



LEISTUNGSERKLÄRUNG



DoP: 0014

für fischer Anker Bolzen EXA (Metalldübel zur Verwendung im Beton (hoch belastbar)) – DE

1. Eindeutiger Kenncode des Produkttyps: **DoP: 0014**
2. Verwendungszweck(e): **Nachträgliche Befestigung im ungerissenen Beton, siehe Anhang, insbesondere Anhänge B 1 bis B 3**
3. Hersteller: **fischerwerke GmbH & Co. KG, Klaus-Fischer-Straße 1, 72178 Waldachtal, Deutschland**
4. Bevollmächtigter: --
5. System(e) zur Bewertung und Überprüfung der Leistungsbeständigkeit: **1**
6. Europäisches Bewertungsdokument: **EAD 330232-00-0601**

Europäische Technische Bewertung: **ETA-05/0185; 2018-06-19**

Technische Bewertungsstelle: **CSTB**

Notifizierte Stelle(n): **1343 – MPA Darmstadt**

7. Erklärte Leistung(en):

Mechanische Festigkeit und Standsicherheit (BWR 1), Sicherheit bei der Nutzung (BWR 4)

- **Charakteristische Zugtragfähigkeit: Siehe Anhang, insbesondere Anhang C 1**
- **Charakteristische Quertragfähigkeit: Siehe Anhang, insbesondere Anhang C 1**
- **Verschiebungen: Siehe Anhang, insbesondere Anhang C 2**

Brandschutz (BWR 2)

- **Brandverhalten: Der Dübel erfüllt die Anforderungen der Klasse A 1**

8. Angemessene Technische Dokumentation und/oder Spezifische Technische Dokumentation: ---

Die Leistung des vorstehenden Produkts entspricht der erklärten Leistung/den erklärten Leistungen. Für die Erstellung der Leistungserklärung im Einklang mit der Verordnung (EU) Nr. 305/2011 ist allein der obengenannte Hersteller verantwortlich.

Unterzeichnet für den Hersteller und im Namen des Herstellers von:

Andreas Bucher, Dipl.-Ing.

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

i.V. A. Bucher

i.V. W. Hengesbach

Tumlingen, 2018-06-26

- Diese Leistungserklärung wurde in verschiedenen Sprachversionen erstellt. Für den Fall unterschiedlicher Auslegung hat immer die englische Version Vorrang.
- Der Anhang enthält freiwillige und ergänzende Informationen in englischer Sprache. Diese gehen über die (sprachneutral angegebenen) gesetzlichen Anforderungen hinaus.

Specific Part

1 Technical description of the product

The fischer Anchor bolt EXA anchor is an anchor made of zinc electroplated steel, with two expansion sleeves in the range of sizes M8, M10, M12, M16 and M20.

The anchor is placed into a drilled hole and anchored by torque-controlled expansion.

The illustration and the description of the product are given in Annexes A.

2 Specification of the intended use

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

The provisions made in this European technical assessment are based on an assumed working life of the anchor of 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

3.1 Mechanical resistance and stability (BWR 1)

| Essential characteristic | Performance |
|--|--------------|
| Characteristic tension resistance acc. EN 1992-4 | See Annex C1 |
| Characteristic shear resistance acc. EN 1992-4 | See Annex C1 |
| Displacements | See Annex C2 |

3.2 Safety in case of fire (BWR 2)

| Essential characteristic | Performance |
|--------------------------|---|
| Reaction to fire | Anchorage satisfy requirements for Class A1 |

3.3 Hygiene, health and the environment (BWR 3)

Regarding dangerous substances contained in this European technical approval, there may be requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Directive, these requirements need also to be complied with, when and where they apply.

3.4 Safety in use (BWR 4)

For Basic requirement Safety in use the same criteria are valid as for Basic Requirement Mechanical resistance and stability.

3.5 Protection against noise (BWR 5)

Not relevant.

3.6 Energy economy and heat retention (BWR 6)

Not relevant.

3.7 Sustainable use of natural resources (BWR 7)

For the sustainable use of natural resources no performance was determined for this product.

3.8 General aspects relating to fitness for use

Durability and Serviceability are only ensured if the specifications of intended use according to Annex B1 are kept.

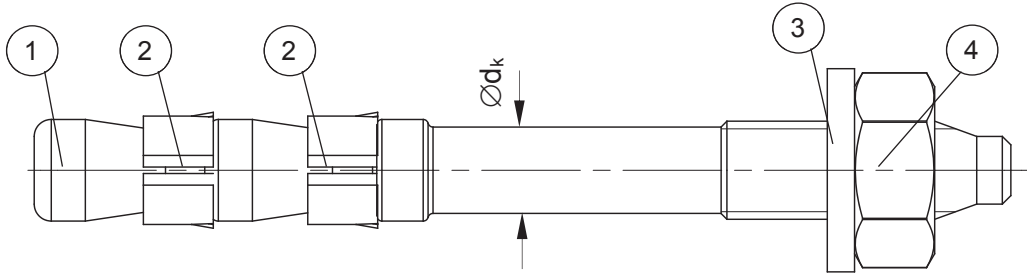
4 Assessment and verification of constancy of performance (AVCP)

According to the Decision 96/582/EC of the European Commission¹, as amended, the system of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) given in the following table apply.

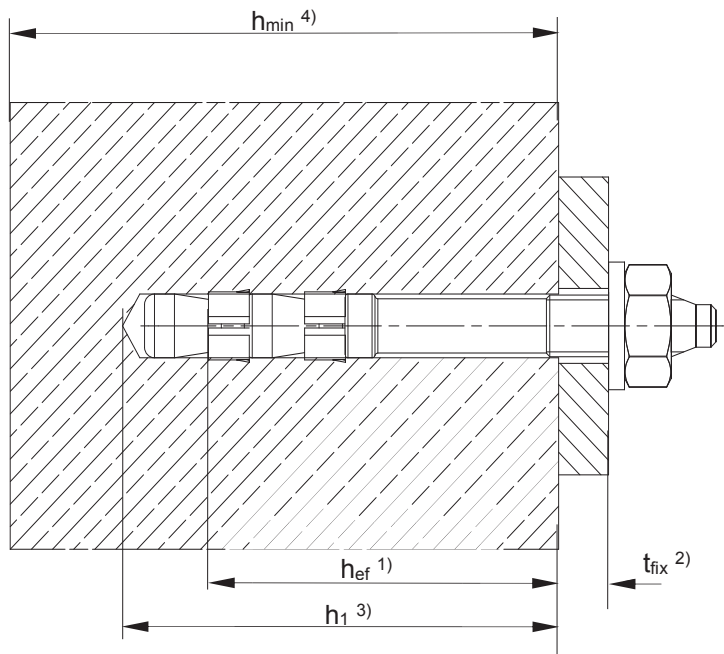
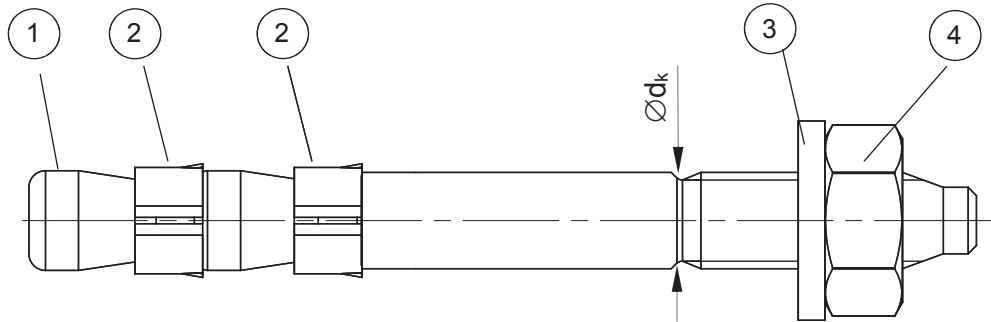
| Product | Intended use | Level or class | System |
|-----------------------------------|--|-----------------------|---------------|
| Metal anchors for use in concrete | For fixing and/or supporting to concrete, structural elements (which contributes to the stability of the works) or heavy units | — | 1 |

1

M8, M10 and M12: Cone bolt manufactured by cold - forming:



M12, M16 and M20: Cone bolt manufactured by metal - cutting:



For use in uncracked concrete subject to dry internal conditions only

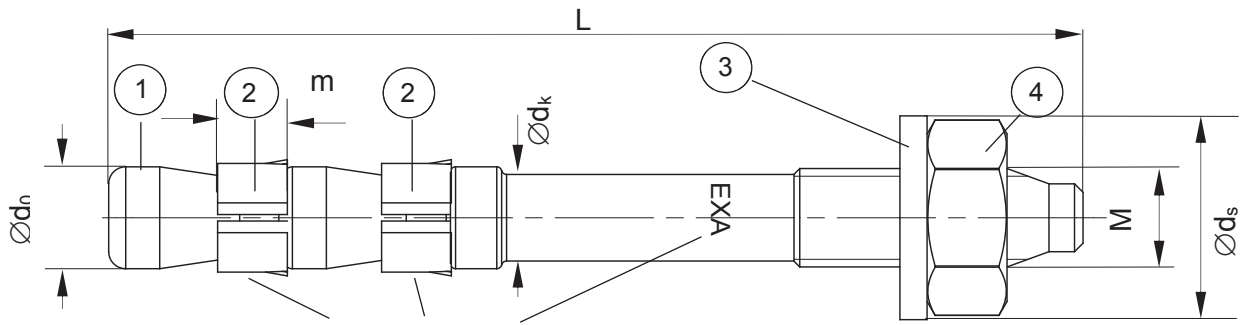
- ① Cone bolt (cold – formed or metal - cut)
- ② Expansion sleeve
- ③ Washer
- ④ Hexagon nut

- 1) effective anchorage depth
- 2) thickness of fixture
- 3) drill hole depth
- 4) min. thickness of concrete member

fischer Anchor bolt EXA

Product description
Installation condition

Annex A1



Marking Cone Bolt on lateral surface and/or on sleeves

U EXA 8 /28
 U works symbol
 EXA type of anchor
 8 /28 thread size
 maximal thickness of fixture ($t_{fix, max}$)

Table A2.1: Anchor dimensions [mm]

| Part | Designation | Dimensions | | EXA | EXA | EXA | EXA | EXA |
|------|---------------------------------------|------------------|---|-----|-----|------|------|------|
| | | | | M8 | M10 | M12 | M16 | M20 |
| 1 | Cone bolt | M | | 8 | 10 | 12 | 16 | 20 |
| | | Ø d ₀ | = | 7,9 | 9,9 | 11,9 | 16,0 | 20,0 |
| | | Ø d _k | = | 7,1 | 8,9 | 10,8 | 15,5 | 18,2 |
| 2 | Expansion sleeve | m | = | 5,3 | 6,4 | 7,2 | 10,3 | 12 |
| 3 | Washer | t _s | ≥ | 1,4 | 1,8 | 2,3 | 2,7 | 2,7 |
| | | Ø d _s | ≥ | 15 | 19 | 23 | 29 | 36 |
| 4 | Hexagon nut | SW | | 13 | 17 | 19 | 24 | 30 |
| | Thickness of fixture t _{fix} | min | ≥ | 0 | 0 | 0 | 0 | 0 |
| | | max | ≤ | 200 | 250 | 350 | 400 | 500 |
| | Length of anchor | L _{min} | | 68 | 73 | 97 | 122 | 146 |
| | | L _{max} | | 267 | 323 | 446 | 522 | 646 |

Table A2.2: Materials

| Part | Designation | Material | Treatment |
|------|------------------|---------------------------------------|--|
| 1 | Cone bolt | Cold form steel or free cutting steel | Zinc plated ≥ 5 µm according to EN ISO 4042 |
| 2 | Expansion sleeve | Cold strip, EN 10088-2 or EN 10139 | EN 10088-2: --- EN 10139: Zinc plated ≥ 5 µm according to EN ISO 4042 |
| 3 | Washer | Cold strip, EN 10139 | Zinc plated ≥ 5 µm according to EN ISO 4042; |
| 4 | Hexagon nut | Steel, property class 8, EN 20898-2 | Nuts M8 and M10 with coating |

fischer Anchor bolt EXA

Product description
 Dimensions and materials

Annex A2

Specifications of intended use

Anchorage subject to:

- Static and quasi-static loads

Base materials:

- Uncracked concrete
- Reinforced or unreinforced normal weight concrete of strength classes C20/25 at least to C50/60 at most according to EN 206.

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions.

Design:

- The anchorages are designed in accordance with the EN 1992-4 "Design of fastenings for use in concrete" or with ETAG001 Annex C "Design Method for Anchorages" under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings.

Installation:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Use of the anchor only as supplied by the manufacturer without exchanging the components of an anchor.
- Anchor installation in accordance with the manufacturer's specifications and drawings and using the appropriate tools.
- Effective anchorage depth, edge distances and spacing not less than the specified values without minus tolerances.
- Hole drilling by hammer drill with conventional bit or hollow drill bit.
- Cleaning of the hole of drilling dust.
- Application of specified torque moment using a calibrated torque wrench.
- In case of aborted hole, drilling of new hole at a minimum distance of twice the depth of the aborted hole, or smaller distance provided the aborted drill hole is filled with high strength mortar and no shear or oblique tension loads in the direction of aborted hole

fischer Anchor bolt EXA

Product description
Specification

Annex B1

Table B2.1: Installation parameters

| Type of anchor / size | | EXA M8 | EXA M10 | EXA M12 | EXA M16 | EXA M20 |
|---|-----------------------------------|--------|---------|---------|---------|---------|
| Nominal drill hole diameter | $d_0 = [\text{mm}]$ | 8 | 10 | 12 | 16 | 20 |
| Cutting diameter of drill bit | $d_{\text{cut}} \leq [\text{mm}]$ | 8,45 | 10,45 | 12,5 | 16,5 | 20,55 |
| Effective anchorage depth | $h_{\text{ef}} \geq [\text{mm}]$ | 47 | 49 | 67 | 85 | 103 |
| Depth of drill hole in concrete | $h_1 \geq [\text{mm}]$ | 60 | 65 | 85 | 110 | 130 |
| Minimum thickness of concrete member | $h_{\text{min}} \geq [\text{mm}]$ | 100 | 100 | 135 | 170 | 205 |
| Diameter of clearance hole in the fixture | $d_f \leq [\text{mm}]$ | 9 | 12 | 14 | 18 | 22 |
| Required torque moment | $T_{\text{inst}} = [\text{Nm}]$ | 14 | 30 | 60 | 80 | 140 |

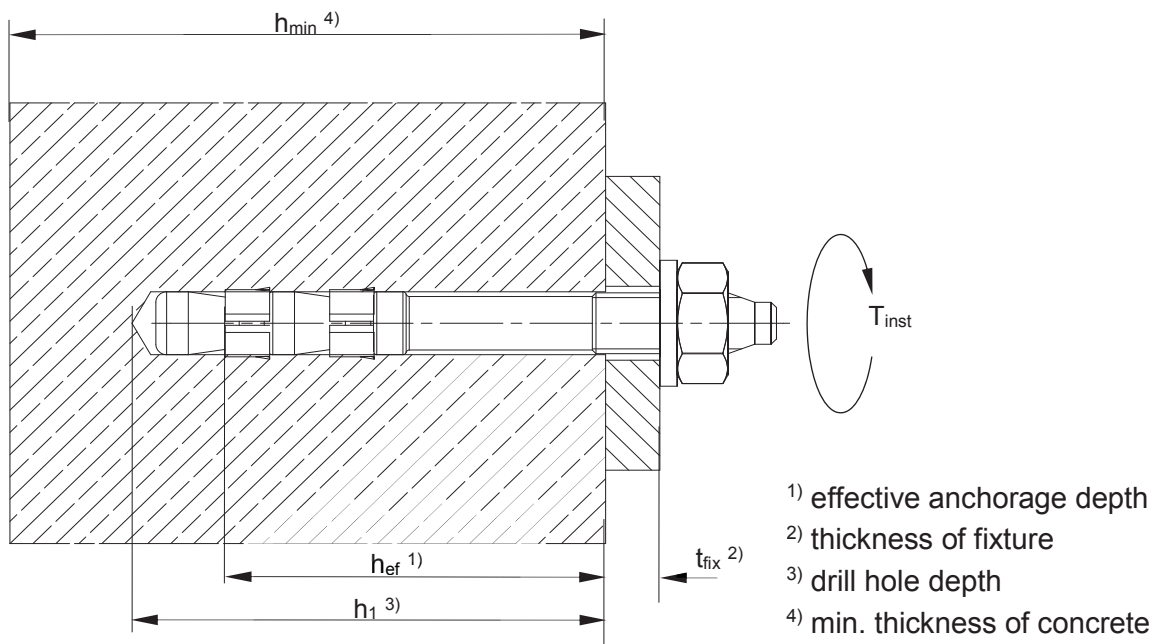


Table B2.2: Minimum spacing and minimum edge distances of anchors

| Type of anchor / size | | EXA M8 | EXA M10 | EXA M12 | EXA M16 | EXA M20 |
|-----------------------|------------------------------|--------|---------|---------|---------|---------|
| Minimum spacing | $s_{\text{min}} [\text{mm}]$ | 45 | 50 | 75 | 85 | 105 |
| | for $c \geq [\text{mm}]$ | 60 | 85 | 90 | 145 | 170 |
| Minimum edge distance | $c_{\text{min}} [\text{mm}]$ | 40 | 65 | 90 | 90 | 100 |
| | for $s \geq [\text{mm}]$ | 100 | 100 | 75 | 145 | 170 |

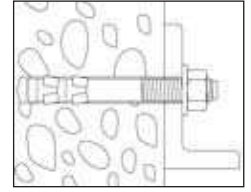
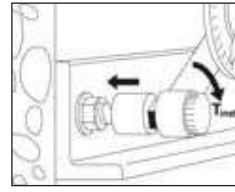
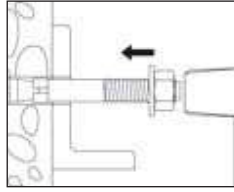
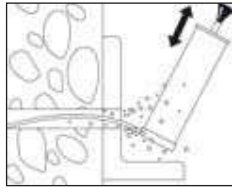
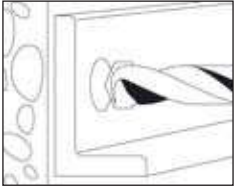
fischer Anchor bolt EXA

Intended Use

Installation parameters, minimum spacing and edge distance

Annex B2

Installation instructions:



fischer Anchor bolt EXA

Intended Use
Installation instructions

Annex B3

Table C1.1: Characteristic resistance to tension and shear load

| | | | EXA M8 | EXA M10 | EXA M12 | EXA M16 | EXA M20 |
|---|----------------------------|----------|--------|---------|------------------|------------------|------------------|
| Steel failure | | | | | | | |
| Characteristic Resistance in tension | $N_{Rk,s}$ | [kN] | 23 | 35 | 48 | 62 | 108 |
| Partial safety factor | $\gamma_{Ms,N}^{1)}$ | [-] | 1,48 | 1,44 | 1,40 | 1,57 | 1,57 |
| Characteristic resistance in shear without lever arm | $V_{Rk,s}$ | [kN] | 13 | 19 | 23 ²⁾ | 51 ²⁾ | 75 ²⁾ |
| Partial safety factor | $\gamma_{Ms,V}^{1)}$ | [-] | 1,50 | 1,50 | 1,50 | 1,31 | 1,31 |
| k ₇ Factor | k ₇ | [-] | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 |
| Characteristic resistance in bending | $M^0_{Rk,s}$ | [Nm] | 27 | 50 | 85 | 183 | 357 |
| Pullout failure | | | | | | | |
| Characteristic resistance in uncracked concrete C20/25 | $N_{Rk,p}$ | [kN] | 12 | 16 | 25 | 35 | 52 |
| Increasing factor for N_{RK} | C25/30 | Ψ_c | [-] | 1,10 | | | |
| | C30/37 | | [-] | 1,22 | | | |
| | C35/45 | | [-] | 1,34 | | | |
| | C40/50 | | [-] | 1,41 | | | |
| | C45/55 | | [-] | 1,48 | | | |
| | C50/60 | | [-] | 1,55 | | | |
| Concrete cone failure and splitting failure | | | | | | | |
| Effective embedment depth | h_{ef} | [mm] | 47 | 49 | 67 | 85 | 103 |
| Factor uncracked concrete | $k_{ucr,N}$ | [-] | 10,1 | | | | |
| Installation safety factor | $\gamma_2 = \gamma_{Inst}$ | | 1,0 | | | | |
| Increasing factor for N_{RK} | C30/37 | Ψ_c | [-] | 1,22 | | 1,12 | 1,00 |
| | C40/50 | | [-] | 1,41 | | 1,23 | 1,00 |
| | C50/60 | | [-] | 1,55 | | 1,30 | 1,00 |
| Characteristic spacing concrete cone failure | $s_{cr,N}$ | [mm] | 140 | 150 | 200 | 260 | 310 |
| Characteristic spacing splitting failure | $s_{cr,sp}$ | [mm] | 330 | 340 | 425 | 425 | 515 |
| Characteristic edge distance concrete cone failure | $c_{cr,N}$ | [mm] | 70 | 75 | 100 | 130 | 155 |
| Characteristic edge distance splitting failure | $c_{cr,sp}$ | [mm] | 165 | 170 | 215 | 215 | 260 |
| Concrete pryout failure | | | | | | | |
| k ₈ factor | k ₈ | [-] | 1,0 | 1,0 | 2,0 | 2,0 | 2,0 |
| Concrete edge failure | | | | | | | |
| Effective length of anchor | $l_f = h_{ef}$ | [mm] | 47 | 49 | 67 | 85 | 103 |
| Outside diameter of anchor | d_{nom} | [mm] | 8 | 10 | 12 | 16 | 20 |

¹⁾ In absence of other national regulations

²⁾ Values issued from the test series because the failure does not occur in the threaded part.

fischer Anchor bolt EXA

Performances

Characteristic Resistances of tension and shear load

Annex C1

Table C2.1: Displacements under tension loads

| | | EXA M8 | EXA M10 | EXA M12 | EXA M16 | EXA M20 |
|--|-------------------------|-----------|------------|------------|------------|------------|
| Tension load in uncracked concrete C20/25 to C50/60 [kN] | | 3,4 | 5,3 | 8,3 | 13,9 | 20,6 |
| Displacement | δ_{N0} [mm] | 0,1 | 0,1 | 0,1 | 0,2 | 0,3 |
| | $\delta_{N\infty}$ [mm] | 0,3 | 0,3 | 0,3 | 0,3 | 0,6 |

Table C2.2: Displacements under shear loads

| | | EXA M8 | EXA M10 | EXA M12 | EXA M16 | EXA M20 |
|--|-------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Shear load in uncracked concrete C20/25 to C50/60 [kN] | | 6,2 | 9,1 | 11,0 | 27,8 | 40,9 |
| Displacement | δ_{V0} [mm] | 2,7 ¹⁾ | 4,5 ¹⁾ | 2,5 ¹⁾ | 3,2 ¹⁾ | 5,5 ¹⁾ |
| | $\delta_{V\infty}$ [mm] | 3,8 ¹⁾ | 6,1 ¹⁾ | 3,1 ¹⁾ | 4,3 ¹⁾ | 7,6 ¹⁾ |

¹⁾ All values including axial clearance from anchor and attachment part.

Displacement under shear loading: additional displacements due to through hole in the fixture shall be considered

fischer Anchor bolt EXA

Performances
Displacements

Annex C2