

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

ETA-10/0383  
of 6 October 2017

English translation prepared by DIBt - Original version in German language

### General Part

Technical Assessment Body issuing the  
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

fischer injection system FIS V for use in  
masonry

Product family  
to which the construction product belongs

Injection system for use in masonry

Manufacturer

fischerwerke GmbH & Co. KG  
Otto-Hahn-Straße 15  
79211 Denzlingen  
DEUTSCHLAND

Manufacturing plant

fischerwerke

This European Technical Assessment  
contains

134 pages including 3 annexes which form an integral  
part of this assessment

This European Technical Assessment is  
issued in accordance with Regulation (EU)  
No 305/2011, on the basis of

ETAG 029, April 2013,  
used as EAD according to Article 66 Paragraph 3 of  
Regulation (EU) No 305/2011.

This version replaces

ETA-10/0383 issued on 17 June 2015

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## Specific part

### 1 Technical description of the product

The Fischer injection system FIS V for masonry is a bonded anchor (injection type) consisting of a mortar cartridge with injection mortar Fischer FIS V, FIS VS and FIS VW, a perforated sieve sleeve and an anchor rod with hexagon nut and washer or an internal threaded rod in the range of M6 to M16. 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 resistance for tension and shear loads  | See Annex C 1 – C 109 |
| Displacements under shear and tension loads            | See Annex C 110       |
| Reduction Factor for job site tests ( $\beta$ -Factor) | See Annex C 110       |
| Edge distances and spacing                             | See Annex C 3 – C 109 |

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

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

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

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

**3.4 Safety and accessibility in use (BWR 4)**

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

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

In accordance with guideline for European technical approval ETAG 029, April 2013 used as European Assessment Document (EAD) according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011 the applicable European legal act is: [97/177/EC].

The system to be applied is: 1

**5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document**

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 6 October 2017 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow  
Head of Department

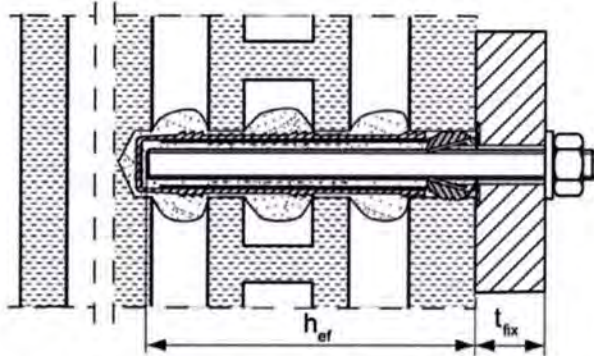
*Beglaubigt:*  
Baderschneider

English translation prepared by DIBt

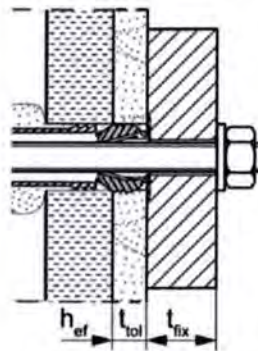
**Installation conditions part 1**

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

**Pre-positioned anchorage:**

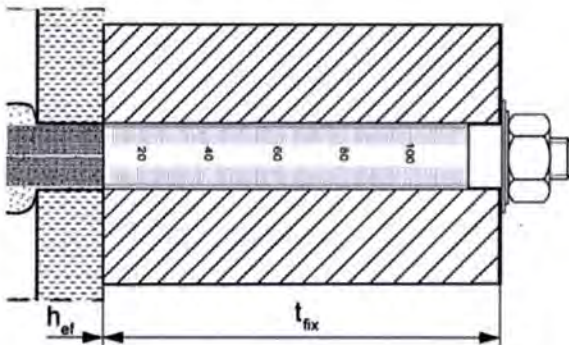


**Installation with render bridge**

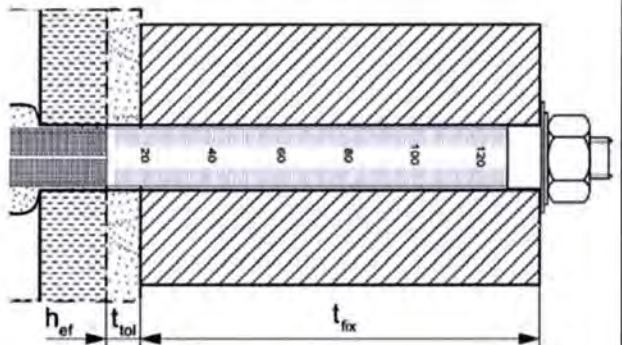


**Size of the perforated sleeve:** FIS H 12x50 K FIS H 16x85 K FIS H 20x85 K FIS H 20x200 K  
 FIS H 12x85 K FIS H 16x130 K FIS H 20x130 K

**Push through anchorage:**



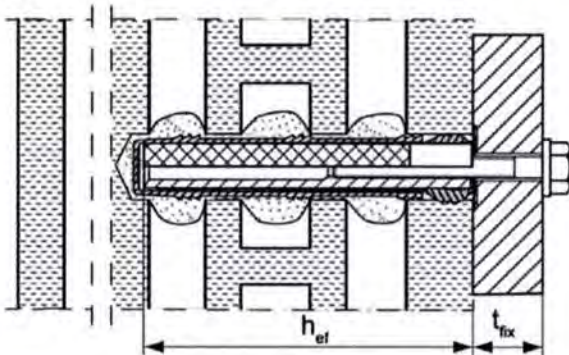
**Installation with render bridge**



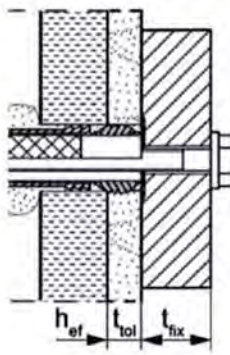
**Size of the perforated sleeve:** FIS H 18x130/200 K FIS H 22x130/200 K

**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**



Pictures not to scale

$h_{ef}$  = effective anchorage depth

$t_{tol}$  = thickness of unbearing layer (e.g. plaster)

$t_{fix}$  = thickness of fixture

fischer injektion system FIS V masonry

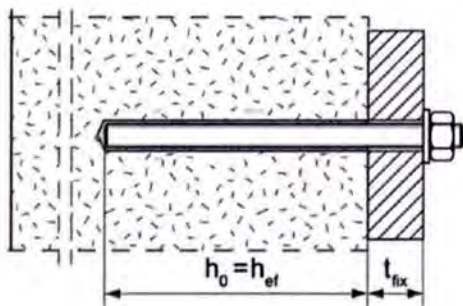
**Product description**  
 Installation conditions part 1,  
 Anchor rods and internal threaded anchor with perforated sleeve

**Annex A 1**

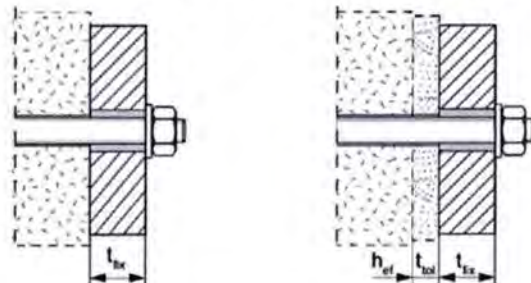
### Installation conditions part 2

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

**Pre-positioned anchorage:**



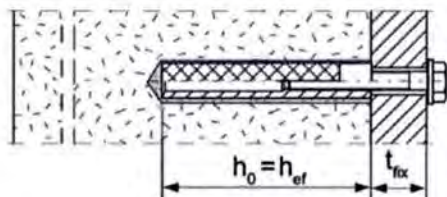
**Push through anchorage: Annular gap filled with mortar**



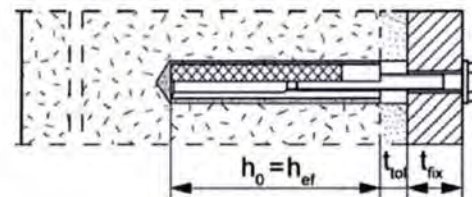
Installation with  
render bridge

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

**Pre-positioned anchorage:**



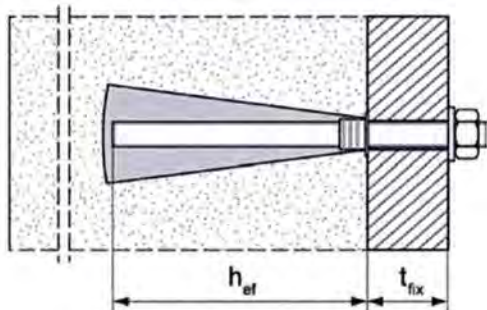
Installation with render bridge



**Anchor rods and internal threaded anchors FIS E without perforated sleeve FIS H K; installation in autoclaved aerated concrete with conical drill hole (installation with special conic drill bit PBB)**

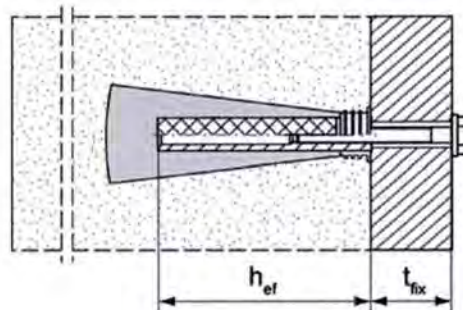
**Pre-positioned anchorage:**

anchor rods M8, M10, M12



**Pre-positioned anchorage:**

Internal threaded anchor FIS E 11x85 M6 / M8



Pictures 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 injektion system FIS V masonry

**Product description**

Installation conditions part 2,  
Anchor rods and internal threaded anchor without perforated sleeve

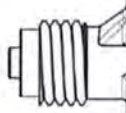
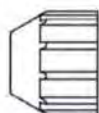
**Annex A 2**

## Overview system components part 1

### Mortar cartridge (shuttle cartridge) with sealing cap

①

Size: 360 ml, 585 ml, 950 ml



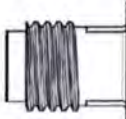
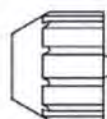
**Imprint:** fischer FIS V or FIS VS or FIS VW, processing notes, shelf-life, hazard code, piston travel scale (optional), curing time and processing time (depending on temperature), size, volume



### Mortar cartridge (coaxial cartridge) with sealing cap

①

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



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

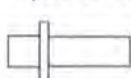


### Static mixer ME / MR with injection adapter and center sleeve for aerated concrete

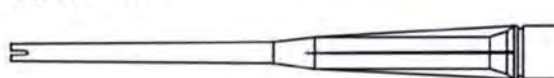
center sleeve



Injection adapter



Static mixer



### Cleaning brush BS / BSB



### Blow-out pump ABG or ABP



Pictures not to scale

fischer injektion system FIS V masonry

#### System description

Overview system components part 1: cartridge / static mixer / cleaning brush

**Annex A 3**

## Overview system components part 2

### fischer anchor rod

②



Size: M6, M8, M10, M12, M16

### Internal threaded anchor FIS E

⑤



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

### Perforated sleeve FIS H K

⑦



Size: FIS H 12x50 K  
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

### Perforated sleeve FIS H K (push through anchorage)

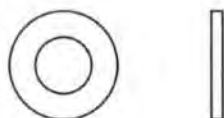
⑦



Size:  
FIS H 18x130/200 K  
FIS H 22x130/200 K

### Washer

③



### Hexagon nut

④



Pictures not to scale

fischer injektion system FIS V masonry



#### System description

Overview system components part 2: steel parts / perforated sleeve

**Annex A 4**



| <b>Table A5.1: Materials</b>            |   |  |   |   |
|---|---|--|---|---|
| <b>Part</b>                             | <b>Designation</b>  | <b>Material</b>  |   |   |
| 1                                       | Mortar cartridge  | Mortar, hardener; filler   |   |   |
|   |   | Steel, zinc plated   | Stainless steel A4  | High corrosion-resistant steel C  |
| 2                                       | Anchor rod  | Property class 4.6; 4.8; 5.8 oder 8.8; EN ISO 898-1: 2013 zinc plated $\geq 5\mu\text{m}$ , EN ISO 4042:1999 A2K or hot-dip galvanised EN ISO 10684:2004 $f_{uk} \leq 1000 \text{ N/mm}^2$ $A_5 > 8\%$ fracture elongation | Property class 50, 70 or 80 EN ISO 3506-1:2009 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; 1.4062 EN 10088-1:2014 $f_{uk} \leq 1000 \text{ N/mm}^2$ $A_5 > 8\%$ fracture elongation | Property class 50 or 80 EN ISO 3506-1:2009 or property class 70 with $f_{yk} = 560 \text{ N/mm}^2$ 1.4565; 1.4529 EN 10088-1:2014 $f_{uk} \leq 1000 \text{ N/mm}^2$ $A_5 > 8\%$ fracture elongation |
| 3                                       | Washer ISO 7089:2000  | zinc plated $\geq 5\mu\text{m}$ , EN ISO 4042:1999 A2K or hot-dip galvanised EN ISO 10684:2004   | 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362 EN 10088-1:2014  | 1.4565; 1.4529 EN 10088-1:2014  |
| 4                                       | Hexagon nut   | Property class 5 or 8; EN ISO 898-2:2012 zinc plated $\geq 5\mu\text{m}$ , ISO 4042:1999 A2K or hot-dip galvanised ISO 10684:2004  | Property class 50, 70 or 80 EN ISO 3506-1:2009 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362 EN 10088-1:2014   | Property class 50, 70 or 80 EN ISO 3506-1:2009 1.4565; 1.4529 EN 10088-1:2014   |
| 5                                       | Internal threaded anchor FIS E  | Property class 5.8; EN 10277-1:2008-06 zinc plated $\geq 5\mu\text{m}$ , ISO 4042:1999 A2K   | Property class 70 EN ISO 3506-1:2009 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362 EN 10088-1:2014   | Property class 70 EN ISO 3506-1:2009 1.4565; 1.4529 EN 10088-1:2014   |
| 6                                       | Commercial standard screw or threaded / anchor rod for internal threaded anchor FIS E | Property class 5.8 or 8.8; EN ISO 898-1:2013 zinc plated $\geq 5\mu\text{m}$ , ISO 4042:1999 A2K   | Property class 70 EN ISO 3506-1:2009 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362 EN 10088-1:2014   | Property class 70 EN ISO 3506-1:2009 1.4565; 1.4529 EN 10088-1:2014   |
| 7                                       | Perforated sleeve   | PP / PE  |   |   |
| fischer injektion system FIS V masonry  |   |  |   | <b>Annex A 5</b>  |
| <b>Product description</b><br>Materials |   |  |   |   |

| <b>Specifications of intended use (part 1)</b>  |   |   |
|---|---|---|
| <b>Table B1.1: Overview use and performance categories</b>  |   |   |
| Anchorages subject to   | <b>fischer injection system FIS V masonry</b> |   |
| Hole drilling with hammer drill mode<br> | all bricks;<br>without C26 to C45, C73 to C76 |   |
| Hole drilling with rotary drill mode<br> | all bricks                                    |   |
| Static and quasi static load,<br>in masonry   | all bricks                                    |   |
| Use category    dry or wet masonry  | all bricks                                    |   |
| Installation  | Pre-positioned anchorage                      | Anchor rod<br>(in solid brick masonry and autoclaved aerated concrete)<br><br>Perforated sleeve<br>(in perforated and solid brick masonry)<br><br>Size:    FIS H 12x50 K<br>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<br>(in solid brick masonry and autoclaved aerated concrete)<br><br>Perforated sleeve<br>(in perforated and solid brick masonry)<br><br>Size:    FIS H 18x130/200 K<br>FIS H 22x130/200 K   |
| Installation conditions   | category d/d<br>category w/d<br>category w/w  | all bricks  |
| Installation temperature  | -10°C to +40°C                                |   |
| In-service temperature  | -40°C to +80°C                                | max. short term temperature +80 °C and<br>max. long term temperature +50 °C   |
|   | -40°C to +120°C                               | max. short term temperature +120 °C and<br>max. long term temperature +72 °C  |
| fischer injektion system FIS V masonry  |   | <b>Annex B 1</b>  |
| <b>Intended Use</b><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 13 / B 14
- Hollow brick masonry (use category c), according to Annex B 13 / B 14
- 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 ETAG 029, Annex B under consideration of the  $\beta$ -factor according to Annex C 110, Table C110.1

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:

- I: From -40°C to +80°C (max. short term temperature +80°C and max. long term temperature +50°C)
- II: From -40°C to +120°C (max. short term temperature +120°C and max. long term temperature +72°C)

### Use conditions (Environmental conditions):

- Dry and wet structure (regarding injection mortar)
- Structures subject to dry internal conditions exist  
(zinc coated steel, stainless steel or high corrosion resistant steel)
- Structures subject to external atmospheric exposure including industrial and marine environment or exposure to permanently damp internal condition, if no particular aggressive conditions exist exist  
(stainless steel or high corrosion resistant steel)
- 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 injektion system FIS V masonry

**Intended Use**  
Specifications (part2)

**Annex B 2**

## Specifications of intended use (part 2)

### Design:

- The anchorages have to be designed in accordance with the ETAG 029, Annex C, 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 ETAG 029, Annex C.

$N_{Rk,s}$ ,  $V_{Rk,s}$  and  $M_{Rk,s}$  see annex C1-C3

Factors for job site tests and displacements see Annex C110

- 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) 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 8, Table B8.2
- 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 injektion system FIS V masonry

**Intended Use**  
Specifications (part2)

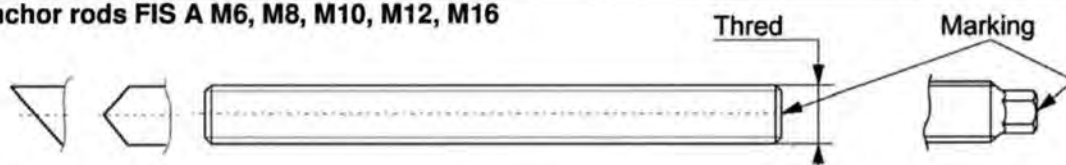
**Annex B 3**

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

| Anchor rod  | Thread                       | M6                      | M8 | M10 | M12 | M16 |
|---|------------------------------|-------------------------|----|-----|-----|-----|
| Nominal drill hole diameter   | $d_0$ [mm]                   | 8                       | 10 | 12  | 14  | 18  |
| Effective anchorage depth $h_{ef}$ <sup>1)</sup><br>in AAC cylindrical drill hole                           | $h_0 = h_{ef, min}$ [mm]     | 100                     |    |     |     |     |
| Effective anchorage depth $h_{ef}$ <sup>1)</sup><br>in AAC conical drill hole                               | $h_{o, min}$ [mm]            | -                       | 80 |     |     | -   |
|   | $h_{ef, min}$ [mm]           |                         | 75 |     |     |     |
|   | $h_{ef, max}$ [mm]           |                         | 95 |     |     |     |
| Effective anchorage depth $h_{ef}$ <sup>1)</sup><br>in solid brick<br>(depth of drill hole $h_0 = h_{ef}$ ) | $h_{ef, min}$ [mm]           | 50                      |    |     |     |     |
|   | $h_{ef, max}$ [mm]           | h-30, $\leq 200$        |    |     |     |     |
| Diameter of clearance<br>hole in the fixture  | pre-position $d_f \leq$ [mm] | 7                       | 9  | 12  | 14  | 18  |
|   | push through $d_f \leq$ [mm] | 9                       | 11 | 14  | 16  | 20  |
| Diameter of cleaning brush  | $d_b \geq$ [mm]              | see Table B8.1          |    |     |     |     |
| Maximum installation torque   | $T_{inst, max}$ [Nm]         | see parameters of brick |    |     |     |     |

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

**fischer anchor rods FIS A M6, M8, M10, M12, M16**



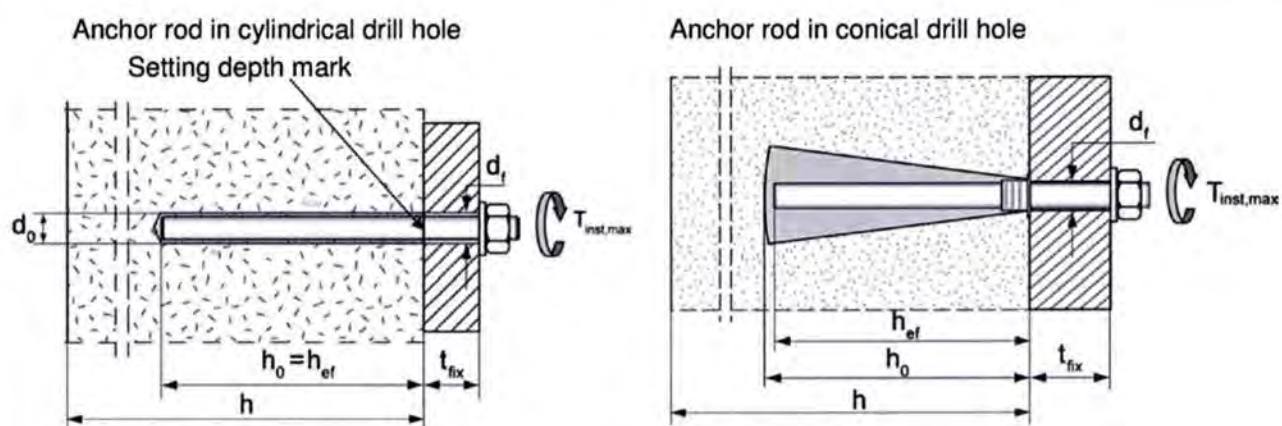
**Marking:**

Property class 8.8, stainless steel A4 property class 80 and  
high corrosion resistant steel C property class 80: •

Stainless steel A4 property class 50 and high corrosion resistant steel C property class 50: ••

Or colour coding according to DIN 976-1:2016-09, property class 4.6 marking according to EN ISO 898-1:2013

**Installation conditions:**



Pictures not to scale

fischer injektion system FIS V masonry

**Intended Use**

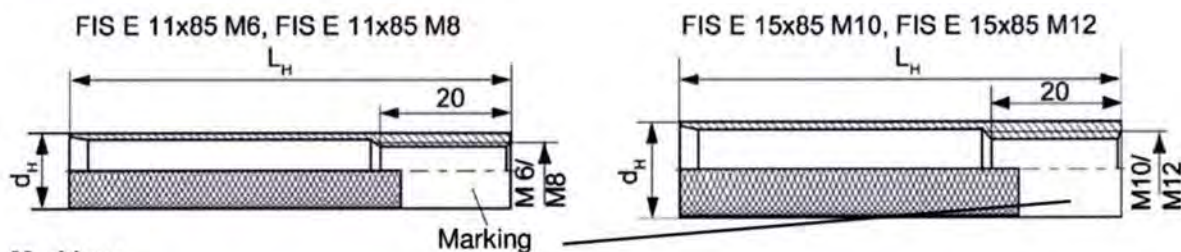
Installation parameters for anchor rods without perforated sleeve

**Annex B 4**

**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   | $d_H$ [mm]          | 11                      |          | 15        |           |
| Nominal drill hole diameter                                    | $d_0$ [mm]          | 14                      |          | 18        |           |
| Length of anchor   | $L_H$ [mm]          | 85                      |          |           |           |
| Effective anchorage depth                                      | $h_0 = h_{ef}$ [mm] | 85                      |          |           |           |
| Effective anchorage depth $h_{ef}$ in AAC (conical drill hole) | $h_0$ [mm]          | 100                     |          | -         |           |
|  | $h_{ef}$ [mm]       | 85                      |          |           |           |
| Diameter of cleaning brush                                     | $d_b \geq$ [mm]     | see Table B8.1          |          |           |           |
| Maximum installation torque                                    | $T_{inst,max}$ [Nm] | see parameters of brick |          |           |           |
| Diameter of clearance hole in the fixture                      | $d_f$ [mm]          | 7                       | 9        | 12        | 14        |
| Screw-in depth   | $l_{E,min}$ [mm]    | 6                       | 8        | 10        | 12        |
|  | $l_{E,max}$ [mm]    | 60                      |          |           |           |

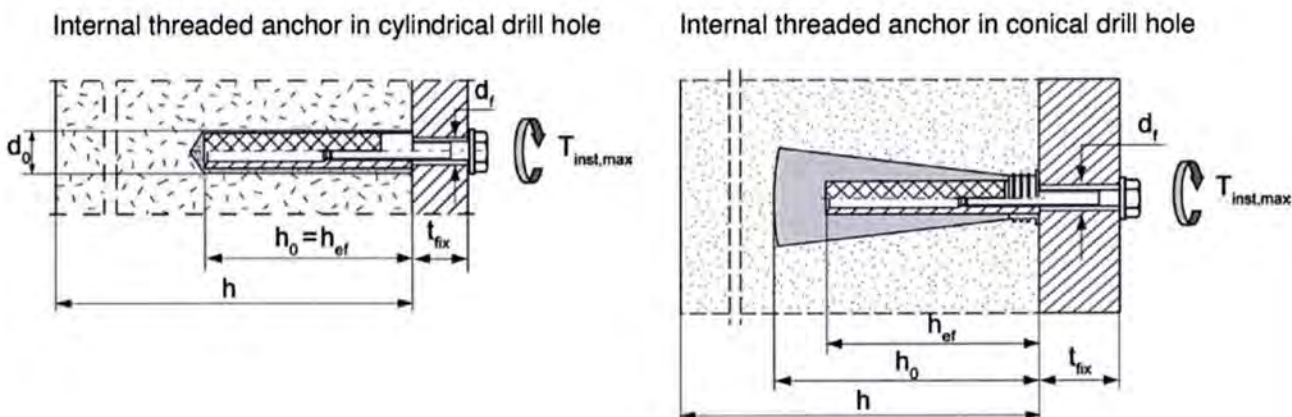
**fischer Internal threaded anchor FIS E**



**Marking:**

Size, e.g. **M8**, Stainless steel: A4, e.g. **M8 A4**, High corrosion-resistant steel: C, e.g. **M8 C**

**Installation conditions:**



Pictures not to scale

fischer injektion system FIS V masonry

**Intended Use**

Installation parameters for internal threaded rods FIS E without perforated sleeve

**Annex B 5**

**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                                     | 12x50                     | 12x85 <sup>2)</sup> | 16x85      | 16x130 <sup>2)</sup> | 20x85       | 20x130 <sup>2)</sup> | 20x200 <sup>2)</sup> |
|---|---------------------------|---------------------|------------|----------------------|-------------|----------------------|----------------------|
| Nominal drill hole diameter<br>$d_0 = D_{\text{sleeve, nom}}$ | 12                        |                     | 16         |                      | 20          |                      |                      |
| Depth of drill hole<br>$h_0$ [mm]                             | 55                        | 90                  | 90         | 135                  | 90          | 135                  | 205                  |
| Effective anchorage depth                                     | $h_{\text{ef, min}}$ [mm] | 50                  | 65         | 85                   | 110         | 85                   | 110                  |
|   | $h_{\text{ef, max}}$ [mm] | 50                  | 85         | 85                   | 130         | 85                   | 130                  |
| Size of threaded rod [-]                                      | M6 und M8                 |                     | M8 und M10 |                      | M12 und M16 |                      |                      |
| Size of internal threaded anchor FIS E                        | -                         | -                   | 11x85      | -                    | 15x85       | -                    | -                    |
| Diameter of cleaning brush <sup>1)</sup><br>$d_b \geq$ [mm]   | see Table B8.1            |                     |            |                      |             |                      |                      |
| Maximum installation torque<br>$T_{\text{inst, max}}$ [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**

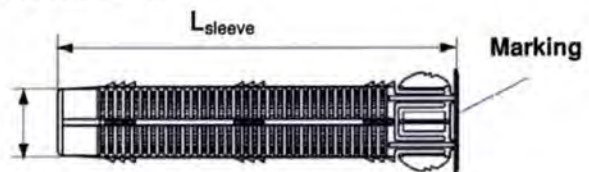
FIS H 12x50 K; FIS H 12x85 K; FIS H 16x85 K; FIS H 16x130 K;  
FIS H 20x85 K; FIS H 20x130 K; FIS H 20x200 K

**Marking:**

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

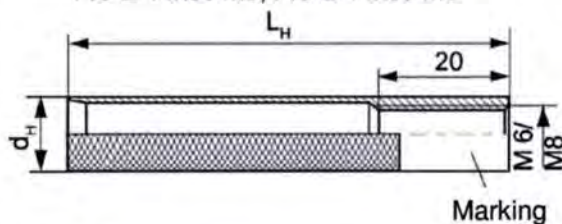


$D_{\text{sleeve, nom}}$

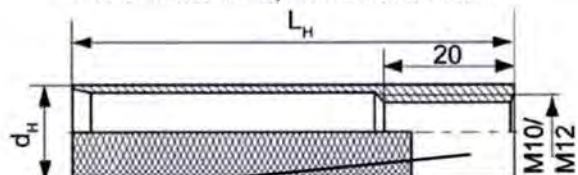


**fischer Internal threaded anchor FIS E**

FIS E 11x85 M6, FIS E 11x85 M8

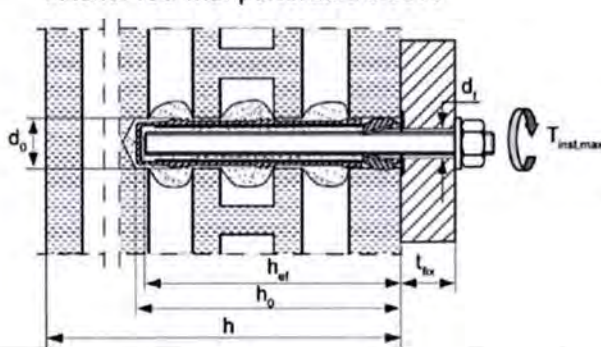


FIS E 15x85 M10, FIS E 15x85 M12

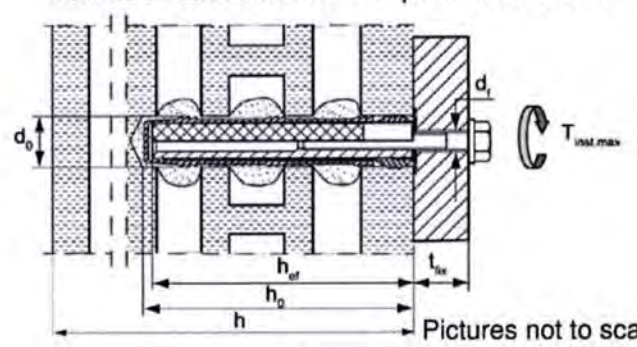


**Installation conditions:**

Anchor rod with perforated sleeve



Internal threaded anchor with perforated sleeve



Pictures not to scale

fischer injektion system FIS V masonry

**Intended Use**

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

**Annex B 6**

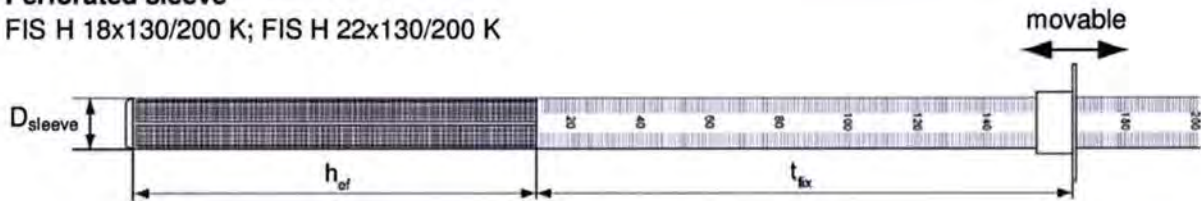
**Table B7.1:** Installation parameters for anchor rods with perforated sleeves  
(push through anchorage)

| Perforated sleeve FIS H K                |                              | 18x130/200              | 22x130/200 |     |
|--|------------------------------|-------------------------|------------|-----|
| Nominal sleeve diameter                  | $D_{\text{sleeve,nom}}$ [mm] | 16                      | 20         |     |
| Nominal drill hole diameter              | $d_0$ [mm]                   | 18                      | 22         |     |
| Depth of drill hole                      | $h_0$ [mm]                   | 135 + $t_{\text{fix}}$  |            |     |
| Effective anchorage depth                | $h_{\text{ef}}$ [mm]         | ≥130                    |            |     |
| Diameter of cleaning brush <sup>1)</sup> | $d_b \geq$ [mm]              | Siehe Tabelle B8.1      |            |     |
| Size of threaded rod                     | [-]                          | M10                     | M12        | M16 |
| Maximum installation torque              | $T_{\text{inst,max}}$ [Nm]   | see parameters of brick |            |     |
| Thickness of fixture                     | $t_{\text{fix,max}}$ [mm]    | 200                     |            |     |

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

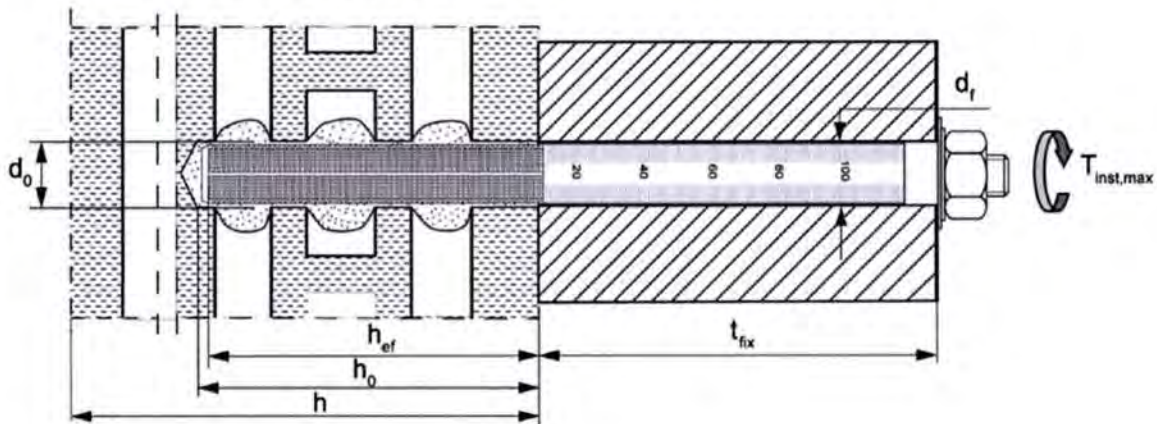
**Perforated sleeve**

FIS H 18x130/200 K; FIS H 22x130/200 K



**Installation conditions:**

Anchor rod with perforated sleeve



Pictures not to scale

fischer injektion system FIS V masonry

**Intended Use**

Installation parameters for anchor rods with perforated sleeves  
(push through anchorage)

**Annex B 7**



**Tabelle B8.1:** Parameters of the cleaning brush BS (steel brush)

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

|                     |            |   |    |    |    |    |    |    |    |
|---------------------|------------|---|----|----|----|----|----|----|----|
| Drill hole diameter | $d_0$ [mm] | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 |
| Brush diameter      | $d_b$ [mm] | 9 | 11 | 14 | 16 | 20 | 20 | 25 | 25 |



Only for solid bricks and autoclaved aerated concrete

**Table B8.2:** 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 [°C] | Minimum curing time <sup>1)</sup> $t_{cure}$ |                     |                                |
|------------------------------------|--|---------------------|--------------------------------|
|                                    | FIS VW High Speed <sup>3)</sup>              | FIS V <sup>2)</sup> | FIS VS Low Speed <sup>2)</sup> |
| -10 to -5                          | 12 h   | -                   | -                              |
| >-5 to $\pm 0$                     | 3 h  | 24 h                | -                              |
| $\pm 0$ to +5                      | 3 h  | 3 h                 | 6 h                            |
| >+5 to +10                         | 50 min                                       | 90 min              | 3 h                            |
| >+10 to +20                        | 30 min                                       | 60 min              | 2 h                            |
| >+20 to +30                        | -  | 45 min              | 60 min                         |
| >+30 to +40                        | -  | 35 min              | 30 min                         |

| System-temperature (mortar) [°C] | Maximum processing time $t_{work}$ |                     |                                |
|----------------------------------|------------------------------------|---------------------|--------------------------------|
|                                  | FIS VW High Speed <sup>3)</sup>    | FIS V <sup>2)</sup> | FIS VS Low Speed <sup>2)</sup> |
| -                                | -                                  | -                   | -                              |
| $\pm 0$                          | 5 min                              | -                   | -                              |
| +5                               | 5 min                              | 13 min              | 20 min                         |
| +10                              | 3 min                              | 9 min               | 20 min                         |
| +20                              | 1 min                              | 5 min               | 10 min                         |
| +30                              | -                                  | 4 min               | 6 min                          |
| +40                              | -                                  | 2 min               | 4 min                          |

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

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

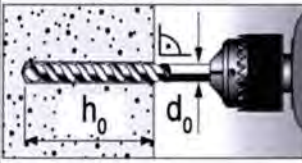
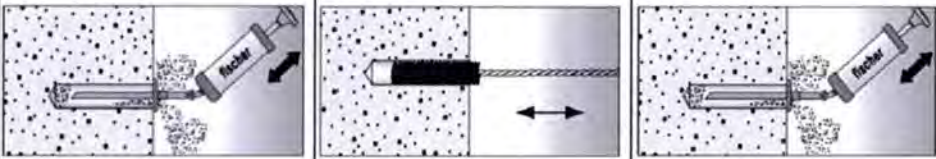
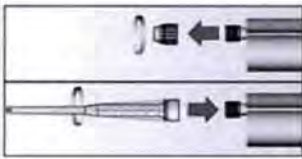



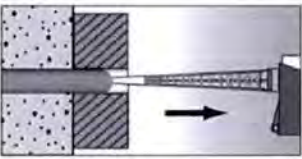
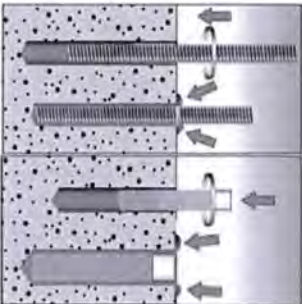

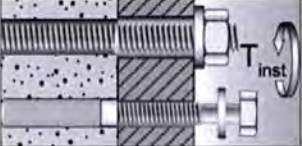
<sup>3)</sup> Minimum cartridge temperature  $\pm 0^\circ\text{C}$

Pictures not to scale

fischer injektion system FIS V masonry

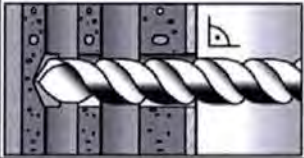
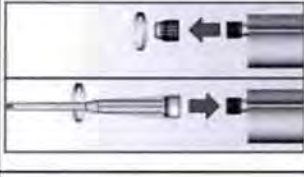


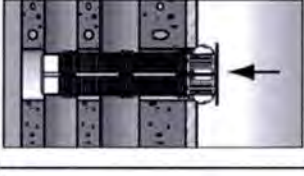
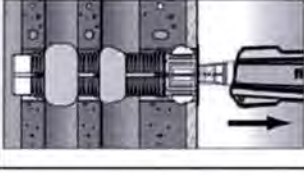
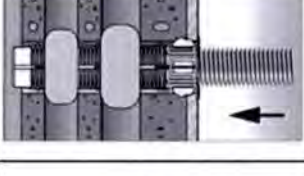

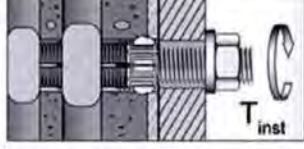
**Intended use**  
Cleaning brush (steel brush)  
Maximum processing times and minimum curing times

**Annex B 8**

| <b>Installation instruction part 1</b>   |   |   |   |
|--|---|---|---|
| <b>Installation in solid brick and autoclaved aerated concrete (without perforated sleeve)</b> |   |   |   |
| <b>1</b>   |    | 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 B4.1; B5.1</b>  |   |
| <b>2</b>   |   | Blow out the drill hole twice. Brush twice and blow out twice again.  |   |
| <b>3</b>   |    | Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible)   |   |
| <b>4</b>   |   |    | 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.                                    |
| <b>5</b>   |  |   | Fill approximately 2/3 of the drill hole with mortar beginning from the bottom of the hole <sup>1)</sup> . Avoid bubbles!<br><br>For push through anchorage fill the annular clearance with mortar. |
| <b>6</b>   |  | Only use clean and oil-free anchor elements. Mark the anchor rod for setting depth. Insert the anchor rod or internal threaded anchor FIS E by hand using light turning motions. When reaching the setting depth marking, excess mortar must emerge from the mouth of the drill hole. |   |
| <b>7</b>   |  |   | Do not touch. Minimum curing time see <b>Table B8.2</b><br><br>Mounting the fixture. $T_{inst,max}$ see parameter of brick.   |
| <sup>1)</sup> Exact volume of mortar see manufacturer's specification.                         |   |   |   |
| fischer injektion system FIS V masonry   |   |   | <b>Annex B 9</b>  |
| Intended use<br>Installation instruction (without perforated sleeve) part 1                    |   |   |   |

## Installation instruction part 2

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

|   |   |  |  |
|---|---|--|--|
| 1 |    | <p>Drill the hole (drilling method see Annex C of the respective brick). depth of drill hole <math>h_0</math> and drill hole diameter <math>d_0</math> see <b>Table B6.1</b></p>   | <p>When install perforated sleeves in solid bricks or solid areas of hollow bricks, also clean the hole by blowing out and brushing.</p>   |
| 2 |    | <p>Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible)</p>   |  |
| 3 |    | <p>Place the cartridge into a suitable dispenser.</p>  |  <p>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.</p> |
| 4 |  | <p>Insert the perforated sleeve flush with the surface of the masonry or plaster.</p>  |  <p>Fill the perforated sleeve completely with mortar beginning from the bottom of the hole<sup>1)</sup>.</p>  |
| 5 |  | <p>Only use clean and oil-free anchor elements. 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).</p> |  |
| 6 |  | <p>Do not touch. Minimum curing time see <b>Table B8.2</b></p>   |  <p>Mounting the fixture. <math>T_{inst,max}</math> see parameter of brick.</p>  |

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

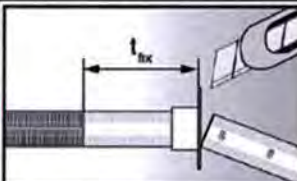




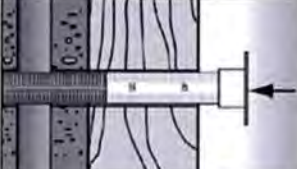
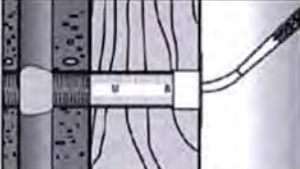
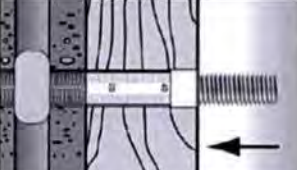

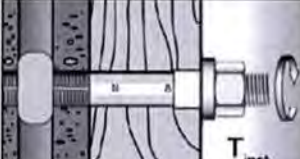
fischer injektion system FIS V masonry

**Intended use**  
Installation instruction (with perforated sleeve) part 2

**Annex B 10**

### Installation instruction part 3

#### Installation in perforated or solid brick with perforated sleeve (push through anchorage)

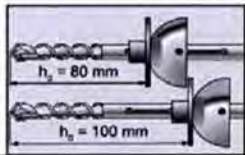
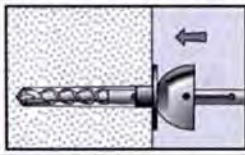
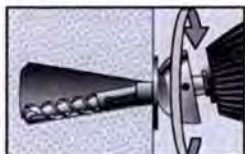
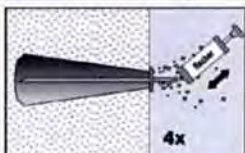
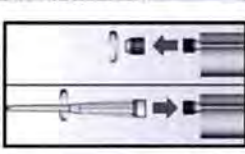


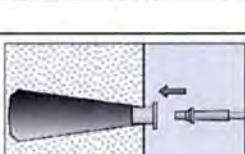
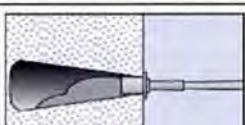
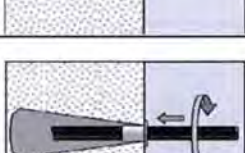
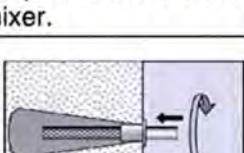
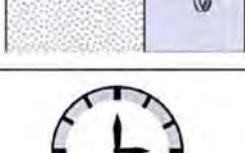

|   |   |  |  |   |
|---|---|--|--|---|
| 1 |    | <p>Push the movable stop up to the correct thickness of fixture and cut the overlap.</p>   |    | <p>Drill the hole through the fixture. Depth of drill hole (<math>h_0 + t_{fix}</math>) and drill hole diameter see <b>Table B7.1</b></p>                               |
| 2 |    | <p>Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible)</p>   |  |   |
| 3 |    | <p>Place the cartridge into a suitable dispenser.</p>  |    | <p>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.</p> |
| 4 |   | <p>Insert the perforated sleeve flush with the surface of the fixture into the drill hole.</p>   |   | <p>Fill the sleeve with mortar beginning from the bottom of the hole.<sup>1)</sup> For deep drill holes use an extension tube.</p>                                      |
| 5 |  | <p>Only use clean and oil-free anchor elements. 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).</p> |  |   |
| 6 |  | <p>Do not touch.<br/>Minimum curing time see <b>Table B8.2</b></p>   |  | <p>Mounting the fixture.<br/><math>T_{inst,max}</math> see parameter of brick.</p>  |

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

fischer injektion system FIS V masonry

**Intended use**  
Installation instruction (with perforated sleeve) part 3

**Annex B 11**

| <b>Installation instruction part 4</b>   |   |   |   |
|--|---|---|---|
| <b>Installation in autoclaved aerated concrete with special conic drill bit PBB (pre-positioned anchorage)</b>                                     |   |   |   |
| 1  |    | Position the movable drill bit arrester on the used drill hole depth. For this, unlock the clamp screw and slide the arrester. Now fix the clamp screw. |   |
| 2  |    | Drill the cylindrical hole with rotating drill until the arrester contact the material surface. (drilling method see Annex C of the respective brick)   |   |
| 3  |    | Deviate the working power drill circulate to generate an conic undercut in the material.  |   |
| 4  |   | Blow out the drill hole four times.   |   |
| 5  |  | Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible)   |   |
| 6  |  |   | 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.  |
| 7  |  |   | Put the center sleeve into the drill hole and adapt the injection adapter onto the static mixer. Fill the drill hole with injection mortar.   |
| 8  |  |    | Only use clean and oil-free anchor elements. Mark the anchor rod for setting depth. Insert the anchor rod or internal threaded anchor FIS E by hand using light turning motions. When reaching the setting depth marking, excess mortar must emerge from the mouth of the drill hole. |
| 9  |  |   | Do not touch. Minimum curing time see <b>Table B8.2</b> . Mounting the fixture. $T_{inst,max}$ see parameter of brick.  |
| fischer injektion system FIS V masonry   |   |   | <b>Annex B 12</b>   |
| <b>Intended use</b><br>Installation instruction for autoclaved aerated concrete with special conic drill bit PBB (pre-positioned anchorage) part 4 |   |   |   |

**Table B13.1:** Overview of controlled bricks (part 1)

| Kind of masonry  | Brick format [mm]                      | Compressive strength $f_b$ N/mm <sup>2</sup> | Producing country | Density $\rho$ [kg/dm <sup>3</sup> ] | Annex     |
|--|--|--|-------------------|--------------------------------------|-----------|
| <b>Solid brick Mz</b>  |  |  |                   |                                      |           |
| Solid brick Mz   | NF $\geq 240 \times 115 \times 71$     | 12 - 20                                      | Germany           | $\geq 1,8$                           | C4 - C7   |
|  | 2DF $\geq 240 \times 115 \times 113$   | 10 - 16                                      | Germany           | $\geq 1,8$                           | C8/C9     |
|  | $\geq 245 \times 118 \times 54$        | 10 - 20                                      | Italy             | $\geq 1,8$                           | C10/C11   |
|  | $\geq 230 \times 108 \times 55$        | 10 - 20                                      | Denmark           | $\geq 1,8$                           | C12/C13   |
| <b>Solid sand- lime brick KS / perforated Sand- lime brick KSL</b> |  |  |                   |                                      |           |
| Solid sand- lime brick KS  | NF $\geq 240 \times 115 \times 71$     | 12 - 28                                      | Germany           | $\geq 2,0$                           | C14/C15   |
| Solid sand- lime brick KS  | 8DF $\geq 250 \times 240 \times 240$   | 10 - 28                                      | Germany           | $\geq 2,0$                           | C16/C17   |
| Solid sand- lime brick KS  | $\geq 997 \times 214 \times 538$       | 10 - 36                                      | Netherlands       | $\geq 1,8$                           | C18/C19   |
| Perforated Sand- lime brick KSL                                    | 3DF $240 \times 175 \times 113$        | 8 - 20                                       | Germany           | $\geq 1,4$                           | C20 - C23 |
| <b>Vertical perforated brick HLz</b>                               |  |  |                   |                                      |           |
| Vertical perforated brick HLz                                      | $375 \times 240 \times 237$            | 4 - 12                                       | Germany           | $\geq 1,0$                           | C24/C25   |
|  | $500 \times 175 \times 237$            | 4 - 12                                       | Germany           | $\geq 1,0$                           | C24/C25   |
|  | 2DF $240 \times 115 \times 113$        | 6 - 28                                       | Germany           | $\geq 1,4$                           | C26/C27   |
|  | $248 \times 365 \times 248$            | 4 - 8  | Germany           | $\geq 0,6$                           | C28 - C31 |
|  | $248 \times 365 \times 249$            | 8 - 12                                       | Germany           | $\geq 0,7$                           | C32 - C35 |
|  | $248 \times 365 \times 249$            | 4 - 6  | Germany           | $\geq 0,5$                           | C36 - C39 |
|  | $248 \times 425 \times 248$            | 4 - 8  | Germany           | $\geq 0,8$                           | C40 - C43 |
|  | $248 \times 425 \times 248$            | 4 - 8  | Germany           | $\geq 0,6$                           | C44 - C47 |
|  | $500 \times 200 \times 315$            | 4 - 8  | France            | $\geq 0,6$                           | C48 - C51 |
|  | $500 \times 200 \times 300$            | 4 - 10                                       | France            | $\geq 0,7$                           | C52 - C55 |
|  | $500 \times 200 \times 315$            | 2 - 8  | France            | $\geq 0,7$                           | C56 - C59 |
|  | $560 \times 200 \times 275$            | 4 - 8  | France            | $\geq 0,7$                           | C60/C61   |
|  | $255 \times 120 \times 118$            | 2 - 12                                       | Italy             | $\geq 1,0$                           | C62 - C64 |
|  | $275 \times 130 \times 94$             | 6 - 20                                       | Spain             | $\geq 0,8$                           | C65/C66   |
|  | $220 \times 190 \times 290$            | 6 - 10                                       | Portugal          | $\geq 0,7$                           | C67 - C70 |
|  | $253 \times 300 \times 240$            | 2 - 6  | Austria           | $\geq 0,8$                           | C71 - C74 |
|  | $250 \times 440 \times 250$            | 6 - 10                                       | Austria           | $\geq 0,7$                           | C75 - C78 |
|  | $230 \times 108 \times 55$             | 2 - 8  | Denmark           | $\geq 1,4$                           | C79/C80   |
|  | <b>Horizontal perforated brick LLz</b> |  |                   |                                      |           |
| Horizontal perforated brick LLz                                    | $248 \times 78 \times 250$             | 2 - 6  | Italy             | $\geq 0,7$                           | C81/C82   |
|  | $128 \times 88 \times 275$             | 2  | Spain             | $\geq 0,8$                           | C83/C84   |
| <b>Light-weight concrete hollow block Hbl</b>                      |  |  |                   |                                      |           |
| Light-weight concrete hollow block Hbl                             | $362 \times 240 \times 240$            | 2 - 4  | Germany           | $\geq 1,0$                           | C85 - C88 |
|  | $500 \times 200 \times 200$            | 2 - 6  | France            | $\geq 1,0$                           | C89/C90   |
|  | $440 \times 215 \times 215$            | 4 - 10                                       | Ireland           | $\geq 1,2$                           | C91 - C94 |
| fischer injektion system FIS V masonry                             |  |  |                   | <b>Annex B 13</b>                    |           |
| Intended use<br>Overview of controlled bricks (part 1)             |  |  |                   |                                      |           |

**Table B14.1:** Overview of controlled bricks (part 2)

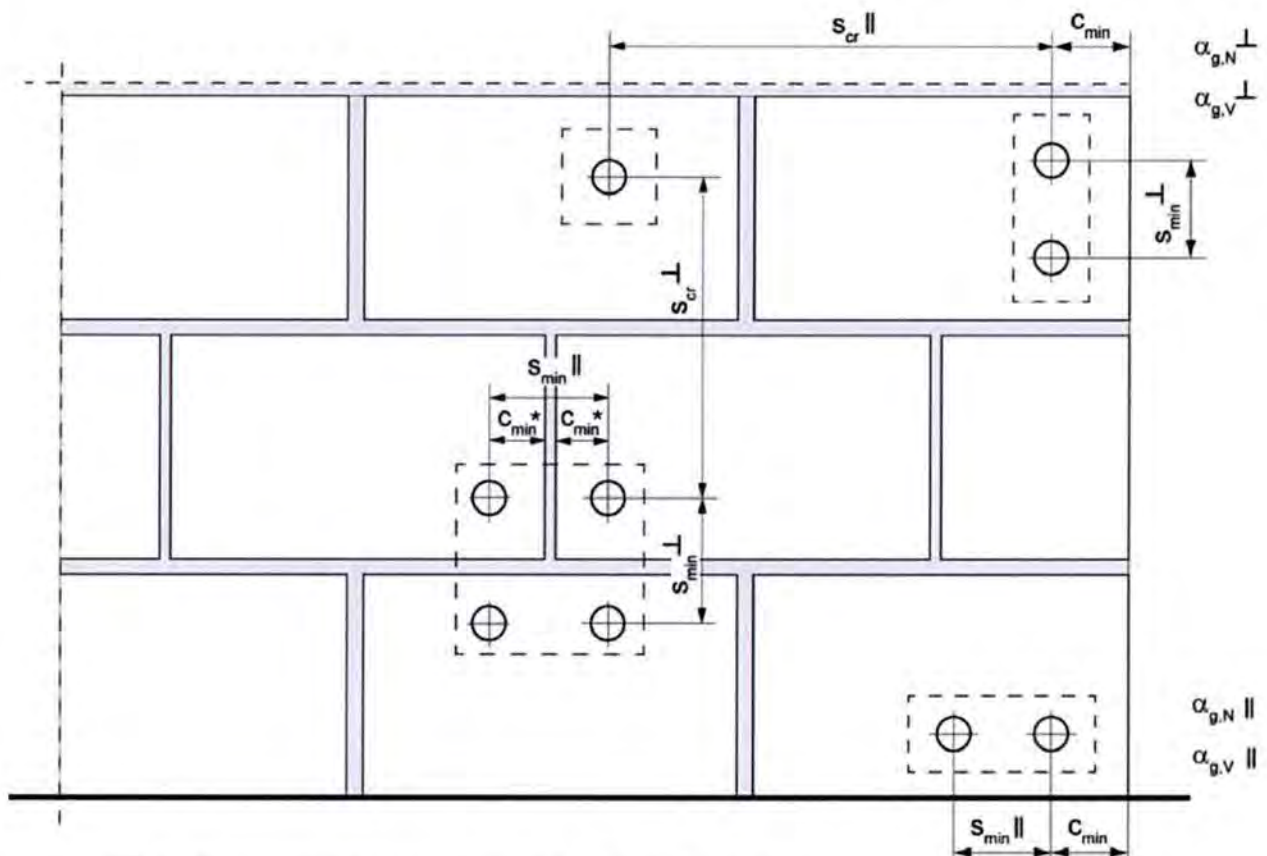
| Kind of masonry                              | Brick format [mm] | Compressive strength $f_b$ N/mm <sup>2</sup> | Producing country | Density $\rho$ [kg/dm <sup>3</sup> ] | Annex       |
|--|-------------------|--|-------------------|--------------------------------------|-------------|
| <b>Light-weight concrete solid block Vbl</b> |                   |  |                   |                                      |             |
| <b>Light-weight concrete solid block Vbl</b> | ≥ 372x300x254     | 2  | Germany           | ≥0,6                                 | C95/C96     |
|  | ≥ 250x240x239     | 4 - 8  | Germany           | ≥1,6                                 | C97 - C100  |
|  | ≥ 440x100x215     | 4 - 10                                       | Ireland           | ≥2,0                                 | C101/C102   |
|  | ≥ 440x95x215      | 6 - 12                                       | England           | ≥2,0                                 | C103/C104   |
| <b>Autoclaved aerated concrete (AAC)</b>     |                   |  |                   |                                      |             |
| <b>PP2 / AAC</b>                             | -                 | 2  | Germany           | 0,35                                 | C105 - C109 |
| <b>PP4 / AAC</b>                             | -                 | 4  | Germany           | 0,5                                  | C105 - C109 |
| <b>PP6 / AAC</b>                             | -                 | 6  | Germany           | 0,65                                 | C105 - C109 |

fischer injektion system FIS V masonry

**Intended use**  
Overview of controlled bricks (part 2)

**Annex B 14**

## 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 injektion system FIS V masonry

**Intended use**  
Spacing and edge distance

**Annex B 15**



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

| Anchor rod  |   | M6  | M8   | M10                       | M12 | M16              |    |     |
|---|---|---|------|---------------------------|-----|------------------|----|-----|
| <b>Bearing capacity under tensile load, steel failure</b>                   |   |   |      |                           |     |                  |    |     |
| Characteristic resistance $N_{Rk,s}$  | Steel zinc plated                                       | 4.6   | [kN] | 8                         | 15  | 23               | 34 | 63  |
|   |   | 4.8   |      | 8                         | 15  | 23               | 34 | 63  |
|   |   | 5.8   |      | 10                        | 18  | 29               | 42 | 78  |
|   |   | 8.8   |      | 16                        | 29  | 46               | 67 | 125 |
|   | Stainless steel A4 and High corrosion resistant steel C | 50  |      | 10                        | 18  | 29               | 42 | 78  |
|   |   | 70  |      | 14                        | 26  | 41               | 59 | 110 |
|   |   | 80  |      | 16                        | 29  | 46               | 67 | 125 |
|   |   | <b>Partial safety factors <sup>1)</sup></b>   |      |                           |     |                  |    |     |
| Partial safety factor $\gamma_{Ms,N}$                                       | Steel zinc plated                                       | 4.6   | [-]  | 2                         |     |                  |    |     |
|   |   | 4.8   |      | 1,5                       |     |                  |    |     |
|   |   | 5.8   |      | 1,50                      |     |                  |    |     |
|   |   | 8.8   |      | 1,50                      |     |                  |    |     |
|   | Stainless steel A4 and High corrosion resistant steel C | 50  |      | 2,86                      |     |                  |    |     |
|   |   | 70  |      | 1,50 <sup>2)</sup> / 1,87 |     |                  |    |     |
|   |   | 80  |      | 1,60                      |     |                  |    |     |
|   |   | <sup>1)</sup> In absence of other national regulations<br><sup>2)</sup> Only for fischer FIS A made of high corrosion-resistant steel C |      |                           |     |                  |    |     |
| fischer injektion system FIS V masonry                                      |   |   |      |                           |     | <b>Annex C 1</b> |    |     |
| <b>Performances</b><br>Characteristic steel bearing capacity of anchor rods |   |   |      |                           |     |                  |    |     |

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

| Anchor rod  |   | M6  | M8   | M10                       | M12 | M16              |     |     |
|---|---|-----|------|---------------------------|-----|------------------|-----|-----|
| <b>Bearing capacity under shear load, steel failure</b>   |   |     |      |                           |     |                  |     |     |
| <b>without lever arm</b>  |   |     |      |                           |     |                  |     |     |
| Characteristic resistance $V_{Rk,s}$  | Steel zinc plated                                       | 4.6 | [kN] | 4                         | 7   | 12               | 17  | 31  |
|   |   | 4.8 |      | 4                         | 7   | 12               | 17  | 31  |
|   |   | 5.8 |      | 5                         | 9   | 15               | 21  | 39  |
|   |   | 8.8 |      | 8                         | 15  | 23               | 34  | 63  |
|   | Stainless steel A4 and High corrosion resistant steel C | 50  |      | 5                         | 9   | 15               | 21  | 39  |
|   |   | 70  |      | 7                         | 13  | 20               | 30  | 55  |
|   |   | 80  |      | 8                         | 15  | 23               | 34  | 63  |
|   |   |     |      |                           |     |                  |     |     |
| <b>with lever arm</b>   |   |     |      |                           |     |                  |     |     |
| Characteristic bending moment $M_{Rk,s}$  | Steel zinc plated                                       | 4.6 | [Nm] | 6                         | 15  | 30               | 52  | 133 |
|   |   | 4.8 |      | 6                         | 15  | 30               | 52  | 133 |
|   |   | 5.8 |      | 8                         | 19  | 37               | 65  | 166 |
|   |   | 8.8 |      | 12                        | 30  | 60               | 105 | 266 |
|   | Stainless steel A4 and High corrosion resistant steel C | 50  |      | 7                         | 19  | 37               | 65  | 166 |
|   |   | 70  |      | 10                        | 26  | 52               | 92  | 232 |
|   |   | 80  |      | 12                        | 30  | 60               | 105 | 266 |
|   |   |     |      |                           |     |                  |     |     |
| <b>Partial safety factors<sup>1)</sup></b>  |   |     |      |                           |     |                  |     |     |
| Partial safety factor $\gamma_{Ms,V}$   | Steel zinc plated                                       | 4.6 | [-]  | 1,67                      |     |                  |     |     |
|   |   | 4.8 |      | 1,25                      |     |                  |     |     |
|   |   | 5.8 |      | 1,25                      |     |                  |     |     |
|   |   | 8.8 |      | 1,25                      |     |                  |     |     |
|   | Stainless steel A4 and High corrosion resistant steel C | 50  |      | 2,38                      |     |                  |     |     |
|   |   | 70  |      | 1,25 <sup>2)</sup> / 1,56 |     |                  |     |     |
|   |   | 80  |      | 1,33                      |     |                  |     |     |
| <sup>1)</sup> In absence of other national regulations<br><sup>2)</sup> Only for fischer FIS A made of high corrosion-resistant steel C |   |     |      |                           |     |                  |     |     |
| fischer injektion system FIS V masonry  |   |     |      |                           |     | <b>Annex C 2</b> |     |     |
| <b>Performances</b><br>Characteristic steel bearing capacity of anchor rods   |   |     |      |                           |     |                  |     |     |

**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 |
|---|-----------------|------------------------|------|------|----|-----|-----|
| <b>Bearing capacity under tensile load, steel failure</b> |                 |                        |      |      |    |     |     |
| Characteristic resistance with screw                      | $N_{Rk,s}$      | Property class 5.8     | [kN] | 10   | 18 | 29  | 42  |
|   |                 | A4                     |      | 14   | 26 | 41  | 59  |
|   |                 | Property class 70<br>C |      | 14   | 26 | 41  | 59  |
| <b>Partial safety factors<sup>1)</sup></b>                |                 |                        |      |      |    |     |     |
| Partial safety factor                                     | $\gamma_{Ms,N}$ | Property class 5.8     | [-]  | 1,50 |    |     |     |
|   |                 | A4                     |      | 1,87 |    |     |     |
|   |                 | Property class 70<br>C |      | 1,87 |    |     |     |
| <b>Bearing capacity under shear load, steel failure</b>   |                 |                        |      |      |    |     |     |
| <b>without lever arm</b>                                  |                 |                        |      |      |    |     |     |
| Characteristic resistance with screw                      | $V_{Rk,s}$      | Property class 5.8     | [kN] | 5    | 9  | 15  | 21  |
|   |                 | A4                     |      | 7    | 13 | 20  | 30  |
|   |                 | Property class 70<br>C |      | 7    | 13 | 20  | 30  |
| <b>with lever arm</b>                                     |                 |                        |      |      |    |     |     |
| Characteristic bending moment                             | $M_{Rk,s}$      | Property class 5.8     | [Nm] | 8    | 19 | 37  | 65  |
|   |                 | A4                     |      | 11   | 26 | 52  | 92  |
|   |                 | Property class 70<br>C |      | 11   | 26 | 52  | 92  |
| <b>Partial safety factors<sup>1)</sup></b>                |                 |                        |      |      |    |     |     |
| Partial safety factor                                     | $\gamma_{Ms,v}$ | Property class 5.8     | [-]  | 1,25 |    |     |     |
|   |                 | A4                     |      | 1,56 |    |     |     |
|   |                 | Property class 70<br>C |      | 1,56 |    |     |     |

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

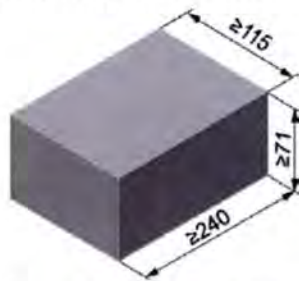
fischer injektion system FIS V masonry

**Performances**

Characteristic steel bearing capacity of fischer internal threaded anchor RG MI

**Annex C 3**

**Solid brick Mz, NF, EN 771-1**



| Solid brick Mz, NF, EN 771-1                    |                   |         |          |
|---|-------------------|---------|----------|
| 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          |         |          |

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

| Anchor rod  |                                | M6   | M8  | M10 | M12 | -           | -                         |  |
|---|--------------------------------|------|-----|-----|-----|-------------|---------------------------|--|
| Internal threaded anchor FIS E  |                                | -    | -   | -   | -   | M6<br>11x85 | M8<br>M10<br>M12<br>15x85 |  |
| Anchor rod and internal threaded anchor FIS E without perforated sleeve |                                |      |     |     |     |             |                           |  |
| Effective anchorage depth   | $h_{ef}$                       | [mm] | 50  | 50  | 50  | 50          | 85                        |  |
|   |                                |      | 80  | 80  | 80  | 80          |                           |  |
|   |                                |      | 200 | 200 | 200 | 200         |                           |  |
| Max. installation torque  | $T_{inst,max}$                 | [Nm] | 4   | 10  |     | 4           | 10                        |  |
| General installation parameters   |                                |      |     |     |     |             |                           |  |
| Edge distance   | $c_{min}$                      | [mm] | 100 |     |     |             | 100                       |  |
| Edge distance $h_{ef}=200$  | $c_{min}$                      |      | 150 |     |     |             | -                         |  |
| Spacing   | $s_{min II,N}$                 |      | 60  |     |     |             | 60                        |  |
|   | $h_{ef}=200 s_{min II,N}$      |      | 240 |     |     |             | -                         |  |
|   | $s_{min II,V}$                 |      | 240 |     |     |             | 240                       |  |
|   | $s_{cr II}$                    |      | 240 |     |     |             | 240                       |  |
|   | $s_{cr \perp} = s_{min \perp}$ |      | 75  |     |     |             | 75                        |  |
| Drilling method   |                                |      |     |     |     |             |                           |  |
| Hammer drilling with hard metal hammer drill                            |                                |      |     |     |     |             |                           |  |

**Table C4.2:** Group factors

| Anchor rods                    |                                 | M6   | M8 | M10 | M12 | -           | -                         |     |
|--------------------------------|---------------------------------|------|----|-----|-----|-------------|---------------------------|-----|
| Internal threaded anchor FIS E |                                 | -    | -  | -   | -   | M6<br>11x85 | M8<br>M10<br>M12<br>15x85 |     |
| Edge distance                  | $c_{min}$                       | [mm] |    |     |     |             |                           | 100 |
| Group factor                   | $\alpha_{g,N II}$               | [-]  |    |     |     |             |                           | 1,5 |
|                                | $\alpha_{g,V II}$               | [-]  |    |     |     |             |                           | 2,0 |
|                                | $h_{ef}=200 \alpha_{g,N II}$    | [-]  |    |     |     |             |                           | 1,5 |
|                                | $h_{ef}=200 \alpha_{g,V II}$    | [-]  |    |     |     |             |                           | 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 |

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**Performances**

Solid brick Mz, NF, dimensions, installation parameters  $c=100\text{mm}$

**Annex C 4**

**Solid brick Mz, NF, EN 771-1**

**Table C5.1:** Characteristic resistance under tensile load for edge distance 100mm

| Anchor rod   |               | M6                                      | M8  | M10 |     |     | M12 |     |      | -     |    | -     |     |
|--|---------------|---|-----|-----|-----|-----|-----|-----|------|-------|----|-------|-----|
| Internal threaded anchor FIS E   |               | -                                       | -   | -   |     |     | -   |     |      | M6    | M8 | M10   | M12 |
|  |               |   |     |     |     |     |     |     |      | 11x85 |    | 15x85 |     |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |               |   |     |     |     |     |     |     |      |       |    |       |     |
| compressive strength $f_b$   | Use categorie | Effective anchorage depth $h_{ef}$ [mm] |     |     |     |     |     |     |      |       |    |       |     |
|  |               | ≥50                                     | ≥50 | 50  | 80  | 200 | 50  | 80  | 200  | 85    |    |       |     |
| 12N/mm <sup>2</sup>  | w/w           | 2,5                                     | 2,5 | 2   | 3   | 7,5 | 2   | 3,5 | 5    | 3,5   |    |       |     |
|  | d/d           | 4                                       | 4   | 3,5 | 5   | 12  | 3   | 5,5 | 8    | 5,5   |    |       |     |
| 20N/mm <sup>2</sup>  | w/w           | 3,5                                     | 3,5 | 3   | 4,5 | 11  | 3   | 5   | 7    | 5     |    |       |     |
|  | d/d           | 5,5                                     | 5,5 | 5   | 7   | 12  | 4,5 | 8   | 11,5 | 8     |    |       |     |

Factor for temperature range 72/120°C: 0,83

**Table C5.2:** Characteristic resistance under shear load for edge distance 100mm

| Anchor rod  |               | M6                                      | M8  | M10 |     |     | M12  |     |  | -     |    | -     |     |
|---|---------------|---|-----|-----|-----|-----|------|-----|--|-------|----|-------|-----|
| Internal threaded anchor FIS E  |               | -                                       | -   | -   |     |     | -    |     |  | M6    | M8 | M10   | M12 |
|   |               |   |     |     |     |     |      |     |  | 11x85 |    | 15x85 |     |
| Shear load $V_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C and 72/120°C) |               |   |     |     |     |     |      |     |  |       |    |       |     |
| compressive strength $f_b$  | Use categorie | Effective anchorage depth $h_{ef}$ [mm] |     |     |     |     |      |     |  |       |    |       |     |
|   |               | ≥50                                     | ≥50 | ≥50 | 200 | ≥50 | 200  | 85  |  |       |    |       |     |
| 12N/mm <sup>2</sup>   | w/w           | 2,5                                     | 2,5 | 4   | 8,5 | 4   | 11,5 | 2,5 |  |       |    |       |     |
|   | d/d           |   |     |     |     |     |      |     |  |       |    |       |     |
| 20N/mm <sup>2</sup>   | w/w           | 4,0                                     | 4,0 | 6   | 12  | 5,5 | 12   | 4   |  |       |    |       |     |
|   | d/d           |   |     |     |     |     |      |     |  |       |    |       |     |

Factor for job site tests and displacements see annex C110

fischer injektion system FIS V masonry

**Performances**

Solid brick Mz, NF, Characteristic resistance under tensile and shear load c=100mm

**Annex C 5**

| <b>Solid brick Mz, NF, EN 771-1</b>  |   |                   |     |     |     |       |           |       |     |     |
|--|---|-------------------|-----|-----|-----|-------|-----------|-------|-----|-----|
| <b>Table C6.1: Installation parameters for edge distance <math>c=60\text{mm}</math></b>        |   |                   |     |     |     |       |           |       |     |     |
| Anchor rod   |   | M6                | M8  | M10 | M12 | M16   | -         |       | -   |     |
| 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]                           | 50                | 50  | 50  | 50  | 50    | 85        |       |     |     |
|  |   | 100               | 100 | 100 | 100 | 100   |           |       |     |     |
|  |   | 200               | 200 | 200 | 200 | 200   |           |       |     |     |
| Max. installation torque   | $T_{inst,max}$ [Nm]                     | 4                 | 10  |     |     |       | 4         | 10    |     |     |
| General installation parameters  |   |                   |     |     |     |       |           |       |     |     |
| Edge distance  | $c_{min}$                               | 60                |     |     |     |       |           |       |     |     |
| Edge distance $h_{ef}=200$   | $c_{min}$                               | 60                |     |     |     |       |           |       |     |     |
| Spacing  | $s_{min \parallel,N}$                   | 80                |     |     |     |       |           |       |     |     |
|  | $h_{ef}=200$ $s_{min \parallel,N}$ [mm] | 80                |     |     |     |       |           |       |     |     |
|  | $s_{min \parallel,V}$                   | 80                |     |     |     |       |           |       |     |     |
|  | $s_{cr \parallel}$                      | $3 \times h_{ef}$ |     |     |     |       |           |       |     |     |
|  | $s_{min \perp}$                         | 80                |     |     |     |       |           |       |     |     |
|  | $s_{cr \perp}$                          | $3 \times h_{ef}$ |     |     |     |       |           |       |     |     |
| Drilling method  |   |                   |     |     |     |       |           |       |     |     |
| Hammer drilling with hard metal hammer drill   |   |                   |     |     |     |       |           |       |     |     |
| Table C6.2: Group factors  |   |                   |     |     |     |       |           |       |     |     |
| Anchor rods  |   | M6                | M8  | M10 | M12 | M16   | -         |       | -   |     |
| Internal threaded anchor FIS E   |   | -                 | -   | -   | -   | -     | M6        | M8    | M10 | M12 |
|  |   |                   |     |     |     | 11x85 |           | 15x85 |     |     |
| Edge distance  | $c_{min}$ [mm]                          | 60                |     |     |     |       |           |       |     |     |
| Group factor   | $\alpha_{q,N \parallel}$                | 0,6               |     |     |     |       |           |       |     |     |
|  | $\alpha_{q,V \parallel}$                | 1,3               |     |     |     |       |           |       |     |     |
|  | $h_{ef}=200$ $\alpha_{q,N \parallel}$   | 1,4               |     |     |     |       |           |       |     |     |
|  | $h_{ef}=200$ $\alpha_{q,V \parallel}$   | 1,5               |     |     |     |       |           |       |     |     |
|  | $\alpha_{q,N \perp}$                    | 0,3               |     |     |     |       |           |       |     |     |
|  | $\alpha_{q,V \perp}$                    | 1,3               |     |     |     |       |           |       |     |     |
|  | $h_{ef}=200$ $\alpha_{q,N \perp}$       | 2,0               |     |     |     |       |           |       |     |     |
|  | $h_{ef}=200$ $\alpha_{q,V \perp}$       | 1,1               |     |     |     |       |           |       |     |     |
| fischer injektion system FIS V masonry   |   |                   |     |     |     |       | Annex C 6 |       |     |     |
| <b>Performances</b><br>Solid brick Mz, NF, dimensions, installation parameters $c=60\text{mm}$ |   |                   |     |     |     |       |           |       |     |     |

**Solid brick Mz, NF, EN 771-1**

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

| Anchor rod                     | M6 | M8 | M10 | M12 | M16 | -  | -     |     |       |
|--------------------------------|----|----|-----|-----|-----|----|-------|-----|-------|
| Internal threaded anchor FIS E | -  | -  | -   | -   | -   | M6 | M8    | M10 | M12   |
|                                |    |    |     |     |     |    | 11x85 |     | 15x85 |

**Tensile load  $N_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C)**

| compressive strength $f_b$ | use category | Effective anchorage depth $h_{ef}$ [mm] |     |     |     |     |     |     |     |     |     |     |     | 85 |
|----------------------------|--------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
|                            |              | 50                                      | 100 | 50  | 100 | 50  | 100 | 200 | 50  | 100 | 200 | 50  | 100 |    |
| 12N/mm <sup>2</sup>        | w/w          | 1,5                                     | 2,0 | 2,0 | 2,0 | 2,5 | -   | 2,0 | 2,5 | -   | 2,0 | 5,5 | -   | -  |
|                            | w/d          | 2,5                                     | 3,0 | 4,0 | 3,0 | 4,0 | 9,5 | 3,0 | 4,0 | 9,5 | 3,0 | 8,5 | 9,5 | -  |
| 20N/mm <sup>2</sup>        | w/w          | 2,0                                     | 2,5 | 3,0 | 2,5 | 3,5 | -   | 3,0 | 3,5 | -   | 3,0 | 7,5 | -   | -  |
|                            | w/d          | 3,5                                     | 4,5 | 5,5 | 4,5 | 5,5 | 12  | 4,5 | 5,5 | 12  | 4,5 | 12  | 12  | -  |
| 28N/mm <sup>2</sup>        | w/w          | 2,5                                     | 3,0 | 4,0 | 3,0 | 4,0 | -   | 3,5 | 4,0 | -   | 3,5 | 9,0 | -   | -  |
|                            | w/d          | 4,0                                     | 5,5 | 6,5 | 5,5 | 6,5 | 12  | 5,5 | 6,5 | 12  | 5,5 | 12  | 12  | -  |

Factor for temperature range 72/120°C: 0,83

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

| Anchor rod                     | M6 | M8 | M10 | M12 | M16 | -  | -     |     |       |
|--------------------------------|----|----|-----|-----|-----|----|-------|-----|-------|
| Internal threaded anchor FIS E | -  | -  | -   | -   | -   | M6 | M8    | M10 | M12   |
|                                |    |    |     |     |     |    | 11x85 |     | 15x85 |

**Shear load  $V_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C and 72/120°C)**

| compressive strength $f_b$ | use category | Effective anchorage depth $h_{ef}$ [mm] |     |     |     |     |     |     |     |     |     |     |     | 85  |
|----------------------------|--------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                            |              | 50                                      | 100 | 50  | 100 | 50  | 100 | 200 | 50  | 100 | 200 | 50  | 100 |     |
| 12N/mm <sup>2</sup>        | w/w          | 1,2                                     | 2,5 | 1,2 | 3,0 | 2,0 | 3,0 | 1,5 | 1,5 | 3,0 | 3,0 | 0,6 | 3,0 | 4,5 |
|                            | w/d          | 1,2                                     | 2,5 | 1,2 | 3,0 | 2,0 | 3,0 | 1,5 | 1,5 | 3,0 | 3,0 | 0,6 | 3,0 | 4,5 |
| 20N/mm <sup>2</sup>        | w/w          | 1,5                                     | 3,5 | 1,5 | 4,5 | 3,0 | 4,5 | 2,5 | 2,0 | 4,5 | 4,5 | 0,9 | 4,5 | 6,0 |
|                            | w/d          | 1,5                                     | 3,5 | 1,5 | 4,5 | 3,0 | 4,5 | 2,5 | 2,0 | 4,5 | 4,5 | 0,9 | 4,5 | 6,0 |
| 28N/mm <sup>2</sup>        | w/w          | 2,0                                     | 4,0 | 2,0 | 5,0 | 3,5 | 5,0 | 3,0 | 2,5 | 5,0 | 5,0 | 1,2 | 5,0 | 7,5 |
|                            | w/d          | 2,0                                     | 4,0 | 2,0 | 5,0 | 3,5 | 5,0 | 3,0 | 2,5 | 5,0 | 5,0 | 1,2 | 5,0 | 7,5 |

Factor for job site tests and displacements see annex C110

fischer injektion system FIS V masonry

**Performances**

Solid brick Mz, NF, Characteristic resistance under tensile and shear load  $c=60$

**Annex C 7**

### Solid brick Mz, 2DF, EN 771-1



#### Solid brick Mz, 2DF, EN 771-1

|   |                   |         |          |
|---|-------------------|---------|----------|
| Producer  | e.g. Wienerberger |         |          |
| Nominal dimensions [mm]                         | length L          | width W | height H |
|   | ≥ 240             | ≥ 115   | ≥ 113    |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 1,8             |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 10 / 16           |         |          |
| Standard or annex                               | EN 771-1          |         |          |

**Table C8.1:** Installation parameters

| Anchor rod  | M6                             | M8  | M10   | M12 | M16 | -   | -  |     |     |  |  |
|---|--------------------------------|-----|-------|-----|-----|-----|----|-----|-----|--|--|
| Internal threaded anchor FIS E  | -                              | -   | -     | -   | -   | M6  | M8 | M10 | M12 |  |  |
|   | 11x85                          |     | 15x85 |     |     |     |    |     |     |  |  |
| <b>Anchor rod and internal threaded anchor FIS E without perforated sleeve</b>            |                                |     |       |     |     |     |    |     |     |  |  |
| Effective anchorage depth $h_{ef}$ [mm]   | 50                             | 100 | 50    | 100 | 50  | 100 | 50 | 100 | 85  |  |  |
| Max. installation torque $T_{inst,max}$ [Nm]  | 4                              |     | 10    |     |     |     | 4  | 10  |     |  |  |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H 16x85 K</b> |                                |     |       |     |     |     |    |     |     |  |  |
| Effective anchorage depth $h_{ef}$ [mm]   |                                |     | 85    |     |     |     | 85 |     |     |  |  |
| Max. installation torque $T_{inst,max}$ [Nm]  |                                |     | 10    |     |     |     | 4  | 10  |     |  |  |
| <b>General Installation parameters</b>  |                                |     |       |     |     |     |    |     |     |  |  |
| Edge distance $c_{min}$   |                                |     |       |     | 60  |     |    |     |     |  |  |
| Spacing   | $s_{min} \parallel$            |     |       |     |     | 120 |    |     |     |  |  |
|   | $s_{cr} \parallel$             |     |       |     |     | 240 |    |     |     |  |  |
|   | $s_{cr} \perp = s_{min} \perp$ |     |       |     |     | 115 |    |     |     |  |  |
| <b>Drilling method</b>  |                                |     |       |     |     |     |    |     |     |  |  |
| Hammer drilling with hard metal hammer drill  |                                |     |       |     |     |     |    |     |     |  |  |

**Table C8.2:** Group factors

| Anchor rods   | M6                       | M8 | M10   | M12 | M16 | -                | -  |     |     |
|---|--------------------------|----|-------|-----|-----|------------------|----|-----|-----|
| Internal threaded anchor FIS E  | -                        | -  | -     | -   | -   | M6               | M8 | M10 | M12 |
|   | 11x85                    |    | 15x85 |     |     |                  |    |     |     |
| Group factor  | $\alpha_{q,N} \parallel$ |    |       |     |     | 1,5              |    |     |     |
|   | $\alpha_{q,V} \parallel$ |    |       |     |     | 1,4              |    |     |     |
|   | $\alpha_{q,N} \perp$     |    |       |     |     | 2                |    |     |     |
|   | $\alpha_{q,V} \perp$     |    |       |     |     |                  |    |     |     |
| fischer injektion system FIS V masonry  |                          |    |       |     |     | <b>Annex C 8</b> |    |     |     |
| <b>Performances</b><br>Solid brick Mz, 2DF, dimensions, installation parameters |                          |    |       |     |     |                  |    |     |     |



**Solid brick Mz, 2DF, EN 771-1**

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

| Anchor rod   |              | M6                                      | M8  | M10 | M12 | M16 | -   |     | -   |     | M8    | M10 | -  |     |  |
|--|--------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-------|-----|----|-----|--|
| Internal threaded anchor FIS E   |              | -                                       | -   | -   | -   | -   | M6  | M8  | M10 | M12 | -     | -   | M6 | M8  |  |
|  |              |   |     |     |     |     |     |     |     |     |       |     |    |     |  |
| Perforated sleeve FIS H K  |              | -                                       | -   | -   | -   | -   | -   |     | -   |     | 16x85 |     |    |     |  |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |              |   |     |     |     |     |     |     |     |     |       |     |    |     |  |
| compressive strength $f_b$   | use category | Effective anchorage depth $h_{ef}$ [mm] |     |     |     |     |     |     |     |     |       |     |    |     |  |
|  |              | 50                                      |     |     |     |     |     | 100 |     |     |       |     |    | 85  |  |
| 10N/mm <sup>2</sup>  | w/w          | 1,5                                     | 2,5 | 1,5 | 2,5 | 1,5 | 3   | 2   | 3,5 | 2   | 3,5   | 2   |    | 1,5 |  |
|  | d/d          | 3                                       | 4,0 | 3,0 | 4,0 | 3,0 | 4,5 | 3   | 5,5 | 3   | 5,5   | 3   |    | 3   |  |
| 16N/mm <sup>2</sup>  | w/w          | 2,5                                     | 4   | 2,5 | 4   | 2,5 | 4,5 | 3,5 | 5,5 | 3,5 | 5,5   | 3,5 |    | 2,5 |  |
|  | d/d          | 4,5                                     | 7,0 | 4,5 | 7,0 | 4,5 | 7,5 | 5,5 | 8   | 5,5 | 8     | 5,5 |    | 4,5 |  |

Factor for temperature range 72/120°C: 0,83

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

| Anchor rod  |              | M6                                      | M8  | M10 | M12 | M16 | -   |     | -   |     | M8    | M10 | -   |     |  |
|---|--------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-------|-----|-----|-----|--|
| Internal threaded anchor FIS E  |              | -                                       | -   | -   | -   | -   | M6  | M8  | M10 | M12 | -     | -   | M6  | M8  |  |
|   |              |   |     |     |     |     |     |     |     |     |       |     |     |     |  |
| Perforated sleeve FIS H K   |              | -                                       | -   | -   | -   | -   | -   |     | -   |     | 16x85 |     |     |     |  |
| Shear load $V_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C and 72/120°C) |              |   |     |     |     |     |     |     |     |     |       |     |     |     |  |
| compressive strength $f_b$  | use category | Effective anchorage depth $h_{ef}$ [mm] |     |     |     |     |     |     |     |     |       |     |     |     |  |
|   |              | ≥ 50                                    |     |     |     |     |     | 85  |     |     |       |     |     |     |  |
| 10N/mm <sup>2</sup>   | w/w          | 2,5                                     | 3,0 | 3,0 | 3,5 | 3,0 | 2,5 | 3,0 | 3,0 | 3,0 | 3,0   | 3,5 | 2,5 | 3,0 |  |
|   | d/d          | 4,0                                     | 5,0 | 5,5 | 5,5 | 5,0 | 4,0 | 5,0 | 5,0 | 5,0 | 5,0   | 6,0 | 4,0 | 5,0 |  |
| 16N/mm <sup>2</sup>   | w/w          | 4,0                                     | 5,0 | 5,5 | 5,5 | 5,0 | 4,0 | 5,0 | 5,0 | 5,0 | 5,0   | 6,0 | 4,0 | 5,0 |  |
|   | d/d          | 4,0                                     | 5,0 | 5,5 | 5,5 | 5,0 | 4,0 | 5,0 | 5,0 | 5,0 | 5,0   | 6,0 | 4,0 | 5,0 |  |

Factor for job site tests and displacements see annex C110

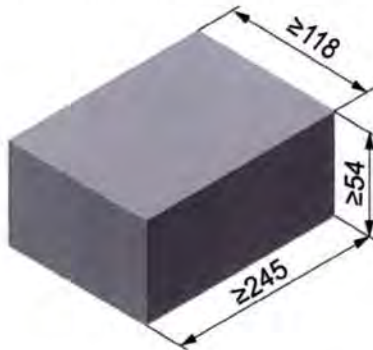
fischer injektion system FIS V masonry

**Performances**

Solid brick Mz, 2DF, Characteristic resistance under tensile and shear load

**Annex C 9**

**Solid brick Mz, EN 771-1**



| Solid brick Mz, EN 771-1                        |            |         |          |
|---|------------|---------|----------|
| Producer  | e.g. Nigra |         |          |
| Nominal dimensions [mm]                         | length L   | width W | height H |
|   | ≥ 245      | ≥ 118   | ≥ 54     |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 1,8      |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 10 / 20    |         |          |
| Standard or annex                               | EN 771-1   |         |          |

**Table C10.1: Installation parameters**

| Anchor rod   | M6                             | M8  | M10 | M12 | M16 | -     | -  |       |     |     |    |
|--|--------------------------------|-----|-----|-----|-----|-------|----|-------|-----|-----|----|
| Internal threaded anchor FIS E   | -                              | -   | -   | -   |     | M6    | M8 | M10   | M12 |     |    |
|  |                                |     |     |     |     | 11x85 |    | 15x85 |     |     |    |
| <b>Anchor rod and internal threaded anchor FIS E without perforated sleeve</b> |                                |     |     |     |     |       |    |       |     |     |    |
| Effective anchorage depth $h_{ef}$ [mm]  | 50                             | 100 | 50  | 100 | 50  | 100   | 50 | 100   | 50  | 100 | 85 |
| Max. installation torque $T_{inst,max}$ [Nm]                                   | 4                              |     | 10  |     |     |       | 4  |       | 10  |     |    |
| <b>General installation parameters</b>   |                                |     |     |     |     |       |    |       |     |     |    |
| Edge distance $c_{min}$  | 60                             |     |     |     |     |       |    |       |     |     |    |
| Spacing $s_{cr \parallel} = s_{min \parallel}$ [mm]                            | 245                            |     |     |     |     |       |    |       |     |     |    |
|  | $s_{cr \perp} = s_{min \perp}$ | 60  |     |     |     |       |    |       |     |     |    |
| <b>Drilling method</b>   |                                |     |     |     |     |       |    |       |     |     |    |
| Hammer drilling with hard metal hammer drill                                   |                                |     |     |     |     |       |    |       |     |     |    |

**Table C10.2: Group factors**

| Anchor rods                    | M6                       | M8  | M10 | M12 | M16 | -     | -  |       |     |
|--------------------------------|--------------------------|-----|-----|-----|-----|-------|----|-------|-----|
| Internal threaded anchor FIS E | -                        | -   | -   | -   | -   | M6    | M8 | M10   | M12 |
|                                |                          |     |     |     |     | 11x85 |    | 15x85 |     |
| Group factor                   | $\alpha_{a,N \parallel}$ | [-] | 2   |     |     |       |    |       |     |
|                                | $\alpha_{a,V \parallel}$ |     |     |     |     |       |    |       |     |
|                                | $\alpha_{a,N \perp}$     |     |     |     |     |       |    |       |     |
|                                | $\alpha_{a,V \perp}$     |     |     |     |     |       |    |       |     |

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**Performances**  
Solid brick Mz, dimensions, installation parameters

**Annex C 10**

**Solid brick Mz, EN 771-1**

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

| Anchor rod   |              | M6                                      | M8  | M10 | M12  | M16  | -     |     | -     |     |
|--|--------------|---|-----|-----|------|------|-------|-----|-------|-----|
| Internal threaded anchor FIS E   |              | -                                       | -   | -   | -    | -    | M6    | M8  | M10   | M12 |
|  |              |   |     |     |      |      | 11x85 |     | 15x85 |     |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |              |   |     |     |      |      |       |     |       |     |
| compressive strength $f_b$   | use category | Effective anchorage depth $h_{ef}$ [mm] |     |     |      |      |       |     |       |     |
|  |              | ≥ 50                                    |     |     |      |      |       | 85  |       |     |
| 10N/mm <sup>2</sup>  | w/w          | w/d                                     | 0,6 | 0,9 | 0,75 | 0,75 | 0,75  | 0,6 | 0,75  |     |
|  | d/d          |   | 1,2 | 1,5 | 1,2  | 1,2  | 1,2   | 1,2 | 1,2   |     |
| 20N/mm <sup>2</sup>  | w/w          | w/d                                     | 0,9 | 1,5 | 1,2  | 1,2  | 1,2   | 0,9 | 1,2   |     |
|  | d/d          |   | 1,5 | 2,5 | 2,0  | 2,0  | 2,0   | 1,5 | 2,0   |     |

Factor for temperature range 72/120°C: 0,83

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

| Anchor rod  |              | M6                                      | M8  | M10 | M12 | M16 | -     |     | -     |     |     |
|---|--------------|---|-----|-----|-----|-----|-------|-----|-------|-----|-----|
| Internal threaded anchor FIS E  |              | -                                       | -   | -   | -   | -   | M6    | M8  | M10   | M12 |     |
|   |              |   |     |     |     |     | 11x85 |     | 15x85 |     |     |
| Shear load $V_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C and 72/120°C) |              |   |     |     |     |     |       |     |       |     |     |
| compressive strength $f_b$  | use category | Effective anchorage depth $h_{ef}$ [mm] |     |     |     |     |       |     |       |     |     |
|   |              | ≥ 50                                    |     |     |     |     |       | 85  |       |     |     |
| 10N/mm <sup>2</sup>   | w/w          | w/d                                     | 2,0 | 3,0 | 4,0 | 4,5 | 5,5   | 2,0 | 3,0   | 4,0 | 4,5 |
|   | d/d          |   |     |     |     |     |       |     |       |     |     |
| 20N/mm <sup>2</sup>   | w/w          | w/d                                     | 2,5 | 4,0 | 5,5 | 6,0 | 8,0   | 2,5 | 4,0   | 5,5 | 6,0 |
|   | d/d          |   |     |     |     |     |       |     |       |     |     |

Factor for job site tests and displacements see annex C110

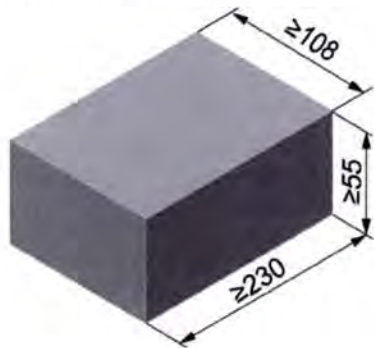
fischer injektion system FIS V masonry

**Performances**

Solid brick Mz, Characteristic resistance under tensile and shear load

**Annex C 11**

### Solid brick Mz, EN 771-1



| Solid brick Mz, EN 771-1                        |                   |         |          |
|---|-------------------|---------|----------|
| Producer  | e.g. Wienerberger |         |          |
| Nominal dimensions [mm]                         | length L          | width W | height H |
|   | ≥ 230             | ≥ 108   | ≥ 55     |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 1,8             |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 10 / 20           |         |          |
| Standard or annex                               | EN 771-1          |         |          |

**Table C12.1:** Installation parameters

| Anchor rod   | M6 | M8 | M10 | M12 | M16 | -  | -     |     |       |
|--|----|----|-----|-----|-----|----|-------|-----|-------|
| Internal threaded anchor FIS E   | -  | -  | -   | -   | -   | M6 | M8    | M10 | M12   |
|  |    |    |     |     |     |    | 11x85 |     | 15x85 |
| <b>Anchor rod and internal threaded anchor FIS E without perforated sleeve</b> |    |    |     |     |     |    |       |     |       |
| Effective anchorage depth $h_{ef}$ [mm]  | 50 | 90 | 50  | 90  | 50  | 90 | 50    | 90  | 85    |
| Max. installation torque $T_{inst,max}$ [Nm]                                   | 4  |    | 10  |     |     |    | 4     | 10  |       |
| <b>General installation parameters</b>   |    |    |     |     |     |    |       |     |       |
| Edge distance $c_{min}$  |    |    |     |     | 60  |    |       |     |       |
| Spacing $s_{cr}$    = $s_{min}$    [mm]  |    |    |     |     | 230 |    |       |     |       |
|  |    |    |     |     | 60  |    |       |     |       |
| <b>Drilling method</b>   |    |    |     |     |     |    |       |     |       |
| Hammer drilling with hard metal hammer drill                                   |    |    |     |     |     |    |       |     |       |

**Table C12.2:** Group factors

| Anchor rods                    | M6               | M8  | M10 | M12 | M16 | -  | -     |     |       |  |
|--------------------------------|------------------|-----|-----|-----|-----|----|-------|-----|-------|--|
| Internal threaded anchor FIS E | -                | -   | -   | -   | -   | M6 | M8    | M10 | M12   |  |
|                                |                  |     |     |     |     |    | 11x85 |     | 15x85 |  |
| Group factor                   | $\alpha_{q,N}$   | [-] |     |     |     |    |       |     |       |  |
|                                | $\alpha_{q,V}$   |     |     |     |     |    |       |     |       |  |
|                                | $\alpha_{q,N}$ ⊥ |     |     |     |     |    |       |     |       |  |
|                                | $\alpha_{q,V}$ ⊥ |     |     |     |     |    |       |     |       |  |
| 2                              |                  |     |     |     |     |    |       |     |       |  |

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**Performances**  
Solid brick Mz, dimensions, installation parameters

**Annex C 12**

**Solid brick Mz, EN 771-1**

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

| Anchor rod   |              | M6                                      | M8  | M10  | M12  | M16  | -     | -  |       |     |
|--|--------------|---|-----|------|------|------|-------|----|-------|-----|
| Internal threaded anchor FIS E   |              | -                                       | -   | -    | -    | -    | M6    | M8 | M10   | M12 |
|  |              |   |     |      |      |      | 11x85 |    | 15x85 |     |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |              |   |     |      |      |      |       |    |       |     |
| compressive strength $f_b$   | use category | Effective anchorage depth $h_{ef}$ [mm] |     |      |      |      |       |    |       |     |
|  |              | ≥ 50                                    |     |      |      |      |       | 85 |       |     |
| 10N/mm <sup>2</sup>  | w/w          | 0,6                                     | 0,9 | 0,75 | 0,75 | 0,75 | 0,75  |    |       |     |
|  | d/d          | 1,2                                     | 1,5 | 1,2  | 1,2  | 1,2  | 1,2   |    |       |     |
| 20N/mm <sup>2</sup>  | w/w          | 0,9                                     | 1,5 | 1,2  | 1,2  | 1,2  | 1,2   |    |       |     |
|  | d/d          | 1,5                                     | 2,5 | 2,0  | 2,0  | 2,0  | 2,0   |    |       |     |

Factor for temperature range 72/120°C: 0,83

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

| Anchor rod  |              | M6                                      | M8  | M10 | M12 | M16 | -     | -   |       |     |
|---|--------------|---|-----|-----|-----|-----|-------|-----|-------|-----|
| Internal threaded anchor FIS E  |              | -                                       | -   | -   | -   | -   | M6    | M8  | M10   | M12 |
|   |              |   |     |     |     |     | 11x85 |     | 15x85 |     |
| Querlast $V_{Rk}$ [kN] in Abhängigkeit von der Druckfestigkeit $f_b$ (Temperaturbereich 50/80°C und 72/120°C) |              |   |     |     |     |     |       |     |       |     |
| compressive strength $f_b$  | use category | Effective anchorage depth $h_{ef}$ [mm] |     |     |     |     |       |     |       |     |
|   |              | ≥ 50                                    |     |     |     |     |       | 85  |       |     |
| 10N/mm <sup>2</sup>   | w/w          | 2,0                                     | 3,0 | 4,0 | 4,5 | 5,5 | 2,0   | 3,0 | 4,0   | 4,5 |
|   | d/d          |   |     |     |     |     |       |     |       |     |
| 20N/mm <sup>2</sup>   | w/w          | 2,5                                     | 4,0 | 5,5 | 6,0 | 8,0 | 2,5   | 4,0 | 5,5   | 6,0 |
|   | d/d          |   |     |     |     |     |       |     |       |     |

Factor for job site tests and displacements see annex C110

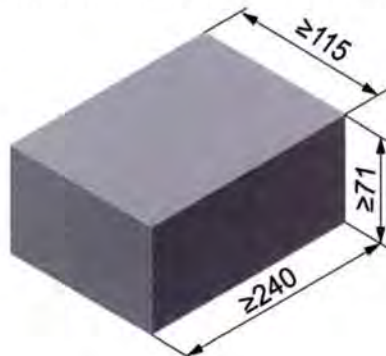
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**Performances**

Solid brick Mz, Characteristic resistance under tensile and shear load

**Annex C 13**

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



| Solid sand-lime brick KS, NF, EN 771-2 |                       |         |          |
|--|-----------------------|---------|----------|
| Producer                               |                       |         |          |
| Nominal dimensions [mm]                | length L              | width W | height H |
|  | ≥ 240                 | ≥ 115   | ≥ 71     |
| Density $\rho$                         | [kg/dm <sup>3</sup> ] |         |          |
| Compressive strength $f_b$             | [N/mm <sup>2</sup> ]  |         |          |
|  | 12 / 20 / 28          |         |          |
| Standard or annex                      | EN 771-2              |         |          |

**Table C14.1:** Installation parameters

| Anchor rod   | M6                     | M8  | M10   | M12 | M16 | -           | -   |     |     |
|--|------------------------|-----|-------|-----|-----|-------------|-----|-----|-----|
| Internal threaded anchor<br>FIS E  | -                      | -   | -     | -   | -   | M6          | M8  | M10 | M12 |
|  | 11x85                  |     | 15x85 |     |     |             |     |     |     |
| <b>Anchor rod and internal threaded anchor FIS E without perforated sleeve</b> |                        |     |       |     |     |             |     |     |     |
| Effective anchorage depth $h_{ef}$   | [mm]                   | 50  | 100   | 50  | 100 | 50          | 100 | 50  | 100 |
|  |                        | 200 |       | 200 |     | 200         |     | 85  |     |
| Max. installation torque $T_{inst,max}$  | [Nm]                   | 3   | 5     | 15  | 15  | 25          | 3   | 5   | 15  |
| <b>General installation parameters</b>   |                        |     |       |     |     |             |     |     |     |
| Edge distance $c_{min}$  |                        |     |       |     |     | 60          |     |     |     |
| Spacing  | $s_{min} \parallel$    |     |       |     |     | 80          |     |     |     |
|  | $s_{cr} \parallel$     |     |       |     |     | 80          |     |     |     |
|  | $s_{min} \perp$        |     |       |     |     | 3x $h_{ef}$ |     |     |     |
|  | $s_{cr} \perp$         |     |       |     |     | 3x $h_{ef}$ |     |     |     |
|  | <b>Drilling method</b> |     |       |     |     |             |     |     |     |
| Hammer drilling with hard metal hammer drill                                   |                        |     |       |     |     |             |     |     |     |

**Table C14.2:** Group factors

| Anchor rod                        | M6                       | M8 | M10   | M12 | M16 | -   | -  |     |     |
|-----------------------------------|--------------------------|----|-------|-----|-----|-----|----|-----|-----|
| Internal threaded anchor<br>FIS E | -                        | -  | -     | -   | -   | M6  | M8 | M10 | M12 |
|                                   | 11x85                    |    | 15x85 |     |     |     |    |     |     |
| Group factor                      | $\alpha_{q,N} \parallel$ |    |       |     |     | 0,7 |    |     |     |
|                                   | $\alpha_{q,V} \parallel$ |    |       |     |     | 1,3 |    |     |     |
|                                   | $\alpha_{q,N} \perp$     |    |       |     |     | 2,0 |    |     |     |
|                                   | $\alpha_{q,V} \perp$     |    |       |     |     | 2,0 |    |     |     |

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**Performances**

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

**Annex C 14**

**Solid sand-lime brick KS, NF, EN 771-2**

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

| Anchor rod   |              | M6                                      |     | M8  |     | M10 |     | M12 |     | M16 |     | -     |     | -     |     |     |
|--|--------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-----|-------|-----|-----|
| Internal threaded anchor FIS E   |              | -                                       |     | -   |     | -   |     | -   |     | -   |     | M6    | M8  | M10   | M12 |     |
|  |              |   |     |     |     |     |     |     |     |     |     | 11x85 |     | 15x85 |     |     |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |              |   |     |     |     |     |     |     |     |     |     |       |     |       |     |     |
| compressive strength $f_b$   | use category | Effective anchorage depth $h_{ef}$ [mm] |     |     |     |     |     |     |     |     |     |       |     |       |     |     |
|  |              | 50                                      | 100 | 50  | 100 | 50  | 100 | 200 | 50  | 100 | 200 | 50    | 100 | 200   | 85  | 85  |
| 12N/mm <sup>2</sup>  | w/w          | 2,0                                     | 3,0 | 2,5 | 4,5 | 2,5 | 3,5 | 7,0 | 2,5 | 3,0 | 6,5 | 2,5   | 3,5 | 8,0   | 2,5 | 2,5 |
|  | d/d          | 4,0                                     | 5,5 | 4,0 | 8,0 | 4,0 | 5,5 | 12  | 4,0 | 4,5 | 12  | 4,5   | 5,5 | 12    | 4,0 | 4,0 |
| 20N/mm <sup>2</sup>  | w/w          | 3,0                                     | 4,5 | 3,5 | 6,5 | 3,5 | 4,5 | 10  | 3,5 | 4,0 | 9,5 | 4,0   | 5,0 | 11    | 3,5 | 3,5 |
|  | d/d          | 5,5                                     | 7,5 | 6,0 | 11  | 6,0 | 8,0 | 12  | 6,0 | 6,5 | 12  | 6,5   | 8,0 | 12    | 6,0 | 6,0 |
| 28N/mm <sup>2</sup>  | w/w          | 3,5                                     | 5,0 | 4,0 | 8,0 | 4,5 | 5,5 | 12  | 4,5 | 5,0 | 11  | 4,5   | 5,5 | 12    | 4,5 | 4,5 |
|  | d/d          | 6,5                                     | 9,0 | 7,0 | 12  | 7,0 | 9,0 | 12  | 7,0 | 7,5 | 12  | 7,5   | 9,5 | 12    | 7,0 | 7,0 |

Factor for temperature range 72/120°C: 0,83

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

| Anchor rod  |              | M6                                      |     | M8  |     | M10 |      | M12 |      | M16 |      | -     |     | -     |     |  |
|---|--------------|---|-----|-----|-----|-----|------|-----|------|-----|------|-------|-----|-------|-----|--|
| Internal threaded anchor FIS E  |              | -                                       |     | -   |     | -   |      | -   |      | -   |      | M6    | M8  | M10   | M12 |  |
|   |              |   |     |     |     |     |      |     |      |     |      | 11x85 |     | 15x85 |     |  |
| Shear load $V_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C and 72/120°C) |              |   |     |     |     |     |      |     |      |     |      |       |     |       |     |  |
| compressive strength $f_b$  | use category | Effective anchorage depth $h_{ef}$ [mm] |     |     |     |     |      |     |      |     |      |       |     |       |     |  |
|   |              | 50                                      | 100 | 50  | 100 | 50  | ≥100 | 50  | ≥100 | 50  | ≥100 | 85    | 85  |       |     |  |
| 12N/mm <sup>2</sup>   | w/w          | 1,5                                     | 3,0 | 1,5 | 3,0 | 1,2 | 2,0  | 1,2 | 2,0  | 1,2 | 2,0  | 1,2   | 2,0 | 1,2   | 1,2 |  |
|   | d/d          | 1,5                                     | 3,0 | 1,5 | 3,0 | 1,2 | 2,0  | 1,2 | 2,0  | 1,2 | 2,0  | 1,2   | 2,0 | 1,2   | 1,2 |  |
| 20N/mm <sup>2</sup>   | w/w          | 2,5                                     | 4,0 | 2,5 | 4,0 | 1,5 | 3,0  | 1,5 | 3,0  | 1,5 | 3,0  | 1,5   | 3,0 | 1,5   | 1,5 |  |
|   | d/d          | 2,5                                     | 4,0 | 2,5 | 4,0 | 1,5 | 3,0  | 1,5 | 3,0  | 1,5 | 3,0  | 1,5   | 3,0 | 1,5   | 1,5 |  |
| 28N/mm <sup>2</sup>   | w/w          | 3,0                                     | 4,5 | 3,0 | 4,5 | 1,5 | 3,5  | 1,5 | 3,5  | 1,5 | 3,5  | 1,5   | 3,5 | 1,5   | 1,5 |  |
|   | d/d          | 3,0                                     | 4,5 | 3,0 | 4,5 | 1,5 | 3,5  | 1,5 | 3,5  | 1,5 | 3,5  | 1,5   | 3,5 | 1,5   | 1,5 |  |

Factor for job site tests and displacements see annex C110

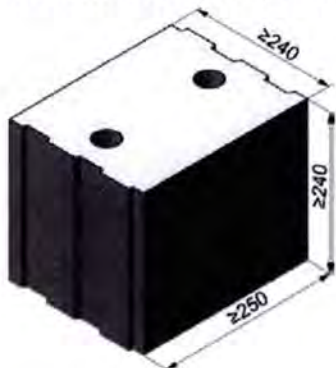
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**Performances**

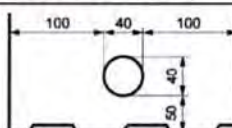
Solid sand-lime brick KS, NF, Characteristic resistance under tensile and shear load

**Annex C 15**

**Solid sand-lime brick KS, 8DF, EN 771-2**



| Solid sand-lime brick KS, 8DF, EN 771-2         |              |         |          |
|---|--------------|---------|----------|
| Producer  | -            |         |          |
| Nominal dimensions [mm]                         | length L     | width W | height H |
|   | ≥ 250        | ≥ 240   | ≥ 240    |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 2,0        |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 10 / 20 / 28 |         |          |
| Standard or annex                               | EN 771-2     |         |          |



**Table C16.1:** Installation parameters

| Anchor rod  | M6                     | M8  | M10 | M12 | M16 | -           | -                         |     |    |     |    |
|---|------------------------|-----|-----|-----|-----|-------------|---------------------------|-----|----|-----|----|
| Internal threaded anchor FIS E  | -                      | -   | -   | -   | -   | M6<br>11x85 | M8<br>M10<br>M12<br>15x85 |     |    |     |    |
| <b>Anchor rod and internal threaded anchor FIS E without perforated sleeve</b>            |                        |     |     |     |     |             |                           |     |    |     |    |
| Effective anchorage depth $h_{ef}$ [mm]   | 50                     | 100 | 50  | 100 | 50  | 100         | 50                        | 100 | 50 | 100 | 85 |
| Max. installation torque $T_{inst,max}$ [Nm]  | 4                      |     | 10  |     |     |             |                           |     | 4  | 10  |    |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H 16x85 K</b> |                        |     |     |     |     |             |                           |     |    |     |    |
| Effective anchorage depth $h_{ef}$ [mm]   | -                      |     | 85  |     |     |             | -                         |     | 85 |     | -  |
| Max. installation torque $T_{inst,max}$ [Nm]  | -                      |     | 10  |     |     |             | -                         |     | 4  | 10  |    |
| <b>General installation parameters</b>  |                        |     |     |     |     |             |                           |     |    |     |    |
| Edge distance $c_{min}$   | 60                     |     |     |     |     |             |                           |     |    |     |    |
| Spacing   | $s_{min} \parallel$    | 80  |     |     |     |             |                           |     |    |     |    |
|   | $s_{cr} \parallel$     | 250 |     |     |     |             |                           |     |    |     |    |
|   | $s_{min} \perp$        | 80  |     |     |     |             |                           |     |    |     |    |
|   | $s_{cr} \perp$         | 240 |     |     |     |             |                           |     |    |     |    |
|   | <b>Drilling method</b> |     |     |     |     |             |                           |     |    |     |    |
| Hammer drilling with hard metal hammer drill  |                        |     |     |     |     |             |                           |     |    |     |    |

**Table C16.2:** Group factors

| Anchor rods                    | M6                       | M8  | M10 | M12 | M16 | -           | -                         |  |  |
|--------------------------------|--------------------------|-----|-----|-----|-----|-------------|---------------------------|--|--|
| Internal threaded anchor FIS E | -                        | -   | -   | -   | -   | M6<br>11x85 | M8<br>M10<br>M12<br>15x85 |  |  |
| Group factors                  | $\alpha_{a,N} \parallel$ | 1,5 |     |     |     |             |                           |  |  |
|                                | $\alpha_{a,V} \parallel$ | 1,2 |     |     |     |             |                           |  |  |
|                                | $\alpha_{a,N} \perp$     | 1,5 |     |     |     |             |                           |  |  |
|                                | $\alpha_{a,V} \perp$     | 1,2 |     |     |     |             |                           |  |  |

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**Performances**

Solid sand-lime brick KS, 8DF, dimensions, installation parameters

**Annex C 16**



**Solid sand-lime brick KS, 8DF, EN 771-2**

**Table C17.1:** Characteristic resistance under tensile load

| Anchor rod   |              | M6                                      | M8  | M10  | M12  | M16  | -    |     | -    |      | M8    | M10   | -   |       |
|--|--------------|---|-----|------|------|------|------|-----|------|------|-------|-------|-----|-------|
| Internal threaded anchor FIS E   |              | -                                       | -   | -    | -    | -    | M6   | M8  | M10  | M12  | -     | -     | M6  | M8    |
|  |              |   |     |      |      |      |      |     |      |      |       | 11x85 |     | 11x85 |
| Perforated sleeve FIS H K  |              | -                                       | -   | -    | -    | -    | -    |     | -    |      | 16x85 |       |     |       |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |              |   |     |      |      |      |      |     |      |      |       |       |     |       |
| compressive strength $f_b$   | use category | Effective anchorage depth $h_{ef}$ [mm] |     |      |      |      |      |     |      |      |       |       |     |       |
|  |              | ≥ 50                                    |     |      |      |      |      | 85  |      |      |       |       |     |       |
| 10N/mm <sup>2</sup>  | w/w          | w/d                                     | 3,0 | 4,0  | 4,5  | 4,5  | 3,5  | 3,0 | 3,5  | 4,5  | 3,0   | 4,5   | 3,0 | 4,5   |
|  | d/d          |   | 5,0 | 7,0  | 7,0  | 7,0  | 5,5  | 5,0 | 5,5  | 8,0  | 5,0   | 8,0   | 5,0 | 8,0   |
| 20N/mm <sup>2</sup>  | w/w          | w/d                                     | 4,5 | 6,0  | 6,0  | 6,0  | 5,0  | 4,5 | 5,0  | 6,5  | 4,5   | 6,5   | 4,5 | 6,5   |
|  | d/d          |   | 7,5 | 10,0 | 10,0 | 10,0 | 7,5  | 7,5 | 7,5  | 11,0 | 7,5   | 11,0  | 7,5 | 11,0  |
| 28N/mm <sup>2</sup>  | w/w          | w/d                                     | 5,0 | 8,0  | 8,5  | 8,5  | 7,0  | 5,0 | 7,0  | 8,5  | 5,0   | 8,5   | 5,0 | 8,5   |
|  | d/d          |   | 8,5 | 12,0 | 12,0 | 12,0 | 11,0 | 8,5 | 11,0 | 12,0 | 8,5   | 12,0  | 8,5 | 12,0  |

Factor for temperature range 72/120°C: 0,83

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

| Anchor rod  |              | M6                                      | M8  | M10 | M12 | M16 | -   |     | -   |     | M8    | M10   | -  |       |
|---|--------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|----|-------|
| Internal threaded anchor FIS E  |              | -                                       | -   | -   | -   | -   | M6  | M8  | M10 | M12 | -     | -     | M6 | M8    |
|   |              |   |     |     |     |     |     |     |     |     |       | 11x85 |    | 11x85 |
| Perforated sleeve FIS H K   |              | -                                       | -   | -   | -   | -   | -   |     | -   |     | 16x85 |       |    |       |
| Shear load $V_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C and 72/120°C) |              |   |     |     |     |     |     |     |     |     |       |       |    |       |
| compressive strength $f_b$  | use category | Effective anchorage depth $h_{ef}$ [mm] |     |     |     |     |     |     |     |     |       |       |    |       |
|   |              | ≥ 50                                    |     |     |     |     |     | 85  |     |     |       |       |    |       |
| 10N/mm <sup>2</sup>   | w/w          | w/d                                     | 2,5 | 4,5 |     |     | 2,5 | 4,5 |     |     | 4,5   | 2,5   |    | 4,5   |
|   | d/d          |   |     |     |     |     |     |     |     |     |       |       |    |       |
| 20N/mm <sup>2</sup>   | w/w          | w/d                                     | 4,0 | 6,5 |     |     | 4,0 | 6,5 |     |     | 6,5   | 4,0   |    | 6,5   |
|   | d/d          |   |     |     |     |     |     |     |     |     |       |       |    |       |
| 28N/mm <sup>2</sup>   | w/w          | w/d                                     | 5,0 | 9,0 |     |     | 5,0 | 9,0 |     |     | 9,0   | 5,0   |    | 9,0   |
|   | d/d          |   |     |     |     |     |     |     |     |     |       |       |    |       |

Factor for job site tests and displacements see annex C110

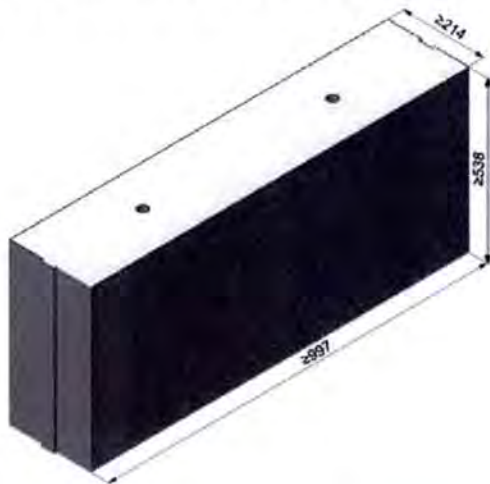
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**Performances**

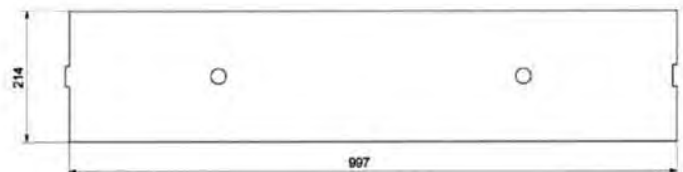
Solid sand-lime brick KS, 8DF, Characteristic resistance under tensile and shear load

**Annex C 17**

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



| Solid sand-lime brick KS, EN 771-2              |               |         |          |
|---|---------------|---------|----------|
| Producer  | e.g. Calduran |         |          |
| Nominal dimensions [mm]                         | length L      | width W | height H |
|   | ≥ 997         | ≥ 214   | ≥ 538    |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | 1,8           |         | 2,2      |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 10 / 20       |         | 36       |
| Standard or annex                               | EN 771-2      |         |          |



**Table C18.1:** Installation parameters

| Anchor rod   | M6  | M8  | M10 | M12 | M16 | -   | -     |       |     |             |    |  |
|--|---|-----|-----|-----|-----|-----|-------|-------|-----|-------------|----|--|
| Internal threaded anchor FIS E   | -   | -   | -   | -   | -   | M6  | M8    | M10   | M12 |             |    |  |
|  |   |     |     |     |     |     | 11x85 | 15x85 |     |             |    |  |
| <b>Anchor rod and internal threaded anchor FIS E without perforated sleeve</b> |   |     |     |     |     |     |       |       |     |             |    |  |
| Effective anchorage depth $h_{ef}$ [mm]  | 50  | 100 | 50  | 100 | 50  | 100 | 50    | 100   | 50  | 100         | 85 |  |
| Max. installation torque $T_{inst,max}$ [Nm]                                   | 4   |     | 10  |     |     |     |       |       | 4   |             | 10 |  |
| <b>General installation parameters</b>   |   |     |     |     |     |     |       |       |     |             |    |  |
| Edge distance $c_{min}$  |   |     |     |     |     |     |       |       |     | 75          |    |  |
| Spacing  | $s_{cr \parallel} = s_{min \parallel}$ [mm] |     |     |     |     |     |       |       |     | 3x $h_{ef}$ |    |  |
|  | $s_{cr \perp} = s_{min \perp}$              |     |     |     |     |     |       |       |     | 3x $h_{ef}$ |    |  |
| <b>Drilling method</b>   |   |     |     |     |     |     |       |       |     |             |    |  |
| Hammer drilling with hard metal hammer drill                                   |   |     |     |     |     |     |       |       |     |             |    |  |

**Table C18.2:** Group factors

| Anchor rod                     | M6                       | M8  | M10 | M12 | M16 | -  | -     |       |     |
|--------------------------------|--------------------------|-----|-----|-----|-----|----|-------|-------|-----|
| Internal threaded anchor FIS E | -                        | -   | -   | -   | -   | M6 | M8    | M10   | M12 |
|                                |                          |     |     |     |     |    | 11x85 | 15x85 |     |
| Group factors                  | $\alpha_{a,N \parallel}$ | [-] |     |     |     |    |       |       |     |
|                                | $\alpha_{a,V \parallel}$ |     | 2   |     |     |    |       |       |     |
|                                | $\alpha_{a,N \perp}$     |     |     |     |     |    |       |       |     |
|                                | $\alpha_{a,V \perp}$     |     |     |     |     |    |       |       |     |

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**Performances**

Solid sand-lime brick KS, dimensions, installation parameters

**Annex C 18**

**Solid sand-lime brick KS, EN 771-2**

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

| Anchor rod   |              | M6                                      | M8   | M10  | M12  | M16  | -    |       | -    |       |      |
|--|--------------|---|------|------|------|------|------|-------|------|-------|------|
| Internal threaded anchor FIS E   |              | -                                       | -    | -    | -    | -    | M6   | M8    | M10  | M12   |      |
|  |              |   |      |      |      |      |      | 11x85 |      | 15x85 |      |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |              |   |      |      |      |      |      |       |      |       |      |
| compressive strength $f_b$   | use category | Effective anchorage depth $h_{ef}$ [mm] |      |      |      |      |      |       |      |       |      |
|  |              | 50                                      | 100  | 50   | 100  | 50   | 100  | 50    | 100  | 50    | 100  |
| 10N/mm <sup>2</sup>  | w/w          | 4,0                                     | 4,0  | 7,0  | 5,0  | 6,0  | 5,0  | 6,0   | 5,5  | 7,5   | 5,5  |
|  | d/d          | 7,0                                     | 7,0  | 12,0 | 8,0  | 9,5  | 8,0  | 10,0  | 9,0  | 11,5  | 9,0  |
| 20N/mm <sup>2</sup>  | w/w          | 5,5                                     | 6,0  | 10,0 | 7,0  | 8,5  | 7,0  | 9,0   | 8,0  | 11,0  | 8,0  |
|  | d/d          | 8,5                                     | 10,5 | 12,0 | 11,5 | 12,0 | 11,0 | 12,0  | 12,0 | 12,0  | 12,0 |
| 36N/mm <sup>2</sup>  | w/w          | 4,5                                     | 8,0  | 12,0 | 11,5 | 12,0 | 12,0 | 12,0  | 12,0 | 12,0  | 12,0 |
|  | d/d          | 8,0                                     | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0  | 12,0 | 12,0  | 12,0 |

Factor for temperature range 72/120°C: 0,83

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

| Anchor rod  |              | M6                                      | M8  | M10  | M12  | M16  | -   |       | -    |       |  |
|---|--------------|---|-----|------|------|------|-----|-------|------|-------|--|
| Internal threaded anchor FIS E  |              | -                                       | -   | -    | -    | -    | M6  | M8    | M10  | M12   |  |
|   |              |   |     |      |      |      |     | 11x85 |      | 15x85 |  |
| Shear load $V_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C and 72/120°C) |              |   |     |      |      |      |     |       |      |       |  |
| compressive strength $f_b$  | use category | Effective anchorage depth $h_{ef}$ [mm] |     |      |      |      |     |       |      |       |  |
|   |              | ≥ 50                                    |     |      |      |      |     |       |      | 85    |  |
| 10N/mm <sup>2</sup>   | w/w          | 3,0                                     | 5,0 | 5,5  | 4,0  | 4,0  | 3,0 | 5,0   | 5,5  | 4,0   |  |
|   | d/d          |   |     |      |      |      |     |       |      |       |  |
| 20N/mm <sup>2</sup>   | w/w          | 4,5                                     | 7,0 | 7,5  | 6,0  | 6,0  | 4,5 | 7,0   | 7,5  | 6,0   |  |
|   | d/d          |   |     |      |      |      |     |       |      |       |  |
| 36N/mm <sup>2</sup>   | w/w          | 4,5                                     | 9,0 | 11,0 | 12,0 | 12,0 | 4,5 | 9,0   | 11,0 | 12,0  |  |
|   | d/d          |   |     |      |      |      |     |       |      |       |  |

Factor for job site tests and displacements see annex C110

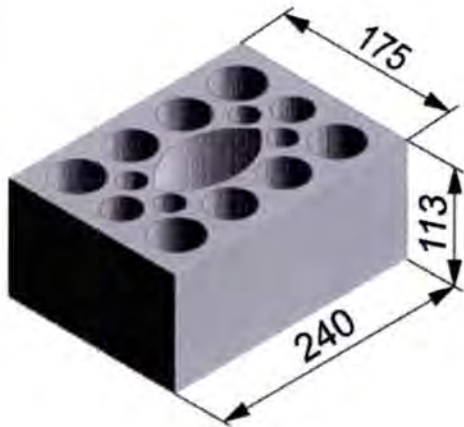
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**Performances**

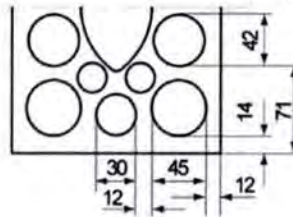
Solid sand-lime brick KS, Characteristic resistance under tensile and shear load

**Annex C 19**

**Perforated sand-lime brick KSL, 3DF, EN 771-2**



| Perforated sand-lime brick KSL, 3DF, EN 771-2   |                       |         |          |
|---|-----------------------|---------|----------|
| Producer  | e.g. KS Wemding       |         |          |
| Nominal dimensions [mm]                         | length L              | width W | height H |
|   | 240                   | 175     | 113      |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 1,4                 |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 8 / 10 / 12 / 16 / 20 |         |          |
| Standard or annex                               | EN 771-2              |         |          |



**Tabelle C20.1:** Installation parameters  
(Pre-positioned anchorage with perforated sleeve FIS HK)

|  |                         |     |       |    |       |    |     |        |     |       |     |     |        |     |
|--|-------------------------|-----|-------|----|-------|----|-----|--------|-----|-------|-----|-----|--------|-----|
| <b>Anchor rod</b>  | M6                      | M8  | M6    | M8 | -     | M8 | M10 | M8     | M10 | -     | M12 | M16 | M12    | M16 |
| <b>Internal threaded anchor FIS E</b>  | -                       | -   | M6    | M8 | -     | -  | -   | M10    | M12 | -     | -   | -   | -      | -   |
|  |                         |     | 11x85 |    |       |    |     | 15x85  |     |       |     |     |        |     |
| <b>Perforated sleeve FIS H K</b>   | 12x50                   |     | 12x85 |    | 16x85 |    |     | 16x130 |     | 20x85 |     |     | 20x130 |     |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS HK</b> |                         |     |       |    |       |    |     |        |     |       |     |     |        |     |
| Max. installation torque $T_{inst,max}$ [Nm]                                       | 2                       |     |       |    |       |    |     |        |     |       |     |     |        |     |
| <b>General installation parameters</b>   |                         |     |       |    |       |    |     |        |     |       |     |     |        |     |
| Edge distance $c_{min}$  | 60                      |     |       |    | 80    |    |     |        |     |       |     |     |        |     |
| Spacing  | $s_{min} \parallel$     | 100 |       |    |       |    |     |        |     |       |     |     |        |     |
|  | $s_{cr} \parallel$ [mm] | 240 |       |    |       |    |     |        |     |       |     |     |        |     |
|  | $s_{min} \perp$         | 115 |       |    |       |    |     |        |     |       |     |     |        |     |
|  | $s_{cr} \perp$          | 115 |       |    |       |    |     |        |     |       |     |     |        |     |
| <b>Drilling method</b>   |                         |     |       |    |       |    |     |        |     |       |     |     |        |     |
| Hammer drilling with hard metal hammer drill                                       |                         |     |       |    |       |    |     |        |     |       |     |     |        |     |

**Table C20.2:** Group factors

|                                       |   |     |       |    |       |    |     |        |     |       |     |     |        |     |
|---------------------------------------|---|-----|-------|----|-------|----|-----|--------|-----|-------|-----|-----|--------|-----|
| <b>Anchor rod</b>                     | M6  | M8  | M6    | M8 | -     | M8 | M10 | M8     | M10 | -     | M12 | M16 | M12    | M16 |
| <b>Internal threaded anchor FIS E</b> | -   | -   | M6    | M8 | -     | -  | -   | M10    | M12 | -     | -   | -   | -      | -   |
|                                       |   |     | 11x85 |    |       |    |     | 15x85  |     |       |     |     |        |     |
| <b>Perforated sleeve FIS H K</b>      | 12x50   |     | 12x85 |    | 16x85 |    |     | 16x130 |     | 20x85 |     |     | 20x130 |     |
| Group factors                         | $\alpha_{a,N} \parallel = \alpha_{a,V} \parallel$ | 1,5 |       |    |       |    |     |        |     |       |     |     |        |     |
|                                       | $\alpha_{a,N} \perp = \alpha_{a,V} \perp$         | 2,0 |       |    |       |    |     |        |     |       |     |     |        |     |

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**Performances**  
Perforated sand-lime brick KSL, 3DF, dimensions, installation parameters

**Annex C 20**

**Perforated sand-lime brick KSL, 3DF, EN 771-2**

**Table C21.1:** Installation parameters  
(Push through anchorage with perforated sleeve FIS HK)

| Anchor rod                                       |                     | M10        | M12 | M16        |
|--|---------------------|------------|-----|------------|
| Perforated sleeve FIS H K                        |                     | 18x130/200 |     | 22x130/200 |
| <b>Anchor rod with perforated sleeve FIS H K</b> |                     |            |     |            |
| Max. installation torque                         | $T_{inst,max}$ [Nm] | 2          |     |            |
| <b>General installation parameters</b>           |                     |            |     |            |
| Edge distance                                    | $c_{min}$           | 80         |     |            |
| Spacing  | $s_{min II}$        | 100        |     |            |
|  | $s_{cr II}$ [mm]    | 240        |     |            |
|  | $s_{min \perp}$     | 115        |     |            |
|  | $s_{cr \perp}$      | 115        |     |            |
| <b>Drilling method</b>                           |                     |            |     |            |
| Hammer drilling with hard metal hammer drill     |                     |            |     |            |

**Table C21.2:** Group factors

| Anchor rod                |                      | M10        | M12 | M16        |
|---------------------------|----------------------|------------|-----|------------|
| Perforated sleeve FIS H K |                      | 18x130/200 |     | 22x130/200 |
| Group factors             | $\alpha_{q,N II}$    | 1,5        |     |            |
|                           | $\alpha_{q,V II}$    |            |     |            |
|                           | $\alpha_{q,N \perp}$ | 2,0        |     |            |
|                           | $\alpha_{q,V \perp}$ |            |     |            |

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**Performances**  
Perforated sand-lime brick KSL, 3DF, dimensions, installation parameters

**Annex C 21**

**Perforated sand-lime brick KSL, 3DF, EN 771-2**

**Table C22.1:** Characteristic resistance under tensile load (Pre-positioned anchorage)

| Anchor rod   |     | M6           | M8  | M6    | M8  | -     | M8  | M10 | M8     | M10   | -     | M12 | M16 | M12    | M16 |
|--|-----|--------------|-----|-------|-----|-------|-----|-----|--------|-------|-------|-----|-----|--------|-----|
| Internal threaded anchor FIS E   |     | -            |     | -     |     | M6    | M8  | -   |        | -     |       | M10 | M12 | -      |     |
|  |     |              |     | 11x85 |     |       |     |     |        | 15x85 |       |     |     |        |     |
| Perforated sleeve FIS H K  |     | 12x50        |     | 12x85 |     | 16x85 |     |     | 16x130 |       | 20x85 |     |     | 20x130 |     |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |     |              |     |       |     |       |     |     |        |       |       |     |     |        |     |
| compressive strength $f_b$   |     | use category |     |       |     |       |     |     |        |       |       |     |     |        |     |
| 8 N/mm <sup>2</sup>  | w/w | w/d          | 1,5 |       | 2,0 |       | 2,0 |     | 2,0    |       | 2,0   |     | 2,0 |        |     |
|  | d/d |              | 1,5 |       | 2,0 |       | 2,5 |     | 2,5    |       | 2,5   |     | 2,5 |        |     |
| 10 N/mm <sup>2</sup>   | w/w | w/d          | 2,0 |       | 2,0 |       | 2,5 |     | 2,5    |       | 2,5   |     | 2,5 |        |     |
|  | d/d |              | 2,0 |       | 2,5 |       | 3,0 |     | 3,0    |       | 3,0   |     | 3,0 |        |     |
| 12 N/mm <sup>2</sup>   | w/w | w/d          | 2,5 |       | 2,5 |       | 3,0 |     | 3,0    |       | 3,0   |     | 3,0 |        |     |
|  | d/d |              | 2,5 |       | 3,0 |       | 3,5 |     | 3,5    |       | 3,5   |     | 3,5 |        |     |
| 16 N/mm <sup>2</sup>   | w/w | w/d          | 3,0 |       | 3,5 |       | 4,5 |     | 4,5    |       | 4,5   |     | 4,5 |        |     |
|  | d/d |              | 3,5 |       | 4,0 |       | 4,5 |     | 4,5    |       | 4,5   |     | 4,5 |        |     |
| 20 N/mm <sup>2</sup>   | w/w | w/d          | 4,0 |       | 4,5 |       | 5,5 |     | 5,5    |       | 5,5   |     | 5,5 |        |     |
|  | d/d |              | 4,5 |       | 5,0 |       | 6,0 |     | 6,0    |       | 6,0   |     | 6,0 |        |     |

**Table C22.2:** Characteristic resistance under tensile load (Push through anchorage)

| Anchor rod   |     | M10          |     | M12 |  | M16        |  |
|--|-----|--------------|-----|-----|--|------------|--|
| Perforated sleeve FIS H K  |     | 18x130/200   |     |     |  | 22x130/200 |  |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |     |              |     |     |  |            |  |
| compressive strength $f_b$   |     | use category |     |     |  |            |  |
| 8 N/mm <sup>2</sup>  | w/w | w/d          | 2,0 |     |  |            |  |
|  | d/d |              | 2,5 |     |  |            |  |
| 10 N/mm <sup>2</sup>   | w/w | w/d          | 2,5 |     |  |            |  |
|  | d/d |              | 3,0 |     |  |            |  |
| 12 N/mm <sup>2</sup>   | w/w | w/d          | 3,0 |     |  |            |  |
|  | d/d |              | 3,5 |     |  |            |  |
| 16 N/mm <sup>2</sup>   | w/w | w/d          | 4,5 |     |  |            |  |
|  | d/d |              | 4,5 |     |  |            |  |
| 20 N/mm <sup>2</sup>   | w/w | w/d          | 5,5 |     |  |            |  |
|  | d/d |              | 6,0 |     |  |            |  |

Factor for job site tests and displacements see annex C110

Factor for temperature range 72/120°C: 0,83

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**Performances**

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

**Annex C 22**

**Perforated sand-lime brick KSL, 3DF, EN 771-2**

**Table C23.1:** Characteristic resistance under shear load (Pre-positioned anchorage)

| Anchor rod   | M6           | M8  | M6    | M8  | -     | M8  | M10 | M8     | M10 | -     | M12 | M16 | M12    | M16 |     |     |     |
|--|--------------|-----|-------|-----|-------|-----|-----|--------|-----|-------|-----|-----|--------|-----|-----|-----|-----|
| Internal threaded anchor FIS E   | -            | -   | M6    | M8  | -     | -   | -   | -      | -   | M10   | M12 | -   | -      | -   |     |     |     |
|  |              |     | 11x85 |     |       |     |     |        |     | 15x85 |     |     |        |     |     |     |     |
| Perforated sleeve FIS H K  | 12x50        |     | 12x85 |     | 16x85 |     |     | 16x130 |     | 20x85 |     |     | 20x130 |     |     |     |     |
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |     |       |     |       |     |     |        |     |       |     |     |        |     |     |     |     |
| compressive strength $f_b$   | use category |     |       |     |       |     |     |        |     |       |     |     |        |     |     |     |     |
| 8 N/mm <sup>2</sup>  | w/w          | w/d | 1,5   |     |       |     |     |        | 3,0 |       |     |     |        |     | 2,5 | 3,0 | 2,5 |
|  | d/d          |     |       |     |       |     |     |        |     |       |     |     |        |     |     |     |     |
| 10 N/mm <sup>2</sup>   | w/w          | w/d | 2,0   |     |       |     |     |        | 3,5 |       |     |     |        |     |     |     |     |
|  | d/d          |     |       |     |       |     |     |        |     |       |     |     |        |     |     |     |     |
| 12 N/mm <sup>2</sup>   | w/w          | w/d | 2,5   |     |       |     |     |        | 4,5 |       |     |     |        |     | 4,0 | 4,5 | 4,0 |
|  | d/d          |     |       |     |       |     |     |        |     |       |     |     |        |     |     |     |     |
| 16 N/mm <sup>2</sup>   | w/w          | w/d | 3,0   | 3,5 | 3,0   | 3,5 | 3,0 | 6,0    |     |       |     |     |        | 5,5 | 6,0 | 5,5 |     |
|  | d/d          |     |       |     |       |     |     |        |     |       |     |     |        |     |     |     |     |
| 20 N/mm <sup>2</sup>   | w/w          | w/d | 4,0   | 4,5 | 4,0   | 4,5 | 4,0 | 7,5    |     |       |     |     |        | 6,5 | 7,5 | 6,5 |     |
|  | d/d          |     |       |     |       |     |     |        |     |       |     |     |        |     |     |     |     |

**Table C23.2:** Characteristic resistance under shear load (Push through anchorage)

| Anchor rod   | M10          |     |     |  | M12 |  |  |  | M16        |  |     |  |
|--|--------------|-----|-----|--|-----|--|--|--|------------|--|-----|--|
| Perforated sleeve FIS H K  | 18x130/200   |     |     |  |     |  |  |  | 22x130/200 |  |     |  |
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |     |     |  |     |  |  |  |            |  |     |  |
| compressive strength $f_b$   | use category |     |     |  |     |  |  |  |            |  |     |  |
| 8 N/mm <sup>2</sup>  | w/w          | w/d | 3,0 |  |     |  |  |  |            |  | 2,5 |  |
|  | d/d          |     |     |  |     |  |  |  |            |  |     |  |
| 10 N/mm <sup>2</sup>   | w/w          | w/d | 3,5 |  |     |  |  |  |            |  | 3,5 |  |
|  | d/d          |     |     |  |     |  |  |  |            |  |     |  |
| 12 N/mm <sup>2</sup>   | w/w          | w/d | 4,5 |  |     |  |  |  |            |  | 4,0 |  |
|  | d/d          |     |     |  |     |  |  |  |            |  |     |  |
| 16 N/mm <sup>2</sup>   | w/w          | w/d | 6,0 |  |     |  |  |  |            |  | 5,5 |  |
|  | d/d          |     |     |  |     |  |  |  |            |  |     |  |
| 20 N/mm <sup>2</sup>   | w/w          | w/d | 7,5 |  |     |  |  |  |            |  | 6,5 |  |
|  | d/d          |     |     |  |     |  |  |  |            |  |     |  |

Factor for job site tests and displacements see annex C110

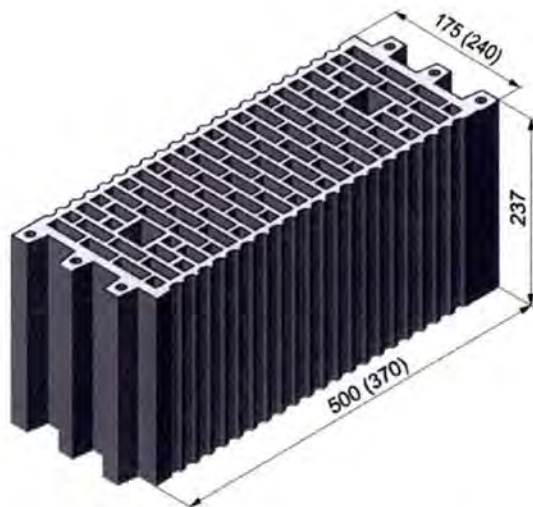
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**Performances**

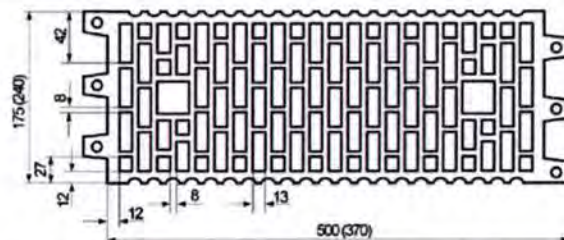
Perforated sand-lime brick KSL, 3DF, Characteristic resistance under shear load

**Annex C 23**

**Vertical perforated brick HLz, form B, EN 771-1**



| Vertical perforated brick HLz, form B, EN 771-1 |                            |         |          |
|---|----------------------------|---------|----------|
| 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> ]            | ≥ 1,0                      |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 4 / 6 / 8 / 10 / 12        |         |          |
| Standard or annex                               | EN 771-1                   |         |          |



**Table C24.1:** Installation parameters

|   |                     |           |       |    |        |    |       |       |        |   |     |     |     |     |
|---|---------------------|-----------|-------|----|--------|----|-------|-------|--------|---|-----|-----|-----|-----|
| <b>Anchor rod</b>   | M6                  | M8        | M6    | M8 | -      | M8 | M10   | M8    | M10    | - | M12 | M16 | M12 | M16 |
| <b>Internal threaded anchor FIS E</b>   | -                   | -         | M6    | M8 | -      | -  | -     | M10   | M12    | - | -   | -   | -   | -   |
|   |                     |           | 11x85 |    |        |    |       | 15x85 |        |   |     |     |     |     |
| <b>Perforated sleeve FIS H K</b>  | 12x50               | 12x85     | 16x85 |    | 16x130 |    | 20x85 |       | 20x130 |   |     |     |     |     |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K</b> |                     |           |       |    |        |    |       |       |        |   |     |     |     |     |
| Max. installation torque  | $T_{inst,max}$ [Nm] | 2         |       |    |        |    |       |       |        |   |     |     |     |     |
| <b>General installation parameters</b>  |                     |           |       |    |        |    |       |       |        |   |     |     |     |     |
| Edge distance   | $c_{min}$           | 100       |       |    |        |    |       |       |        |   |     |     |     |     |
| Spacing   | $s_{min}   $        | 100       |       |    |        |    |       |       |        |   |     |     |     |     |
|   | $s_{cr}   $ [mm]    | 500 (370) |       |    |        |    |       |       |        |   |     |     |     |     |
|   | $s_{min} \perp$     | 100       |       |    |        |    |       |       |        |   |     |     |     |     |
|   | $s_{cr} \perp$      | 240       |       |    |        |    |       |       |        |   |     |     |     |     |
| <b>Drilling method</b>  |                     |           |       |    |        |    |       |       |        |   |     |     |     |     |
| Hammer drilling with hard metal hammer drill  |                     |           |       |    |        |    |       |       |        |   |     |     |     |     |

**Table C24.2:** Group factors

|                                       |   |       |       |    |        |    |       |       |        |   |     |     |     |     |
|---------------------------------------|---|-------|-------|----|--------|----|-------|-------|--------|---|-----|-----|-----|-----|
| <b>Anchor rod</b>                     | M6  | M8    | M6    | M8 | -      | M8 | M10   | M8    | M10    | - | M12 | M16 | M12 | M16 |
| <b>Internal threaded anchor FIS E</b> | -   | -     | M6    | M8 | -      | -  | -     | M10   | M12    | - | -   | -   | -   | -   |
|                                       |   |       | 11x85 |    |        |    |       | 15x85 |        |   |     |     |     |     |
| <b>Perforated sleeve FIS H K</b>      | 12x50   | 12x85 | 16x85 |    | 16x130 |    | 20x85 |       | 20x130 |   |     |     |     |     |
| Group factors                         | $\frac{\alpha_{q,N}    = \alpha_{q,V}   }{\alpha_{q,N} \perp = \alpha_{q,V} \perp}$ [-] | 1     |       |    |        |    |       |       |        |   |     |     |     |     |

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**Performances**

Vertical perforated brick HLz, form B, dimensions, installation parameters

**Annex C 24**



**Vertical perforated brick HLz, form B, EN 771-1**

**Table C25.1:** Characteristic resistance under tensile load

| Anchor rod   |     | M6           | M8   | M6    | M8 | -     | M8 | M10 | M8     | M10   | -     | M12 | M16 | M12    | M16 |
|--|-----|--------------|------|-------|----|-------|----|-----|--------|-------|-------|-----|-----|--------|-----|
| Internal threaded anchor FIS E   |     | -            |      | -     |    | M6    | M8 | -   |        | -     |       | M10 | M12 | -      |     |
|  |     |              |      | 11x85 |    |       |    |     |        | 15x85 |       |     |     |        |     |
| Perforated sleeve FIS H K  |     | 12x50        |      | 12x85 |    | 16x85 |    |     | 16x130 |       | 20x85 |     |     | 20x130 |     |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |     |              |      |       |    |       |    |     |        |       |       |     |     |        |     |
| compressive strength $f_b$   |     | use category |      |       |    |       |    |     |        |       |       |     |     |        |     |
| 4 N/mm <sup>2</sup>  | w/w | w/d          | 0,3  |       |    | 0,9   |    |     |        |       |       | 1,2 |     |        |     |
|  | d/d |              | 0,4  |       |    | 0,9   |    |     |        |       |       | 1,2 |     |        |     |
| 6 N/mm <sup>2</sup>  | w/w | w/d          | 0,5  |       |    | 1,5   |    |     |        |       |       | 2,0 |     |        |     |
|  | d/d |              | 0,6  |       |    | 1,5   |    |     |        |       |       | 2,0 |     |        |     |
| 8 N/mm <sup>2</sup>  | w/w | w/d          | 0,75 |       |    | 2,0   |    |     |        |       |       | 2,5 |     |        |     |
|  | d/d |              | 0,75 |       |    | 2,0   |    |     |        |       |       | 2,5 |     |        |     |
| 10 N/mm <sup>2</sup>   | w/w | w/d          | 0,9  |       |    | 2,5   |    |     |        |       |       | 3,0 |     |        |     |
|  | d/d |              | 0,9  |       |    | 2,5   |    |     |        |       |       | 3,5 |     |        |     |
| 12 N/mm <sup>2</sup>   | w/w | w/d          | 0,9  |       |    | 3,0   |    |     |        |       |       | 3,5 |     |        |     |
|  | d/d |              | 1,2  |       |    | 3,0   |    |     |        |       |       | 4,0 |     |        |     |

Factor for temperature range 72/120°C: 0,83

**Table C25.2:** Characteristic resistance under shear load

| Anchor rod  |     | M6           | M8   | M6    | M8 | -     | M8 | M10  | M8     | M10   | -     | M12 | M16 | M12    | M16 |
|---|-----|--------------|------|-------|----|-------|----|------|--------|-------|-------|-----|-----|--------|-----|
| Internal threaded anchor FIS E  |     | -            |      | -     |    | M6    | M8 | -    |        | -     |       | M10 | M12 | -      |     |
|   |     |              |      | 11x85 |    |       |    |      |        | 15x85 |       |     |     |        |     |
| Perforated sleeve FIS H K   |     | 12x50        |      | 12x85 |    | 16x85 |    |      | 16x130 |       | 20x85 |     |     | 20x130 |     |
| Shear load $V_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C and 72/120°C) |     |              |      |       |    |       |    |      |        |       |       |     |     |        |     |
| compressive strength $f_b$  |     | use category |      |       |    |       |    |      |        |       |       |     |     |        |     |
| 4 N/mm <sup>2</sup>   | w/w | w/d          | 0,5  |       |    | 0,6   |    | 0,5  |        |       | 0,6   |     |     |        |     |
|   | d/d |              | 0,5  |       |    | 0,6   |    | 0,5  |        |       | 0,6   |     |     |        |     |
| 6 N/mm <sup>2</sup>   | w/w | w/d          | 0,75 |       |    | 0,9   |    | 0,75 |        |       | 0,9   |     |     |        |     |
|   | d/d |              | 0,75 |       |    | 0,9   |    | 0,75 |        |       | 0,9   |     |     |        |     |
| 8 N/mm <sup>2</sup>   | w/w | w/d          | 0,9  |       |    | 1,2   |    | 0,9  |        |       | 1,2   |     |     |        |     |
|   | d/d |              | 0,9  |       |    | 1,2   |    | 0,9  |        |       | 1,2   |     |     |        |     |
| 10 N/mm <sup>2</sup>  | w/w | w/d          | 1,2  |       |    | 1,5   |    | 1,2  |        |       | 1,5   |     |     |        |     |
|   | d/d |              | 1,2  |       |    | 1,5   |    | 1,2  |        |       | 1,5   |     |     |        |     |
| 12 N/mm <sup>2</sup>  | w/w | w/d          | 1,5  |       |    | 2,0   |    | 1,5  |        |       | 2,0   |     |     |        |     |
|   | d/d |              | 1,5  |       |    | 2,0   |    | 1,5  |        |       | 2,0   |     |     |        |     |

Factor for job site tests and displacements see annex C110

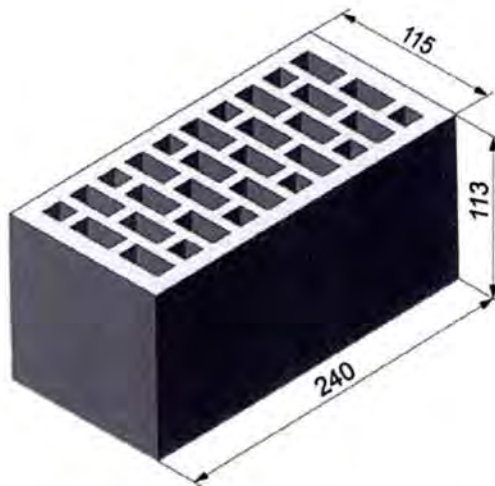
fischer injektion system FIS V masonry

**Performances**

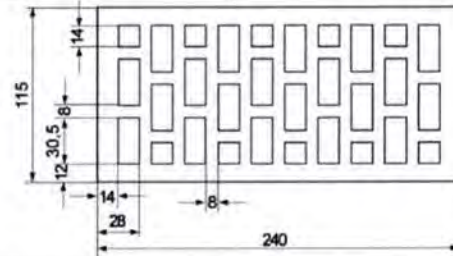
Vertical perforated brick HLz, form B,  
Characteristic resistance under tensile and shear load

**Annex C 25**

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



| Vertical perforated brick HLz, 2DF, EN 771-1    |                       |         |          |
|---|-----------------------|---------|----------|
| Producer  | e.g. Wienerberger     |         |          |
| Nominal dimensions [mm]                         | length L              | width W | height H |
|   | 240                   | 115     | 113      |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 1,4                 |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 6 / 10 / 16 / 20 / 28 |         |          |
| Standard or annex                               | EN 771-1              |         |          |



**Table C26.1:** Installation parameters

|   |   |    |       |    |       |    |     |       |       |     |
|---|---|----|-------|----|-------|----|-----|-------|-------|-----|
| <b>Anchor rod</b>   | M6  | M8 | M6    | M8 | -     | M8 | M10 | -     | M12   | M16 |
| <b>Internal threaded anchor FIS E</b>   | -   |    | -     |    | M6    | M8 | -   |       | M10   | M12 |
|   |   |    |       |    | 11x85 |    |     |       | 15x85 |     |
| <b>Perforated sleeve FIS H K</b>  | 12x50                                       |    | 12x85 |    | 16x85 |    |     | 20x85 |       |     |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K</b> |   |    |       |    |       |    |     |       |       |     |
| Max. installation torque $T_{inst,max}$ [Nm]  | 2   |    |       |    |       |    |     |       |       |     |
| <b>General installation parameters</b>  |   |    |       |    |       |    |     |       |       |     |
| Edge distance $C_{min}$   | 80  |    |       |    |       |    |     |       |       |     |
| Spacing   | $s_{cr \parallel} = s_{min \parallel}$ [mm] |    | 240   |    |       |    |     |       |       |     |
|   | $s_{cr \perp} = s_{min \perp}$              |    | 115   |    |       |    |     |       |       |     |
| <b>Drilling method</b>  |   |    |       |    |       |    |     |       |       |     |
| Hammer drilling with hard metal hammer drill  |   |    |       |    |       |    |     |       |       |     |

**Table C26.2:** Group factors

|                                       |                          |     |       |    |       |    |     |       |       |     |
|---------------------------------------|--------------------------|-----|-------|----|-------|----|-----|-------|-------|-----|
| <b>Anchor rod</b>                     | M6                       | M8  | M6    | M8 | -     | M8 | M10 | -     | M12   | M16 |
| <b>Internal threaded anchor FIS E</b> | -                        |     | -     |    | M6    | M8 | -   |       | M10   | M12 |
|                                       |                          |     |       |    | 11x85 |    |     |       | 15x85 |     |
| <b>Perforated sleeve FIS H K</b>      | 12x50                    |     | 12x85 |    | 16x85 |    |     | 20x85 |       |     |
| Group factors                         | $\alpha_{q,N \parallel}$ | [-] | 2     |    |       |    |     |       |       |     |
|                                       | $\alpha_{q,V \parallel}$ |     |       |    |       |    |     |       |       |     |
|                                       | $\alpha_{q,N \perp}$     |     |       |    |       |    |     |       |       |     |
|                                       | $\alpha_{q,V \perp}$     |     |       |    |       |    |     |       |       |     |

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**Performances**

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

**Annex C 26**

**Vertical perforated brick HLz, 2DF, EN 771-1**

**Table C27.1:** Characteristic resistance under tensile load

| Anchor rod   |              | M6    | M8   | M6    | M8 | -     | M8   | M10 | -     | M12   | M16 |   |
|--|--------------|-------|------|-------|----|-------|------|-----|-------|-------|-----|---|
| Internal threaded anchor FIS E   |              | -     |      | -     |    | M6    | M8   | -   |       | M10   | M12 | - |
|  |              |       |      |       |    | 11x85 |      |     |       | 15x85 |     |   |
| Perforated sleeve FIS H K  |              | 12x50 |      | 12x85 |    | 16x85 |      |     | 20x85 |       |     |   |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |              |       |      |       |    |       |      |     |       |       |     |   |
| compressive strength $f_b$   | use category |       |      |       |    |       |      |     |       |       |     |   |
| 6 N/mm <sup>2</sup>  | w/w          | w/d   | 0,75 | 0,9   |    |       | 0,75 |     |       |       | 0,9 |   |
|  | d/d          |       | 0,75 | 1,2   |    |       | 0,75 |     |       |       | 0,9 |   |
| 10 N/mm <sup>2</sup>   | w/w          | w/d   | 1,2  | 1,5   |    |       | 1,2  |     |       |       | 1,5 |   |
|  | d/d          |       | 1,2  | 2,0   |    |       | 1,2  |     |       |       | 1,5 |   |
| 16 N/mm <sup>2</sup>   | w/w          | w/d   | 2,0  | 2,5   |    |       | 2,0  |     |       |       | 2,0 |   |
|  | d/d          |       | 2,0  | 3,0   |    |       | 2,0  |     |       |       | 2,5 |   |
| 20 N/mm <sup>2</sup>   | w/w          | w/d   | 2,5  | 3,5   |    |       | 2,5  |     |       |       | 3,0 |   |
|  | d/d          |       | 2,5  | 4,0   |    |       | 2,5  |     |       |       | 3,0 |   |
| 28 N/mm <sup>2</sup>   | w/w          | w/d   | 3,0  | 5,0   |    |       | 3,5  |     |       |       | 4,0 |   |
|  | d/d          |       | 3,5  | 5,5   |    |       | 3,5  |     |       |       | 4,5 |   |

Factor for temperature range 72/120°C: 0,83

**Table C27.2:** Characteristic resistance under shear load

| Anchor rod  |              | M6    | M8  | M6    | M8  | -     | M8  | M10 | -     | M12   | M16 |   |
|---|--------------|-------|-----|-------|-----|-------|-----|-----|-------|-------|-----|---|
| Internal threaded anchor FIS E  |              | -     |     | -     |     | M6    | M8  | -   |       | M10   | M12 | - |
|   |              |       |     |       |     | 11x85 |     |     |       | 15x85 |     |   |
| Perforated sleeve FIS H K   |              | 12x50 |     | 12x85 |     | 16x85 |     |     | 20x85 |       |     |   |
| Shear load $V_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C and 72/120°C) |              |       |     |       |     |       |     |     |       |       |     |   |
| compressive strength $f_b$  | use category |       |     |       |     |       |     |     |       |       |     |   |
| 6 N/mm <sup>2</sup>   | w/w          | w/d   | 1,2 | 1,5   | 1,2 | 2,0   | 1,2 | 1,5 |       | 2,5   |     |   |
|   | d/d          |       | 1,2 | 1,5   | 1,2 | 2,0   | 1,2 | 1,5 |       | 2,5   |     |   |
| 10 N/mm <sup>2</sup>  | w/w          | w/d   | 2,0 | 2,5   | 2,0 | 4,0   | 2,0 | 2,5 |       | 4,5   |     |   |
|   | d/d          |       | 2,0 | 2,5   | 2,0 | 4,0   | 2,0 | 2,5 |       | 4,5   |     |   |
| 16 N/mm <sup>2</sup>  | w/w          | w/d   | 3,0 | 3,5   | 3,0 | 6,0   | 3,0 | 3,5 |       | 7,0   |     |   |
|   | d/d          |       | 3,0 | 3,5   | 3,0 | 6,0   | 3,0 | 3,5 |       | 7,0   |     |   |
| 20 N/mm <sup>2</sup>  | w/w          | w/d   | 4,0 | 4,5   | 4,0 | 7,5   | 4,0 | 4,5 |       | 8,5   |     |   |
|   | d/d          |       | 4,0 | 4,5   | 4,0 | 7,5   | 4,0 | 4,5 |       | 8,5   |     |   |
| 28 N/mm <sup>2</sup>  | w/w          | w/d   | 5,0 | 6,5   | 5,0 | 9,5   | 5,0 | 6,5 |       | 12,0  |     |   |
|   | d/d          |       | 5,0 | 6,5   | 5,0 | 9,5   | 5,0 | 6,5 |       | 12,0  |     |   |

Factor for job site tests and displacements see annex C110

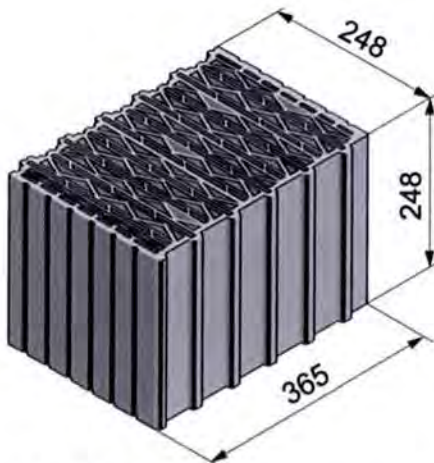
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**Performances**

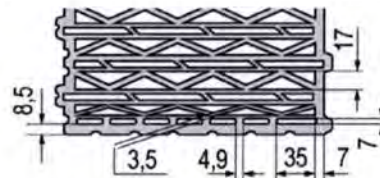
Vertical perforated brick HLz, 2DF,  
Characteristic resistance under tensile and shear load

**Annex C 27**

**Vertical perforated brick HLz, U8, EN 771-1**



| Vertical perforated brick HLz, U8, EN 771-1     |           |         |          |
|---|-----------|---------|----------|
| Producer  | -         |         |          |
| Nominal dimensions [mm]                         | length L  | width W | height H |
|   | 248       | 365     | 248      |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | 0,6       |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 4 / 6 / 8 |         |          |
| Standard or annex                               | EN 771-1  |         |          |



**Table C28.1:** Installation parameters  
(Pre-positioned anchorage with perforated sleeve FIS HK)

| Anchor rod  | M6                      | M8    | M6    | M8    | -              | M8     | M10    | M8     | M10    | -                | M12   | M16    | M12    | M16    | M12    | M16    |  |
|---|-------------------------|-------|-------|-------|----------------|--------|--------|--------|--------|------------------|-------|--------|--------|--------|--------|--------|--|
| Internal threaded anchor FIS E  | -                       | -     | -     | -     | M6 M8<br>11x85 | -      | -      | -      | -      | M10 M12<br>15x85 | -     | -      | -      | -      | -      | -      |  |
| Perforated sleeve FIS H K   | 12x50                   | 12x85 | 12x85 | 12x85 | 16x85          | 16x130 | 16x130 | 16x130 | 16x130 | 20x85            | 20x85 | 20x130 | 20x130 | 20x200 | 20x200 | 20x200 |  |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K</b> |                         |       |       |       |                |        |        |        |        |                  |       |        |        |        |        |        |  |
| Max. installation torque $T_{inst,max}$ [Nm]  | 3                       | 5     | 3     | 5     | 3              | 5      | 3      | 5      | 3      | 5                | 5     | 5      | 5      | 5      | 5      | 5      |  |
| <b>General installation parameters</b>  |                         |       |       |       |                |        |        |        |        |                  |       |        |        |        |        |        |  |
| Edge distance $c_{min}$   |                         |       |       |       |                |        |        |        |        |                  | 60    |        |        |        |        |        |  |
| Spacing   | $s_{min} \parallel$     |       |       |       |                |        |        |        |        |                  |       | 80     |        |        |        |        |  |
|   | $s_{cr} \parallel$ [mm] |       |       |       |                |        |        |        |        |                  |       | 250    |        |        |        |        |  |
|   | $s_{min} \perp$         |       |       |       |                |        |        |        |        |                  |       | 80     |        |        |        |        |  |
|   | $s_{cr} \perp$          |       |       |       |                |        |        |        |        |                  |       | 250    |        |        |        |        |  |
|   | <b>Drilling method</b>  |       |       |       |                |        |        |        |        |                  |       |        |        |        |        |        |  |
| Rotary drilling with carbide drill  |                         |       |       |       |                |        |        |        |        |                  |       |        |        |        |        |        |  |

**Table C28.2:** Group factors

| Anchor rod                     | M6                       | M8    | M6    | M8    | -              | M8     | M10    | M8     | M10    | -                | M12   | M16    | M12    | M16    | M12    | M16    |  |
|--------------------------------|--------------------------|-------|-------|-------|----------------|--------|--------|--------|--------|------------------|-------|--------|--------|--------|--------|--------|--|
| Internal threaded anchor FIS E | -                        | -     | -     | -     | M6 M8<br>11x85 | -      | -      | -      | -      | M10 M12<br>15x85 | -     | -      | -      | -      | -      | -      |  |
| Perforated sleeve FIS H K      | 12x50                    | 12x85 | 12x85 | 12x85 | 16x85          | 16x130 | 16x130 | 16x130 | 16x130 | 20x85            | 20x85 | 20x130 | 20x130 | 20x200 | 20x200 | 20x200 |  |
| Group factors                  | $\alpha_{a,N} \parallel$ |       |       |       |                |        |        |        |        |                  |       | 1,3    |        |        |        |        |  |
|                                | $\alpha_{a,V} \parallel$ |       |       |       |                |        |        |        |        |                  |       | 1,2    |        |        |        |        |  |
|                                | $\alpha_{a,N} \perp$     |       |       |       |                |        |        |        |        |                  |       | 1,3    |        |        |        |        |  |
|                                | $\alpha_{a,V} \perp$     |       |       |       |                |        |        |        |        |                  |       | 1,0    |        |        |        |        |  |

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**Performances**  
Vertical perforated brick HLz, U8, dimensions, installation parameters

**Annex C 28**

**Vertical perforated brick HLz, U8, EN 771-1**

**Table C29.1:** Installation parameters  
(Push through anchorage with perforated sleeve FIS HK)

| Anchor rod                                       |                         | M10        | M12 | M16        |
|--|-------------------------|------------|-----|------------|
| Perforated sleeve FIS H K                        |                         | 18x130/200 |     | 22x130/200 |
| <b>Anchor rod with perforated sleeve FIS H K</b> |                         |            |     |            |
| Max. installation torque                         | $T_{inst,max}$ [Nm]     | 5          |     |            |
| <b>General installation parameters</b>           |                         |            |     |            |
| Edge distance                                    | $c_{min}$               | 60         |     |            |
|  | $s_{min} \parallel$     | 80         |     |            |
| Spacing  | $s_{cr} \parallel$ [mm] | 250        |     |            |
|  | $s_{min} \perp$         | 80         |     |            |
|  | $s_{cr} \perp$          | 250        |     |            |
| <b>Drilling method</b>                           |                         |            |     |            |
| Rotary drilling with carbide drill               |                         |            |     |            |

**Table C29.2:** Group factors

| Anchor rod                |                          | M10        | M12 | M16        |
|---------------------------|--------------------------|------------|-----|------------|
| Perforated sleeve FIS H K |                          | 18x130/200 |     | 22x130/200 |
| Group factors             | $\alpha_{q,N} \parallel$ | 1,3        |     |            |
|                           | $\alpha_{q,V} \parallel$ | 1,2        |     |            |
|                           | $\alpha_{q,N} \perp$     | 1,3        |     |            |
|                           | $\alpha_{q,V} \perp$     | 1,0        |     |            |

fischer injektion system FIS V masonry

**Performances**

Vertical perforated brick HLz, U8, dimensions, installation parameters

**Annex C 29**

**Vertical perforated brick HLz, U8, EN 771-1**

**Table C30.1:** Characteristic resistance under tensile load (Pre-positioned anchorage)

| Anchor rod                     | M6    | M8 | M6    | M8 | -     | M8 | M10 | M8     | M10 | -     | M12 | M16   | M12    | M16 | M12    | M16 |
|--------------------------------|-------|----|-------|----|-------|----|-----|--------|-----|-------|-----|-------|--------|-----|--------|-----|
| Internal threaded anchor FIS E | -     | -  | M6    | M8 | 11x85 | -  | -   | -      | -   | M10   | M12 | 15x85 | -      | -   | -      | -   |
| Perforated sleeve FIS H K      | 12x50 |    | 12x85 |    | 16x85 |    |     | 16x130 |     | 20x85 |     |       | 20x130 |     | 20x200 |     |

**Tensile load  $N_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C)**

| compressive strength $f_b$ | use category        |     |     |     |  |     |     |     |  |  |  |  |  |  |  |  |
|----------------------------|---------------------|-----|-----|-----|--|-----|-----|-----|--|--|--|--|--|--|--|--|
|                            | 4 N/mm <sup>2</sup> | w/w | w/d | 1,2 |  |     |     | 1,2 |  |  |  |  |  |  |  |  |
| d/d                        |                     | 1,2 |     |     |  | 1,5 |     |     |  |  |  |  |  |  |  |  |
| 6 N/mm <sup>2</sup>        | w/w                 | w/d | 1,5 |     |  |     | 1,5 |     |  |  |  |  |  |  |  |  |
|                            | d/d                 |     | 1,5 |     |  |     | 1,5 |     |  |  |  |  |  |  |  |  |
| 8 N/mm <sup>2</sup>        | w/w                 | w/d | 1,5 |     |  |     | 2,0 |     |  |  |  |  |  |  |  |  |
|                            | d/d                 |     | 2,0 |     |  |     | 2,0 |     |  |  |  |  |  |  |  |  |

**Table C30.2:** Characteristic resistance under tensile load (Push through anchorage)

| Anchor rod                | M10        | M12 | M16        |
|---------------------------|------------|-----|------------|
| Perforated sleeve FIS H K | 18x130/200 |     | 22x130/200 |

**Tensile load  $N_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C)**

| compressive strength $f_b$ | use category        |     |     |     |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------------|---------------------|-----|-----|-----|--|--|--|--|--|--|--|--|--|--|--|--|
|                            | 4 N/mm <sup>2</sup> | w/w | w/d | 1,2 |  |  |  |  |  |  |  |  |  |  |  |  |
| d/d                        |                     | 1,5 |     |     |  |  |  |  |  |  |  |  |  |  |  |  |
| 6 N/mm <sup>2</sup>        | w/w                 | w/d | 1,5 |     |  |  |  |  |  |  |  |  |  |  |  |  |
|                            | d/d                 |     | 1,5 |     |  |  |  |  |  |  |  |  |  |  |  |  |
| 8 N/mm <sup>2</sup>        | w/w                 | w/d | 2,0 |     |  |  |  |  |  |  |  |  |  |  |  |  |
|                            | d/d                 |     | 2,0 |     |  |  |  |  |  |  |  |  |  |  |  |  |

Factor for job site tests and displacements see annex C110

Factor for temperature range 72/120°C: 0,83

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**Performances**

Vertical perforated brick HLz, U8, Characteristic resistance under tensile load

**Annex C 30**

**Vertical perforated brick HLz, U8, EN 771-1**

**Table C31.1:** Characteristic resistance under shear load (Pre-positioned anchorage)

| Anchor rod                     | M6    | M8 | M6    | M8 | -     | M8 | M10 | M8     | M10 | -   | M12   | M16   | M12    | M16 | M12    | M16 |
|--------------------------------|-------|----|-------|----|-------|----|-----|--------|-----|-----|-------|-------|--------|-----|--------|-----|
| Internal threaded anchor FIS E | -     | -  | M6    | M8 | 11x85 | -  | -   | -      | -   | M10 | M12   | 15x85 | -      | -   | -      | -   |
| Perforated sleeve FIS H K      | 12x50 |    | 12x85 |    | 16x85 |    |     | 16x130 |     |     | 20x85 |       | 20x130 |     | 20x200 |     |

**Shear load  $V_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C and 72/120°C)**

| compressive strength $f_b$ | use category |     |     |
|----------------------------|--------------|-----|-----|
| 4 N/mm <sup>2</sup>        | w/w          | w/d | 1,2 |
|                            | d/d          |     |     |
| 6 N/mm <sup>2</sup>        | w/w          | w/d | 1,5 |
|                            | d/d          |     |     |
| 8 N/mm <sup>2</sup>        | w/w          | w/d | 1,5 |
|                            | d/d          |     |     |

**Table C31.2:** Characteristic resistance under shear load (Push through anchorage)

| Anchor rod                | M10        | M12 | M16        |
|---------------------------|------------|-----|------------|
| Perforated sleeve FIS H K | 18x130/200 |     | 22x130/200 |

**Shear load  $V_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C and 72/120°C)**

| compressive strength $f_b$ | use category |     |     |
|----------------------------|--------------|-----|-----|
| 4 N/mm <sup>2</sup>        | w/w          | w/d | 1,2 |
|                            | d/d          |     |     |
| 6 N/mm <sup>2</sup>        | w/w          | w/d | 1,5 |
|                            | d/d          |     |     |
| 8 N/mm <sup>2</sup>        | w/w          | w/d | 1,5 |
|                            | d/d          |     |     |

Factor for job site tests and displacements see annex C108

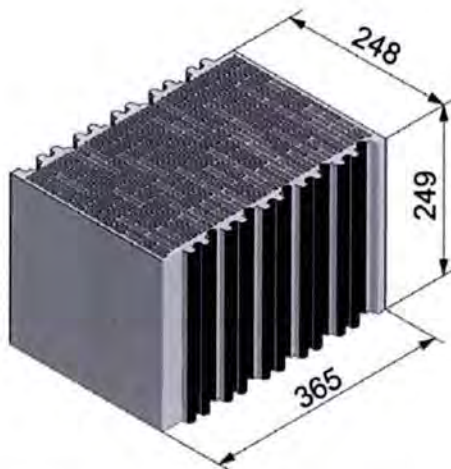
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**Performances**

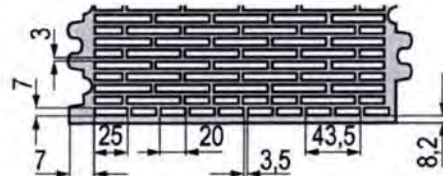
Vertical perforated brick HLz, U8, Characteristic resistance under shear load

**Annex C 31**

### Vertical perforated brick HLz, T10, T11, EN 771-1



| Vertical perforated brick HLz, T10, T11, EN 771-1 |             |         |          |
|---|-------------|---------|----------|
| Producer  | -           |         |          |
| Nominal dimensions [mm]                           | length L    | width W | height H |
|   | 248         | 365     | 249      |
| Density $\rho$ [kg/dm <sup>3</sup> ]              | 0,7         |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ]   | 8 / 10 / 12 |         |          |
| Standard or annex                                 | EN 771-1    |         |          |



**Table C32.1:** Installation parameters  
(Pre-positioned anchorage with perforated sleeve FIS HK)

|   |                     |    |       |    |       |    |     |    |        |     |       |     |        |     |        |     |     |
|---|---------------------|----|-------|----|-------|----|-----|----|--------|-----|-------|-----|--------|-----|--------|-----|-----|
| <b>Anchor rod</b>   | M6                  | M8 | M6    | M8 | -     | M8 | M10 | M8 | M10    | -   | M12   | M16 | M12    | M16 | M12    | M16 |     |
| <b>Internal threaded anchor FIS E</b>   | -                   | -  | M6    | M8 | M6    | M8 | -   | -  | M10    | M12 | -     | -   | -      | -   | -      | -   |     |
|   |                     |    | 11x85 |    |       |    |     |    | 15x85  |     |       |     |        |     |        |     |     |
| <b>Perforated sleeve FIS H K</b>  | 12x50               |    | 12x85 |    | 16x85 |    |     |    | 16x130 |     | 20x85 |     | 20x130 |     | 20x200 |     |     |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K</b> |                     |    |       |    |       |    |     |    |        |     |       |     |        |     |        |     |     |
| Max. installation torque $T_{inst,max}$ [Nm]  | 3                   |    |       |    | 5     |    | 3   |    | 5      |     |       |     |        |     |        |     |     |
| <b>General installation parameters</b>  |                     |    |       |    |       |    |     |    |        |     |       |     |        |     |        |     |     |
| Edge distance $c_{min}$   |                     |    |       |    |       |    |     |    |        |     |       |     |        |     |        | 60  |     |
| Spacing   | $s_{min \parallel}$ |    |       |    |       |    |     |    |        |     |       |     |        |     |        |     | 80  |
|   | $s_{cr \parallel}$  |    |       |    |       |    |     |    |        |     |       |     |        |     |        |     | 250 |
|   | $s_{min \perp}$     |    |       |    |       |    |     |    |        |     |       |     |        |     |        |     | 80  |
|   | $s_{cr \perp}$      |    |       |    |       |    |     |    |        |     |       |     |        |     |        |     | 250 |
| <b>Drilling method</b>  |                     |    |       |    |       |    |     |    |        |     |       |     |        |     |        |     |     |
| Rotary drilling with carbide drill  |                     |    |       |    |       |    |     |    |        |     |       |     |        |     |        |     |     |

**Table C32.2:** Group factors

|                                       |                          |    |       |    |       |    |     |    |        |     |       |     |        |     |        |     |     |
|---------------------------------------|--------------------------|----|-------|----|-------|----|-----|----|--------|-----|-------|-----|--------|-----|--------|-----|-----|
| <b>Anchor rod</b>                     | M6                       | M8 | M6    | M8 | -     | M8 | M10 | M8 | M10    | -   | M12   | M16 | M12    | M16 | M12    | M16 |     |
| <b>Internal threaded anchor FIS E</b> | -                        | -  | M6    | M8 | M6    | M8 | -   | -  | M10    | M12 | -     | -   | -      | -   | -      | -   |     |
|                                       |                          |    | 11x85 |    |       |    |     |    | 15x85  |     |       |     |        |     |        |     |     |
| <b>Perforated sleeve FIS H K</b>      | 12x50                    |    | 12x85 |    | 16x85 |    |     |    | 16x130 |     | 20x85 |     | 20x130 |     | 20x200 |     |     |
| Group factors                         | $\alpha_{g,N \parallel}$ |    |       |    |       |    |     |    |        |     |       |     |        |     |        |     | 1,7 |
|                                       | $\alpha_{g,V \parallel}$ |    |       |    |       |    |     |    |        |     |       |     |        |     |        |     | 0,5 |
|                                       | $\alpha_{g,N \perp}$     |    |       |    |       |    |     |    |        |     |       |     |        |     |        |     | 1,3 |
|                                       | $\alpha_{g,V \perp}$     |    |       |    |       |    |     |    |        |     |       |     |        |     |        |     | 0,5 |

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**Performances**

Vertical perforated brick HLz, T10, T11, dimensions, installation parameters

**Annex C 32**



**Vertical perforated brick HLz, T10, T11, EN 771-1**

**Table C33.1:** Installation parameters  
(Push through anchorage with perforated sleeve FIS HK)

| Anchor rod                                       |                         | M10        | M12 | M16        |
|--|-------------------------|------------|-----|------------|
| Perforated sleeve FIS H K                        |                         | 18x130/200 |     | 22x130/200 |
| <b>Anchor rod with perforated sleeve FIS H K</b> |                         |            |     |            |
| Max. installation torque                         | $T_{inst,max}$ [Nm]     | 5          |     |            |
| <b>General installation parameters</b>           |                         |            |     |            |
| Edge distance                                    | $c_{min}$               | 60         |     |            |
| Spacing  | $s_{min} \parallel$     | 80         |     |            |
|  | $s_{cr} \parallel$ [mm] | 250        |     |            |
|  | $s_{min} \perp$         | 80         |     |            |
|  | $s_{cr} \perp$          | 250        |     |            |
| <b>Drilling method</b>                           |                         |            |     |            |
| Rotary drilling with carbide drill               |                         |            |     |            |

**Table C33.2:** Group factors

| Anchor rod                |                          | M10        | M12 | M16        |
|---------------------------|--------------------------|------------|-----|------------|
| Perforated sleeve FIS H K |                          | 18x130/200 |     | 22x130/200 |
| Group factors             | $\alpha_{q,N} \parallel$ | 1,7        |     |            |
|                           | $\alpha_{q,V} \parallel$ | 0,5        |     |            |
|                           | $\alpha_{q,N} \perp$     | 1,3        |     |            |
|                           | $\alpha_{q,V} \perp$     | 0,5        |     |            |

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**Performances**

Vertical perforated brick HLz, T10, T11, dimensions, installation parameters

**Annex C 33**

**Vertical perforated brick HLz, T10, T11, EN 771-1**

**Table C34.1:** Characteristic resistance under tensile load (Pre-positioned anchorage)

| Anchor rod  | M6           | M8  | M6    | M8 | -     | M8 | M10 | M8     | M10 | -     | M12 | M16   | M12    | M16 | M12    | M16 |
|---|--------------|-----|-------|----|-------|----|-----|--------|-----|-------|-----|-------|--------|-----|--------|-----|
| Internal threaded anchor FIS E  | -            | -   | M6    | M8 | 11x85 | -  | -   | -      | -   | M10   | M12 | 15x85 | -      | -   | -      | -   |
| Perforated sleeve FIS H K   | 12x50        |     | 12x85 |    | 16x85 |    |     | 16x130 |     | 20x85 |     |       | 20x130 |     | 20x200 |     |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |     |       |    |       |    |     |        |     |       |     |       |        |     |        |     |
| compressive strength $f_b$  | use category |     |       |    |       |    |     |        |     |       |     |       |        |     |        |     |
| 8 N/mm <sup>2</sup>   | w/w          | w/d | 1,5   |    |       |    |     |        |     |       |     |       |        |     | 1,5    |     |
|   | d/d          |     | 1,5   |    |       |    |     |        |     |       |     |       |        |     | 2,0    |     |
| 10 N/mm <sup>2</sup>  | w/w          | w/d | 1,5   |    |       |    |     |        |     |       |     |       |        |     | 2,0    |     |
|   | d/d          |     | 2,0   |    |       |    |     |        |     |       |     |       |        |     | 2,0    |     |
| 12 N/mm <sup>2</sup>  | w/w          | w/d | 2,0   |    |       |    |     |        |     |       |     |       |        |     | 2,0    |     |
|   | d/d          |     | 2,0   |    |       |    |     |        |     |       |     |       |        |     | 2,5    |     |

**Table C34.2:** Characteristic resistance under tensile load (Push through anchorage)

| Anchor rod  | M10          |     | M12 |  | M16        |  |
|---|--------------|-----|-----|--|------------|--|
| Perforated sleeve FIS H K   | 18x130/200   |     |     |  | 22x130/200 |  |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |     |     |  |            |  |
| compressive strength $f_b$  | use category |     |     |  |            |  |
| 8 N/mm <sup>2</sup>   | w/w          | w/d | 1,5 |  | 1,5        |  |
|   | d/d          |     | 2,0 |  | 2,0        |  |
| 10 N/mm <sup>2</sup>  | w/w          | w/d | 2,0 |  | 2,0        |  |
|   | d/d          |     | 2,0 |  | 2,0        |  |
| 12 N/mm <sup>2</sup>  | w/w          | w/d | 2,0 |  | 2,0        |  |
|   | d/d          |     | 2,5 |  | 2,5        |  |

Factor for job site tests and displacements see annex C110

Factor for temperature range 72/120°C: 0,83

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**Performances**

Vertical perforated brick HLz, T10, T11, Characteristic resistance under tensile load

**Annex C 34**

**Vertical perforated brick HLz, T10, T11, EN 771-1**

**Table C35.1:** Characteristic resistance under shear load (Pre-positioned anchorage)

| Anchor rod   | M6           | M8    | M6    | M8     | -     | M8     | M10    | M8 | M10 | -   | M12 | M16   | M12 | M16 | M12 | M16 |
|--|--------------|-------|-------|--------|-------|--------|--------|----|-----|-----|-----|-------|-----|-----|-----|-----|
| Internal threaded anchor FIS E   | -            | -     | M6    | M8     | 11x85 | -      | -      | -  | -   | M10 | M12 | 15x85 | -   | -   | -   | -   |
| Perforated sleeve FIS H K  | 12x50        | 12x85 | 16x85 | 16x130 | 20x85 | 20x130 | 20x200 |    |     |     |     |       |     |     |     |     |
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |       |       |        |       |        |        |    |     |     |     |       |     |     |     |     |
| compressive strength $f_b$   | use category |       |       |        |       |        |        |    |     |     |     |       |     |     |     |     |
| 8 N/mm <sup>2</sup>  | w/w          | w/d   | 0,9   | 1,5    | 2,0   |        |        |    |     |     |     |       |     |     |     |     |
|  | d/d          |       |       |        |       |        |        |    |     |     |     |       |     |     |     |     |
| 10 N/mm <sup>2</sup>   | w/w          | w/d   | 0,9   | 1,5    | 2,0   |        |        |    |     |     |     |       |     |     |     |     |
|  | d/d          |       |       |        |       |        |        |    |     |     |     |       |     |     |     |     |
| 12 N/mm <sup>2</sup>   | w/w          | w/d   | 1,2   | 2,0    | 2,0   |        |        |    |     |     |     |       |     |     |     |     |
|  | d/d          |       |       |        |       |        |        |    |     |     |     |       |     |     |     |     |

**Table C35.2:** Characteristic resistance under shear load (Push through anchorage)

| Anchor rod   | M10          | M12        | M16 |
|--|--------------|------------|-----|
| Perforated sleeve FIS H K  | 18x130/200   | 22x130/200 |     |
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |            |     |
| compressive strength $f_b$   | use category |            |     |
| 8 N/mm <sup>2</sup>  | w/w          | w/d        | 1,5 |
|  | d/d          |            |     |
| 10 N/mm <sup>2</sup>   | w/w          | w/d        | 1,5 |
|  | d/d          |            |     |
| 12 N/mm <sup>2</sup>   | w/w          | w/d        | 2,0 |
|  | d/d          |            |     |

Factor for job site tests and displacements see annex C110

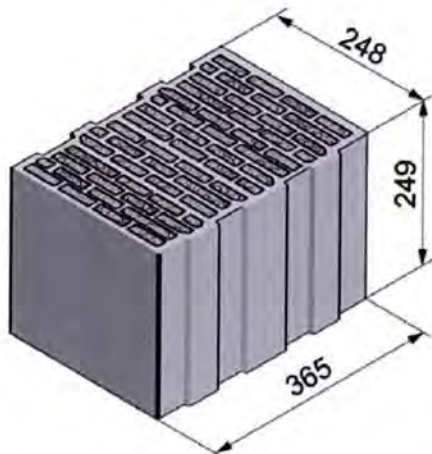
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**Performances**

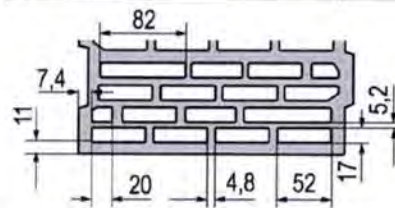
Vertical perforated brick HLz, T10, T11, Characteristic resistance under shear load

**Annex C 35**

**Vertical perforated brick HLz, T7 PF, filled with perlite, EN 771-1**



| Vertical perforated brick HLz, T7 PF, filled with perlite, EN 771-1 |          |         |          |
|---|----------|---------|----------|
| Producer  | -        |         |          |
| Nominal dimensions [mm]   | length L | width W | height H |
|   | 248      | 365     | 249      |
| Density $\rho$ [kg/dm <sup>3</sup> ]                                | 0,5      |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ]                     | 4 / 6    |         |          |
| Standard or annex   | EN 771-1 |         |          |



**Table C36.1:** Installation parameters  
(Pre-positioned anchorage with perforated sleeve FIS HK)

| Anchor rod  | M6                      | M8    | M6    | M8 | -      | M8    | M10 | M8     | M10    | -   | M12    | M16 | M12    | M16 | M12 | M16 |  |
|---|-------------------------|-------|-------|----|--------|-------|-----|--------|--------|-----|--------|-----|--------|-----|-----|-----|--|
| Internal threaded anchor FIS E  | -                       | -     | M6    | M8 | 11x85  | -     | -   | -      | M10    | M12 | 15x85  | -   | -      | -   | -   | -   |  |
| Perforated sleeve FIS H K   | 12x50                   | 12x85 | 16x85 |    | 16x130 | 20x85 |     | 20x130 | 20x200 |     | 20x130 |     | 20x200 |     |     |     |  |
| <b>Ankerstangen und Innengewindeanker FIS E mit Injektionsanker-Hülse FIS H K</b> |                         |       |       |    |        |       |     |        |        |     |        |     |        |     |     |     |  |
| Max. installation torque $T_{inst,max}$ [Nm]                                      | 2                       |       |       |    | 5      | 2     | 5   |        |        |     |        |     |        |     |     |     |  |
| <b>General installation parameters</b>  |                         |       |       |    |        |       |     |        |        |     |        |     |        |     |     |     |  |
| Edge distance $c_{min}$   |                         |       |       |    |        |       |     |        |        |     | 60     |     |        |     |     |     |  |
| Spacing   | $s_{min} \parallel$     |       |       |    |        |       |     |        |        |     |        | 80  |        |     |     |     |  |
|   | $s_{cr} \parallel$ [mm] |       |       |    |        |       |     |        |        |     |        | 250 |        |     |     |     |  |
|   | $s_{min} \perp$         |       |       |    |        |       |     |        |        |     |        | 80  |        |     |     |     |  |
|   | $s_{cr} \perp$          |       |       |    |        |       |     |        |        |     |        | 250 |        |     |     |     |  |
| <b>Drilling method</b>  |                         |       |       |    |        |       |     |        |        |     |        |     |        |     |     |     |  |
| Rotary drilling with carbide drill  |                         |       |       |    |        |       |     |        |        |     |        |     |        |     |     |     |  |

**Table C36.2:** Group factors

| Anchor rod                     | M6                       | M8    | M6    | M8 | -      | M8    | M10 | M8     | M10    | -   | M12    | M16 | M12    | M16 | M12 | M16 |  |
|--------------------------------|--------------------------|-------|-------|----|--------|-------|-----|--------|--------|-----|--------|-----|--------|-----|-----|-----|--|
| Internal threaded anchor FIS E | -                        | -     | M6    | M8 | 11x85  | -     | -   | -      | M10    | M12 | 15x85  | -   | -      | -   | -   | -   |  |
| Perforated sleeve FIS H K      | 12x50                    | 12x85 | 16x85 |    | 16x130 | 20x85 |     | 20x130 | 20x200 |     | 20x130 |     | 20x200 |     |     |     |  |
| Group factors                  | $\alpha_{a,N} \parallel$ |       |       |    |        |       |     |        |        |     |        | 1,1 |        |     |     |     |  |
|                                | $\alpha_{a,V} \parallel$ |       |       |    |        |       |     |        |        |     |        | 1,2 |        |     |     |     |  |
|                                | $\alpha_{a,N} \perp$     |       |       |    |        |       |     |        |        |     |        | 1,1 |        |     |     |     |  |
|                                | $\alpha_{a,V} \perp$     |       |       |    |        |       |     |        |        |     |        | 1,2 |        |     |     |     |  |

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**Performances**

Vertical perforated brick HLz, T7 PF, filled with perlite, dimensions, installation parameters

**Annex C 36**

**Vertical perforated brick HLz, T7 PF, filled with perlite, EN 771-1**

**Table C37.1:** Installation parameters  
(Push through anchorage with perforated sleeve FIS HK)

| Anchor rod                                       | M10                 | M12 | M16        |
|--|---------------------|-----|------------|
| Perforated sleeve FIS H K                        | 18x130/200          |     | 22x130/200 |
| <b>Anchor rod with perforated sleeve FIS H K</b> |                     |     |            |
| Max. installation torque                         | $T_{inst,max}$ [Nm] | 5   |            |
| <b>General installation parameters</b>           |                     |     |            |
| Edge distance                                    | $c_{min}$           | 60  |            |
| Spacing  | $s_{min} \parallel$ | 80  |            |
|  | $s_{cr} \parallel$  | 250 |            |
|  | $s_{min} \perp$     | 80  |            |
|  | $s_{cr} \perp$      | 250 |            |
| <b>Drilling method</b>                           |                     |     |            |
| Rotary drilling with carbide drill               |                     |     |            |

**Table C37.2:** Group factors

| Anchor rod                | M10                      | M12 | M16        |
|---------------------------|--------------------------|-----|------------|
| Perforated sleeve FIS H K | 18x130/200               |     | 22x130/200 |
| Group factors             | $\alpha_{q,N} \parallel$ | 1,1 |            |
|                           | $\alpha_{q,V} \parallel$ | 1,2 |            |
|                           | $\alpha_{q,N} \perp$     | 1,1 |            |
|                           | $\alpha_{q,V} \perp$     | 1,2 |            |

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**Performances**

Vertical perforated brick HLz, T7 PF, filled with perlite,  
dimensions, installation parameters

**Annex C 37**

**Vertical perforated brick HLz, T7 PF, filled with perlite, EN 771-1**

**Table C38.1:** Characteristic resistance under tensile load (Pre-positioned anchorage)

| Anchor rod                     | M6    | M8    | M6    | M8 | -     | M8     | M10 | M8  | M10   | -     | M12 | M16    | M12 | M16    | M12 | M16 |
|--------------------------------|-------|-------|-------|----|-------|--------|-----|-----|-------|-------|-----|--------|-----|--------|-----|-----|
| Internal threaded anchor FIS E | -     | -     | M6    | M8 | 11x85 | -      | -   | M10 | M12   | 15x85 | -   | -      | -   | -      | -   | -   |
| Perforated sleeve FIS H K      | 12x50 | 12x85 | 16x85 |    |       | 16x130 |     |     | 20x85 |       |     | 20x130 |     | 20x200 |     |     |

**Tensile load  $N_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C)**

| compressive strength $f_b$ | use category |     |     |  |     |  |     |  |     |  |     |
|----------------------------|--------------|-----|-----|--|-----|--|-----|--|-----|--|-----|
|                            | w/w          | w/d |     |  |     |  |     |  |     |  |     |
| 4 N/mm <sup>2</sup>        | w/w          | w/d | 1,2 |  | 1,2 |  | 1,2 |  | 1,2 |  | 2,0 |
|                            | d/d          |     | 1,5 |  | 1,5 |  | 1,5 |  | 1,5 |  | 2,0 |
| 6 N/mm <sup>2</sup>        | w/w          | w/d | 1,5 |  | 1,5 |  | 1,5 |  | 1,5 |  | 2,5 |
|                            | d/d          |     | 1,5 |  | 2,0 |  | 1,5 |  | 2,0 |  | 3,0 |

**Table C38.2:** Characteristic resistance under tensile load (Push through anchorage)

| Anchor rod                | M10        | M12 | M16        |
|---------------------------|------------|-----|------------|
| Perforated sleeve FIS H K | 18x130/200 |     | 22x130/200 |

**Tensile load  $N_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C)**

| compressive strength $f_b$ | use category |     |     |  |     |  |
|----------------------------|--------------|-----|-----|--|-----|--|
|                            | w/w          | w/d |     |  |     |  |
| 4 N/mm <sup>2</sup>        | w/w          | w/d | 1,2 |  | 1,2 |  |
|                            | d/d          |     | 1,5 |  | 1,5 |  |
| 6 N/mm <sup>2</sup>        | w/w          | w/d | 1,5 |  | 1,5 |  |
|                            | d/d          |     | 2,0 |  | 2,0 |  |

Factor for job site tests and displacements see annex C110

Factor for temperature range 72/120°C: 0,83

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**Performances**

Vertical perforated brick HLz, T7 PF, filled with perlite,  
Characteristic resistance under tensile load

**Annex C 38**

**Vertical perforated brick HLz, T7 PF, filled with perlite, EN 771-1**

**Table C39.1:** Characteristic resistance under shear load (Pre-positioned anchorage)

| Anchor rod                     | M6    | M8 | M6    | M8 | -     | M8 | M10 | M8     | M10 | -     | M12   | M16 | M12    | M16 | M12    | M16 |
|--------------------------------|-------|----|-------|----|-------|----|-----|--------|-----|-------|-------|-----|--------|-----|--------|-----|
| Internal threaded anchor FIS E | -     |    | -     |    | M6    | M8 | -   |        | -   |       | M10   | M12 | -      |     | -      |     |
|                                |       |    |       |    | 11x85 |    |     |        |     |       | 15x85 |     |        |     |        |     |
| Perforated sleeve FIS H K      | 12x50 |    | 12x85 |    | 16x85 |    |     | 16x130 |     | 20x85 |       |     | 20x130 |     | 20x200 |     |

**Shear load  $V_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C and 72/120°C)**

| compressive strength $f_b$ | use category        |     |     |     |     |     |
|----------------------------|---------------------|-----|-----|-----|-----|-----|
|                            | 4 N/mm <sup>2</sup> | w/w | w/d | 0,9 | 1,5 |     |
| d/d                        |                     |     |     |     |     |     |
| 6 N/mm <sup>2</sup>        | w/w                 | w/d | 1,2 | 2,0 |     | 1,5 |
|                            | d/d                 |     |     |     |     |     |

**Table C39.2:** Characteristic resistance under shear load (Push through anchorage)

| Anchor rod                | M10        | M12 | M16        |
|---------------------------|------------|-----|------------|
| Perforated sleeve FIS H K | 18x130/200 |     | 22x130/200 |

**Shear load  $V_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C and 72/120°C)**

| compressive strength $f_b$ | use category        |     |     |     |
|----------------------------|---------------------|-----|-----|-----|
|                            | 4 N/mm <sup>2</sup> | w/w | w/d | 1,5 |
| d/d                        |                     |     |     |     |
| 6 N/mm <sup>2</sup>        | w/w                 | w/d | 2,0 | 1,5 |
|                            | d/d                 |     |     |     |

Factor for job site tests and displacements see annex C110

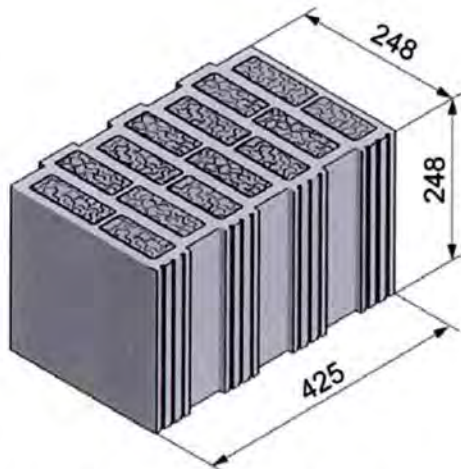
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**Performances**

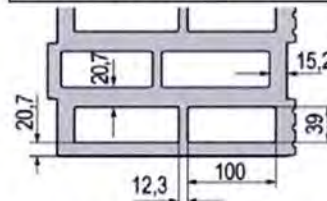
Vertical perforated brick HLz, T7 PF, filled with perlite,  
Characteristic resistance under shear load

**Annex C 39**

**Vertical perforated brick HLz, T9 MW, filled with mineral wool, EN 771-1**



| Vertical perforated brick HLz, T9 MW, filled with mineral wool, EN 771-1 |           |         |          |
|--|-----------|---------|----------|
| Producer   | -         |         |          |
| Nominal dimensions [mm]  | length L  | width W | height H |
|  | 248       | 425     | 248      |
| Density $\rho$ [kg/dm <sup>3</sup> ]                                     | 0,8       |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ]                          | 4 / 6 / 8 |         |          |
| Standard or annex  | EN 771-1  |         |          |



**Table C40.1:** Installation parameters  
(Pre-positioned anchorage with perforated sleeve FIS HK)

| Anchor rod  |                         | M6    | M8    | M6    | M8 | -     | M8     | M10 | M8 | M10   | -     | M12 | M16    | M12 | M16    | M12 | M16 |  |
|---|-------------------------|-------|-------|-------|----|-------|--------|-----|----|-------|-------|-----|--------|-----|--------|-----|-----|--|
| Internal threaded anchor FIS E  |                         | -     | -     |       |    | M6    | M8     |     |    |       | M10   | M12 |        |     |        |     |     |  |
|   |                         |       |       |       |    | 11x85 |        |     |    |       | 15x85 |     |        |     |        |     |     |  |
| Perforated sleeve FIS H K   |                         | 12x50 | 12x85 | 16x85 |    |       | 16x130 |     |    | 20x85 |       |     | 20x130 |     | 20x200 |     |     |  |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K</b> |                         |       |       |       |    |       |        |     |    |       |       |     |        |     |        |     |     |  |
| Max. installation torque  | $T_{inst,max}$ [Nm]     | 3     |       |       |    |       | 5      |     | 3  |       | 5     |     |        |     |        |     |     |  |
| <b>General installation parameters</b>  |                         |       |       |       |    |       |        |     |    |       |       |     |        |     |        |     |     |  |
| Edge distance   | $c_{min}$               |       |       |       |    |       |        |     |    |       |       | 60  |        |     |        |     |     |  |
| Spacing   | $s_{min} \parallel$     |       |       |       |    |       |        |     |    |       |       | 80  |        |     |        |     |     |  |
|   | $s_{cr} \parallel$ [mm] |       |       |       |    |       |        |     |    |       |       | 250 |        |     |        |     |     |  |
|   | $s_{min} \perp$         |       |       |       |    |       |        |     |    |       |       | 80  |        |     |        |     |     |  |
|   | $s_{cr} \perp$          |       |       |       |    |       |        |     |    |       |       | 250 |        |     |        |     |     |  |
| <b>Drilling method</b>  |                         |       |       |       |    |       |        |     |    |       |       |     |        |     |        |     |     |  |
| Rotary drilling with carbide drill  |                         |       |       |       |    |       |        |     |    |       |       |     |        |     |        |     |     |  |

**Table C40.2:** Group factors

| Anchor rod                     |                          | M6    | M8    | M6    | M8 | -     | M8     | M10 | M8 | M10   | -     | M12 | M16    | M12 | M16    | M12 | M16 |  |
|--------------------------------|--------------------------|-------|-------|-------|----|-------|--------|-----|----|-------|-------|-----|--------|-----|--------|-----|-----|--|
| Internal threaded anchor FIS E |                          | -     | -     |       |    | M6    | M8     |     |    |       | M10   | M12 |        |     |        |     |     |  |
|                                |                          |       |       |       |    | 11x85 |        |     |    |       | 15x85 |     |        |     |        |     |     |  |
| Perforated sleeve FIS H K      |                          | 12x50 | 12x85 | 16x85 |    |       | 16x130 |     |    | 20x85 |       |     | 20x130 |     | 20x200 |     |     |  |
| Group factors                  | $\alpha_{q,N} \parallel$ |       |       |       |    |       |        |     |    |       |       | 1,3 |        |     |        |     |     |  |
|                                | $\alpha_{q,V} \parallel$ |       |       |       |    |       |        |     |    |       |       | 1,2 |        |     |        |     |     |  |
|                                | $\alpha_{q,N} \perp$     |       |       |       |    |       |        |     |    |       |       | 0,6 |        |     |        |     |     |  |
|                                | $\alpha_{q,V} \perp$     |       |       |       |    |       |        |     |    |       |       | 1,2 |        |     |        |     |     |  |

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**Performances**

Vertical perforated brick HLz, T9 MW, filled with mineral wool, dimensions, installation parameters

**Annex C 40**



**Vertical perforated brick HLz, T9 MW, filled with mineral wool, EN 771-1**

**Table C41.1:** Installation parameters  
(Push through anchorage with perforated sleeve FIS HK)

| Anchor rod                                       |                        | M10        | M12 | M16        |
|--|------------------------|------------|-----|------------|
| Perforated sleeve FIS H K                        |                        | 18x130/200 |     | 22x130/200 |
| <b>Anchor rod with perforated sleeve FIS H K</b> |                        |            |     |            |
| Max. installation torque                         | $T_{inst,max}$ [Nm]    | 5          |     |            |
| <b>General installation parameters</b>           |                        |            |     |            |
| Edge distance                                    | $c_{min}$              | 60         |     |            |
| Spacing  | $s_{min II}$           | 80         |     |            |
|  | $s_{cr II}$ [mm]       | 250        |     |            |
|  | $s_{min \perp}$        | 80         |     |            |
|  | $s_{cr \perp}$         | 250        |     |            |
|  | <b>Drilling method</b> |            |     |            |
| Rotary drilling with carbide drill               |                        |            |     |            |

**Table C41.2:** Group factors

| Anchor rod                |                      | M10        | M12 | M16        |
|---------------------------|----------------------|------------|-----|------------|
| Perforated sleeve FIS H K |                      | 18x130/200 |     | 22x130/200 |
| Group factors             | $\alpha_{q,N II}$    | 1,3        |     |            |
|                           | $\alpha_{q,V II}$    | 1,2        |     |            |
|                           | $\alpha_{q,N \perp}$ | 0,6        |     |            |
|                           | $\alpha_{q,V \perp}$ | 1,2        |     |            |

fischer injektion system FIS V masonry

**Performances**

Vertical perforated brick HLz, T9 MW, filled with mineral wool, dimensions, installation parameters

**Annex C 41**

**Vertical perforated brick HLz, T9 MW, filled with mineral wool, EN 771-1**

**Table C42.1:** Characteristic resistance under tensile load (Pre-positioned anchorage)

| Anchor rod  | M6           | M8  | M6    | M8 | -     | M8 | M10 | M8     | M10 | -     | M12 | M16 | M12    | M16 | M12    | M16 |
|---|--------------|-----|-------|----|-------|----|-----|--------|-----|-------|-----|-----|--------|-----|--------|-----|
| Internal threaded anchor FIS E  | -            | -   | M6    | M8 | 11x85 | -  | -   | -      | M10 | M12   | -   | -   | -      | -   | -      | -   |
| Perforated sleeve FIS H K   | 12x50        |     | 12x85 |    | 16x85 |    |     | 16x130 |     | 20x85 |     |     | 20x130 |     | 20x200 |     |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |     |       |    |       |    |     |        |     |       |     |     |        |     |        |     |
| compressive strength $f_b$  | use category |     |       |    |       |    |     |        |     |       |     |     |        |     |        |     |
| 4 N/mm <sup>2</sup>   | w/w          | w/d | 1,5   |    | 2,0   |    |     | 3,0    |     | 2,5   |     |     | 4,0    |     |        |     |
|   | d/d          |     | 2,0   |    | 2,5   |    |     | 3,0    |     | 2,5   |     |     | 4,5    |     |        |     |
| 6 N/mm <sup>2</sup>   | w/w          | w/d | 2,0   |    | 2,5   |    |     | 3,5    |     | 3,0   |     |     | 5,0    |     |        |     |
|   | d/d          |     | 2,0   |    | 3,0   |    |     | 4,0    |     | 3,0   |     |     | 5,5    |     |        |     |
| 8 N/mm <sup>2</sup>   | w/w          | w/d | 2,5   |    | 3,0   |    |     | 4,0    |     | 3,5   |     |     | 6,0    |     |        |     |
|   | d/d          |     | 2,5   |    | 3,0   |    |     | 4,5    |     | 3,5   |     |     | 6,5    |     |        |     |

**Table C42.2:** Characteristic resistance under tensile load (Push through anchorage)

| Anchor rod  | M10          |     | M12 |  | M16        |  |
|---|--------------|-----|-----|--|------------|--|
| Perforated sleeve FIS H K   | 18x130/200   |     |     |  | 22x130/200 |  |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |     |     |  |            |  |
| compressive strength $f_b$  | use category |     |     |  |            |  |
| 4 N/mm <sup>2</sup>   | w/w          | w/d | 3,0 |  | 4,0        |  |
|   | d/d          |     | 3,0 |  | 4,5        |  |
| 6 N/mm <sup>2</sup>   | w/w          | w/d | 3,5 |  | 5,0        |  |
|   | d/d          |     | 4,0 |  | 5,5        |  |
| 8 N/mm <sup>2</sup>   | w/w          | w/d | 4,0 |  | 6,0        |  |
|   | d/d          |     | 4,5 |  | 6,5        |  |

Factor for job site tests and displacements see annex C110

Factor for temperature range 72/120°C: 0,83

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**Performances**

Vertical perforated brick HLz, T9 MW, filled with mineral wool;  
Characteristic resistance under tensile load

**Annex C 42**

**Vertical perforated brick HLz, T9 MW, filled with mineral wool, EN 771-1**

**Table C43.1:** Characteristic resistance under shear load (Pre-positioned anchorage)

| Anchor rod                     | M6    | M8 | M6    | M8 | -     | M8 | M10 | M8     | M10 | -   | M12   | M16 | M12    | M16 | M12    | M16 |
|--------------------------------|-------|----|-------|----|-------|----|-----|--------|-----|-----|-------|-----|--------|-----|--------|-----|
| Internal threaded anchor FIS E | -     | -  | M6    | M8 | 11x85 | -  | -   | -      | -   | M10 | M12   | -   | -      | -   | -      | -   |
| Perforated sleeve FIS H K      | 12x50 |    | 12x85 |    | 16x85 |    |     | 16x130 |     |     | 20x85 |     | 20x130 |     | 20x200 |     |

**Shear load  $V_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C and 72/120°C)**

| compressive strength $f_b$ | use category |     |     |     |  |     |     |     |
|----------------------------|--------------|-----|-----|-----|--|-----|-----|-----|
|                            | w/w          | w/d |     |     |  |     |     |     |
| 4 N/mm <sup>2</sup>        | w/w          | w/d | 2,0 | 2,0 |  | 2,5 | 2,0 | 1,5 |
|                            | d/d          |     |     |     |  |     |     |     |
| 6 N/mm <sup>2</sup>        | w/w          | w/d | 2,5 | 2,5 |  | 3,0 | 2,5 | 2,0 |
|                            | d/d          |     |     |     |  |     |     |     |
| 8 N/mm <sup>2</sup>        | w/w          | w/d | 2,5 | 3,0 |  | 4,0 | 3,0 | 2,5 |
|                            | d/d          |     |     |     |  |     |     |     |

**Table C43.2:** Characteristic resistance under shear load (Push through anchorage)

| Anchor rod                | M10        | M12 | M16        |
|---------------------------|------------|-----|------------|
| Perforated sleeve FIS H K | 18x130/200 |     | 22x130/200 |

**Shear load  $V_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C and 72/120°C)**

| compressive strength $f_b$ | use category |     |     |     |
|----------------------------|--------------|-----|-----|-----|
|                            | w/w          | w/d |     |     |
| 4 N/mm <sup>2</sup>        | w/w          | w/d | 2,5 | 2,0 |
|                            | d/d          |     |     |     |
| 6 N/mm <sup>2</sup>        | w/w          | w/d | 3,0 | 2,5 |
|                            | d/d          |     |     |     |
| 8 N/mm <sup>2</sup>        | w/w          | w/d | 4,0 | 3,0 |
|                            | d/d          |     |     |     |

Factor for job site tests and displacements see annex C110

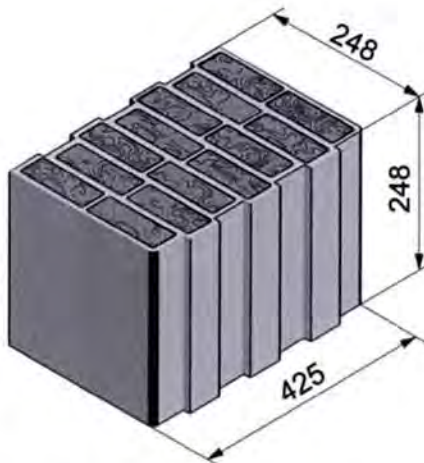
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**Performances**

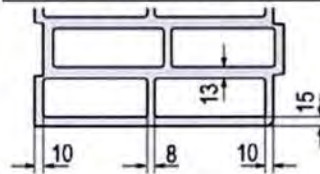
Vertical perforated brick HLz, T9 MW, filled with mineral wool;  
Characteristic resistance under shear load

**Annex C 43**

**Vertical perforated brick HLz, FZ 7, filled with mineral wool, EN 771-1**



| Vertical perforated brick HLz, FZ 7, filled with mineral wool, EN 771-1 |           |         |          |
|---|-----------|---------|----------|
| Producer  | -         |         |          |
| Nominal dimensions [mm]   | length L  | width W | height H |
|   | 248       | 425     | 248      |
| Density $\rho$ [kg/dm <sup>3</sup> ]                                    | 0,6       |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ]                         | 4 / 6 / 8 |         |          |
| Standard or annex   | EN 771-1  |         |          |



**Table C44.1:** Installation parameters  
(Pre-positioned anchorage with perforated sleeve FIS HK)

|   |                         |    |       |    |       |    |     |        |       |       |     |        |     |        |     |     |  |  |
|---|-------------------------|----|-------|----|-------|----|-----|--------|-------|-------|-----|--------|-----|--------|-----|-----|--|--|
| <b>Anchor rod</b>   | M6                      | M8 | M6    | M8 | -     | M8 | M10 | M8     | M10   | -     | M12 | M16    | M12 | M16    | M12 | M16 |  |  |
| <b>Internal threaded anchor FIS E</b>   | -                       | -  | M6    | M8 | M6    | M8 | -   | -      | M10   | M12   | -   | -      | -   | -      | -   | -   |  |  |
|   |                         |    | 11x85 |    |       |    |     |        | 15x85 |       |     |        |     |        |     |     |  |  |
| <b>Perforated sleeve FIS H K</b>  | 12x50                   |    | 12x85 |    | 16x85 |    |     | 16x130 |       | 20x85 |     | 20x130 |     | 20x200 |     |     |  |  |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K</b> |                         |    |       |    |       |    |     |        |       |       |     |        |     |        |     |     |  |  |
| Max. installation torque $T_{inst,max}$ [Nm]  | 2                       |    |       |    | 5     |    | 2   |        | 5     |       |     |        |     |        |     |     |  |  |
| <b>General installation parameters</b>  |                         |    |       |    |       |    |     |        |       |       |     |        |     |        |     |     |  |  |
| Edge distance $c_{min}$   |                         |    |       |    |       |    | 60  |        |       |       |     |        |     |        |     |     |  |  |
| Spacing   | $s_{min} \parallel$     |    |       |    |       |    |     | 80     |       |       |     |        |     |        |     |     |  |  |
|   | $s_{cr} \parallel$ [mm] |    |       |    |       |    |     | 250    |       |       |     |        |     |        |     |     |  |  |
|   | $s_{min} \perp$         |    |       |    |       |    |     | 80     |       |       |     |        |     |        |     |     |  |  |
|   | $s_{cr} \perp$          |    |       |    |       |    |     | 250    |       |       |     |        |     |        |     |     |  |  |
| <b>Drilling method</b>  |                         |    |       |    |       |    |     |        |       |       |     |        |     |        |     |     |  |  |
| Rotary drilling with carbide drill  |                         |    |       |    |       |    |     |        |       |       |     |        |     |        |     |     |  |  |

**Table C44.2:** Group factors

|                                       |                          |    |       |    |       |    |     |        |       |       |     |        |     |        |     |     |  |  |
|---------------------------------------|--------------------------|----|-------|----|-------|----|-----|--------|-------|-------|-----|--------|-----|--------|-----|-----|--|--|
| <b>Anchor rod</b>                     | M6                       | M8 | M6    | M8 | -     | M8 | M10 | M8     | M10   | -     | M12 | M16    | M12 | M16    | M12 | M16 |  |  |
| <b>Internal threaded anchor FIS E</b> | -                        | -  | M6    | M8 | M6    | M8 | -   | -      | M10   | M12   | -   | -      | -   | -      | -   | -   |  |  |
|                                       |                          |    | 11x85 |    |       |    |     |        | 15x85 |       |     |        |     |        |     |     |  |  |
| <b>Perforated sleeve FIS H K</b>      | 12x50                    |    | 12x85 |    | 16x85 |    |     | 16x130 |       | 20x85 |     | 20x130 |     | 20x200 |     |     |  |  |
| Group factors                         | $\alpha_{q,N} \parallel$ |    |       |    |       |    |     | 1,9    |       |       |     |        |     |        |     |     |  |  |
|                                       | $\alpha_{q,V} \parallel$ |    |       |    |       |    |     | 0,9    |       |       |     |        |     |        |     |     |  |  |
|                                       | $\alpha_{q,N} \perp$     |    |       |    |       |    |     | 1,0    |       |       |     |        |     |        |     |     |  |  |
|                                       | $\alpha_{q,V} \perp$     |    |       |    |       |    |     | 0,7    |       |       |     |        |     |        |     |     |  |  |

fischer injektion system FIS V masonry

**Performances**

Vertical perforated brick HLz, FZ 7, filled with mineral wool;  
dimensions, installation parameters

**Annex C 44**

**Vertical perforated brick HLz, FZ 7, filled with mineral wool, EN 771-1**

**Table C45.1:** Installation parameters  
(Push through anchorage with perforated sleeve FIS HK)

| Anchor rod                                       |                     | M10        | M12 | M16        |
|--|---------------------|------------|-----|------------|
| Perforated sleeve FIS H K                        |                     | 18x130/200 |     | 22x130/200 |
| <b>Anchor rod with perforated sleeve FIS H K</b> |                     |            |     |            |
| Max. installation torque                         | $T_{inst,max}$ [Nm] | 5          |     |            |
| <b>General installation parameters</b>           |                     |            |     |            |
| Edge distance                                    | $c_{min}$           | 60         |     |            |
| Spacing  | $s_{min} \parallel$ | 80         |     |            |
|  | $s_{cr} \parallel$  | 250        |     |            |
|  | $s_{min} \perp$     | 80         |     |            |
|  | $s_{cr} \perp$      | 250        |     |            |
|  |                     |            |     |            |
| <b>Drilling method</b>                           |                     |            |     |            |
| Rotary drilling with carbide drill               |                     |            |     |            |

**Table C45.2:** Group factors

| Anchor rod                |                          | M10        | M12 | M16        |
|---------------------------|--------------------------|------------|-----|------------|
| Perforated sleeve FIS H K |                          | 18x130/200 |     | 22x130/200 |
| Group factors             | $\alpha_{q,N} \parallel$ | 1,9        |     |            |
|                           | $\alpha_{q,V} \parallel$ | 0,9        |     |            |
|                           | $\alpha_{q,N} \perp$     | 1,0        |     |            |
|                           | $\alpha_{q,V} \perp$     | 0,7        |     |            |

fischer injektion system FIS V masonry

**Performances**

Vertical perforated brick HLz, FZ 7, filled with mineral wool;  
dimensions, installation parameters

**Annex C 45**

**Vertical perforated brick HLz, FZ 7, filled with mineral wool, EN 771-1**

**Table C46.1:** Characteristic resistance under tensile load (Pre-positioned anchorage)

| Anchor rod  | M6           | M8  | M6    | M8   | -     | M8 | M10 | M8     | M10 | -     | M12   | M16 | M12    | M16 | M12    | M16 |
|---|--------------|-----|-------|------|-------|----|-----|--------|-----|-------|-------|-----|--------|-----|--------|-----|
| Internal threaded anchor FIS E  | -            |     | -     |      | M6    | M8 | -   |        | -   |       | M10   | M12 | -      |     | -      |     |
|   |              |     |       |      | 11x85 |    |     |        |     |       | 15x85 |     |        |     |        |     |
| Perforated sleeve FIS H K   | 12x50        |     | 12x85 |      | 16x85 |    |     | 16x130 |     | 20x85 |       |     | 20x130 |     | 20x200 |     |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |     |       |      |       |    |     |        |     |       |       |     |        |     |        |     |
| compressive strength $f_b$  | use category |     |       |      |       |    |     |        |     |       |       |     |        |     |        |     |
| 4 N/mm <sup>2</sup>   | w/w          | w/d | 0,6   | 0,75 | 1,5   |    |     | 2,0    |     | 1,2   |       |     | 2,0    |     | 2,0    |     |
|   | d/d          |     | 0,6   | 0,9  | 1,5   |    |     | 2,0    |     | 1,5   |       |     | 2,0    |     | 2,5    |     |
| 6 N/mm <sup>2</sup>   | w/w          | w/d | 0,75  | 0,9  | 1,5   |    |     | 2,0    |     | 1,5   |       |     | 2,5    |     | 2,5    |     |
|   | d/d          |     | 0,9   | 0,9  | 2,0   |    |     | 2,5    |     | 2,0   |       |     | 2,5    |     | 3,0    |     |
| 8 N/mm <sup>2</sup>   | w/w          | w/d | 0,9   | 1,2  | 2,0   |    |     | 2,5    |     | 2,0   |       |     | 2,5    |     | 3,0    |     |
|   | d/d          |     | 0,9   | 1,2  | 2,0   |    |     | 3,0    |     | 2,0   |       |     | 3,0    |     | 3,5    |     |

**Table C46.2:** Characteristic resistance under tensile load (Push through anchorage)

| Anchor rod  | M10          |     | M12 |  | M16        |     |
|---|--------------|-----|-----|--|------------|-----|
| Perforated sleeve FIS H K   | 18x130/200   |     |     |  | 22x130/200 |     |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |     |     |  |            |     |
| compressive strength $f_b$  | use category |     |     |  |            |     |
| 4 N/mm <sup>2</sup>   | w/w          | w/d | 2,0 |  |            | 2,0 |
|   | d/d          |     | 2,0 |  |            | 2,0 |
| 6 N/mm <sup>2</sup>   | w/w          | w/d | 2,0 |  |            | 2,5 |
|   | d/d          |     | 2,5 |  |            | 2,5 |
| 8 N/mm <sup>2</sup>   | w/w          | w/d | 2,5 |  |            | 2,5 |
|   | d/d          |     | 3,0 |  |            | 3,0 |

Factor for job site tests and displacements see annex C110

Factor for temperature range 72/120°C: 0,83

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**Performances**

Vertical perforated brick HLz, FZ 7, filled with mineral wool;  
Characteristic resistance under tensile load

**Annex C 46**

**Vertical perforated brick HLz, FZ 7, filled with mineral wool, EN 771-1**

**Table C47.1:** Characteristic resistance under shear load (Pre-positioned anchorage)

| Anchor rod                     | M6    | M8 | M6    | M8 | -     | M8 | M10 | M8     | M10   | -     | M12 | M16 | M12    | M16 | M12    | M16 |
|--------------------------------|-------|----|-------|----|-------|----|-----|--------|-------|-------|-----|-----|--------|-----|--------|-----|
| Internal threaded anchor FIS E | -     | -  | M6    | M8 | -     | -  | -   | -      | M10   | M12   | -   | -   | -      | -   | -      | -   |
|                                |       |    | 11x85 |    |       |    |     |        | 15x85 |       |     |     |        |     |        |     |
| Perforated sleeve FIS H K      | 12x50 |    | 12x85 |    | 16x85 |    |     | 16x130 |       | 20x85 |     |     | 20x130 |     | 20x200 |     |

**Shear load  $V_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C and 72/120°C)**

| compressive strength $f_b$ | use category |     |     |  |  |  |  |  |  |  |  |  |  |     |     |  |
|----------------------------|--------------|-----|-----|--|--|--|--|--|--|--|--|--|--|-----|-----|--|
| 4 N/mm <sup>2</sup>        | w/w          | w/d | 1,2 |  |  |  |  |  |  |  |  |  |  | 1,5 | 1,5 |  |
|                            | d/d          |     |     |  |  |  |  |  |  |  |  |  |  |     |     |  |
| 6 N/mm <sup>2</sup>        | w/w          | w/d | 1,5 |  |  |  |  |  |  |  |  |  |  | 2,0 | 1,5 |  |
|                            | d/d          |     |     |  |  |  |  |  |  |  |  |  |  |     |     |  |
| 8 N/mm <sup>2</sup>        | w/w          | w/d | 1,5 |  |  |  |  |  |  |  |  |  |  | 2,5 | 2,0 |  |
|                            | d/d          |     |     |  |  |  |  |  |  |  |  |  |  |     |     |  |

**Table C47.2:** Characteristic resistance under shear load (Push through anchorage)

| Anchor rod                | M10        | M12 | M16        |
|---------------------------|------------|-----|------------|
| Perforated sleeve FIS H K | 18x130/200 |     | 22x130/200 |

**Shear load  $V_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C and 72/120°C)**

| compressive strength $f_b$ | use category |     |  |  |  |  |  |  |  |  |  |  |     |  |  |  |
|----------------------------|--------------|-----|--|--|--|--|--|--|--|--|--|--|-----|--|--|--|
| 4 N/mm <sup>2</sup>        | w/w          | w/d |  |  |  |  |  |  |  |  |  |  | 1,5 |  |  |  |
|                            | d/d          |     |  |  |  |  |  |  |  |  |  |  |     |  |  |  |
| 6 N/mm <sup>2</sup>        | w/w          | w/d |  |  |  |  |  |  |  |  |  |  | 2,0 |  |  |  |
|                            | d/d          |     |  |  |  |  |  |  |  |  |  |  |     |  |  |  |
| 8 N/mm <sup>2</sup>        | w/w          | w/d |  |  |  |  |  |  |  |  |  |  | 2,5 |  |  |  |
|                            | d/d          |     |  |  |  |  |  |  |  |  |  |  |     |  |  |  |

Factor for job site tests and displacements see annex C110

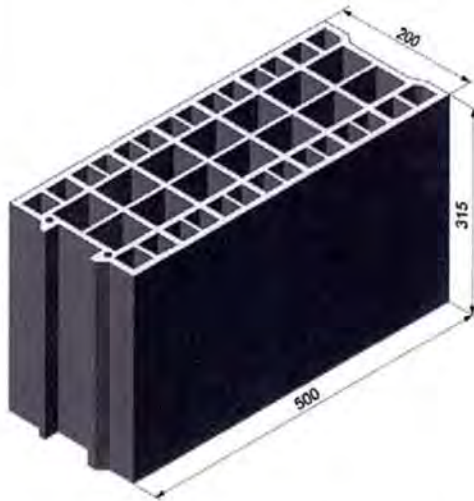
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**Performances**

Vertical perforated brick HLz, FZ 7, filled with mineral wool;  
Characteristic resistance under shear load

**Annex C 47**

**Vertical perforated brick HLz, form B, EN 771-1**



| Vertical perforated brick HLz, form B, EN 771-1 |                    |         |          |
|---|--------------------|---------|----------|
| Producer  | e.g. Bouyer Leroux |         |          |
| Nominal dimensions [mm]                         | length L           | width W | height H |
|   | 500                | 200     | 315      |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 0,6              |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 4 / 6 / 8          |         |          |
| Standard or annex                               | EN 771-1           |         |          |



**Table C48.1:** Installation parameters  
(Pre-positioned anchorage with perforated sleeve FIS HK)

|   |                                |     |       |    |       |    |     |        |         |       |       |     |        |     |
|---|--------------------------------|-----|-------|----|-------|----|-----|--------|---------|-------|-------|-----|--------|-----|
| <b>Anchor rod</b>   | M6                             | M8  | M6    | M8 | -     | M8 | M10 | M8     | M10     | -     | M12   | M16 | M12    | M16 |
| <b>Internal threaded anchor FIS E</b>   | -                              | -   | M6 M8 |    | 11x85 |    | -   | -      | M10 M12 |       | 15x85 |     | -      | -   |
| <b>Perforated sleeve FIS H K</b>  | 12x50                          |     | 12x85 |    | 16x85 |    |     | 16x130 |         | 20x85 |       |     | 20x130 |     |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K</b> |                                |     |       |    |       |    |     |        |         |       |       |     |        |     |
| Max. installation torque $T_{inst,max}$ [Nm]  | 2                              |     |       |    |       |    |     |        |         |       |       |     |        |     |
| <b>General installation parameters</b>  |                                |     |       |    |       |    |     |        |         |       |       |     |        |     |
| Edge distance $c_{min}$   | 120                            |     |       |    |       |    |     |        |         |       |       |     |        |     |
| Spacing   | $s_{min} \parallel$            | 120 |       |    |       |    |     |        |         |       |       |     |        |     |
|   | $s_{cr} \parallel$             | 500 |       |    |       |    |     |        |         |       |       |     |        |     |
|   | $s_{min} \perp = s_{cr} \perp$ | 315 |       |    |       |    |     |        |         |       |       |     |        |     |
| <b>Drilling method</b>  |                                |     |       |    |       |    |     |        |         |       |       |     |        |     |
| Hammer drilling with hard metal hammer drill  |                                |     |       |    |       |    |     |        |         |       |       |     |        |     |

**Table C48.2:** Group factors

|                                       |   |     |       |    |       |    |     |        |         |       |       |     |        |     |
|---------------------------------------|---|-----|-------|----|-------|----|-----|--------|---------|-------|-------|-----|--------|-----|
| <b>Anchor rod</b>                     | M6  | M8  | M6    | M8 | -     | M8 | M10 | M8     | M10     | -     | M12   | M16 | M12    | M16 |
| <b>Internal threaded anchor FIS E</b> | -   | -   | M6 M8 |    | 11x85 |    | -   | -      | M10 M12 |       | 15x85 |     | -      | -   |
| <b>Perforated sleeve FIS H K</b>      | 12x50                                     |     | 12x85 |    | 16x85 |    |     | 16x130 |         | 20x85 |       |     | 20x130 |     |
| Group factors                         | $\alpha_{q,N} \parallel$                  | 1,3 |       |    |       |    |     |        |         |       |       |     |        |     |
|                                       | $\alpha_{q,V} \parallel$                  | 1,7 |       |    |       |    |     |        |         |       |       |     |        |     |
|                                       | $\alpha_{q,N} \perp = \alpha_{q,V} \perp$ | 2   |       |    |       |    |     |        |         |       |       |     |        |     |

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**Performances**  
Vertical perforated brick HLz, form B, dimensions, installation parameters

**Annex C 48**



**Vertical perforated brick HLz, form B, EN 771-1**

**Table C49.1:** Installation parameters  
(Push through anchorage with perforated sleeve FIS HK)

| Anchor rod                                       |                                | M10        | M12 | M16        |
|--|--------------------------------|------------|-----|------------|
| Perforated sleeve FIS H K                        |                                | 18x130/200 |     | 22x130/200 |
| <b>Anchor rod with perforated sleeve FIS H K</b> |                                |            |     |            |
| Max. installation torque                         | $T_{inst,max}$ [Nm]            | 2          |     |            |
| <b>General installation parameters</b>           |                                |            |     |            |
| Edge distance                                    | $c_{min}$                      | 120        |     |            |
| Spacing  | $s_{min} \parallel$            | 120        |     |            |
|  | $s_{cr} \parallel$             | 500        |     |            |
|  | $s_{min} \perp = s_{cr} \perp$ | 315        |     |            |
| <b>Drilling method</b>                           |                                |            |     |            |
| Hammer drilling with hard metal hammer drill     |                                |            |     |            |

**Table C49.2:** Group factors

| Anchor rod                |   | M10        | M12 | M16        |
|---------------------------|---|------------|-----|------------|
| Perforated sleeve FIS H K |   | 18x130/200 |     | 22x130/200 |
| Group factors             | $\alpha_{q,N} \parallel$                  | 1,3        |     |            |
|                           | $\alpha_{q,V} \parallel$                  | 1,7        |     |            |
|                           | $\alpha_{q,N} \perp = \alpha_{q,V} \perp$ | 2          |     |            |

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**Performances**  
Vertical perforated brick HLz, form B, dimensions, installation parameters

**Annex C 49**

**Vertical perforated brick HLz, form B, EN 771-1**

**Table C50.1:** Characteristic resistance under tensile load (Pre-positioned anchorage)

| Anchor rod  |              | M6    | M8   | M6    | M8  | -     | M8 | M10  | M8     | M10   | -     | M12 | M16    | M12 | M16 |
|---|--------------|-------|------|-------|-----|-------|----|------|--------|-------|-------|-----|--------|-----|-----|
| Internal threaded anchor FIS E  |              | -     | -    | M6    | M8  |       |    |      |        | M10   | M12   |     |        |     |     |
|   |              |       |      | 11x85 |     |       |    |      |        | 15x85 |       |     |        |     |     |
| Perforated sleeve FIS H K   |              | 12x50 |      | 12x85 |     | 16x85 |    |      | 16x130 |       | 20x85 |     | 20x130 |     |     |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |       |      |       |     |       |    |      |        |       |       |     |        |     |     |
| compressive strength $f_b$  | use category |       |      |       |     |       |    |      |        |       |       |     |        |     |     |
| 4 N/mm <sup>2</sup>   | w/w          | w/d   | 0,5  |       | 1,5 |       |    | 0,75 |        | 1,5   |       | 1,5 |        |     |     |
|   |              | d/d   | 0,6  |       | 1,5 |       |    | 0,9  |        | 1,5   |       | 2,0 |        |     |     |
| 6 N/mm <sup>2</sup>   | w/w          | w/d   | 0,75 |       | 2,0 |       |    | 1,2  |        | 2,0   |       | 2,5 |        |     |     |
|   |              | d/d   | 0,9  |       | 2,5 |       |    | 1,2  |        | 2,5   |       | 2,5 |        |     |     |
| 8 N/mm <sup>2</sup>   | w/w          | w/d   | 0,9  |       | 3,0 |       |    | 1,5  |        | 3,0   |       | 3,5 |        |     |     |
|   |              | d/d   | 1,2  |       | 3,0 |       |    | 2,0  |        | 3,0   |       | 3,5 |        |     |     |

**Table C50.2:** Characteristic resistance under tensile load (Push through anchorage)

| Anchor rod  |              | M10        |      | M12 |     | M16        |  |
|---|--------------|------------|------|-----|-----|------------|--|
| Perforated sleeve FIS H K   |              | 18x130/200 |      |     |     | 22x130/200 |  |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |            |      |     |     |            |  |
| compressive strength $f_b$  | use category |            |      |     |     |            |  |
| 4 N/mm <sup>2</sup>   | w/w          | w/d        | 0,75 |     | 1,5 |            |  |
|   |              | d/d        | 0,9  |     | 2,0 |            |  |
| 6 N/mm <sup>2</sup>   | w/w          | w/d        | 1,2  |     | 2,5 |            |  |
|   |              | d/d        | 1,2  |     | 2,5 |            |  |
| 8 N/mm <sup>2</sup>   | w/w          | w/d        | 1,5  |     | 3,5 |            |  |
|   |              | d/d        | 2,0  |     | 3,5 |            |  |

Factor for job site tests and displacements see annex C110

Factor for temperature range 72/120°C: 0,83

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**Performances**

Vertical perforated brick HLz, form B, Characteristic resistance under tensile load

**Annex C 50**

### Vertical perforated brick HLz, form B, EN 771-1

**Table C51.1:** Characteristic resistance under shear load (Pre-positioned anchorage)

| Anchor rod   | M6           | M8  | M6    | M8 | -     | M8 | M10 | M8     | M10 | -     | M12   | M16 | M12    | M16 |
|--|--------------|-----|-------|----|-------|----|-----|--------|-----|-------|-------|-----|--------|-----|
| Internal threaded anchor FIS E   | -            |     | -     |    | M6    | M8 | -   |        | -   |       | M10   | M12 | -      |     |
|  |              |     |       |    | 11x85 |    |     |        |     |       | 15x85 |     |        |     |
| Perforated sleeve FIS H K  | 12x50        |     | 12x85 |    | 16x85 |    |     | 16x130 |     | 20x85 |       |     | 20x130 |     |
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |     |       |    |       |    |     |        |     |       |       |     |        |     |
| compressive strength $f_b$   | use category |     |       |    |       |    |     |        |     |       |       |     |        |     |
| 4 N/mm <sup>2</sup>  | w/w          | w/d | 1,5   |    |       |    | 0,9 |        | 1,5 |       | 2,5   |     | 0,9    |     |
|  | d/d          |     |       |    |       |    |     |        |     |       |       |     |        |     |
| 6 N/mm <sup>2</sup>  | w/w          | w/d | 2,5   |    |       |    | 1,5 |        | 2,5 |       | 3,5   |     | 1,5    |     |
|  | d/d          |     |       |    |       |    |     |        |     |       |       |     |        |     |
| 8 N/mm <sup>2</sup>  | w/w          | w/d | 3,5   |    |       |    | 2,0 |        | 3,5 |       | 4,5   |     | 2,0    |     |
|  | d/d          |     |       |    |       |    |     |        |     |       |       |     |        |     |

**Table C51.2:** Characteristic resistance under shear load (Push through anchorage)

| Anchor rod   | M10          |     | M12 |  | M16        |  |
|--|--------------|-----|-----|--|------------|--|
| Perforated sleeve FIS H K  | 18x130/200   |     |     |  | 22x130/200 |  |
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |     |     |  |            |  |
| compressive strength $f_b$   | use category |     |     |  |            |  |
| 4 N/mm <sup>2</sup>  | w/w          | w/d | 0,9 |  |            |  |
|  | d/d          |     |     |  |            |  |
| 6 N/mm <sup>2</sup>  | w/w          | w/d | 1,5 |  |            |  |
|  | d/d          |     |     |  |            |  |
| 8 N/mm <sup>2</sup>  | w/w          | w/d | 2,0 |  |            |  |
|  | d/d          |     |     |  |            |  |

Factor for job site tests and displacements see annex C110

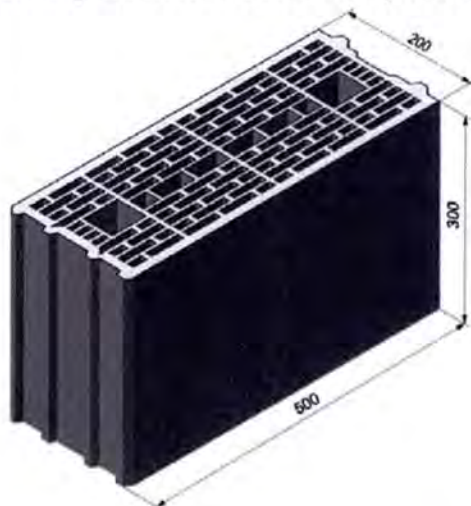
fischer injektion system FIS V masonry

**Performances**

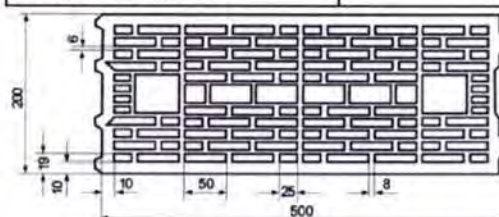
Vertical perforated brick HLz, form B, Characteristic resistance under shear load

**Annex C 51**

### Vertical perforated brick HLz, form B, EN 771-1



| Vertical perforated brick HLz, form B, EN 771-1 |                   |         |          |
|---|-------------------|---------|----------|
| Producer  | e.g. Wienerberger |         |          |
| Nominal dimensions [mm]                         | length L          | width W | height H |
|   | 500               | 200     | 300      |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 0,7             |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 4 / 6 / 8 / 10    |         |          |
| Standard or annex                               | EN 771-1          |         |          |



**Table C52.1:** Installation parameters  
(Pre-positioned anchorage with perforated sleeve FIS HK)

|   |                                |     |       |    |       |    |     |        |     |       |       |     |        |     |  |
|---|--------------------------------|-----|-------|----|-------|----|-----|--------|-----|-------|-------|-----|--------|-----|--|
| <b>Anchor rod</b>   | M6                             | M8  | M6    | M8 | -     | M8 | M10 | M8     | M10 | --    | M12   | M16 | M12    | M16 |  |
| <b>Internal threaded anchor FIS E</b>   | -                              |     | -     |    | M6    | M8 | -   |        | -   |       | M10   | M12 | -      |     |  |
|   |                                |     |       |    | 11x85 |    |     |        |     |       | 15x85 |     |        |     |  |
| <b>Perforated sleeve FIS H K</b>  | 12x50                          |     | 12x85 |    | 16x85 |    |     | 16x130 |     | 20x85 |       |     | 20x130 |     |  |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K</b> |                                |     |       |    |       |    |     |        |     |       |       |     |        |     |  |
| Max. installation torque $T_{inst,max}$ [Nm]  | 2                              |     |       |    |       |    |     |        |     |       |       |     |        |     |  |
| <b>General installation parameters</b>  |                                |     |       |    |       |    |     |        |     |       |       |     |        |     |  |
| Edge distance $c_{min}$   | 50                             |     |       |    | 80    |    |     |        | 50  |       | 80    |     |        |     |  |
| Spacing [mm]  | $s_{min} \parallel$            | 100 |       |    |       |    |     |        |     |       |       |     |        |     |  |
|   | $s_{cr} \parallel$             | 500 |       |    |       |    |     |        |     |       |       |     |        |     |  |
|   | $s_{min} \perp = s_{cr} \perp$ | 300 |       |    |       |    |     |        |     |       |       |     |        |     |  |
| <b>Drilling method</b>  |                                |     |       |    |       |    |     |        |     |       |       |     |        |     |  |
| Hammer drilling with hard metal hammer drill  |                                |     |       |    |       |    |     |        |     |       |       |     |        |     |  |

**Table C52.2:** Group factors

|                                       |   |     |       |    |       |    |     |        |     |       |       |     |        |     |  |
|---------------------------------------|---|-----|-------|----|-------|----|-----|--------|-----|-------|-------|-----|--------|-----|--|
| <b>Anchor rod</b>                     | M6  | M8  | M6    | M8 | -     | M8 | M10 | M8     | M10 | -     | M12   | M16 | M12    | M16 |  |
| <b>Internal threaded anchor FIS E</b> | -   |     | -     |    | M6    | M8 | -   |        | -   |       | M10   | M12 | -      |     |  |
|                                       |   |     |       |    | 11x85 |    |     |        |     |       | 15x85 |     |        |     |  |
| <b>Perforated sleeve FIS H K</b>      | 12x50                                     |     | 12x85 |    | 16x85 |    |     | 16x130 |     | 20x85 |       |     | 20x130 |     |  |
| Group factors [-]                     | $\alpha_{q,N} \parallel$                  | 1,4 |       |    |       |    |     |        |     |       |       |     |        |     |  |
|                                       | $\alpha_{q,V} \parallel$                  | 2   |       |    |       |    |     |        |     |       |       |     |        |     |  |
|                                       | $\alpha_{q,N} \perp = \alpha_{q,V} \perp$ | 2   |       |    |       |    |     |        |     |       |       |     |        |     |  |

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**Performances**

Vertical perforated brick HLz, form B, dimensions, installation parameters

**Annex C 52**

**Vertical perforated brick HLz, form B, EN 771-1**

**Table C53.1:** Installation parameters  
(Push through anchorage with perforated sleeve FIS HK)

| Anchor rod                                       |                                | M10        | M12 | M16        |
|--|--------------------------------|------------|-----|------------|
| Perforated sleeve FIS H K                        |                                | 18x130/200 |     | 22x130/200 |
| <b>Anchor rod with perforated sleeve FIS H K</b> |                                |            |     |            |
| Max. installation torque                         | $T_{inst,max}$ [Nm]            | 2          |     |            |
| <b>General installation parameters</b>           |                                |            |     |            |
| Edge distance                                    | $c_{min}$                      | 80         |     |            |
| Spacing  | $s_{min} \parallel$            | 100        |     |            |
|  | $s_{cr} \parallel$             | 500        |     |            |
|  | $s_{min} \perp = s_{cr} \perp$ | 300        |     |            |
| <b>Drilling method</b>                           |                                |            |     |            |
| Hammer drilling with hard metal hammer drill     |                                |            |     |            |

**Table C53.2:** Group factors

| Anchor rod                |   | M10        | M12 | M16        |
|---------------------------|---|------------|-----|------------|
| Perforated sleeve FIS H K |   | 18x130/200 |     | 22x130/200 |
| Group factors             | $\alpha_{a,N} \parallel$                  | 1,4        |     |            |
|                           | $\alpha_{a,V} \parallel$                  | 2          |     |            |
|                           | $\alpha_{a,N} \perp = \alpha_{a,V} \perp$ | 2          |     |            |

fischer injektion system FIS V masonry

**Performances**

Vertical perforated brick HLz, form B, dimensions, installation parameters

**Annex C 53**

**Vertical perforated brick HLz, form B, EN 771-1**

**Table C54.1:** Characteristic resistance under tensile load (Pre-positioned anchorage)

| Anchor rod  | M6           | M8    | M6    | M8 | -     | M8     | M10 | M8  | M10   | -     | M12 | M16    | M12 | M16 |     |  |  |
|---|--------------|-------|-------|----|-------|--------|-----|-----|-------|-------|-----|--------|-----|-----|-----|--|--|
| Internal threaded anchor FIS E  | -            | -     | M6    | M8 | 11x85 | -      | -   | M10 | M12   | 15x85 | -   | -      | -   | -   |     |  |  |
| Perforated sleeve FIS H K   | 12x50        | 12x85 | 16x85 |    |       | 16x130 |     |     | 20x85 |       |     | 20x130 |     |     |     |  |  |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |       |       |    |       |        |     |     |       |       |     |        |     |     |     |  |  |
| compressive strength $f_b$  | use category |       |       |    |       |        |     |     |       |       |     |        |     |     |     |  |  |
| 4 N/mm <sup>2</sup>   | w/w          | w/d   | 0,5   |    |       | 0,6    |     |     | 1,2   |       |     | 0,75   |     |     | 1,5 |  |  |
|   | d/d          |       | 0,6   |    |       | 0,75   |     |     | 1,2   |       |     | 0,9    |     |     | 1,5 |  |  |
| 6 N/mm <sup>2</sup>   | w/w          | w/d   | 0,75  |    |       | 0,9    |     |     | 1,5   |       |     | 1,2    |     |     | 2,0 |  |  |
|   | d/d          |       | 0,9   |    |       | 1,2    |     |     | 2,0   |       |     | 1,2    |     |     | 2,5 |  |  |
| 8 N/mm <sup>2</sup>   | w/w          | w/d   | 0,9   |    |       | 1,2    |     |     | 2,0   |       |     | 1,5    |     |     | 2,5 |  |  |
|   | d/d          |       | 1,2   |    |       | 1,5    |     |     | 2,5   |       |     | 1,5    |     |     | 3,0 |  |  |
| 10 N/mm <sup>2</sup>  | w/w          | w/d   | 1,2   |    |       | 1,5    |     |     | 2,5   |       |     | 2,0    |     |     | 3,5 |  |  |
|   | d/d          |       | 1,5   |    |       | 2,0    |     |     | 3,0   |       |     | 2,0    |     |     | 4,0 |  |  |

**Table C54.2:** Characteristic resistance under tensile load (Push through anchorage)

| Anchor rod  | M10          |     | M12 |  | M16        |  |
|---|--------------|-----|-----|--|------------|--|
| Perforated sleeve FIS H K   | 18x130/200   |     |     |  | 22x130/200 |  |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |     |     |  |            |  |
| compressive strength $f_b$  | use category |     |     |  |            |  |
| 4 N/mm <sup>2</sup>   | w/w          | w/d | 1,2 |  | 1,5        |  |
|   | d/d          |     | 1,2 |  | 1,5        |  |
| 6 N/mm <sup>2</sup>   | w/w          | w/d | 1,5 |  | 2,0        |  |
|   | d/d          |     | 2,0 |  | 2,5        |  |
| 8 N/mm <sup>2</sup>   | w/w          | w/d | 2,0 |  | 2,5        |  |
|   | d/d          |     | 2,5 |  | 3,0        |  |
| 10 N/mm <sup>2</sup>  | w/w          | w/d | 2,5 |  | 3,5        |  |
|   | d/d          |     | 3,0 |  | 4,0        |  |

Factor for job site tests and displacements see annex C110

Factor for temperature range 72/120°C: 0,83

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**Performances**

Vertical perforated brick HLz, form B, Characteristic resistance under tensile load

**Annex C 54**

**Vertical perforated brick HLz, form B, EN 771-1**

**Table C55.1:** Characteristic resistance under shear load (Pre-positioned anchorage)

| Anchor rod   | M6           | M8  | M6    | M8  | -     | M8  | M10 | M8     | M10 | -     | M12   | M16 | M12    | M16 |
|--|--------------|-----|-------|-----|-------|-----|-----|--------|-----|-------|-------|-----|--------|-----|
| Internal threaded anchor FIS E   | -            |     | -     |     | M6    | M8  | -   |        | -   |       | M10   | M12 | -      |     |
|  |              |     |       |     | 11x85 |     |     |        |     |       | 15x85 |     |        |     |
| Perforated sleeve FIS H K  | 12x50        |     | 12x85 |     | 16x85 |     |     | 16x130 |     | 20x85 |       |     | 20x130 |     |
| <b>Shear load <math>V_{RK}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |     |       |     |       |     |     |        |     |       |       |     |        |     |
| compressive strength $f_b$   | use category |     |       |     |       |     |     |        |     |       |       |     |        |     |
|  | w/w          | w/d |       |     |       |     |     |        |     |       |       |     |        |     |
| 4 N/mm <sup>2</sup>  | d/d          |     | 0,9   | 1,2 | 0,9   | 1,2 | 0,6 | 2,0    |     | 0,6   |       |     |        |     |
|  | w/w          | w/d |       |     |       |     |     |        |     |       |       |     |        |     |
| 6 N/mm <sup>2</sup>  | d/d          |     | 1,2   | 1,5 | 1,2   | 1,5 | 0,9 | 3,0    |     | 0,9   |       |     |        |     |
|  | w/w          | w/d |       |     |       |     |     |        |     |       |       |     |        |     |
| 8 N/mm <sup>2</sup>  | d/d          |     | 1,5   | 2,0 | 1,5   | 2,0 | 1,2 | 4,0    |     | 1,2   |       |     |        |     |
|  | w/w          | w/d |       |     |       |     |     |        |     |       |       |     |        |     |
| 10 N/mm <sup>2</sup>   | d/d          |     | 2,0   | 3,0 | 2,0   | 3,0 | 1,5 | 5,0    |     | 1,5   |       |     |        |     |
|  | w/w          | w/d |       |     |       |     |     |        |     |       |       |     |        |     |

**Table C55.2:** Characteristic resistance under shear load (Push through anchorage)

| Anchor rod   | M10          | M12 | M16        |
|--|--------------|-----|------------|
| Perforated sleeve FIS H K  | 18x130/200   |     | 22x130/200 |
| <b>Shear load <math>V_{RK}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |     |            |
| compressive strength $f_b$   | use category |     |            |
|  | w/w          | w/d |            |
| 4 N/mm <sup>2</sup>  | d/d          |     | 0,6        |
|  | w/w          | w/d |            |
| 6 N/mm <sup>2</sup>  | d/d          |     | 0,9        |
|  | w/w          | w/d |            |
| 8 N/mm <sup>2</sup>  | d/d          |     | 1,2        |
|  | w/w          | w/d |            |
| 10 N/mm <sup>2</sup>   | d/d          |     | 1,5        |
|  | w/w          | w/d |            |

Factor for job site tests and displacements see annex C110

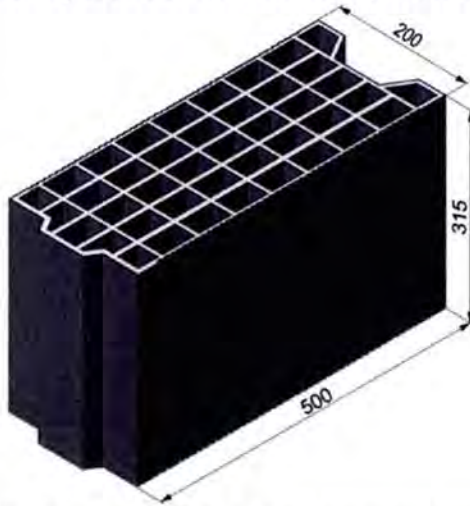
fischer injektion system FIS V masonry

**Performances**

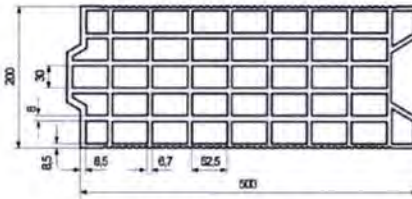
Vertical perforated brick HLz, form B, Characteristic resistance under shear load

**Annex C 55**

**Vertical perforated brick HLz, form B, EN 771-1**



| Vertical perforated brick HLz, form B, EN 771-1 |               |         |          |
|---|---------------|---------|----------|
| Producer  | e.g. Terreal  |         |          |
| Nominal dimensions [mm]                         | length L      | width W | height H |
|   | 500           | 200     | 315      |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 0,7         |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 2 / 4 / 6 / 8 |         |          |
| Standard or annex                               | EN 771-1      |         |          |



**Table C56.1:** Installation parameters  
(Pre-positioned anchorage with perforated sleeve FIS HK)

|   |                     |      |       |    |       |    |     |        |     |       |     |        |     |     |
|---|---------------------|------|-------|----|-------|----|-----|--------|-----|-------|-----|--------|-----|-----|
| <b>Anchor rod</b>   | M6                  | M8   | M6    | M8 | -     | M8 | M10 | M8     | M10 | -     | M12 | M16    | M12 | M16 |
| <b>Internal threaded anchor FIS E</b>   | -                   | -    | -     | -  | M6    | M8 | -   | -      | -   | M10   | M12 | -      | -   | -   |
|   |                     |      |       |    | 11x85 |    |     |        |     | 15x85 |     |        |     |     |
| <b>Perforated sleeve FIS H K</b>  | 12x50               |      | 12x85 |    | 16x85 |    |     | 16x130 |     | 20x85 |     | 20x130 |     |     |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K</b> |                     |      |       |    |       |    |     |        |     |       |     |        |     |     |
| Max. installation torque  | $T_{inst,max}$      | [Nm] | 2     |    |       |    |     |        |     |       |     |        |     |     |
| <b>General installation parameters</b>  |                     |      |       |    |       |    |     |        |     |       |     |        |     |     |
| Edge distance   | $c_{min}$           |      | 50    |    |       |    | 80  |        |     |       | 50  |        | 80  |     |
| Spacing   | $s_{min} \parallel$ |      | 100   |    |       |    |     |        |     |       |     |        |     |     |
|   | $s_{cr} \parallel$  | [mm] | 500   |    |       |    |     |        |     |       |     |        |     |     |
|   | $s_{min} \perp$     |      | 100   |    |       |    |     |        |     |       |     |        |     |     |
|   | $s_{cr} \perp$      |      | 315   |    |       |    |     |        |     |       |     |        |     |     |
| <b>Drilling method</b>  |                     |      |       |    |       |    |     |        |     |       |     |        |     |     |
| Hammer drilling with hard metal hammer drill  |                     |      |       |    |       |    |     |        |     |       |     |        |     |     |

**Table C56.2:** Group factors

|                                       |                          |     |       |    |       |    |     |        |     |       |     |        |     |     |
|---------------------------------------|--------------------------|-----|-------|----|-------|----|-----|--------|-----|-------|-----|--------|-----|-----|
| <b>Anchor rod</b>                     | M6                       | M8  | M6    | M8 | -     | M8 | M10 | M8     | M10 | -     | M12 | M16    | M12 | M16 |
| <b>Internal threaded anchor FIS E</b> | -                        | -   | -     | -  | M6    | M8 | -   | -      | -   | M10   | M12 | -      | -   | -   |
|                                       |                          |     |       |    | 11x85 |    |     |        |     | 15x85 |     |        |     |     |
| <b>Perforated sleeve FIS H K</b>      | 12x50                    |     | 12x85 |    | 16x85 |    |     | 16x130 |     | 20x85 |     | 20x130 |     |     |
| Group factors                         | $\alpha_{q,N} \parallel$ | [-] | 1,1   |    |       |    |     |        |     |       |     |        |     |     |
|                                       | $\alpha_{q,V} \parallel$ |     | 1,2   |    |       |    |     |        |     |       |     |        |     |     |
|                                       | $\alpha_{q,N} \perp$     |     | 1,1   |    |       |    |     |        |     |       |     |        |     |     |
|                                       | $\alpha_{q,V} \perp$     |     | 1,2   |    |       |    |     |        |     |       |     |        |     |     |

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**Performances**

Vertical perforated brick HLz, form B, dimensions, installation parameters

**Annex C 56**



| <b>Vertical perforated brick HLz, form B, EN 771-1</b>  |                      |                   |            |
|---|----------------------|-------------------|------------|
| <b>Table C57.1: Installation parameters</b><br>(Push through anchorage with perforated sleeve FIS HK) |                      |                   |            |
| <b>Anchor rod</b>   |                      | <b>M10</b>        | <b>M12</b> |
| <b>Perforated sleeve FIS H K</b>  |                      | <b>18x130/200</b> |            |
|   |                      |                   | <b>M16</b> |
|   |                      | <b>22x130/200</b> |            |
| <b>Anchor rod with perforated sleeve FIS H K</b>  |                      |                   |            |
| Max. installation torque  | $T_{inst,max}$       | [Nm]              | 2          |
| <b>General installation parameters</b>  |                      |                   |            |
| Edge distance   | $c_{min}$            |                   | 80         |
|   | $s_{min}   $         |                   | 100        |
| Spacing   | $s_{cr}   $          | [mm]              | 500        |
|   | $s_{min} \perp$      |                   | 100        |
|   | $s_{cr} \perp$       |                   | 315        |
| <b>Drilling method</b>  |                      |                   |            |
| Hammer drilling with hard metal hammer drill  |                      |                   |            |
| <b>Table C57.2: Group factors</b>   |                      |                   |            |
| <b>Anchor rod</b>   |                      | <b>M10</b>        | <b>M12</b> |
| <b>Perforated sleeve FIS H K</b>  |                      | <b>18x130/200</b> |            |
|   |                      |                   | <b>M16</b> |
|   |                      | <b>22x130/200</b> |            |
| Group factors   | $\alpha_{q,N}   $    | [-]               | 1,1        |
|   | $\alpha_{q,V}   $    |                   | 1,2        |
|   | $\alpha_{q,N} \perp$ |                   | 1,1        |
|   | $\alpha_{q,V} \perp$ |                   | 1,2        |
| fischer injektion system FIS V masonry  |                      |                   |            |
| <b>Performances</b><br>Vertical perforated brick HLz, form B, dimensions, installation parameters     |                      | <b>Annex C 57</b> |            |

**Vertical perforated brick HLz, form B, EN 771-1**

**Table C58.1:** Characteristic resistance under tensile load (Pre-positioned anchorage)

| Anchor rod  | M6           | M8    | M6    | M8  | - | M8     | M10 | M8 | M10   | -   | M12 | M16    | M12 | M16 |
|---|--------------|-------|-------|-----|---|--------|-----|----|-------|-----|-----|--------|-----|-----|
| Internal threaded anchor FIS E  | -            | -     | M6    | M8  |   |        |     |    | M10   | M12 |     |        |     |     |
|   |              |       | 11x85 |     |   |        |     |    | 15x85 |     |     |        |     |     |
| Perforated sleeve FIS H K   | 12x50        | 12x85 | 16x85 |     |   | 16x130 |     |    | 20x85 |     |     | 20x130 |     |     |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |       |       |     |   |        |     |    |       |     |     |        |     |     |
| compressive strength $f_b$  | use category |       |       |     |   |        |     |    |       |     |     |        |     |     |
| 2 N/mm <sup>2</sup>   | w/w          | w/d   | 0,5   |     |   |        |     |    |       |     |     |        |     |     |
|   | d/d          |       | 0,5   |     |   | 0,6    |     |    | 0,5   |     |     | 0,6    |     |     |
| 4 N/mm <sup>2</sup>   | w/w          | w/d   | 0,9   |     |   |        |     |    |       |     |     |        |     |     |
|   | d/d          |       | 0,9   | 1,2 |   |        |     |    |       |     |     |        |     |     |
| 6 N/mm <sup>2</sup>   | w/w          | w/d   | 1,5   |     |   |        |     |    |       |     |     |        |     |     |
|   | d/d          |       | 1,5   |     |   |        |     |    |       |     |     |        |     |     |
| 8 N/mm <sup>2</sup>   | w/w          | w/d   | 2,0   |     |   |        |     |    |       |     |     |        |     |     |
|   | d/d          |       | 2,0   |     |   |        |     |    |       |     |     |        |     |     |

**Table C58.2:** Characteristic resistance under tensile load (Push through anchorage)

| Anchor rod  | M10          | M12 | M16        |
|---|--------------|-----|------------|
| Perforated sleeve FIS H K   | 18x130/200   |     | 22x130/200 |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |     |            |
| compressive strength $f_b$  | use category |     |            |
| 2 N/mm <sup>2</sup>   | w/w          | w/d | 0,5        |
|   | d/d          |     | 0,6        |
| 4 N/mm <sup>2</sup>   | w/w          | w/d | 0,9        |
|   | d/d          |     | 1,2        |
| 6 N/mm <sup>2</sup>   | w/w          | w/d | 1,5        |
|   | d/d          |     | 1,5        |
| 8 N/mm <sup>2</sup>   | w/w          | w/d | 2,0        |
|   | d/d          |     | 2,0        |

Factor for job site tests and displacements see annex C110

Factor for temperature range 72/120°C: 0,83

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**Performances**

Vertical perforated brick HLz, form B, Characteristic resistance under tensile load

**Annex C 58**

**Vertical perforated brick HLz, form B, EN 771-1**

**Table C59.1:** Characteristic resistance under shear load (Pre-positioned anchorage)

| Anchor rod   | M6           | M8  | M6    | M8  | -     | M8  | M10 | M8     | M10 | -     | M12   | M16 | M12    | M16 |
|--|--------------|-----|-------|-----|-------|-----|-----|--------|-----|-------|-------|-----|--------|-----|
| Internal threaded anchor FIS E   | -            |     | -     |     | M6    | M8  | -   |        | -   |       | M10   | M12 | -      |     |
|  |              |     |       |     | 11x85 |     |     |        |     |       | 15x85 |     |        |     |
| Perforated sleeve FIS H K  | 12x50        |     | 12x85 |     | 16x85 |     |     | 16x130 |     | 20x85 |       |     | 20x130 |     |
| <b>Shear load <math>V_{RK}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |     |       |     |       |     |     |        |     |       |       |     |        |     |
| compressive strength $f_b$   | use category |     |       |     |       |     |     |        |     |       |       |     |        |     |
| 2 N/mm <sup>2</sup>  | w/w          | w/d | 0,3   | 0,6 | 0,3   | 0,6 | 0,6 | 0,6    | 0,9 | 0,9   | 0,9   | 1,2 | 1,5    | 2,0 |
|  | d/d          |     |       |     |       |     |     |        |     |       |       |     |        |     |
| 4 N/mm <sup>2</sup>  | w/w          | w/d | 0,75  | 1,2 | 0,75  | 1,2 | 1,2 | 1,2    | 2,0 | 2,0   | 2,0   | 2,0 | 3,0    | 1,5 |
|  | d/d          |     |       |     |       |     |     |        |     |       |       |     |        |     |
| 6 N/mm <sup>2</sup>  | w/w          | w/d | 0,9   | 2,0 | 0,9   | 2,0 | 2,0 | 1,5    | 3,0 | 3,0   | 3,0   | 3,0 | 3,0    | 2,0 |
|  | d/d          |     |       |     |       |     |     |        |     |       |       |     |        |     |
| 8 N/mm <sup>2</sup>  | w/w          | w/d | 1,5   | 2,5 | 1,5   | 2,5 | 2,5 | 2,0    | 4,0 | 4,0   | 4,0   | 4,0 | 4,0    | 3,0 |
|  | d/d          |     |       |     |       |     |     |        |     |       |       |     |        |     |

**Table C59.2:** Characteristic resistance under shear load (Push through anchorage)

| Anchor rod   | M10          | M12 | M16        |
|--|--------------|-----|------------|
| Perforated sleeve FIS H K  | 18x130/200   |     | 22x130/200 |
| <b>Shear load <math>V_{RK}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |     |            |
| compressive strength $f_b$   | use category |     |            |
| 2 N/mm <sup>2</sup>  | w/w          | w/d | 0,6        |
|  | d/d          |     |            |
| 4 N/mm <sup>2</sup>  | w/w          | w/d | 1,2        |
|  | d/d          |     |            |
| 6 N/mm <sup>2</sup>  | w/w          | w/d | 1,5        |
|  | d/d          |     |            |
| 8 N/mm <sup>2</sup>  | w/w          | w/d | 2,0        |
|  | d/d          |     |            |

Factor for job site tests and displacements see annex C110

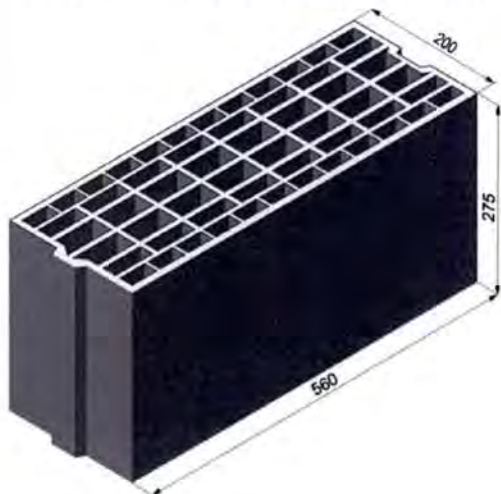
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**Performances**

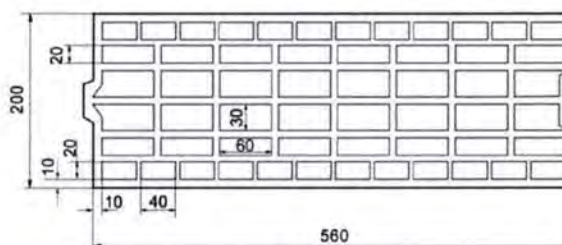
Vertical perforated brick HLz, form B, Characteristic resistance under shear load

**Annex C 59**

### Vertical perforated brick HLz, form B, EN 771-1



| Vertical perforated brick HLz, form B, EN 771-1 |            |         |          |
|---|------------|---------|----------|
| Producer  | e.g. Imery |         |          |
| Nominal dimensions [mm]                         | length L   | width W | height H |
|   | 560        | 200     | 275      |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 0,7      |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 4 / 6 / 8  |         |          |
| Standard or annex                               | EN 771-1   |         |          |



**Table C60.1:** Installation parameters

| Anchor rod                                       | M8                       | M10 | M10        | M12 | M12    | M16 | M16        |  |
|--|--------------------------|-----|------------|-----|--------|-----|------------|--|
| Perforated sleeve FIS H K                        | 16x130                   |     | 18x130/200 |     | 20x130 |     | 22x130/200 |  |
| <b>Anchor rod with perforated sleeve FIS H K</b> |                          |     |            |     |        |     |            |  |
| Max. installation torque $T_{inst,max}$ [Nm]     | 2                        |     |            |     |        |     |            |  |
| <b>General installation parameters</b>           |                          |     |            |     |        |     |            |  |
| Edge distance $c_{min}$                          | 80                       |     |            |     |        |     |            |  |
| Spacing $s_{min}$    = $s_{cr}$    [mm]          | 560                      |     |            |     |        |     |            |  |
|  | $s_{min}$ ⊥ = $s_{cr}$ ⊥ | 275 |            |     |        |     |            |  |
| <b>Drilling method</b>                           |                          |     |            |     |        |     |            |  |
| Hammer drilling with hard metal hammer drill     |                          |     |            |     |        |     |            |  |

**Table C60.2:** Group factors

| Anchor rod   | M8     | M10 | M10        | M12 | M12    | M16 | M16        |  |
|--|--------|-----|------------|-----|--------|-----|------------|--|
| Perforated sleeve FIS H K  | 16x130 |     | 18x130/200 |     | 20x130 |     | 22x130/200 |  |
| Group factors $\alpha_{g,N}$   , $\alpha_{g,V}$   , $\alpha_{g,N}$ ⊥, $\alpha_{g,V}$ ⊥ [-] | 2      |     |            |     |        |     |            |  |

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**Performances**

Vertical perforated brick HLz, form B, dimensions, installation parameters

**Annex C 60**

**Vertical perforated brick HLz, form B, EN 771-1**

**Table C61.1:** Characteristic resistance under tensile load

| Anchor rod  |              | M8     | M10 | M10        | M12 | M12    | M16 | M16        |
|---|--------------|--------|-----|------------|-----|--------|-----|------------|
| Perforated sleeve FIS H K   |              | 16x130 |     | 18x130/200 |     | 20x130 |     | 22x130/200 |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |        |     |            |     |        |     |            |
| compressive strength $f_b$  | use category |        |     |            |     |        |     |            |
|   | w/w          | w/d    |     |            |     |        |     |            |
| 4 N/mm <sup>2</sup>   | w/w          | w/d    | 0,9 |            |     | 1,2    |     |            |
|   | d/d          |        | 1,2 |            |     | 1,5    |     |            |
| 6 N/mm <sup>2</sup>   | w/w          | w/d    | 1,5 |            |     | 2,0    |     |            |
|   | d/d          |        | 1,5 |            |     | 2,0    |     |            |
| 8 N/mm <sup>2</sup>   | w/w          | w/d    | 2,0 |            |     | 2,5    |     |            |
|   | d/d          |        | 2,5 |            |     | 3,0    |     |            |

Factor for temperature range 72/120°C: 0,83

**Table C61.2:** Characteristic resistance under shear load

| Anchor rod   |              | M8     | M10 | M10        | M12 | M12    | M16 | M16        |
|--|--------------|--------|-----|------------|-----|--------|-----|------------|
| Perforated sleeve FIS H K  |              | 16x130 |     | 18x130/200 |     | 20x130 |     | 22x130/200 |
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |        |     |            |     |        |     |            |
| compressive strength $f_b$   | use category |        |     |            |     |        |     |            |
|  | w/w          | w/d    |     |            |     |        |     |            |
| 4 N/mm <sup>2</sup>  | w/w          | w/d    |     |            |     | 0,9    |     |            |
|  | d/d          |        |     |            |     | 0,9    |     |            |
| 6 N/mm <sup>2</sup>  | w/w          | w/d    |     |            |     | 1,5    |     |            |
|  | d/d          |        |     |            |     | 1,5    |     |            |
| 8 N/mm <sup>2</sup>  | w/w          | w/d    |     |            |     | 2,0    |     |            |
|  | d/d          |        |     |            |     | 2,0    |     |            |

Factor for job site tests and displacements see annex C110

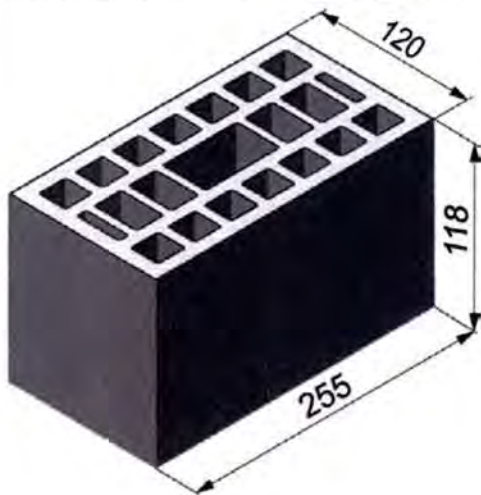
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**Performances**

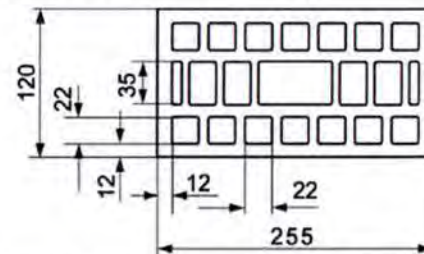
Vertical perforated brick HLz, form B,  
Characteristic resistance under tensile and shear load

**Annex C 61**

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



| Vertical perforated brick HLz, EN 771-1         |                         |         |          |
|---|-------------------------|---------|----------|
| Producer  | e.g. Wienerberger       |         |          |
| Nominal dimensions [mm]                         | length L                | width W | height H |
|   | 255                     | 120     | 118      |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 1,0                   |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 2 / 4 / 6 / 8 / 10 / 12 |         |          |
| Standard or annex                               | EN 771-1                |         |          |



**Table C62.1:** Installation parameters

|   |  |    |       |    |       |    |     |       |       |     |
|---|--|----|-------|----|-------|----|-----|-------|-------|-----|
| <b>Anchor rod</b>   | M6                                     | M8 | M6    | M8 | -     | M8 | M10 | -     | M12   | M16 |
| <b>Internal threaded anchor FIS E</b>   | -                                      |    | -     |    | M6    | M8 | -   |       | M10   | M12 |
|   |  |    |       |    | 11x85 |    |     |       | 15x85 |     |
| <b>Perforated sleeve FIS H K</b>  | 12x50                                  |    | 12x85 |    | 16x85 |    |     | 20x85 |       |     |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K</b> |  |    |       |    |       |    |     |       |       |     |
| Max. installation torque $T_{inst,max}$ [Nm]  | 2                                      |    |       |    |       |    |     |       |       |     |
| <b>General installation parameters</b>  |  |    |       |    |       |    |     |       |       |     |
| Edge distance $c_{min}$   | 60                                     |    |       |    |       |    |     |       |       |     |
| Spacing $s_{cr}$ [mm]   | $s_{cr \parallel} = s_{min \parallel}$ |    |       |    |       |    |     |       |       |     |
|   | $s_{cr \perp} = s_{min \perp}$         |    |       |    |       |    |     |       |       |     |
| <b>Drilling method</b>  |  |    |       |    |       |    |     |       |       |     |
| Hammer drilling with hard metal hammer drill  |  |    |       |    |       |    |     |       |       |     |

**Table C62.2:** Group factors

|                                       |                          |    |       |    |       |    |     |       |       |     |
|---------------------------------------|--------------------------|----|-------|----|-------|----|-----|-------|-------|-----|
| <b>Anchor rod</b>                     | M6                       | M8 | M6    | M8 | -     | M8 | M10 | -     | M12   | M16 |
| <b>Internal threaded anchor FIS E</b> | -                        |    | -     |    | M6    | M8 | -   |       | M10   | M12 |
|                                       |                          |    |       |    | 11x85 |    |     |       | 15x85 |     |
| <b>Perforated sleeve FIS H K</b>      | 12x50                    |    | 12x85 |    | 16x85 |    |     | 20x85 |       |     |
| Group factors $\alpha_{g,N}$ [-]      | $\alpha_{g,N \parallel}$ |    |       |    |       |    |     |       |       |     |
|                                       | $\alpha_{g,N \perp}$     |    |       |    |       |    |     |       |       |     |
|                                       | $\alpha_{g,V \parallel}$ |    |       |    |       |    |     |       |       |     |
|                                       | $\alpha_{g,V \perp}$     |    |       |    |       |    |     |       |       |     |
| 2                                     |                          |    |       |    |       |    |     |       |       |     |

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**Performances**

Vertical perforated brick HLz, dimensions, installation parameters

**Annex C 62**

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

**Table C63.1:** Characteristic resistance under tensile load

| Anchor rod  |              | M6    | M8  | M6    | M8  | -     | M8   | M10 | -     | M12   | M16 |   |
|---|--------------|-------|-----|-------|-----|-------|------|-----|-------|-------|-----|---|
| Internal threaded anchor FIS E  |              | -     |     | -     |     | M6    | M8   | -   |       | M10   | M12 | - |
|   |              |       |     |       |     | 11x85 |      |     |       | 15x85 |     |   |
| Perforated sleeve FIS H K   |              | 12x50 |     | 12x85 |     | 16x85 |      |     | 20x85 |       |     |   |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |       |     |       |     |       |      |     |       |       |     |   |
| compressive strength $f_b$  | use category |       |     |       |     |       |      |     |       |       |     |   |
| 2 N/mm <sup>2</sup>   | w/w          | w/d   | 0,4 |       | 0,5 |       | -    |     |       |       |     |   |
|   | d/d          |       | 0,5 |       | 0,5 |       | -    |     |       |       |     |   |
| 4 N/mm <sup>2</sup>   | w/w          | w/d   | 0,9 |       | 0,9 |       | 0,5  |     |       |       |     |   |
|   | d/d          |       | 0,9 |       | 1,2 |       | 0,5  |     |       |       |     |   |
| 6 N/mm <sup>2</sup>   | w/w          | w/d   | 1,2 |       | 1,5 |       | 0,75 |     |       |       |     |   |
|   | d/d          |       | 1,5 |       | 1,5 |       | 0,75 |     |       |       |     |   |
| 8 N/mm <sup>2</sup>   | w/w          | w/d   | 1,5 |       | 2,0 |       | 0,9  |     |       |       |     |   |
|   | d/d          |       | 2,0 |       | 2,0 |       | 0,9  |     |       |       |     |   |
| 10 N/mm <sup>2</sup>  | w/w          | w/d   | 2,0 |       | 2,5 |       | 1,2  |     |       |       |     |   |
|   | d/d          |       | 2,5 |       | 2,5 |       | 1,2  |     |       |       |     |   |
| 12 N/mm <sup>2</sup>  | w/w          | w/d   | 2,5 |       | 3,0 |       | 1,5  |     |       |       |     |   |
|   | d/d          |       | 3,0 |       | 3,5 |       | 1,5  |     |       |       |     |   |

Factor for job site tests and displacements see annex C110

Factor for temperature range 72/120°C: 0,83

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**Performances**

Vertical perforated brick HLz, Characteristic resistance under tensile load

**Annex C 63**

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

**Table C64.1:** Characteristic resistance under shear load

| Anchor rod   | M6           | M8  | M6    | M8   | -     | M8   | M10 | -     | M12   | M16 |   |
|--|--------------|-----|-------|------|-------|------|-----|-------|-------|-----|---|
| Internal threaded anchor<br>FIS E  | -            |     | -     |      | M6    | M8   | -   |       | M10   | M12 | - |
|  |              |     |       |      | 11x85 |      |     |       | 15x85 |     |   |
| Perforated sleeve FIS H K  | 12x50        |     | 12x85 |      | 16x85 |      |     | 20x85 |       |     |   |
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |     |       |      |       |      |     |       |       |     |   |
| compressive strength $f_b$   | use category |     |       |      |       |      |     |       |       |     |   |
| 2 N/mm <sup>2</sup>  | w/w          | w/d | 0,6   | 0,75 | 0,6   | 0,75 | 0,9 |       |       |     |   |
|  | d/d          |     |       |      |       |      |     |       |       |     |   |
| 4 N/mm <sup>2</sup>  | w/w          | w/d | 1,2   | 1,5  | 1,2   | 1,5  | 2,0 |       |       |     |   |
|  | d/d          |     |       |      |       |      |     |       |       |     |   |
| 6 N/mm <sup>2</sup>  | w/w          | w/d | 2,0   | 2,0  | 2,0   | 2,0  | 2,5 |       |       |     |   |
|  | d/d          |     |       |      |       |      |     |       |       |     |   |
| 8 N/mm <sup>2</sup>  | w/w          | w/d | 2,5   | 3,0  | 2,5   | 3,0  | 3,5 |       |       |     |   |
|  | d/d          |     |       |      |       |      |     |       |       |     |   |
| 10 N/mm <sup>2</sup>   | w/w          | w/d | 3,0   | 3,5  | 3,0   | 3,5  | 4,5 |       |       |     |   |
|  | d/d          |     |       |      |       |      |     |       |       |     |   |
| 12 N/mm <sup>2</sup>   | w/w          | w/d | 4,0   | 4,5  | 4,0   | 4,5  | 5,5 |       |       |     |   |
|  | d/d          |     |       |      |       |      |     |       |       |     |   |

Factor for job site tests and displacements see annex C110

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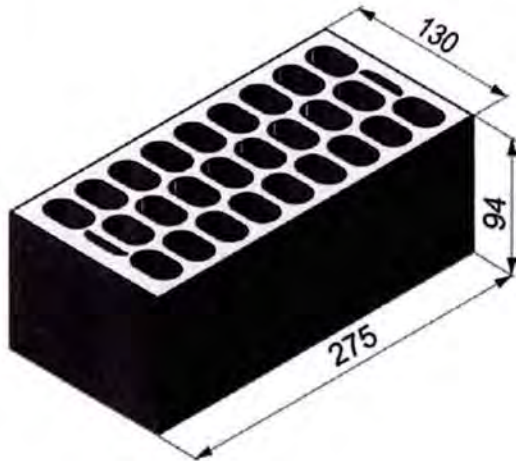
**Performances**

Vertical perforated brick HLz, Characteristic resistance under shear load

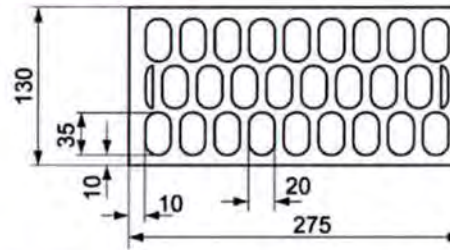
**Annex C 64**



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



| Vertical perforated brick HLz, EN 771-1         |                            |         |          |
|---|----------------------------|---------|----------|
| Producer  | e.g. Ceramica Farreny S.A. |         |          |
| Nominal dimensions [mm]                         | length L                   | width W | height H |
|   | 275                        | 130     | 94       |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 0,8                      |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 6 / 8 / 12 / 16 / 20       |         |          |
| Standard or annex                               | EN 771-1                   |         |          |



**Table C65.1:** Installation parameters

|   |   |    |       |    |       |     |       |       |     |     |
|---|---|----|-------|----|-------|-----|-------|-------|-----|-----|
| <b>Anchor rod</b>   | M6  | M8 | M6    | M8 | -     | M8  | M10   | -     | M12 | M16 |
| <b>Internal threaded anchor FIS E</b>   | -   | -  | M6    | M8 | -     | -   | M10   | M12   | -   | -   |
|   |   |    | 11x85 |    |       |     | 15x85 |       |     |     |
| <b>Perforated sleeve FIS H K</b>  | 12x50                                       |    | 12x85 |    | 16x85 |     |       | 20x85 |     |     |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K</b> |   |    |       |    |       |     |       |       |     |     |
| Max. installation torque $T_{inst,max}$ [Nm]  | 2   |    |       |    |       |     |       |       |     |     |
| <b>General installation parameters</b>  |   |    |       |    |       |     |       |       |     |     |
| Edge distance $c_{min}$   | 100   |    |       |    |       | 120 |       |       |     |     |
| Spacing   | $s_{cr \parallel} = s_{min \parallel}$ [mm] |    |       |    |       | 275 |       |       |     |     |
|   | $s_{cr \perp} = s_{min \perp}$              |    |       |    |       | 95  |       |       |     |     |
| <b>Drilling method</b>  |   |    |       |    |       |     |       |       |     |     |
| Hammer drilling with hard metal hammer drill  |   |    |       |    |       |     |       |       |     |     |

**Table C65.2:** Group factors

|                                       |                          |    |       |    |       |    |       |       |     |     |
|---------------------------------------|--------------------------|----|-------|----|-------|----|-------|-------|-----|-----|
| <b>Anchor rod</b>                     | M6                       | M8 | M6    | M8 | -     | M8 | M10   | -     | M12 | M16 |
| <b>Internal threaded anchor FIS E</b> | -                        | -  | M6    | M8 | -     | -  | M10   | M12   | -   | -   |
|                                       |                          |    | 11x85 |    |       |    | 15x85 |       |     |     |
| <b>Perforated sleeve FIS H K</b>      | 12x50                    |    | 12x85 |    | 16x85 |    |       | 20x85 |     |     |
| Group factors                         | $\alpha_{a,N \parallel}$ |    |       |    |       | 2  |       |       |     |     |
|                                       | $\alpha_{a,V \parallel}$ |    |       |    |       |    |       |       |     |     |
|                                       | $\alpha_{a,N \perp}$     |    |       |    |       |    |       |       |     |     |
|                                       | $\alpha_{a,V \perp}$     |    |       |    |       |    |       |       |     |     |

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**Performances**  
Vertical perforated brick HLz, dimensions, installation parameters

**Annex C 65**

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

**Table C66.1:** Characteristic resistance under tensile load

| Anchor rod   |              | M6    | M8   | M6    | M8 | -     | M8  | M10 | -     | M12   | M16 |   |
|--|--------------|-------|------|-------|----|-------|-----|-----|-------|-------|-----|---|
| Internal threaded anchor FIS E   |              | -     |      | -     |    | M6    | M8  | -   |       | M10   | M12 | - |
|  |              |       |      |       |    | 11x85 |     |     |       | 15x85 |     |   |
| Perforated sleeve FIS H K  |              | 12x50 |      | 12x85 |    | 16x85 |     |     | 20x85 |       |     |   |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |              |       |      |       |    |       |     |     |       |       |     |   |
| compressive strength $f_b$   | use category |       |      |       |    |       |     |     |       |       |     |   |
| 6 N/mm <sup>2</sup>  | w/w          | w/d   | 0,4  |       |    |       | 0,9 |     |       |       |     |   |
|  | d/d          |       | 0,4  |       |    |       | 0,9 |     |       |       |     |   |
| 8 N/mm <sup>2</sup>  | w/w          | w/d   | 0,5  |       |    |       | 1,2 |     |       |       |     |   |
|  | d/d          |       | 0,6  |       |    |       | 1,2 |     |       |       |     |   |
| 12 N/mm <sup>2</sup>   | w/w          | w/d   | 0,75 |       |    |       | 1,5 |     |       |       |     |   |
|  | d/d          |       | 0,9  |       |    |       | 2,0 |     |       |       |     |   |
| 16 N/mm <sup>2</sup>   | w/w          | w/d   | 0,9  |       |    |       | 2,0 |     |       |       |     |   |
|  | d/d          |       | 1,2  |       |    |       | 2,5 |     |       |       |     |   |
| 20 N/mm <sup>2</sup>   | w/w          | w/d   | 1,2  |       |    |       | 3,0 |     |       |       |     |   |
|  | d/d          |       | 1,5  |       |    |       | 3,0 |     |       |       |     |   |

Factor for temperature range 72/120°C: 0,83

**Table C66.2:** Characteristic resistance under shear load

| Anchor rod  |              | M6    | M8  | M6    | M8 | -     | M8  | M10 | -     | M12   | M16 |   |
|---|--------------|-------|-----|-------|----|-------|-----|-----|-------|-------|-----|---|
| Internal threaded anchor FIS E  |              | -     |     | -     |    | M6    | M8  | -   |       | M10   | M12 | - |
|   |              |       |     |       |    | 11x85 |     |     |       | 15x85 |     |   |
| Perforated sleeve FIS H K   |              | 12x50 |     | 12x85 |    | 16x85 |     |     | 20x85 |       |     |   |
| Shear load $V_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C and 72/120°C) |              |       |     |       |    |       |     |     |       |       |     |   |
| compressive strength $f_b$  | use category |       |     |       |    |       |     |     |       |       |     |   |
| 6 N/mm <sup>2</sup>   | w/w          | w/d   | 1,2 |       |    |       | 1,2 |     |       |       |     |   |
|   | d/d          |       | 1,2 |       |    |       | 1,2 |     |       |       |     |   |
| 8 N/mm <sup>2</sup>   | w/w          | w/d   | 1,5 |       |    |       | 1,5 |     |       |       |     |   |
|   | d/d          |       | 1,5 |       |    |       | 1,5 |     |       |       |     |   |
| 12 N/mm <sup>2</sup>  | w/w          | w/d   | 2,0 |       |    |       | 2,5 |     |       |       |     |   |
|   | d/d          |       | 2,0 |       |    |       | 2,5 |     |       |       |     |   |
| 16 N/mm <sup>2</sup>  | w/w          | w/d   | 3,0 |       |    |       | 3,0 |     |       |       |     |   |
|   | d/d          |       | 3,0 |       |    |       | 3,0 |     |       |       |     |   |
| 20 N/mm <sup>2</sup>  | w/w          | w/d   | 4,0 |       |    |       | 4,0 |     |       |       |     |   |
|   | d/d          |       | 4,0 |       |    |       | 4,0 |     |       |       |     |   |

Factor for job site tests and displacements see annex C110

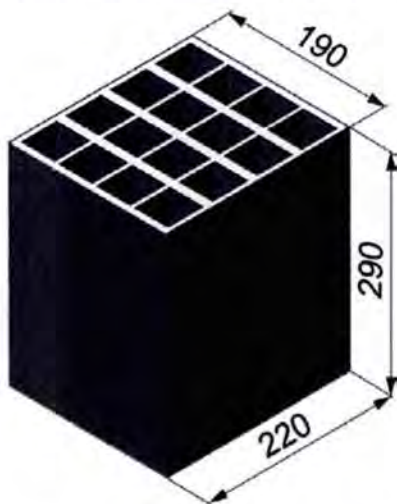
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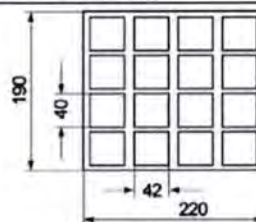
Vertical perforated brick HLz, Characteristic resistance under tensile and shear load

**Annex C 66**

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



| Vertical perforated brick HLz, EN 771-1         |               |         |          |
|---|---------------|---------|----------|
| Producer  | e.g. Perceram |         |          |
| Nominal dimensions [mm]                         | length L      | width W | height H |
|   | 220           | 190     | 290      |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 0,7         |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 6 / 8 / 10    |         |          |
| Standard or annex                               | EN 771-1      |         |          |



**Table C67.1:** Installation parameters  
(Pre-positioned anchorage with perforated sleeve FIS HK)

|   |                          |       |       |        |       |        |     |     |     |       |     |     |     |     |
|---|--------------------------|-------|-------|--------|-------|--------|-----|-----|-----|-------|-----|-----|-----|-----|
| <b>Anchor rod</b>   | M6                       | M8    | M6    | M8     | -     | M8     | M10 | M8  | M10 | -     | M12 | M16 | M12 | M16 |
| <b>Internal threaded anchor FIS E</b>   | -                        | -     | M6    | M8     | 11x85 | -      | -   | M10 | M12 | 15x85 | -   | -   | -   | -   |
| <b>Perforated sleeve FIS H K</b>  | 12x50                    | 12x85 | 16x85 | 16x130 | 20x85 | 20x130 |     |     |     |       |     |     |     |     |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K</b> |                          |       |       |        |       |        |     |     |     |       |     |     |     |     |
| Max. installation torque $T_{inst,max}$ [Nm]  | 2                        |       |       |        |       |        |     |     |     |       |     |     |     |     |
| <b>General installation parameters</b>  |                          |       |       |        |       |        |     |     |     |       |     |     |     |     |
| Edge distance $C_{min}$   | 110                      |       |       |        |       |        |     |     |     |       |     |     |     |     |
| Spacing $s_{min}$    = $s_{cr}$   | 220                      |       |       |        |       |        |     |     |     |       |     |     |     |     |
|   | $s_{min}$ ⊥ = $s_{cr}$ ⊥ | 290   |       |        |       |        |     |     |     |       |     |     |     |     |
| <b>Drilling method</b>  |                          |       |       |        |       |        |     |     |     |       |     |     |     |     |
| Hammer drilling with hard metal hammer drill  |                          |       |       |        |       |        |     |     |     |       |     |     |     |     |

**Table C67.2:** Group factors

|                                       |                  |       |       |        |       |        |     |     |     |       |     |     |     |     |
|---------------------------------------|------------------|-------|-------|--------|-------|--------|-----|-----|-----|-------|-----|-----|-----|-----|
| <b>Anchor rod</b>                     | M6               | M8    | M6    | M8     | -     | M8     | M10 | M8  | M10 | -     | M12 | M16 | M12 | M16 |
| <b>Internal threaded anchor FIS E</b> | -                | -     | M6    | M8     | 11x85 | -      | -   | M10 | M12 | 15x85 | -   | -   | -   | -   |
| <b>Perforated sleeve FIS H K</b>      | 12x50            | 12x85 | 16x85 | 16x130 | 20x85 | 20x130 |     |     |     |       |     |     |     |     |
| Group factors                         | $\alpha_{q,N}$   | [-]   | 2     |        |       |        |     |     |     |       |     |     |     |     |
|                                       | $\alpha_{q,V}$   |       |       |        |       |        |     |     |     |       |     |     |     |     |
|                                       | $\alpha_{q,N}$ ⊥ |       |       |        |       |        |     |     |     |       |     |     |     |     |
|                                       | $\alpha_{q,V}$ ⊥ |       |       |        |       |        |     |     |     |       |     |     |     |     |

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Vertical perforated brick HLz, dimensions, installation parameters

**Annex C 67**

| <b>Vertical perforated brick HLz, EN 771-1</b>  |   |            |                   |
|---|---|------------|-------------------|
| <b>Table C68.1: Installation parameters</b><br>(Push through anchorage with perforated sleeve FIS HK) |   |            |                   |
| <b>Anchor rod</b>   | <b>M10</b>                                  | <b>M12</b> | <b>M16</b>        |
| <b>Perforated sleeve FIS H K</b>  | <b>18x130/200</b>                           |            | <b>22x130/200</b> |
| <b>Anchor rod with perforated sleeve FIS H K</b>  |   |            |                   |
| Max. installation torque  | $T_{inst,max}$ [Nm]                         | 2          |                   |
| <b>General installation parameters</b>  |   |            |                   |
| Edge distance   | $c_{min}$                                   | 110        |                   |
| Spacing   | $s_{min \parallel} = s_{cr \parallel}$ [mm] | 220        |                   |
|   | $s_{min \perp} = s_{cr \perp}$              | 290        |                   |
| <b>Drilling method</b>  |   |            |                   |
| Hammer drilling with hard metal hammer drill  |   |            |                   |
| <b>Table C68.2: Group factors</b>   |   |            |                   |
| <b>Anchor rod</b>   | <b>M10</b>                                  | <b>M12</b> | <b>M16</b>        |
| <b>Perforated sleeve FIS H K</b>  | <b>18x130/200</b>                           |            | <b>22x130/200</b> |
| Group factors   | $\alpha_{q,N \parallel}$                    | [-]        | 2                 |
|   | $\alpha_{q,V \parallel}$                    |            |                   |
|   | $\alpha_{q,N \perp}$                        |            |                   |
|   | $\alpha_{q,V \perp}$                        |            |                   |
| fischer injektion system FIS V masonry  |   |            | <b>Annex C 68</b> |
| <b>Performances</b><br>Vertical perforated brick HLz, dimensions, installation parameters             |   |            |                   |

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

**Table C69.1:** Characteristic resistance under tensile load (Pre-positioned anchorage)

| Anchor rod   |     | M6           | M8  | M6    | M8  | -     | M8 | M10 | M8     | M10   | -     | M12 | M16 | M12    | M16 |
|--|-----|--------------|-----|-------|-----|-------|----|-----|--------|-------|-------|-----|-----|--------|-----|
| Internal threaded anchor FIS E   |     | -            |     | -     |     | M6    | M8 | -   |        | -     |       | M10 | M12 | -      |     |
|  |     |              |     | 11x85 |     |       |    |     |        | 15x85 |       |     |     |        |     |
| Perforated sleeve FIS H K  |     | 12x50        |     | 12x85 |     | 16x85 |    |     | 16x130 |       | 20x85 |     |     | 20x130 |     |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |     |              |     |       |     |       |    |     |        |       |       |     |     |        |     |
| compressive strength $f_b$   |     | use category |     |       |     |       |    |     |        |       |       |     |     |        |     |
| 6 N/mm <sup>2</sup>  | w/w | w/d          | 0,3 | 1,2   | 1,2 |       |    | 1,5 |        | 1,2   |       |     | 1,5 |        |     |
|  | d/d |              | 0,4 | 1,5   | 1,5 |       |    | 1,5 |        | 1,5   |       |     | 1,5 |        |     |
| 8 N/mm <sup>2</sup>  | w/w | w/d          | 0,5 | 1,5   | 1,5 |       |    | 2,0 |        | 1,5   |       |     | 2,0 |        |     |
|  | d/d |              | 0,5 | 2,0   | 2,0 |       |    | 2,5 |        | 2,0   |       |     | 2,5 |        |     |
| 10 N/mm <sup>2</sup>   | w/w | w/d          | 0,6 | 2,0   | 2,0 |       |    | 2,5 |        | 2,0   |       |     | 2,5 |        |     |
|  | d/d |              | 0,6 | 2,5   | 2,5 |       |    | 3,0 |        | 2,5   |       |     | 3,0 |        |     |

**Table C69.2:** Characteristic resistance under tensile load (Push through anchorage)

| Anchor rod   |     | M10          |     | M12 |  | M16        |  |
|--|-----|--------------|-----|-----|--|------------|--|
| Perforated sleeve FIS H K  |     | 18x130/200   |     |     |  | 22x130/200 |  |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |     |              |     |     |  |            |  |
| compressive strength $f_b$   |     | use category |     |     |  |            |  |
| 6 N/mm <sup>2</sup>  | w/w | w/d          | 1,5 |     |  |            |  |
|  | d/d |              | 1,5 |     |  |            |  |
| 8 N/mm <sup>2</sup>  | w/w | w/d          | 2,0 |     |  |            |  |
|  | d/d |              | 2,5 |     |  |            |  |
| 10 N/mm <sup>2</sup>   | w/w | w/d          | 2,5 |     |  |            |  |
|  | d/d |              | 3,0 |     |  |            |  |

Factor for job site tests and displacements see annex C110

Factor for temperature range 72/120°C: 0,83

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**Performances**

Vertical perforated brick HLz, Characteristic resistance under tensile load

**Annex C 69**

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

**Table C70.1:** Characteristic resistance under shear load (Pre-positioned anchorage)

| Anchor rod  |              | M6    | M8  | M6    | M8  | -     | M8  | M10 | M8     | M10   | -     | M12 | M16    | M12 | M16 |
|---|--------------|-------|-----|-------|-----|-------|-----|-----|--------|-------|-------|-----|--------|-----|-----|
| Internal threaded anchor FIS E  |              | -     | -   | M6    | M8  |       |     |     |        | M10   | M12   |     |        |     |     |
|   |              |       |     | 11x85 |     |       |     |     |        | 15x85 |       |     |        |     |     |
| Perforated sleeve FIS H K   |              | 12x50 |     | 12x85 |     | 16x85 |     |     | 16x130 |       | 20x85 |     | 20x130 |     |     |
| Shear load $V_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C and 72/120°C) |              |       |     |       |     |       |     |     |        |       |       |     |        |     |     |
| compressive strength $f_b$  | use category |       |     |       |     |       |     |     |        |       |       |     |        |     |     |
| 6 N/mm <sup>2</sup>   | w/w          | w/d   | 1,5 | 1,5   | 1,5 | 2,5   | 1,5 | 2,0 |        |       |       |     |        |     |     |
|   | d/d          |       |     |       |     |       |     |     |        |       |       |     |        |     |     |
| 8 N/mm <sup>2</sup>   | w/w          | w/d   | 2,0 | 2,0   | 2,0 | 3,5   | 2,0 | 3,0 |        |       |       |     |        |     |     |
|   | d/d          |       |     |       |     |       |     |     |        |       |       |     |        |     |     |
| 10 N/mm <sup>2</sup>  | w/w          | w/d   | 2,5 | 3,0   | 3,0 | 4,5   | 3,0 | 3,5 |        |       |       |     |        |     |     |
|   | d/d          |       |     |       |     |       |     |     |        |       |       |     |        |     |     |

**Table C70.2:** Characteristic resistance under shear load (Push through anchorage)

| Anchor rod  |              | M10        |     | M12 |  | M16        |  |
|---|--------------|------------|-----|-----|--|------------|--|
| Perforated sleeve FIS H K   |              | 18x130/200 |     |     |  | 22x130/200 |  |
| Shear load $V_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C and 72/120°C) |              |            |     |     |  |            |  |
| compressive strength $f_b$  | use category |            |     |     |  |            |  |
| 6 N/mm <sup>2</sup>   | w/w          | w/d        | 2,0 |     |  |            |  |
|   | d/d          |            |     |     |  |            |  |
| 8 N/mm <sup>2</sup>   | w/w          | w/d        | 3,0 |     |  |            |  |
|   | d/d          |            |     |     |  |            |  |
| 10 N/mm <sup>2</sup>  | w/w          | w/d        | 3,5 |     |  |            |  |
|   | d/d          |            |     |     |  |            |  |

Factor for job site tests and displacements see annex C110

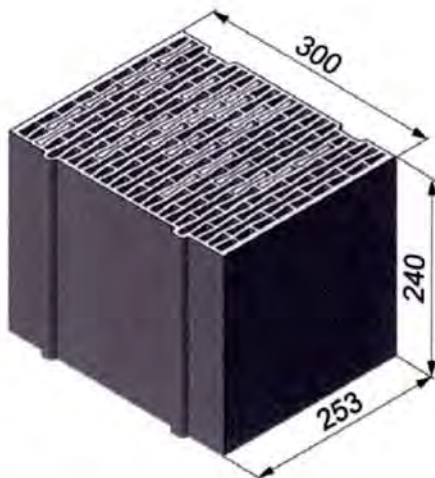
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**Performances**

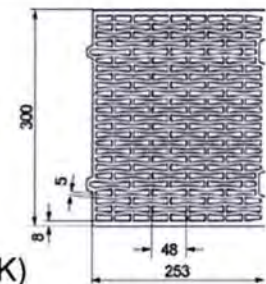
Vertical perforated brick HLz, Characteristic resistance under shear load

**Annex C 70**

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



| Vertical perforated brick HLz, EN 771-1         |                        |         |          |
|---|------------------------|---------|----------|
| Producer  | e.g. Ziegelwerk Brenna |         |          |
| Nominal dimensions [mm]                         | length L               | width W | height H |
|   | 253                    | 300     | 240      |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 0,8                  |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 2 / 4 / 6              |         |          |
| Standard or annex                               | EN 771-1               |         |          |



**Table C71.1:** Installation parameters  
(Pre-positioned anchorage with perforated sleeve FIS HK)

| Anchor rod  | M6  | M8    | M6    | M8    | -                | M8     | M10    | M8     | M10    | -                  | M12   | M16    | M12    | M16    |
|---|---|-------|-------|-------|------------------|--------|--------|--------|--------|--------------------|-------|--------|--------|--------|
| Internal threaded anchor FIS E  | -   | -     | -     | -     | M6   M8<br>11x85 | -      | -      | -      | -      | M10   M12<br>15x85 | -     | -      | -      | -      |
| Perforated sleeve FIS H K   | 12x50                                       | 12x85 | 12x85 | 12x85 | 16x85            | 16x130 | 16x130 | 16x130 | 16x130 | 20x85              | 20x85 | 20x130 | 20x130 | 20x130 |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K</b> |   |       |       |       |                  |        |        |        |        |                    |       |        |        |        |
| Max. installation torque $T_{inst,max}$ [Nm]  | 2   |       |       |       |                  |        |        |        |        |                    |       |        |        |        |
| <b>General installation parameters</b>  |   |       |       |       |                  |        |        |        |        |                    |       |        |        |        |
| Edge distance $c_{min}$   | 60  |       |       |       |                  |        |        |        |        |                    |       |        |        |        |
| Spacing   | $s_{min \parallel} = s_{cr \parallel}$ [mm] |       |       |       |                  |        |        |        |        |                    |       |        |        |        |
|   | 255   |       |       |       |                  |        |        |        |        |                    |       |        |        |        |
| Spacing   | $s_{min \perp} = s_{cr \perp}$              |       |       |       |                  |        |        |        |        |                    |       |        |        |        |
|   | 240   |       |       |       |                  |        |        |        |        |                    |       |        |        |        |
| <b>Drilling method</b>  |   |       |       |       |                  |        |        |        |        |                    |       |        |        |        |
| Hammer drilling with hard metal hammer drill  |   |       |       |       |                  |        |        |        |        |                    |       |        |        |        |

**Table C71.2:** Group factors

| Anchor rod                     | M6                       | M8    | M6    | M8    | -                | M8     | M10    | M8     | M10    | -                  | M12   | M16    | M12    | M16    |
|--------------------------------|--------------------------|-------|-------|-------|------------------|--------|--------|--------|--------|--------------------|-------|--------|--------|--------|
| Internal threaded anchor FIS E | -                        | -     | -     | -     | M6   M8<br>11x85 | -      | -      | -      | -      | M10   M12<br>15x85 | -     | -      | -      | -      |
| Perforated sleeve FIS H K      | 12x50                    | 12x85 | 12x85 | 12x85 | 16x85            | 16x130 | 16x130 | 16x130 | 16x130 | 20x85              | 20x85 | 20x130 | 20x130 | 20x130 |
| Group factors                  | $\alpha_{q,N \parallel}$ |       |       |       |                  |        |        |        |        |                    |       |        |        |        |
|                                | $\alpha_{q,V \parallel}$ |       |       |       |                  |        |        |        |        |                    |       |        |        |        |
|                                | $\alpha_{q,N \perp}$     |       |       |       |                  |        |        |        |        |                    |       |        |        |        |
|                                | $\alpha_{q,V \perp}$     |       |       |       |                  |        |        |        |        |                    |       |        |        |        |
| [-]                            |                          |       |       |       |                  |        |        |        |        |                    |       |        |        |        |
| 2                              |                          |       |       |       |                  |        |        |        |        |                    |       |        |        |        |

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**Performances**  
Vertical perforated brick HLz, dimensions, installation parameters

**Annex C 71**

| <b>Vertical perforated brick HLz, EN 771-1</b>  |   |            |                   |
|---|---|------------|-------------------|
| <b>Table C72.1: Installation parameters</b><br>(Push through anchorage with perforated sleeve FIS HK) |   |            |                   |
| <b>Anchor rod</b>   | <b>M10</b>                                  | <b>M12</b> | <b>M16</b>        |
| <b>Perforated sleeve FIS H K</b>  | <b>18x130/200</b>                           |            | <b>22x130/200</b> |
| <b>Anchor rod with perforated sleeve FIS H K</b>  |   |            |                   |
| Max. installation torque  | $T_{inst,max}$ [Nm]                         | 2          |                   |
| <b>General installation parameters</b>  |   |            |                   |
| Edge distance   | $c_{min}$                                   | 60         |                   |
| Spacing   | $s_{min \parallel} = s_{cr \parallel}$ [mm] | 255        |                   |
|   | $s_{min \perp} = s_{cr \perp}$              | 240        |                   |
| <b>Drilling method</b>  |   |            |                   |
| Hammer drilling with hard metal hammer drill  |   |            |                   |
| <b>Table C72.2: Group factors</b>   |   |            |                   |
| <b>Anchor rod</b>   | <b>M10</b>                                  | <b>M12</b> | <b>M16</b>        |
| <b>Perforated sleeve FIS H K</b>  | <b>18x130/200</b>                           |            | <b>22x130/200</b> |
| Group factors   | $\alpha_{g,N \parallel}$                    | [-]        | 2                 |
|   | $\alpha_{g,V \parallel}$                    |            |                   |
|   | $\alpha_{g,N \perp}$                        |            |                   |
|   | $\alpha_{g,V \perp}$                        |            |                   |
| fischer injektion system FIS V masonry  |   |            | <b>Annex C 72</b> |
| <b>Performances</b><br>Vertical perforated brick HLz, dimensions, installation parameters             |   |            |                   |



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

**Table C73.1:** Characteristic resistance under tensile load (Pre-positioned anchorage)

| Anchor rod  | M6           | M8  | M6    | M8  | -     | M8 | M10 | M8     | M10 | -     | M12   | M16 | M12    | M16 |
|---|--------------|-----|-------|-----|-------|----|-----|--------|-----|-------|-------|-----|--------|-----|
| Internal threaded anchor FIS E  | -            |     | -     |     | M6    | M8 | -   |        | -   |       | M10   | M12 | -      |     |
|   |              |     |       |     | 11x85 |    |     |        |     |       | 15x85 |     |        |     |
| Perforated sleeve FIS H K   | 12x50        |     | 12x85 |     | 16x85 |    |     | 16x130 |     | 20x85 |       |     | 20x130 |     |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |     |       |     |       |    |     |        |     |       |       |     |        |     |
| compressive strength $f_b$  | use category |     |       |     |       |    |     |        |     |       |       |     |        |     |
| 2 N/mm <sup>2</sup>   | w/w          | w/d | -     | 0,5 | 0,5   |    |     | 0,4    |     | 0,5   |       |     | 0,4    |     |
|   | d/d          |     | 0,3   | 0,5 | 0,5   |    |     | 0,5    |     | 0,5   |       |     | 0,5    |     |
| 4 N/mm <sup>2</sup>   | w/w          | w/d | 0,5   | 0,9 | 0,9   |    |     | 0,9    |     | 0,9   |       |     | 0,9    |     |
|   | d/d          |     | 0,6   | 0,9 | 0,9   |    |     | 0,9    |     | 0,9   |       |     | 0,9    |     |
| 6 N/mm <sup>2</sup>   | w/w          | w/d | 0,75  | 1,5 | 1,5   |    |     | 1,2    |     | 1,5   |       |     | 1,2    |     |
|   | d/d          |     | 0,9   | 1,5 | 1,5   |    |     | 1,5    |     | 1,5   |       |     | 1,5    |     |

**Table C73.2:** Characteristic resistance under tensile load (Push through anchorage)

| Anchor rod  | M10          |     | M12 |  | M16        |  |
|---|--------------|-----|-----|--|------------|--|
| Perforated sleeve FIS H K   | 18x130/200   |     |     |  | 22x130/200 |  |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |     |     |  |            |  |
| compressive strength $f_b$  | use category |     |     |  |            |  |
| 2 N/mm <sup>2</sup>   | w/w          | w/d | 0,4 |  |            |  |
|   | d/d          |     | 0,5 |  |            |  |
| 4 N/mm <sup>2</sup>   | w/w          | w/d | 0,9 |  |            |  |
|   | d/d          |     | 0,9 |  |            |  |
| 6 N/mm <sup>2</sup>   | w/w          | w/d | 1,2 |  |            |  |
|   | d/d          |     | 1,5 |  |            |  |

Factor for job site tests and displacements see annex C110

Factor for temperature range 72/120°C: 0,83

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**Performances**

Vertical perforated brick HLz, Characteristic resistance under tensile load

**Annex C 73**

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

**Table C74.1:** Characteristic resistance under shear load (Pre-positioned anchorage)

| Anchor rod                     | M6    | M8    | M6    | M8 | - | M8     | M10 | M8 | M10   | -   | M12 | M16    | M12 | M16 |
|--------------------------------|-------|-------|-------|----|---|--------|-----|----|-------|-----|-----|--------|-----|-----|
| Internal threaded anchor FIS E | -     | -     | M6    | M8 | - | -      | -   | -  | M10   | M12 | -   | -      | -   | -   |
|                                |       |       | 11x85 |    |   |        |     |    | 15x85 |     |     |        |     |     |
| Perforated sleeve FIS H K      | 12x50 | 12x85 | 16x85 |    |   | 16x130 |     |    | 20x85 |     |     | 20x130 |     |     |

**Shear load  $V_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C and 72/120°C)**

| compressive strength $f_b$ | use category |     |     |     |
|----------------------------|--------------|-----|-----|-----|
| 2 N/mm <sup>2</sup>        | w/w          | w/d | 0,5 | 0,6 |
|                            | d/d          |     |     |     |
| 4 N/mm <sup>2</sup>        | w/w          | w/d | 0,9 | 1,2 |
|                            | d/d          |     |     |     |
| 6 N/mm <sup>2</sup>        | w/w          | w/d | 1,5 | 1,5 |
|                            | d/d          |     |     |     |

**Table C74.2:** Characteristic resistance under shear load (Push through anchorage)

| Anchor rod                | M10        | M12 | M16        |
|---------------------------|------------|-----|------------|
| Perforated sleeve FIS H K | 18x130/200 |     | 22x130/200 |

**Shear load  $V_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C and 72/120°C)**

| compressive strength $f_b$ | use category |     |     |     |
|----------------------------|--------------|-----|-----|-----|
| 2 N/mm <sup>2</sup>        | w/w          | w/d | 0,5 | 0,6 |
|                            | d/d          |     |     |     |
| 4 N/mm <sup>2</sup>        | w/w          | w/d | 0,9 | 1,2 |
|                            | d/d          |     |     |     |
| 6 N/mm <sup>2</sup>        | w/w          | w/d | 1,5 | 1,5 |
|                            | d/d          |     |     |     |

Factor for job site tests and displacements see annex C110

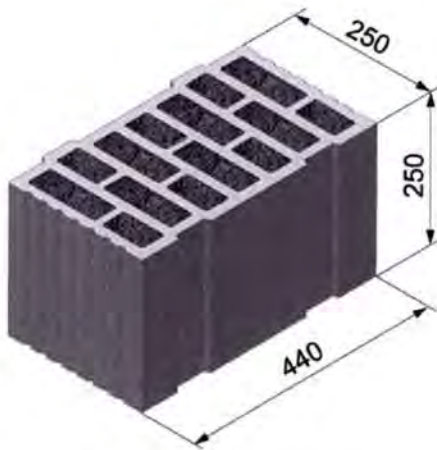
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**Performances**

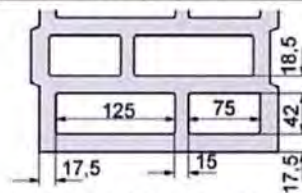
Vertical perforated brick HLz, Characteristic resistance under shear load

**Annex C 74**

**Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool, EN 771-1**



| Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool, EN 771-1 |            |         |          |
|---|------------|---------|----------|
| Producer  | -          |         |          |
| Nominal dimensions [mm]   | length L   | width W | height H |
|   | 250        | 440     | 250      |
| Density $\rho$ [kg/dm <sup>3</sup> ]  | 0,7        |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ]                                   | 6 / 8 / 10 |         |          |
| Standard or annex   | EN 771-1   |         |          |



**Table C75.1:** Installation parameters  
(Pre-positioned anchorage with perforated sleeve FIS HK)

| Anchor rod  | M6               | M8    | M6    | M8    | -              | M8    | M10    | M8     | M10 | -               | M12 | M16 | M12 | M16 | M12 | M16 |
|---|------------------|-------|-------|-------|----------------|-------|--------|--------|-----|-----------------|-----|-----|-----|-----|-----|-----|
| Internal threaded anchor FIS E  | -                | -     | -     | -     | M6 M8<br>11x85 | -     | -      | -      | -   | M10M12<br>15x85 | -   | -   | -   | -   | -   | -   |
| Perforated sleeve FIS H K   | 12x50            | 12x85 | 12x85 | 16x85 | 16x130         | 20x85 | 20x130 | 20x200 |     |                 |     |     |     |     |     |     |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K</b> |                  |       |       |       |                |       |        |        |     |                 |     |     |     |     |     |     |
| Max. installation torque $T_{inst,max}$ [Nm]  | 2                |       |       |       | 5              |       | 2      | 5      |     | 6               |     |     |     |     |     |     |
| <b>General installation parameters</b>  |                  |       |       |       |                |       |        |        |     |                 |     |     |     |     |     |     |
| Edge distance $c_{min}$   | 60               |       |       |       |                |       |        |        |     |                 |     |     |     |     |     |     |
| Spacing   | $s_{min}   $     | 80    |       |       |                |       |        |        |     |                 |     |     |     |     |     |     |
|   | $s_{cr}   $ [mm] | 250   |       |       |                |       |        |        |     |                 |     |     |     |     |     |     |
|   | $s_{min} \perp$  | 80    |       |       |                |       |        |        |     |                 |     |     |     |     |     |     |
|   | $s_{cr} \perp$   | 250   |       |       |                |       |        |        |     |                 |     |     |     |     |     |     |
| <b>Drilling method</b>  |                  |       |       |       |                |       |        |        |     |                 |     |     |     |     |     |     |
| Rotary drilling with carbide drill  |                  |       |       |       |                |       |        |        |     |                 |     |     |     |     |     |     |

**Table C75.2:** Group factors

| Anchor rod                     | M6                   | M8    | M6    | M8    | -              | M8    | M10    | M8     | M10 | -               | M12 | M16 | M12 | M16 | M12 | M16 |
|--------------------------------|----------------------|-------|-------|-------|----------------|-------|--------|--------|-----|-----------------|-----|-----|-----|-----|-----|-----|
| Internal threaded anchor FIS E | -                    | -     | -     | -     | M6 M8<br>11x85 | -     | -      | -      | -   | M10M12<br>15x85 | -   | -   | -   | -   | -   | -   |
| Perforated sleeve FIS H K      | 12x50                | 12x85 | 12x85 | 16x85 | 16x130         | 20x85 | 20x130 | 20x200 |     |                 |     |     |     |     |     |     |
| Group factors                  | $\alpha_{q,N}   $    | 1,3   |       |       |                |       |        |        |     |                 |     |     |     |     |     |     |
|                                | $\alpha_{q,V}   $    | 1,3   |       |       |                |       |        |        |     |                 |     |     |     |     |     |     |
|                                | $\alpha_{q,N} \perp$ | 0,8   |       |       |                |       |        |        |     |                 |     |     |     |     |     |     |
|                                | $\alpha_{q,V} \perp$ | 1,3   |       |       |                |       |        |        |     |                 |     |     |     |     |     |     |

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**Performances**

Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool;  
dimensions, installation parameters

**Annex C 75**

**Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool, EN 771-1**

**Table C76.1:** Installation parameters  
(Push through anchorage with perforated sleeve FIS HK)

| Anchor rod                                       |                     | M10        | M12 | M16        |
|--|---------------------|------------|-----|------------|
| Perforated sleeve FIS H K                        |                     | 18x130/200 |     | 22x130/200 |
| <b>Anchor rod with perforated sleeve FIS H K</b> |                     |            |     |            |
| Max. installation torque                         | $T_{inst,max}$ [Nm] | 5          | 6   |            |
| <b>General installation parameters</b>           |                     |            |     |            |
| Edge distance                                    | $c_{min}$           | 60         |     |            |
| Spacing  | $s_{min \parallel}$ | 80         |     |            |
|  | $s_{cr \parallel}$  | 250        |     |            |
|  | $s_{min \perp}$     | 80         |     |            |
|  | $s_{cr \perp}$      | 250        |     |            |
| <b>Drilling method</b>                           |                     |            |     |            |
| Rotary drilling with carbide drill               |                     |            |     |            |

**Table C76.2:** Group factors

| Anchor rod                |                          | M10        | M12 | M16        |
|---------------------------|--------------------------|------------|-----|------------|
| Perforated sleeve FIS H K |                          | 18x130/200 |     | 22x130/200 |
| Group factors             | $\alpha_{g,N \parallel}$ | 1,3        |     |            |
|                           | $\alpha_{g,V \parallel}$ | 1,3        |     |            |
|                           | $\alpha_{g,N \perp}$     | 0,8        |     |            |
|                           | $\alpha_{g,V \perp}$     | 1,3        |     |            |

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**Performances**

Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool;  
dimensions, installation parameters

**Annex C 76**

**Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool, EN 771-1**

**Table C77.1:** Characteristic resistance under tensile load (Pre-positioned anchorage)

| Anchor rod  | M6           | M8    | M6    | M8     | -     | M8     | M10    | M8 | M10 | -   | M12 | M16   | M12 | M16 | M12 | M16 |     |
|---|--------------|-------|-------|--------|-------|--------|--------|----|-----|-----|-----|-------|-----|-----|-----|-----|-----|
| Internal threaded anchor FIS E  | -            | -     | M6    | M8     | 11x85 | -      | -      | -  | -   | M10 | M12 | 15x85 | -   | -   | -   | -   |     |
| Perforated sleeve FIS H K   | 12x50        | 12x85 | 16x85 | 16x130 | 20x85 | 20x130 | 20x200 |    |     |     |     |       |     |     |     |     |     |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |       |       |        |       |        |        |    |     |     |     |       |     |     |     |     |     |
| compressive strength $f_b$  | use category |       |       |        |       |        |        |    |     |     |     |       |     |     |     |     |     |
| 6 N/mm <sup>2</sup>   | w/w          | w/d   | 0,75  | 1,5    | 1,2   |        |        |    |     |     | 1,5 |       |     |     |     |     | 2,5 |
|   | d/d          |       | 0,9   | 1,5    | 1,2   |        |        |    |     |     | 1,5 |       |     |     |     |     | 2,5 |
| 8 N/mm <sup>2</sup>   | w/w          | w/d   | 0,9   | 1,5    | 1,2   |        |        |    |     |     | 1,5 |       |     |     |     |     | 2,5 |
|   | d/d          |       | 0,9   | 2,0    | 1,5   |        |        |    |     |     | 2,0 |       |     |     |     |     | 3,0 |
| 10 N/mm <sup>2</sup>  | w/w          | w/d   | 0,9   | 2,0    | 1,5   |        |        |    |     |     | 2,0 |       |     |     |     |     | 3,0 |
|   | d/d          |       | 1,2   | 2,0    | 1,5   |        |        |    |     |     | 2,0 |       |     |     |     |     | 3,5 |

**Table C77.2:** Characteristic resistance under tensile load (Push through anchorage)

| Anchor rod  | M10          |     | M12 |  | M16        |  |
|---|--------------|-----|-----|--|------------|--|
| Perforated sleeve FIS H K   | 18x130/200   |     |     |  | 22x130/200 |  |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |     |     |  |            |  |
| compressive strength $f_b$  | use category |     |     |  |            |  |
| 6 N/mm <sup>2</sup>   | w/w          | w/d | 1,5 |  |            |  |
|   | d/d          |     | 1,5 |  |            |  |
| 8 N/mm <sup>2</sup>   | w/w          | w/d | 1,5 |  |            |  |
|   | d/d          |     | 2,0 |  |            |  |
| 10 N/mm <sup>2</sup>  | w/w          | w/d | 2,0 |  |            |  |
|   | d/d          |     | 2,0 |  |            |  |

Factor for job site tests and displacements see annex C110

Factor for temperature range 72/120°C: 0,83

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**Performances**

Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool,  
Characteristic resistance under tensile load

**Annex C 77**

**Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool, EN 771-1**

**Table C78.1:** Characteristic resistance under shear load (Pre-positioned anchorage)

| Anchor rod   | M6           | M8    | M6    | M8 | -     | M8     | M10 | M8  | M10   | -     | M12 | M16    | M12 | M16    | M12 | M16 |     |  |
|--|--------------|-------|-------|----|-------|--------|-----|-----|-------|-------|-----|--------|-----|--------|-----|-----|-----|--|
| Internal threaded anchor FIS E   | -            | -     | M6    | M8 | 11x85 | -      | -   | M10 | M12   | 15x85 | -   | -      | -   | -      | -   | -   |     |  |
| Perforated sleeve FIS H K  | 12x50        | 12x85 | 16x85 |    |       | 16x130 |     |     | 20x85 |       |     | 20x130 |     | 20x200 |     |     |     |  |
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |       |       |    |       |        |     |     |       |       |     |        |     |        |     |     |     |  |
| compressive strength $f_b$   | use category |       |       |    |       |        |     |     |       |       |     |        |     |        |     |     |     |  |
| 6 N/mm <sup>2</sup>  | w/w          | w/d   | 0,9   |    |       |        | 1,2 |     |       |       | 0,9 |        |     |        | 1,2 |     | 1,2 |  |
|  | d/d          |       |       |    |       |        |     |     |       |       |     |        |     |        |     |     |     |  |
| 8 N/mm <sup>2</sup>  | w/w          | w/d   | 0,9   |    |       |        | 1,5 |     |       |       | 0,9 |        |     |        | 1,5 |     | 1,2 |  |
|  | d/d          |       |       |    |       |        |     |     |       |       |     |        |     |        |     |     |     |  |
| 10 N/mm <sup>2</sup>   | w/w          | w/d   | 1,2   |    |       |        | 1,5 |     |       |       | 1,2 |        |     |        | 1,5 |     | 1,5 |  |
|  | d/d          |       |       |    |       |        |     |     |       |       |     |        |     |        |     |     |     |  |

**Table C78.2:** Characteristic resistance under shear load (Push through anchorage)

| Anchor rod   | M10          |     | M12 |  | M16        |  |
|--|--------------|-----|-----|--|------------|--|
| Perforated sleeve FIS H K  | 18x130/200   |     |     |  | 22x130/200 |  |
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |     |     |  |            |  |
| compressive strength $f_b$   | use category |     |     |  |            |  |
| 6 N/mm <sup>2</sup>  | w/w          | w/d | 1,2 |  | 1,2        |  |
|  | d/d          |     |     |  |            |  |
| 8 N/mm <sup>2</sup>  | w/w          | w/d | 1,5 |  | 1,5        |  |
|  | d/d          |     |     |  |            |  |
| 10 N/mm <sup>2</sup>   | w/w          | w/d | 1,5 |  | 1,5        |  |
|  | d/d          |     |     |  |            |  |

Factor for job site tests and displacements see annex C110

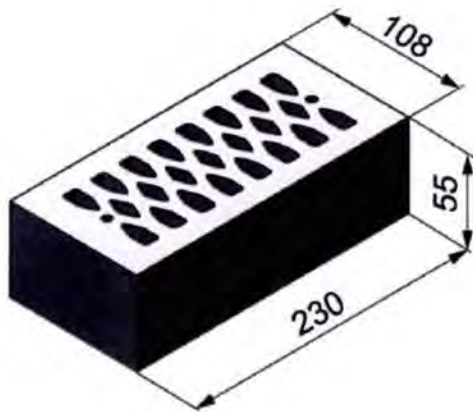
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**Performances**

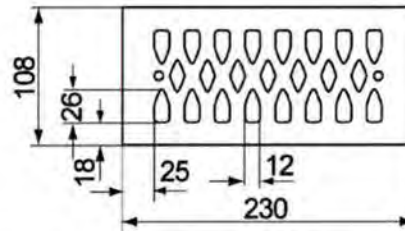
Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool;  
Characteristic resistance under shear load

**Annex C 78**

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



| Vertical perforated brick HLz, EN 771-1         |                    |         |          |
|---|--------------------|---------|----------|
| Producer  | e.g. Wienerberger. |         |          |
| Nominal dimensions [mm]                         | length L           | width W | height H |
|   | 230                | 108     | 55       |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | $\geq 1,4$         |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 2 / 4 / 6 / 8      |         |          |
| Standard or annex                               | EN 771-1           |         |          |



**Table C79.1:** Installation parameters

|  |                  |     |       |    |       |    |     |       |       |     |
|--|------------------|-----|-------|----|-------|----|-----|-------|-------|-----|
| Anchor rod   | M6               | M8  | M6    | M8 | -     | M8 | M10 | -     | M12   | M16 |
| Internal threaded anchor FIS E   | -                |     | -     |    | M6    | M8 | -   |       | M10   | M12 |
|  |                  |     |       |    | 11x85 |    |     |       | 15x85 |     |
| Perforated sleeve FIS H K  | 12x50            |     | 12x85 |    | 16x85 |    |     | 20x85 |       |     |
| Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K |                  |     |       |    |       |    |     |       |       |     |
| Max. installation torque $T_{inst,max}$ [Nm]                                 | 2                |     |       |    |       |    |     |       |       |     |
| <b>General installation parameters</b>                                       |                  |     |       |    |       |    |     |       |       |     |
| Edge distance $c_{min}$  | 60               |     |       |    |       |    |     |       |       |     |
| Spacing  | $s_{min II}$     | 80  |       |    |       |    |     |       |       |     |
|  | $s_{cr II}$ [mm] | 230 |       |    |       |    |     |       |       |     |
|  | $s_{min \perp}$  | 60  |       |    |       |    |     |       |       |     |
|  | $s_{cr \perp}$   | 60  |       |    |       |    |     |       |       |     |
| <b>Drilling method</b>   |                  |     |       |    |       |    |     |       |       |     |
| Hammer drilling with hard metal hammer drill                                 |                  |     |       |    |       |    |     |       |       |     |

**Table C79.2:** Group factors

|                                |                      |     |       |    |       |    |     |       |       |     |
|--------------------------------|----------------------|-----|-------|----|-------|----|-----|-------|-------|-----|
| Anchor rod                     | M6                   | M8  | M6    | M8 | -     | M8 | M10 | -     | M12   | M16 |
| Internal threaded anchor FIS E | -                    |     | -     |    | M6    | M8 | -   |       | M10   | M12 |
|                                |                      |     |       |    | 11x85 |    |     |       | 15x85 |     |
| Perforated sleeve FIS H K      | 12x50                |     | 12x85 |    | 16x85 |    |     | 20x85 |       |     |
| Group factors                  | $\alpha_{a,N II}$    | [-] | 2     |    |       |    |     |       |       |     |
|                                | $\alpha_{a,V II}$    |     |       |    |       |    |     |       |       |     |
|                                | $\alpha_{a,N \perp}$ |     |       |    |       |    |     |       |       |     |
|                                | $\alpha_{a,V \perp}$ |     |       |    |       |    |     |       |       |     |

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**Performances**

Vertical perforated brick HLz, dimensions, installation parameters

**Annex C 79**

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

**Table C80.1:** Characteristic resistance under tensile load <sup>1)</sup>

| Anchor rod  |              | M6    | M8   | M6    | M8   | -     | M8 | M10 | -     | M12   | M16 |   |
|---|--------------|-------|------|-------|------|-------|----|-----|-------|-------|-----|---|
| Internal threaded anchor FIS E  |              | -     |      | -     |      | M6    | M8 | -   |       | M10   | M12 | - |
|   |              |       |      |       |      | 11x85 |    |     |       | 15x85 |     |   |
| Perforated sleeve FIS H K   |              | 12x50 |      | 12x85 |      | 16x85 |    |     | 20x85 |       |     |   |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |       |      |       |      |       |    |     |       |       |     |   |
| compressive strength $f_b$  | use category |       |      |       |      |       |    |     |       |       |     |   |
| 2 N/mm <sup>2</sup>   | w/w          | w/d   | 0,3  | 0,9   | 0,75 |       |    | 0,5 |       |       |     |   |
|   | d/d          |       | 0,3  | 0,9   | 0,9  |       |    | 0,6 |       |       |     |   |
| 4 N/mm <sup>2</sup>   | w/w          | w/d   | 0,6  | 1,5   | 1,5  |       |    | 0,9 |       |       |     |   |
|   | d/d          |       | 0,75 | 2,0   | 1,5  |       |    | 1,2 |       |       |     |   |
| 6 N/mm <sup>2</sup>   | w/w          | w/d   | 0,9  | 2,5   | 2,5  |       |    | 1,5 |       |       |     |   |
|   | d/d          |       | 0,9  | 3,0   | 2,5  |       |    | 1,5 |       |       |     |   |
| 8 N/mm <sup>2</sup>   | w/w          | w/d   | 1,2  | 3,5   | 3,0  |       |    | 2,0 |       |       |     |   |
|   | d/d          |       | 1,5  | 4,0   | 3,5  |       |    | 2,5 |       |       |     |   |

<sup>1)</sup> If the fixing is in a solid area, for w/w, the characteristic value shall be reduced with the factor 0,64.

Factor for temperature range 72/120°C: 0,83

**Table C80.2:** Characteristic resistance under shear load

| Anchor rod   |              | M6    | M8  | M6    | M8 | -     | M8 | M10 | -     | M12   | M16 |   |
|--|--------------|-------|-----|-------|----|-------|----|-----|-------|-------|-----|---|
| Internal threaded anchor FIS E   |              | -     |     | -     |    | M6    | M8 | -   |       | M10   | M12 | - |
|  |              |       |     |       |    | 11x85 |    |     |       | 15x85 |     |   |
| Perforated sleeve FIS H K  |              | 12x50 |     | 12x85 |    | 16x85 |    |     | 20x85 |       |     |   |
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |       |     |       |    |       |    |     |       |       |     |   |
| compressive strength $f_b$   | use category |       |     |       |    |       |    |     |       |       |     |   |
| 2 N/mm <sup>2</sup>  | w/w          | w/d   | 0,6 |       |    |       |    |     | 0,4   |       |     |   |
|  | d/d          |       | 0,6 |       |    |       |    |     | 0,4   |       |     |   |
| 4 N/mm <sup>2</sup>  | w/w          | w/d   | 1,2 |       |    |       |    |     | 0,9   |       |     |   |
|  | d/d          |       | 1,2 |       |    |       |    |     | 0,9   |       |     |   |
| 6 N/mm <sup>2</sup>  | w/w          | w/d   | 1,5 |       |    |       |    |     | 1,2   |       |     |   |
|  | d/d          |       | 1,5 |       |    |       |    |     | 1,2   |       |     |   |
| 8 N/mm <sup>2</sup>  | w/w          | w/d   | 2,5 |       |    |       |    |     | 1,5   |       |     |   |
|  | d/d          |       | 2,5 |       |    |       |    |     | 1,5   |       |     |   |

Factor for job site tests and displacements see annex C110

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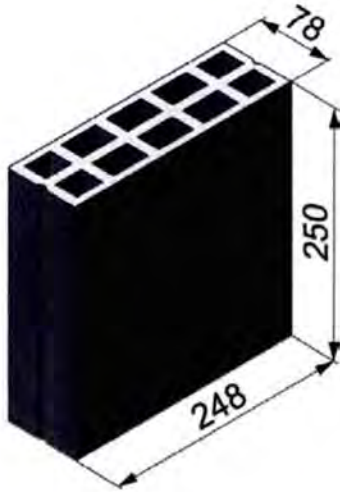
**Performances**

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

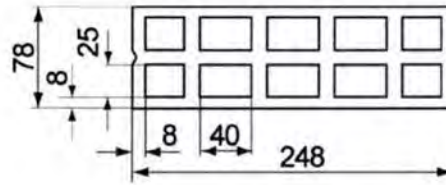
**Annex C 80**



**Horizontal perforated brick LLz, EN 771-1**



| Horizontal perforated brick LLz, EN 771-1       |           |         |          |
|---|-----------|---------|----------|
| Producer  | -         |         |          |
| Nominal dimensions [mm]                         | length L  | width W | height H |
|   | 250       | 78      | 248      |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 0,7     |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 2 / 4 / 6 |         |          |
| Standard or annex                               | EN 771-1  |         |          |



**Table C81.1:** Installation parameters

| Anchor rod                                   |                                | M6    | M8 |
|--|--------------------------------|-------|----|
| Perforated sleeve FIS H K                    |                                | 12x50 |    |
| Anchor rod with perforated sleeve FIS H K    |                                |       |    |
| Max. installation torque                     | $T_{inst,max}$ [Nm]            | 2     |    |
| <b>General installation parameters</b>       |                                |       |    |
| Edge distance                                | $c_{min}$                      | 100   |    |
| Spacing                                      | $s_{min \parallel}$            | 75    |    |
|  | $s_{cr \parallel}$             | 250   |    |
|  | $s_{min \perp} = s_{cr \perp}$ | 250   |    |
| <b>Drilling method</b>                       |                                |       |    |
| Hammer drilling with hard metal hammer drill |                                |       |    |

**Table C81.2:** Group factors

| Anchor rod                |                          | M6    | M8 |
|---------------------------|--------------------------|-------|----|
| Perforated sleeve FIS H K |                          | 12x50 |    |
| Group factors             | $\alpha_{q,N \parallel}$ | 1,6   |    |
|                           | $\alpha_{q,V \parallel}$ | 1,1   |    |
|                           | $\alpha_{q,N \perp}$     | 2,0   |    |
|                           | $\alpha_{q,V \perp}$     |       |    |

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**Performances**

Horizontal perforated brick LLz, dimensions, installation parameters

**Annex C 81**

**Horizontal perforated brick LLz, EN 771-1**

**Table C82.1:** Characteristic resistance under tensile load

| Anchor rod   |                     | M6    |     | M8  |  |
|--|---------------------|-------|-----|-----|--|
| Perforated sleeve FIS H K  |                     | 12x50 |     |     |  |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |                     |       |     |     |  |
| compressive strength $f_b$   | use category        |       |     |     |  |
|  | 2 N/mm <sup>2</sup> | w/w   | w/d | 0,5 |  |
| d/d  |                     | 0,6   |     |     |  |
| 4 N/mm <sup>2</sup>  | w/w                 | w/d   | 0,9 |     |  |
|  | d/d                 |       | 1,2 |     |  |
| 6 N/mm <sup>2</sup>  | w/w                 | w/d   | 1,5 |     |  |
|  | d/d                 |       | 1,5 |     |  |

Factor for temperature range 72/120°C: 0,83

**Table C82.2:** Characteristic resistance under shear load

| Anchor rod  |                     | M6    |     | M8  |  |
|---|---------------------|-------|-----|-----|--|
| Perforated sleeve FIS H K   |                     | 12x50 |     |     |  |
| Shear load $V_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C and 72/120°C) |                     |       |     |     |  |
| compressive strength $f_b$  | use category        |       |     |     |  |
|   | 2 N/mm <sup>2</sup> | w/w   | w/d | 0,5 |  |
| d/d   |                     | 0,5   |     |     |  |
| 4 N/mm <sup>2</sup>   | w/w                 | w/d   | 0,9 |     |  |
|   | d/d                 |       | 0,9 |     |  |
| 6 N/mm <sup>2</sup>   | w/w                 | w/d   | 1,5 |     |  |
|   | d/d                 |       | 1,5 |     |  |

Factor for job site tests and displacements see annex C110

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**Performances**

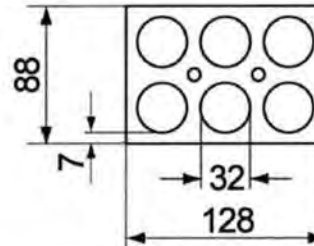
Horizontal perforated brick LLz, Characteristic resistance under tensile and shear load

**Annex C 82**

**Horizontal perforated brick LLz, EN 771-1**



| Horizontal perforated brick LLz, EN 771-1       |                             |         |          |
|---|-----------------------------|---------|----------|
| Producer  | e.g. Cermanica Farreny S.A. |         |          |
| Nominal dimensions [mm]                         | length L                    | width W | height H |
|   | 275                         | 88      | 128      |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 0,8                       |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 2                           |         |          |
| Standard or annex                               | EN 771-1                    |         |          |



**Table C83.1:** Installation parameters

|  |                         |     |           |
|--|-------------------------|-----|-----------|
| <b>Anchor rod</b>                                | <b>M6</b>               |     | <b>M8</b> |
| <b>Perforated sleeve FIS H K</b>                 | <b>12x50</b>            |     |           |
| <b>Anchor rod with perforated sleeve FIS H K</b> |                         |     |           |
| Max. installation torque $T_{inst,max}$ [Nm]     | 2                       |     |           |
| <b>General installation parameters</b>           |                         |     |           |
| Edge distance $c_{min}$                          | 60                      |     |           |
| Spacing  | $s_{min} \parallel$     | 75  |           |
|  | $s_{cr} \parallel$ [mm] | 275 |           |
|  | $s_{min} \perp$         | 75  |           |
|  | $s_{cr} \perp$          | 130 |           |
|  | <b>Drilling method</b>  |     |           |
| Hammer drilling with hard metal hammer drill     |                         |     |           |

**Table C83.2:** Group factors

|                                  |                          |     |           |
|----------------------------------|--------------------------|-----|-----------|
| <b>Anchor rod</b>                | <b>M6</b>                |     | <b>M8</b> |
| <b>Perforated sleeve FIS H K</b> | <b>12x50</b>             |     |           |
| Group factors                    | $\alpha_{q,N} \parallel$ | 1,3 |           |
|                                  | $\alpha_{q,V} \parallel$ | 1,5 |           |
|                                  | $\alpha_{q,N} \perp$     | 1,3 |           |
|                                  | $\alpha_{q,V} \perp$     | 1,5 |           |

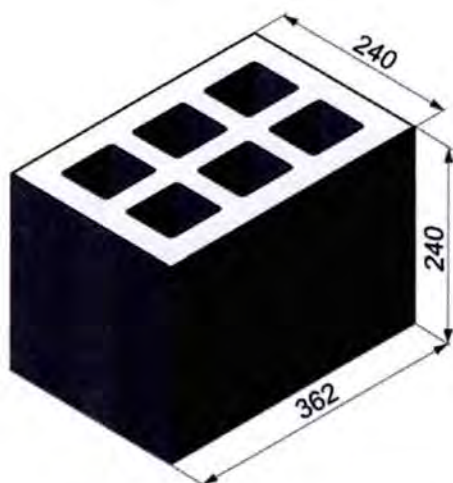
fischer injektion system FIS V masonry

**Performances**  
Horizontal perforated brick LLz, dimensions, installation parameters

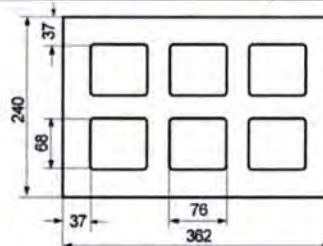
**Annex C 83**

| <b>Horizontal perforated brick LLz, EN 771-1</b>   |  |              |                   |
|--|--|--------------|-------------------|
| <b>Table C84.1: Characteristic resistance under tensile load</b>   |  |              |                   |
| <b>Anchor rod</b>  |  | <b>M6</b>    | <b>M8</b>         |
| <b>Perforated sleeve FIS H K</b>   |  | <b>12x50</b> |                   |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b>            |  |              |                   |
| compressive strength $f_b$   | use category   |              | 1,5               |
|  | w/w  | w/d          |                   |
| <b>2 N/mm<sup>2</sup></b>  | d/d  |              |                   |
|  | Factor for temperature range 72/120°C: 0,83                |              |                   |
| <b>Table C84.2: Characteristic resistance under shear load</b>   |  |              |                   |
| <b>Anchor rod</b>  |  | <b>M6</b>    | <b>M8</b>         |
| <b>Perforated sleeve FIS H K</b>   |  | <b>12x50</b> |                   |
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |  |              |                   |
| compressive strength $f_b$   | use category   |              | 1,2               |
|  | w/w  | w/d          |                   |
| <b>2 N/mm<sup>2</sup></b>  | d/d  |              |                   |
|  | Factor for job site tests and displacements see annex C110 |              |                   |
| fischer injektion system FIS V masonry   |  |              | <b>Annex C 84</b> |
| <b>Performances</b><br>Horizontal perforated brick LLz, Characteristic resistance under tensile and shear load                             |  |              |                   |

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



| Light-weight concrete hollow block Hbl, EN 771-3 |          |          |        |
|--|----------|----------|--------|
| Producer   | -        |          |        |
| Nominal dimensions [mm]                          | Länge L  | Breite B | Höhe H |
|  | 362      | 240      | 240    |
| Density $\rho$ [kg/dm <sup>3</sup> ]             | ≥ 1,0    |          |        |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ]  | 2 / 4    |          |        |
| Standard or annex                                | EN 771-3 |          |        |



**Table C85.1:** Installation parameters  
(Pre-positioned anchorage with perforated sleeve FIS HK)

|   |                                |       |       |    |        |    |       |    |        |     |        |     |     |     |     |     |
|---|--------------------------------|-------|-------|----|--------|----|-------|----|--------|-----|--------|-----|-----|-----|-----|-----|
| <b>Anchor rod</b>   | M6                             | M8    | M6    | M8 | -      | M8 | M10   | M8 | M10    | -   | M12    | M16 | M12 | M16 | M12 | M16 |
| <b>Internal threaded anchor FIS E</b>   | -                              | -     | M6    | M8 | 11x85  | -  | -     | -  | M10    | M12 | 15x85  | -   | -   | -   | -   | -   |
| <b>Perforated sleeve FIS H K</b>  | 12x50                          | 12x85 | 16x85 |    | 16x130 |    | 20x85 |    | 20x130 |     | 20x200 |     |     |     |     |     |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K</b> |                                |       |       |    |        |    |       |    |        |     |        |     |     |     |     |     |
| Max. installation torque $T_{inst,max}$ [Nm]  | 2                              |       |       |    |        |    |       |    |        |     |        |     |     |     |     |     |
| <b>General installation parameters</b>  |                                |       |       |    |        |    |       |    |        |     |        |     |     |     |     |     |
| Edge distance $c_{min}$   | 60                             |       |       |    |        |    |       |    |        |     |        |     |     |     |     |     |
| Spacing [mm]  | $s_{min}   $                   | 100   |       |    |        |    |       |    |        |     |        |     |     |     |     |     |
|   | $s_{cr}   $                    | 362   |       |    |        |    |       |    |        |     |        |     |     |     |     |     |
|   | $s_{min} \perp = s_{cr} \perp$ | 240   |       |    |        |    |       |    |        |     |        |     |     |     |     |     |
| <b>Drilling method</b>  |                                |       |       |    |        |    |       |    |        |     |        |     |     |     |     |     |
| Hammer drilling with hard metal hammer drill  |                                |       |       |    |        |    |       |    |        |     |        |     |     |     |     |     |

**Table C85.2:** Group factors

|                                       |                      |       |       |    |        |    |       |    |        |     |        |     |     |     |     |     |
|---------------------------------------|----------------------|-------|-------|----|--------|----|-------|----|--------|-----|--------|-----|-----|-----|-----|-----|
| <b>Anchor rod</b>                     | M6                   | M8    | M6    | M8 | -      | M8 | M10   | M8 | M10    | -   | M12    | M16 | M12 | M16 | M12 | M16 |
| <b>Internal threaded anchor FIS E</b> | -                    | -     | M6    | M8 | 11x85  | -  | -     | -  | M10    | M12 | 15x85  | -   | -   | -   | -   | -   |
| <b>Perforated sleeve FIS H K</b>      | 12x50                | 12x85 | 16x85 |    | 16x130 |    | 20x85 |    | 20x130 |     | 20x200 |     |     |     |     |     |
| Group factors [-]                     | $\alpha_{q,N}   $    | 1,2   |       |    |        |    |       |    |        |     |        |     |     |     |     |     |
|                                       | $\alpha_{q,V}   $    | 1,1   |       |    |        |    |       |    |        |     |        |     |     |     |     |     |
|                                       | $\alpha_{q,N} \perp$ | 2,0   |       |    |        |    |       |    |        |     |        |     |     |     |     |     |
|                                       | $\alpha_{q,V} \perp$ | 2,0   |       |    |        |    |       |    |        |     |        |     |     |     |     |     |

fischer injektion system FIS V masonry

**Performances**

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

**Annex C 85**

**Light-weight concrete hollow block Hbl, EN 771-3**

**Table C86.1:** Installation parameters  
(Push through anchorage with perforated sleeve FIS HK)

| Anchor rod                                       |                                | M10        | M12 | M16        |
|--|--------------------------------|------------|-----|------------|
| Perforated sleeve FIS H K                        |                                | 18x130/200 |     | 22x130/200 |
| <b>Anchor rod with perforated sleeve FIS H K</b> |                                |            |     |            |
| Max. installation torque                         | $T_{inst,max}$ [Nm]            | 2          |     |            |
| <b>General installation parameters</b>           |                                |            |     |            |
| Edge distance                                    | $c_{min}$                      | 60         |     |            |
| Spacing  | $s_{min} \parallel$            | 100        |     |            |
|  | $s_{cr} \parallel$             | 362        |     |            |
|  | $s_{min} \perp = s_{cr} \perp$ | 240        |     |            |
| <b>Drilling method</b>                           |                                |            |     |            |
| Hammer drilling with hard metal hammer drill     |                                |            |     |            |

**Table C86.2:** Group factors

| Anchor rod                |                          | M10        | M12 | M16        |
|---------------------------|--------------------------|------------|-----|------------|
| Perforated sleeve FIS H K |                          | 18x130/200 |     | 22x130/200 |
| Group factors             | $\alpha_{q,N} \parallel$ | 1,2        |     |            |
|                           | $\alpha_{q,V} \parallel$ | 1,1        |     |            |
|                           | $\alpha_{q,N} \perp$     | 2,0        |     |            |
|                           | $\alpha_{q,V} \perp$     | 2,0        |     |            |

fischer injektion system FIS V masonry

**Performances**

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

**Annex C 86**

**Light-weight concrete hollow block Hbl, EN 771-3**

**Table C87.1:** Characteristic resistance under tensile load (Pre-positioned anchorage)

| Anchor rod  | M6           | M8  | M6    | M8 | -     | M8 | M10 | M8     | M10 | -   | M12   | M16 | M12    | M16 | M12    | M16 |  |
|---|--------------|-----|-------|----|-------|----|-----|--------|-----|-----|-------|-----|--------|-----|--------|-----|--|
| Internal threaded anchor FIS E  | -            | -   | M6    | M8 | 11x85 | -  | -   | -      | -   | M10 | M12   | -   | -      | -   | -      | -   |  |
| Perforated sleeve FIS H K   | 12x50        |     | 12x85 |    | 16x85 |    |     | 16x130 |     |     | 20x85 |     | 20x130 |     | 20x200 |     |  |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |     |       |    |       |    |     |        |     |     |       |     |        |     |        |     |  |
| compressive strength $f_b$  | use category |     |       |    |       |    |     |        |     |     |       |     |        |     |        |     |  |
| 2 N/mm <sup>2</sup>   | w/w          | w/d | 1,2   |    |       |    |     |        |     |     | 1,5   |     |        |     |        | 2,5 |  |
|   | d/d          |     | 1,2   |    |       |    |     |        |     |     | 1,5   |     |        |     |        | 2,5 |  |
| 4 N/mm <sup>2</sup>   | w/w          | w/d | 2,0   |    |       |    |     |        |     |     | 3,0   |     |        |     |        | 5,0 |  |
|   | d/d          |     | 2,5   |    |       |    |     |        |     |     | 3,0   |     |        |     |        | 5,5 |  |

**Table C87.2:** Characteristic resistance under tensile load (Push through anchorage)

| Anchor rod  | M10          |     | M12 |  | M16        |  |
|---|--------------|-----|-----|--|------------|--|
| Perforated sleeve FIS H K   | 18x130/200   |     |     |  | 22x130/200 |  |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |     |     |  |            |  |
| compressive strength $f_b$  | use category |     |     |  |            |  |
| 2 N/mm <sup>2</sup>   | w/w          | w/d | 1,5 |  |            |  |
|   | d/d          |     | 1,5 |  |            |  |
| 4 N/mm <sup>2</sup>   | w/w          | w/d | 3,0 |  |            |  |
|   | d/d          |     | 3,0 |  |            |  |

Factor for job site tests and displacements see annex C110

Factor for temperature range 72/120°C: 0,83

fischer injektion system FIS V masonry

**Performances**

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

**Annex C 87**

**Light-weight concrete hollow block Hbl, EN 771-3**

**Table C88.1:** Characteristic resistance under shear load (Pre-positioned anchorage)

|                                       |       |    |       |    |       |    |     |        |       |       |     |     |        |     |        |     |
|---------------------------------------|-------|----|-------|----|-------|----|-----|--------|-------|-------|-----|-----|--------|-----|--------|-----|
| <b>Anchor rod</b>                     | M6    | M8 | M6    | M8 | -     | M8 | M10 | M8     | M10   | -     | M12 | M16 | M12    | M16 | M12    | M16 |
| <b>Internal threaded anchor FIS E</b> | -     | -  | -     | -  | M6    | M8 | -   | -      | M10   | M12   | -   | -   | -      | -   | -      | -   |
|                                       |       |    |       |    | 11x85 |    |     |        | 15x85 |       |     |     |        |     |        |     |
| <b>Perforated sleeve FIS H K</b>      | 12x50 |    | 12x85 |    | 16x85 |    |     | 16x130 |       | 20x85 |     |     | 20x130 |     | 20x200 |     |

**Shear load  $V_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C and 72/120°C)**

|                            |              |     |     |
|----------------------------|--------------|-----|-----|
| compressive strength $f_b$ | use category |     |     |
| 2 N/mm <sup>2</sup>        | w/w          | w/d | 0,9 |
|                            | d/d          |     |     |
| 4 N/mm <sup>2</sup>        | w/w          | w/d | 2,0 |
|                            | d/d          |     |     |

**Table C88.2:** Characteristic resistance under shear load (Push through anchorage)

|                                  |                   |            |                   |
|----------------------------------|-------------------|------------|-------------------|
| <b>Anchor rod</b>                | <b>M10</b>        | <b>M12</b> | <b>M16</b>        |
| <b>Perforated sleeve FIS H K</b> | <b>18x130/200</b> |            | <b>22x130/200</b> |

**Shear load  $V_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C and 72/120°C)**

|                            |              |     |     |
|----------------------------|--------------|-----|-----|
| compressive strength $f_b$ | use category |     |     |
| 2 N/mm <sup>2</sup>        | w/w          | w/d | 0,9 |
|                            | d/d          |     |     |
| 4 N/mm <sup>2</sup>        | w/w          | w/d | 2,0 |
|                            | d/d          |     |     |

Factor for job site tests and displacements see annex C110

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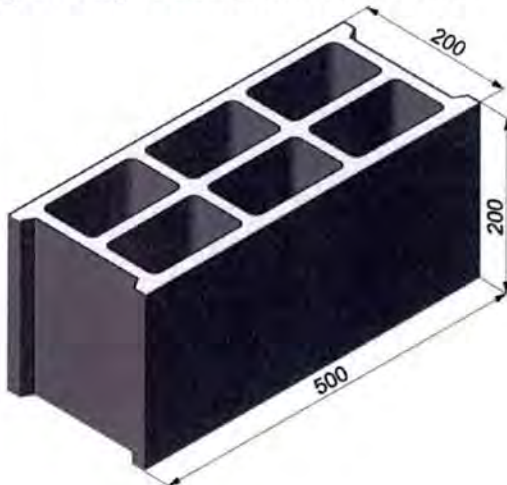
**Performances**

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

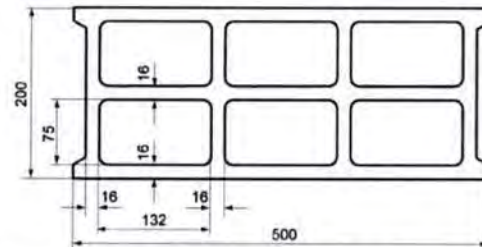
**Annex C 88**



**Light-weight concrete hollow block Hbl, EN 771-3**



| Light-weight concrete hollow block Hbl, EN 771-3 |           |         |          |
|--|-----------|---------|----------|
| Producer   | e.g. Sepa |         |          |
| Nominal dimensions [mm]                          | length L  | width W | height H |
|  | 500       | 200     | 200      |
| Density $\rho$ [kg/dm <sup>3</sup> ]             | ≥ 1,0     |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ]  | 2 / 4 / 6 |         |          |
| Standard or annex                                | EN 771-1  |         |          |



**Table C89.1:** Installation parameters

|   |       |       |       |    |        |            |       |    |     |     |     |     |     |     |
|---|-------|-------|-------|----|--------|------------|-------|----|-----|-----|-----|-----|-----|-----|
| <b>Anchor rod</b>   | M6    | M8    | M6    | M8 | -      | M8         | M10   | M8 | M10 | M10 | M12 | -   | M12 | M16 |
| <b>Internal threaded anchor FIS E</b>   | -     | -     | M6    | M8 | 11x85  | -          | -     | -  | -   | -   | -   | M10 | M12 | -   |
| <b>Perforated sleeve FIS H K</b>  | 12x50 | 12x85 | 16x85 |    | 16x130 | 18x130/200 | 20x85 |    |     |     |     |     |     |     |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K</b> |       |       |       |    |        |            |       |    |     |     |     |     |     |     |
| Max. installation torque $T_{inst,max}$ [Nm]  | 1     |       |       |    | 2      |            |       |    |     |     |     |     |     |     |
| <b>General installation parameters</b>  |       |       |       |    |        |            |       |    |     |     |     |     |     |     |
| Edge distance $C_{min}$   |       |       |       |    | 100    |            |       |    |     |     |     |     |     |     |
| Spacing $S_{min}$    = $S_{cr}$   |       |       |       |    | 500    |            |       |    |     |     |     |     |     |     |
|   |       |       |       |    | 200    |            |       |    |     |     |     |     |     |     |
| <b>Drilling method</b>  |       |       |       |    |        |            |       |    |     |     |     |     |     |     |
| Hammer drilling with hard metal hammer drill  |       |       |       |    |        |            |       |    |     |     |     |     |     |     |

**Table C89.2:** Group factors

|                                       |                  |       |       |    |        |            |       |    |     |     |     |     |     |     |
|---------------------------------------|------------------|-------|-------|----|--------|------------|-------|----|-----|-----|-----|-----|-----|-----|
| <b>Anchor rod</b>                     | M6               | M8    | M6    | M8 | -      | M8         | M10   | M8 | M10 | M10 | M12 | -   | M12 | M16 |
| <b>Internal threaded anchor FIS E</b> | -                | -     | M6    | M8 | 11x85  | -          | -     | -  | -   | -   | -   | M10 | M12 | -   |
| <b>Perforated sleeve FIS H K</b>      | 12x50            | 12x85 | 16x85 |    | 16x130 | 18x130/200 | 20x85 |    |     |     |     |     |     |     |
| Group factors                         | $\alpha_{q,N}$   | 2     |       |    |        |            |       |    |     |     |     |     |     |     |
|                                       | $\alpha_{q,V}$   |       |       |    |        |            |       |    |     |     |     |     |     |     |
|                                       | $\alpha_{q,N}$ ⊥ |       |       |    |        |            |       |    |     |     |     |     |     |     |
|                                       | $\alpha_{q,V}$ ⊥ |       |       |    |        |            |       |    |     |     |     |     |     |     |

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**Performances**

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

**Annex C 89**

**Light-weight concrete hollow block Hbl, EN 771-3**

**Table C90.1:** Characteristic resistance under tensile load

|                                       |       |    |       |    |       |    |     |        |            |     |       |       |     |     |
|---------------------------------------|-------|----|-------|----|-------|----|-----|--------|------------|-----|-------|-------|-----|-----|
| <b>Anchor rod</b>                     | M6    | M8 | M6    | M8 | -     | M8 | M10 | M8     | M10        | M10 | M12   | -     | M12 | M16 |
| <b>Internal threaded anchor FIS E</b> | -     | -  | M6    | M8 | -     | -  | -   | -      | -          | -   | -     | M10   | M12 | -   |
|                                       |       |    | 11x85 |    |       |    |     |        |            |     |       | 15x85 |     |     |
| <b>Perforated sleeve FIS H K</b>      | 12x50 |    | 12x85 |    | 16x85 |    |     | 16x130 | 18x130/200 |     | 20x85 |       |     |     |

**Tensile load  $N_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C)**

|                            |              |     |     |
|----------------------------|--------------|-----|-----|
| compressive strength $f_b$ | use category |     |     |
| 2 N/mm <sup>2</sup>        | w/w          | w/d | 0,4 |
|                            | d/d          |     | 0,5 |
| 4 N/mm <sup>2</sup>        | w/w          | w/d | 0,9 |
|                            | d/d          |     | 0,9 |
| 6 N/mm <sup>2</sup>        | w/w          | w/d | 1,2 |
|                            | d/d          |     | 1,5 |

Factor for temperature range 72/120°C: 0,83

**Table C90.2:** Characteristic resistance under shear load

|                                       |       |    |       |    |       |    |     |        |            |     |       |       |     |     |
|---------------------------------------|-------|----|-------|----|-------|----|-----|--------|------------|-----|-------|-------|-----|-----|
| <b>Anchor rod</b>                     | M6    | M8 | M6    | M8 | -     | M8 | M10 | M8     | M10        | M10 | M12   | -     | M12 | M16 |
| <b>Internal threaded anchor FIS E</b> | -     | -  | M6    | M8 | -     | -  | -   | -      | -          | -   | -     | M10   | M12 | -   |
|                                       |       |    | 11x85 |    |       |    |     |        |            |     |       | 15x85 |     |     |
| <b>Perforated sleeve FIS H K</b>      | 12x50 |    | 12x85 |    | 16x85 |    |     | 16x130 | 18x130/200 |     | 20x85 |       |     |     |

**Shear load  $V_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C and 72/120°C)**

|                            |              |     |     |
|----------------------------|--------------|-----|-----|
| compressive strength $f_b$ | use category |     |     |
| 2 N/mm <sup>2</sup>        | w/w          | w/d | 0,9 |
|                            | d/d          |     |     |
| 4 N/mm <sup>2</sup>        | w/w          | w/d | 1,5 |
|                            | d/d          |     |     |
| 6 N/mm <sup>2</sup>        | w/w          | w/d | 2,5 |
|                            | d/d          |     |     |

Factor for job site tests and displacements see annex C110

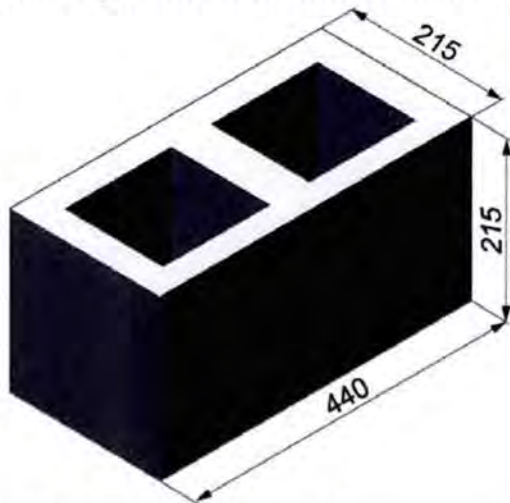
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**Performances**

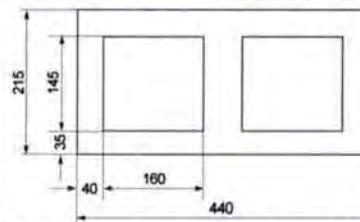
Light-weight concrete hollow block Hbl,  
Characteristic resistance under tensile and shear load

**Annex C 90**

**Light-weight concrete hollow block Hbl, EN 771-3**



| Light-weight concrete hollow block Hbl, EN 771-3 |                     |         |          |
|--|---------------------|---------|----------|
| Producer   | e.g. Roadstone wood |         |          |
| Nominal dimensions [mm]                          | length L            | width W | height H |
|  | 440                 | 215     | 215      |
| Density $\rho$ [kg/dm <sup>3</sup> ]             | ≥ 1,2               |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ]  | 4 / 6 / 8 / 10      |         |          |
| Standard or annex                                | EN 771-3            |         |          |



**Table C91.1:** Installation parameters  
(Pre-positioned anchorage with perforated sleeve FIS HK)

| Anchor rod   | M6                      | M8    | M6    | M8    | -     | M8    | M10    | M8     | M10    | -     | M12   | M16    | M12    | M16    |
|--|-------------------------|-------|-------|-------|-------|-------|--------|--------|--------|-------|-------|--------|--------|--------|
| Internal threaded anchor FIS E   | -                       | -     | -     | -     | M6    | M8    | -      | -      | -      | M10   | M12   | -      | -      | -      |
| Perforated sleeve FIS H K  | 12x50                   | 12x85 | 12x85 | 12x85 | 16x85 | 16x85 | 16x130 | 16x130 | 16x130 | 20x85 | 20x85 | 20x130 | 20x130 | 20x130 |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS HK</b> |                         |       |       |       |       |       |        |        |        |       |       |        |        |        |
| Max. installation torque $T_{inst,max}$ [Nm]                                       | 2                       |       |       |       |       |       |        |        |        |       |       |        |        |        |
| <b>General installation parameters</b>   |                         |       |       |       |       |       |        |        |        |       |       |        |        |        |
| Edge distance $c_{min}$  | 110                     |       |       |       |       |       |        |        |        |       |       |        |        |        |
| Spacing  | $s_{min} \parallel$     | 100   |       |       |       |       |        |        |        |       |       |        |        |        |
|  | $s_{cr} \parallel$ [mm] | 440   |       |       |       |       |        |        |        |       |       |        |        |        |
|  | $s_{min} \perp$         | 100   |       |       |       |       |        |        |        |       |       |        |        |        |
|  | $s_{cr} \perp$          | 215   |       |       |       |       |        |        |        |       |       |        |        |        |
| <b>Drilling method</b>   |                         |       |       |       |       |       |        |        |        |       |       |        |        |        |
| Hammer drilling with hard metal hammer drill                                       |                         |       |       |       |       |       |        |        |        |       |       |        |        |        |

**Table C91.2:** Group factors

| Anchor rod                     | M6                       | M8    | M6    | M8    | -     | M8    | M10    | M8     | M10    | -     | M12   | M16    | M12    | M16    |
|--------------------------------|--------------------------|-------|-------|-------|-------|-------|--------|--------|--------|-------|-------|--------|--------|--------|
| Internal threaded anchor FIS E | -                        | -     | -     | -     | M6    | M8    | -      | -      | -      | M10   | M12   | -      | -      | -      |
| Perforated sleeve FIS H K      | 12x50                    | 12x85 | 12x85 | 12x85 | 16x85 | 16x85 | 16x130 | 16x130 | 16x130 | 20x85 | 20x85 | 20x130 | 20x130 | 20x130 |
| Group factors                  | $\alpha_{a,N} \parallel$ | 1,4   |       |       |       |       |        |        |        |       |       |        |        |        |
|                                | $\alpha_{a,V} \parallel$ | 2,0   |       |       |       |       |        |        |        |       |       |        |        |        |
|                                | $\alpha_{a,N} \perp$     | 1,4   |       |       |       |       |        |        |        |       |       |        |        |        |
|                                | $\alpha_{a,V} \perp$     | 1,2   |       |       |       |       |        |        |        |       |       |        |        |        |

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

**Annex C 91**

**Light-weight concrete hollow block Hbl, EN 771-3**

**Table C92.1:** Installation parameters  
(Push through anchorage with perforated sleeve FIS HK)

| Anchor rod                                     | M10                     | M12 | M16        |
|--|-------------------------|-----|------------|
| Perforated sleeve FIS H K                      | 18x130/200              |     | 22x130/200 |
| <b>Anchor rod with perforated sleeve FIS H</b> |                         |     |            |
| Max. installation torque $T_{inst,max}$ [Nm]   | 2                       |     |            |
| <b>General installation parameters</b>         |                         |     |            |
| Edge distance $c_{min}$                        | 110                     |     |            |
| Spacing  | $s_{min} \parallel$     | 100 |            |
|  | $s_{cr} \parallel$ [mm] | 440 |            |
|  | $s_{min} \perp$         | 100 |            |
|  | $s_{cr} \perp$          | 215 |            |
|  | <b>Drilling method</b>  |     |            |
| Hammer drilling with hard metal hammer drill   |                         |     |            |

**Table C92.2:** Group factors

| Anchor rod                | M10                      | M12 | M16        |
|---------------------------|--------------------------|-----|------------|
| Perforated sleeve FIS H K | 18x130/200               |     | 22x130/200 |
| Group factors             | $\alpha_{q,N} \parallel$ | 1,4 |            |
|                           | $\alpha_{q,V} \parallel$ | 2,0 |            |
|                           | $\alpha_{q,N} \perp$     | 1,4 |            |
|                           | $\alpha_{q,V} \perp$     | 1,2 |            |

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

**Annex C 92**

**Light-weight concrete hollow block Hbl, EN 771-3**

**Table C93.1:** Characteristic resistance under tensile load (Pre-positioned anchorage)

| Anchor rod  | M6           | M8  | M6    | M8 | -     | M8  | M10 | M8     | M10   | -     | M12 | M16 | M12    | M16 |
|---|--------------|-----|-------|----|-------|-----|-----|--------|-------|-------|-----|-----|--------|-----|
| Internal threaded anchor FIS E  | -            | -   | M6    | M8 |       |     |     |        | M10   | M12   |     |     |        |     |
|   |              |     | 11x85 |    |       |     |     |        | 15x85 |       |     |     |        |     |
| Perforated sleeve FIS H K   | 12x50        |     | 12x85 |    | 16x85 |     |     | 16x130 |       | 20x85 |     |     | 20x130 |     |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |     |       |    |       |     |     |        |       |       |     |     |        |     |
| compressive strength $f_b$  | use category |     |       |    |       |     |     |        |       |       |     |     |        |     |
| 4 N/mm <sup>2</sup>   | w/w          | w/d | 0,9   |    |       | 1,2 |     |        | 2,0   |       |     |     |        |     |
|   | d/d          |     | 1,2   |    |       | 1,5 |     |        | 2,0   |       |     |     |        |     |
| 6 N/mm <sup>2</sup>   | w/w          | w/d | 1,5   |    |       | 2,0 |     |        | 3,0   |       |     |     |        |     |
|   | d/d          |     | 1,5   |    |       | 2,0 |     |        | 3,0   |       |     |     |        |     |
| 8 N/mm <sup>2</sup>   | w/w          | w/d | 2,0   |    |       | 2,5 |     |        | 3,5   |       |     |     |        |     |
|   | d/d          |     | 2,0   |    |       | 3,0 |     |        | 4,0   |       |     |     |        |     |
| 10 N/mm <sup>2</sup>  | w/w          | w/d | 2,5   |    |       | 3,0 |     |        | 4,5   |       |     |     |        |     |
|   | d/d          |     | 3,0   |    |       | 3,5 |     |        | 5,0   |       |     |     |        |     |

**Table C93.2:** Characteristic resistance under tensile load (Push through anchorage)

| Anchor rod  | M10          |     | M12 |  | M16        |  |
|---|--------------|-----|-----|--|------------|--|
| Perforated sleeve FIS H K   | 18x130/200   |     |     |  | 22x130/200 |  |
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |     |     |  |            |  |
| compressive strength $f_b$  | use category |     |     |  |            |  |
| 4 N/mm <sup>2</sup>   | w/w          | w/d | 1,2 |  | 2,0        |  |
|   | d/d          |     | 1,5 |  | 2,0        |  |
| 6 N/mm <sup>2</sup>   | w/w          | w/d | 2,0 |  | 3,0        |  |
|   | d/d          |     | 2,0 |  | 3,0        |  |
| 8 N/mm <sup>2</sup>   | w/w          | w/d | 2,5 |  | 3,5        |  |
|   | d/d          |     | 3,0 |  | 4,0        |  |
| 10 N/mm <sup>2</sup>  | w/w          | w/d | 3,0 |  | 4,5        |  |
|   | d/d          |     | 3,5 |  | 5,0        |  |

Factor for job site tests and displacements see annex C110

Factor for temperature range 72/120°C: 0,83

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**Performances**

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

**Annex C 93**

**Light-weight concrete hollow block Hbl, EN 771-3**

**Table C94.1:** Characteristic resistance under shear load (Pre-positioned anchorage)

| Anchor rod   | M6           | M8  | M6    | M8  | -     | M8  | M10  | M8     | M10 | -     | M12   | M16 | M12    | M16 |     |
|--|--------------|-----|-------|-----|-------|-----|------|--------|-----|-------|-------|-----|--------|-----|-----|
| Internal threaded anchor FIS E   | -            |     | -     |     | M6    | M8  | -    |        | -   |       | M10   | M12 | -      |     |     |
|  |              |     |       |     | 11x85 |     |      |        |     |       | 15x85 |     |        |     |     |
| Perforated sleeve FIS H K  | 12x50        |     | 12x85 |     | 16x85 |     |      | 16x130 |     | 20x85 |       |     | 20x130 |     |     |
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |     |       |     |       |     |      |        |     |       |       |     |        |     |     |
| compressive strength $f_b$   | use category |     |       |     |       |     |      |        |     |       |       |     |        |     |     |
| 4 N/mm <sup>2</sup>  | w/w          | w/d | 0,75  | 1,2 | 0,75  | 1,2 | 0,75 |        |     |       |       |     |        |     | 1,2 |
|  | d/d          |     |       |     |       |     |      |        |     |       |       |     |        |     |     |
| 6 N/mm <sup>2</sup>  | w/w          | w/d | 1,2   | 2,0 | 1,2   | 2,0 | 1,2  |        |     |       |       |     |        |     | 2,0 |
|  | d/d          |     |       |     |       |     |      |        |     |       |       |     |        |     |     |
| 8 N/mm <sup>2</sup>  | w/w          | w/d | 1,5   | 2,5 | 1,5   | 2,5 | 1,5  |        |     |       |       |     |        |     | 2,5 |
|  | d/d          |     |       |     |       |     |      |        |     |       |       |     |        |     |     |
| 10 N/mm <sup>2</sup>   | w/w          | w/d | 2,0   | 3,0 | 2,0   | 3,0 | 2,0  |        |     |       |       |     |        |     | 3,0 |
|  | d/d          |     |       |     |       |     |      |        |     |       |       |     |        |     |     |

**Table C94.2:** Characteristic resistance under shear load (Push through anchorage)

| Anchor rod   | M10          |     | M12 |  | M16        |  |     |
|--|--------------|-----|-----|--|------------|--|-----|
| Perforated sleeve FIS H K  | 18x130/200   |     |     |  | 22x130/200 |  |     |
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |     |     |  |            |  |     |
| compressive strength $f_b$   | use category |     |     |  |            |  |     |
| 4 N/mm <sup>2</sup>  | w/w          | w/d |     |  |            |  | 1,2 |
|  | d/d          |     |     |  |            |  |     |
| 6 N/mm <sup>2</sup>  | w/w          | w/d |     |  |            |  | 2,0 |
|  | d/d          |     |     |  |            |  |     |
| 8 N/mm <sup>2</sup>  | w/w          | w/d |     |  |            |  | 2,5 |
|  | d/d          |     |     |  |            |  |     |
| 10 N/mm <sup>2</sup>   | w/w          | w/d |     |  |            |  | 3,0 |
|  | d/d          |     |     |  |            |  |     |

Factor for job site tests and displacements see annex C110

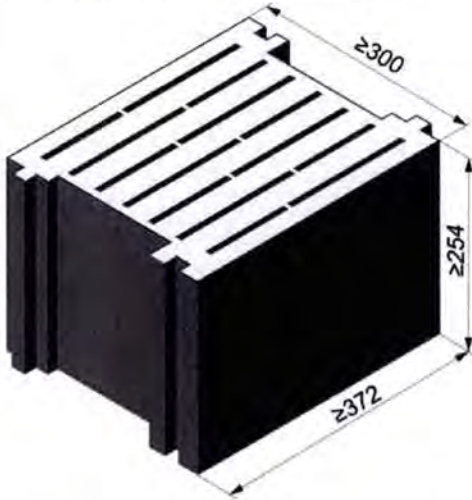
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**Performances**

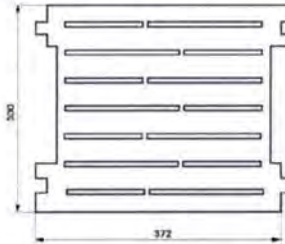
Light-weight concrete hollow block Hbl, Characteristic resistance under shear load

**Annex C 94**

**Light-weight concrete solid block Vbl, EN 771-3**



| Light-weight concrete solid block Vbl, EN 771-3 |           |         |          |
|---|-----------|---------|----------|
| Producer  | e.g. Sepa |         |          |
| Nominal dimensions [mm]                         | length L  | width W | height H |
|   | ≥ 372     | ≥ 300   | ≥ 254    |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 0,6     |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 2         |         |          |
| Standard or annex                               | EN 771-3  |         |          |



**Table C95.1: Installation parameters**

| Anchor rod  | M8                             | M10 | M10        | M12 | M12    | M16 | M16        | M12 | M16    |
|---|--------------------------------|-----|------------|-----|--------|-----|------------|-----|--------|
| Perforated sleeve FIS H K                           | 16x130                         |     | 18x130/200 |     | 20x130 |     | 22x130/200 |     | 20x200 |
| Anchor rod with perforated sleeve FIS H K           |                                |     |            |     |        |     |            |     |        |
| Max. installation torque $T_{inst,max}$ [Nm]        | 4                              |     |            |     |        |     |            |     |        |
| General installation parameters                     |                                |     |            |     |        |     |            |     |        |
| Edge distance $c_{min}$                             | 130                            |     |            |     |        |     |            |     |        |
| Spacing $s_{min} \parallel = s_{cr} \parallel$ [mm] | 370                            |     |            |     |        |     |            |     |        |
|   | $s_{min} \perp = s_{cr} \perp$ | 250 |            |     |        |     |            |     |        |
| Drilling method                                     |                                |     |            |     |        |     |            |     |        |
| Hammer drilling with hard metal hammer drill        |                                |     |            |     |        |     |            |     |        |

**Table C95.2: Group factors**

| Anchor rod   | M8     | M10 | M10        | M12 | M12    | M16 | M16        | M12 | M16    |
|--|--------|-----|------------|-----|--------|-----|------------|-----|--------|
| Perforated sleeve FIS H K  | 16x130 |     | 18x130/200 |     | 20x130 |     | 22x130/200 |     | 20x200 |
| Group factors $\alpha_{g,N \parallel}$<br>$\alpha_{g,V \parallel}$<br>$\alpha_{g,N \perp}$<br>$\alpha_{g,V \perp}$ [-] | 2      |     |            |     |        |     |            |     |        |

fischer injektion system FIS V masonry

**Performances**

Light-weight concrete solid block Vbl, dimensions, installation parameters

**Annex C 95**

**Light-weight concrete solid block Vbl, EN 771-3**

**Table C96.1:** Characteristic resistance under tensile load

| Anchor rod   |              | M8     | M10 | M10        | M12 | M12    | M16 | M16        | M12 | M16    |
|--|--------------|--------|-----|------------|-----|--------|-----|------------|-----|--------|
| Perforated sleeve FIS H K  |              | 16x130 |     | 18x130/200 |     | 20x130 |     | 22x130/200 |     | 20x200 |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |              |        |     |            |     |        |     |            |     |        |
| compressive strength $f_b$   | use category |        |     |            |     |        |     |            |     |        |
|  | w/w          | w/d    | 2,0 |            |     | 2,5    |     |            | 3,0 |        |
| 2 N/mm <sup>2</sup>  | d/d          |        | 2,0 |            |     | 3,0    |     |            | 4,0 |        |

Factor for temperature range 72/120°C: 0,83

**Table C96.2:** Characteristic resistance under shear load

| Anchor rod  |              | M8     | M10 | M10        | M12 | M12    | M16 | M16        | M12 | M16    |
|---|--------------|--------|-----|------------|-----|--------|-----|------------|-----|--------|
| Perforated sleeve FIS H K   |              | 16x130 |     | 18x130/200 |     | 20x130 |     | 22x130/200 |     | 20x200 |
| Shear load $V_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C and 72/120°C) |              |        |     |            |     |        |     |            |     |        |
| compressive strength $f_b$  | use category |        |     |            |     |        |     |            |     |        |
|   | w/w          | w/d    | 4,5 |            |     | 6,5    |     |            |     |        |
| 2 N/mm <sup>2</sup>   | d/d          |        | 4,5 |            |     | 6,5    |     |            |     |        |

Factor for job site tests and displacements see annex C110

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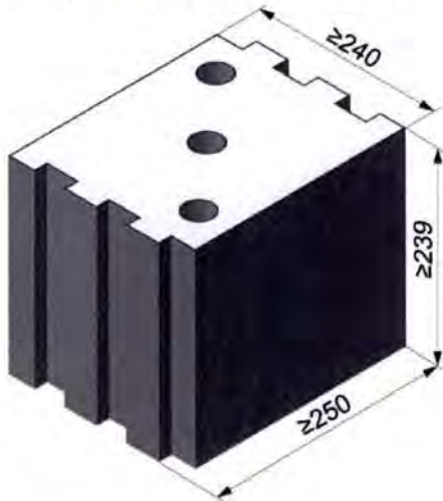
**Performances**

Light-weight concrete solid block Vbl,  
Characteristic resistance under tensile and shear load

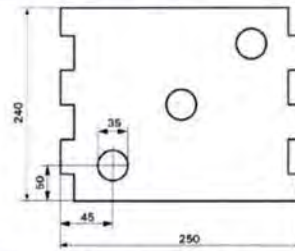
**Annex C 96**



**Light-weight concrete solid block Vbl, EN 771-3**



| Light-weight concrete solid block Vbl, EN 771-3 |           |         |          |
|---|-----------|---------|----------|
| Producer  | KLB       |         |          |
| Nominal dimensions [mm]                         | length L  | width W | height H |
|   | ≥ 250     | ≥ 240   | ≥ 239    |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 1,6     |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 4 / 6 / 8 |         |          |
| Standard or annex                               | EN 771-3  |         |          |



**Table C97.1:** Installation parameters  
(Pre-positioned anchorage with perforated sleeve FIS HK)

|   |                                |     |       |    |       |    |     |        |       |       |     |        |     |        |     |     |
|---|--------------------------------|-----|-------|----|-------|----|-----|--------|-------|-------|-----|--------|-----|--------|-----|-----|
| <b>Anchor rod</b>   | M6                             | M8  | M6    | M8 | -     | M8 | M10 | M8     | M10   | -     | M12 | M16    | M12 | M16    | M12 | M16 |
| <b>Internal threaded anchor FIS E</b>   | -                              | -   | M6    | M8 | M6    | M8 | -   | -      | M10   | M12   | -   | -      | -   | -      | -   | -   |
|   |                                |     | 11x85 |    |       |    |     |        | 15x85 |       |     |        |     |        |     |     |
| <b>Perforated sleeve FIS H K</b>  | 12x50                          |     | 12x85 |    | 16x85 |    |     | 16x130 |       | 20x85 |     | 20x130 |     | 20x200 |     |     |
| <b>Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K</b> |                                |     |       |    |       |    |     |        |       |       |     |        |     |        |     |     |
| Max. installation torque $T_{inst,max}$ [Nm]  | 4                              |     |       |    |       |    |     |        |       |       |     |        |     |        |     |     |
| <b>General installation parameters</b>  |                                |     |       |    |       |    |     |        |       |       |     |        |     |        |     |     |
| Edge distance $C_{min}$   | 130                            |     |       |    |       |    |     |        |       |       |     |        |     |        |     |     |
| Spacing $S_{min} \parallel = S_{cr} \parallel$ [mm]                                 | 250                            |     |       |    |       |    |     |        |       |       |     |        |     |        |     |     |
|   | $S_{min} \perp = S_{cr} \perp$ | 250 |       |    |       |    |     |        |       |       |     |        |     |        |     |     |
| <b>Drilling method</b>  |                                |     |       |    |       |    |     |        |       |       |     |        |     |        |     |     |
| Hammer drilling with hard metal hammer drill  |                                |     |       |    |       |    |     |        |       |       |     |        |     |        |     |     |

**Table C97.2:** Group factors

|                                       |                          |     |       |    |       |    |     |        |       |       |     |        |     |        |     |     |
|---------------------------------------|--------------------------|-----|-------|----|-------|----|-----|--------|-------|-------|-----|--------|-----|--------|-----|-----|
| <b>Anchor rod</b>                     | M6                       | M8  | M6    | M8 | -     | M8 | M10 | M8     | M10   | -     | M12 | M16    | M12 | M16    | M12 | M16 |
| <b>Internal threaded anchor FIS E</b> | -                        | -   | M6    | M8 | M6    | M8 | -   | -      | M10   | M12   | -   | -      | -   | -      | -   | -   |
|                                       |                          |     | 11x85 |    |       |    |     |        | 15x85 |       |     |        |     |        |     |     |
| <b>Perforated sleeve FIS H K</b>      | 12x50                    |     | 12x85 |    | 16x85 |    |     | 16x130 |       | 20x85 |     | 20x130 |     | 20x200 |     |     |
| Group factors                         | $\alpha_{q,N} \parallel$ | [-] | 2,0   |    |       |    |     |        |       |       |     |        |     |        |     |     |
|                                       | $\alpha_{q,V} \parallel$ |     |       |    |       |    |     |        |       |       |     |        |     |        |     |     |
|                                       | $\alpha_{q,N} \perp$     |     |       |    |       |    |     |        |       |       |     |        |     |        |     |     |
|                                       | $\alpha_{q,V} \perp$     |     |       |    |       |    |     |        |       |       |     |        |     |        |     |     |

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**Performances**

Light-weight concrete solid block Vbl, dimensions, installation parameters

**Annex C 97**

**Light-weight concrete solid block Vbl, EN 771-3**

**Table C98.1:** Installation parameters  
(Push through anchorage with perforated sleeve FIS HK)

| Anchor rod                                       | M10   | M12 | M16        |
|--|---|-----|------------|
| Perforated sleeve FIS H K                        | 18x130/200                                  |     | 22x130/200 |
| <b>Anchor rod with perforated sleeve FIS H K</b> |   |     |            |
| Max. installation torque                         | $T_{inst,max}$ [Nm]                         | 2   |            |
| <b>General installation parameters</b>           |   |     |            |
| Edge distance                                    | $c_{min}$                                   | 130 |            |
| Spacing  | $s_{min \parallel} = s_{cr \parallel}$ [mm] | 250 |            |
|  | $s_{min \perp} = s_{cr \perp}$              | 250 |            |
| <b>Drilling method</b>                           |   |     |            |
| Hammer drilling with hard metal hammer drill     |   |     |            |

**Table C98.2:** Group factors

| Anchor rod                | M10                      | M12 | M16        |
|---------------------------|--------------------------|-----|------------|
| Perforated sleeve FIS H K | 18x130/200               |     | 22x130/200 |
| Group factors             | $\alpha_{g,N \parallel}$ | [-] | 2,0        |
|                           | $\alpha_{g,V \parallel}$ |     |            |
|                           | $\alpha_{g,N \perp}$     |     |            |
|                           | $\alpha_{g,V \perp}$     |     |            |

fischer injektion system FIS V masonry

**Performances**  
Light-weight concrete solid block Vbl, dimensions, installation parameters

**Annex C 98**

### Light-weight concrete solid block Vbl, EN 771-3

**Table C99.1:** Characteristic resistance under tensile load (Pre-positioned anchorage)

| Anchor rod                     | M6    | M8    | M6    | M8 | - | M8     | M10 | M8 | M10   | -   | M12 | M16    | M12 | M16    | M12 | M16 |
|--------------------------------|-------|-------|-------|----|---|--------|-----|----|-------|-----|-----|--------|-----|--------|-----|-----|
| Internal threaded anchor FIS E | -     | -     | M6    | M8 | - | -      | -   | -  | M10   | M12 | -   | -      | -   | -      | -   | -   |
|                                |       |       | 11x85 |    |   |        |     |    | 15x85 |     |     |        |     |        |     |     |
| Perforated sleeve FIS H K      | 12x50 | 12x85 | 16x85 |    |   | 16x130 |     |    | 20x85 |     |     | 20x130 |     | 20x200 |     |     |

**Tensile load  $N_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C)**

| compressive strength $f_b$ | use category |     |     |     |     |  |     |
|----------------------------|--------------|-----|-----|-----|-----|--|-----|
|                            |              | w/w | w/d |     |     |  |     |
| 4 N/mm <sup>2</sup>        | w/w          | w/d | 1,2 | 2,0 | 2,5 |  | 3,0 |
|                            |              | d/d | 2,0 | 3,5 | 4,0 |  | 5,0 |
| 6 N/mm <sup>2</sup>        | w/w          | w/d | 1,5 | 3,0 | 4,0 |  | 5,0 |
|                            |              | d/d | 3,0 | 5,0 | 6,5 |  | 7,5 |
| 8 N/mm <sup>2</sup>        | w/w          | w/d | 2,0 | 4,0 | 5,0 |  | 6,5 |
|                            |              | d/d | 4,0 | 7,0 | 8,5 |  | 9,0 |

**Table C99.2:** Characteristic resistance under tensile load (Push through anchorage)

| Anchor rod                | M10        | M12 | M16        |
|---------------------------|------------|-----|------------|
| Perforated sleeve FIS H K | 18x130/200 |     | 22x130/200 |

**Tensile load  $N_{Rk}$  [kN] depending on the compressive strength  $f_b$  (temperature range 50/80°C)**

| compressive strength $f_b$ | use category |     |     |  |  |     |
|----------------------------|--------------|-----|-----|--|--|-----|
|                            |              | w/w | w/d |  |  |     |
| 4 N/mm <sup>2</sup>        | w/w          | w/d | 2,5 |  |  | 3,0 |
|                            |              | d/d | 4,0 |  |  | 5,0 |
| 6 N/mm <sup>2</sup>        | w/w          | w/d | 4,0 |  |  | 5,0 |
|                            |              | d/d | 6,5 |  |  | 7,5 |
| 8 N/mm <sup>2</sup>        | w/w          | w/d | 5,0 |  |  | 6,5 |
|                            |              | d/d | 8,5 |  |  | 9,0 |

Factor for job site tests and displacements see annex C110

Factor for temperature range 72/120°C: 0,83

fischer injektion system FIS V masonry

**Performances**

Light-weight concrete solid block Vbl, Characteristic resistance under tensile load

**Annex C 99**

### Light-weight concrete solid block Vbl, EN 771-3

**Table C100.1:** Characteristic resistance under shear load (Pre-positioned anchorage)

| Anchor rod   | M6           | M8  | M6    | M8  | -     | M8  | M10 | M8     | M10     | -     | M12 | M16 | M12    | M16 | M12    | M16 |     |
|--|--------------|-----|-------|-----|-------|-----|-----|--------|---------|-------|-----|-----|--------|-----|--------|-----|-----|
| Internal threaded anchor FIS E   | -            | -   | M6 M8 |     | -     |     | -   |        | M10 M12 |       | -   |     | -      |     | -      |     |     |
| Perforated sleeve FIS H K  | 12x50        |     | 12x85 |     | 16x85 |     |     | 16x130 |         | 20x85 |     |     | 20x130 |     | 20x200 |     |     |
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |     |       |     |       |     |     |        |         |       |     |     |        |     |        |     |     |
| compressive strength $f_b$   | use category |     |       |     |       |     |     |        |         |       |     |     |        |     |        |     |     |
| 4 N/mm <sup>2</sup>  | w/w          | w/d | 2,0   | 3,0 | 2,0   | 3,0 | 2,0 | 3,5    |         |       |     |     |        |     |        |     | 4,5 |
|  | d/d          |     |       |     |       |     |     |        |         |       |     |     |        |     |        |     |     |
| 6 N/mm <sup>2</sup>  | w/w          | w/d | 3,0   | 4,5 | 3,0   | 4,5 | 3,0 | 5,5    |         |       |     |     |        |     |        |     | 6,5 |
|  | d/d          |     |       |     |       |     |     |        |         |       |     |     |        |     |        |     |     |
| 8 N/mm <sup>2</sup>  | w/w          | w/d | 4,0   | 6,0 | 4,0   | 6,0 | 4,0 | 7,0    |         |       |     |     |        |     |        |     | 8,5 |
|  | d/d          |     |       |     |       |     |     |        |         |       |     |     |        |     |        |     |     |

**Table C100.2:** Characteristic resistance under shear load (Push through anchorage)

| Anchor rod   | M10          |     | M12 |  | M16        |  |
|--|--------------|-----|-----|--|------------|--|
| Perforated sleeve FIS H K  | 18x130/200   |     |     |  | 22x130/200 |  |
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |     |     |  |            |  |
| compressive strength $f_b$   | use category |     |     |  |            |  |
| 4 N/mm <sup>2</sup>  | w/w          | w/d | 3,5 |  | 4,5        |  |
|  | d/d          |     |     |  |            |  |
| 6 N/mm <sup>2</sup>  | w/w          | w/d | 5,5 |  | 6,5        |  |
|  | d/d          |     |     |  |            |  |
| 8 N/mm <sup>2</sup>  | w/w          | w/d | 7,0 |  | 8,5        |  |
|  | d/d          |     |     |  |            |  |

Factor for job site tests and displacements see annex C110

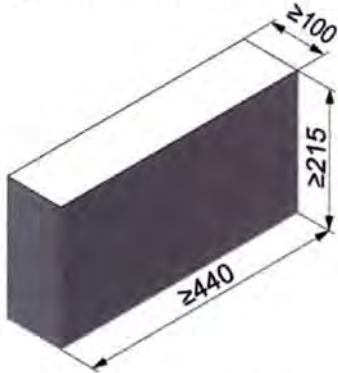
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**Performances**

Light-weight concrete solid block Vbl, Characteristic resistance under shear load

**Annex C 100**

**Light-weight concrete solid block Vbl, EN 771-3**



| Light-weight concrete solid block Vbl, EN 771-3 |                |         |          |
|---|----------------|---------|----------|
| Producer  | Roadstone wood |         |          |
| Nominal dimensions [mm]                         | length L       | width W | height H |
|   | ≥ 440          | ≥ 100   | ≥ 215    |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 2,0          |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 4 / 6 / 8 / 10 |         |          |
| Standard or annex                               | EN 771-3       |         |          |

**Table C101.1: Installation parameters**

| Anchor rod                                   | M6                      | M8  | M10 | M12 | M16 |    |
|--|-------------------------|-----|-----|-----|-----|----|
| <b>Anchor rod without perforated sleeve</b>  |                         |     |     |     |     |    |
| Effective anchorage depth $h_{ef}$ [mm]      | 50                      | 70  | 50  | 70  | 50  | 70 |
| Max. installation torque $T_{inst,max}$ [Nm] | 4                       |     | 10  |     |     |    |
| <b>General installation parameters</b>       |                         |     |     |     |     |    |
| Edge distance $c_{min}$                      | 100                     |     |     |     |     |    |
| Spacing                                      | $s_{min} \parallel$     | 75  |     |     |     |    |
|  | $s_{cr} \parallel$ [mm] | 440 |     |     |     |    |
|  | $s_{min} \perp$         | 75  |     |     |     |    |
|  | $s_{cr} \perp$          | 215 |     |     |     |    |
|  | <b>Drilling method</b>  |     |     |     |     |    |
| Hammer drilling with hard metal hammer drill |                         |     |     |     |     |    |

**Table C101.2: Group factors**

| Anchor rod    | M6                       | M8  | M10 | M12 | M16 |
|---------------|--------------------------|-----|-----|-----|-----|
| Group factors | $\alpha_{q,N} \parallel$ | 1,6 |     |     |     |
|               | $\alpha_{q,V} \parallel$ | 1,3 |     |     |     |
|               | $\alpha_{q,N} \perp$     | 1,4 |     |     |     |
|               | $\alpha_{q,V} \perp$     | 1,3 |     |     |     |

fischer injektion system FIS V masonry

**Performances**

Light-weight concrete solid block Vbl, dimensions, installation parameters

**Annex C 101**

**Light-weight concrete solid block Vbl, EN 771-3**

**Table C102.1:** Characteristic resistance under tensile load

| Anchor rod  |              | M6   | M8 | M10 | M12 | M16 |
|---|--------------|--|----|-----|-----|-----|
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |  |    |     |     |     |
| compressive strength $f_b$  | use category | Effective anchorage depth $h_{ef}$ [mm]<br>$\geq 50$ |    |     |     |     |
|   |              |  |    |     |     |     |
| 4 N/mm <sup>2</sup>   | w/w   w/d    | 1,2  |    |     | 1,2 |     |
|   | d/d          | 2,0  |    |     | 2,0 |     |
| 6 N/mm <sup>2</sup>   | w/w   w/d    | 1,5  |    |     | 2,0 |     |
|   | d/d          | 3,0  |    |     | 3,5 |     |
| 8 N/mm <sup>2</sup>   | w/w   w/d    | 2,0  |    |     | 2,5 |     |
|   | d/d          | 4,0  |    |     | 4,5 |     |
| 10N/mm <sup>2</sup>   | w/w   w/d    | 3,0  |    |     | 3,5 |     |
|   | d/d          | 5,0  |    |     | 5,5 |     |

Factor for temperature range 72/120°C: 0,83

**Table C102.2:** Characteristic resistance under shear load

| Anchor rod   |              | M6   | M8  | M10 | M12 | M16 |
|--|--------------|--|-----|-----|-----|-----|
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |  |     |     |     |     |
| compressive strength $f_b$   | use category | Effective anchorage depth $h_{ef}$ [mm]<br>$\geq 50$ |     |     |     |     |
|  |              |  |     |     |     |     |
| 4 N/mm <sup>2</sup>  | w/w   w/d    | 1,2  | 1,5 | 1,5 | 1,5 | 1,5 |
|  | d/d          |  |     |     |     |     |
| 6 N/mm <sup>2</sup>  | w/w   w/d    | 2,0  | 2,0 | 2,5 | 2,5 | 2,5 |
|  | d/d          |  |     |     |     |     |
| 8 N/mm <sup>2</sup>  | w/w   w/d    | 2,5  | 2,5 | 3,0 | 3,0 | 3,5 |
|  | d/d          |  |     |     |     |     |
| 10N/mm <sup>2</sup>  | w/w   w/d    | 3,0  | 3,5 | 4,0 | 4,0 | 4,5 |
|  | d/d          |  |     |     |     |     |

Factor for job site tests and displacements see annex C110

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**Performances**

Light-weight concrete solid block Vbl,  
Characteristic resistance under tensile and shear load

**Annex C 102**

**Light-weight concrete solid block Vbl, EN 771-3**



| Light-weight concrete solid block Vbl, EN 771-3 |                 |         |          |
|---|-----------------|---------|----------|
| Producer  | Tramac          |         |          |
| Nominal dimensions [mm]                         | length L        | width W | height H |
|   | ≥ 440           | ≥ 95    | ≥ 215    |
| Density $\rho$ [kg/dm <sup>3</sup> ]            | ≥ 2,0           |         |          |
| Compressive strength $f_b$ [N/mm <sup>2</sup> ] | 6 / 8 / 10 / 12 |         |          |
| Standard or annex                               | EN 771-3        |         |          |

**Table C103.1: Installation parameters**

| Anchor rod                                   | M6                      |     | M8 |    | M10 |    | M12 |    | M16 |    |
|--|-------------------------|-----|----|----|-----|----|-----|----|-----|----|
| <b>Anchor rod without perforated sleeve</b>  |                         |     |    |    |     |    |     |    |     |    |
| Effective anchorage depth $h_{ef}$ [mm]      | 50                      | 70  | 50 | 70 | 50  | 70 | 50  | 70 | 50  | 70 |
| Max. installation torque $T_{inst,max}$ [Nm] | 4                       |     | 10 |    |     |    |     |    |     |    |
| <b>General installation parameters</b>       |                         |     |    |    |     |    |     |    |     |    |
| Edge distance $c_{min}$                      | 60                      |     |    |    |     |    |     |    |     |    |
| Spacing                                      | $s_{min} \parallel$     | 75  |    |    |     |    |     |    |     |    |
|  | $s_{cr} \parallel$ [mm] | 440 |    |    |     |    |     |    |     |    |
|  | $s_{min} \perp$         | 75  |    |    |     |    |     |    |     |    |
|  | $s_{cr} \perp$          | 215 |    |    |     |    |     |    |     |    |
|  | <b>Drilling method</b>  |     |    |    |     |    |     |    |     |    |
| Hammer drilling with hard metal hammer drill |                         |     |    |    |     |    |     |    |     |    |

**Table C103.2: Group factors**

| Anchor rod    | M6                       |     | M8 |  | M10 |  | M12 |  | M16 |  |
|---------------|--------------------------|-----|----|--|-----|--|-----|--|-----|--|
| Group factors | $\alpha_{q,N} \parallel$ | 1,9 |    |  |     |  |     |  |     |  |
|               | $\alpha_{q,V} \parallel$ | 1,4 |    |  |     |  |     |  |     |  |
|               | $\alpha_{q,N} \perp$     | 1,9 |    |  |     |  |     |  |     |  |
|               | $\alpha_{q,V} \perp$     | 1,4 |    |  |     |  |     |  |     |  |

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**Performances**  
Light-weight concrete solid block Vbl, dimensions, installation parameters

**Annex C 103**

### Light-weight concrete solid block Vbl, EN 771-3

**Table C104.1:** Characteristic resistance under tensile load

| Anchor rod  |              | M6                                      | M8  | M10 | M12 | M16 |     |     |     |     |     |
|---|--------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <b>Tensile load <math>N_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C)</b> |              |   |     |     |     |     |     |     |     |     |     |
| compressive strength $f_b$  | use category | Effective anchorage depth $h_{ef}$ [mm] |     |     |     |     |     |     |     |     |     |
|   |              | 50                                      | 70  | 50  | 70  | 50  | 70  | 50  | 70  | 50  | 70  |
| 6 N/mm <sup>2</sup>   | w/w   w/d    | 1,5                                     | 2,0 | 1,5 | 2,0 | 1,5 | 2,0 | 1,5 | 2,0 | 1,5 | 2,0 |
|   | d/d          | 2,5                                     | 3,5 | 2,5 | 3,5 | 2,5 | 3,5 | 2,5 | 3,5 | 2,5 | 3,5 |
| 8 N/mm <sup>2</sup>   | w/w   w/d    | 2,0                                     | 2,5 | 2,0 | 2,5 | 2,0 | 3,0 | 2,0 | 3,0 | 2,0 | 3,0 |
|   | d/d          | 3,5                                     | 4,5 | 3,5 | 4,5 | 3,5 | 5,0 | 3,5 | 5,0 | 3,5 | 5,0 |
| 10N/mm <sup>2</sup>   | w/w   w/d    | 2,5                                     | 3,5 | 2,5 | 3,5 | 2,5 | 3,5 | 2,5 | 3,5 | 2,5 | 3,5 |
|   | d/d          | 4,5                                     | 6,0 | 4,5 | 6,0 | 4,5 | 6,0 | 4,5 | 6,0 | 4,5 | 6,0 |
| 12N/mm <sup>2</sup>   | w/w   w/d    | 3,0                                     | 4,0 | 3,0 | 4,0 | 3,0 | 4,5 | 3,0 | 4,5 | 3,0 | 4,5 |
|   | d/d          | 5,0                                     | 7,0 | 5,0 | 7,0 | 5,0 | 7,5 | 5,0 | 7,5 | 5,0 | 7,5 |

Factor for temperature range 72/120°C: 0,83

**Table C104.2:** Characteristic resistance under shear load

| Anchor rod   |              | M6                                      | M8  | M10 | M12 | M16 |
|--|--------------|---|-----|-----|-----|-----|
| <b>Shear load <math>V_{Rk}</math> [kN] depending on the compressive strength <math>f_b</math> (temperature range 50/80°C and 72/120°C)</b> |              |   |     |     |     |     |
| compressive strength $f_b$   | use category | Effective anchorage depth $h_{ef}$ [mm] |     |     |     |     |
|  |              | ≥ 50                                    |     |     |     |     |
| 6 N/mm <sup>2</sup>  | w/w   w/d    | 2,0                                     | 2,0 | 2,0 | 1,5 | 1,5 |
|  | d/d          |   |     |     |     |     |
| 8 N/mm <sup>2</sup>  | w/w   w/d    | 2,5                                     | 2,5 | 3,0 | 2,5 | 2,5 |
|  | d/d          |   |     |     |     |     |
| 10N/mm <sup>2</sup>  | w/w   w/d    | 3,5                                     | 3,5 | 4,0 | 3,0 | 3,0 |
|  | d/d          |   |     |     |     |     |
| 12N/mm <sup>2</sup>  | w/w   w/d    | 4,0                                     | 4,0 | 4,5 | 3,5 | 3,5 |
|  | d/d          |   |     |     |     |     |

Factor for job site tests and displacements see annex C110

fischer injektion system FIS V masonry

**Performances**

Light-weight concrete solid block Vbl,  
Characteristic resistance under tensile and shear load

**Annex C 104**



**Autoclaved aerated concrete (cylindrical drill hole), EN 771-4**



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

**Table C105.1: Installation parameters**

| Anchor rod   | M6                                     | M8  | M10 | M12 | M16 | -           | -                  |
|--|--|-----|-----|-----|-----|-------------|--------------------|
| Internal threaded anchor FIS E   | -                                      | -   | -   | -   |     | M6<br>11x85 | M8<br>15x85        |
| <b>Anchor rod and internal threaded anchor FIS E without perforated sleeve</b>                                   |  |     |     |     |     |             |                    |
| Effective anchorage depth $h_{ef}$ [mm]  | 100                                    | 200 | 100 | 200 | 100 | 200         | 85                 |
| Max. installation torque $T_{inst,max}$ [Nm]   | 1                                      | 4   | 1   | 8   | 2   | 12          | 2                  |
| <b>General installation parameters</b>   |  |     |     |     |     |             |                    |
| Edge distance $c_{min}$  | 100                                    |     |     |     |     |             |                    |
| Spacing  | $s_{cr \parallel} = s_{min \parallel}$ | 250 |     |     |     |             |                    |
|  | $h_{ef}=200mm$                         | 80  |     |     |     |             |                    |
|  | $s_{cr \perp} = s_{min \perp}$         | 250 |     |     |     |             |                    |
|  | $h_{ef}=200mm$                         | 80  |     |     |     |             |                    |
|  | $s_{cr \perp} = s_{min \perp}$         |     |     |     |     |             |                    |
| <b>Drilling method</b>   |  |     |     |     |     |             |                    |
| Hammer drilling with hard metal hammer drill   |  |     |     |     |     |             |                    |
| fischer injektion system FIS V masonry   |  |     |     |     |     |             | <b>Annex C 105</b> |
| <b>Performances</b><br>Autoclaved aerated concrete (cylindrical drill hole), dimensions, installation parameters |  |     |     |     |     |             |                    |

**Table C106.1:** Group factors for autoclaved aerated concrete  
(Compressive strength  $f_b=2 \text{ N/mm}^2$ )

| Anchor rod                     | M6   | M8  | M10 | M12 | M16 | -     |    | -     |     |
|--------------------------------|--|-----|-----|-----|-----|-------|----|-------|-----|
| Internal threaded anchor FIS E | -  | -   | -   | -   | -   | M6    | M8 | M10   | M12 |
|                                |  |     |     |     |     | 11x85 |    | 15x85 |     |
| Group factors                  | $h_{ef}=200 \alpha_{q,N} \parallel$              | 1,6 |     |     |     | -     | -  |       |     |
|                                | $h_{ef}=200 \alpha_{q,V} \parallel$              | 1,1 |     |     |     | -     | -  |       |     |
|                                | $\alpha_{q,N} \parallel, \alpha_{q,V} \parallel$ | 2   |     |     |     |       |    |       |     |
|                                | $h_{ef}=200 \alpha_{q,N} \perp$                  | 1,6 |     |     |     | -     | -  |       |     |
|                                | $h_{ef}=200 \alpha_{q,V} \perp$                  | 0,8 |     |     |     | -     | -  |       |     |
|                                | $\alpha_{q,N} \perp, \alpha_{q,V} \perp$         | 2   |     |     |     |       |    |       |     |

**Table C106.2:** Group factors for autoclaved aerated concrete  
(Compressive strength  $f_b=4 \text{ N/mm}^2$ )

| Anchor rod                     | M6   | M8  | M10 | M12 | M16 | -     |    | -     |     |
|--------------------------------|--|-----|-----|-----|-----|-------|----|-------|-----|
| Internal threaded anchor FIS E | -  | -   | -   | -   | -   | M6    | M8 | M10   | M12 |
|                                |  |     |     |     |     | 11x85 |    | 15x85 |     |
| Group factors                  | $h_{ef}=200 \alpha_{q,N} \parallel$              | 0,7 |     |     |     | -     | -  |       |     |
|                                | $h_{ef}=200 \alpha_{q,V} \parallel$              | 2,0 |     |     |     | -     | -  |       |     |
|                                | $\alpha_{q,N} \parallel, \alpha_{q,V} \parallel$ | 2   |     |     |     |       |    |       |     |
|                                | $h_{ef}=200 \alpha_{q,N} \perp$                  | 0,7 |     |     |     | -     | -  |       |     |
|                                | $h_{ef}=200 \alpha_{q,V} \perp$                  | 1,2 |     |     |     | -     | -  |       |     |
|                                | $\alpha_{q,N} \perp, \alpha_{q,V} \perp$         | 2   |     |     |     |       |    |       |     |

**Table C106.3:** Group factors for autoclaved aerated concrete  
(Compressive strength  $f_b=6 \text{ N/mm}^2$ )

| Anchor rod                     | M6   | M8  | M10 | M12 | M16 | -     |    | -     |     |
|--------------------------------|--|-----|-----|-----|-----|-------|----|-------|-----|
| Internal threaded anchor FIS E | -  | -   | -   | -   | -   | M6    | M8 | M10   | M12 |
|                                |  |     |     |     |     | 11x85 |    | 15x85 |     |
| Group factors                  | $h_{ef}=200 \alpha_{q,N} \parallel$              | 0,7 |     |     |     | -     | -  |       |     |
|                                | $h_{ef}=200 \alpha_{q,V} \parallel$              | 2,0 |     |     |     | -     | -  |       |     |
|                                | $\alpha_{q,N} \parallel, \alpha_{q,V} \parallel$ | 2   |     |     |     |       |    |       |     |
|                                | $h_{ef}=200 \alpha_{q,N} \perp$                  | 0,7 |     |     |     | -     | -  |       |     |
|                                | $h_{ef}=200 \alpha_{q,V} \perp$                  | 1,2 |     |     |     | -     | -  |       |     |
|                                | $\alpha_{q,N} \perp, \alpha_{q,V} \perp$         | 2   |     |     |     |       |    |       |     |

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**Performances**  
Autoclaved aerated concrete (cylindrical drill hole), Group factors

**Annex C 106**

**Autoclaved aerated concrete (cylindrical drill hole), EN 771-4**

**Table C107.1:** Characteristic resistance under tensile load

| Anchor rod   |              | M6                                      | M8  | M10 | M12 | M16 | -     |     | -     |     |      |     |     |
|--|--------------|---|-----|-----|-----|-----|-------|-----|-------|-----|------|-----|-----|
| Internal threaded anchor FIS E   |              | -                                       | -   | -   | -   | -   | M6    | M8  | M10   | M12 |      |     |     |
|  |              |   |     |     |     |     | 11x85 |     | 15x85 |     |      |     |     |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |              |   |     |     |     |     |       |     |       |     |      |     |     |
| compressive strength $f_b$   | use category | Effective anchorage depth $h_{ef}$ [mm] |     |     |     |     |       |     |       |     |      |     |     |
|  |              | 100                                     | 200 | 100 | 200 | 100 | 200   | 100 | 200   | 100 | 200  | 85  |     |
| 2 N/mm <sup>2</sup>  | w/w   w/d    | 1,2                                     | 1,2 | 1,5 | 2,0 | 1,5 | 3,0   | 1,5 | 3,0   | 2,0 | 3,0  | 1,5 | 1,5 |
|  | d/d          | 1,5                                     | 3,0 | 1,5 | 3,0 | 1,5 | 3,5   | 2,0 | 4,0   | 2,0 | 4,0  | 1,5 | 1,5 |
| 4 N/mm <sup>2</sup>  | w/w   w/d    | 1,2                                     | -   | 2,0 | 1,5 | 2,5 | 3,5   | 2,5 | 3,5   | 2,0 | 3,5  | 2,0 | 1,5 |
|  | d/d          | 1,5                                     | -   | 2,0 | 3,0 | 3,0 | 5,0   | 2,5 | 5,0   | 2,0 | 5,0  | 2,0 | 1,5 |
| 6 N/mm <sup>2</sup>  | w/w   w/d    | 1,5                                     | -   | 3,0 | 2,5 | 4,5 | 5,0   | 4,5 | 7,0   | 3,0 | 8,5  | 3,5 | 2,5 |
|  | d/d          | 1,5                                     | -   | 3,5 | 4,0 | 5,0 | 7,0   | 5,0 | 9,0   | 3,0 | 11,5 | 3,5 | 2,5 |

Factor for temperature range 72/120°C: 0,83

**Table C107.2:** Characteristic resistance under shear load

| Anchor rod  |              | M6                                      | M8  | M10 | M12 | M16 | -     |     | -     |     |     |     |     |
|---|--------------|---|-----|-----|-----|-----|-------|-----|-------|-----|-----|-----|-----|
| Internal threaded anchor FIS E  |              | -                                       | -   | -   | -   | -   | M6    | M8  | M10   | M12 |     |     |     |
|   |              |   |     |     |     |     | 11x85 |     | 15x85 |     |     |     |     |
| Shear load $V_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C and 72/120°C) |              |   |     |     |     |     |       |     |       |     |     |     |     |
| compressive strength $f_b$  | use category | Effective anchorage depth $h_{ef}$ [mm] |     |     |     |     |       |     |       |     |     |     |     |
|   |              | 100                                     | 200 | 100 | 200 | 100 | 200   | 100 | 200   | 100 | 200 | 85  |     |
| 2 N/mm <sup>2</sup>   | w/w   w/d    | 1,2                                     | 1,2 | 1,2 | 1,2 | 1,2 | 1,2   | 1,5 | 1,2   | 1,2 | 1,2 | 1,2 | 1,5 |
|   | d/d          | 1,2                                     | 1,2 | 1,2 | 1,2 | 1,2 | 1,2   | 1,5 | 1,2   | 1,2 | 1,2 | 1,2 | 1,5 |
| 4 N/mm <sup>2</sup>   | w/w   w/d    | 2,0                                     | -   | 2,5 | 2,0 | 2,0 | 2,0   | 2,5 | 2,0   | 2,0 | 2,0 | 2,0 | 2,5 |
|   | d/d          | 2,0                                     | -   | 2,5 | 2,0 | 2,0 | 2,0   | 2,5 | 2,0   | 2,0 | 2,0 | 2,0 | 2,5 |
| 6 N/mm <sup>2</sup>   | w/w   w/d    | 2,5                                     | -   | 3,0 | 2,5 | 3,0 | 3,0   | 3,5 | 4,0   | 4,5 | 4,5 | 2,5 | 3,5 |
|   | d/d          | 2,5                                     | -   | 3,0 | 2,5 | 3,0 | 3,0   | 3,5 | 4,0   | 4,5 | 4,5 | 2,5 | 3,5 |

Factor for job site tests and displacements see annex C110

fischer injektion system FIS V masonry

**Performances**

Autoclaved aerated concrete (cylindrical drill hole),  
Characteristic resistance under tensile and shear load

**Annex C 107**

**Autoclaved aerated concrete (conical drill hole with special drill bit PBB), EN 771-4**



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

**Table C108.1: Installation parameters**

| Anchor rod  | M8  |     | M10 |     | M12 |     | -   |    |
|---|-----|-----|-----|-----|-----|-----|-----|----|
| Internal threaded anchor FIS E  | -   | -   | -   | -   | -   | -   | M6  | M8 |
| Anchor rod and internal threaded anchor FIS E without perforated sleeve |     |     |     |     |     |     |     |    |
| Effective anchorage depth $h_{ef}$ [mm]                                 | 75  | 95  | 75  | 95  | 75  | 95  | 85  |    |
| Max. installation torque $T_{inst,max}$ [Nm]                            | 2   |     |     |     |     |     |     |    |
| <b>General installation parameters</b>                                  |     |     |     |     |     |     |     |    |
| Edge distance $c_{min}$   | 120 | 150 | 120 | 150 | 120 | 150 | 150 |    |
| Spacing $s_{cr \parallel} = s_{min \parallel}$ [mm]                     | 240 | 300 | 240 | 300 | 240 | 300 | 300 |    |
| $s_{cr \perp} = s_{min \perp}$  | 240 | 250 | 240 | 250 | 240 | 250 | 250 |    |
| <b>Drilling method</b>  |     |     |     |     |     |     |     |    |
| Hammer drilling with hard metal hammer drill                            |     |     |     |     |     |     |     |    |

**Table C108.2: Group factors**

| Anchor rod                     | M8  |   | M10 |   | M12 |   | -  |    |
|--------------------------------|-----|---|-----|---|-----|---|----|----|
| Internal threaded anchor FIS E | -   | - | -   | - | -   | - | M6 | M8 |
| Group factors                  |     |   |     |   |     |   |    |    |
| $\alpha_{q,N \parallel}$       | [-] | 2 |     |   |     |   |    |    |
| $\alpha_{q,V \parallel}$       |     |   |     |   |     |   |    |    |
| $\alpha_{q,N \perp}$           |     |   |     |   |     |   |    |    |
| $\alpha_{q,V \perp}$           |     |   |     |   |     |   |    |    |

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**Performances**

Autoclaved aerated concrete (conical drill hole with special drill bit PBB), dimensions, installation parameters

**Annex C 108**

**Autoclaved aerated concrete (conical drill hole with special drill bit PBB), EN 771-4**

**Table C109.1:** Characteristic resistance under tensile load

| Anchor rod   |              | M8                                      |     | M10 |     | M12 |     | -   |     |
|--|--------------|---|-----|-----|-----|-----|-----|-----|-----|
| Internal threaded anchor FIS E   |              | -                                       | -   | -   | -   | -   | -   | M6  | M8  |
| 11x85  |              |   |     |     |     |     |     |     |     |
| Tensile load $N_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C) |              |   |     |     |     |     |     |     |     |
| compressive strength $f_b$   | use category | Effective anchorage depth $h_{ef}$ [mm] |     |     |     |     |     |     |     |
|  |              | 75                                      | 95  | 75  | 95  | 75  | 95  | 85  |     |
| 2 N/mm <sup>2</sup>  | w/w   w/d    | 2,0                                     | 2,5 | 2,0 | 2,5 | 2,0 | 2,5 | 2,0 | 2,0 |
|  | d/d          | 2,0                                     | 2,5 | 2,0 | 2,5 | 2,0 | 2,5 | 2,0 | 2,0 |
| 4 N/mm <sup>2</sup>  | w/w   w/d    | 3,0                                     | 3,5 | 3,0 | 3,5 | 3,0 | 3,5 | 3,0 | 3,0 |
|  | d/d          | 3,0                                     | 3,5 | 3,0 | 3,5 | 3,0 | 3,5 | 3,0 | 3,0 |
| 6 N/mm <sup>2</sup>  | w/w   w/d    | 3,5                                     | 4,0 | 3,5 | 4,0 | 3,5 | 4,0 | 3,5 | 3,5 |
|  | d/d          | 4,0                                     | 4,5 | 4,0 | 4,5 | 4,0 | 4,5 | 4,0 | 4,0 |

Factor for temperature range 72/120°C: 0,83

**Table C109.2:** Characteristic resistance under shear load

| Anchor rod  |              | M8                                      |    | M10 |    | M12 |    | -  |    |
|---|--------------|---|----|-----|----|-----|----|----|----|
| Internal threaded anchor FIS E  |              | -                                       | -  | -   | -  | -   | -  | M6 | M8 |
| 11x85   |              |   |    |     |    |     |    |    |    |
| Shear load $V_{Rk}$ [kN] depending on the compressive strength $f_b$ (temperature range 50/80°C and 72/120°C) |              |   |    |     |    |     |    |    |    |
| compressive strength $f_b$  | use category | Effective anchorage depth $h_{ef}$ [mm] |    |     |    |     |    |    |    |
|   |              | 75                                      | 95 | 75  | 95 | 75  | 95 | 85 |    |
| 2 N/mm <sup>2</sup>   | w/w   w/d    | 2,5                                     |    |     |    |     |    |    |    |
|   | d/d          |   |    |     |    |     |    |    |    |
| 4 N/mm <sup>2</sup>   | w/w   w/d    | 4,5                                     |    |     |    |     |    |    |    |
|   | d/d          |   |    |     |    |     |    |    |    |
| 6 N/mm <sup>2</sup>   | w/w   w/d    | 6,0                                     |    |     |    |     |    |    |    |
|   | d/d          |   |    |     |    |     |    |    |    |

Factor for job site tests and displacements see annex C110

fischer injektion system FIS V masonry

**Performances**

Autoclaved aerated concrete (conical drill hole with special drill bit PBB),  
Characteristic resistance under tensile and shear load

**Annex C 109**

**β-factors for job site tests; displacements**

**Table C110.1: β-factors for job site tests**

| use category  |                    | w/w and w/d |        | d/d   |        |
|---|--------------------|-------------|--------|-------|--------|
| temperature range                                     |                    | 50/80       | 72/120 | 50/80 | 72/120 |
| Material  | Size               |             |        |       |        |
| solid units   | M6                 | 0,55        | 0,46   | 0,96  | 0,80   |
|   | M8                 | 0,57        | 0,51   |       |        |
|   | M10                | 0,59        | 0,52   |       |        |
|   | M12<br>FIS E 11x85 | 0,6         | 0,54   |       |        |
|   | M16<br>FIS E 15x85 | 0,62        | 0,52   |       |        |
|   | 16x85              | 0,55        | 0,46   |       |        |
| hollow units  | all sizes          | 0,86        | 0,72   | 0,96  | 0,8    |
| Autoclaved aerated concrete<br>cylindrical drill hole | all sizes          | 0,73        | 0,73   | 0,81  | 0,81   |
| Autoclaved aerated concrete<br>conical drill hole     | all sizes          | 0,66        | 0,59   | 0,73  | 0,66   |

**Table C110.2: 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<br>aerated concrete h <sub>ef</sub> =100m | $\frac{N_{Rk}}{1,4 \cdot \gamma_{Mm}}$ | 0,03                    | 0,06                    | $\frac{V_{Rk}}{1,4 \cdot \gamma_{Mm}}$ | 0,82                    | 0,88                    |
| hollow units   | $\frac{N_{Rk}}{1,4 \cdot \gamma_{Mm}}$ | 0,48                    | 0,06                    | $\frac{V_{Rk}}{1,4 \cdot \gamma_{Mm}}$ | 1,71                    | 2,56                    |
| solid brick Mz NF<br>annex C 4 - C 7                                 | $\frac{N_{Rk}}{1,4 \cdot \gamma_{Mm}}$ | 0,74                    | 1,48                    | $\frac{V_{Rk}}{1,4 \cdot \gamma_{Mm}}$ | 1,23                    | 1,85                    |
| solid brick Ks NF<br>annex C 14 / C 15                               | $\frac{N_{Rk}}{1,4 \cdot \gamma_{Mm}}$ | 0,2                     | 0,4                     | $\frac{V_{Rk}}{1,4 \cdot \gamma_{Mm}}$ | 0,91                    | 1,37                    |
| AAC h <sub>ef</sub> =200 mm<br>annex C 105 - C 107                   | $\frac{N_{Rk}}{1,4 \cdot \gamma_{Mm}}$ | 1,03                    | 2,06                    | $\frac{V_{Rk}}{1,4 \cdot \gamma_{Mm}}$ | 1,25                    | 1,88                    |
| brick<br>Annex C 89 / C 90   | $\frac{N_{Rk}}{1,4 \cdot \gamma_{Mm}}$ | 0,03                    | 0,06                    | $\frac{V_{Rk}}{1,4 \cdot \gamma_{Mm}}$ | 6,44                    | 9,66                    |

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

fischer injektion system FIS V masonry

**Performances**  
β-factors for job site tests; displacements

**Annex C 110**