

## VYHLÁSENIE O PARAMETROCH

### DoP 0213

pre fischer chemický kotviaci systém FIS AB (Kovové injektážne kotvy pre použitie v murive)

SK

- |                                                                       |                                                                                        |
|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 1. <u>Jedinečný identifikačný kód typu výrobku:</u>                   | <b>DoP 0213</b>                                                                        |
| 2. <u>Zamýšľané použitie/použitia:</u>                                | <b>Dodatočné upevnenie do muriva, pozri prílohu, najmä prílohy B1 - B12.</b>           |
| 3. <u>Výrobca:</u>                                                    | <b>fischerwerke GmbH &amp; Co. KG, Klaus-Fischer-Str. 1, 72178 Waldachtal, Germany</b> |
| 4. <u>Splnomocnený zástupca:</u>                                      | <b>—</b>                                                                               |
| 5. <u>Systém(-y) posudzovania a overovania nemennosti parametrov:</u> | <b>1</b>                                                                               |
| 6. <u>Európsky hodnotiaci dokument:</u>                               | <b>EAD 330076-00-0604, Edition 11/ 2017</b>                                            |
| Európske technické posúdenie:                                         | <b>ETA-17/0352; 2021-06-08</b>                                                         |
| Orgán technického posudzovania:                                       | <b>DIBt- Deutsches Institut für Bautechnik</b>                                         |
| Notifikovaný(-é) subjekt(-y):                                         | <b>2873 TU Darmstadt</b>                                                               |

### 7. Deklarované parametre:

#### **Mechanická odolnosť a stabilita (BWR 1)**

##### **Charakteristické hodnoty únosnosti:**

Redukčný faktor: pozri prílohu, najmä prílohu C27

Charakteristická odolnosť jednej kotvy pri zaťažení ťahom: pozri prílohu, najmä prílohy B3, C5, C7, C9, C11, C13, C15, C17, C19, C21, C23, C26

Charakteristická odolnosť skupiny kotiev pri zaťažení ťahom: pozri prílohu, najmä prílohu B11

Charakteristická odolnosť jednej kotvy pri zaťažení šmykom: pozri prílohu, najmä prílohy B3, C2, C3, C5, C7, C9, C11, C13, C15, C17, C19, C21, C23, C26

Charakteristická odolnosť skupiny kotiev pri zaťažení šmykom bez a s ovplyvnením od okrajov: pozri prílohu, najmä prílohu B11

Charakteristická okrajová a osová vzdialenosť: pozri prílohu, najmä prílohy B11, C4, C6, C8, C10, C12, C14, C16, C18, C20, C22, C24

Minimálna vzdialenosť od okraja a osová vzdialenosť: pozri prílohu, najmä prílohy B11, C4, C6, C8, C10, C12, C14, C16, C18, C20, C22, C24

Skupinový faktor pri zaťažení ťahom a šmykom: pozri prílohu, najmä prílohy B11, C4, C6, C8, C10, C12, C14, C16, C18, C20, C22, C25

Minimálne hrúbka základného materiálu: pozri prílohu, najmä prílohu B2

Životnosť: pozri prílohu, najmä prílohy A5, B2, B3

Posuny: pozri prílohu, najmä prílohu C27

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

Reacție la foc: Clasa (A1)

#### **Igienă, sănătate și mediu (BWR 3)**

Conținutul, emisia și / sau eliberarea de substanțe periculoase: NPD

8. Vhodná technická dokumentácia a/alebo špecifická –  
technická dokumentácia:

Uvedené parametre výrobku sú v zhode so súborom deklarovaných parametrov. Toto vyhlásenie o parametroch sa v súlade s nariadením (EÚ) č. 305/2011 vydáva na výhradnú zodpovednosť uvedeného výrobcu.

Podpísal(-a) za a v mene výrobcu:



Dr. Oliver Geibig, konateľ oddelenia Produkt management & vývoj  
Tumlingen, 2021-06-14



Jürgen Grün, konateľ oddelenia Chemická výroba & kvalita

Toto vyhlásenie o vlastnostiach bolo vyhotovené v rôznych jazykoch. V prípade, že dôjde k rozdielnemu výkladu má anglická verzia vždy prednosť.

Príloha obsahuje dobrovoľné a doplnujúce informácie v anglickom jazyku. Tieto vychádzajú zo zákonom stanovených požiadaviek (jazykovo neutrálnych) .

## Specific Part

### 1 Technical description of the product

The fischer injectionsystem FIS AB for masonry is a bonded anchor (injection type) consisting of a mortar cartridge with injection mortar fischer FIS AB, FIS AB Low Speed and FIS AB High Speed, a perforated sieve sleeve and an anchor rod with hexagon nut and washer or an internal threaded rod. The steel elements are made of zinc coated steel, stainless steel or high corrosion resistant steel.

The anchor rod is placed into a drilled hole filled with injection mortar and is anchored via the bond between steel element, injection mortar and masonry and mechanical interlock.

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 values for resistance | See Annexes C 1 to C 26 |
| Displacements                        | See Annex C 27          |
| Durability                           | See annex B 2           |

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

| Essential characteristic | Performance |
|--------------------------|-------------|
| Reaction to fire         | Class A1    |

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

| Essential characteristic                                 | Performance             |
|----------------------------------------------------------|-------------------------|
| Content, emission and/or release of dangerous substances | 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 330076-00-0604 the applicable European legal act is: [97/177/EC].

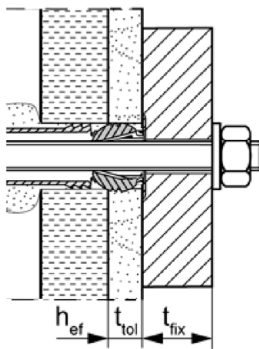
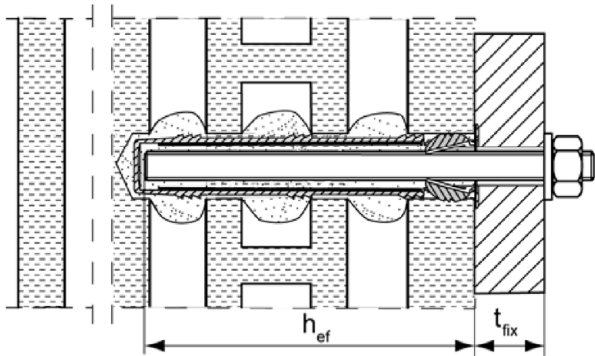
The system to be applied is: 1

Installation conditions part 1

Anchor rods with perforated sleeve FIS H K; Installation in perforated and solid brick masonry

Pre-positioned anchorage:

Installation with render bridge

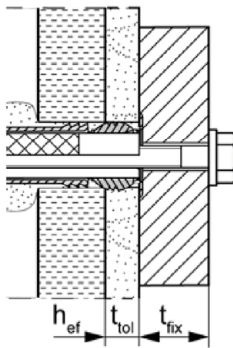
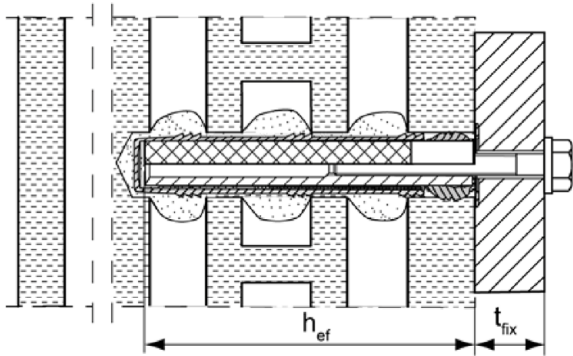


|                                |               |                |                |
|--------------------------------|---------------|----------------|----------------|
| Size of the perforated sleeve: | FIS H 12x85 K | FIS H 16x130 K | FIS H 20x130 K |
|                                | FIS H 16x85 K | FIS H 20x85 K  | FIS H 20x200 K |

Internal threaded anchor FIS E with perforated sleeve FIS H K;  
Installation in perforated and solid brick masonry

Pre-positioned anchorage:

Installation with render bridge



Figures not to scale

|                                      |                                                         |
|--------------------------------------|---------------------------------------------------------|
| $h_{ef}$ = effective anchorage depth | $t_{tol}$ = thickness of unbearing layer (e.g. plaster) |
| $t_{fix}$ = thickness of fixture     |                                                         |

fischer injection system FIS AB for masonry

**Product description**  
Installation conditions part 1, Installation in perforated and solid brick masonry  
Anchor rods and internal threaded anchor with perforated sleeve

Installation conditions part 2

Anchor rods without perforated sleeve FIS H K;  
Installation in solid brick masonry and autoclaved aerated concrete

Pre-positioned anchorage: Push through anchorage: Annular gap filled with mortar



Installation with render bridge

Internal threaded anchors FIS E without perforated sleeve FIS H K;  
Installation in solid brick masonry and autoclaved aerated concrete

Pre-positioned anchorage:



Installation with render bridge

Figures not to scale

|                                      |                                                         |
|--------------------------------------|---------------------------------------------------------|
| $h_0$ = depth of drill hole          | $t_{tol}$ = thickness of unbearing layer (e.g. plaster) |
| $h_{ef}$ = effective anchorage depth | $t_{fix}$ = thickness of fixture                        |

fischer injection system FIS AB for masonry

**Product description**  
Installation conditions part 2, Installation in solid brick masonry and autoclaved aerated concrete. Anchor rods and internal threaded anchors without perforated sleeve

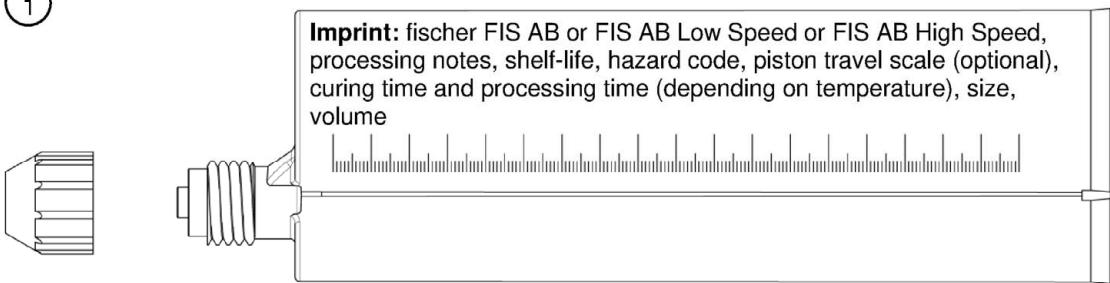
Overview system components part 1

Mortar cartridge (shuttle cartridge) with sealing cap

1

Size: 350 ml, 360 ml, 390 ml, 550 ml, 825 ml

**Imprint:** fischer FIS AB or FIS AB Low Speed or FIS AB High Speed, processing notes, shelf-life, hazard code, piston travel scale (optional), curing time and processing time (depending on temperature), size, volume

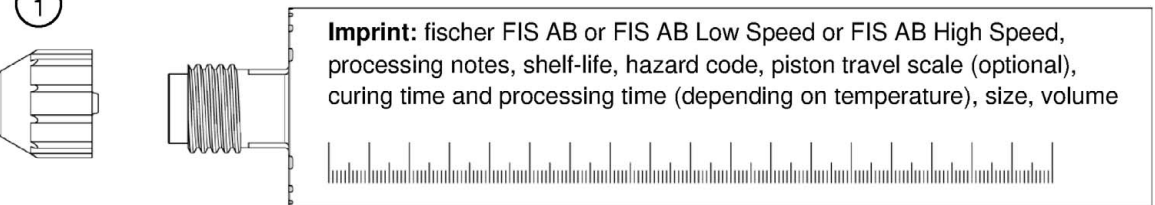


Mortar cartridge (coaxial cartridge) with sealing cap

1

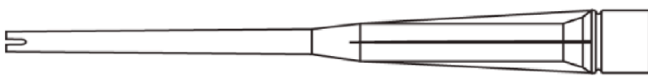
Size: 100 ml, 150 ml, 300 ml, 380 ml, 400 ml, 410 ml

**Imprint:** fischer FIS AB or FIS AB Low Speed or FIS AB High Speed, processing notes, shelf-life, hazard code, piston travel scale (optional), curing time and processing time (depending on temperature), size, volume

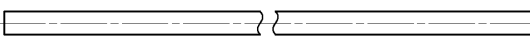


Static mixer MR Plus with extension tube

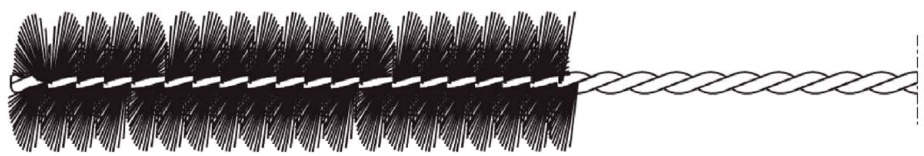
Static mixer



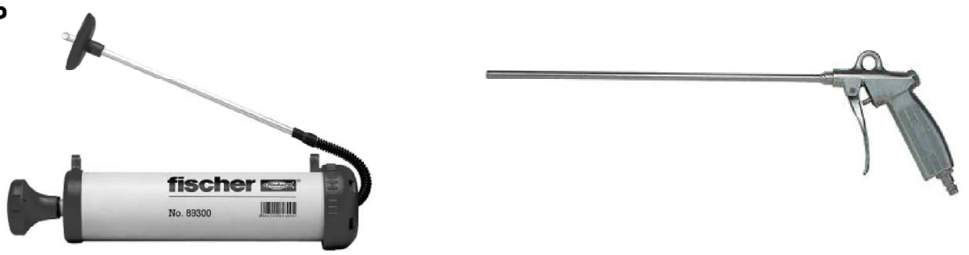
Extension tube



Cleaning brush BS



Blow-out pump ABG or ABP



|                                                                                                           |                                     |
|-----------------------------------------------------------------------------------------------------------|-------------------------------------|
| Figures not to scale                                                                                      |                                     |
| fischer injection system FIS AB for masonry                                                               | <b>Annex A 3</b><br>Appendix 4 / 45 |
| <b>System description</b><br>Overview system components part 1: cartridge / static mixer / cleaning tools |                                     |

Overview system components part 2

fischer anchor rod

2



Size: M8, M10, M12

Internal threaded anchor FIS E

5



Size: 11x85 M6 / M8  
15x85 M10 / M12

Perforated sleeve FIS H K

7



Size: FIS H 12x85 K  
FIS H 16x85 K  
FIS H 20x85 K

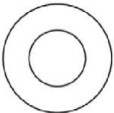
7



Size: FIS H 16x130 K  
FIS H 20x130 K  
FIS H 20x200 K

Washer

3



Hexagon nut

4



Figures not to scale

fischer injection system FIS AB for masonry

**System description**  
Overview system components part 2: steel parts / perforated sleeve

**Table A5.1: Materials**

| Part | Designation                                                                           | Material                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                 |
|------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Mortar cartridge                                                                      | Mortar, hardener; filler                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                 |
|      |                                                                                       | Steel                                                                                                                                                                                                                                                     | Stainless steel R                                                                                                                                                                                                                    | High corrosion-resistant steel HCR                                                                                                                                                                                              |
|      |                                                                                       | zinc plated                                                                                                                                                                                                                                               | acc. to EN 10088-1:2014<br>Corrosion resistance class<br>CRC III<br>acc. to EN 1993-1-4:2015                                                                                                                                         | acc. to EN 10088-1:2014<br>Corrosion resistance class<br>CRC V<br>acc. to EN 1993-1-4:2015                                                                                                                                      |
| 2    | Anchor rod                                                                            | Property class<br>4.8; 5.8 or 8.8;<br>EN ISO 898-1: 2013<br>zinc plated $\geq 5\mu\text{m}$ ,<br>EN ISO 4042:2018<br>Zn5/An(A2K)<br>or hot-dip galvanised<br>EN ISO 10684:2004<br>$f_{uk} \leq 1000 \text{ N/mm}^2$<br>$A_5 > 8\%$ fracture<br>elongation | Property class<br>50, 70 or 80;<br>EN ISO 3506-1:2009<br>1.4401; 1.4404; 1.4578;<br>1.4571; 1.4439; 1.4362;<br>1.4062; 1.4662; 1.4462;<br>EN 10088-1:2014<br>$f_{uk} \leq 1000 \text{ N/mm}^2$<br>$A_5 > 8\%$ fracture<br>elongation | Property class<br>50 or 80;<br>EN ISO 3506-1:2009<br>or property class 70 with<br>$f_{yk} = 560 \text{ N/mm}^2$<br>1.4565; 1.4529<br>EN 10088-1:2014<br>$f_{uk} \leq 1000 \text{ N/mm}^2$<br>$A_5 > 8\%$ fracture<br>elongation |
| 3    | Washer<br>ISO 7089:2000                                                               | zinc plated $\geq 5\mu\text{m}$ ,<br>EN ISO 4042:2018<br>Zn5/An(A2K)<br>or hot-dip galvanised<br>EN ISO 10684:2004                                                                                                                                        | 1.4401; 1.4404;<br>1.4578; 1.4571;<br>1.4439; 1.4362;<br>EN 10088-1:2014                                                                                                                                                             | 1.4565; 1.4529<br>EN 10088-1:2014                                                                                                                                                                                               |
| 4    | Hexagon nut                                                                           | Property class 5 or 8;<br>EN ISO 898-2:2012<br>zinc plated $\geq 5\mu\text{m}$ ,<br>EN ISO 4042:2018<br>Zn5/An(A2K)<br>or hot-dip galvanised<br>ISO 10684:2004                                                                                            | Property class<br>50, 70 or 80;<br>EN ISO 3506-1:2020<br>1.4401; 1.4404;<br>1.4578; 1.4571;<br>1.4439; 1.4362;<br>EN 10088-1:2014                                                                                                    | Property class<br>50, 70 or 80;<br>EN ISO 3506-1:2009<br>1.4565; 1.4529<br>EN 10088-1:2014                                                                                                                                      |
| 5    | Internal threaded<br>anchor FIS E                                                     | Property class 5.8;<br>EN 10277-1:2008-06<br>zinc plated $\geq 5\mu\text{m}$ ,<br>EN ISO 4042:2018<br>Zn5/An(A2K)                                                                                                                                         | Property class 70;<br>EN ISO 3506-1:2020<br>1.4401; 1.4404;<br>1.4578; 1.4571;<br>1.4439; 1.4362;<br>EN 10088-1:2014                                                                                                                 | Property class 70<br>EN ISO 3506-1:2009<br>1.4565; 1.4529<br>EN 10088-1:2014                                                                                                                                                    |
| 6    | Commercial standard<br>screw or threaded rod<br>for internal threaded<br>anchor FIS E | Property class<br>5.8 or 8.8;<br>EN ISO 898-1:2013<br>zinc plated $\geq 5\mu\text{m}$ ,<br>EN ISO 4042:2018<br>Zn5/An(A2K)                                                                                                                                | Property class 70;<br>EN ISO 3506-1:2020<br>1.4401; 1.4404;<br>1.4578; 1.4571;<br>1.4439; 1.4362;<br>EN 10088-1:2014                                                                                                                 | Property class 70;<br>EN ISO 3506-1:2009<br>1.4565; 1.4529<br>EN 10088-1:2014                                                                                                                                                   |
| 7    | Perforated sleeve                                                                     | PP / PE                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                 |

fischer injection system FIS AB for masonry

**Product description**  
 Materials
**Annex A 5**

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| Specifications of intended use (part 1)                                                                                   |                          |                                                                                                 |                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Table B1.1: Overview use and performance categories                                                                       |                          |                                                                                                 |                                                                                                                                                                                                                          |
|                                                                                                                           |                          | fischer injection system FIS AB for masonry                                                     |                                                                                                                                                                                                                          |
| Hole drilling with hammer drill mode<br> |                          | all bricks                                                                                      |                                                                                                                                                                                                                          |
| Hole drilling with rotary drill mode<br> |                          | all bricks                                                                                      |                                                                                                                                                                                                                          |
| Static and quasi static load, in masonry                                                                                  |                          | all bricks                                                                                      |                                                                                                                                                                                                                          |
| Use category                                                                                                              | dry or wet masonry       | all bricks                                                                                      |                                                                                                                                                                                                                          |
| Installation                                                                                                              | Pre-positioned anchorage | Anchor rod or internal threaded anchor (in solid brick masonry and autoclaved aerated concrete) | Perforated sleeve with anchor rod or internal threaded anchor (in perforated and solid brick masonry)<br><br>Size: FIS H 12x85 K<br>FIS H 16x85 K<br>FIS H 16x130 K<br>FIS H 20x85 K<br>FIS H 20x130 K<br>FIS H 20x200 K |
|                                                                                                                           | Push through anchorage   | Anchor rod (in solid brick masonry and autoclaved aerated concrete)                             | ---                                                                                                                                                                                                                      |
| Installation conditions                                                                                                   | category d/d             | all bricks                                                                                      |                                                                                                                                                                                                                          |
|                                                                                                                           | category w/d             |                                                                                                 |                                                                                                                                                                                                                          |
|                                                                                                                           | category w/w             |                                                                                                 |                                                                                                                                                                                                                          |
| Installation direction                                                                                                    |                          | D3 (downward and horizontal and upwards (e.g. overhead) installation)                           |                                                                                                                                                                                                                          |
| Installation temperature                                                                                                  |                          | T <sub>i,min</sub> = 0 °C bis T <sub>i,max</sub> = +40 °C                                       |                                                                                                                                                                                                                          |
| In-service temperature                                                                                                    | Temperature range Tb     | -40 °C to +80 °C (max. short term temperature +80 °C<br>max. long term temperature +50 °C)      |                                                                                                                                                                                                                          |
|                                                                                                                           |                          |                                                                                                 |                                                                                                                                                                                                                          |
| fischer injection system FIS AB for masonry                                                                               |                          |                                                                                                 | Annex B 1<br><br>Appendix 7 / 45                                                                                                                                                                                         |
| Intended Use<br>Specifications (part 1)                                                                                   |                          |                                                                                                 |                                                                                                                                                                                                                          |

## Specifications of intended use (part 2)

### Anchorage subject to:

- Static and quasi-static loads

### Base materials:

- Solid brick masonry (Use category b) and autoclaved aerated concrete (Use category d), acc. to Annex B 10
- Hollow brick masonry (use category c), according to Annex B 10
- For minimum thickness of masonry member is  $h_{ef}+30\text{mm}$
- Mortar strength class of the masonry M2,5 at minimum according to EN 998-2:2010
- For other bricks in solid masonry, hollow or perforated masonry and autoclaved aerated concrete, the characteristic resistance of the anchor may be determined by job site tests according to EOTA Technical Report TR 053, Annex B under consideration of the  $\beta$ -factor according to Annex C 27, Table C27.

Note (only applies to solid bricks and autoclaved aerated concrete):

The characteristic resistance is also valid for larger brick sizes, higher compressive strength and higher raw density of the masonry unit.

### Temperature Range:

- **Tb:** From - 40°C to +80°C (max. short term temperature +80°C and max. long term temperature +50°C)

### Use conditions (Environmental conditions):

- **X1:** Structures subject to dry internal conditions exist  
(zinc coated steel, stainless steel or high corrosion resistant steel)
- **X2:** Structures subject to external atmospheric exposure including industrial and marine environment or exposure to permanently damp internal condition, if no particular aggressive conditions exist  
(stainless steel or high corrosion resistant steel)
- **X3:** Structures subject to external atmospheric exposure and to permanently damp internal condition, if other particular aggressive conditions exist (high corrosion resistant steel)

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)

fischer injection system FIS AB for masonry

**Intended Use**  
Specifications (part 2)

**Annex B 2**

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## Specifications of intended use (part 2 continued)

### Design:

- The anchorages have to be designed in accordance with EOTA Technical Report TR 054, Design method A under the responsibility of an engineer experienced in anchorages and masonry work.

Applies to all bricks, if no other values are specified:

$$N_{Rk} = N_{Rk,b} = N_{Rk,p}$$

$$V_{Rk} = V_{Rk,b} = V_{Rk,c}$$

For the Calculation of pulling out a brick under tensile load  $N_{Rk,pb}$  or pushing out a brick under shear load  $V_{Rk,pb}$  see EOTA Technical Report TR 054.

$N_{Rk,s}$ ,  $V_{Rk,s}$  and  $M^0_{Rk,s}$  see annex C1-C3

Factors for job site tests and displacements see Annex C27

- Verifiable calculation notes and drawings have to be prepared taking account the relevant masonry in the region of the anchorage, the loads to be transmitted and their transmission to the supports of the structure. The position of the anchor is indicated on the design drawings.

### Installation:

- Category d/d: - Installation and use in dry structures
- Category w/w: - Installation and use in dry and wet structures
- Category w/d: - Installation in wet structures and use in dry structures
- Hole drilling see Annex C (drilling method)
- In case of aborted hole: The hole shall be filled with mortar
- Bridging of unbearing layer (e.g. plaster) at perforated brick masonry see Annex B 6, Table B6.1
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site
- Fastening screws or anchor rods (including nut and washer) must comply with the appropriate material and property class of the fischer internal threaded anchor FIS E.
- minimum curing time see Annex B 7, Table B7.2
- Commercial standard threaded rods, washers and hexagon nuts may also be used if the following requirements are fulfilled:

Material dimensions and mechanical properties of the metal parts according to the specifications are given in Annex A 5, Table 5.1

Conformation of material and mechanical properties of the metal parts by inspection certificate 3.1 according to EN 10204:2004, the documents shall be stored.

Marking of the anchor rod with the envisage embedment depth. This may be done by the manufacturer of the rod or by a person on job site.

fischer injection system FIS AB for masonry

**Intended Use**  
Specifications (part 2 continued)

**Annex B 3**

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**Table B4.1:** Installation parameters for anchor rods in solid bricks and autoclaved aerated concrete without perforated sleeves

| Anchor rod                                                                                      | Thread                                                       | M8                      | M10      | M12      |
|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------|----------|----------|
| Nominal drill hole diameter                                                                     | $d_0$ [mm]                                                   | 10                      | 12       | 14       |
| Effective anchorage depth $h_{ef}^{1)}$ in AAC                                                  | $h_{0,min}=h_{ef,min}$ [mm]<br>$h_{0,max}=h_{ef,max}$ [mm]   | 100<br>200              |          |          |
| Effective anchorage depth $h_{ef}^{1)}$ in solid brick<br>(depth of drill hole $h_0 = h_{ef}$ ) | $h_{ef,min}$ [mm]<br>$h_{ef,max}$ [mm]                       | 50<br>$h-30, \leq 200$  |          |          |
| Diameter of clearance hole in the fixture                                                       | pre-position $d_r \leq$ [mm]<br>push through $d_r \leq$ [mm] | 9<br>11                 | 12<br>14 | 14<br>16 |
| Diameter of cleaning brush                                                                      | $d_b \geq$ [mm]                                              | see Table B7.1          |          |          |
| Maximum installation torque                                                                     | $T_{inst}$ [Nm]                                              | see parameters of brick |          |          |

<sup>1)</sup>  $h_{ef,min} \leq h_{ef} \leq h_{ef,max}$  is possible.

**fischer anchor rods M8, M10, M12**



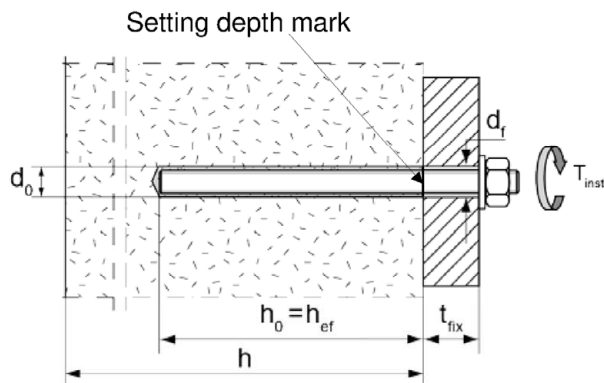
**Marking (on random place) fischer anchor rod:**

|                                                        |        |                                                        |   |
|--------------------------------------------------------|--------|--------------------------------------------------------|---|
| Steel zinc plated PC <sup>1)</sup> 8.8                 | • or + | Steel hot-dip PC <sup>1)</sup> 8.8                     | • |
| High corrosion resistant steel HCR PC <sup>1)</sup> 50 | •      | High corrosion resistant steel HCR PC <sup>1)</sup> 70 | - |
| High corrosion resistant steel HCR PC <sup>1)</sup> 80 | (      | Stainless steel R property class 50                    | ~ |
| Stainless steel R property class 80                    | *      |                                                        |   |

Alternatively: Colour coding according to DIN 976-1: 2016

<sup>1)</sup> PC = property class

**Installation condition:**



Figures not to scale

fischer injection system FIS AB for masonry

**Intended Use**

Installation parameters for anchor rods without perforated sleeve

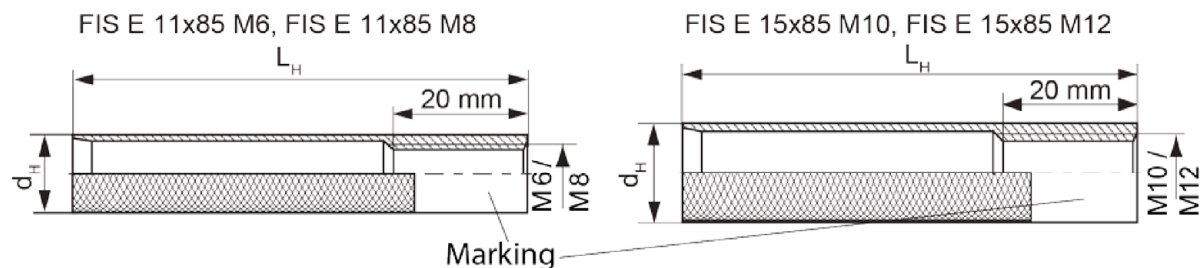
**Annex B 4**

Appendix 10 / 45

**Table B5.1:** Installation parameters for internal threaded anchors FIS E in solid bricks and autoclaved aerated concrete without perforated sleeves

| Internal threaded anchor FIS E            |                                       | 11x85 M6                | 11x85 M8 | 15x85 M10 | 15x85 M12 |
|-------------------------------------------|---------------------------------------|-------------------------|----------|-----------|-----------|
| Diameter of anchor                        | d <sub>H</sub> [mm]                   | 11                      |          | 15        |           |
| Nominal drill hole diameter               | d <sub>0</sub> [mm]                   | 14                      |          | 18        |           |
| Length of anchor                          | L <sub>H</sub> [mm]                   | 85                      |          |           |           |
| Effective anchorage depth                 | h <sub>0</sub> = h <sub>ef</sub> [mm] | 85                      |          |           |           |
| Diameter of cleaning brush                | d <sub>b</sub> ≥ [mm]                 | see Table B7.1          |          |           |           |
| Maximum installation torque               | T <sub>inst</sub> [Nm]                | see parameters of brick |          |           |           |
| Diameter of clearance hole in the fixture | d <sub>f</sub> [mm]                   | 7                       | 9        | 12        | 14        |
| Screw-in depth                            | l <sub>E,min</sub> [mm]               | 6                       | 8        | 10        | 12        |
|                                           | l <sub>E,max</sub> [mm]               | 60                      |          |           |           |

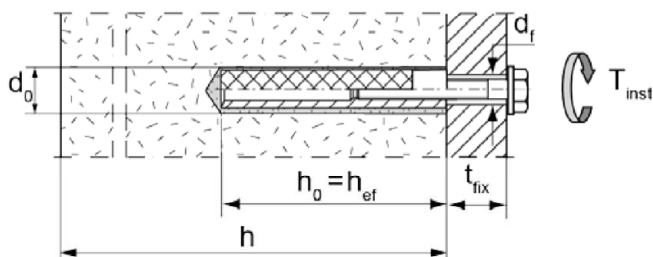
**fischer internal threaded anchor FIS E**



**Marking:**

Size, e.g. **M8**, Stainless steel: R, e.g. **M8 R**, High corrosion-resistant steel: HCR, e.g. **M8 HCR**

**Installation condition:**



Figures not to scale

fischer injection system FIS AB for masonry

**Intended Use**

Installation parameters for internal threaded rods FIS E without perforated sleeve

**Annex B 5**

Appendix 11 / 45

**Table B6.1:** Installation parameters for anchor rods and internal threaded anchors FIS E with perforated sleeves (pre-positioned anchorage)

| perforated sleeve FIS H K                                     |                           | 12x85                   | 16x85      | 16x130 <sup>2)</sup> | 20x85 | 20x130 <sup>2)</sup> | 20x200 <sup>2)</sup> |
|---------------------------------------------------------------|---------------------------|-------------------------|------------|----------------------|-------|----------------------|----------------------|
| Nominal drill hole diameter<br>$d_0 = D_{\text{sleeve, nom}}$ | $d_0$ [mm]                | 12                      | 16         |                      | 20    |                      |                      |
| Depth of drill hole                                           | $h_0$ [mm]                | 90                      | 90         | 135                  | 90    | 135                  | 205                  |
| Effective anchorage depth                                     | $h_{\text{ef, min}}$ [mm] | 65                      | 85         | 110                  | 85    | 110                  | 180                  |
|                                                               | $h_{\text{ef, max}}$ [mm] | 85                      | 85         | 130                  | 85    | 130                  | 200                  |
| Size of threaded rod                                          | [-]                       | M8                      | M8 and M10 |                      | M12   |                      |                      |
| Size of internal threaded anchor FIS E                        |                           | ---                     | 11x85      | ---                  | 15x85 | ---                  | ---                  |
| Diameter of cleaning brush <sup>1)</sup>                      | $d_b \geq$ [mm]           | see Table B7.1          |            |                      |       |                      |                      |
| Maximum installation torque                                   | $T_{\text{inst}}$ [Nm]    | see parameters of brick |            |                      |       |                      |                      |

<sup>1)</sup> Only for solid areas in hollow bricks and solid bricks.

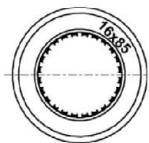
<sup>2)</sup> Bridging of unbearing layer (e.g. plaster) is possible. When reducing the effective anchorage depth  $h_{\text{ef, min}}$ , the values of the next shorter perforated sleeve of the same diameter must be used. The smaller value of characteristic resistance must be taken.

#### Perforated sleeve

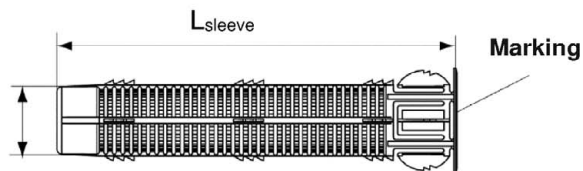
FIS H 12x85 K; FIS H 16x85 K; FIS H 16x130 K;  
FIS H 20x85 K; FIS H 20x130 K; FIS H 20x200 K

#### Marking:

Size  $D_{\text{sleeve, nom}}$  x  $L_{\text{sleeve}}$   
(e.g.: 16x85)



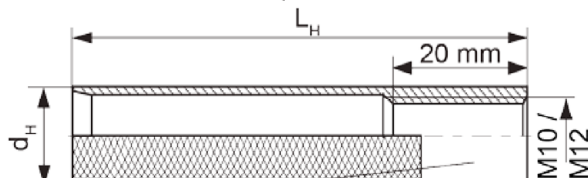
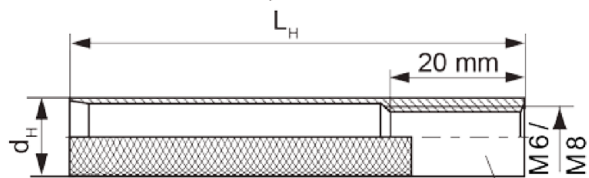
$D_{\text{sleeve, nom}}$



#### fischer internal threaded anchor FIS E

FIS E 11x85 M6, FIS E 11x85 M8

FIS E 15x85 M10, FIS E 15x85 M12

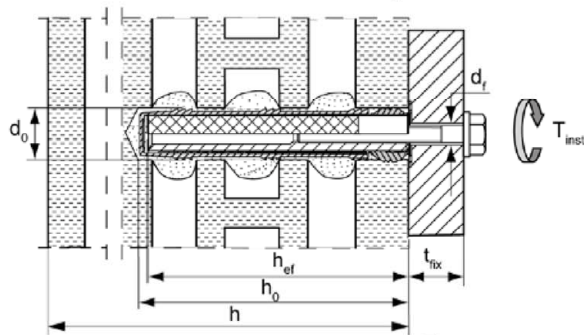
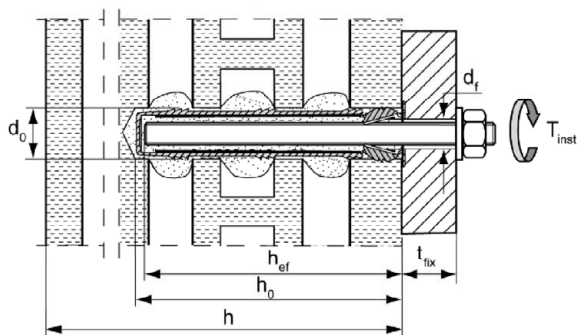


Marking

#### Installation conditions:

Anchor rod with perforated sleeve

Internal threaded anchor with perforated sleeve



Figures not to scale

fischer injection system FIS AB for masonry

#### Intended Use

Installation parameters for anchor rods and internal threaded anchors FIS E with perforated sleeve (pre-positioned anchorage)

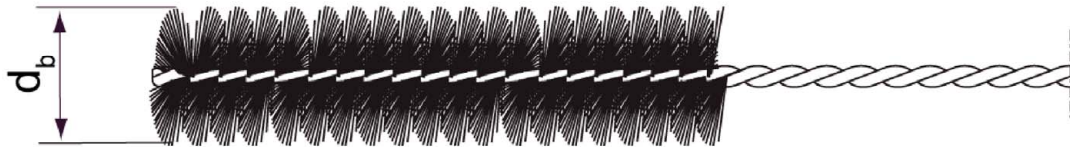
**Annex B 6**

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**Table B7.1:** Parameters of the cleaning brush BS (steel brush with steel bristles)

The size of the cleaning brush refers to the drill hole diameter

|                     |            |    |    |    |    |    |    |
|---------------------|------------|----|----|----|----|----|----|
| Drill hole diameter | $d_0$ [mm] | 10 | 12 | 14 | 16 | 18 | 20 |
| Brush diameter      | $d_b$ [mm] | 11 | 14 | 16 | 20 | 20 | 25 |



Only for solid bricks and autoclaved aerated concrete

**Table B7.2:** Maximum processing times and minimum curing times  
(During the curing time of the mortar the masonry temperature may not fall below the listed minimum temperature)

| Temperature at anchoring base<br>[°C] | Maximum processing time<br>$t_{work}$ |                      |                                   | Minimum curing time <sup>1)</sup><br>$t_{cure}$ |                      |                                   |
|---------------------------------------|---------------------------------------|----------------------|-----------------------------------|-------------------------------------------------|----------------------|-----------------------------------|
|                                       | FIS AB<br>High Speed <sup>3)</sup>    | FIS AB <sup>2)</sup> | FIS AB<br>Low Speed <sup>2)</sup> | FIS AB<br>High Speed <sup>3)</sup>              | FIS AB <sup>2)</sup> | FIS AB<br>Low Speed <sup>2)</sup> |
| > 0 to 5                              | 5 min                                 | 13 min               | 20 min                            | 90 min                                          | 3 h                  | 6 h                               |
| > 5 to 10                             | 3 min                                 | 9 min                | 20 min                            | 45 min                                          | 90 min               | 3 h                               |
| > 10 to 20                            | 1 min                                 | 5 min                | 10 min                            | 30 min                                          | 60 min               | 2 h                               |
| > 20 to 30                            | -                                     | 4 min                | 6 min                             | -                                               | 45 min               | 60 min                            |
| > 30 to 40                            | -                                     | 2 min                | 4 min                             | -                                               | 35 min               | 30 min                            |

<sup>1)</sup> For wet bricks the curing time must be doubled

<sup>2)</sup> Minimum cartridge temperature +5°C

<sup>3)</sup> Minimum cartridge temperature ±0°C

Figures not to scale

fischer injection system FIS AB for masonry

**Intended use**

Cleaning brush (steel brush)

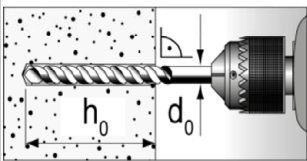
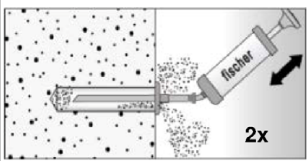
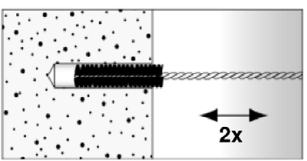
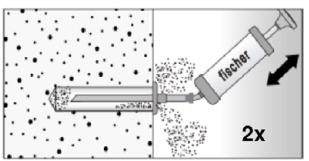
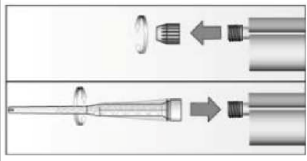
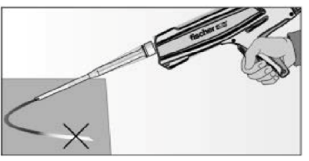
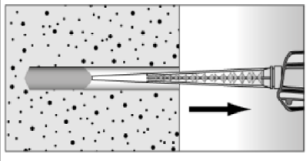
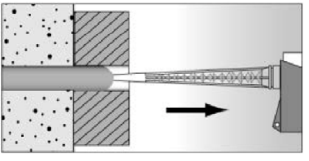
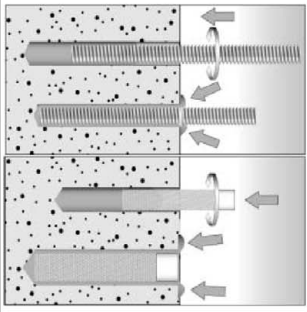
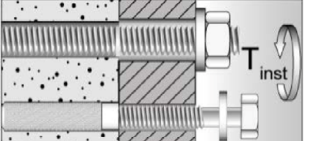
Maximum processing times and minimum curing times

**Annex B 7**

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# Installation instruction part 1

Installation in solid brick and autoclaved aerated concrete (without perforated sleeve)

|   |                                                                                     |                                                                                                                                                                                           |                                                                                      |                                                                                                                                                                  |
|---|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 |    | Drill the hole (drilling method see Annex C of the respective brick)<br>depth of drill hole <b>h<sub>0</sub></b> and drill hole diameter <b>d<sub>0</sub></b> see <b>Table B4.1; B5.1</b> |                                                                                      |                                                                                                                                                                  |
| 2 |    |                                                                                                          |    | Blow out the drill hole twice. Brush twice and blow out twice again.                                                                                             |
| 3 |    |                                                                                                                                                                                           |                                                                                      |                                                                                                                                                                  |
| 4 |    | Place the cartridge into a suitable dispenser                                                                                                                                             |    | Press out approximately 10 cm of mortar until the resin is permanently grey in colour. Mortar which is not grey in colour will not cure and must be disposed of. |
| 5 |   | Fill approximately 2/3 of the drill hole with mortar beginning from the bottom of the hole <sup>1)</sup> . Avoid bubbles!                                                                 |   | For push through anchorage (not FIS E) fill the annular clearance with mortar.                                                                                   |
| 6 |  |                                                                                                                                                                                           |                                                                                      |                                                                                                                                                                  |
| 7 |  | Do not touch.<br>Minimum curing time see <b>Table B7.2</b>                                                                                                                                |  | Mounting the fixture. <b>T<sub>inst</sub></b> see parameter of brick.                                                                                            |

<sup>1)</sup> Exact volume of mortar see manufacturer's specification.

fischer injection system FIS AB for masonry

## Intended use

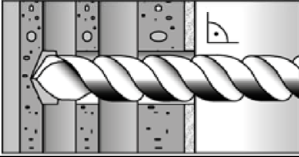
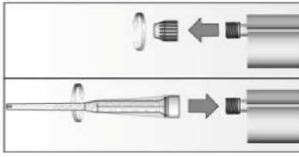
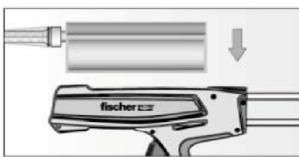
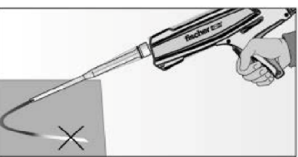
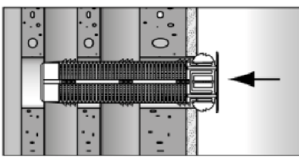
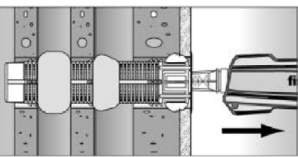
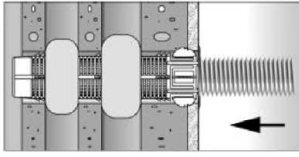
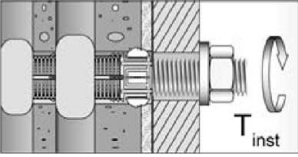
Installation instruction (without perforated sleeve) part 1

## Annex B 8

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## Installation instruction part 2

### Installation in perforated or solid brick with perforated sleeve (pre-positioned anchorage)

|   |                                                                                     |                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                     |
|---|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 |    | Drill the hole (drilling method see Annex C of the respective brick). depth of drill hole $h_0$ and drill hole diameter $d_0$ see <b>Table B6.1</b>                                                                                                                                         | When install perforated sleeves in solid bricks or solid areas of hollow bricks, also clean the hole by blowing out and brushing.                                                                                                                   |
| 2 |    | Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible)                                                                                                                                                                                 |                                                                                                                                                                                                                                                     |
| 3 |    | Place the cartridge into a suitable dispenser.                                                                                                                                                                                                                                              |  Press out approximately 10 cm of mortar until the resin is permanently grey in colour. Mortar which is not grey in colour will not cure and must be disposed of. |
| 4 |    | Insert the perforated sleeve flush with the surface of the masonry or plaster.                                                                                                                                                                                                              |  Fill the perforated sleeve completely with mortar beginning from the bottom of the hole <sup>1)</sup> .                                                          |
| 5 |   | Only use clean and oil-free metal parts. Mark the anchor rod for setting depth. Insert the anchor rod or the internal threaded anchor FIS E by hand using light turning motions until reaching the setting depth marking (anchor rod) or flush with the surface (internal threaded anchor). |                                                                                                                                                                                                                                                     |
| 6 |  | Do not touch. Minimum curing time see <b>Table B7.2</b>                                                                                                                                                                                                                                     |  Mounting the fixture. $T_{inst}$ see parameter of brick.                                                                                                       |

<sup>1)</sup> Exact volume of mortar see manufacturer's specification.

fischer injection system FIS AB for masonry

#### Intended use

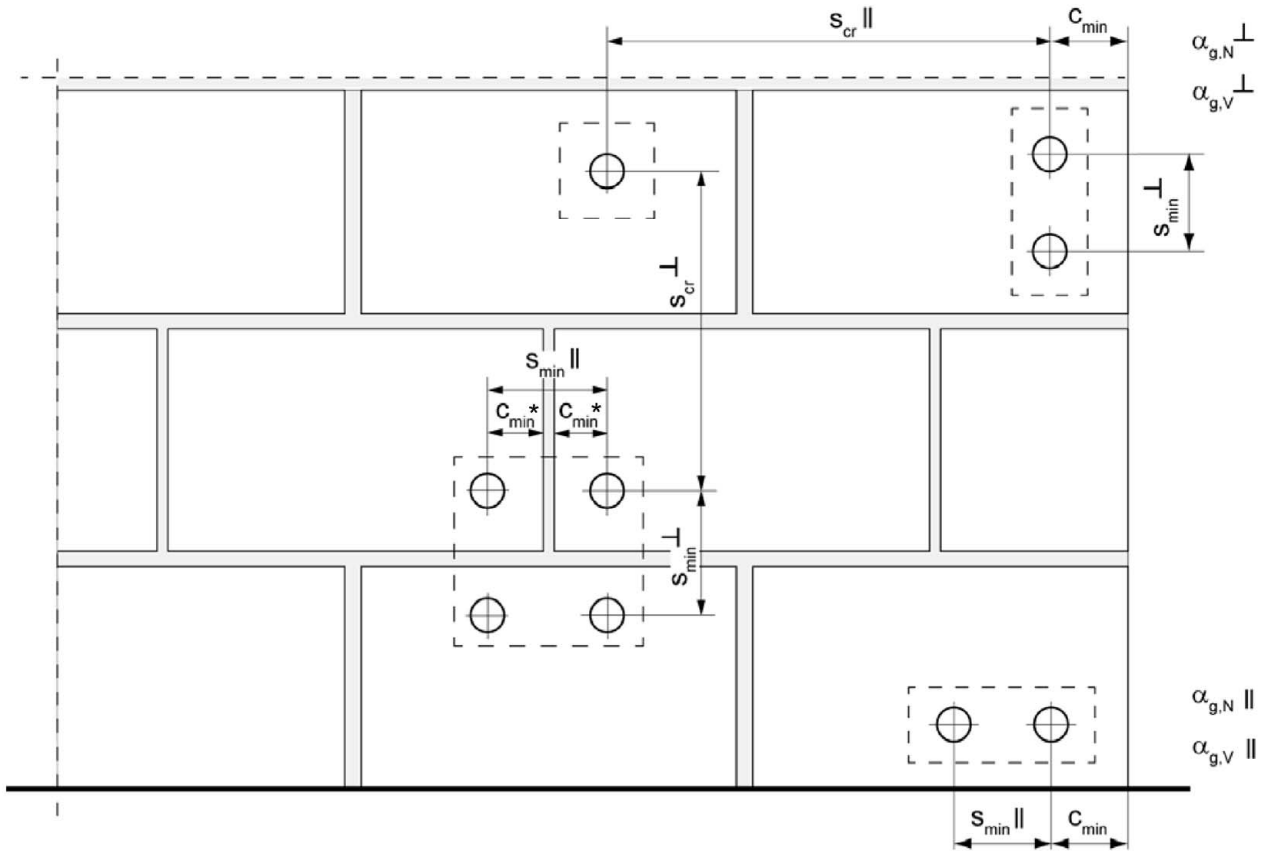
Installation instruction (with perforated sleeve) part 2

#### Annex B 9

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## Spacing and edge distance



\* Only, if vertical joints are not completely filled with mortar

- $s_{min} \parallel$  = Minimum spacing parallel to bed joint
- $s_{min} \perp$  = Minimum spacing vertical to bed joint
- $s_{cr} \parallel$  = Characteristic spacing parallel to bed joint
- $s_{cr} \perp$  = Characteristic spacing vertical to bed joint
- $C_{cr} = C_{min}$  = Edge distance
- $\alpha_{g,N} \parallel$  = Group factor for tensile load, anchor group parallel to bed joint
- $\alpha_{g,V} \parallel$  = Group factor for shear load, anchor group parallel to bed joint
- $\alpha_{g,N} \perp$  = Group factor for tensile load, anchor group vertical to bed joint
- $\alpha_{g,V} \perp$  = Group factor for shear load, anchor group vertical to bed joint

For  $s \geq s_{cr}$   $\alpha_g = 2$

For  $s_{min} \leq s < s_{cr}$   $\alpha_g$  according to installation parameters of brick

$N_{Rk}^g = \alpha_{g,N} \cdot N_{Rk}$ ;  $V_{Rk}^g = \alpha_{g,V} \cdot V_{Rk}$  (Group of 2 anchors)

$N_{Rk}^g = \alpha_{g,N} \parallel \cdot \alpha_{g,N} \perp \cdot N_{Rk}$ ;  $V_{Rk}^g = \alpha_{g,V} \parallel \cdot \alpha_{g,V} \perp \cdot V_{Rk}$  (Group of 4 anchors)

fischer injection system FIS AB for masonry

**Intended use**  
Spacing and edge distance

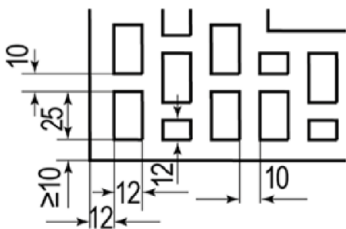
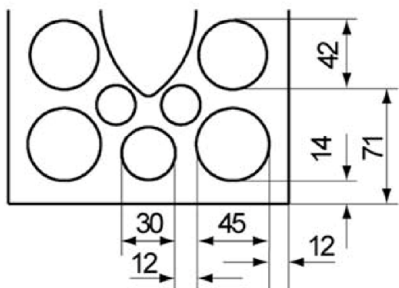
**Annex B 11**

Appendix 17 / 45

**Table B12.1: Overview dimensions of perforated and hollow bricks**

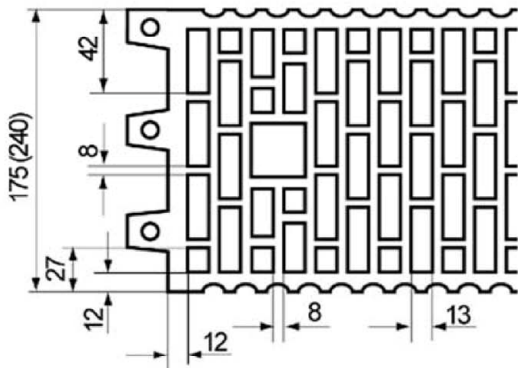
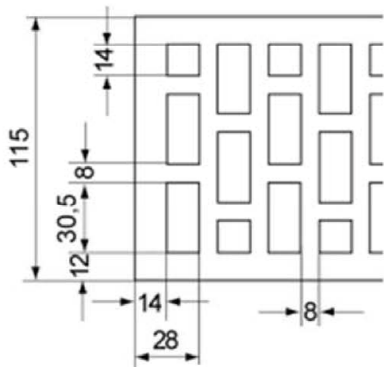
Perforated sand-lime brick KSL, 3DF, EN 771-2:2015;  
e.g. KS Wemding according to Annex C 12

Vertical perforated brick HLz, EN 771-1:2015:  
e.g. Wienerberger, according to Annex C 14

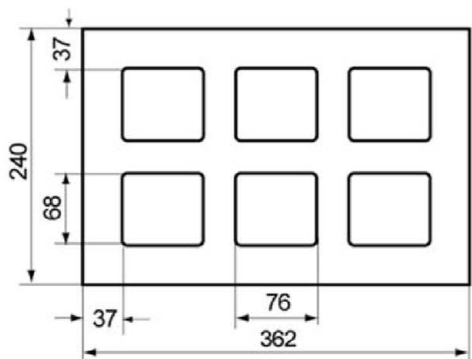


Vertical perforated brick HLz, 2DF, EN 771-1:2015:  
e.g. Wienerberger, Poroton according to Annex C 16

Vertical perforated brick HLz, EN 771-1:2015  
according to Annex C 18



Light-weight concrete hollow block Hbl, EN 771-3:2015  
according to Annex C 22



Figures not to scale

**Table C1.1:** Characteristic values for the **steel bearing capacity** of **anchor rods** under tensile load

| Anchor rod                                         |                                                          |     |      | M8                        | M10    | M12 |
|----------------------------------------------------|----------------------------------------------------------|-----|------|---------------------------|--------|-----|
| Bearing capacity under tensile load, steel failure |                                                          |     |      |                           |        |     |
| Characteristic resistance $N_{Rk,s}$               | Steel zinc plated                                        | 4.8 | [kN] | 15(13)                    | 23(21) | 33  |
|                                                    |                                                          | 5.8 |      | 19(17)                    | 29(27) | 43  |
|                                                    |                                                          | 8.8 |      | 29(27)                    | 47(43) | 68  |
|                                                    | Stainless steel R and High corrosion resistant steel HCR | 50  |      | 19                        | 29     | 43  |
|                                                    |                                                          | 70  |      | 26                        | 41     | 59  |
|                                                    |                                                          | 80  |      | 30                        | 47     | 68  |
| Partial factors <sup>1)</sup>                      |                                                          |     |      |                           |        |     |
| Partial factor $\gamma_{Ms,N}$                     | Steel zinc plated                                        | 4.8 | [-]  | 1,50                      |        |     |
|                                                    |                                                          | 5.8 |      | 1,50                      |        |     |
|                                                    |                                                          | 8.8 |      | 1,50                      |        |     |
|                                                    | Stainless steel R and High corrosion resistant steel HCR | 50  |      | 2,86                      |        |     |
|                                                    |                                                          | 70  |      | 1,50 <sup>2)</sup> / 1,87 |        |     |
|                                                    |                                                          | 80  |      | 1,60                      |        |     |

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

<sup>2)</sup> Only for fischer FIS A made of high corrosion-resistant steel HCR

<sup>3)</sup> Values in brackets are valid for undersized threaded rods with smaller stress area  $A_s$  for hot dip galvanised standard threaded rods according to EN ISO 10684:2004+AC:2009.

fischer injection system FIS AB for masonry

**Performance**

Characteristic steel bearing capacity of anchor rods under tensile load

**Annex C 1**

Appendix 19 / 45

**Table C2.1:** Characteristic values for the **steel bearing capacity** of **anchor rods** under shear load

| Anchor rod                                       |                                                          |                | M8                        |      | M10    |        | M12 |  |
|--------------------------------------------------|----------------------------------------------------------|----------------|---------------------------|------|--------|--------|-----|--|
| Bearing capacity under shear load, steel failure |                                                          |                |                           |      |        |        |     |  |
| without lever arm                                |                                                          |                |                           |      |        |        |     |  |
| Characteristic resistance $V_{Rk,s}$             | Steel zinc plated                                        | Property class | 4.8                       | [kN] | 9(8)   | 14(13) | 20  |  |
|                                                  |                                                          |                | 5.8                       |      | 11(10) | 17(16) | 25  |  |
|                                                  |                                                          |                | 8.8                       |      | 15(13) | 23(21) | 34  |  |
|                                                  | Stainless steel R and High corrosion resistant steel HCR | 50             | 9                         | 15   | 21     |        |     |  |
|                                                  |                                                          | 70             | 13                        | 20   | 30     |        |     |  |
|                                                  |                                                          | 80             | 15                        | 23   | 34     |        |     |  |
| with lever arm                                   |                                                          |                |                           |      |        |        |     |  |
| Characteristic resistance $M^0_{Rk,s}$           | Steel zinc plated                                        | Property class | 4.8                       | [Nm] | 15(13) | 30(27) | 52  |  |
|                                                  |                                                          |                | 5.8                       |      | 19(16) | 37(33) | 65  |  |
|                                                  |                                                          |                | 8.8                       |      | 30(26) | 60(53) | 105 |  |
|                                                  | Stainless steel R and High corrosion resistant steel HCR | 50             | 19                        | 37   | 65     |        |     |  |
|                                                  |                                                          | 70             | 26                        | 52   | 92     |        |     |  |
|                                                  |                                                          | 80             | 30                        | 60   | 105    |        |     |  |
| Partial factors <sup>1)</sup>                    |                                                          |                |                           |      |        |        |     |  |
| Partial factors $\gamma_{Ms,V}$                  | Steel zinc plated                                        | Property class | 4.8                       | [-]  | 1,25   |        |     |  |
|                                                  |                                                          |                | 5.8                       |      | 1,25   |        |     |  |
|                                                  |                                                          |                | 8.8                       |      | 1,25   |        |     |  |
|                                                  | 50                                                       |                | 2,38                      |      |        |        |     |  |
|                                                  | 70                                                       |                | 1,25 <sup>2)</sup> / 1,56 |      |        |        |     |  |
|                                                  | 80                                                       |                | 1,33                      |      |        |        |     |  |

1) In absence of other national regulations

2) Only for fischer FIS A made of high corrosion-resistant steel HCR

3) Values in brackets are valid for undersized threaded rods with smaller stress area  $A_s$  for hot dip galvanised standard threaded rods according to EN ISO 10684:2004+AC:2009.

**Table C3.1:** Characteristic values for the **steel bearing capacity** of **internal threaded anchors FIS E** under tensile / shear load

| fischer internal threaded anchor FIS E             |                 |                   |     | M6   | M8   | M10 | M12 |    |
|----------------------------------------------------|-----------------|-------------------|-----|------|------|-----|-----|----|
| Bearing capacity under tensile load, steel failure |                 |                   |     |      |      |     |     |    |
| Characteristic resistance with screw               | $N_{Rk,s}$      | Property class    | 5.8 | [kN] | 10   | 18  | 29  | 42 |
|                                                    |                 | Property class 70 | R   |      | 14   | 26  | 41  | 59 |
|                                                    |                 |                   | HCR |      | 14   | 26  | 41  | 59 |
| Partial factors <sup>1)</sup>                      |                 |                   |     |      |      |     |     |    |
| Partial factor                                     | $\gamma_{Ms,N}$ | Property class    | 5.8 | [-]  | 1,50 |     |     |    |
|                                                    |                 | Property class 70 | R   |      | 1,87 |     |     |    |
|                                                    |                 |                   | HCR |      | 1,87 |     |     |    |
| Bearing capacity under shear load, steel failure   |                 |                   |     |      |      |     |     |    |
| without lever arm                                  |                 |                   |     |      |      |     |     |    |
| Characteristic resistance with screw               | $V_{Rk,s}$      | Property class    | 5.8 | [kN] | 5    | 9   | 15  | 21 |
|                                                    |                 | Property class 70 | R   |      | 7    | 13  | 20  | 30 |
|                                                    |                 |                   | HCR |      | 7    | 13  | 20  | 30 |
| with lever arm                                     |                 |                   |     |      |      |     |     |    |
| Characteristic resistance                          | $M^0_{Rk,s}$    | Property class    | 5.8 | [Nm] | 8    | 19  | 37  | 65 |
|                                                    |                 | Property class 70 | R   |      | 11   | 26  | 52  | 92 |
|                                                    |                 |                   | HCR |      | 11   | 26  | 52  | 92 |
| Partial factors <sup>1)</sup>                      |                 |                   |     |      |      |     |     |    |
| Partial factor                                     | $\gamma_{Ms,V}$ | Property class    | 5.8 | [-]  | 1,25 |     |     |    |
|                                                    |                 | Property class 70 | R   |      | 1,56 |     |     |    |
|                                                    |                 |                   | HCR |      | 1,56 |     |     |    |

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

fischer injection system FIS AB for masonry

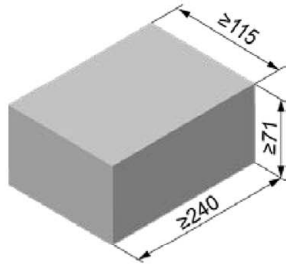
## Performance

Characteristic steel bearing capacity of fischer internal threaded anchor FIS E

## Annex C 3

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# Solid brick Mz, NF, EN 771-1:2015



| Solid brick Mz, NF, EN 771-1:2015               |                   |         |          |
|-------------------------------------------------|-------------------|---------|----------|
| Producer                                        | e.g. Wienerberger |         |          |
| Nominal dimensions [mm]                         | length L          | width W | height H |
|                                                 | ≥ 240             | ≥ 115   | ≥ 71     |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 1,8             |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | ≥ 12 / ≥ 20       |         |          |
| Standard or annex                               | EN 771-1:2015     |         |          |

**Table C4.1:** Installation parameters for edge distance  $c=100\text{mm}$

| Anchor rod                                                              |      | M8  | M10 | M12 | -     |    |
|-------------------------------------------------------------------------|------|-----|-----|-----|-------|----|
| Internal threaded anchor FIS E                                          |      | -   | -   | -   | M6    | M8 |
|                                                                         |      |     |     |     | 11x85 |    |
| Anchor rod and internal threaded anchor FIS E without perforated sleeve |      |     |     |     |       |    |
| Effective anchorage depth<br>$h_{ef}$                                   | [mm] | 50  | 50  | 50  | 85    |    |
|                                                                         |      | 80  | 80  | 80  |       |    |
|                                                                         |      | 200 | 200 | 200 |       |    |
| Max. installation torque<br>$T_{inst}$                                  | [Nm] | 10  |     |     | 4     | 10 |
| General installation parameters                                         |      |     |     |     |       |    |
| Edge distance<br>$C_{min}$                                              | [mm] | 100 |     |     | 100   |    |
| Edge distance $h_{ef}=200$<br>$C_{min}$                                 |      | 150 |     |     | _1)   |    |
| $s_{min II,N}$                                                          |      | 60  |     |     | 60    |    |
| $h_{ef}=200$ $s_{min II,N}$                                             |      | 240 |     |     | _1)   |    |
| $s_{min II,v}$                                                          |      | 240 |     |     | 240   |    |
| $s_{scr II}$                                                            |      | 240 |     |     | 240   |    |
| $s_{scr \perp} = s_{min \perp}$                                         |      | 75  |     |     | 75    |    |
| Drilling method                                                         |      |     |     |     |       |    |

## Drilling method

Hammer drilling with hard metal hammer drill

<sup>1)</sup> No performance assessed

**Table C4.2:** Group factors

| Anchor rods                    |                                     | M8   | M10 | M12 | -     |    |
|--------------------------------|-------------------------------------|------|-----|-----|-------|----|
| Internal threaded anchor FIS E |                                     | -    | -   | -   | M6    | M8 |
|                                |                                     |      |     |     | 11x85 |    |
| Edge distance                  | Cmin                                | [mm] | 100 |     |       |    |
| Group factor                   | $\alpha_{g,N} \parallel$            | [-]  | 1,5 |     |       |    |
|                                | $\alpha_{g,V} \parallel$            |      | 2,0 |     |       |    |
|                                | $h_{ef}=200 \alpha_{g,N} \parallel$ |      | 1,5 |     |       |    |
|                                | $h_{ef}=200 \alpha_{g,V} \parallel$ |      | 2,0 |     |       |    |
|                                | $\alpha_{g,N} \perp$                |      | 2,0 |     |       |    |
|                                | $\alpha_{g,V} \perp$                |      | 2,0 |     |       |    |
|                                | $h_{ef}=200 \alpha_{g,N} \perp$     |      | 2,0 |     |       |    |
|                                | $h_{ef}=200 \alpha_{g,V} \perp$     |      | 2,0 |     |       |    |

|                                                                                                |                                      |
|------------------------------------------------------------------------------------------------|--------------------------------------|
| fischer injection system FIS AB for masonry                                                    | <b>Annex C 4</b><br>Appendix 22 / 45 |
| <b>Performance</b><br>Solid brick Mz, NF, dimensions, installation parameters $c=100\text{mm}$ |                                      |

# Solid brick Mz, NF, EN 771-1:2015

**Table C5.1:** Characteristic resistance under tensile load for edge distance  $c=100\text{mm}$

| Anchor rod                                                                                                         |               |     | M8                                             |     | M10 |      |     | M12 |      |     | -     |    |
|--------------------------------------------------------------------------------------------------------------------|---------------|-----|------------------------------------------------|-----|-----|------|-----|-----|------|-----|-------|----|
| Internal threaded anchor FIS E                                                                                     |               |     | -                                              |     | -   |      |     | -   |      |     | M6    | M8 |
|                                                                                                                    |               |     |                                                |     |     |      |     |     |      |     | 11x85 |    |
| Tensile load N <sub>Rk</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |               |     |                                                |     |     |      |     |     |      |     |       |    |
| compressive strength f <sub>b</sub>                                                                                | use categorie |     | Effective anchorage depth h <sub>ef</sub> [mm] |     |     |      |     |     |      |     |       |    |
|                                                                                                                    |               |     | ≥ 50                                           | 50  | 80  | 200  | 50  | 80  | 200  | 85  |       |    |
| ≥ 12N/mm <sup>2</sup>                                                                                              | w/w           | w/d | 2,5                                            | 2,0 | 3,0 | 7,5  | 2,0 | 3,5 | 5,0  | 3,5 |       |    |
|                                                                                                                    | d/d           |     | 4,0                                            | 3,5 | 5,0 | 12,0 | 3,0 | 5,5 | 8,0  | 5,5 |       |    |
| ≥ 20N/mm <sup>2</sup>                                                                                              | w/w           | w/d | 3,5                                            | 3,0 | 4,5 | 11,0 | 3,0 | 5,0 | 7,0  | 5,0 |       |    |
|                                                                                                                    | d/d           |     | 5,5                                            | 5,0 | 7,0 | 12,0 | 4,5 | 8,0 | 11,5 | 8,0 |       |    |

**Table C5.2:** Characteristic resistance under shear load for edge distance  $c=100\text{mm}$

| Anchor rod                                                                                                       |               |     | M8                                             |      | M10  |      | M12  |     | -     |    |
|------------------------------------------------------------------------------------------------------------------|---------------|-----|------------------------------------------------|------|------|------|------|-----|-------|----|
| Internal threaded anchor FIS E                                                                                   |               |     | -                                              |      | -    |      | -    |     | M6    | M8 |
|                                                                                                                  |               |     |                                                |      |      |      |      |     | 11x85 |    |
| Shear load V <sub>Rk</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |               |     |                                                |      |      |      |      |     |       |    |
| compressive strength f <sub>b</sub>                                                                              | use categorie |     | Effective anchorage depth h <sub>ef</sub> [mm] |      |      |      |      |     |       |    |
|                                                                                                                  |               |     | ≥ 50                                           | ≥ 50 | 200  | ≥ 50 | 200  | 85  |       |    |
| ≥ 12N/mm²                                                                                                        | w/w           | w/d | 2,5                                            | 4,0  | 8,5  | 4,0  | 11,5 | 2,5 |       |    |
|                                                                                                                  | d/d           |     |                                                |      |      |      |      |     |       |    |
| ≥ 20N/mm²                                                                                                        | w/w           | w/d | 4,0                                            | 6,0  | 12,0 | 5,5  | 12,0 | 4,0 |       |    |
|                                                                                                                  | d/d           |     |                                                |      |      |      |      |     |       |    |

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

## Performance

Solid brick Mz, NF, Characteristic resistance under tensile and shear load  $c=100\text{mm}$

## Annex C 5

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# Solid brick Mz, NF, EN 771-1:2015

**Table C6.1:** Installation parameters for edge distance  $c=60\text{mm}$

| Anchor rod                                                              |                                     | M8   | M10         | M12 | -     |         |
|-------------------------------------------------------------------------|-------------------------------------|------|-------------|-----|-------|---------|
| Internal threaded anchor FIS E                                          |                                     | -    | -           | -   | M6    | M8      |
|                                                                         |                                     |      |             |     | 11x85 |         |
| Anchor rod and internal threaded anchor FIS E without perforated sleeve |                                     |      |             |     |       |         |
| Effective anchorage depth                                               | $h_{ef}$                            | [mm] | 50          | 50  | 50    | 85      |
|                                                                         |                                     |      | 100         | 100 | 100   |         |
|                                                                         |                                     |      | 200         | 200 | 200   |         |
| Max. installation torque                                                | $T_{inst}$                          | [Nm] | 10          |     |       | 4    10 |
| General installation parameters                                         |                                     |      |             |     |       |         |
| Edge distance                                                           | $c_{min}$                           | [mm] | 60          |     |       |         |
| Edge distance $h_{ef}=200$                                              | $c_{min}$                           |      | 60          |     |       |         |
| Spacing                                                                 | $s_{min \parallel, N}$              |      | 80          |     |       |         |
|                                                                         | $h_{ef}=200 \ s_{min \parallel, N}$ |      | 80          |     |       |         |
|                                                                         | $s_{min \parallel, V}$              |      | 80          |     |       |         |
|                                                                         | $s_{scr \parallel}$                 |      | 3x $h_{ef}$ |     |       |         |
|                                                                         | $s_{min \perp}$                     |      | 80          |     |       |         |
|                                                                         | $s_{scr \perp}$                     |      | 3x $h_{ef}$ |     |       |         |
| Drilling method                                                         |                                     |      |             |     |       |         |
| Hammer drilling with hard metal hammer drill                            |                                     |      |             |     |       |         |

**Table C6.2:** Group factors

| Anchor rods                    |                                     | M8   | M10 | M12 | -     |    |
|--------------------------------|-------------------------------------|------|-----|-----|-------|----|
| Internal threaded anchor FIS E |                                     | -    | -   | -   | M6    | M8 |
|                                |                                     |      |     |     | 11x85 |    |
| Edge distance                  | Cmin                                | [mm] | 60  |     |       |    |
| Group factor                   | $\alpha_{g,N} \parallel$            | [-]  | 0,6 |     |       |    |
|                                | $\alpha_{g,V} \parallel$            |      | 1,3 |     |       |    |
|                                | $h_{ef}=200 \alpha_{g,N} \parallel$ |      | 1,4 |     |       |    |
|                                | $h_{ef}=200 \alpha_{g,V} \parallel$ |      | 1,5 |     |       |    |
|                                | $\alpha_{g,N} \perp$                |      | 0,3 |     |       |    |
|                                | $\alpha_{g,V} \perp$                |      | 1,3 |     |       |    |
|                                | $h_{ef}=200 \alpha_{g,N} \perp$     |      | 2,0 |     |       |    |
|                                | $h_{ef}=200 \alpha_{g,V} \perp$     |      | 1,1 |     |       |    |

fischer injection system FIS AB for masonry

## Performance

Solid brick Mz, NF, dimensions, installation parameters  $c=60\text{mm}$

## Annex C 6

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# Solid brick Mz, NF, EN 771-1:2015

**Table C7.1:** Characteristic resistance under tensile load for edge distance  $c=60\text{mm}$

| Anchor rod                                                                                                         |              |     | M8                                             |     | M10 |     |                 | M12 |     |                 | -               |    |
|--------------------------------------------------------------------------------------------------------------------|--------------|-----|------------------------------------------------|-----|-----|-----|-----------------|-----|-----|-----------------|-----------------|----|
| Internal threaded anchor FIS E                                                                                     |              |     | -                                              |     | -   |     |                 | -   |     |                 | M6              | M8 |
|                                                                                                                    |              |     |                                                |     |     |     |                 |     |     |                 | 11x85           |    |
| Tensile load N <sub>Rk</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |     |                                                |     |     |     |                 |     |     |                 |                 |    |
| compressive strength f <sub>b</sub>                                                                                | use category |     | Effective anchorage depth h <sub>ef</sub> [mm] |     |     |     |                 |     |     |                 |                 |    |
|                                                                                                                    |              |     | 50                                             | 100 | 50  | 100 | 200             | 50  | 100 | 200             | 85              |    |
| ≥ 12N/mm²                                                                                                          | w/w          | w/d | 2,0                                            | 2,0 | 2,0 | 2,5 | - <sup>1)</sup> | 2,0 | 2,5 | - <sup>1)</sup> | - <sup>1)</sup> |    |
|                                                                                                                    | d/d          |     | 3,0                                            | 4,0 | 3,0 | 4,0 | 9,5             | 3,0 | 4,0 | 9,5             | - <sup>1)</sup> |    |
| ≥ 20N/mm²                                                                                                          | w/w          | w/d | 2,5                                            | 3,0 | 2,5 | 3,5 | - <sup>1)</sup> | 3,0 | 3,5 | - <sup>1)</sup> | - <sup>1)</sup> |    |
|                                                                                                                    | d/d          |     | 4,5                                            | 5,5 | 4,5 | 5,5 | 12              | 4,5 | 5,5 | 12              | - <sup>1)</sup> |    |

<sup>1)</sup> No performance assessed

**Table C7.2:** Characteristic resistance under shear load for edge distance  $c=60\text{mm}$

| Anchor rod                                                                                                       |              | M8  |                                                | M10 |     | M12 |     | -     |     |     |                 |
|------------------------------------------------------------------------------------------------------------------|--------------|-----|------------------------------------------------|-----|-----|-----|-----|-------|-----|-----|-----------------|
| Internal threaded anchor FIS E                                                                                   |              | -   |                                                | -   |     | -   |     | M6    | M8  |     |                 |
|                                                                                                                  |              |     |                                                |     |     |     |     | 11x85 |     |     |                 |
| Shear load V <sub>RK</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |     |                                                |     |     |     |     |       |     |     |                 |
| compressive strength f <sub>b</sub>                                                                              | use category |     | Effective anchorage depth h <sub>ef</sub> [mm] |     |     |     |     |       |     |     |                 |
|                                                                                                                  |              |     | 50                                             | 100 | 50  | 100 | 200 | 50    | 100 | 200 | 85              |
| ≥ 12N/mm²                                                                                                        | w/w          | w/d | 1,2                                            | 3,0 | 2,0 | 3,0 | 1,5 | 1,5   | 3,0 | 3,0 | - <sup>1)</sup> |
|                                                                                                                  | d/d          |     |                                                |     |     |     |     |       |     |     |                 |
| ≥ 20N/mm²                                                                                                        | w/w          | w/d | 1,5                                            | 4,5 | 3,0 | 4,5 | 2,5 | 2,0   | 4,5 | 4,5 | - <sup>1)</sup> |
|                                                                                                                  | d/d          |     |                                                |     |     |     |     |       |     |     |                 |

<sup>1)</sup> No performance assessed

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

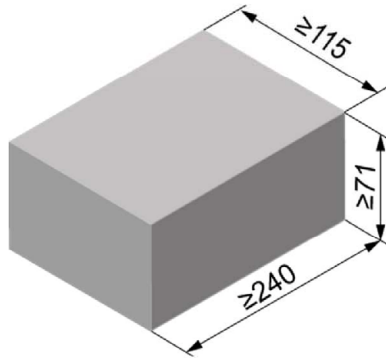
## Performance

Solid brick Mz, NF, Characteristic resistance under tensile and shear load  $c=60\text{mm}$

## Annex C 7

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# Solid sand-lime brick KS, NF, EN 771-2:2015



| Solid sand-lime brick KS, NF, EN 771-2:2015     |               |         |          |
|-------------------------------------------------|---------------|---------|----------|
| Producer                                        | -             |         |          |
| Nominal dimensions [mm]                         | length L      | width W | height H |
|                                                 | ≥ 240         | ≥ 115   | ≥ 71     |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 1,8         |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | ≥ 12 / ≥ 20   |         |          |
| Standard or annex                               | EN 771-2:2015 |         |          |

**Table C8.1:** Installation parameters

| Anchor rod                                                              |                    | M8   | M10                | M12 | -     |    |   |
|-------------------------------------------------------------------------|--------------------|------|--------------------|-----|-------|----|---|
| Internal threaded anchor FIS E                                          |                    | -    | -                  | -   | M6    | M8 |   |
|                                                                         |                    |      |                    |     | 11x85 |    |   |
| Anchor rod and internal threaded anchor FIS E without perforated sleeve |                    |      |                    |     |       |    |   |
| Effective anchorage depth                                               | h <sub>ef</sub>    | [mm] | 50                 | 50  | 50    | 85 |   |
|                                                                         |                    |      | 100                | 100 | 100   |    |   |
|                                                                         |                    |      | 1)<br>200          | 200 | 200   |    |   |
| Max. installation torque                                                | T <sub>inst</sub>  | [Nm] | 5                  | 15  | 15    | 3  | 5 |
| General installation parameters                                         |                    |      |                    |     |       |    |   |
| Edge distance                                                           | C <sub>min</sub>   | [mm] | 60                 |     |       |    |   |
| Spacing                                                                 | S <sub>min</sub>   |      | 80                 |     |       |    |   |
|                                                                         | S <sub>cr</sub>    |      | 3x h <sub>ef</sub> |     |       |    |   |
|                                                                         | S <sub>min</sub> ⊥ |      | 80                 |     |       |    |   |
|                                                                         | S <sub>cr</sub> ⊥  |      | 3x h <sub>ef</sub> |     |       |    |   |
|                                                                         |                    |      |                    |     |       |    |   |
| Drilling method                                                         |                    |      |                    |     |       |    |   |
| Hammer drilling with hard metal hammer drill                            |                    |      |                    |     |       |    |   |

<sup>1)</sup> No performance assessed

**Table C8.2:** Group factors

| Anchor rod                                                                                           |     | M8    | M10 | M12 | -  |    |
|------------------------------------------------------------------------------------------------------|-----|-------|-----|-----|----|----|
| Internal threaded anchor FIS E                                                                       |     | -     | -   | -   | M6 | M8 |
| Group factor                                                                                         |     | 11x85 |     |     |    |    |
| $\alpha_{g,N} \parallel$<br>$\alpha_{g,V} \parallel$<br>$\alpha_{g,N} \perp$<br>$\alpha_{g,V} \perp$ | [-] | 0,7   |     |     |    |    |
|                                                                                                      |     | 1,3   |     |     |    |    |
|                                                                                                      |     | 2,0   |     |     |    |    |
|                                                                                                      |     | 2,0   |     |     |    |    |

fischer injection system FIS AB for masonry

**Performance**  
Solid sand-lime brick KS, NF, dimensions, installation parameters

**Annex C 8**

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# Solid sand-lime brick KS, NF, EN 771-2:2015

**Table C9.1:** Characteristic resistance under tensile load

| Anchor rod                                                                                                         |              |     | M8                                             |     | M10 |     |     | M12 |     |     | -     |    |
|--------------------------------------------------------------------------------------------------------------------|--------------|-----|------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-------|----|
| Internal threaded anchor FIS E                                                                                     |              |     | -                                              |     | -   |     |     | -   |     |     | M6    | M8 |
|                                                                                                                    |              |     |                                                |     |     |     |     |     |     |     | 11x85 |    |
| Tensile load N <sub>Rk</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |     |                                                |     |     |     |     |     |     |     |       |    |
| compressive strength f <sub>b</sub>                                                                                | use category |     | Effective anchorage depth h <sub>ef</sub> [mm] |     |     |     |     |     |     |     |       |    |
|                                                                                                                    |              |     | 50                                             | 100 | 50  | 100 | 200 | 50  | 100 | 200 | 85    |    |
| ≥ 12N/mm²                                                                                                          | w/w          | w/d | 2,5                                            | 4,5 | 2,5 | 3,5 | 7,0 | 2,5 | 3,0 | 6,5 | 2,5   |    |
|                                                                                                                    | d/d          |     | 4,0                                            | 8,0 | 4,0 | 5,5 | 12  | 4,0 | 4,5 | 12  | 4,0   |    |
| ≥ 20N/mm²                                                                                                          | w/w          | w/d | 3,5                                            | 6,5 | 3,5 | 4,5 | 10  | 3,5 | 4,0 | 9,5 | 3,5   |    |
|                                                                                                                    | d/d          |     | 6,0                                            | 11  | 6,0 | 8,0 | 12  | 6,0 | 6,5 | 12  | 6,0   |    |

**Table C9.2:** Characteristic resistance under shear load

| Anchor rod                                                                                                       |              | M8  |                                                | M10 |     | M12  |     | -     |     |
|------------------------------------------------------------------------------------------------------------------|--------------|-----|------------------------------------------------|-----|-----|------|-----|-------|-----|
| Internal threaded anchor FIS E                                                                                   |              | -   |                                                | -   |     | -    |     | M6    | M8  |
|                                                                                                                  |              |     |                                                |     |     |      |     | 11x85 |     |
| Shear load V <sub>RK</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |     |                                                |     |     |      |     |       |     |
| compressive strength f <sub>b</sub>                                                                              | use category |     | Effective anchorage depth h <sub>ef</sub> [mm] |     |     |      |     |       |     |
|                                                                                                                  |              |     | 50                                             | 100 | 50  | ≥100 | 50  | ≥100  | 85  |
| ≥ 12N/mm²                                                                                                        | w/w          | w/d | 1,5                                            | 3,0 | 1,2 | 2,0  | 1,2 | 2,0   | 1,2 |
|                                                                                                                  | d/d          |     |                                                |     |     |      |     |       |     |
| ≥ 20N/mm²                                                                                                        | w/w          | w/d | 2,5                                            | 4,0 | 1,5 | 3,0  | 1,5 | 3,0   | 1,5 |
|                                                                                                                  | d/d          |     |                                                |     |     |      |     |       |     |

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

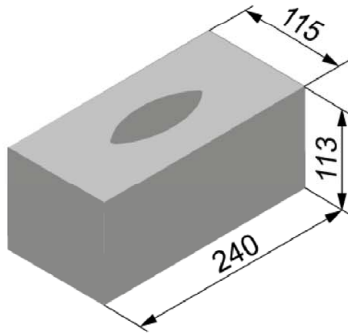
## Performance

Solid sand-lime brick KS, NF, Characteristic resistance under tensile and shear load

## Annex C 9

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# Solid sand-lime brick KS, EN 771-2:2015



| Solid sand-lime brick KS, EN 771-2:2015         |                     |         |          |
|-------------------------------------------------|---------------------|---------|----------|
| Producer                                        | -                   |         |          |
| Nominal dimensions [mm]                         | length L            | width W | height H |
|                                                 | 240                 | 115     | 113      |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | $\geq 1,8$          |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | $\geq 10 / \geq 20$ |         |          |
| Standard or annex                               | EN 771-2:2015       |         |          |

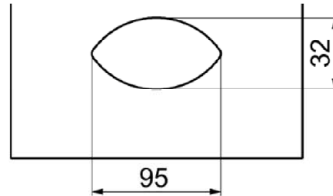


**Table C10.1:** Installation parameters

|                                |       |             |    |        |    |              |     |        |     |
|--------------------------------|-------|-------------|----|--------|----|--------------|-----|--------|-----|
| Anchor rod                     | M8    | -           | M8 | M10    | M8 | M10          | -   | M12    | M12 |
| Internal threaded anchor FIS E | -     | M6<br>11x85 | M8 | -      | -  | M10<br>15x85 | M12 | -      | -   |
| Perforated sleeve FIS H K      | 12x85 | 16x85       |    | 16x130 |    | 20x85        |     | 20x130 |     |

## Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K

|                          |                 |   |
|--------------------------|-----------------|---|
| Max. installation torque | $T_{inst}$ [Nm] | 2 |
|--------------------------|-----------------|---|

## General installation parameters

|               |                         |     |
|---------------|-------------------------|-----|
| Edge distance | $c_{min}$               | 100 |
| Spacing       | $s_{min} \parallel$     | 240 |
|               | $s_{cr} \parallel$ [mm] | 240 |
|               | $s_{min} \perp$         | 115 |
|               | $s_{cr} \perp$          | 115 |

## Drilling method

Hammer drilling with hard metal hammer drill

**Table C10.2:** Group factors

|                                |       |             |    |        |    |              |     |        |     |
|--------------------------------|-------|-------------|----|--------|----|--------------|-----|--------|-----|
| Anchor rod                     | M8    | -           | M8 | M10    | M8 | M10          | -   | M12    | M12 |
| Internal threaded anchor FIS E | -     | M6<br>11x85 | M8 | -      | -  | M10<br>15x85 | M12 | -      | -   |
| Perforated sleeve FIS H K      | 12x85 | 16x85       |    | 16x130 |    | 20x85        |     | 20x130 |     |

|              |                                                   |     |     |
|--------------|---------------------------------------------------|-----|-----|
| Group factor | $\alpha_{g,N \parallel} = \alpha_{g,V \parallel}$ | [-] | 2,0 |
|              | $\alpha_{g,N \perp} = \alpha_{g,V \perp}$         |     | 2,0 |

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|--|--|--|--|

|                                                                                          |                                       |
|------------------------------------------------------------------------------------------|---------------------------------------|
| fischer injection system FIS AB for masonry                                              | <b>Annex C 10</b><br>Appendix 28 / 45 |
| <b>Performance</b><br>Perforated sand-lime brick KS, dimensions, installation parameters |                                       |

# Solid sand-lime brick KS, EN 771-2:2015

**Table C11.1:** Characteristic resistance under tensile load

|                                                                                                                    |              |     |       |     |    |     |        |     |       |     |     |        |
|--------------------------------------------------------------------------------------------------------------------|--------------|-----|-------|-----|----|-----|--------|-----|-------|-----|-----|--------|
| Anchor rod                                                                                                         | M8           |     | -     |     | M8 | M10 | M8     | M10 | -     |     | M12 | M12    |
| Internal threaded anchor FIS E                                                                                     | -            |     | M6    | M8  | -  |     | -      |     | M10   | M12 | -   | -      |
|                                                                                                                    |              |     | 11x85 |     |    |     |        |     | 15x85 |     |     |        |
| Perforated sleeve FIS H K                                                                                          | 12x85        |     | 16x85 |     |    |     | 16x130 |     | 20x85 |     |     | 20x130 |
| Tensile load N <sub>RK</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |     |       |     |    |     |        |     |       |     |     |        |
| compressive strength f <sub>b</sub>                                                                                | use category |     |       |     |    |     |        |     |       |     |     |        |
| ≥ 10N/mm²                                                                                                          | w/w          | w/d | 3,5   | 2,0 |    |     | 2,0    |     | 6,5   |     |     | 4,5    |
|                                                                                                                    | d/d          |     | 6,0   | 3,5 |    |     | 3,5    |     | 8,5   |     |     | 7,0    |
| ≥ 20N/mm²                                                                                                          | w/w          | w/d | 5,0   | 3,0 |    |     | 3,0    |     | 8,5   |     |     | 6,0    |
|                                                                                                                    | d/d          |     | 8,5   | 5,5 |    |     | 5,0    |     | 8,5   |     |     | 8,5    |

**Table C11.2:** Characteristic resistance under shear load

|                                                                                                                  |              |       |     |     |     |        |     |       |     |     |        |
|------------------------------------------------------------------------------------------------------------------|--------------|-------|-----|-----|-----|--------|-----|-------|-----|-----|--------|
| Anchor rod                                                                                                       | M8           | -     |     | M8  | M10 | M8     | M10 | -     |     | M12 | M12    |
| Internal threaded anchor FIS E                                                                                   | -            | M6    | M8  | -   | -   | -      | -   | M10   | M12 | -   | -      |
|                                                                                                                  |              | 11x85 |     |     |     |        |     | 15x85 |     |     |        |
| Perforated sleeve FIS H K                                                                                        | 12x85        | 16x85 |     |     |     | 16x130 |     | 20x85 |     |     | 20x130 |
| Shear load V <sub>Rk</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |       |     |     |     |        |     |       |     |     |        |
| compressive strength f <sub>b</sub>                                                                              | use category |       |     |     |     |        |     |       |     |     |        |
| ≥ 10N/mm²                                                                                                        | w/w          | w/d   | 3,0 | 3,5 |     |        |     |       |     |     |        |
|                                                                                                                  | d/d          |       |     |     |     |        |     |       |     |     |        |
| ≥ 20N/mm²                                                                                                        | w/w          | w/d   | 4,5 | 5,5 |     |        |     |       |     |     |        |
|                                                                                                                  | d/d          |       |     |     |     |        |     |       |     |     |        |

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

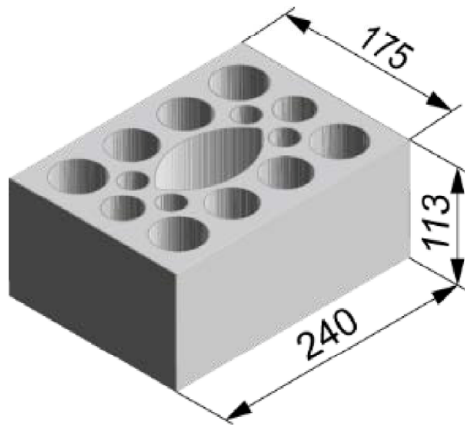
## Performance

Perforated sand-lime brick KS, Characteristic resistance under tensile and shear load

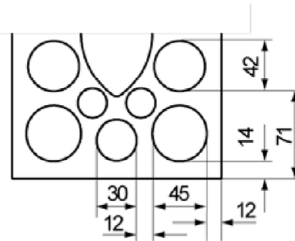
## Annex C 11

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# Perforated sand-lime brick KSL, 3DF, EN 771-2:2015



| Perforated sand-lime brick KSL, 3DF, EN 771-2:2015 |                     |         |          |
|----------------------------------------------------|---------------------|---------|----------|
| Producer                                           | e.g. KS Wemding     |         |          |
| Nominal dimensions [mm]                            | length L            | width W | height H |
|                                                    | 240                 | 175     | 113      |
| Density $\rho$ [kg/dm <sup>3</sup> ]               | $\geq 1,4$          |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ]    | $\geq 12 / \geq 20$ |         |          |
| Standard or annex                                  | EN 771-2:2015       |         |          |



Dimension see also Annex B 12

**Table C12.1:** Installation parameters

|                                |       |                   |    |     |        |                     |       |     |        |
|--------------------------------|-------|-------------------|----|-----|--------|---------------------|-------|-----|--------|
| Anchor rod                     | M8    | -                 | M8 | M10 | M8     | M10                 | -     | M12 | M12    |
| Internal threaded anchor FIS E | -     | M6<br>M8<br>11x85 | -  | -   | -      | M10<br>M12<br>15x85 | -     | -   | -      |
| Perforated sleeve FIS H K      | 12x85 | 16x85             |    |     | 16x130 |                     | 20x85 |     | 20x130 |

## Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K

|                          |                 |   |
|--------------------------|-----------------|---|
| Max. installation torque | $T_{inst}$ [Nm] | 2 |
|--------------------------|-----------------|---|

## General installation parameters

|               |                     |     |    |
|---------------|---------------------|-----|----|
| Edge distance | $C_{min}$           | 60  | 80 |
| Spacing       | $S_{min} \parallel$ | 100 |    |
|               | $S_{scr} \parallel$ | 240 |    |
|               | $S_{min} \perp$     | 115 |    |
|               | $S_{scr} \perp$     | 115 |    |

## Drilling method

Hammer drilling with hard metal hammer drill

**Table C12.2:** Group factors

|                                |       |                   |    |     |        |                     |       |     |        |
|--------------------------------|-------|-------------------|----|-----|--------|---------------------|-------|-----|--------|
| Anchor rod                     | M8    | -                 | M8 | M10 | M8     | M10                 | -     | M12 | M12    |
| Internal threaded anchor FIS E | -     | M6<br>M8<br>11x85 | -  | -   | -      | M10<br>M12<br>15x85 | -     | -   | -      |
| Perforated sleeve FIS H K      | 12x85 | 16x85             |    |     | 16x130 |                     | 20x85 |     | 20x130 |

|               |                                                                                                |       |            |
|---------------|------------------------------------------------------------------------------------------------|-------|------------|
| Group factors | $\alpha_{g,N \parallel} = \alpha_{g,V \parallel}$<br>$\alpha_{g,N \perp} = \alpha_{g,V \perp}$ | $[-]$ | 1,5<br>2,0 |
|---------------|------------------------------------------------------------------------------------------------|-------|------------|

|                                                                                                |                                       |
|------------------------------------------------------------------------------------------------|---------------------------------------|
| fischer injection system FIS AB for masonry                                                    | <b>Annex C 12</b><br>Appendix 30 / 45 |
| <b>Performance</b><br>Perforated sand-lime brick KSL, 3DF, dimensions, installation parameters |                                       |

# Perforated sand-lime brick KSL, 3DF, EN 771-2:2015

**Table C13.1:** Characteristic resistance under tensile load

|                                                                                                                    |              |     |       |     |    |     |        |     |       |     |     |        |
|--------------------------------------------------------------------------------------------------------------------|--------------|-----|-------|-----|----|-----|--------|-----|-------|-----|-----|--------|
| Anchor rod                                                                                                         | M8           |     | -     |     | M8 | M10 | M8     | M10 | -     |     | M12 | M12    |
| Internal threaded anchor FIS E                                                                                     | -            |     | M6    | M8  | -  |     | -      |     | M10   | M12 | -   | -      |
|                                                                                                                    |              |     | 11x85 |     |    |     |        |     | 15x85 |     |     |        |
| Perforated sleeve FIS H K                                                                                          | 12x85        |     | 16x85 |     |    |     | 16x130 |     | 20x85 |     |     | 20x130 |
| Tensile load N <sub>RK</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |     |       |     |    |     |        |     |       |     |     |        |
| compressive strength f <sub>b</sub>                                                                                | use category |     |       |     |    |     |        |     |       |     |     |        |
| ≥ 12N/mm²                                                                                                          | w/w          | w/d | 2,5   | 2,5 |    |     | 3,0    |     | 3,0   |     |     | 3,0    |
|                                                                                                                    | d/d          |     | 2,5   | 3,0 |    |     | 3,5    |     | 3,5   |     |     | 3,5    |
| ≥ 20N/mm²                                                                                                          | w/w          | w/d | 4,0   | 4,5 |    |     | 5,5    |     | 5,5   |     |     | 5,5    |
|                                                                                                                    | d/d          |     | 4,5   | 5,0 |    |     | 6,0    |     | 6,0   |     |     | 6,0    |

**Table C13.2:** Characteristic resistance under shear load

|                                                                                                                  |              |       |     |    |     |        |     |       |     |     |        |
|------------------------------------------------------------------------------------------------------------------|--------------|-------|-----|----|-----|--------|-----|-------|-----|-----|--------|
| Anchor rod                                                                                                       | M8           | -     |     | M8 | M10 | M8     | M10 | -     |     | M12 | M12    |
| Internal threaded anchor FIS E                                                                                   | -            | M6    | M8  | -  |     | -      |     | M10   | M12 | -   | -      |
|                                                                                                                  |              | 11x85 |     |    |     |        |     | 15x85 |     |     |        |
| Perforated sleeve FIS H K                                                                                        | 12x85        | 16x85 |     |    |     | 16x130 |     | 20x85 |     |     | 20x130 |
| Shear load V <sub>Rk</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |       |     |    |     |        |     |       |     |     |        |
| compressive strength f <sub>b</sub>                                                                              | use category |       |     |    |     |        |     |       |     |     |        |
| ≥ 12N/mm²                                                                                                        | w/w          | w/d   | 2,5 |    | 4,5 |        |     |       |     |     |        |
|                                                                                                                  | d/d          |       |     |    |     |        |     |       |     |     |        |
| ≥ 20N/mm²                                                                                                        | w/w          | w/d   | 4,5 |    | 4,0 |        | 7,5 |       |     |     |        |
|                                                                                                                  | d/d          |       |     |    |     |        |     |       |     |     |        |

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

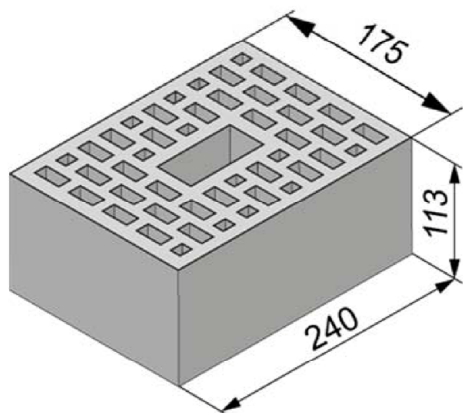
## Performance

Perforated sand-lime brick KSL, 3DF,  
Characteristic resistance under tensile and shear load

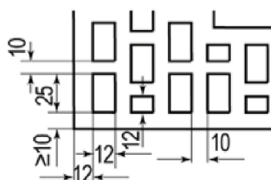
## Annex C 13

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**Vertical perforated brick HLz, EN 771-1:2015**



| Vertical perforated brick HLz, EN 771-1:2015    |                   |         |          |
|-------------------------------------------------|-------------------|---------|----------|
| Producer                                        | e.g. Wienerberger |         |          |
| Nominal dimensions [mm]                         | length L          | width W | height H |
|                                                 | 240               | 175     | 113      |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 0,9             |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | ≥ 10              |         |          |
| Standard or annex                               | EN 771-1:2015     |         |          |



Dimension see also Annex B 12

**Table C14.1:** Installation parameters

|                                   |       |       |    |    |     |        |     |       |     |     |        |
|-----------------------------------|-------|-------|----|----|-----|--------|-----|-------|-----|-----|--------|
| Anchor rod                        | M8    | -     |    | M8 | M10 | M8     | M10 | -     |     | M12 | M12    |
| Internal threaded anchor<br>FIS E | -     | M6    | M8 | -  |     | -      |     | M10   | M12 | -   | -      |
|                                   |       | 11x85 |    |    |     |        |     | 15x85 |     |     |        |
| Perforated sleeve FIS H K         | 12x85 | 16x85 |    |    |     | 16x130 |     | 20x85 |     |     | 20x130 |

**Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K**

|                          |                   |      |   |
|--------------------------|-------------------|------|---|
| Max. installation torque | $T_{\text{inst}}$ | [Nm] | 2 |
|--------------------------|-------------------|------|---|

## General installation parameters

|               |                     |      |     |
|---------------|---------------------|------|-----|
| Edge distance | $c_{min}$           | [mm] | 100 |
| Spacing       | $s_{min \parallel}$ |      | 240 |
|               | $s_{cr \parallel}$  |      | 240 |
|               | $s_{min \perp}$     |      | 115 |
|               | $s_{cr \perp}$      |      | 115 |

### Drilling method

Hammer drilling with hard metal hammer drill

**Table C14.2: Group factors**

|                                   |       |       |    |    |     |        |       |       |   |        |     |
|-----------------------------------|-------|-------|----|----|-----|--------|-------|-------|---|--------|-----|
| Anchor rod                        | M8    | -     |    | M8 | M10 | M8     | M10   | -     |   | M12    | M12 |
| Internal threaded anchor<br>FIS E | -     | M6    | M8 | -  |     | -      | M10   | M12   | - | -      |     |
|                                   |       | 11x85 |    |    |     |        | 15x85 |       |   |        |     |
| Perforated sleeve FIS H K         | 12x85 | 16x85 |    |    |     | 16x130 |       | 20x85 |   | 20x130 |     |

|               |                                                   |     |     |
|---------------|---------------------------------------------------|-----|-----|
| Group factors | $\alpha_{g,N} \parallel = \alpha_{g,V} \parallel$ | [-] | 2,0 |
|               | $\alpha_{g,N} \perp = \alpha_{g,V} \perp$         |     | 2,0 |

fischer injection system FIS AB for masonry

## Performance

### Vertical perforated brick HLz, dimensions, installation parameters

## Annex C 14

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# Vertical perforated brick HLz, EN 771-1:2015

**Table C15.1:** Characteristic resistance under tensile load

|                                                                                                                    |  |              |       |     |       |    |    |     |        |     |       |     |     |  |        |  |
|--------------------------------------------------------------------------------------------------------------------|--|--------------|-------|-----|-------|----|----|-----|--------|-----|-------|-----|-----|--|--------|--|
| Anchor rod                                                                                                         |  |              | M8    |     | -     |    | M8 | M10 | M8     | M10 | -     |     | M12 |  | M12    |  |
| Internal threaded anchor FIS E                                                                                     |  |              | -     |     | M6    | M8 | -  |     | -      |     | M10   | M12 | -   |  | -      |  |
|                                                                                                                    |  |              |       |     | 11x85 |    |    |     |        |     | 15x85 |     |     |  |        |  |
| Perforated sleeve FIS H K                                                                                          |  |              | 12x85 |     | 16x85 |    |    |     | 16x130 |     | 20x85 |     |     |  | 20x130 |  |
| Tensile load N <sub>Rk</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |  |              |       |     |       |    |    |     |        |     |       |     |     |  |        |  |
| compressive strength f <sub>b</sub>                                                                                |  | use category |       |     |       |    |    |     |        |     |       |     |     |  |        |  |
| ≥ 10N/mm²                                                                                                          |  | w/w          | w/d   | 3,5 | 3,5   |    |    |     | 4,5    |     |       |     |     |  |        |  |
|                                                                                                                    |  | d/d          |       | 4,0 | 3,5   |    |    |     | 5,0    |     |       |     |     |  |        |  |

**Table C15.2:** Characteristic resistance under shear load

|                                                                                                                  |              |       |     |   |     |        |    |       |     |   |        |     |
|------------------------------------------------------------------------------------------------------------------|--------------|-------|-----|---|-----|--------|----|-------|-----|---|--------|-----|
| Anchor rod                                                                                                       | M8           |       | -   |   | M8  | M10    | M8 | M10   | -   |   | M12    | M12 |
| Internal threaded anchor FIS E                                                                                   | -            | M6    | M8  | - |     | -      |    | M10   | M12 | - | -      |     |
|                                                                                                                  |              | 11x85 |     |   |     |        |    | 15x85 |     |   |        |     |
| Perforated sleeve FIS H K                                                                                        | 12x85        | 16x85 |     |   |     | 16x130 |    | 20x85 |     |   | 20x130 |     |
| Shear load V <sub>Rk</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |       |     |   |     |        |    |       |     |   |        |     |
| compressive strength f <sub>b</sub>                                                                              | use category |       |     |   |     |        |    |       |     |   |        |     |
| ≥ 10N/mm²                                                                                                        | w/w          | w/d   | 4,0 |   | 5,5 |        |    |       | 6,0 |   |        |     |
|                                                                                                                  | d/d          |       |     |   |     |        |    |       |     |   |        |     |

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

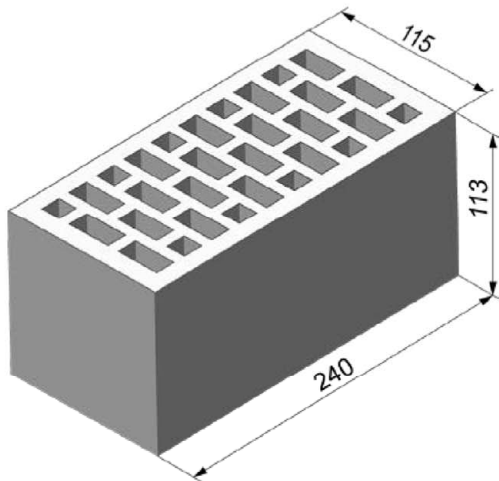
## Performance

Vertical perforated brick HLz, Characteristic resistance under tensile and shear load

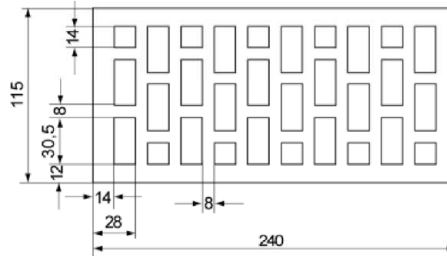
## Annex C 15

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# Vertical perforated brick HLz, 2DF, EN 771-1:2015



| Vertical perforated brick HLz, 2DF, EN 771-1:2015 |                   |         |          |
|---------------------------------------------------|-------------------|---------|----------|
| Producer                                          | e.g. Wienerberger |         |          |
| Nominal dimensions [mm]                           | length L          | width W | height H |
|                                                   | 240               | 115     | 113      |
| Density $\rho$ [kg/dm <sup>3</sup> ]              | $\geq 1,4$        |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ]   | $\geq 20$         |         |          |
| Standard or annex                                 | EN 771-1:2015     |         |          |



Dimension see also Annex B 12

**Table C16.1:** Installation parameters

|                                                                              |                                        |      |       |    |    |     |       |     |     |
|------------------------------------------------------------------------------|----------------------------------------|------|-------|----|----|-----|-------|-----|-----|
| Anchor rod                                                                   | M8                                     |      | -     |    | M8 | M10 | -     |     | M12 |
| Internal threaded anchor FIS E                                               | -                                      |      | M6    | M8 | -  |     | M10   | M12 | -   |
|                                                                              |                                        |      | 11x85 |    |    |     | 15x85 |     |     |
| Perforated sleeve FIS H K                                                    | 12x85                                  |      | 16x85 |    |    |     | 20x85 |     |     |
| Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K |                                        |      |       |    |    |     |       |     |     |
| Max. installation torque                                                     | T <sub>inst</sub>                      | [Nm] | 2     |    |    |     |       |     |     |
| General installation parameters                                              |                                        |      |       |    |    |     |       |     |     |
| Edge distance                                                                | C <sub>min</sub>                       | [mm] | 80    |    |    |     |       |     |     |
| Spacing                                                                      | S <sub>cr</sub>    = S <sub>min</sub>  |      | 240   |    |    |     |       |     |     |
|                                                                              | S <sub>cr</sub> ⊥ = S <sub>min</sub> ⊥ |      | 115   |    |    |     |       |     |     |
| Drilling method                                                              |                                        |      |       |    |    |     |       |     |     |
| Hammer drilling with hard metal hammer drill                                 |                                        |      |       |    |    |     |       |     |     |

**Table C16.2:** Group factors

|                                |                          |       |   |       |    |    |     |       |     |     |  |
|--------------------------------|--------------------------|-------|---|-------|----|----|-----|-------|-----|-----|--|
| Anchor rod                     |                          | M8    |   | -     |    | M8 | M10 | -     |     | M12 |  |
| Internal threaded anchor FIS E |                          | -     |   | M6    | M8 | -  |     | M10   | M12 | -   |  |
|                                |                          |       |   | 11x85 |    |    |     | 15x85 |     |     |  |
| Perforated sleeve FIS H K      |                          | 12x85 |   | 16x85 |    |    |     | 20x85 |     |     |  |
| Group factors                  | $\alpha_{g,N} \parallel$ | [-]   | 2 |       |    |    |     |       |     |     |  |
|                                | $\alpha_{g,V} \parallel$ |       |   |       |    |    |     |       |     |     |  |
|                                | $\alpha_{g,N} \perp$     |       |   |       |    |    |     |       |     |     |  |
|                                | $\alpha_{g,V} \perp$     |       |   |       |    |    |     |       |     |     |  |

fischer injection system FIS AB for masonry

## Performance

Vertical perforated brick HLz, 2DF, dimensions, installation parameters

## Annex C 16

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**Vertical perforated brick HLz, 2DF, EN 771-1:2015****Table C17.1:** Characteristic resistance under tensile load

|                                                                                                                    |              |     |       |     |    |     |       |     |     |
|--------------------------------------------------------------------------------------------------------------------|--------------|-----|-------|-----|----|-----|-------|-----|-----|
| Anchor rod                                                                                                         | M8           |     | -     |     | M8 | M10 | -     |     | M12 |
| Internal threaded anchor FIS E                                                                                     | -            |     | M6    | M8  | -  |     | M10   | M12 | -   |
|                                                                                                                    |              |     | 11x85 |     |    |     | 15x85 |     |     |
| Perforated sleeve FIS H K                                                                                          | 12x85        |     | 16x85 |     |    |     | 20x85 |     |     |
| Tensile load N <sub>RK</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |     |       |     |    |     |       |     |     |
| compressive strength f <sub>b</sub>                                                                                | use category |     |       |     |    |     |       |     |     |
| ≥ 20N/mm²                                                                                                          | w/w          | w/d | 3,5   | 2,5 |    |     | 3,0   |     |     |
|                                                                                                                    | d/d          |     | 4,0   | 2,5 |    |     | 3,0   |     |     |

**Table C17.2:** Characteristic resistance under shear load

|                                                                                                                  |              |       |     |     |     |       |     |   |     |
|------------------------------------------------------------------------------------------------------------------|--------------|-------|-----|-----|-----|-------|-----|---|-----|
| Anchor rod                                                                                                       | M8           |       | -   |     | M8  | M10   | -   |   | M12 |
| Internal threaded anchor FIS E                                                                                   | -            | M6    | M8  | -   |     | M10   | M12 | - |     |
|                                                                                                                  |              | 11x85 |     |     |     | 15x85 |     |   |     |
| Perforated sleeve FIS H K                                                                                        | 12x85        | 16x85 |     |     |     | 20x85 |     |   |     |
| Shear load V <sub>Rk</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |       |     |     |     |       |     |   |     |
| compressive strength f <sub>b</sub>                                                                              | use category |       |     |     |     |       |     |   |     |
| ≥ 20N/mm²                                                                                                        | w/w          | w/d   | 7,5 | 4,0 | 4,5 |       | 8,5 |   |     |
|                                                                                                                  | d/d          |       |     |     |     |       |     |   |     |

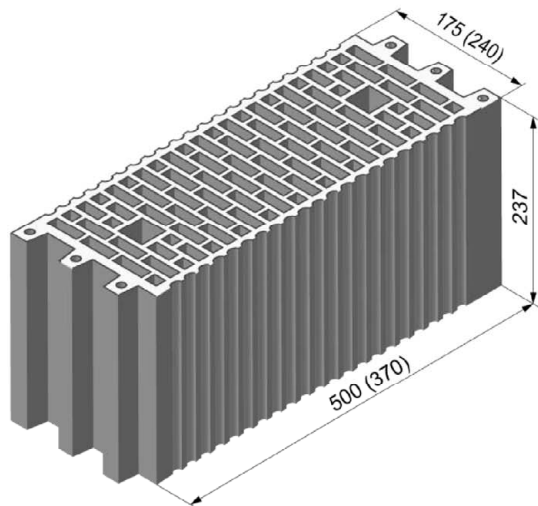
Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

**Performance**Vertical perforated brick HLz, 2DF,  
Characteristic resistance under tensile and shear load**Annex C 17**

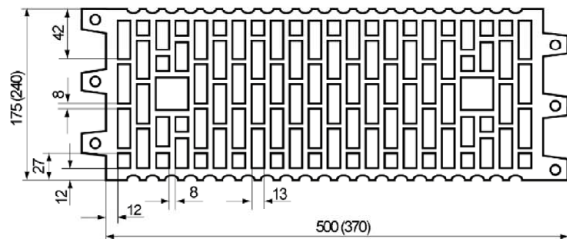
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# Vertical perforated brick HLz, EN 771-1:2015



## Vertical perforated brick HLz, EN 771-1:2015

|                                                 |                            |         |          |
|-------------------------------------------------|----------------------------|---------|----------|
| Producer                                        | e.g. Wienerberger, Poroton |         |          |
| Nominal dimensions [mm]                         | length L                   | width W | height H |
|                                                 | 500                        | 175     | 237      |
|                                                 | 370                        | 240     | 237      |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | $\geq 1,0$                 |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | $\geq 10$                  |         |          |
| Standard or annex                               | EN 771-1:2015              |         |          |



Dimension  
see also  
Annex B 12

**Table C18.1:** Installation parameters

|                                                                              |                    |       |           |    |   |    |        |    |       |     |   |        |     |
|------------------------------------------------------------------------------|--------------------|-------|-----------|----|---|----|--------|----|-------|-----|---|--------|-----|
| Anchor rod                                                                   |                    | M8    |           | -  |   | M8 | M10    | M8 | M10   | -   |   | M12    | M12 |
| Internal threaded anchor FIS E                                               |                    | -     | M6        | M8 | - |    | -      |    | M10   | M12 | - | -      |     |
|                                                                              |                    |       | 11x85     |    |   |    |        |    | 15x85 |     |   |        |     |
| Perforated sleeve FIS H K                                                    |                    | 12x85 | 16x85     |    |   |    | 16x130 |    | 20x85 |     |   | 20x130 |     |
| Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K |                    |       |           |    |   |    |        |    |       |     |   |        |     |
| Max. installation torque                                                     | T <sub>inst</sub>  | [Nm]  | 2         |    |   |    |        |    |       |     |   |        |     |
| General installation parameters                                              |                    |       |           |    |   |    |        |    |       |     |   |        |     |
| Edge distance                                                                | C <sub>min</sub>   | [mm]  | 100       |    |   |    |        |    |       |     |   |        |     |
| Spacing                                                                      | S <sub>min</sub>   |       | 100       |    |   |    |        |    |       |     |   |        |     |
|                                                                              | S <sub>scr</sub>   |       | 500 (370) |    |   |    |        |    |       |     |   |        |     |
|                                                                              | S <sub>min</sub> ⊥ |       | 100       |    |   |    |        |    |       |     |   |        |     |
|                                                                              | S <sub>scr</sub> ⊥ |       | 240       |    |   |    |        |    |       |     |   |        |     |
| Drilling method                                                              |                    |       |           |    |   |    |        |    |       |     |   |        |     |
| Hammer drilling with hard metal hammer drill                                 |                    |       |           |    |   |    |        |    |       |     |   |        |     |

**Table C18.2:** Group factors

|                                |                                                                                                |     |       |       |    |    |     |        |     |       |     |     |        |
|--------------------------------|------------------------------------------------------------------------------------------------|-----|-------|-------|----|----|-----|--------|-----|-------|-----|-----|--------|
| Anchor rod                     |                                                                                                |     | M8    | -     |    | M8 | M10 | M8     | M10 | -     |     | M12 | M12    |
| Internal threaded anchor FIS E |                                                                                                |     | -     | M6    | M8 | -  | -   | -      | -   | M10   | M12 | -   | -      |
|                                |                                                                                                |     |       | 11x85 |    |    |     |        |     | 15x85 |     |     |        |
| Perforated sleeve FIS H K      |                                                                                                |     | 12x85 | 16x85 |    |    |     | 16x130 |     | 20x85 |     |     | 20x130 |
| Group factors                  | $\alpha_{g,N} \parallel = \alpha_{g,V} \parallel$<br>$\alpha_{g,N} \perp = \alpha_{g,V} \perp$ | [-] | 1     |       |    |    |     |        |     |       |     |     |        |

fischer injection system FIS AB for masonry

### Performance

Vertical perforated brick HLz, dimensions, installation parameters

## Annex C 18

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# Vertical perforated brick HLz, EN 771-1:2015

**Table C19.1:** Characteristic resistance under tensile load

|                                                                                                                    |              |       |     |     |    |        |    |       |     |   |        |     |
|--------------------------------------------------------------------------------------------------------------------|--------------|-------|-----|-----|----|--------|----|-------|-----|---|--------|-----|
| Anchor rod                                                                                                         | M8           |       | -   |     | M8 | M10    | M8 | M10   | -   |   | M12    | M12 |
| Internal threaded anchor FIS E                                                                                     | -            | M6    | M8  | -   |    | -      |    | M10   | M12 | - | -      |     |
|                                                                                                                    |              | 11x85 |     |     |    |        |    | 15x85 |     |   |        |     |
| Perforated sleeve FIS H K                                                                                          | 12x85        | 16x85 |     |     |    | 16x130 |    | 20x85 |     |   | 20x130 |     |
| Tensile load N <sub>Rk</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |       |     |     |    |        |    |       |     |   |        |     |
| compressive strength f <sub>b</sub>                                                                                | use category |       |     |     |    |        |    |       |     |   |        |     |
| ≥ 10N/mm²                                                                                                          | w/w          | w/d   | 0,9 | 2,5 |    |        |    |       |     |   | 3,0    |     |
|                                                                                                                    | d/d          |       | 0,9 | 2,5 |    |        |    |       |     |   | 3,5    |     |

**Table C19.2:** Characteristic resistance under shear load

|                                                                                                                  |              |       |     |    |     |        |     |       |     |     |        |
|------------------------------------------------------------------------------------------------------------------|--------------|-------|-----|----|-----|--------|-----|-------|-----|-----|--------|
| Anchor rod                                                                                                       | M8           | -     |     | M8 | M10 | M8     | M10 | -     |     | M12 | M12    |
| Internal threaded anchor FIS E                                                                                   | -            | M6    | M8  | -  |     | -      |     | M10   | M12 | -   | -      |
|                                                                                                                  |              | 11x85 |     |    |     |        |     | 15x85 |     |     |        |
| Perforated sleeve FIS H K                                                                                        | 12x85        | 16x85 |     |    |     | 16x130 |     | 20x85 |     |     | 20x130 |
| Shear load V <sub>Rk</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |       |     |    |     |        |     |       |     |     |        |
| compressive strength f <sub>b</sub>                                                                              | use category |       |     |    |     |        |     |       |     |     |        |
| ≥ 10N/mm²                                                                                                        | w/w          | w/d   | 1,2 |    |     |        | 1,5 | 1,2   |     |     | 1,5    |
|                                                                                                                  | d/d          |       |     |    |     |        |     |       |     |     |        |

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

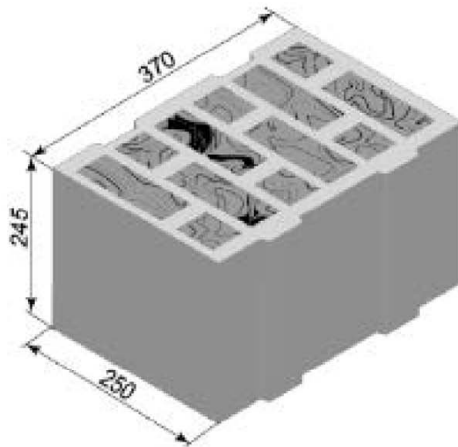
## Performance

Vertical perforated brick HLz, Characteristic resistance under tensile and shear load

## Annex C 19

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# Vertical perforated brick HLz, filled with mineral wool, EN 771-1:2015



| Vertical perforated brick HLz,<br>filled with mineral wool, EN 771-1:2015 |               |         |          |
|---------------------------------------------------------------------------|---------------|---------|----------|
| Producer                                                                  | -             |         |          |
| Nominal dimensions [mm]                                                   | length L      | width W | height H |
|                                                                           | 370           | 250     | 245      |
| Density $\rho$ [kg/dm <sup>3</sup> ]                                      | $\geq 0,6$    |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ]                           | $\geq 8$      |         |          |
| Standard or annex                                                         | EN 771-1:2015 |         |          |

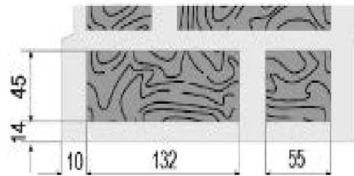


**Table C20.1:** Installation parameters

|                                                                              |                    |       |       |    |   |    |        |    |       |   |       |        |        |     |
|------------------------------------------------------------------------------|--------------------|-------|-------|----|---|----|--------|----|-------|---|-------|--------|--------|-----|
| Anchor rod                                                                   |                    | M8    |       | -  |   | M8 | M10    | M8 | M10   | - |       | M12    | M12    | M12 |
| Internal threaded anchor FIS E                                               |                    | -     | M6    | M8 | - |    | -      |    | M10   |   | M12   | -      | -      | -   |
|                                                                              |                    |       | 11x85 |    |   |    |        |    |       |   | 15x85 |        |        |     |
| Perforated sleeve FIS H K                                                    |                    | 12x85 | 16x85 |    |   |    | 16x130 |    | 20x85 |   |       | 20x130 | 20x200 |     |
| Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K |                    |       |       |    |   |    |        |    |       |   |       |        |        |     |
| Max. installation torque                                                     | T <sub>inst</sub>  | [Nm]  | 2     |    |   |    |        |    |       |   |       |        |        |     |
| General installation parameters                                              |                    |       |       |    |   |    |        |    |       |   |       |        |        |     |
| Edge distance                                                                | c <sub>min</sub>   | [mm]  | 250   |    |   |    |        |    |       |   |       |        |        |     |
| Spacing                                                                      | s <sub>min</sub>   |       | 250   |    |   |    |        |    |       |   |       |        |        |     |
|                                                                              | s <sub>scr</sub>   |       | 250   |    |   |    |        |    |       |   |       |        |        |     |
|                                                                              | s <sub>min</sub> ⊥ |       | 245   |    |   |    |        |    |       |   |       |        |        |     |
|                                                                              | s <sub>scr</sub> ⊥ |       | 245   |    |   |    |        |    |       |   |       |        |        |     |
| Drilling method                                                              |                    |       |       |    |   |    |        |    |       |   |       |        |        |     |
| Hammer drilling with hard metal hammer drill                                 |                    |       |       |    |   |    |        |    |       |   |       |        |        |     |

**Table C20.2:** Group factors

|                                |                          |     |       |       |    |    |     |        |     |       |     |     |        |        |
|--------------------------------|--------------------------|-----|-------|-------|----|----|-----|--------|-----|-------|-----|-----|--------|--------|
| Anchor rod                     |                          |     | M8    | -     |    | M8 | M10 | M8     | M10 | -     |     | M12 | M12    | M12    |
| Internal threaded anchor FIS E |                          |     | -     | M6    | M8 | -  |     | -      |     | M10   | M12 | -   | -      | -      |
|                                |                          |     |       | 11x85 |    |    |     |        |     | 15x85 |     |     |        |        |
| Perforated sleeve FIS H K      |                          |     | 12x85 | 16x85 |    |    |     | 16x130 |     | 20x85 |     |     | 20x130 | 20x200 |
| Group factors                  | $\alpha_{g,N} \parallel$ | [-] | 2,0   |       |    |    |     |        |     |       |     |     |        |        |
|                                | $\alpha_{g,V} \parallel$ |     |       |       |    |    |     |        |     |       |     |     |        |        |
|                                | $\alpha_{g,N} \perp$     |     |       |       |    |    |     |        |     |       |     |     |        |        |
|                                | $\alpha_{g,V} \perp$     |     |       |       |    |    |     |        |     |       |     |     |        |        |

fischer injection system FIS AB for masonry

## Performance

Vertical perforated brick HLz, filled with mineral wool;  
dimensions, installation parameters

## Annex C 20

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# Vertical perforated brick HLz, filled with mineral wool, EN 771-1:2015

**Table C21.1:** Characteristic resistance under tensile load

|                                                                                                                    |  |              |       |       |     |    |     |        |     |       |     |     |        |        |
|--------------------------------------------------------------------------------------------------------------------|--|--------------|-------|-------|-----|----|-----|--------|-----|-------|-----|-----|--------|--------|
| Anchor rod                                                                                                         |  |              | M8    | -     |     | M8 | M10 | M8     | M10 | -     |     | M12 | M12    | M12    |
| Internal threaded anchor FIS E                                                                                     |  |              | -     | M6    | M8  | -  |     | -      |     | M10   | M12 | -   | -      | -      |
|                                                                                                                    |  |              |       | 11x85 |     |    |     |        |     | 15x85 |     |     |        |        |
| Perforated sleeve FIS H K                                                                                          |  |              | 12x85 | 16x85 |     |    |     | 16x130 |     | 20x85 |     |     | 20x130 | 20x200 |
| Tensile load N <sub>Rk</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |  |              |       |       |     |    |     |        |     |       |     |     |        |        |
| compressive strength f <sub>b</sub>                                                                                |  | use category |       |       |     |    |     |        |     |       |     |     |        |        |
| ≥ 8N/mm <sup>2</sup>                                                                                               |  | w/w          | w/d   | 2,0   | 1,5 |    |     | 2,5    |     | 2,0   |     |     | 3,0    |        |
|                                                                                                                    |  | d/d          |       | 2,0   | 2,0 |    |     | 3,0    |     | 2,0   |     |     | 3,0    |        |

**Table C21.2:** Characteristic resistance under shear load

|                                                                                                                  |              |       |     |    |     |        |     |       |     |        |        |     |
|------------------------------------------------------------------------------------------------------------------|--------------|-------|-----|----|-----|--------|-----|-------|-----|--------|--------|-----|
| Anchor rod                                                                                                       | M8           | -     |     | M8 | M10 | M8     | M10 | -     |     | M12    | M12    | M12 |
| Internal threaded anchor FIS E                                                                                   | -            | M6    | M8  | -  |     | -      |     | M10   | M12 | -      | -      | -   |
|                                                                                                                  |              | 11x85 |     |    |     |        |     | 15x85 |     |        |        |     |
| Perforated sleeve FIS H K                                                                                        | 12x85        | 16x85 |     |    |     | 16x130 |     | 20x85 |     | 20x130 | 20x200 |     |
| Shear load V <sub>Rk</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |       |     |    |     |        |     |       |     |        |        |     |
| compressive strength f <sub>b</sub>                                                                              | use category |       |     |    |     |        |     |       |     |        |        |     |
| ≥ 8N/mm²                                                                                                         | w/w          | w/d   | 2,5 |    | 3,0 |        |     |       | 1,5 |        |        |     |
|                                                                                                                  | d/d          |       |     |    |     |        |     |       |     |        |        |     |

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

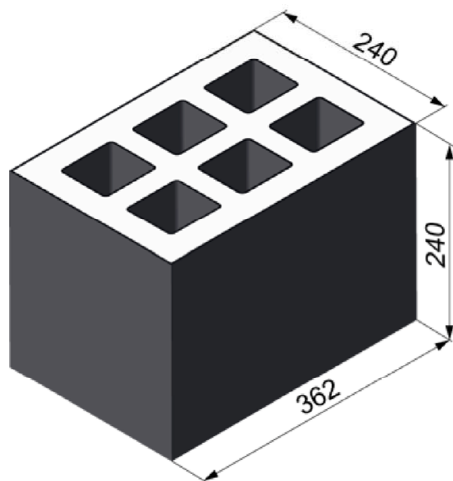
## Performance

Vertical perforated brick HLz, filled with mineral wool;  
Characteristic resistance under tensile and shear load

## Annex C 21

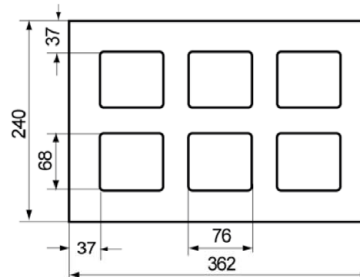
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# Light-weight concrete hollow block Hbl, EN 771-3:2015



## Light-weight concrete hollow block Hbl, EN 771-3:2015

|                                                 |               |         |          |
|-------------------------------------------------|---------------|---------|----------|
| Producer                                        | -             |         |          |
| Nominal dimensions [mm]                         | length L      | width W | height H |
|                                                 | 362           | 240     | 240      |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | $\geq 1,0$    |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | $\geq 4$      |         |          |
| Standard or annex                               | EN 771-3:2015 |         |          |



Dimension see also Annex B 12

**Table C22.1:** Installation parameters

|                                                                              |                                         |       |     |       |    |    |     |        |     |       |     |     |        |
|------------------------------------------------------------------------------|-----------------------------------------|-------|-----|-------|----|----|-----|--------|-----|-------|-----|-----|--------|
| Anchor rod                                                                   |                                         | M8    |     | -     |    | M8 | M10 | M8     | M10 | -     |     | M12 | M12    |
| Internal threaded anchor FIS E                                               |                                         | -     |     | M6    | M8 | -  |     | -      |     | M10   | M12 | -   | -      |
|                                                                              |                                         |       |     | 11x85 |    |    |     |        |     | 15x85 |     |     |        |
| Perforated sleeve FIS H K                                                    |                                         | 12x85 |     | 16x85 |    |    |     | 16x130 |     | 20x85 |     |     | 20x130 |
| Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K |                                         |       |     |       |    |    |     |        |     |       |     |     |        |
| Max. installation torque                                                     | T <sub>inst</sub>                       | [Nm]  | 2   |       |    |    |     |        |     |       |     |     |        |
| General installation parameters                                              |                                         |       |     |       |    |    |     |        |     |       |     |     |        |
| Edge distance                                                                | C <sub>min</sub>                        | [mm]  | 60  |       |    |    |     |        |     |       |     |     |        |
| Spacing                                                                      | S <sub>min</sub>                        |       | 100 |       |    |    |     |        |     |       |     |     |        |
|                                                                              | S <sub>scr</sub>                        |       | 362 |       |    |    |     |        |     |       |     |     |        |
|                                                                              | S <sub>min</sub> ⊥ = S <sub>scr</sub> ⊥ |       | 240 |       |    |    |     |        |     |       |     |     |        |
| Drilling method                                                              |                                         |       |     |       |    |    |     |        |     |       |     |     |        |
| Hammer drilling with hard metal hammer drill                                 |                                         |       |     |       |    |    |     |        |     |       |     |     |        |

**Table C22.2:** Group factors

|                                |                          |       |       |    |   |    |        |    |       |     |   |        |     |
|--------------------------------|--------------------------|-------|-------|----|---|----|--------|----|-------|-----|---|--------|-----|
| Anchor rod                     |                          | M8    |       | -  |   | M8 | M10    | M8 | M10   | -   |   | M12    | M12 |
| Internal threaded anchor FIS E |                          | -     | M6    | M8 | - |    | -      |    | M10   | M12 | - | -      |     |
|                                |                          |       | 11x85 |    |   |    |        |    | 15x85 |     |   |        |     |
| Perforated sleeve FIS H K      |                          | 12x85 | 16x85 |    |   |    | 16x130 |    | 20x85 |     |   | 20x130 |     |
| Group factors                  | $\alpha_{g,N} \parallel$ | [-]   | 1,2   |    |   |    |        |    |       |     |   |        |     |
|                                | $\alpha_{g,V} \parallel$ |       | 1,1   |    |   |    |        |    |       |     |   |        |     |
|                                | $\alpha_{g,N} \perp$     |       | 2,0   |    |   |    |        |    |       |     |   |        |     |
|                                | $\alpha_{g,V} \perp$     |       |       |    |   |    |        |    |       |     |   |        |     |

fischer injection system FIS AB for masonry

### Performance

Light-weight concrete hollow block Hbl, dimensions, installation parameters

## Annex C 22

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# Light-weight concrete hollow block Hbl, EN 771-3:2015

**Table C23.1:** Characteristic resistance under tensile load

|                                                                                                                    |              |       |     |   |    |        |    |       |     |   |     |        |     |
|--------------------------------------------------------------------------------------------------------------------|--------------|-------|-----|---|----|--------|----|-------|-----|---|-----|--------|-----|
| Anchor rod                                                                                                         | M8           |       | -   |   | M8 | M10    | M8 | M10   | -   |   | M12 |        | M12 |
| Internal threaded anchor FIS E                                                                                     | -            | M6    | M8  | - |    | -      |    | M10   | M12 | - |     | -      |     |
|                                                                                                                    |              | 11x85 |     |   |    |        |    | 15x85 |     |   |     |        |     |
| Perforated sleeve FIS H K                                                                                          | 12x85        | 16x85 |     |   |    | 16x130 |    | 20x85 |     |   |     | 20x130 |     |
| Tensile load N <sub>Rk</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |       |     |   |    |        |    |       |     |   |     |        |     |
| compressive strength f <sub>b</sub>                                                                                | use category |       |     |   |    |        |    |       |     |   |     |        |     |
| ≥ 4N/mm²                                                                                                           | w/w          | w/d   | 3,0 |   |    |        |    |       |     |   |     |        |     |
|                                                                                                                    | d/d          |       | 3,0 |   |    |        |    |       |     |   |     |        |     |

**Table C23.2:** Characteristic resistance under shear load

|                                                                                                                  |              |       |     |    |     |        |     |       |     |     |        |
|------------------------------------------------------------------------------------------------------------------|--------------|-------|-----|----|-----|--------|-----|-------|-----|-----|--------|
| Anchor rod                                                                                                       | M8           | -     |     | M8 | M10 | M8     | M10 | -     |     | M12 | M12    |
| Internal threaded anchor FIS E                                                                                   | -            | M6    | M8  | -  |     | -      |     | M10   | M12 | -   | -      |
|                                                                                                                  |              | 11x85 |     |    |     |        |     | 15x85 |     |     |        |
| Perforated sleeve FIS H K                                                                                        | 12x85        | 16x85 |     |    |     | 16x130 |     | 20x85 |     |     | 20x130 |
| Shear load V <sub>Rk</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |       |     |    |     |        |     |       |     |     |        |
| compressive strength f <sub>b</sub>                                                                              | use category |       |     |    |     |        |     |       |     |     |        |
| ≥ 4N/mm <sup>2</sup>                                                                                             | w/w          | w/d   | 2,0 |    |     |        |     |       |     |     |        |
|                                                                                                                  | d/d          |       |     |    |     |        |     |       |     |     |        |

Factor for job site tests and displacements see annex C27

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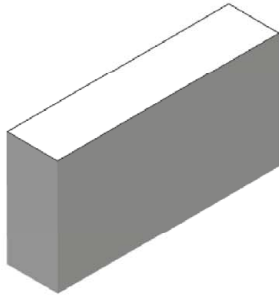
## Performance

Light-weight concrete hollow block Hbl,  
Characteristic resistance under tensile and shear load

## Annex C 23

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# Autoclaved aerated concrete, EN 771-4:2015



| Autoclaved aerated concrete, EN 771-4:2015 |                       |             |                        |
|--------------------------------------------|-----------------------|-------------|------------------------|
| Producer                                   |                       | e.g. Ytong  |                        |
| Density $\rho$                             | [kg/dm <sup>3</sup> ] | $\geq 0,35$ | $\geq 0,5$ $\geq 0,65$ |
| Compressive strength $f_b$                 | [N/mm <sup>2</sup> ]  | $\geq 2$    | $\geq 4$ $\geq 6$      |
| Standard or annex                          |                       | EN 771-4    |                        |

**Table C24.1:** Installation parameters

| Anchor rod                     | M8 | M10 | M12 | -     |    | -     |     |
|--------------------------------|----|-----|-----|-------|----|-------|-----|
| Internal threaded anchor FIS E | -  | -   | -   | M6    | M8 | M10   | M12 |
|                                |    |     |     | 11x85 |    | 15x85 |     |

| Anchor rod and internal threaded anchor FIS E without perforated sleeve |            |      |     |     |     |     |     |     |       |
|-------------------------------------------------------------------------|------------|------|-----|-----|-----|-----|-----|-----|-------|
| Effective anchorage depth                                               | $h_{ef}$   | [mm] | 100 | 200 | 100 | 200 | 100 | 200 | 85    |
| Max. installation torque                                                | $T_{inst}$ | [Nm] | 1   | 8   | 2   | 12  | 2   | 16  | 1   2 |

| General installation parameters |                                        |           |             |  |  |  |  |  |  |
|---------------------------------|----------------------------------------|-----------|-------------|--|--|--|--|--|--|
| Edge distance                   |                                        | $c_{min}$ | 100         |  |  |  |  |  |  |
| Spacing                         | $s_{cr \parallel} = s_{min \parallel}$ |           | 250         |  |  |  |  |  |  |
|                                 | $h_{ef}=200mm$<br>$s_{min \parallel}$  |           | 80          |  |  |  |  |  |  |
|                                 | $h_{ef}=200mm$<br>$s_{cr \parallel}$   |           | $3x h_{ef}$ |  |  |  |  |  |  |
|                                 | $s_{cr \perp} = s_{min \perp}$         |           | 250         |  |  |  |  |  |  |
|                                 | $h_{ef}=200mm$<br>$s_{min \perp}$      |           | 80          |  |  |  |  |  |  |
|                                 | $h_{ef}=200mm$<br>$s_{cr \perp}$       |           | $3x h_{ef}$ |  |  |  |  |  |  |
|                                 |                                        |           |             |  |  |  |  |  |  |
|                                 |                                        |           |             |  |  |  |  |  |  |

| Drilling method                              |  |  |  |  |  |  |  |  |  |
|----------------------------------------------|--|--|--|--|--|--|--|--|--|
| Hammer drilling with hard metal hammer drill |  |  |  |  |  |  |  |  |  |

|                                                                                                                                                           |  |  |  |  |  |  |  |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|
| <div>fischer injection system FIS AB for masonry</div> <div>Performance</div> <div>Autoclaved aerated concrete, dimensions, installation parameters</div> |  |  |  |  |  |  |  |  |  |
|                                                                                                                                                           |  |  |  |  |  |  |  |  |  |

**Table C25.1:** Group factors for autoclaved aerated concrete  
(Compressive strength  $f_b \geq 2 \text{ N/mm}^2$ )

| Anchor rod                     |                                                  | M8  | M10 | M12 | -     |     | -     |     |
|--------------------------------|--------------------------------------------------|-----|-----|-----|-------|-----|-------|-----|
| Internal threaded anchor FIS E |                                                  | -   | -   | -   | M6    | M8  | M10   | M12 |
|                                |                                                  |     |     |     | 11x85 |     | 15x85 |     |
| Group factors                  | $h_{ef}=200 \alpha_{g,N} \parallel$              | [-] | 1,6 |     |       | _1) |       | _1) |
|                                | $h_{ef}=200 \alpha_{g,V} \parallel$              |     | 1,1 |     |       | _1) |       | _1) |
|                                | $\alpha_{g,N} \parallel, \alpha_{g,V} \parallel$ |     | 2   |     |       |     |       |     |
|                                | $h_{ef}=200 \alpha_{g,N} \perp$                  |     | 1,6 |     |       | _1) |       | _1) |
|                                | $h_{ef}=200 \alpha_{g,V} \perp$                  |     | 0,8 |     |       | _1) |       | _1) |
|                                | $\alpha_{g,N} \perp, \alpha_{g,V} \perp$         |     | 2   |     |       |     |       |     |

<sup>1)</sup> No performance assessed

**Table C25.2:** Group factors for autoclaved aerated concrete  
(Compressive strength  $f_b \geq 4 \text{ N/mm}^2$ )

| Anchor rod                     |                                                  | M8  | M10 | M12 | -     |     | -     |     |
|--------------------------------|--------------------------------------------------|-----|-----|-----|-------|-----|-------|-----|
| Internal threaded anchor FIS E |                                                  | -   | -   | -   | M6    | M8  | M10   | M12 |
|                                |                                                  |     |     |     | 11x85 |     | 15x85 |     |
| Group factors                  | $h_{ef}=200 \alpha_{g,N} \parallel$              | [-] | 0,7 |     |       | _1) |       | _1) |
|                                | $h_{ef}=200 \alpha_{g,V} \parallel$              |     | 2,0 |     |       | _1) |       | _1) |
|                                | $\alpha_{g,N} \parallel, \alpha_{g,V} \parallel$ |     | 2   |     |       |     |       |     |
|                                | $h_{ef}=200 \alpha_{g,N} \perp$                  |     | 0,7 |     |       | _1) |       | _1) |
|                                | $h_{ef}=200 \alpha_{g,V} \perp$                  |     | 1,2 |     |       | _1) |       | _1) |
|                                | $\alpha_{g,N} \perp, \alpha_{g,V} \perp$         |     | 2   |     |       |     |       |     |

<sup>1)</sup> No performance assessed

**Table C25.3:** Group factors for autoclaved aerated concrete  
(Compressive strength  $f_b \geq 6 \text{ N/mm}^2$ )

| Anchor rod                     |                                                  | M8  | M10 | M12 | -     |     | -     |     |
|--------------------------------|--------------------------------------------------|-----|-----|-----|-------|-----|-------|-----|
| Internal threaded anchor FIS E |                                                  | -   | -   | -   | M6    | M8  | M10   | M12 |
|                                |                                                  |     |     |     | 11x85 |     | 15x85 |     |
| Group factors                  | $h_{ef}=200 \alpha_{g,N} \parallel$              | [-] | 0,7 |     |       | _1) |       | _1) |
|                                | $h_{ef}=200 \alpha_{g,V} \parallel$              |     | 2,0 |     |       | _1) |       | _1) |
|                                | $\alpha_{g,N} \parallel, \alpha_{g,V} \parallel$ |     | 2   |     |       |     |       |     |
|                                | $h_{ef}=200 \alpha_{g,N} \perp$                  |     | 0,7 |     |       | _1) |       | _1) |
|                                | $h_{ef}=200 \alpha_{g,V} \perp$                  |     | 1,2 |     |       | _1) |       | _1) |
|                                | $\alpha_{g,N} \perp, \alpha_{g,V} \perp$         |     | 2   |     |       |     |       |     |

<sup>1)</sup> No performance assessed

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**Performance**  
Autoclaved aerated concrete, Group factors

**Annex C 25**

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# Autoclaved aerated concrete, EN 771-4:2015

**Table C26.1:** Characteristic resistance under tensile load

| Anchor rod                                                                                                         |              |     | M8                                             |     | M10 |     | M12 |     | -     |     | -     |     |
|--------------------------------------------------------------------------------------------------------------------|--------------|-----|------------------------------------------------|-----|-----|-----|-----|-----|-------|-----|-------|-----|
| Internal threaded anchor FIS E                                                                                     |              |     | -                                              |     | -   |     | -   |     | M6    | M8  | M10   | M12 |
|                                                                                                                    |              |     |                                                |     |     |     |     |     | 11x85 |     | 15x85 |     |
| Tensile load N <sub>Rk</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |     |                                                |     |     |     |     |     |       |     |       |     |
| compressive strength f <sub>b</sub>                                                                                | use category |     | Effective anchorage depth h <sub>ef</sub> [mm] |     |     |     |     |     |       |     |       |     |
|                                                                                                                    |              |     | 100                                            | 200 | 100 | 200 | 100 | 200 | 85    |     |       |     |
| ≥ 2 N/mm²                                                                                                          | w/w          | w/d | 1,5                                            | 2,0 | 1,5 | 3,0 | 1,5 | 3,0 | 1,5   | 1,5 |       |     |
|                                                                                                                    | d/d          |     | 1,5                                            | 3,0 | 1,5 | 3,5 | 2,0 | 4,0 | 1,5   | 1,5 |       |     |
| ≥ 4 N/mm²                                                                                                          | w/w          | w/d | 2,0                                            | 1,5 | 2,5 | 3,5 | 2,5 | 3,5 | 2,0   | 1,5 |       |     |
|                                                                                                                    | d/d          |     | 2,0                                            | 3,0 | 3,0 | 5,0 | 2,5 | 5,0 | 2,0   | 1,5 |       |     |
| ≥ 6 N/mm²                                                                                                          | w/w          | w/d | 3,0                                            | 2,5 | 4,5 | 5,0 | 4,5 | 7,0 | 3,5   | 2,5 |       |     |
|                                                                                                                    | d/d          |     | 3,5                                            | 4,0 | 5,0 | 7,0 | 5,0 | 9,0 | 3,5   | 2,5 |       |     |

**Table C26.2:** Characteristic resistance under shear load

| Anchor rod                                                                                                       |              | M8  |                                                | M10 |     | M12 |     | -     |     | -     |     |
|------------------------------------------------------------------------------------------------------------------|--------------|-----|------------------------------------------------|-----|-----|-----|-----|-------|-----|-------|-----|
| Internal threaded anchor FIS E                                                                                   |              | -   |                                                | -   |     | -   |     | M6    | M8  | M10   | M12 |
|                                                                                                                  |              |     |                                                |     |     |     |     | 11x85 |     | 15x85 |     |
| Shear load V <sub>RK</sub> [kN] depending on the compressive strength f <sub>b</sub> (temperature range 50/80°C) |              |     |                                                |     |     |     |     |       |     |       |     |
| compressive strength f <sub>b</sub>                                                                              | use category |     | Effective anchorage depth h <sub>ef</sub> [mm] |     |     |     |     |       |     |       |     |
|                                                                                                                  |              |     | 100                                            | 200 | 100 | 200 | 100 | 200   | 85  |       |     |
| ≥ 2 N/mm²                                                                                                        | w/w          | w/d | 1,2                                            | 1,2 | 1,2 | 1,2 | 1,5 | 1,2   | 1,2 |       | 1,5 |
|                                                                                                                  | d/d          |     |                                                |     |     |     |     |       |     |       |     |
| ≥ 4 N/mm²                                                                                                        | w/w          | w/d | 2,5                                            | 2,0 | 2,0 | 2,0 | 2,5 | 2,0   | 2,0 |       | 2,5 |
|                                                                                                                  | d/d          |     |                                                |     |     |     |     |       |     |       |     |
| ≥ 6 N/mm²                                                                                                        | w/w          | w/d | 3,0                                            | 2,5 | 3,0 | 3,0 | 3,5 | 4,0   | 2,5 |       | 3,5 |
|                                                                                                                  | d/d          |     |                                                |     |     |     |     |       |     |       |     |

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

## Performance

Autoclaved aerated concrete, Characteristic resistance under tensile and shear load

## Annex C 26

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## β-factors for job site tests; displacements

**Table C27.1:** β-factors for job site tests

|                                   |               |             |       |
|-----------------------------------|---------------|-------------|-------|
| use category                      |               | w/w and w/d | d/d   |
| temperature range                 |               | 50/80       | 50/80 |
| Material                          | Size          |             |       |
| solid units                       | M8            | 0,57        | 0,96  |
|                                   | M10           | 0,59        |       |
|                                   | M12           | 0,6         |       |
|                                   | FIS E 11x85   | 0,62        |       |
|                                   | FIS H 16x85 K | 0,55        |       |
| hollow units                      | all sizes     | 0,86        | 0,96  |
| Autoclaved aerated concrete (AAC) | all sizes     | 0,73        | 0,81  |

**Table C27.2:** Displacements

| Material                                                                    | N<br>[kN]                          | δN <sub>0</sub><br>[mm] | δN <sub>∞</sub><br>[mm] | V<br>[kN]                          | δV <sub>0</sub><br>[mm] | δV <sub>∞</sub><br>[mm] |
|-----------------------------------------------------------------------------|------------------------------------|-------------------------|-------------------------|------------------------------------|-------------------------|-------------------------|
| solid units and autoclaved aerated concrete h <sub>ef</sub> =100mm          | $\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$ | 0,03                    | 0,06                    | $\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$ | 0,82                    | 0,88                    |
| hollow units                                                                | $\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$ | 0,48                    | 0,06                    | $\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$ | 1,71                    | 2,56                    |
| solid brick Mz NF annex C 4 - C 7                                           | $\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$ | 0,74                    | 1,48                    | $\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$ | 1,23                    | 1,85                    |
| solid brick KS NF annex C 8 / C 9                                           | $\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$ | 0,2                     | 0,4                     | $\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$ | 0,91                    | 1,37                    |
| Autoclaved aerated concrete (AAC) h <sub>ef</sub> =200 mm annex C 24 - C 26 | $\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$ | 1,03                    | 2,06                    | $\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$ | 1,25                    | 1,88                    |

For anchorage in autoclaved aerated concrete, the partial factor  $\gamma_{MAAC}$  shall be used instead of  $\gamma_{Mm}$ .

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### Performance

β-factors for job site tests; displacements

### Annex C 27

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