup> <sup>1)</sup> | Steel f <sub>uk</sub> ≥ 800 N/mm <sup>2</sup> ; f <sub>yk</sub> ≥ 640 N/mm <sup>2</sup> |
| 6   | Cone nut          | Steel EN 10277:2008 <sup>1)</sup>                                                                     | Class 80, EN ISO 3506:2010                                                              |
| 7   | Distance sleeve   | Steel EN 10305:2016 <sup>1)</sup>                                                                     | EN 10088:2014                                                                           |
| 8   | Expansion sleeve  | Steel EN 10139:2016/ EN 10277:2008 <sup>1)</sup>                                                      | EN 10088:2014                                                                           |
| 9   | Plastic sleeve    | ABS (plastic)                                                                                         |                                                                                         |
| 10  | Washer            | Steel EN 10139:2016 <sup>1)</sup>                                                                     | EN 10088:2014                                                                           |
| 11  | Conical washer    | Steel EN 10277:2008 <sup>1)</sup>                                                                     | EN 10088:2014                                                                           |

<sup>1)</sup> Galvanised according to EN ISO 4042:2001, ≥ 5 µm

**Table A3.3:** Material FH II-I and FH II-I A4

| No.                              | Designation          | FH II-I                                                                                                                   | FH II-I A4                                                                                            |
|----------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| 6                                | Cone nut             | Steel EN 10277:2008 <sup>1)</sup>                                                                                         | Strength class ≥ 70<br>EN ISO 3506:2010                                                               |
| 8                                | Expansion sleeve     | Steel EN 10139:2016 / EN 10277:2008 <sup>1)</sup>                                                                         | EN 10088:2014                                                                                         |
| 9                                | Plastic sleeve       | ABS (plastic)                                                                                                             |                                                                                                       |
| 12                               | Internal thread bolt | Steel EN 10277:2008 <sup>1)</sup><br>f <sub>uk</sub> ≥ 750 N/mm <sup>2</sup> ,<br>f <sub>yk</sub> ≥ 600 N/mm <sup>2</sup> | EN 10088:2014<br>f <sub>uk</sub> ≥ 750 N/mm <sup>2</sup> ,<br>f <sub>yk</sub> ≥ 600 N/mm <sup>2</sup> |
| Requirements for fixing elements |                      | Steel strength class 5.8, 6.8 or 8.8<br>EN ISO 898-1:2013 <sup>1)</sup>                                                   | Steel strength class A50, A70 or A80<br>EN ISO 3506:2010<br>1.4362, 1.4401, 1.4404, 1.4571, 1.4529    |

<sup>1)</sup> Galvanised according to EN ISO 4042:2001, ≥ 5 µm

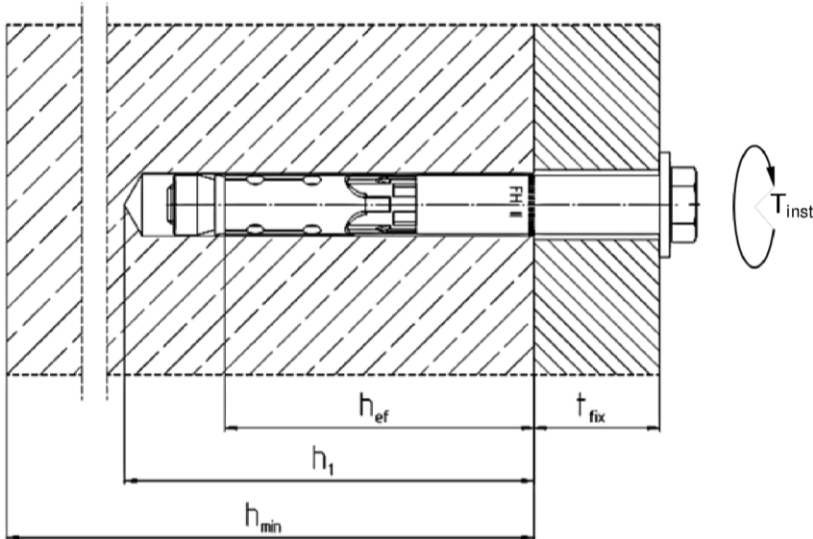
fischer High-Performance Anchor FH II, FH II-I

**Product description**

Anchor types and dimensions FH II-I, FH II I-A4  
Materials

**Annex A 3**

| Specifications of intended use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |     |     |    |    |    |           |    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----|-----|----|----|----|-----------|----|
| Anchorage subject to:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |             |     |     |    |    |    |           |    |
| Size                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |             | 10  | 12  | 15 | 18 | 24 | 28        | 32 |
| High Performance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | FH II       |     |     |    |    |    |           |    |
| Anchor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | FH II A4    | ✓ - |     |    |    |    |           |    |
| High Performance Anchor FH II-I, FH II-I A4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |             | -   | ✓   |    |    |    | -         |    |
| Static and quasi-static loads                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |     |     |    |    |    |           |    |
| Cracked and uncracked concrete                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             | ✓   |     |    |    |    |           |    |
| Fire exposure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |     |     |    |    |    |           |    |
| Seismic performance category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | C1 FH II    | -   | ✓   |    |    |    |           |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | C1 FH II A4 |     | ✓ - |    |    |    |           |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | C2 FH II    |     | ✓   |    |    |    |           |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | C2 FH II A4 |     | ✓ - |    |    |    |           |    |
| <b>Base materials:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |     |     |    |    |    |           |    |
| <ul style="list-style-type: none"><li>• Compacted reinforced or unreinforced normal weight concrete without fibres (cracked or uncracked) according to EN 206:2013</li><li>• Strength classes C20/25 to C50/60 according to EN 206-1:2013</li></ul>                                                                                                                                                                                                                                                                                                   |             |     |     |    |    |    |           |    |
| <b>Use conditions (Environmental conditions):</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |     |     |    |    |    |           |    |
| <ul style="list-style-type: none"><li>• Structures subject to dry internal conditions (FH II, FH II A4, FH II-I, FH II-I A4)</li><li>• Structures subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal conditions, if no particular aggressive conditions exist (FH II A4, FH II-I A4)</li></ul>                                                                                                                                                                                   |             |     |     |    |    |    |           |    |
| Note: Particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used)                                                                                                                                                                                                                                           |             |     |     |    |    |    |           |    |
| <b>Design:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |     |     |    |    |    |           |    |
| <ul style="list-style-type: none"><li>• Anchorages are to be designed under the responsibility of an engineer experienced in anchorages and concrete work</li><li>• Verifiable calculation notes and drawings are to be prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to reinforcement or to supports, etc.)</li><li>• Design of fastenings according to FprEN 1992-4: 2016 and EOTA Technical Report TR 055</li></ul>                    |             |     |     |    |    |    |           |    |
| <b>Installation:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |             |     |     |    |    |    |           |    |
| <ul style="list-style-type: none"><li>• Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site</li><li>• Hammer or hollow drilling according to Annex B5 and B6</li><li>• In case of aborted hole: New hole must be drilled at a minimum distance of twice the depth of the aborted hole or closer, if the hole is filled with a high strength mortar and only if the hole is not in the direction of the oblique tensile or shear load</li></ul> |             |     |     |    |    |    |           |    |
| fischer High-Performance Anchor FH II, FH II-I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |     |     |    |    |    | Annex B 1 |    |
| Intended use Specifications                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |             |     |     |    |    |    |           |    |



- $h_{ef}$  = Effective embedment depth  
 $t_{fix}$  = Thickness of the fixture  
 $h_1$  = Depth of drill hole to deepest point  
 $h_{min}$  = Minimum thickness of concrete member  
 $T_{inst}$  = Required setting torque

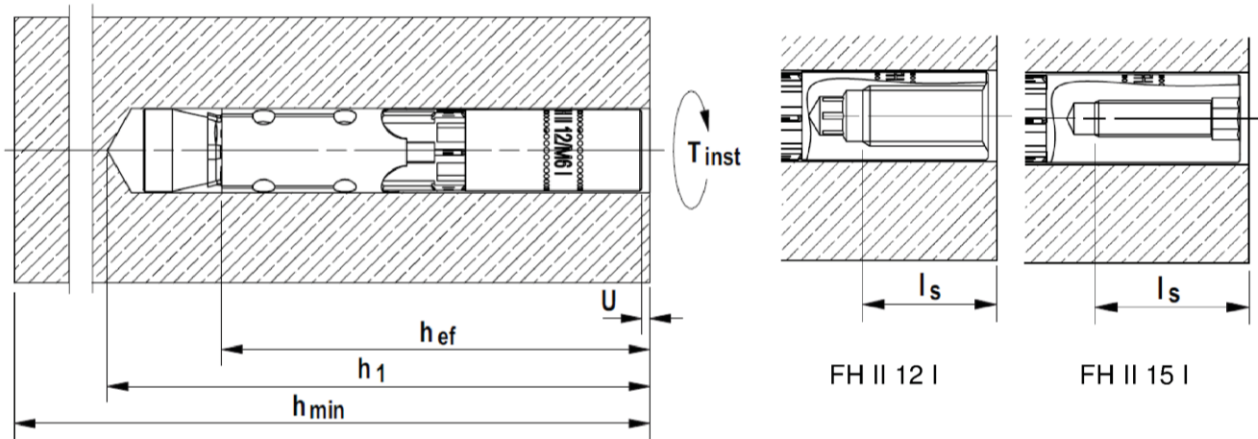
**Table B2.1:** Installation parameters FH II and FH II A4

| Anchor type FH II-S,-SK,-B,-H and<br>FH II-S A4, FH II-SK A4, FH II-B A4, FH II H A4 |                                      | FH II<br>10 | FH II<br>12 | FH II<br>15 | FH II<br>18 | FH II<br>24 | FH II<br>28 | FH II<br>32 |
|--------------------------------------------------------------------------------------|--------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Nominal drill hole diameter $d_0$                                                    |                                      | 10          | 12          | 15          | 18          | 24          | 28          | 32          |
| Maximum diameter of drill bit $d_{cut} \leq$                                         |                                      | 10,45       | 12,50       | 15,50       | 18,50       | 24,55       | 28,55       | 32,70       |
| Depth of drill hole to deepest $h_1 \geq$                                            |                                      | 55          | 80          | 90          | 105         | 125         | 155         | 180         |
| Diameter of clearance hole $d_f \leq$                                                |                                      | 12          | 14          | 17          | 20          | 26          | 31          | 35          |
| Diameter of counter sunk FH II-SK                                                    |                                      | 18          | 22          | 25          | 32          | -           |             |             |
| Depth of counter sunk, 90° FH II-SK A4                                               |                                      | 5,0         | 5,8         | 5,8         | 8,0         |             |             |             |
| Required<br>setting<br>torque                                                        | FH II-S                              | 10          | 22,5        | 40          | 80          | 160         | 180         | 200         |
|                                                                                      | FH II-B                              |             | 17,5        | 38          |             | 120         | 180         | 200         |
|                                                                                      | FH II-H                              |             | 22,5        | 40          |             | 90          | -           |             |
|                                                                                      | FH II-SK                             | -           |             |             |             |             |             |             |
|                                                                                      | FH II-S A4, FH II-B A4<br>FH II-H A4 | 15          | 25          | 40          | 100         | 160         | -           |             |
|                                                                                      | FH II-SK A4                          | 10          |             |             |             | -           |             |             |

fischer High-Performance Anchor FH II, FH II-I

**Intended use**  
Installation parameters FH II, FH II A4

**Annex B 2**



- $h_{ef}$  = Effective embedment depth  
 $h_1$  = Depth of drill hole to deepest point  
 $h_{min}$  = Minimum thickness of concrete member  
 $T_{inst}$  = Required setting torque  
 $U$  = Required gap after torquing  
 $l_s$  = Screw-in depth

**Table B3.1:** Installation parameters FH II-I and FH II-I A4

| Anchor type FH II-I and FH II-I A4                                                                                |                     | FH II<br>12/M6 I | FH II<br>12/M8 I | FH II<br>15/M10 I | FH II<br>15/M12 I |
|-------------------------------------------------------------------------------------------------------------------|---------------------|------------------|------------------|-------------------|-------------------|
| Nominal drill hole diameter                                                                                       | $d_0$               | 12               |                  | 15                |                   |
| Maximum bit diameter                                                                                              | $d_{cut} \leq$      | 12,50            |                  | 15,50             |                   |
| Depth of drill hole                                                                                               | $h_1 \geq$ [mm]     | 85               |                  | 95                |                   |
| Diameter of clearance hole                                                                                        | $d_f \leq$          | 7                | 9                | 12                | 14                |
| Required gap after torquing <sup>1)</sup>                                                                         | $U$                 | 3 - 5            |                  |                   |                   |
| Required setting torque <sup>1)</sup>                                                                             | $T_{inst}$ [Nm]     | 15               |                  | 25                |                   |
| Minimum screw-in depth                                                                                            | $l_s \geq$          | 11 + U           | 13 + U           | 10 + U            | 12 + U            |
| Maximum screw-in depth                                                                                            | $l_s \leq$ [mm]     | 20 + U           |                  |                   |                   |
| Maximum torque on fixture in combination with screws and threaded rods strength class $\geq 5.8$ resp. $\geq A50$ | $\max T_{fix}$ [Nm] | 3                | 8                | 15                | 20                |

<sup>1)</sup> At least one of the requirements concerning the gap  $U$  or the required setting torque  $T_{inst}$  have to be fulfilled

fischer High-Performance Anchor FH II, FH II-I

**Intended use**  
Installation parameters FH II-I, FH II-I A4

**Annex B 3**

**Table B4.1:** Minimum thickness of concrete member, minimum spacing and minimum edge distances  
FH II, FH II A4

| Anchor type FH II-S,-SK,-B,-H and<br>FH II-S A4,-SK A4,-B A4,-H A4 |                           | FH II<br>10 | FH II<br>12 | FH II<br>15 | FH II<br>18 | FH II<br>24 | FH II<br>28 | FH II<br>32 |
|--------------------------------------------------------------------|---------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Minimum thickness of concrete member                               | $h_{min}$ [mm]            | 80          | 120         | 140         | 160         | 200         | 250         | 300         |
| Minimum spacing,<br>cracked concrete                               | $s_{min}$<br>for $c \geq$ | 40          | 50          | 60          | 70          | 80          | 100         | 120         |
|                                                                    | [mm]                      | 40          | 80          | 120         | 140         | 180         | 200         | 260         |
| Minimum edge distance,<br>cracked concrete                         | $c_{min}$<br>for $s \geq$ | 40          | 50          | 60          | 70          | 80          | 100         | 120         |
|                                                                    | [mm]                      | 40          | 80          | 120         | 160         | 200         | 220         | 280         |
| Minimum spacing,<br>uncracked concrete                             | $s_{min}$<br>for $c \geq$ | 40          | 60          | 70          | 80          | 100         | 120         | 160         |
|                                                                    | [mm]                      | 70          | 100         | 100         | 160         | 200         | 220         | 360         |
| Minimum edge distance,<br>uncracked concrete                       | $c_{min}$<br>for $s \geq$ | 40          | 60          | 70          | 80          | 100         | 120         | 180         |
|                                                                    | [mm]                      | 70          | 100         | 140         | 200         | 220         | 240         | 380         |

Intermediate values may be calculated by linear interpolation

**Table B4.2:** Minimum thickness of concrete member, minimum spacing and minimum edge distances  
FH II-I, FH II-I A4

| Anchor type FH II-I and FH II-I A4           |                           | FH II 12/M6 I<br>FH II 12/M8 I | FH II 15/M10 I<br>FH II 15/M12 I |
|----------------------------------------------|---------------------------|--------------------------------|----------------------------------|
| Minimum thickness of concrete member         | $h_{min}$ [mm]            | 125                            | 150                              |
| Minimum spacing,<br>cracked concrete         | $s_{min}$<br>for $c \geq$ | 50                             | 60                               |
|                                              | [mm]                      | 80                             | 120                              |
| Minimum edge distance,<br>cracked concrete   | $c_{min}$<br>for $s \geq$ | 50                             | 60                               |
|                                              | [mm]                      | 80                             | 120                              |
| Minimum spacing,<br>uncracked concrete       | $s_{min}$<br>for $c \geq$ | 60                             | 70                               |
|                                              | [mm]                      | 100                            | 100                              |
| Minimum edge distance,<br>uncracked concrete | $c_{min}$<br>for $s \geq$ | 60                             | 70                               |
|                                              | [mm]                      | 100                            | 140                              |

Intermediate values may be calculated by linear interpolation.

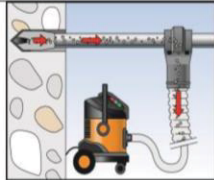
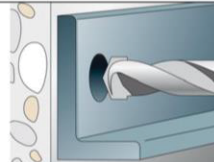
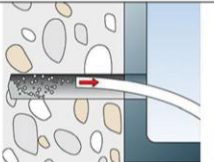
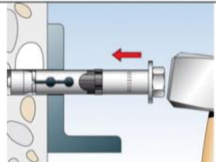
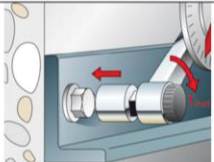
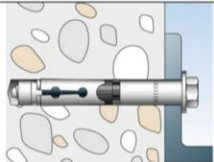
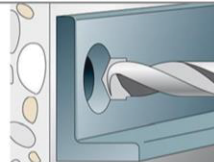
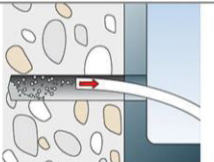
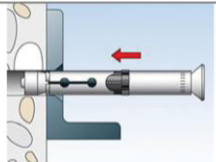
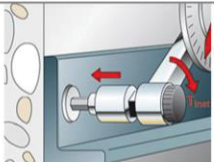
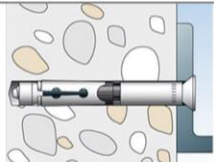
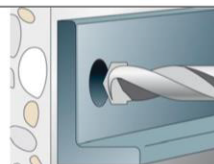
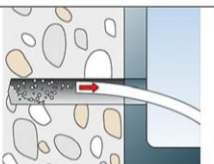
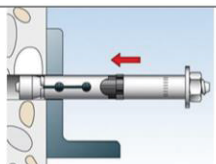
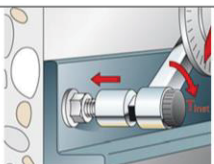
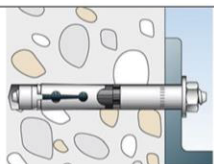
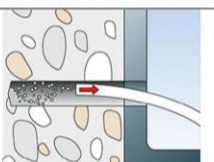
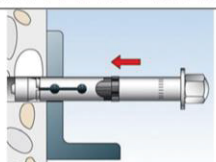
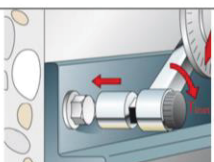
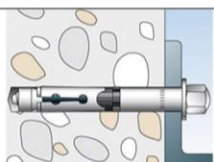
**Table B4.3:** Minimum spacings and minimum edge distances of anchors under **fire exposure** for  
tension and shear loads

| Anchor type                                         | FH II 10                                                                                               | FH II 12<br>FH II 12-I | FH II 15<br>FH II 15-I | FH II 18 | FH II 24 | FH II 28 | FH II 32 |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------|------------------------|----------|----------|----------|----------|
| Spacing $\frac{s_{cr,N,fi}}{s_{min,fi}}$            | $4 \times h_{ef}$                                                                                      |                        |                        |          |          |          |          |
|                                                     | 40                                                                                                     | 50                     | 60                     | 70       | 80       | 100      | 120      |
| Edge distance $\frac{c_{cr,N,fi}}{c_{min,fi}}$ [mm] | $2 \times h_{ef}$                                                                                      |                        |                        |          |          |          |          |
|                                                     | $c_{min,fi} = 2 \times h_{ef}$ ,<br>for fire exposure from more than one side $c_{min,fi} \geq 300$ mm |                        |                        |          |          |          |          |

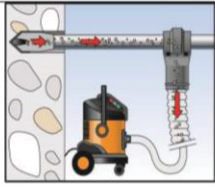
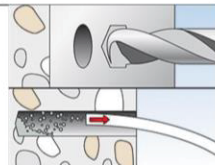
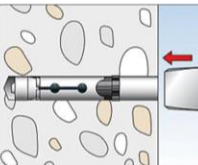
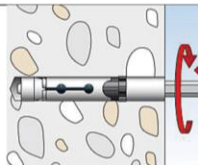
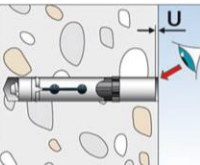
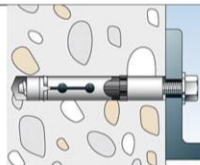
fischer High-Performance Anchor FH II, FH II-I

**Intended use**Minimum thickness of concrete member, minimum spacings and min. edge distances  
Minimum spacings and minimum edge distances of anchors under fire exposure**Annex B 4**

**Installation instruction for the fischer High-Performance anchor  
FH II 10 - FH II 32 and FH II 10 A4 - FH II 24 A4**

|                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--|--|--|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--|--|--|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--|--|--|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--|--|--|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--|--|--|--|
| Hollow drilling                                                                     |   |  |  |  |                                                                                     | Continue with step 3, 4 and 5                                                      |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
|                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
| Hammer drilling                                                                     |   |  |  |  |                                                                                     |   |  |  |  |                                                                                     |   |  |  |  |                                                                                       |   |  |  |  |                                                                                       |   |  |  |  |  |
|                                                                                     | Installation instruction FH II 10 - 32 S and FH II 10 - 24 S A4                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
|                                                                                     |   |  |  |  |                                                                                     |   |  |  |  |                                                                                     |   |  |  |  |                                                                                       |   |  |  |  |                                                                                       |   |  |  |  |  |
|                                                                                     | Installation instruction FH II 10 - 18 SK and FH II 10 - 18 SK A4                  |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
|                                                                                     |  |  |  |  |                                                                                     |  |  |  |  |                                                                                     |  |  |  |  |                                                                                       |  |  |  |  |                                                                                       |  |  |  |  |  |
|                                                                                     | Installation instruction FH II 10 - 32 B and FH II 10 - 24 B A4                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
|  |                                                                                    |  |  |  |  |                                                                                    |  |  |  |  |                                                                                    |  |  |  |  |                                                                                      |  |  |  |  |                                                                                      |  |  |  |  |
| Installation instruction FH II 10 - 24 H and FH II 10 - 24 H A4                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
| Step                                                                                | 1                                                                                  |  |  |  |                                                                                     | 2                                                                                  |  |  |  |                                                                                     | 3                                                                                  |  |  |  |                                                                                       | 4                                                                                    |  |  |  |                                                                                       | 5                                                                                    |  |  |  |  |
|                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
| Step                                                                                | Description                                                                        |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
| 1                                                                                   | Create drill hole with hammer drill                                                |  |  |  |                                                                                     |                                                                                    |  |  |  | Create drill hole with hollow drill and vacuum cleaner                              |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
| 2                                                                                   | Clean the hole                                                                     |  |  |  |                                                                                     |                                                                                    |  |  |  | -                                                                                   |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
| 3                                                                                   | Set the fastener                                                                   |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
| 4                                                                                   | Apply $T_{inst}$                                                                   |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
| 5                                                                                   | Installed fastener                                                                 |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
|                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
| Types of drill bits                                                                 |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
| Hammer drill                                                                        |                                                                                    |  |  |  |  |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
| Hollow drill                                                                        |                                                                                    |  |  |  |  |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
|                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
| fischer High-Performance Anchor FH II, FH II-I                                      |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  | Annex B 5                                                                             |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |
| Intended use<br>Installation instructions FH II, FH II A4                           |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                     |                                                                                    |  |  |  |                                                                                       |                                                                                      |  |  |  |                                                                                       |                                                                                      |  |  |  |  |

Installation instruction for the fischer High-Performance anchor internal thread  
**FH II-I and FH II-I A4**

|                                                               |                                                                                                                                                                                                                                                                                                                                                                       |                                                                                     |                                                                                   |                                                                                     |                                                                                     |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Hollow drilling                                               |                                                                                                                                                                                                                                                                                      | Continue with step 2, 3, and 4                                                      |                                                                                   |                                                                                     |                                                                                     |
| Hammer drilling                                               |                                                                                                                                                                                                                                                                                      |    |  |  |  |
| Step                                                          | 1                                                                                                                                                                                                                                                                                                                                                                     | 2                                                                                   | 3                                                                                 |                                                                                     | 4                                                                                   |
|                                                               |                                                                                                                                                                                                                                                                                                                                                                       |                                                                                     |                                                                                   |                                                                                     |                                                                                     |
| Step                                                          | Description                                                                                                                                                                                                                                                                                                                                                           |                                                                                     |                                                                                   |                                                                                     |                                                                                     |
| 1                                                             | Create drill hole with hammer drill, clean drill hole                                                                                                                                                                                                                                                                                                                 |                                                                                     |                                                                                   | Create drill hole with hollow drill and vacuum cleaner                              |                                                                                     |
| 2                                                             | Hammering in the anchor flushed with the surface of the concrete                                                                                                                                                                                                                                                                                                      |                                                                                     |                                                                                   |                                                                                     |                                                                                     |
| 3                                                             | Tighten the anchor. The included hexagon bit in the package should be used. Other tightening methods are allowed.<br>Tighten the anchor in the concrete until the gap U is 3 - 5 mm or the required setting torque $T_{inst}$ is reached. Only one of the above requirements has to be fulfilled.                                                                     |                                                                                     |                                                                                   |                                                                                     |                                                                                     |
| 4                                                             | Attach the fixture and use a suitable screw or anchor rod. The length of the screw or anchor rod should be determined depending on the thickness of fixture $t_{fix}$ , admissible tolerances, and available thread length $l_{s,max}$ and $l_{s,min}$ including the gap U.<br>Tighten the screw with the torque $\leq \max T_{fix}$ ( $\max T_{fix}$ see table B3.1) |                                                                                     |                                                                                   |                                                                                     |                                                                                     |
|                                                               |                                                                                                                                                                                                                                                                                                                                                                       |                                                                                     |                                                                                   |                                                                                     |                                                                                     |
| Types of drill bits                                           |                                                                                                                                                                                                                                                                                                                                                                       |                                                                                     |                                                                                   |                                                                                     |                                                                                     |
| Hammer drill                                                  |                                                                                                                                                                                                                                                                                                                                                                       |  |                                                                                   |                                                                                     |                                                                                     |
| Hollow drill                                                  |                                                                                                                                                                                                                                                                                                                                                                       |  |                                                                                   |                                                                                     |                                                                                     |
|                                                               |                                                                                                                                                                                                                                                                                                                                                                       |                                                                                     |                                                                                   |                                                                                     |                                                                                     |
| fischer High-Performance Anchor FH II, FH II-I                |                                                                                                                                                                                                                                                                                                                                                                       |                                                                                     |                                                                                   |                                                                                     | Annex B 6                                                                           |
| Intended use<br>Installation instructions FH II-I, FH II-I A4 |                                                                                                                                                                                                                                                                                                                                                                       |                                                                                     |                                                                                   |                                                                                     |                                                                                     |

**Table C1.1:** Performance characteristics of **tension resistance** under static and quasi-static loads for FH II and FH II A4

| Anchor type FH II-S,-SK,-B,-H and<br>FH II-S A4,-SK A4,-B A4,-H A4                                                                                                                                                        |                             |        | FH II<br>10        | FH II<br>12 | FH II<br>15 | FH II<br>18 | FH II<br>24      | FH II<br>28 <sup>3)</sup> | FH II<br>32 <sup>3)</sup> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|--------|--------------------|-------------|-------------|-------------|------------------|---------------------------|---------------------------|
| <b>Steel failure</b>                                                                                                                                                                                                      |                             |        |                    |             |             |             |                  |                           |                           |
| FH II                                                                                                                                                                                                                     | $N_{Rk,s}$                  | [kN]   | 16,1               | 29,3        | 46,4        | 67,4        | 125,3            | 195,8                     | 282,0                     |
| FH II A4-B, -H                                                                                                                                                                                                            | $N_{Rk,s}$                  | [kN]   | 16,1               | 29,3        | 46,4        | 67,4        | 125,3            | -                         |                           |
| Partial factor for steel failure                                                                                                                                                                                          | $\gamma_{Ms}$ <sup>1)</sup> | [-]    | 1,5                |             |             |             |                  |                           |                           |
| FH II A4-S,-SK                                                                                                                                                                                                            | $N_{Rk,s}$                  | [kN]   | 16,1               | 29,3        | 46,4        | 67,4        | 125,3            | -                         |                           |
| Partial factor for steel failure                                                                                                                                                                                          | $\gamma_{Ms}$ <sup>1)</sup> | [-]    | 1,6                |             |             |             |                  |                           |                           |
| <b>Pullout failure</b>                                                                                                                                                                                                    |                             |        |                    |             |             |             |                  |                           |                           |
| Characteristic resistance in<br>cracked concrete C20/25<br>FH II and FH II A4                                                                                                                                             | $N_{Rk,p}$                  | [kN]   | 7,5                | 12          | 16          | 25          | 2)               |                           |                           |
| Characteristic resistance in<br>uncracked concrete C20/25<br>FH II                                                                                                                                                        |                             |        | 2)                 |             |             |             |                  |                           |                           |
| Characteristic resistance in<br>uncracked concrete C20/25<br>FH II A4                                                                                                                                                     |                             |        | 2)                 | 20          | 2)          |             | -                |                           |                           |
| Increasing factors for $N_{Rk,p}$ for<br>cracked and uncracked concrete                                                                                                                                                   | $\psi_c$                    | C25/30 | 1,12               |             |             |             |                  |                           |                           |
|                                                                                                                                                                                                                           |                             | C30/37 | 1,22               |             |             |             |                  |                           |                           |
|                                                                                                                                                                                                                           |                             | C35/45 | 1,32               |             |             |             |                  |                           |                           |
|                                                                                                                                                                                                                           |                             | C40/50 | 1,41               |             |             |             |                  |                           |                           |
|                                                                                                                                                                                                                           |                             | C45/55 | 1,50               |             |             |             |                  |                           |                           |
|                                                                                                                                                                                                                           |                             | C50/60 | 1,58               |             |             |             |                  |                           |                           |
| Robustness factor                                                                                                                                                                                                         | $\gamma_{Inst}$             | [-]    | 1,0                |             |             |             |                  |                           |                           |
| <b>Concrete cone failure and splitting failure</b>                                                                                                                                                                        |                             |        |                    |             |             |             |                  |                           |                           |
| Effective embedment depth                                                                                                                                                                                                 | $h_{ef}$                    | [mm]   | 40                 | 60          | 70          | 80          | 100              | 125                       | 150                       |
| Factor for cracked concrete                                                                                                                                                                                               | $k_{cr,N}$                  | [-]    | 7,7 <sup>4)</sup>  |             |             |             |                  |                           |                           |
| Factor for uncracked concrete                                                                                                                                                                                             | $k_{ucr,N}$                 |        | 11,0 <sup>4)</sup> |             |             |             |                  |                           |                           |
| Spacing                                                                                                                                                                                                                   | $s_{cr,N}$                  | [mm]   | 120                | 180         | 210         | 240         | 300              | 375                       | 450                       |
| Edge distance                                                                                                                                                                                                             | $c_{cr,N}$                  |        | 60                 | 90          | 105         | 120         | 150              | 187,5                     | 225                       |
| Spacing (splitting)                                                                                                                                                                                                       | $s_{cr,sp}$                 |        | 190                | 300         | 320         | 340         | 380              | 480                       | 570                       |
| Edge distance (splitting)                                                                                                                                                                                                 | $c_{cr,sp}$                 |        | 95                 | 150         | 160         | 170         | 190              | 240                       | 285                       |
| <sup>1)</sup> In absence of other national regulations<br><sup>2)</sup> Pullout failure not relevant<br><sup>3)</sup> Only valid for zinc-plated version<br><sup>4)</sup> Based on concrete strength as cylinder strength |                             |        |                    |             |             |             |                  |                           |                           |
| fischer High-Performance Anchor FH II, FH II-I                                                                                                                                                                            |                             |        |                    |             |             |             | <b>Annex C 1</b> |                           |                           |
| <b>Performances</b><br>Performance characteristics of tension resistance for FH II and FH II A4                                                                                                                           |                             |        |                    |             |             |             |                  |                           |                           |

**Table C2.1:** Performance characteristics of **tension resistance** under static and quasi-static loads for FH II-I and FH II-I A4

| Anchor type FH II-I and FH II-I A4                                                                                                                                       |                               |        | FH II<br>12/M6 I   | FH II<br>12/M8 I | FH II<br>15/M10 I | FH II<br>15/M12 I |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------|--------------------|------------------|-------------------|-------------------|
| Steel failure                                                                                                                                                            |                               |        |                    |                  |                   |                   |
| Anchor in combination with screw / threaded rod of galvanised steel complying with DIN EN ISO 898                                                                        |                               |        |                    |                  |                   |                   |
| Strength class 5.8                                                                                                                                                       | N <sub>Rk,s</sub>             | [kN]   | 10                 | 19               | 29                | 43                |
| Strength class 6.8                                                                                                                                                       |                               |        | 12                 | 23               | 35                | 44                |
| Strength class 8.8                                                                                                                                                       |                               |        | 16                 | 27               | 44                | 44                |
| Partial factor for steel failure                                                                                                                                         | γ <sub>Ms</sub> <sup>1)</sup> | [-]    | 1,5                |                  |                   |                   |
| Anchor in combination with screw / threaded rod of stainless steel complying with DIN EN ISO 3506                                                                        |                               |        |                    |                  |                   |                   |
| Screw/thread strength class A50                                                                                                                                          | N <sub>Rk,s</sub>             | [kN]   | 10                 | 19               | 29                | 43                |
| Partial factor for steel failure                                                                                                                                         | γ <sub>Ms</sub> <sup>1)</sup> | [-]    | 2,86               |                  |                   |                   |
| Screw/thread strength class A70                                                                                                                                          | N <sub>Rk,s</sub>             | [kN]   | 14                 | 26               | 41                | 54                |
| Partial factor for steel failure                                                                                                                                         | γ <sub>Ms</sub> <sup>1)</sup> | [-]    | 1,87               |                  |                   |                   |
| Screw/thread strength class A80                                                                                                                                          | N <sub>Rk,s</sub>             | [kN]   | 16                 | 29               | 46                | 46                |
| Partial factor for steel failure                                                                                                                                         | γ <sub>Ms</sub> <sup>1)</sup> | [-]    | 1,60               |                  |                   |                   |
| Pullout failure                                                                                                                                                          |                               |        |                    |                  |                   |                   |
| Characteristic resistance in cracked concrete C20/25                                                                                                                     | N <sub>Rk,p</sub>             | [kN]   | 9                  |                  | 12                |                   |
| Characteristic resistance in uncracked concrete C20/25                                                                                                                   |                               |        | 20                 |                  | 2)                |                   |
| Increasing factors for N <sub>Rk,p</sub> for cracked and uncracked concrete                                                                                              | ψ <sub>c</sub>                | C25/30 | 1,12               |                  |                   |                   |
|                                                                                                                                                                          |                               | C30/37 | 1,22               |                  |                   |                   |
|                                                                                                                                                                          |                               | C35/45 | 1,32               |                  |                   |                   |
|                                                                                                                                                                          |                               | C40/50 | 1,41               |                  |                   |                   |
|                                                                                                                                                                          |                               | C45/55 | 1,50               |                  |                   |                   |
|                                                                                                                                                                          |                               | C50/60 | 1,58               |                  |                   |                   |
| Robustness factor                                                                                                                                                        | γ <sub>inst</sub>             | [-]    | 1,0                |                  |                   |                   |
| Concrete cone failure and splitting failure                                                                                                                              |                               |        |                    |                  |                   |                   |
| Effective embedment depth                                                                                                                                                | h <sub>ef</sub>               | [mm]   | 60                 |                  | 70                |                   |
| Factor for cracked concrete                                                                                                                                              | k <sub>cr,N</sub>             | [-]    | 7,7 <sup>3)</sup>  |                  |                   |                   |
| Factor for uncracked concrete                                                                                                                                            | k <sub>ucr,N</sub>            |        | 11,0 <sup>3)</sup> |                  |                   |                   |
| Spacing                                                                                                                                                                  | s <sub>cr,N</sub>             | [mm]   | 180                |                  | 210               |                   |
| Edge distance                                                                                                                                                            | c <sub>cr,N</sub>             |        | 90                 |                  | 105               |                   |
| Spacing (splitting)                                                                                                                                                      | s <sub>cr,sp</sub>            |        | 300                |                  | 320               |                   |
| Edge distance (splitting)                                                                                                                                                | c <sub>cr,sp</sub>            |        | 150                |                  | 160               |                   |
| <sup>1)</sup> In absence of other national regulations<br><sup>2)</sup> Pullout failure is not decisive<br><sup>3)</sup> Based on concrete strength as cylinder strength |                               |        |                    |                  |                   |                   |
| fischer High-Performance Anchor FH II, FH II-I                                                                                                                           |                               |        |                    |                  | Annex C 2         |                   |
| Performances<br>Performance characteristics of tension resistance for FH II-I and FH II-I A4                                                                             |                               |        |                    |                  |                   |                   |

**Table C3.1:** Performance characteristics of **shear resistance** for **FH II** and **FH II A4** under static and quasi-static loads

| Anchor type FH II-S, -SK, -B, -H and FH II-S A4, -SK A4, -B A4, -H A4                                                                                                                                                                                    |                     |      | FH II<br>10 | FH II<br>12 | FH II<br>15 | FH II<br>18 | FH II<br>24      | FH II<br>28 <sup>3)</sup> | FH II<br>32 <sup>3)</sup> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------|-------------|-------------|-------------|-------------|------------------|---------------------------|---------------------------|
| <b>Steel failure without lever arm</b>                                                                                                                                                                                                                   |                     |      |             |             |             |             |                  |                           |                           |
| FH II-S,                                                                                                                                                                                                                                                 | $V_{Rk,s}^0$ [kN]   |      | 18,0        | 33,0        | 59,0        | 76,0        | 146,0            | 176,4                     | 217,0                     |
| FH II-B,-H                                                                                                                                                                                                                                               |                     |      | 16,0        | 27,2        | 42,8        | 61,9        | 119,0            | 148,8                     | 169,0                     |
| FH II-SK                                                                                                                                                                                                                                                 | $t_{fix}^{2)}$ [mm] |      | $\geq 10$   |             | $\geq 15$   |             | -                |                           |                           |
|                                                                                                                                                                                                                                                          | $V_{Rk,s}^0$ [kN]   |      | 18,0        | 33,0        | 59,0        | 76,0        |                  |                           |                           |
|                                                                                                                                                                                                                                                          | $t_{fix}^{2)}$ [mm] |      | $< 10$      |             | $< 15$      |             |                  |                           |                           |
|                                                                                                                                                                                                                                                          | $V_{Rk,s}^0$ [kN]   |      | 8,0         | 14,0        | 23,0        | 34,0        |                  |                           |                           |
| Partial factor for steel failure                                                                                                                                                                                                                         | $\gamma_{Ms}^{1)}$  | [-]  | 1,25        |             |             |             |                  |                           |                           |
| Factor for ductility                                                                                                                                                                                                                                     | $k_7$               | [-]  | 1,0         |             |             |             |                  |                           |                           |
| FH II-S A4                                                                                                                                                                                                                                               | $V_{Rk,s}^0$ [kN]   |      | 18,0        | 33,0        | 59,0        | 76,0        | 146,0            | -                         |                           |
| Partial factor for steel failure                                                                                                                                                                                                                         | $\gamma_{Ms}^{1)}$  | [-]  | 1,33        |             |             |             |                  |                           |                           |
| FH II-B A4,-H A4                                                                                                                                                                                                                                         | $V_{Rk,s}^0$ [kN]   |      | 16,0        | 27,2        | 42,8        | 61,9        | 119,0            | -                         |                           |
| Partial factor for steel failure                                                                                                                                                                                                                         | $\gamma_{Ms}^{1)}$  | [-]  | 1,25        |             |             |             |                  |                           |                           |
| FH II-SK A4                                                                                                                                                                                                                                              | $t_{fix}^{2)}$ [mm] |      | $\geq 10$   |             | $\geq 15$   |             | -                |                           |                           |
|                                                                                                                                                                                                                                                          | $V_{Rk,s}^0$ [kN]   |      | 18,0        | 33,0        | 59,0        | 76,0        |                  |                           |                           |
|                                                                                                                                                                                                                                                          | $t_{fix}^{2)}$ [mm] |      | $< 10$      |             | $< 15$      |             |                  |                           |                           |
|                                                                                                                                                                                                                                                          | $V_{Rk,s}^0$ [kN]   |      | 8,0         | 14,0        | 23,0        | 34,0        |                  |                           |                           |
| Partial factor for steel failure                                                                                                                                                                                                                         | $\gamma_{Ms}^{1)}$  | [-]  | 1,33        |             |             |             |                  |                           |                           |
| Factor for ductility                                                                                                                                                                                                                                     | $k_7$               | [-]  | 1,0         |             |             |             |                  |                           |                           |
| <b>Steel failure with lever arm and concrete pryout failure</b>                                                                                                                                                                                          |                     |      |             |             |             |             |                  |                           |                           |
| Characteristic bending resistance FH II                                                                                                                                                                                                                  | $M_{Rk,s}^0$ [Nm]   |      | 12          | 30          | 60          | 105         | 266              | 518                       | 896                       |
| Partial factor for steel failure                                                                                                                                                                                                                         | $\gamma_{Ms}^{1)}$  | [-]  | 1,25        |             |             |             |                  |                           |                           |
| Characteristic bending resistance FH II A4                                                                                                                                                                                                               | $M_{Rk,s}^0$ [Nm]   |      | 12          | 30          | 60          | 105         | 266              | -                         |                           |
| Partial factor for steel failure -B,-H                                                                                                                                                                                                                   | $\gamma_{Ms}^{1)}$  | [-]  | 1,25        |             |             |             |                  |                           |                           |
| Partial factor for steel failure -S,-SK                                                                                                                                                                                                                  | $\gamma_{Ms}^{1)}$  | [-]  | 1,33        |             |             |             |                  |                           |                           |
| Factor for pryout failure                                                                                                                                                                                                                                | $k_8$               | [-]  | 1,0         | 2,0         |             |             |                  |                           |                           |
| <b>Concrete edge failure</b>                                                                                                                                                                                                                             |                     |      |             |             |             |             |                  |                           |                           |
| Effective embedment depth for calculation                                                                                                                                                                                                                | $l_f =$             | [mm] | $h_{ef}$    |             |             |             |                  |                           |                           |
| Outside diameter of a fastener                                                                                                                                                                                                                           | $d_{nom}$           |      | 10          | 12          | 15          | 18          | 24               | 28                        | 32                        |
| <sup>1)</sup> In absence of other national regulations<br><sup>2)</sup> The thickness of the fixture has influence to the characteristic resistance for shear loads, steel failure without lever arm<br><sup>3)</sup> Only valid for zinc-plated version |                     |      |             |             |             |             |                  |                           |                           |
| fischer High-Performance Anchor FH II, FH II-I                                                                                                                                                                                                           |                     |      |             |             |             |             | <b>Annex C 3</b> |                           |                           |
| <b>Performances</b><br>Performance characteristics of shear resistance for FH II and FH II A4                                                                                                                                                            |                     |      |             |             |             |             |                  |                           |                           |

**Table C4.1:** Performance characteristics of **shear resistance** for **FH II-I and FH II-I A4** under static and quasi-static loads

| Anchor type FH II-I and FH II-I A4                                                                     |                        | FH II<br>12/M6 I | FH II<br>12/M8 I | FH II<br>15/M10 I | FH II<br>15/M12 I |
|--------------------------------------------------------------------------------------------------------|------------------------|------------------|------------------|-------------------|-------------------|
| Steel failure without lever arm                                                                        |                        |                  |                  |                   |                   |
| Anchor in combination with screw / threaded rod of galvanised steel complying with DIN EN ISO 898:2013 |                        |                  |                  |                   |                   |
| Strength class 5.8                                                                                     | $V_{Rk,s}^0$ [kN]      | 5                | 9                | 15                | 21                |
| Strength class 6.8                                                                                     |                        | 6                | 11               | 18                | 24                |
| Strength class 8.8                                                                                     |                        | 8                | 14               | 23                | 24                |
| Partial factor for steel failure                                                                       | $\gamma_{Ms}^{1)}$ [-] | 1,25             |                  |                   |                   |
| Factor for ductility                                                                                   | $k_7$                  | 1,0              |                  |                   |                   |
| Anchor in combination with screw / threaded rod of stainless steel complying with DIN EN ISO 3506:2010 |                        |                  |                  |                   |                   |
| Strength class A50                                                                                     | $V_{Rk,s}^0$ [kN]      | 5                | 9                | 15                | 21                |
| Partial factor for steel failure                                                                       | $\gamma_{Ms}^{1)}$ [-] | 2,38             |                  |                   |                   |
| Strength class A70                                                                                     | $V_{Rk,s}^0$ [kN]      | 7                | 13               | 20                | 30                |
| Partial factor for steel failure                                                                       | $\gamma_{Ms}^{1)}$ [-] | 1,56             |                  |                   |                   |
| Strength class A80                                                                                     | $V_{Rk,s}^0$ [kN]      | 8                | 15               | 23                | 32                |
| Partial factor for steel failure                                                                       | $\gamma_{Ms}^{1)}$ [-] | 1,33             |                  |                   |                   |
| Factor for ductility                                                                                   | $k_7$                  | 1,0              |                  |                   |                   |
| Steel failure with lever arm and concrete pryout failure                                               |                        |                  |                  |                   |                   |
| Anchor in combination with screw / threaded rod of galvanised steel complying with DIN EN ISO 898:2013 |                        |                  |                  |                   |                   |
| Strength class 5.8                                                                                     | $M_{Rk,s}^0$ [Nm]      | 8                | 19               | 37                | 65                |
| Strength class 6.8                                                                                     |                        | 9                | 23               | 44                | 78                |
| Strength class 8.8                                                                                     |                        | 12               | 30               | 60                | 105               |
| Partial factor for steel failure                                                                       | $\gamma_{Ms}^{1)}$ [-] | 1,25             |                  |                   |                   |
| Factor for ductility                                                                                   | $k_7$                  | 1,0              |                  |                   |                   |
| Anchor in combination with screw / threaded rod of stainless steel complying with DIN EN ISO 3506:2010 |                        |                  |                  |                   |                   |
| Strength class A50                                                                                     | $M_{Rk,s}^0$ [Nm]      | 8                | 19               | 37                | 65                |
| Partial factor for steel failure                                                                       | $\gamma_{Ms}^{1)}$ [-] | 2,38             |                  |                   |                   |
| Strength class A70                                                                                     | $M_{Rk,s}^0$ [Nm]      | 11               | 26               | 52                | 92                |
| Partial factor for steel failure                                                                       | $\gamma_{Ms}^{1)}$ [-] | 1,56             |                  |                   |                   |
| Strength class A80                                                                                     | $M_{Rk,s}^0$ [Nm]      | 12               | 30               | 60                | 105               |
| Partial factor for steel failure                                                                       | $\gamma_{Ms}^{1)}$     | 1,33             |                  |                   |                   |
| Factor for ductility                                                                                   | $k_7$ [-]              | 1,0              |                  |                   |                   |
| Factor for pryout failure                                                                              | $k_8$                  | 2,0              |                  |                   |                   |
| Concrete edge failure                                                                                  |                        |                  |                  |                   |                   |
| Effective embedment depth for calculation                                                              | $l_f =$ [mm]           | $h_{ef}$         |                  |                   |                   |
| Outside diameter of fastener                                                                           | $d_{nom}$              | 12               |                  | 15                |                   |
| 1) In absence of other national regulations                                                            |                        |                  |                  |                   |                   |
| fischer High-Performance Anchor FH II, FH II-I                                                         |                        |                  |                  | Annex C 4         |                   |
| Performances<br>Performance characteristics of shear resistance for FH II-I and FH II-I A4             |                        |                  |                  |                   |                   |

**Table C5.1:** Performance characteristics of **tension resistance** under **fire exposure**

| Anchor type           |                                | R30                             |                                 |                                              | R60                              |                                  |                                               |
|-----------------------|--------------------------------|---------------------------------|---------------------------------|----------------------------------------------|----------------------------------|----------------------------------|-----------------------------------------------|
|                       |                                | N <sub>Rk,s,fi,30</sub><br>[kN] | N <sub>Rk,p,fi,30</sub><br>[kN] | N <sup>0</sup> <sub>Rk,c,fi,30</sub><br>[kN] | N <sub>Rk,s,fi,60</sub><br>[kN]  | N <sub>Rk,p,fi,60</sub><br>[kN]  | N <sup>0</sup> <sub>Rk,c,fi,60</sub><br>[kN]  |
| FH II 10, FH II 10 A4 |                                | 0,2                             | 1,8                             | 1,8                                          | 0,2                              | 1,8                              | 1,8                                           |
| FH II 12, FH II 12 A4 |                                | 2,0                             | 3,0                             | 5,0                                          | 1,3                              | 3,0                              | 5,0                                           |
| FH II 15, FH II 15 A4 |                                | 3,2                             | 4,0                             | 7,4                                          | 2,3                              | 4,0                              | 7,4                                           |
| FH II 18, FH II 18 A4 |                                | 4,8                             | 6,3                             | 10,3                                         | 3,9                              | 6,3                              | 10,3                                          |
| FH II 24, FH II 24 A4 |                                | 8,9                             | 9,0                             | 18,0                                         | 7,3                              | 9,0                              | 18,0                                          |
| FH II 28              |                                | 13,9                            | 12,6                            | 31,4                                         | 11,3                             | 12,6                             | 31,4                                          |
| FH II 32              |                                | 20,0                            | 16,5                            | 49,6                                         | 16,3                             | 16,5                             | 49,6                                          |
| FH II 12/M6-I,        | 5.8, A50 <sup>1)</sup>         | 0,1                             | 2,3                             | 5,0                                          | 0,1                              | 2,3                              | 5,0                                           |
| FH II 12/M6-I A4      | 8.8, A70, A80 <sup>1) 2)</sup> | 0,2                             |                                 |                                              | 0,2                              |                                  |                                               |
| FH II 12/M8-I,        | 5.8, A50 <sup>1)</sup>         | 1,3                             |                                 |                                              | 0,8                              |                                  |                                               |
| FH II 12/M8-I A4      | 8.8, A70, A80 <sup>1) 2)</sup> | 2,0                             |                                 |                                              | 1,3                              |                                  |                                               |
| FH II 15/M10-I,       | 5.8, A50 <sup>1)</sup>         | 2,0                             | 3,0                             | 7,4                                          | 1,4                              | 3,0                              | 7,4                                           |
| FH II 15/M10-I A4     | 8.8, A70, A80 <sup>1) 2)</sup> | 3,2                             |                                 |                                              | 2,3                              |                                  |                                               |
| FH II 15/M12-I,       | 5.8/A50 <sup>1)</sup>          | 3,0                             |                                 |                                              | 2,4                              |                                  |                                               |
| FH II 15/M12-I A4     | 8.8, A70, A80 <sup>1) 2)</sup> | 4,8                             |                                 |                                              | 3,9                              |                                  |                                               |
| Anchor type           |                                | R90                             |                                 |                                              | R120                             |                                  |                                               |
|                       |                                | N <sub>Rk,s,fi,90</sub><br>[kN] | N <sub>Rk,p,fi,90</sub><br>[kN] | N <sup>0</sup> <sub>Rk,c,fi,90</sub><br>[kN] | N <sub>Rk,s,fi,120</sub><br>[kN] | N <sub>Rk,p,fi,120</sub><br>[kN] | N <sup>0</sup> <sub>Rk,c,fi,120</sub><br>[kN] |
| FH II 10, FH II 10 A4 |                                | 0,1                             | 1,8                             | 1,8                                          | 0,1                              | 1,5                              | 1,5                                           |
| FH II 12, FH II 12 A4 |                                | 0,6                             | 3,0                             | 5,0                                          | 0,2                              | 2,4                              | 4,0                                           |
| FH II 15, FH II 15 A4 |                                | 1,4                             | 4,0                             | 7,4                                          | 1,0                              | 3,2                              | 5,9                                           |
| FH II 18, FH II 18 A4 |                                | 3,0                             | 6,3                             | 10,3                                         | 2,6                              | 5,0                              | 8,2                                           |
| FH II 24, FH II 24 A4 |                                | 5,6                             | 9,0                             | 18,0                                         | 4,8                              | 7,2                              | 14,4                                          |
| FH II 28              |                                | 8,8                             | 12,6                            | 31,4                                         | 7,5                              | 10,1                             | 25,2                                          |
| FH II 32              |                                | 12,6                            | 16,5                            | 49,6                                         | 10,8                             | 13,2                             | 39,7                                          |
| FH II 12/M6-I,        | 5.8, A50 <sup>1)</sup>         | 0,1                             | 2,3                             | 5,0                                          | 0,1                              | 1,8                              | 4,0                                           |
| FH II 12/M6-I A4      | 8.8, A70, A80 <sup>1) 2)</sup> | 0,1                             |                                 |                                              | 0,1                              |                                  |                                               |
| FH II 12/M8-I,        | 5.8, A50 <sup>1)</sup>         | 0,4                             |                                 |                                              | 0,1                              |                                  |                                               |
| FH II 12/M8-I A4      | 8.8, A70, A80 <sup>1) 2)</sup> | 0,6                             |                                 |                                              | 0,2                              |                                  |                                               |
| FH II 15/M10-I,       | 5.8, A50 <sup>1)</sup>         | 0,9                             | 3,0                             | 7,4                                          | 0,6                              | 2,4                              | 5,9                                           |
| FH II 15/M10-I A4     | 8.8, A70, A80 <sup>1) 2)</sup> | 1,4                             |                                 |                                              | 1,0                              |                                  |                                               |
| FH II 15/M12-I,       | 5.8/A50 <sup>1)</sup>          | 1,9                             |                                 |                                              | 1,6                              |                                  |                                               |
| FH II 15/M12-I A4     | 8.8, A70, A80 <sup>1) 2)</sup> | 3,0                             |                                 |                                              | 2,6                              |                                  |                                               |

<sup>1)</sup> Intermediate values by linear interpolation

<sup>2)</sup> In combination with screw / threaded rod strength class 8.8, A70, A80

In absence of other national regulations the partial safety factor for resistance under fire exposure  $\gamma_{M,fi} = 1,0$  is recommended

fischer High-Performance Anchor FH II, FH II-I

#### Performances

Performance characteristics of tension resistance under fire exposure

**Annex C 5**

**Table C6.1: Performance characteristics of shear resistance under fire exposure**

| Anchor type                                      | R30                      |                            | R60                       |                             |
|--------------------------------------------------|--------------------------|----------------------------|---------------------------|-----------------------------|
|                                                  | $V_{Rk,s,fi,30}$<br>[kN] | $M_{Rk,s,fi,30}^0$<br>[Nm] | $V_{Rk,s,fi,60}$<br>[kN]  | $M_{Rk,s,fi,60}^0$<br>[Nm]  |
| FH II 10, FH II 10 A4                            | 0,3                      | 0                          | 0,3                       | 0                           |
| FH II 12, FH II 12 A4                            | 2,0                      | 2                          | 1,3                       | 1                           |
| FH II 15, FH II 15 A4                            | 3,2                      | 4                          | 2,3                       | 3                           |
| FH II 18, FH II 18 A4                            | 4,8                      | 7                          | 3,9                       | 6                           |
| FH II 24, FH II 24 A4                            | 8,9                      | 19                         | 7,3                       | 15                          |
| FH II 28                                         | 13,9                     | 37                         | 11,3                      | 30                          |
| FH II 32                                         | 20,0                     | 64                         | 16,3                      | 52                          |
| FH II 12/M6 I, 5.8, A50 <sup>1)</sup>            | 0,2                      | 0                          | 0,2                       | 0                           |
| FH II 12/M6 I A4 8.8, A70, A80 <sup>1) 2)</sup>  | 0,3                      | 0                          | 0,3                       | 0                           |
| FH II 12/M8 I, 5.8, A50 <sup>1)</sup>            | 1,3                      | 1                          | 0,8                       | 1                           |
| FH II 12/M8-I A4 8.8, A70, A80 <sup>1) 2)</sup>  | 2,0                      | 2                          | 1,3                       | 1                           |
| FH II 15/M10 I, 5.8, A50 <sup>1)</sup>           | 2,0                      | 3                          | 1,4                       | 2                           |
| FH II 15/M10-I A4 8.8, A70, A80 <sup>1) 2)</sup> | 3,2                      | 4                          | 2,3                       | 3                           |
| FH II 15/M12-I, 5.8/A50 <sup>1)</sup>            | 3,0                      | 4                          | 2,4                       | 4                           |
| FH II 15/M12-I A4 8.8, A70, A80 <sup>1) 2)</sup> | 4,8                      | 7                          | 3,9                       | 6                           |
| Anchor type                                      | R90                      |                            | R120                      |                             |
|                                                  | $V_{Rk,s,fi,90}$<br>[kN] | $M_{Rk,s,fi,90}^0$<br>[Nm] | $V_{Rk,s,fi,120}$<br>[kN] | $M_{Rk,s,fi,120}^0$<br>[Nm] |
| FH II 10, FH II 10 A4                            | 0,2                      | 0                          | 0,1                       | 0                           |
| FH II 12, FH II 12 A4                            | 0,6                      | 1                          | 0,2                       | 0                           |
| FH II 15, FH II 15 A4                            | 1,4                      | 2                          | 1,0                       | 1                           |
| FH II 18, FH II 18 A4                            | 3,0                      | 5                          | 2,6                       | 4                           |
| FH II 24, FH II 24 A4                            | 5,6                      | 12                         | 4,8                       | 10                          |
| FH II 28                                         | 8,8                      | 23                         | 7,5                       | 20                          |
| FH II 32                                         | 12,6                     | 40                         | 10,8                      | 34                          |
| FH II 12/M6-I, 5.8, A50 <sup>1)</sup>            | 0,1                      | 0                          | 0,1                       | 0                           |
| FH II 12/M6-I A4 8.8, A70, A80 <sup>1) 2)</sup>  | 0,2                      | 0                          | 0,1                       | 0                           |
| FH II 12/M8-I, 5.8, A50 <sup>1)</sup>            | 0,4                      | 1                          | 0,1                       | 0                           |
| FH II 12/M8-I A4 8.8, A70, A80 <sup>1) 2)</sup>  | 0,6                      | 1                          | 0,2                       | 0                           |
| FH II 15/M10 I, 5.8, A50 <sup>1)</sup>           | 0,9                      | 2                          | 0,6                       | 1                           |
| FH II 15/M10-I A4 8.8, A70, A80 <sup>1) 2)</sup> | 1,4                      | 3                          | 1,0                       | 1                           |
| FH II 15/M12 I, 5.8/A50 <sup>1)</sup>            | 1,9                      | 4                          | 1,6                       | 3                           |
| FH II 15/M12-I A4 8.8, A70, A80 <sup>1) 2)</sup> | 3,0                      | 6                          | 2,6                       | 4                           |

<sup>1)</sup> Intermediate values by linear interpolation

<sup>2)</sup> In combination with screw / threaded rod strength class 8.8, A70, A80

In absence of other national regulations the partial safety factor for resistance under fire exposure

$\gamma_{M,fi} = 1,0$  is recommended

fischer High-Performance Anchor FH II, FH II-I

#### Performances

Performance characteristics of shear resistance under fire exposure

**Annex C 6**

**Table C7.1:** Performance characteristics of **tension and shear resistance** for **seismic performance category C1** for FH II-S,-SK,-B,-H and FH II-S A4,-SK A4,-B A4,-H A4

| Anchor type FH II-S,-SK,-B,-H and<br>FH II-S A4,-SK A4,-B A4,-H A4 |                                   |                                  |      | FH II<br>12 | FH II<br>15 | FH II<br>18 | FH II<br>24 | FH II<br>28 <sup>3)</sup> | FH II<br>32 <sup>3)</sup> |
|--------------------------------------------------------------------|-----------------------------------|----------------------------------|------|-------------|-------------|-------------|-------------|---------------------------|---------------------------|
| Steel failure                                                      |                                   |                                  |      |             |             |             |             |                           |                           |
| Characteristic resistance of tension load C1                       | FH II-S,-SK,-B,-H<br>-B A4, -H A4 | N <sub>Rk,s,C1</sub>             | [kN] | 29,3        | 46,4        | 67,4        | 125,3       | 195,8                     | 282,0                     |
|                                                                    |                                   | γ <sub>Ms,C1</sub> <sup>1)</sup> | [-]  | 1,5         |             |             |             |                           |                           |
|                                                                    | FH II-S A4,-SK A4<br>-B A4, -H A4 | N <sub>Rk,s,C1</sub>             | [kN] | 29,3        | 46,4        | 67,4        | 125,3       | -                         |                           |
|                                                                    |                                   | γ <sub>Ms,C1</sub> <sup>1)</sup> | [-]  | 1,6         |             |             |             |                           |                           |
| Pullout failure                                                    |                                   |                                  |      |             |             |             |             |                           |                           |
| Characteristic resistance of tension load in cracked concrete C1   | N <sub>Rk,P,C1</sub>              |                                  | [kN] | 12,0        | 16,0        | 25,0        | 36,0        | 50,3                      | 66,1                      |
|                                                                    | γ <sub>Mp,C1</sub> <sup>1)</sup>  |                                  | [-]  | 1,5         |             |             |             |                           |                           |
| Steel failure without lever arm                                    |                                   |                                  |      |             |             |             |             |                           |                           |
| Characteristic resistance of shear load C1                         |                                   |                                  |      |             |             |             |             |                           |                           |
| FH II-S                                                            | V <sup>0</sup> <sub>Rk,s,C1</sub> |                                  | [kN] | 25,0        | 41,0        | 60,0        | 123,0       | 141,0                     | 200,0                     |
| FH II-B,-H                                                         |                                   |                                  |      | 17,0        | 30,0        | 46,0        | 103,0       | 117,0                     | 169,0                     |
| FH II-SK                                                           | t <sub>fix</sub> <sup>2)</sup>    | [mm]                             | ≥ 10 | ≥ 15        |             | -           |             |                           |                           |
|                                                                    | V <sub>Rk,s,C1</sub>              | [kN]                             | 25,0 | 41,0        | 60,0        |             |             |                           |                           |
|                                                                    | t <sub>fix</sub> <sup>2)</sup>    | [mm]                             | < 10 | < 15        |             |             |             |                           |                           |
|                                                                    | V <sub>Rk,s,C1</sub>              | [kN]                             | 11,0 | 16,0        | 27,0        |             |             |                           |                           |
| Partial factor for steel failure                                   | γ <sub>Ms,C1</sub> <sup>1)</sup>  | [-]                              | 1,25 |             |             |             |             |                           |                           |
| FH II-S A4                                                         | V <sub>Rk,s,C1</sub>              | [kN]                             | 25,0 | 41,0        | 60,0        | 123,0       | -           |                           |                           |
| Partial factor for steel failure                                   | γ <sub>Ms,C1</sub> <sup>1)</sup>  | [-]                              | 1,33 |             |             |             |             |                           |                           |
| FH II-B A4,-H A4                                                   | V <sub>Rk,s,C1</sub>              | [kN]                             | 17,0 | 30,0        | 46,0        | 103,0       | -           |                           |                           |
| Partial factor for steel failure                                   | γ <sub>Ms,C1</sub> <sup>1)</sup>  | [-]                              | 1,25 |             |             |             |             |                           |                           |
| FH II-SK A4                                                        | t <sub>fix</sub> <sup>2)</sup>    | [mm]                             | ≥ 10 | ≥ 15        |             | -           |             |                           |                           |
|                                                                    | V <sub>Rk,s,C1</sub>              | [kN]                             | 25,0 | 41,0        | 60,0        |             |             |                           |                           |
|                                                                    | t <sub>fix</sub> <sup>2)</sup>    | [mm]                             | < 10 | < 15        |             |             |             |                           |                           |
|                                                                    | V <sub>Rk,s,C1</sub>              | [kN]                             | 11,0 | 16,0        | 27,0        |             |             |                           |                           |
| Partial factor for steel failure                                   | γ <sub>Ms,C1</sub> <sup>1)</sup>  | [-]                              | 1,33 |             |             |             |             |                           |                           |
| Factor for annular gap                                             | α <sub>gap</sub>                  |                                  | 0,50 |             |             |             |             |                           |                           |

<sup>1)</sup> In absence of other national regulations<sup>2)</sup> The thickness of the fixture has influence to the characteristic resistance for shear loads, steel failure without lever arm<sup>3)</sup> Only valid for zinc-plated version

fischer High-Performance Anchor FH II, FH II-I

**Performances**  
Performance characteristics of tension and shear resistance for seismic performance category C1

**Annex C 7**

**Table C8.1:** Performance characteristics of **tension and shear resistance** for **seismic performance category C2** for FH II-S,-SK,-B,-H and FH II-S A4,-SK A4,-B A4,-H A4

| Anchor type FH II-S,-SK,-B,-H and<br>FH II-S A4,-SK A4,-B A4,-H A4  |                                   |                                  |      | FH II<br>12 | FH II<br>15 | FH II<br>18 | FH II<br>24 | FH II<br>28 <sup>3)</sup> | FH II<br>32 <sup>3)</sup> |
|---------------------------------------------------------------------|-----------------------------------|----------------------------------|------|-------------|-------------|-------------|-------------|---------------------------|---------------------------|
| Steel failure                                                       |                                   |                                  |      |             |             |             |             |                           |                           |
| Characteristic<br>resistance of<br>tension load C2                  | FH II-S,-SK,-B,-H<br>-B A4, -H A4 | N <sub>Rk,s,C2</sub>             | [kN] | 29,3        | 46,4        | 67,4        | 125,3       | 195,8                     |                           |
|                                                                     |                                   | γ <sub>Ms,C2</sub> <sup>1)</sup> | [-]  | 1,5         |             |             |             |                           |                           |
|                                                                     | FH II-S A4,-SK A4                 | N <sub>Rk,s,C2</sub>             | [kN] | 29,3        | 46,4        | 67,4        | 125,3       | -                         |                           |
|                                                                     |                                   | γ <sub>Ms,C2</sub> <sup>1)</sup> | [-]  | 1,6         |             |             |             |                           |                           |
| Pullout failure                                                     |                                   |                                  |      |             |             |             |             |                           |                           |
| Characteristic resistance of<br>tension load in cracked concrete C2 | N <sub>Rk,P,C2</sub>              |                                  | [kN] | 6,2         | 11,3        | 21,8        | 43,0        | 65,9                      |                           |
|                                                                     | γ <sub>Mp,C2</sub> <sup>1)</sup>  |                                  | [-]  | 1,5         |             |             |             |                           |                           |
| Steel failure without lever arm                                     |                                   |                                  |      |             |             |             |             |                           |                           |
| Characteristic resistance of shear load C2                          |                                   |                                  |      |             |             |             |             |                           |                           |
| FH II-S                                                             | V <sub>Rk,s,C2</sub>              | [kN]                             |      | 14,7        | 28,9        | 41,0        | 100,7       |                           |                           |
| FH II-B,-H                                                          |                                   |                                  |      | 9,8         | 20,9        | 34,1        | 61,9        | 67,2                      |                           |
| FH II-SK                                                            | t <sub>fix</sub> <sup>2)</sup>    | [mm]                             | ≥ 10 | ≥ 15        |             |             | -           |                           |                           |
|                                                                     | V <sub>Rk,s,C2</sub>              | [kN]                             | 14,8 | 23,3        | 33,8        |             |             |                           |                           |
|                                                                     | t <sub>fix</sub> <sup>2)</sup>    | [mm]                             | < 10 | < 15        |             |             |             |                           |                           |
|                                                                     | V <sub>Rk,s,C2</sub>              | [kN]                             | 6,3  | 9,1         | 15,1        |             |             |                           |                           |
| Partial factor for steel failure                                    | γ <sub>Ms,C2</sub> <sup>1)</sup>  |                                  | [-]  | 1,25        |             |             |             |                           |                           |
| FH II-S A4                                                          | V <sub>Rk,s,C2</sub>              |                                  | [kN] | 14,7        | 28,9        | 41,0        | 100,7       | -                         |                           |
| Partial factor for steel failure                                    | γ <sub>Ms,C2</sub> <sup>1)</sup>  |                                  | [-]  | 1,33        |             |             |             |                           |                           |
| FH II-B A4,-H A4                                                    | V <sub>Rk,s,C2</sub>              |                                  | [kN] | 9,8         | 20,9        | 34,1        | 61,9        | -                         |                           |
| Partial factor for steel failure                                    | γ <sub>Ms,C2</sub> <sup>1)</sup>  |                                  | [-]  | 1,25        |             |             |             |                           |                           |
| FH II-SK A4                                                         | t <sub>fix</sub> <sup>2)</sup>    | [mm]                             | ≥ 10 | ≥ 15        |             |             | -           |                           |                           |
|                                                                     | V <sub>Rk,s,C2</sub>              | [kN]                             | 14,8 | 23,3        | 33,8        |             |             |                           |                           |
|                                                                     | t <sub>fix</sub> <sup>2)</sup>    | [mm]                             | < 10 | < 15        |             |             |             |                           |                           |
|                                                                     | V <sub>Rk,s,C2</sub>              | [kN]                             | 6,3  | 9,1         | 15,1        |             |             |                           |                           |
| Partial factor for steel failure                                    | γ <sub>Ms,C2</sub> <sup>1)</sup>  |                                  | [-]  | 1,33        |             |             |             |                           |                           |
| Factor for annular gap                                              | α <sub>gap</sub>                  |                                  |      | 0,50        |             |             |             |                           |                           |

<sup>1)</sup> In absence of other national regulations<sup>2)</sup> The thickness of the fixture has influence to the characteristic resistance for shear loads, steel failure without lever arm<sup>3)</sup> Only valid for zinc-plated version

fischer High-Performance Anchor FH II, FH II-I

**Performances**Performance characteristics of tension and shear resistance for  
seismic performance category C2**Annex C 8**

**Table C9.1:** Displacements under static and quasi static **tension loads** for FH II and FH II A4

| Anchor type FH II-S,-SK,-B,-H and<br>FH II-S A4,-SK A4,-B A4,-H A4 |                                        |      | FH II<br>10 | FH II<br>12 | FH II<br>15 | FH II<br>18 | FH II<br>24 | FH II<br>28 | FH II<br>32 |
|--------------------------------------------------------------------|----------------------------------------|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Tension load cracked concrete                                      | N                                      | [kN] | 3,6         | 5,7         | 7,6         | 11,9        | 17,1        | 24,0        | 31,5        |
| Corresponding displacements                                        | $\frac{\delta_{N0}}{\delta_{N\infty}}$ | [mm] | 1,0         | 1,0         | 1,0         | 1,0         | 1,0         | 0,7         | 0,7         |
|                                                                    |                                        |      | 1,7         | 1,6         | 1,6         | 1,6         | 1,8         | 1,3         | 1,1         |
| Tension load uncracked concrete                                    | N                                      | [kN] | 6,0         | 11,2        | 14,1        | 17,2        | 24,0        | 33,6        | 44,2        |
| Corresponding displacements                                        | $\frac{\delta_{N0}}{\delta_{N\infty}}$ | [mm] | 0,6         | 1,0         | 1,0         | 1,0         | 1,0         | 0,3         | 0,3         |
|                                                                    |                                        |      | 1,7         | 1,6         | 1,6         | 1,6         | 1,8         | 1,3         | 1,1         |

**Table C9.2:** Displacements under static and quasi static **tension loads** for FH II-I and FH II-I A4

| Anchor type FH II-I and FH II-I A4 |                                        |      | FH II 12/M6 I<br>FH II 12/M8 I | FH II 15/M10 I<br>FH II 15/M12 I |
|------------------------------------|----------------------------------------|------|--------------------------------|----------------------------------|
| Tension load cracked concrete      | N                                      | [kN] | 4,3                            | 5,7                              |
| Tension load uncracked concrete    |                                        |      | 9,5                            | 14,1                             |
| Corresponding displacements        | $\frac{\delta_{N0}}{\delta_{N\infty}}$ | [mm] | 1,7                            | 1,9                              |
|                                    |                                        |      | 2,2                            | 2,9                              |

**Table C9.3:** Displacements under static and quasi static **shear loads** for FH II-S and -SK

| Anchor type FH II-S and FH II-SK             |                                        |      | FH II<br>10 | FH II<br>12 | FH II<br>15 | FH II<br>18 | FH II<br>24 | FH II<br>28 | FH II<br>32 |
|----------------------------------------------|----------------------------------------|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Shear load in cracked and uncracked concrete | V                                      | [kN] | 10,3        | 18,9        | 33,7        | 43,4        | 83,4        | 99,4        | 124,0       |
| Corresponding displacements                  | $\frac{\delta_{V0}}{\delta_{V\infty}}$ | [mm] | 2,4         | 2,7         | 4,4         | 5,0         | 7,0         | 6,0         | 8,0         |
|                                              |                                        |      | 3,6         | 4,1         | 6,6         | 7,5         | 10,5        | 9,0         | 12,0        |

**Table C9.4:** Displacements under static and quasi static **shear loads** for FH II-B and -H

| Anchor type FH II-B and FH II-H              |                                        |      | FH II<br>10 | FH II<br>12 | FH II<br>15 | FH II<br>18 | FH II<br>24 | FH II<br>28 | FH II<br>32 |
|----------------------------------------------|----------------------------------------|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Shear load in cracked and uncracked concrete | V                                      | [kN] | 8,9         | 15,4        | 23,4        | 35,4        | 68,0        | 83,4        | 96,6        |
| Corresponding displacements                  | $\frac{\delta_{V0}}{\delta_{V\infty}}$ | [mm] | 2,2         | 2,3         | 3,0         | 5,0         | 7,0         | 5,0         | 5,0         |
|                                              |                                        |      | 3,3         | 3,5         | 4,5         | 7,5         | 10,5        | 7,5         | 7,5         |

fischer High-Performance Anchor FH II, FH II-I

**Performances**  
Displacements under tension and shear loads

**Annex C 9**

**Table C10.1:** Displacements under static and quasi static **shear loads** for FH II-S A4, FH II-SK A4, FH II-B A4 and FH II-H A4

| Anchor type<br>FH II-S A4, -SK A4, -B A4, -H A4 |                                             | FH II<br>10 | FH II<br>12 | FH II<br>15 | FH II<br>18 | FH II<br>24 |
|-------------------------------------------------|---------------------------------------------|-------------|-------------|-------------|-------------|-------------|
| Shear load in cracked and uncracked concrete    | V [kN]                                      | 10,3        | 16,0        | 24,6        | 37,7        | 68,0        |
| Corresponding displacements                     | $\frac{\delta_{V0}}{\delta_{V\infty}}$ [mm] | 3,5         | 3,5         | 3,7         | 5,7         | 9,0         |
|                                                 |                                             | 5,3         | 5,3         | 5,6         | 8,6         | 13,5        |

**Table C10.2:** Displacements under static and quasi static **shear loads** for FH II-I and FH II-I A4

| Anchor type: FH II-I and FH II-I A4          |                                             | FH II<br>12/M6 I | FH II<br>12/M8 I | FH II<br>15/M10 I | FH II<br>15/M12 I |
|----------------------------------------------|---------------------------------------------|------------------|------------------|-------------------|-------------------|
| Shear load in cracked and uncracked concrete | V [kN]                                      | 4,6              | 8,3              | 13,3              | 13,7              |
| Corresponding displacements                  | $\frac{\delta_{V0}}{\delta_{V\infty}}$ [mm] | 2,6              | 2,6              | 2,2               | 2,2               |
|                                              |                                             | 3,9              | 3,9              | 3,3               | 3,3               |

**Table C10.3:** Displacements under **tension loads** for **seismic performance category C2** for FH II and FH II A4

| Anchor type FH II-S,-SK,-B,-H and<br>FH II-S A4,-SK A4,-B A4,-H A4 |      | FH II<br>12 | FH II<br>15 | FH II<br>18 | FH II<br>24 | FH II<br>28 | FH II<br>32 |
|--------------------------------------------------------------------|------|-------------|-------------|-------------|-------------|-------------|-------------|
| Displacement DLS $\delta_{N,C2}$ (DLS)                             | [mm] | 1,55        | 2,63        | 2,04        | 4,26        | 3,06        |             |
| Displacement ULS $\delta_{N,C2}$ (ULS)                             |      | 8,71        | 11,07       | 7,30        | 11,70       | 11,44       |             |

**Table C10.4:** Displacements under **shear loads** for **seismic performance category C2** for FH II and FH II A4

| Anchor type FH II-S,-SK and<br>FH II-S A4,-SK A4 |      | FH II<br>12 | FH II<br>15 | FH II<br>18 | FH II<br>24 | FH II<br>28 | FH II<br>32 |
|--------------------------------------------------|------|-------------|-------------|-------------|-------------|-------------|-------------|
| Displacement DLS $\delta_{V,C2}$ (DLS)           | [mm] | 3,53        | 4,18        | 4,67        | 5,59        | 4,79        |             |
| Displacement ULS $\delta_{V,C2}$ (ULS)           |      | 6,62        | 7,38        | 9,03        | 14,09       | 9,95        |             |

| Anchor type FH II-B,-H and<br>FH II-B A4,-H A4 |      | FH II<br>12 | FH II<br>15 | FH II<br>18 | FH II<br>24 | FH II<br>28 | FH II<br>32 |
|------------------------------------------------|------|-------------|-------------|-------------|-------------|-------------|-------------|
| Displacement DLS $\delta_{V,C2}$ (DLS)         | [mm] | 3,42        | 4,26        | 4,29        | 4,79        |             |             |
| Displacement ULS $\delta_{V,C2}$ (ULS)         |      | 5,26        | 6,66        | 7,95        | 7,69        | 9,95        |             |

fischer High-Performance Anchor FH II, FH II-I

**Performances**  
Displacements under tension and shear loads

**Annex C 10**