**DECLARATION OF PERFORMANCE**

**DoP: 0125**

for fischer Highbond-Anchor FHB (Bonded anchor for use in concrete) – **EN**

1. Unique identification code of the product-type: **DoP: 0125**

2. Intended use/es: **Post-installed fastening in cracked or uncracked concrete, see appendix, especially Annexes B 1 to B 4**

3. Manufacturer: **fischerwerke GmbH & Co. KG, Klaus-Fischer-Straße 1, 72178 Waldachtal, Germany**

4. Authorised representative: **--**

5. System/s of AVCP: **1**

6. European Assessment Document: **ETAG 001; 2013-04**

   European Technical Assessment: **ETA-06/0171; 2017-05-26**

   Technical Assessment Body: **DIBt**

   Notified body/ies: **1343 – MPA Darmstadt**

7. Declared performance/s:

**Mechanical resistance and stability (BWR 1), Safety in use (BWR 4)**

- **Characteristic resistance: See appendix, especially Annexes C 1 to C 3**
- **Displacements under tension an shear loads: See appendix, especially Annex C 3**

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

- **Reaction to fire: Anchorages satisfy requirements for Class A 1**
- **Resistance to fire: NPD**

8. Appropriate Technical Documentation and/or Specific Technical Documentation: ---

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

Andreas Bucher, Dipl.-Ing.

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

Tumlingen, 2017-06-02

- This DoP has been prepared in different languages. In case there is a dispute on the interpretation the english version shall always prevail.
- The Appendix includes voluntary and complementary information in English language exceeding the (language-neutrally specified) legal requirements.

**Specific Part**

## 1 Technical description of the product

The fischer Highbond-anchor FHB is a torque controlled bonded anchor consisting of a mortar cartridge with FIS HB and an anchor rod with hexagon nut and washer. The anchor rod (including nut and washer) is made of galvanised steel.

The load transfer is realised by mechanical interlock of several cones in the bonding mortar and then via a combination of bonding and friction forces in the anchorage ground (concrete).

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 | See Annex C 1 to C 3 |
| Displacements under tension and shear loads | See Annex C 3 |

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

| Essential characteristic | Performance |
|---|---|
| Reaction to fire | Anchorages satisfy requirements for Class A1 |
| Resistance to fire | No performance assessed |

### 3.3 Hygiene, health and the environment (BWR 3)

Regarding dangerous substances there may be requirements (e.g. transposed European legislation and national laws, regulations and administrative provisions) applicable to the products falling within the scope of this European Technical Assessment. In order to meet the provisions of Regulation (EU) No 305/2011, these requirements need also to be complied with, when and where they apply.

### 3.4 Safety in use (BWR 4)

The essential characteristics regarding Safety in use are included under the Basic Works Requirement Mechanical resistance and stability.

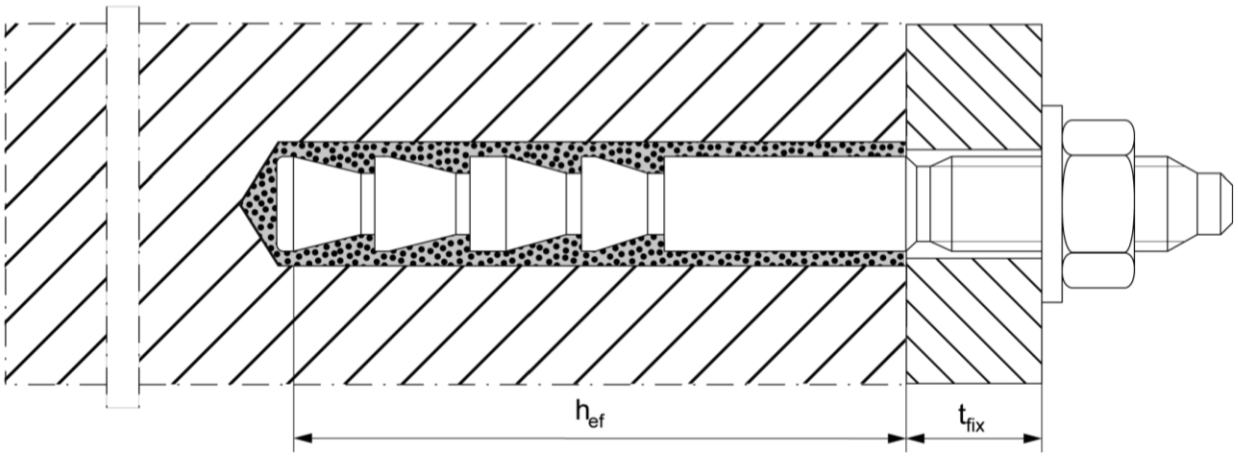
**4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base**

In accordance with guideline for European technical approval ETAG 001, April 2013, used as European Assessment Document (EAD) according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011, the applicable European legal act is: [96/582/EC].

The system to be applied is: 1

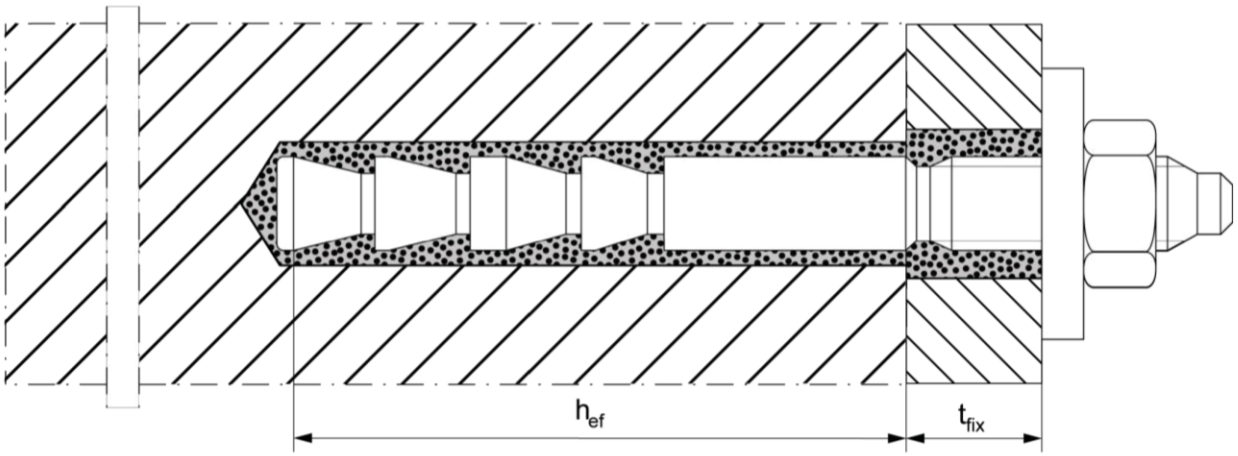
## Installation conditions

Pre-positioned anchor




## Installation conditions with additional mounted filling disc

Pre-positioned or push through anchor

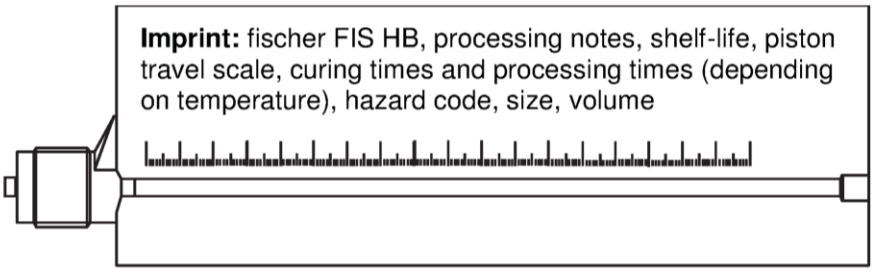



$t_{fix}$ Thickness of the fixture
$h_{ef}$ Effective anchorage depth

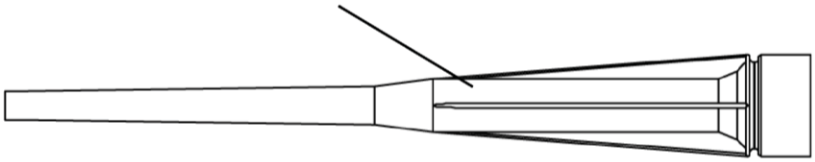
| fischer Highbond-Anchor FHB | **Annex A 1** |
|---|---|
| **Product description**<br>Installation conditions | |

**Cartridge sizes FIS HB (345 ml or 150 ml)**

**Sealing cap**




**Static mixer FIS MR or FIS UMR**



**Highbond-Anchor rod FHB-A**

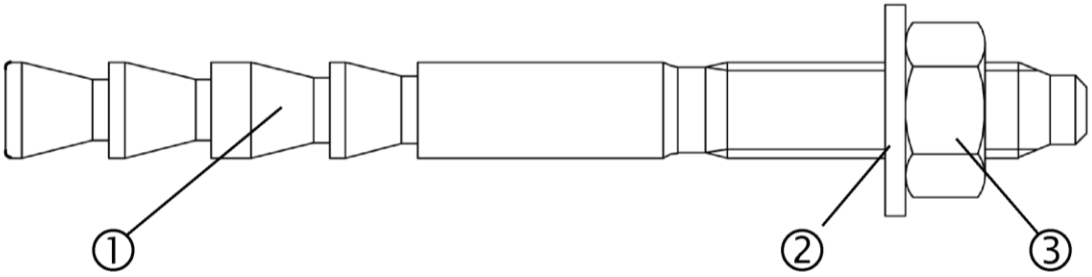



**Table A1:** Materials

| Part | Designation | M10 to M16 | M20 to M24 |
|---|---|---|---|
| 1 | Highbond-Anchor rod FHB-A | Steel<br>$f_{uk}$ = 800 N/mm²<br>$f_{yk}$ = 640 N/mm²<br>(ISO 898-1: 2013)<br>zinc plated ≥ 5 µm,<br>(EN ISO 4042:1999 A2K)<br>$f_{uk}$ ≤ 1000 N/mm²<br>$A_5$ > 12 % fracture elongation<br>coated | Steel<br>$f_{uk}$ = 550 N/mm²<br>$f_{yk}$ = 440 N/mm²<br>(ISO 898-1: 2013)<br>zinc plated ≥ 5 µm,<br>(EN ISO 4042:1999 A2K)<br>$f_{uk}$ ≤ 1000 N/mm²<br>$A_5$ > 12 % fracture elongation<br>coated |
| 2 | Washer<br>ISO 7089:2000<br>or<br>fischer filling disc | zinc plated ≥ 5 µm, EN ISO 4042:1999 A2K | |
| 3 | Hexagon nut | Property class 8;(EN ISO 898-2:2013),<br>zinc plated ≥ 5 µm,(ISO 4042:1999 A2K) | |

| fischer Highbond-Anchor FHB | **Annex A 2** |
|---|---|
| **Product description**<br>Cartridge / Static mixer / Anchor rod with hexagon nut and washer<br>Materials | |

## Specifications of intended use

**Table B1:** Overview use and performance categories

| Anchorages subject to | | **FIS HB with …** | |
|---|---|---|---|
| | | fischer Highbond-Anchor rod FHB  | |
| Hammer drilling with standard drill bit  | | all sizes | |
| Hammer drilling with hollow drill bit (Heller "Duster Expert" or Hilti "TE-CD, TE-YD")  | | all sizes | |
| Static and quasi static load, in | uncracked concrete | all sizes | Tables: C1, C2, C3, C4 |
| | cracked concrete | | |
| Use category | dry or wet concrete | all sizes | |
| | flooded hole | all sizes | |
| Installation temperature | | -5 °C to +40 °C | |
| In-service temperature | Temperature range | -40 °C to +80 °C | (max. long term temperature +50 °C and max. short term temperature +80 °C) |

**Base materials:**

- Reinforced or unreinforced normal weight concrete Strength classes C20/25 to C50/60 according to EN 206-1:2000

**Use conditions (Environmental conditions):**

- Structures subject to dry internal conditions

**Design:**

- Anchorages have to be designed by a responsible engineer with experience of concrete anchor design
- Verifiable calculation notes and drawings are 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.)
- Anchorages under static or quasi-static are designed in accordance with:
  - EOTA ETAG 001, Annex C, 08/2010

**Installation:**

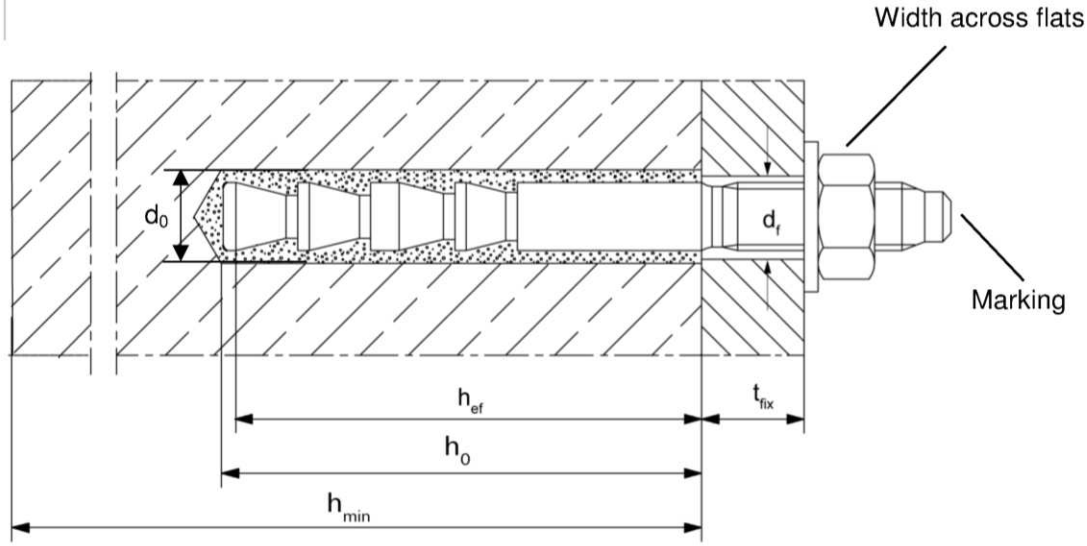
- Anchor installation is to be carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site
- In case of aborted hole: The hole shall be filled with mortar
- Anchorage depth should be marked and adhered to on installation
- Overhead installation is allowed

**Table B2:** Installation parameters for fischer Highbond-Anchor rod FHB-A

| Size | | | FHB-A 10x60 | FHB-A 12x80 | FHB-A 12x100 | FHB-A 16x125 | FHB-A 20x170 | FHB-A 24x220 |
|---|---|---|---|---|---|---|---|---|
| Width across flat | SW | [mm] | 17 | 19 | | 24 | 30 | 36 |
| Nominal drill bit diameter | $d_0$ | | 12 | 14 | | 18 | 24 | 28 |
| Drill hole depth | $h_0$ | | 65 | 85 | 105 | 130 | 175 | 225 |
| Embedment depth of anchor | $l_d$ | | 62 | 82 | 102 | 128 | 175 | 225 |
| Effective anchorage depth | $h_{ef}$ | | 60 | 80 | 100 | 125 | 170 | 220 |
| Minimum spacing and minimum edge distance | $s_{min}$ = $c_{min}$ | | 60 | 80 | 100 | 100 | 150 | 180 |
| Diameter of clearance hole in the fixture[1)] | $d_f$ | | 12 | 14 | | 18 | 22 | 26 |
| Minimum thickness of concrete member | $h_{min}$ | | 120 | 160 | 200 | 250 | 340 | 440 |
| Maximum installation torque | $T_{inst,max}$ | [Nm] | 20 | 40 | | 60 | 100 | 120 |
| Designation steel brush | | | FIS BS 12 | FIS BS 14 | | FIS BS 18 | FIS BS 24 | FIS BS 28 |
| Corresponding steel brush diameter | $d_b$ | [mm] | 13 | 16 | | 20 | 26 | 30 |

[1)] For larger clearance holes in the fixture see EOTA ETAG 001, Annex C, 08/2010


Steel brush FIS BS




**Marking:** Work symbol; size, anchorage depth $h_{ef}$; e. g. 16 x 125

fischer Highbond- Anchor FHB

**Intended Use**
Installation parameters Highbond-Anchor rods FHB-A

**Annex B 2**

**Table B3**: Maximum processing time of the mortar and minimum curing time

| System temperature[1) ] [°C] | Maximum processing time $t_{work}$ [2)] | Minimum curing time $t_{cure}$ [3)] |
|---|---|---|
| -5 to -1 | -- | 6 h |
| 0 to +4 | -- | 3 h |
| +5 to +9 | 15 min | 90 min |
| +10 to +19 | 6 min | 35 min |
| +20 to +29 | 4 min | 20 min |
| +30 to +39 | 2 min | 12 min |

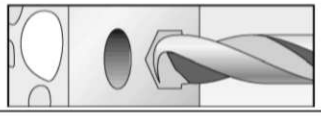
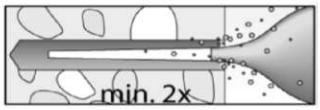
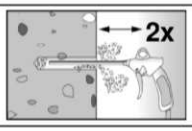
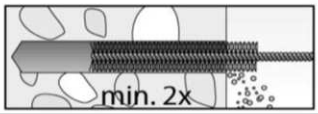
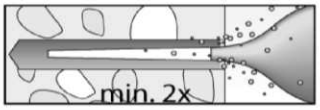
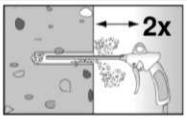
[1)] During the curing of the mortar the temperature of the concrete may not fall below -5°C

[2)] The temperature of the mortar may not fall below +5°C

[3)] In wet concrete or flooded holes the curing times must be doubled

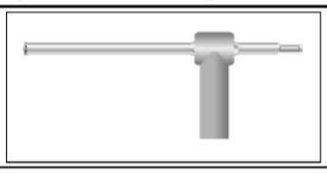
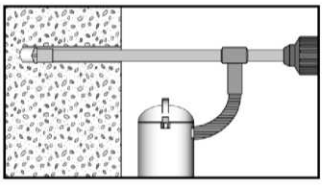
## Installation instructions (Part 1)

Drilling and cleaning the hole (hammer drilling with standard drill bit)

| | | | |
|---|---|---|---|
| 1 |  | Drill the hole with hammer drill.<br>Drill hole diameter $\mathbf{d_0}$ and drill hole depth $\mathbf{h_0}$<br>see **Table B2** | |
| 2 |  | Blow out the drill hole twice by hand |  For anchor size ≥ M20 blow out the hole twice with oil free compressed air (≥ 6bar). Use a cleaning nozzle fischer ABP Ø 19 mm |
| 3 |  | Brush the hole twice.<br>Corresponding steel brushes see **Table B2** | |
| 4 |  | Blow out the drill hole twice by hand |  For anchor size ≥ M20 blow out the hole twice with oil free compressed air (≥ 6bar). Use a cleaning nozzle fischer ABP Ø 19 mm |

Go to step 5

Drilling and cleaning the hole (hammer drilling with hollow drill bit)

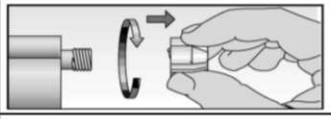
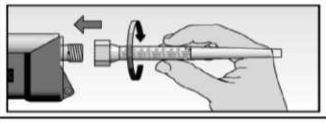
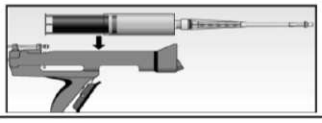
| | | |
|---|---|---|
| 1 |  | Check a suitable hollow drill (see **Table B1**) for correct operation of the dust extraction |
| 2 |  | Use a suitable dust extraction system, e. g.<br>Bosch GAS 35 M AFC or a comparable dust extraction system with equivalent performance data<br><br>Drill the hole with hollow drill bit. The dust extraction system has to extract the drill dust nonstop during the drilling process and must be adjusted to maximum power. Diameter of drill hole $\mathbf{d_0}$ and drill hole depth $\mathbf{h_0}$ see **Table B2** |

Go to step 5

| | |
|---|---|
| fischer Highbond- Anchor FHB | **Annex B 3** |
| **Intended use**<br>Processing times and curing times<br>Installation instructions part 1 | |

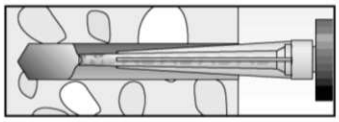
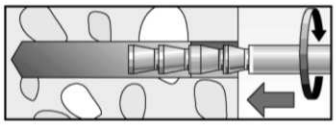
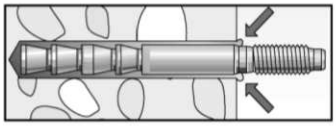
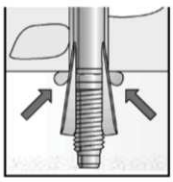
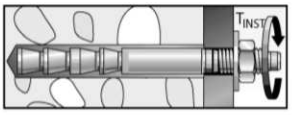
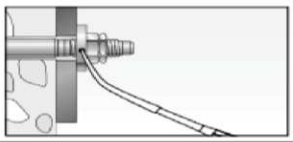
**Installation instructions part 2**

Preparing the cartridge

| | | |
|---|---|---|
| 5 |  | Remove the sealing cap |
| 6 |  | Screw on the static mixer<br>(the spiral in the static mixer must be clearly visible) |
| 7 |  | Place the cartridge into the dispenser |
| 8 |   | Extrude approximately 10 cm of material until the resin is evenly grey in colour. Do not use mortar that is not uniformly grey |

Go to step 9

Injection the mortar; Installation Highbond-Anchor rod FHB-A

| | | |
|---|---|---|
| 9 |  | Adhere to the maximum processing time ($t_{work}$) of the mortar (see **Table B3**).<br>Fill approximately 2/3 of the drill hole with mortar. Exact quantity of mortar (travel scale on the cartridge) see instruction sheet.<br>Fill the drill hole with mortar, always begin from the bottom of the hole to avoid bubbles |
| 10 |  | Only use clean and oil-free Highbond- Anchor rod FHB-A.<br>Push the anchor rod down to the bottom of the hole, turning it slightly while doing so |
| |  | After inserting the anchor rod, excess mortar must be emerged around the anchor rod |
| |  | For overhead installations support the anchor rod with wedges. (e.g. fischer centering wedges)  |
| 11 |  | Wait for the specified curing time $t_{cure}$ see **Table B3** |
| 12 |   | Screw on the fixture and for installation check generate the correct torque moment ($T_{inst,max}$ see **Table B2**) |
| Option |  | After the minimum curing time is reached, the gap between anchor and fixture and the fischer filling disc may be filled with mortar (for eliminating the gap); compressive strength ≥ 50 N/mm² (e.g. FIS HB) |

fischer Highbond- Anchor FHB

**Intended use**
Installation instructions part 2

**Annex B 4**

**Table C1:** Characteristic values under static or quasi-static **tension load** for **fischer Highbond-Anchor FHB-A**

| **Size FHB-A** | | | **10x60** | **12x80** | **12x100** | **16x125** | **20x170** | **24x220** |
|---|---|---|---|---|---|---|---|---|
| **Bearing capacity under tensile load, steel failure** | | | | | | | | |
| Characteristic resistance | $N_{Rk,s}$ | [kN] | 26 | 44 | 44 | 82 | 131 | 180 |
| **Partial safety factors**[1)] | | | | | | | | |
| Partial safety factor | $\gamma_{Ms,N}$ | [-] | 1,50 | | | | | |
| **Bearing capacity under shear load, steel failure** | | | | | | | | |
| **without lever arm** | | | | | | | | |
| Characteristic resistance | $V_{Rk,s}$ | [kN] | 16 | 30 | 30 | 55 | 60 | 85 |
| **with lever arm** | | | | | | | | |
| Characteristic bending moment | $M^0_{Rk,s}$ | [Nm] | 60 | 105 | 105 | 266 | 357 | 617 |
| **Partial safety factors** [1)] | | | | | | | | |
| Partial safety factor | $\gamma_{Ms,V}$ | [-] | 1,25 | | | | | |

[1)] In absence of other national regulations

**Table C2: General design factors** for the bearing capacity under tensile / shear load; **uncracked or cracked concrete**

| **Size FHB-A** | | | | **all sizes** | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Bearing capacity under tensile load** | | | | | | | | | |
| **Factors for the compressive strength of concrete > C20/25** | | | | | | | | | |
| Increasing factor for $N_{Rk,p}$ | C30/37 | $\Psi_c$ | [-] | 1,22 | | | | | |
| | C40/50 | | | 1,41 | | | | | |
| | C50/60 | | | 1,55 | | | | | |
| **Splitting failure** | | | | | | | | | |
| Edge distance | | $c_{cr,sp} = c_{cr,N}$ | [mm] | $1,5\ h_{ef}$ | | | | | |
| Spacing | | $s_{cr,sp} = s_{cr,N}$ | | $3,0\ h_{ef}$ | | | | | |
| **Bearing capacity under shear load** | | | | | | | | | |
| **Concrete pry-out failure** | | | | | | | | | |
| Factor k according to ETAG 001, Annex C, Section 5.2.3.3 | | k | [-] | 2,0 | | | | | |
| **Concrete edge failure** | | | | | | | | | |
| The value of $h_{ef}$ ($= l_f$) under shear load | | | [mm] | 60 | 80 | 100 | 125 | 170 | 220 |
| Calculation diameters | | | | | | | | | |
| Size FHB-A | | | | 10x60 | 12x80 | 12x100 | 16x125 | 20x170 | 24x220 |
| | | $d_{nom}$ | [mm] | 10 | 12 | 12 | 16 | 20 | 24 |

**Table C3:** Characteristic values of **resistance** for **fischer Highbond-Anchor FHB-A; uncracked or cracked concrete**

| **Size FHB-A** | | | **10x60** | **12x80** | **12x100** | **16x125** | **20x170** | **24x220** |
|---|---|---|---|---|---|---|---|---|
| **Combined pullout and concrete cone failure** | | | | | | | | |
| Calculation diameter | d | [mm] | 10 | 12 | | 16 | 20 | 24 |
| **Uncracked concrete** | | | | | | | | |
| **Characteristic resistance in uncracked concrete C20/25** | | | | | | | | |
| Temperature range 50 °C / 80 °C | $N_{Rk,p}$ | [kN] | 20 | 25 | 35 | 50 | 60 | 115 |
| **Cracked concrete** | | | | | | | | |
| **Characteristic resistance in cracked concrete C20/25** | | | | | | | | |
| Temperature range 50 °C / 80 °C | $N_{Rk,p}$ | [kN] | [1] | [1] | 30 | [1] | 60 | 95 |
| **Montagesicherheitsfaktor** | | | | | | | | |
| All installation conditions | $\gamma_2 = \gamma_{inst}$ | [-] | 1,0 | | | | | |

[1] Pullout not decisive

**Table C4:** Displacements for **fischer Highbond-Anchor FHB-A**

| **Size FHB-A** | | | **10x60** | **12x80** | **12x100** | **16x125** | **20x170** | **24x220** |
|---|---|---|---|---|---|---|---|---|
| **Displacement-Factors for tensile-load** | | | | | | | | |
| **Uncracked concrete** | | | | | | | | |
| Tension load | N | [kN] | 9,5 | 11,9 | 16,7 | 23,8 | 28,6 | 54,8 |
| Displacements | $\delta_{N0}$ | [mm] | 0,2 | 0,2 | | 0,3 | 0,3 | 0,5 |
| | $\delta_{N\infty}$ | | 0,8 | 0,7 | | 0,7 | 0,7 | 1,1 |
| **Cracked concrete** | | | | | | | | |
| Tension load | N | [kN] | 7,8 | 12,0 | 14,3 | 23,4 | 28,6 | 45,2 |
| Displacements | $\delta_{N0}$ | [mm] | 0,5 | 0,5 | | 0,6 | 0,6 | 0,9 |
| | $\delta_{N\infty}$ | | 0,8 | 0,7 | | 0,7 | 0,7 | 1,1 |
| **Displacement-Factors for tensile-load** | | | | | | | | |
| **Uncracked or cracked concrete** | | | | | | | | |
| Shear load | V | [kN] | 9,3 | 17,0 | | 31,6 | 33,9 | 48,8 |
| Displacements | $\delta_{V0}$ | [mm] | 1,3 | | | | | |
| | $\delta_{V\infty}$ | | 2,0 | | | | | |

fischer Highbond-Anchor FHB

**Performances**
Characteristic values for static or quasi-static action under tensile load (uncracked and cracked concrete); Displacements

**Annex C 3**