

## YDEEVNEDEKLARATION

### DoP 0193

til fischer ankerbolt FXA, FXA R (Metalanker til brug i beton)

DA

|                                                                                       |                                                                                          |                |                              |
|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|----------------|------------------------------|
| 1. <u>Varetypens unikke identifikationskode:</u>                                      | DoP 0193                                                                                 |                |                              |
| 2. <u>Anvendelsesformål:</u>                                                          | Eftermonteret befæstelse i ikke-revnet beton.<br>Se appendiks, specifikt bilagene B1- B3 |                |                              |
| 3. <u>Fabrikant:</u>                                                                  | fischerwerke GmbH & Co. KG, Klaus-Fischer-Str. 1, 72178 Waldachtal, Tyskland             |                |                              |
| 4. <u>Bemyndiget repræsentant:</u>                                                    | -                                                                                        |                |                              |
| 5. <u>System(er) til vurdering og kontrol af konstansen af ydeevnen:</u>              | 1                                                                                        |                |                              |
| 6. <u>Europæisk vurderingsdokument:</u>                                               | EAD 330232-01-0601, (Edition 12/ 2019)                                                   |                |                              |
| Europæisk Teknisk Vurdering                                                           | ETA-13/0772; 2020-07-14                                                                  |                |                              |
| Teknisk vurderingsorgan:                                                              | DIBt- Deutsches Institut für Bautechnik                                                  |                |                              |
| Notificeret organ(er)                                                                 | 1343 MPA Darmstadt / 2873 TU Darmstadt                                                   |                |                              |
| 7. <u>Deklareret ydeevne(r):</u>                                                      |                                                                                          |                |                              |
| <b>Mekanisk modstand og stabilitet (BWR 1)</b>                                        |                                                                                          |                |                              |
| Karakteristisk modstand for træklast (statisk og quasi-statisk belastning):           | Modstand overfor stålsvig:                                                               | Bilagen C1     | E <sub>s</sub> = 210 000 MPa |
|                                                                                       | Modstand overfor svigt ved udtrækning:                                                   | Bilagen C1     |                              |
|                                                                                       | Modstand overfor svigt af beton-kegle:                                                   | Bilagen C1     | k <sub>cr,N</sub> = NPD      |
|                                                                                       | Robusthed:                                                                               | Bilagen C1     |                              |
|                                                                                       | Min. kant og indbyrdes afstand:                                                          | Bilagen C2     |                              |
| Kantafstand til forhindring af flækning under belastning:                             | Bilagen C1                                                                               |                |                              |
| Karakteristisk modstand for tværlast (statisk og quasi-statisk belastning), Metode A: | Modstand overfor stålsvigt (tværlast):                                                   | Bilagen C2     |                              |
|                                                                                       | Modstand overfor svigt ved udtrækning:                                                   | Bilagen C2     |                              |
| Karakteristisk modstand og Forskydninger for seismiske ydelseskategorier C1 og C2:    | Modstand overfor spændingslast, forskydninger, kategori C1:                              | NPD            |                              |
|                                                                                       | Modstand overfor spændingslast, forskydninger, kategori C2:                              | NPD            |                              |
|                                                                                       | Modstand overfor tværlast, forskydninger, kategori C1:                                   | NPD            |                              |
|                                                                                       | Modstand overfor tværlast, forskydninger, kategori C2:                                   | NPD            |                              |
|                                                                                       | Faktor ringhul:                                                                          | NPD            |                              |
|                                                                                       |                                                                                          |                |                              |
| Karakteristisk modstand for forenklet design:                                         | Metode B:                                                                                | NPD            |                              |
|                                                                                       | Metode C:                                                                                | NPD            |                              |
| Forskydninger og Holdbarhed:                                                          | Forskydninger under statisk og quasi-statisk belastning:                                 | Bilagen C2     |                              |
|                                                                                       | Holdbarhed:                                                                              | Bilagen A3, B1 |                              |
| <b>Brandbeskyttelse (BWR 2)</b>                                                       |                                                                                          |                |                              |
| Brandegenskaber:                                                                      | Klasse (A1)                                                                              |                |                              |
| Brandbeskyttelse:                                                                     | Brandbeskyttelse overfor stålsvigt (spændingslast):                                      | NPD            |                              |
|                                                                                       | Brandbeskyttelse overfor svigt ved udtrækning                                            | NPD            |                              |
|                                                                                       | Brandbeskyttelse overfor stålsvigt (tværlast):                                           | NPD            |                              |

8. Relevant teknisk dokumentation og/eller specifik teknisk dokumentation:

Ydeevnen for den vare, der er anført ovenfor, er i overensstemmelse med den deklarerede ydeevne. Denne ydeevnedeklaration er udarbejdet i overensstemmelse med forordning (EU) nr. 305/2011 på eneansvar af den fabrikant, der er anført ovenfor.

Underskrevet for fabrikanten og på dennes vegne af:



Thilo Pregartner, Dr.-Ing.  
Tumlingen, 2020-07-28



Peter Schillinger, Dipl.-Ing.

Denne DoP er tilgængelig i forskellige sprogversioner. I tilfælde af fortolkningsmæssig uoverensstemmelse, henvises der til den engelske version, som altid er gældende.

Appendikset indeholder frivillige og udvidede informationer på engelsk. Disse overgår de lokale (sprogneutrale) retslige krav.

**Specific Part**

**1 Technical description of the product**

The fischer Bolt anchor FXA and FXA R is an anchor made of zinc plate or stainless steel 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 fastener 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 fastener 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 C2    |
| Characteristic resistance to shear load (static and quasi-static loading)                | See Annex C 2           |
| Displacements (static and quasi-static loading)                                          | See Annex C 2           |
| Characteristic resistance and displacements for seismic performance categories C1 and C2 | No performance assessed |
| Durability                                                                               | See Annex B 1           |

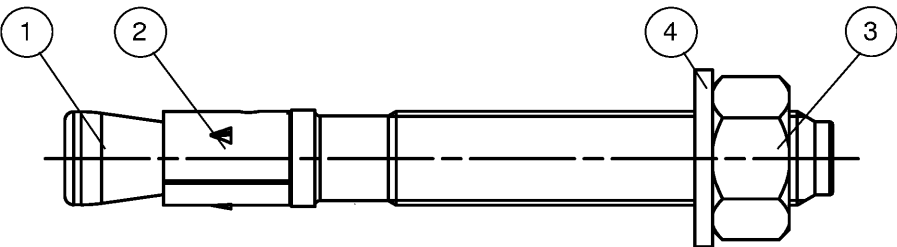
**3.2 Safety in case of fire (BWR 2)**

| Essential characteristic | Performance             |
|--------------------------|-------------------------|
| Reaction to fire         | Class A1                |
| Resistance to fire       | No performance assessed |

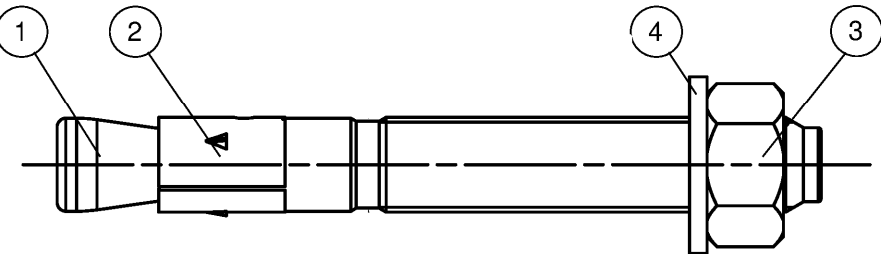
**4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base**

In accordance with the European Assessment Document EAD 330232-01-0601 the applicable European legal act is: [96/582/EC].  
The system to be applied is: 1

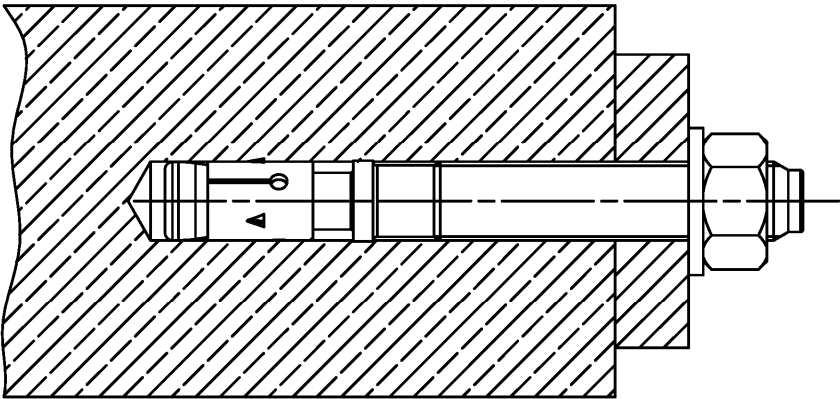
Cone bolt manufactured by cold - forming:



Cone bolt manufactured by turning:



- ① Cone bolt (cold – formed or turned)
- ② Expansion sleeve
- ③ Hexagon nut
- ④ Washer



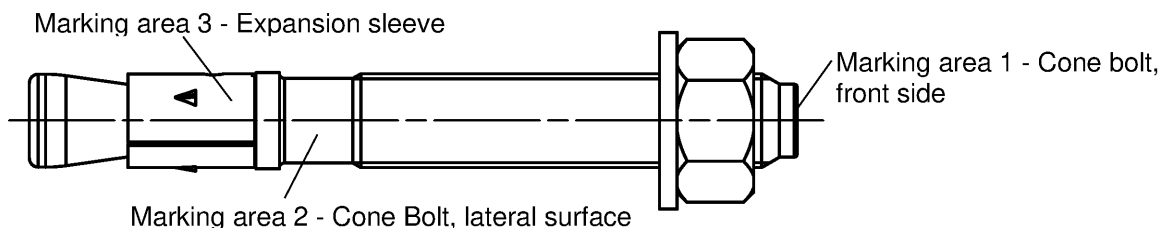
(Fig. not to scale)

fischer Bolt Anchor FXA, FXA R

**Product description**  
Installed condition

**Annex A 1**

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Product label, example:

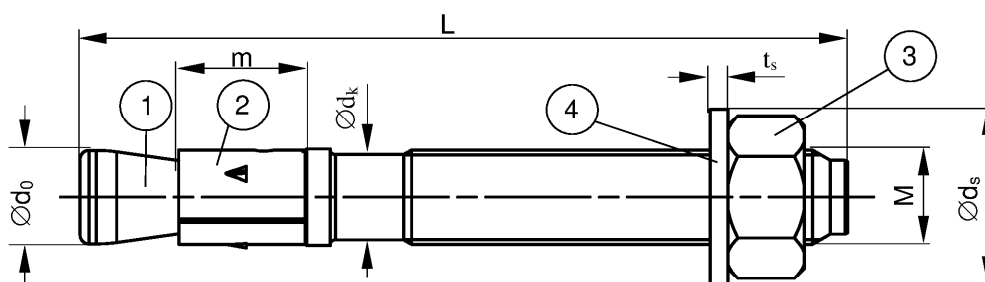
Brand | type of anchor  
placed on marking area 2 or marking area 3

FXA 12/10 R

thread size / thickness of fixture ( $t_{fix}$ )  
identification R  
placed on marking area 2

**Table A2.1:** Letter-code on marking area 1 and maximum thickness of fixture  $t_{fix}$ :

| Marking        | A | B  | C  | D  | E  | F  | G  | H  | I  | K  | L  | M  | N  | O  | P   | R   | S   | T   | U   | V   | W   | X   | Y   | Z   |
|----------------|---|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Max. $t_{fix}$ | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70 | 80 | 90 | 100 | 120 | 140 | 160 | 180 | 200 | 250 | 300 | 350 | 400 |



**Table A2.2:** Anchor dimensions [mm]

| Part                 | Designation      |                     | FXA, FXA R |      |      |      |
|----------------------|------------------|---------------------|------------|------|------|------|
|                      |                  |                     | M8         | M10  | M12  | M16  |
| 1                    | Cone bolt        | M                   | 8          | 10   | 12   | 16   |
|                      |                  | $\varnothing d_0$ = | 7,9        | 9,9  | 11,9 | 15,9 |
|                      |                  | $\varnothing d_k$   | 7,1        | 8,9  | 10,8 | 14,5 |
| 2                    | Expansion sleeve | m =                 | 11,5       | 13,5 | 16,5 | 21,5 |
| 3                    | Hexagon nut      | SW =                | 13         | 17   | 19   | 24   |
| 4                    | Washer           | $t_s$ ≥             | 1,4        | 1,8  | 2,3  | 2,7  |
|                      |                  | $\varnothing d_s$ ≥ | 15         | 19   | 23   | 29   |
| Thickness of fixture |                  | $t_{fix}$ ≥         | 0          |      |      |      |
|                      |                  | $t_{fix}$ ≤         | 200        | 250  | 300  | 400  |
| Length of anchor     |                  | $L_{min}$ =         | 56         | 71   | 86   | 120  |
|                      |                  | $L_{max}$           | 261        | 316  | 396  | 520  |

(Fig. not to scale)

fischer Bolt Anchor FXA, FXA R

**Product description**

Product label and letter code and anchor dimensions

**Annex A 2**

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**Table A3.1:** Materials FXA (zinc plated  $\geq 5\mu\text{m}$ , DIN EN ISO 4042:2018)

| Part | Designation      | Material                                        |
|------|------------------|-------------------------------------------------|
| 1    | Cone bolt        | Cold form steel or free cutting steel           |
| 2    | Expansion sleeve | Cold strip, EN 10139:2016 <sup>1)</sup>         |
| 3    | Hexagon nut      | Steel, property class min. 8, EN ISO 898-2:2012 |
| 4    | Washer           | Cold strip, EN 10139:2013                       |

<sup>1)</sup> Optional stainless steel EN 10088:2014

**Table A3.2: Materials FXA R**

| Part | Designation      | Material                                                                  |
|------|------------------|---------------------------------------------------------------------------|
| 1    | Cone bolt        | Stainless steel EN 10088:2014                                             |
| 2    | Expansion sleeve |                                                                           |
| 3    | Hexagon nut      | Stainless steel EN 10088:2014<br>ISO 3506-2: 2009; property class min. 70 |
| 4    | Washer           | Stainless steel EN 10088:2014                                             |

fischer Bolt Anchor FXA, FXA R

### Product description

#### Materials

## Annex A 3

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## Specifications of intended use

| fischer Bolt Anchor FXA, FXA R |             | M8 | M10 | M12 | M16 |
|--------------------------------|-------------|----|-----|-----|-----|
| Material                       | Steel       | ✓  |     |     |     |
|                                | Zinc plated |    |     |     |     |
| Stainless steel                |             |    |     |     |     |
| R                              |             |    |     |     |     |
| Static and quasi-static loads  |             |    |     |     |     |
| Uncracked concrete             |             |    |     |     |     |

### Base materials:

- Reinforced or unreinforced normal concrete without fibres of strength classes C20/25 to C50/60 according to EN 206:2013+A1:2016

### Use conditions (Environmental conditions):

- Structures subject to dry internal conditions: **FXA**
- For all other conditions according to EN 1993-1-4:2015-10 corresponding to corrosion resistance class CRC III **FXA R**

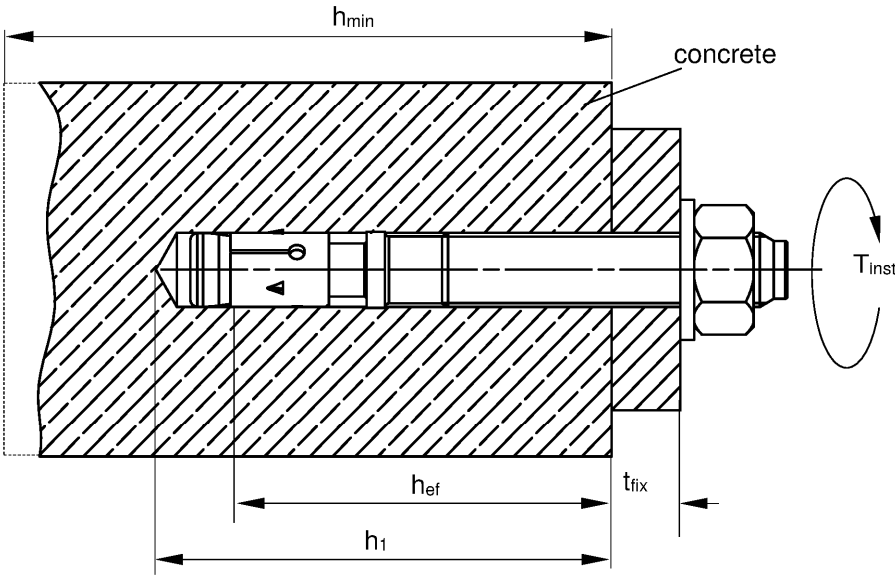
### Design:

- Anchorage is to be designed under the responsibility of an engineer experienced in anchorages and concrete work
- 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.)
- Design of fastenings according to EN 1992-4:2018 and TR 055

|                                       |                                       |
|---------------------------------------|---------------------------------------|
| fischer Bolt Anchor FXA, FXA R        | <b>Annex B 1</b><br><br>Appendix 5/ 9 |
| <b>Intended Use</b><br>Specifications |                                       |

**Table B2.1:** Installation parameters

| Type of anchor / size                     |                   | FXA, FXA R |       |      |      |
|-------------------------------------------|-------------------|------------|-------|------|------|
|                                           |                   | M8         | M10   | M12  | M16  |
| Nominal drill hole diameter               | $d_0 =$           | 8          | 10    | 12   | 16   |
| Cutting diameter of drill bit             | $d_{cut} \leq$    | 8,45       | 10,45 | 12,5 | 16,5 |
| Effective anchorage depth                 | $h_{ef} =$ [mm]   | 40         | 50    | 65   | 80   |
| Depth of drill hole in concrete           | $h_1 \geq$        | 56         | 68    | 85   | 104  |
| Diameter of clearance hole in the fixture | $d_f \leq$        | 9          | 12    | 14   | 18   |
| Required torque moment FXA (zinc plated)  | $T_{inst} =$ [Nm] | 15         | 30    | 50   | 100  |
| Required torque moment FXA R              |                   | 10         | 20    | 35   | 80   |



- $h_{ef}$  = 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

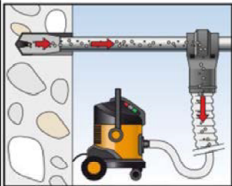
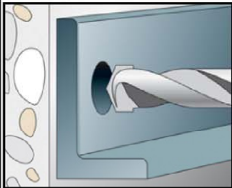
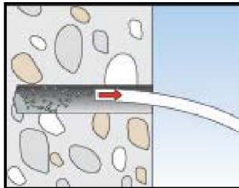
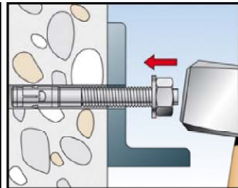
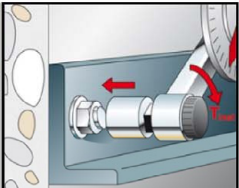
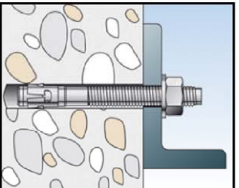
(Fig. not to scale)

fischer Bolt Anchor FXA, FXA R

**Intended Use**  
Installation parameters

Installation instructions

- Fastener installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site
- Use of the fastener only as supplied by the manufacturer without exchanging the components of the fastener
- Checking before placing the fastener to ensure that the strength class of the concrete in which the fastener is to be placed is in the range given and is not lower than that of the concrete to which the characteristic loads apply
- Check of concrete being well compacted, e.g. without significant voids
- Hammer or hollow drilling
- Drill hole created perpendicular +/- 5° to concrete surface, positioning without damaging the reinforcement
- In case of aborted hole: new drilling at a minimum distance twice the depth of the aborted drill hole or smaller distance if the aborted drill hole is filled with high strength mortar and if under shear or oblique tension load it is not in the direction of load application

|                 |                                                                                    |                                                                                    |                                                                                    |                                                                                     |                                                                                      |
|-----------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Hollow drilling |   |                                                                                    |                                                                                    |                                                                                     |                                                                                      |
|                 | Continue with step 3, 4 and 5                                                      |                                                                                    |                                                                                    |                                                                                     |                                                                                      |
| Hammer drilling |  |  |  |  |  |
|                 | 1                                                                                  | 2                                                                                  | 3                                                                                  | 4                                                                                   | 5                                                                                    |

| No. | Description                                                  |                                                        |
|-----|--------------------------------------------------------------|--------------------------------------------------------|
| 1   | Create drill hole with hammer drill                          | Create drill hole with hollow drill and vacuum cleaner |
| 2   | Clean bore hole                                              | -                                                      |
| 3   | Set anchor                                                   |                                                        |
| 4   | Expand anchor with prescribed installation torque $T_{inst}$ |                                                        |
| 5   | Finished installation                                        |                                                        |

Types of drills

Hammer drill



Hollow drill



fischer Bolt Anchor FXA, FXA R

Intended Use  
Installation instructions

**Table C1.1:** Characteristic values of **tension** resistance under static and quasi-static action

| Type of anchor / size                    |                                 |        | FXA, FXA R                                                              |     |     |     |
|------------------------------------------|---------------------------------|--------|-------------------------------------------------------------------------|-----|-----|-----|
|                                          |                                 |        | M8                                                                      | M10 | M12 | M16 |
| Steel failure                            |                                 |        |                                                                         |     |     |     |
| Characteristic resistance                | N <sub>Rk,s</sub>               | [kN]   | 16                                                                      | 25  | 36  | 67  |
| Partial factor                           | γ <sub>Ms</sub> <sup>1)</sup>   | [-]    | 1,4                                                                     |     |     | 1,5 |
| Pullout failure                          |                                 |        |                                                                         |     |     |     |
| Characteristic resistance C20/25         | N <sub>Rk,p</sub>               | [kN]   | 12                                                                      | 16  | 25  | 35  |
| Increasing factors for N <sub>Rk,p</sub> | ψ/c                             | C25/30 | 1,12                                                                    |     |     |     |
|                                          |                                 | C30/37 | 1,23                                                                    |     |     |     |
|                                          |                                 | C35/45 | 1,32                                                                    |     |     |     |
|                                          |                                 | C40/50 | 1,41                                                                    |     |     |     |
|                                          |                                 | C45/55 | 1,50                                                                    |     |     |     |
|                                          |                                 | C50/60 | 1,58                                                                    |     |     |     |
| Installation sensitivity factor          | γ <sub>inst</sub>               | [-]    | 1,2                                                                     |     |     | 1,0 |
| Concrete cone and splitting failure      |                                 |        |                                                                         |     |     |     |
| Effective anchorage depth                | h <sub>ef</sub>                 | [mm]   | 40                                                                      | 50  | 65  | 80  |
| Factor for uncracked concrete            | k <sub>ucr,N</sub>              | [-]    | 11,0 <sup>2)</sup>                                                      |     |     |     |
| Characteristic spacing                   | s <sub>cr,N</sub>               | [mm]   | 3 h <sub>ef</sub>                                                       |     |     |     |
| Characteristic edge distance             | c <sub>cr,N</sub>               |        | 1,5 h <sub>ef</sub>                                                     |     |     |     |
| Spacing (splitting failure)              | s <sub>cr,sp</sub>              |        | 190                                                                     | 200 | 290 | 350 |
| Edge distance (splitting failure)        | c <sub>cr,sp</sub>              |        | 95                                                                      | 100 | 145 | 175 |
| Characteristic resistance to splitting   | N <sup>0</sup> <sub>Rk,sp</sub> | [kN]   | min {N <sup>0</sup> <sub>Rk,c</sub> , N <sub>Rk,p</sub> } <sup>3)</sup> |     |     |     |

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

<sup>2)</sup> Based on concrete strength as cylinder strength

<sup>3)</sup>  $N^0_{Rk,c}$  according to EN 1992-4:2018

fischer Bolt Anchor FXA, FXA R

**Performances**

Characteristic values of tension resistance

**Annex C 1**

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**Table C2.1:** Characteristic values of **shear** resistance under static and quasi-static action

| Type of anchor / size                                    |  |  | FXA, FXA R |     |     |     |
|----------------------------------------------------------|--|--|------------|-----|-----|-----|
|                                                          |  |  | M8         | M10 | M12 | M16 |
| Installation factor $\gamma_{inst}$ [-]                  |  |  | 1,2        |     |     | 1,0 |
| Steel failure without lever arm                          |  |  |            |     |     |     |
| Characteristic resistance $V_{Rk,s}^0$ [kN]              |  |  | 11         | 17  | 25  | 47  |
| Partial factor for steel failure $\gamma_{Ms}^{1)}$ [-]  |  |  | 1,25       |     |     |     |
| Steel failure with lever arm and concrete pryout failure |  |  |            |     |     |     |
| Characteristic bending moment $M_{Rk,s}^0$ [Nm]          |  |  | 23         | 45  | 79  | 200 |
| Partial factor for steel failure $\gamma_{Ms}^{1)}$      |  |  | 1,25       |     |     |     |
| Factor for ductility $k_7$ [-]                           |  |  | 1,0        |     |     |     |
| Factor for pryout $k_8$                                  |  |  | 1          |     | 2   |     |
| Concrete edge failure                                    |  |  |            |     |     |     |
| Effective length of anchor $l_f$ [mm]                    |  |  | 40         | 50  | 65  | 80  |
| Effective diameter of anchor $d_{nom}$                   |  |  | 8          | 10  | 12  | 16  |

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

**Table C2.2:** Minimum thickness of concrete members, minimum spacing and minimum edge distances

| Type of anchor / size       |                | FXA, FXA R |     |     |     |
|-----------------------------|----------------|------------|-----|-----|-----|
|                             |                | M8         | M10 | M12 | M16 |
| Minimum thickness of member | $h_{min}$      | 100        |     | 120 | 160 |
| Minimum spacing             | $s_{min}$ [mm] | 40         | 70  |     | 120 |
| Minimum edge distance       | $c_{min}$      | 45         | 55  | 70  | 90  |

**Table C2.3:** Displacements under static and quasi static **tension** loads

| Type of anchor / size |                                             | FXA, FXA R |     |     |      |
|-----------------------|---------------------------------------------|------------|-----|-----|------|
|                       |                                             | M8         | M10 | M12 | M16  |
| Tension load          | N [kN]                                      | 4,7        | 6,3 | 9,9 | 16,5 |
| Displacements         | $\frac{\delta_{N0}}{\delta_{N\infty}}$ [mm] | 0,6        | 0,9 | 1,9 | 1,8  |
|                       |                                             | 3,1        |     |     |      |

**Table C2.4:** Displacements under static and quasi static **shear** loads

| Type of anchor / size |                                             | FXA, FXA R |     |      |      |
|-----------------------|---------------------------------------------|------------|-----|------|------|
|                       |                                             | M8         | M10 | M12  | M16  |
| Shear load            | V [kN]                                      | 6,3        | 9,5 | 14,3 | 26,8 |
| Displacements         | $\frac{\delta_{V0}}{\delta_{V\infty}}$ [mm] | 1,8        | 2,4 |      | 2,6  |
|                       |                                             | 2,7        | 3,6 |      | 3,9  |

fischer Bolt Anchor FXA, FXA R

#### Performances

Characteristic values of shear resistance, Minimum thickness of concrete members, minimum spacing and edge distance, Displacements due to tension and shear loads

## Annex C 2

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