

## DÉCLARATION DES PERFORMANCES

### DoP 0178

pour le système d'injection fischer FIS HT II (cheville à scellement pour utilisation dans la maçonnerie)

FR

1. <u>Code d'identification unique du type de produit:</u>	<b>DoP 0178</b>
2. <u>Usage(s) prévu(s):</u>	<b>Fixation dans la maçonnerie. Voir annexes, en particulier les annexes B1- B13</b>
3. <u>Fabricant:</u>	<b>fischerwerke GmbH &amp; Co. KG, Klaus-Fischer-Str. 1, 72178 Waldachtal, Allemagne</b>
4. <u>Mandataire:</u>	–
5. <u>Système(s) d'évaluation et de vérification de la constance des performances:</u>	<b>1</b>
6. <u>Document d'évaluation européen:</u> Evaluation Technique Européenne: Organisme d'évaluation technique: Organisme(s) notifié(s):	<b>EAD 330076-00-0604, July 2014 ETA-12/0544; 2019-10-18 DIBt- Deutsches Institut für Bautechnik 1343 MPA Darmstadt / 2873 TU Darmstadt</b>
7. <u>Performance(s) déclarée(s):</u> <b>Résistance mécanique et stabilité (BWR 1)</b> Valeurs caractéristiques de résistance:	Facteur de réduction: Annexes C36 Résistance caractéristique d'une cheville isolée sous charge de traction: Annexes B3, C1, C3, C5, C7, C9, C11, C13, C15, C17, C19, C21, C23, C25, C27, C29, C31, C33, C35  Résistance caractéristique d'un groupe de chevilles sous charge de traction: Annexes B13 Résistance caractéristique d'une cheville isolée sous charge de cisaillement: Annexes B3, C2, C3, C5, C7, C9, C11, C13, C15, C17, C19, C21, C23, C25, C27, C29, C31, C33, C35  Résistance caractéristique d'un groupe de chevilles sous charge de cisaillement avec ou sans influence du bord: Annexes B13 Distance au bord et entraxe caractéristiques: Annexes B13, C4, C6, C8, C10, C12, C14, C16, C18, C20, C22, C24, C26, C28, C30, C32, C34  Distance au bord et entraxe mini.: Annexes B13, C4, C6, C8, C10, C12, C14, C16, C18, C20, C22, C24, C26, C28, C30, C32, C34  Facteur de groupe sous charges de traction et de cisaillement: Annexes C4, C6, C8, C10, C12, C14, C16, C18, C20, C22, C24, C26, C28, C30, C32, C34  Epaisseur mini. du support: Annexes B2
Durabilité:	Annexes A5, B2
Déplacements:	Annexes C36
<b>Sécurité en cas d'incendie (BWR 2)</b> Réaction au feu: –	Classe (A1)
<b>Hygiène, santé et environnement (BWR 3)</b> Contenu, émission et/ou rejet de substances dangereuses:	NPA



8. Documentation technique appropriée et/ou  
documentation technique spécifique:

-

Les performances du produit identifié ci-dessus sont conformes aux performances déclarées. Conformément au règlement (UE) no 305/2011, la présente déclaration des performances est établie sous la seule responsabilité du fabricant mentionné ci-dessus.

Signé pour le fabricant et en son nom par:

Thilo Pregartner, Dr.-Ing.  
Tumlingen, 2019-12-09

Peter Schillinger, Dipl.-Ing.

Cette DoP a été préparée en plusieurs langues. En cas de différend relatif à l'interprétation, la version anglaise prévaudra.

L'annexe comprend des informations volontaires et complémentaires en langue anglaise dépassant les exigences légales (spécifiées de manière neutre).

## Specific Part

### 1 Technical description of the product

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

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

The product description is given in Annex A.

### 2 Specification of the intended use in accordance with the applicable European Assessment Document

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

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchor of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

### 3 Performance of the product and references to the methods used for its assessment

#### 3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic values for resistance	See Annexes C 1 to C 35
Displacements	See Annex C 36
Durability	See Annex B2

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

Essential characteristic	Performance
Reaction to fire	Class A1

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

Essential characteristic	Performance
Content, emission and/or release of dangerous substances	No performance assessed

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

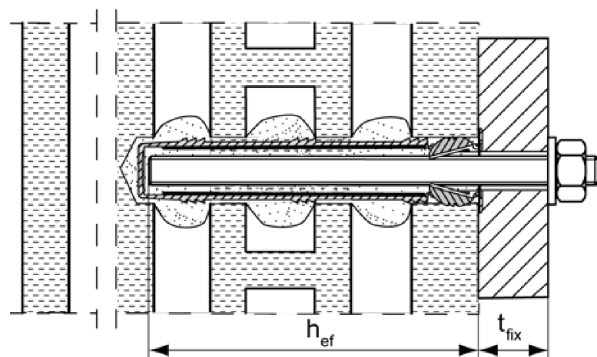
In accordance with the European Assessment Document EAD 330076-00-0604 the applicable European legal act is: [97/177/EC].

The system to be applied is: 1

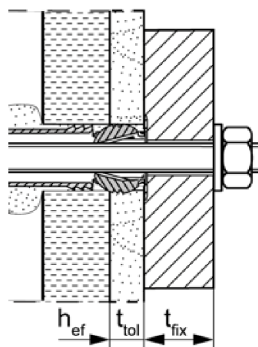
# Installation conditions part 1

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

### Pre-positioned anchorage:

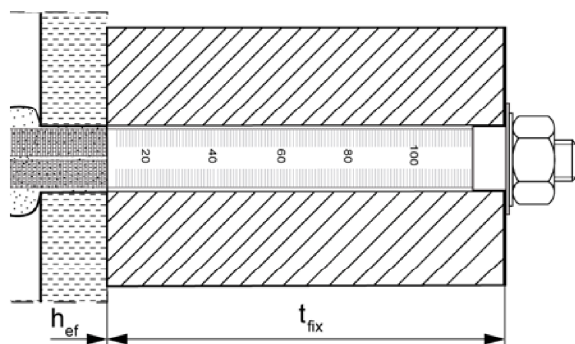


### Installation with render bridge

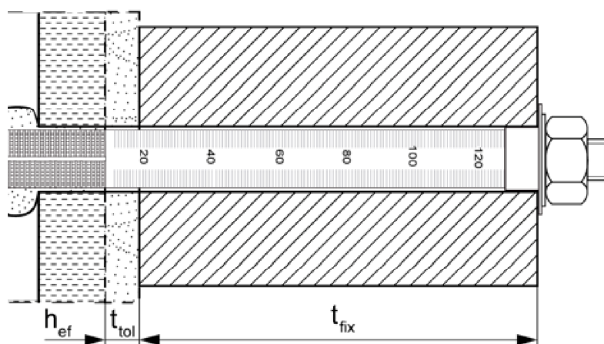


Size of the perforated sleeve: FIS H 12x50 K FIS H 16x85 K FIS H 20x85 K FIS H 20x200 K  
 FIS H 12x85 K FIS H 16x130 K FIS H 20x130 K

### Push through anchorage:



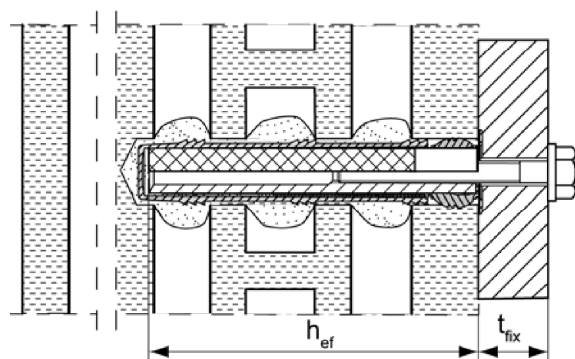
### Installation with render bridge



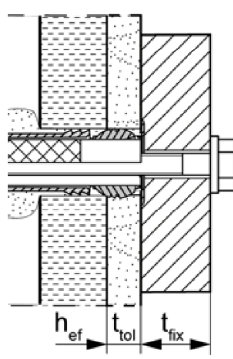
Size of the perforated sleeve: FIS H 18x130/200 K FIS H 22x130/200 K

## 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 HT II masonry

### Product description

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

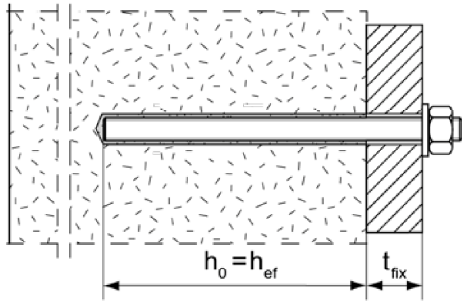
**Annex A 1**

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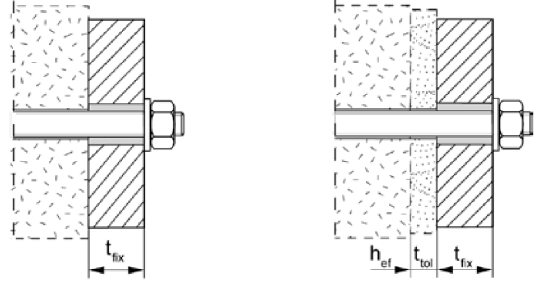
## Installation conditions part 2

**Anchor rods without perforated sleeve FIS H K;  
installation in solid brick masonry**

**Pre-positioned anchorage:**



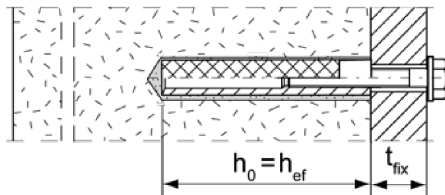
**Push through anchorage: Annular gap filled with mortar**



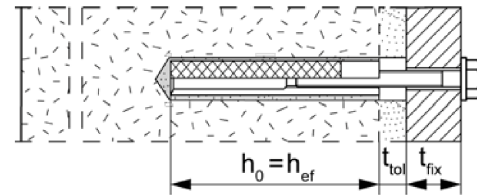
Installation with  
render bridge

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

**Pre-positioned anchorage:**



Installation with render bridge



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 HT II masonry

### Product description

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

**Annex A 2**

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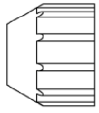
## Overview system components part 1

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

1

Size: 350 ml, 360 ml, 585 ml, 950 ml

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

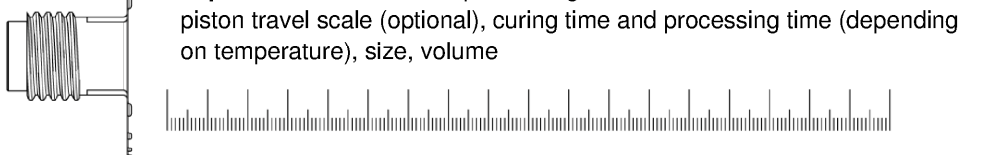
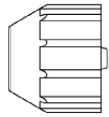


### Mortar cartridge (coaxial cartridge) with sealing cap

1

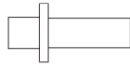
Size: 100 ml, 150 ml, 300 ml, 380 ml, 400 ml, 410 ml

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

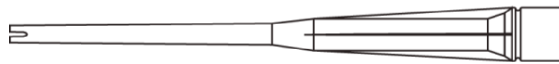


### Static mixer MR Plus with injection adapter

Injection adapter



Static mixer



### Cleaning brush BS / BSB



### Blow-out pump ABG or ABP



Pictures not to scale

fischer injektion system FIS HT II masonry

#### System description

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

**Annex A 3**

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## 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

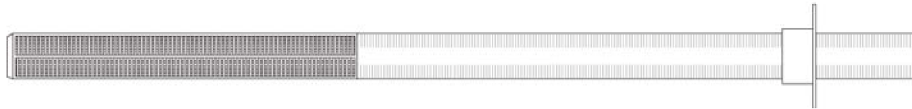
⑦



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

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

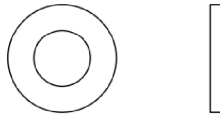
⑦



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

### Washer

③



### Hexagon nut

④



Pictures not to scale

fischer injektion system FIS HT II masonry

#### System description

Overview system components part 2: steel parts / perforated sleeve

**Annex A 4**

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**Table A5.1: Materials**

Part	Designation	Material		
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 HT II masonry



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

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## Specifications of intended use (part 1)

**Table B1.1:** Overview use and performance conditions

Anchorages subject to		fischer injection system FIS HT II masonry	
Hole drilling with hammer drill mode 		all bricks	
Hole drilling with rotary drill mode 		all bricks	
Static and quasi static load, in masonry		all bricks	
Condition	dry or wet masonry	all bricks	
Installation	Pre-positioned anchorage	Anchor rod or internal threaded anchor (in solid brick masonry)	Perforated sleeve with anchor rod or internal threaded anchor (in perforated and solid brick masonry)  Size: 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
	Push through anchorage	Anchor rod (in solid brick masonry)	Perforated sleeve with anchor rod (in perforated and solid brick masonry)  Size: FIS H 18x130/200 K FIS H 22x130/200 K
Installation conditions	condition d/d	all bricks	
	condition w/d		
	condition w/w		
Installation temperature	0°C to +40°C		
In-service temperature	-40°C to +80°C	max. short term temperature +80 °C and max. long term temperature +50 °C	
	-40°C to +120°C	max. short term temperature +120 °C and max. long term temperature +72 °C	

fischer injektion system FIS HT II masonry

**Intended Use**  
Specifications (part 1)

**Annex B 1**

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## Specifications of intended use (part 2)

### Anchorage subject to:

- Static and quasi-static loads

### Base materials:

- Solid brick masonry (masonry group b), acc. to Annex B 13
- Hollow brick masonry (masonry group c), according to Annex B 13
- 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, the characteristic resistance of the anchor may be determined by job site tests according to Technical Report TR 053, April 2016, Annex C under consideration of the  $\beta$ -factor according to Annex C 36, Table C36.1

Note (only applies to solid bricks):

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 HT II masonry

**Intended Use**  
Specifications (part 2)

**Annex B 2**

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## Specifications of intended use (part 3)

### Design:

- The anchorages have to be designed in accordance with the Technical Report TR054, April 2016, 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 Technical Report TR 054, April 2016.

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

Factors for job site tests and displacements see Annex C36

- 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:

- Condition d/d: - Installation and use in dry structures
- Condition w/w: - Installation and use in dry and wet structures
- Condition 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 HT II masonry

**Intended Use**  
Specifications (part 3)

**Annex B 3**

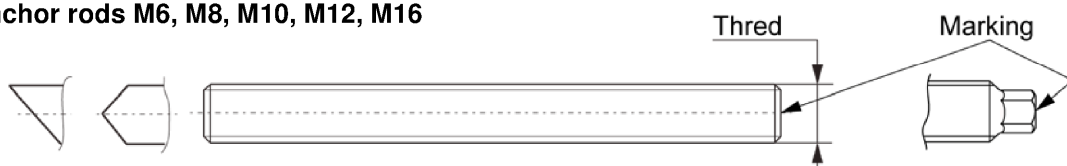
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**Table B4.1:** Installation parameters for anchor rods in solid bricks without perforated sleeves

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> in solid brick (depth of drill hole $h_0 = h_{ef}$ )	$h_{ef,min}$ [mm]	50				
	$h_{ef,max}$ [mm]	$h-30, \leq 200$				
Diameter of clearance 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 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: •

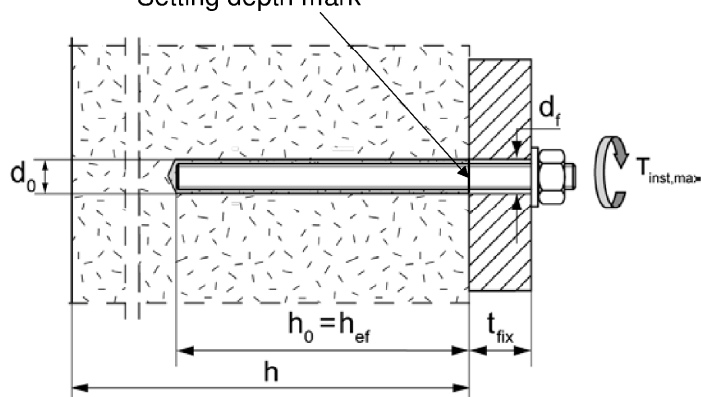
Stainless steel A4 property class 50 and high corrosion resistant steel C property class 50: ••

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

**Installation conditions:**

Anchor rod in cylindrical drill hole

Setting depth mark



Pictures not to scale

fischer injektion system FIS HT II masonry

**Intended Use**

Installation parameters for anchor rods without perforated sleeve

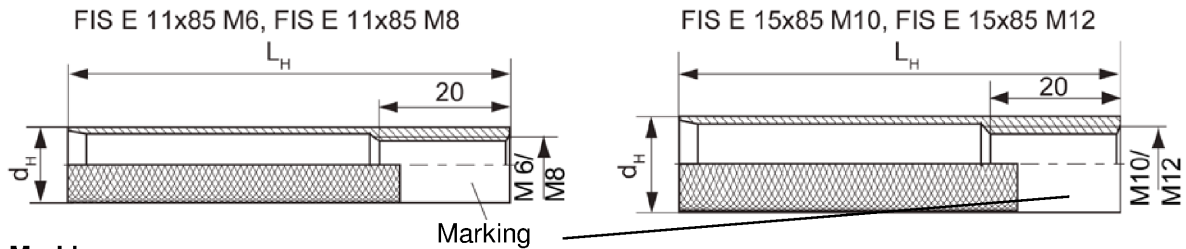
**Annex B 4**

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**Table B5.1:** Installation parameters for internal threaded anchors FIS E in solid bricks 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**

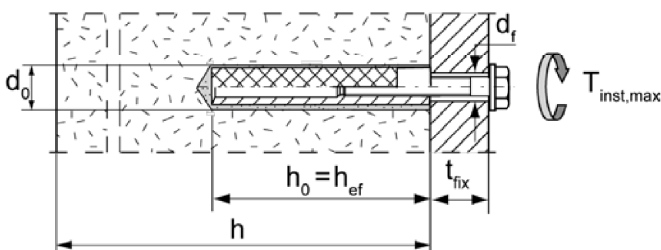


**Marking:**

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

**Installation conditions:**

Internal threaded anchor in cylindrical drill hole



Pictures not to scale

fischer injektion system FIS HT II masonry

**Intended Use**

Installation parameters for anchor rods without perforated sleeve

**Annex B 5**

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**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 $d_0 = D_{\text{sleeve, nom}}$	$d_0$ [mm]	12		16		20		
Depth of drill hole	$h_0$ [mm]	55	90	90	140	90	140	210
Effective anchorage depth	$h_{\text{ef, min}}$ [mm]	50	65	85	110	85	110	180
	$h_{\text{ef, max}}$ [mm]	50	85	85	130	85	130	200
Size of threaded rod	[-]	M6 or M8		M8 or M10		M12 or M16		
Size of internal threaded anchor FIS E		-	-	11x85	-	15x85	-	-
Diameter of cleaning brush <sup>1)</sup>	$d_b \geq$ [mm]	see Table B8.1						
Maximum installation torque	$T_{\text{inst, max}}$ [Nm]	see parameters of brick						

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

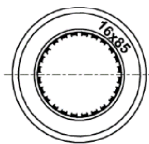
<sup>2)</sup> Bridging of unbearing layer (e.g. plaster) is possible. When reducing the effective anchorage depth  $h_{\text{ef, min}}$ , the values of the next shorter perforated sleeve of the same diameter must be used. The smaller value of characteristic resistance must be taken.

**Perforated sleeve**

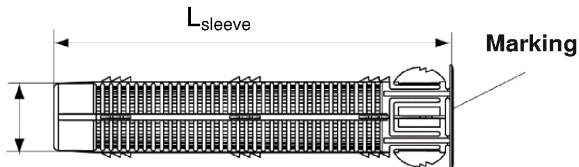
FIS H 12x50 K; FIS H 12x85 K; FIS H 16x85 K; FIS H 16x130 K;  
FIS H 20x85 K; FIS H 20x130 K; FIS H 20x200 K

**Marking:**

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

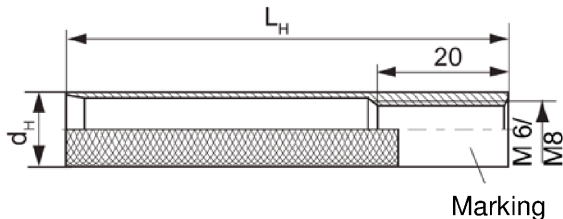


$D_{\text{sleeve, nom}}$

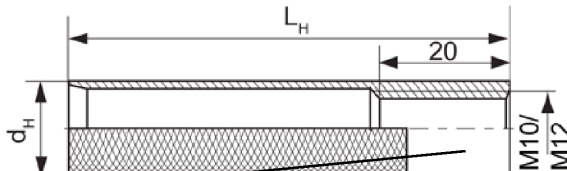


**fischer Internal threaded anchor FIS E**

FIS E 11x85 M6, FIS E 11x85 M8

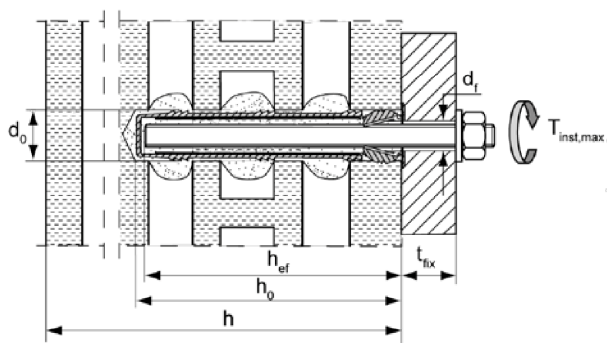


FIS E 15x85 M10, FIS E 15x85 M12

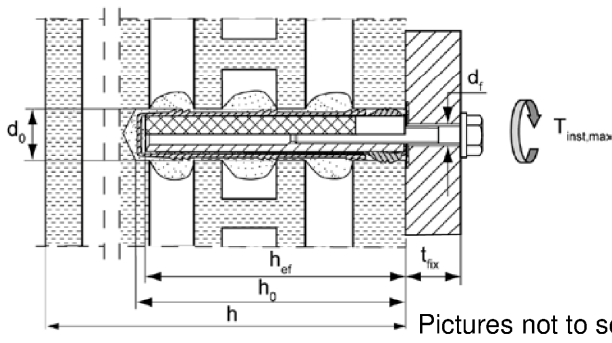


**Installation conditions:**

Anchor rod with perforated sleeve



Internal threaded anchor with perforated sleeve



Pictures not to scale

fischer injektion system FIS HT II masonry

**Intended Use**

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

**Annex B 6**

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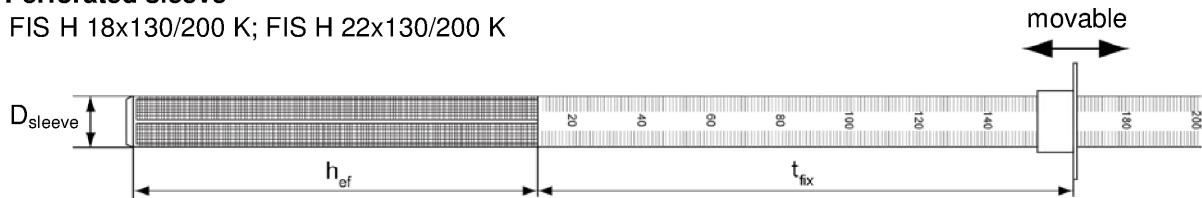
**Table B7.1:** Installation parameters for anchor rods with perforated sleeves (push through anchorage)

<b>Perforated sleeve FIS H K</b>		<b>18x130/200</b>		<b>22x130/200</b>	
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.

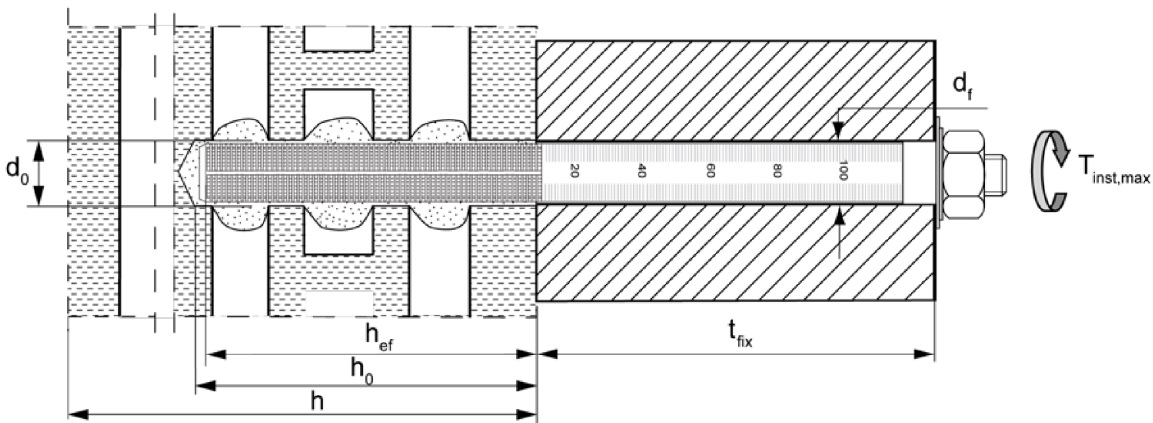
**Perforated sleeve**

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 HT II masonry

**Intended Use**

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

**Annex B 7**

Appendix 13/ 55

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

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

Drill hole diameter	$d_0$ [mm]	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 solid areas in perforated bricks

**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> $t_{cure}$			System-temperature (mortar) [°C]	Maximum processing time $t_{work}$		
	FIS HT II High Speed	FIS HT II <sup>2)</sup>	FIS HT II Low Speed <sup>2)</sup>		FIS HT II High Speed	FIS HT II <sup>2)</sup>	FIS HT II Low Speed <sup>2)</sup>
±0 to +5	3 h	3 h	6 h	+5	5 min	13 min	20 min
>+5 to +10	50 min	90 min	3 h	+10	3 min	9 min	20 min
>+10 to +20	30 min	60 min	2 h	+20	1 min	5 min	10 min
>+20 to +30	-	45 min	60 min	+30	-	4 min	6 min
>+30 to +40	-	35 min	30 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

Pictures not to scale

fischer injektion system FIS HT II masonry

**Intended use**

Cleaning brush (steel brush)

Maximum processing times and minimum curing times

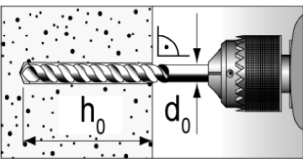
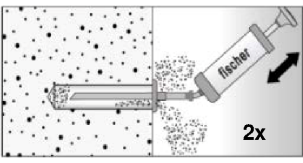
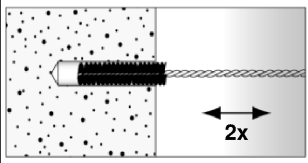
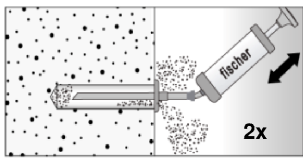
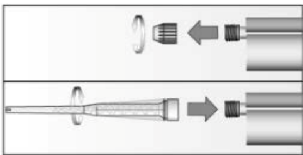
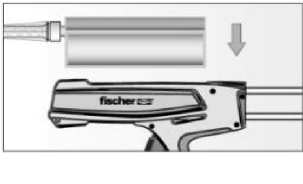
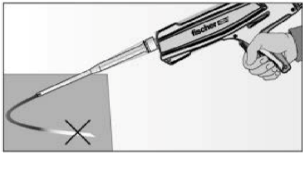
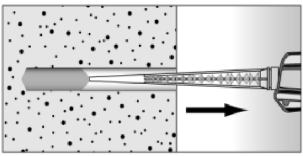
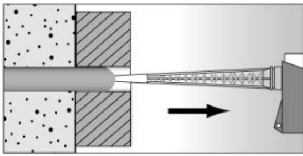
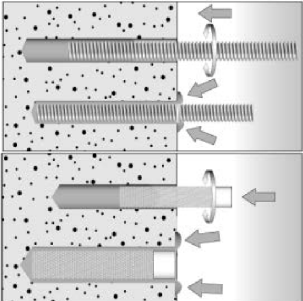

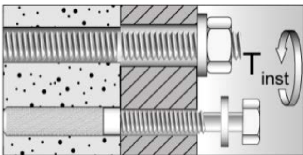
**Annex B 8**

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# Installation instruction part 1

## Installation in solid brick (without perforated sleeve)

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>Tables B4.1; B5.1</b></p>	
2			 <p>Blow out the drill hole twice. Brush twice and blow out twice again.</p>
3		<p>Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible)</p>	
4		<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>
5		<p>Fill approximately 2/3 of the drill hole with mortar beginning from the bottom of the hole<sup>1)</sup>. Avoid bubbles!</p>	 <p>For push through anchorage fill the annular clearance with mortar.</p>
6		<p>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.</p>	
7		<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 HT II masonry

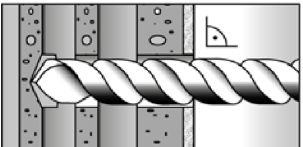
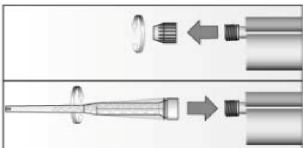


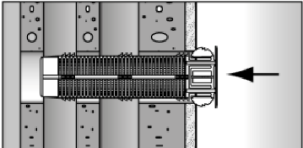
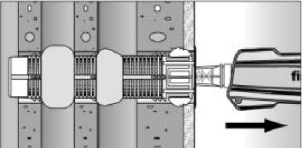
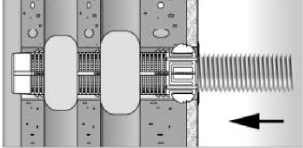

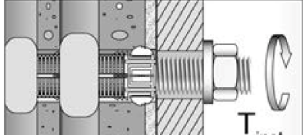
**Intended use**  
Installation instruction (without perforated sleeve) part 1

**Annex B 9**

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## Installation instruction part 2

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

1		<p>Drill the hole (drilling method see Annexes C). 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 HT II masonry

#### Intended use

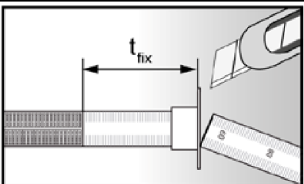
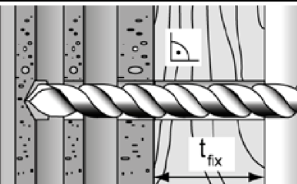
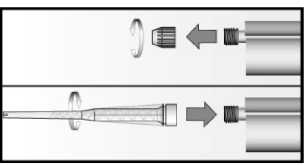
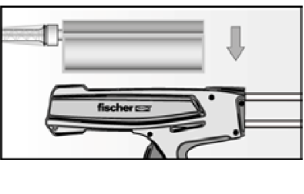
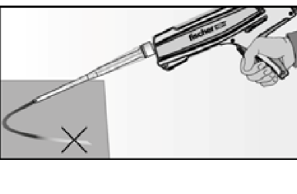
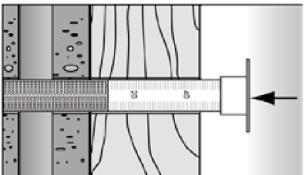
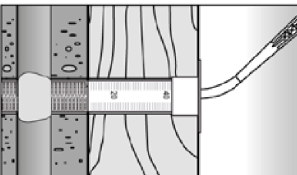
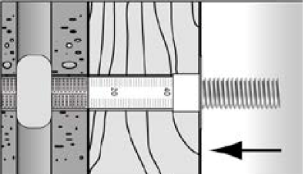

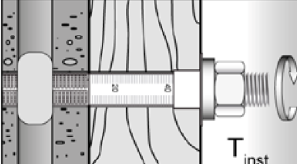
Installation instruction (with perforated sleeve) part 2

**Annex B 10**

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### 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. 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.

**Table B12.1:** Overview of controlled bricks

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	<b>2DF</b> ≥240x115x113	10 - 16	Germany	≥1,8	C4/C5
<b>Solid sand- lime brick KS / perforated Sand- lime brick KSL</b>					
Solid sand- lime brick KS	<b>NF</b> ≥240x115x71	12 - 28	Germany	≥2,0	C6/C7
Solid sand- lime brick KS	<b>8DF</b> ≥ 250x240x240	10 - 28	Germany	≥2,0	C8/C9
Perforated Sand- lime brick KSL	<b>3DF</b> 240x175x113	8 - 20	Germany	≥1,4	C10 – C13
<b>Vertical perforated brick HLz</b>					
Vertical perforated brick HLz	375x240x237	4 - 12	Germany	≥1,0	C14/C15
	<b>2DF</b> 240x115x113	6 - 28	Germany	≥1,4	C16/C17
	500x200x315	4 - 8	France	≥0,6	C18 – C21
	500x200x300	4 - 10	France	≥0,7	C22 – C25
	500x200x315	2 - 8	France	≥0,7	C26 – C29
	560x200x275	4 - 8	France	≥0,7	C30/C31
<b>Light-weight concrete hollow block Hbl</b>					
Light-weight concrete hollow block Hbl	500x200x200	2 - 6	France	≥1,0	C32/C33
<b>Light-weight concrete solid block Vbl</b>					
Light-weight concrete solid block Vbl	≥ 372x300x254	2	Germany	≥0,6	C34/C35

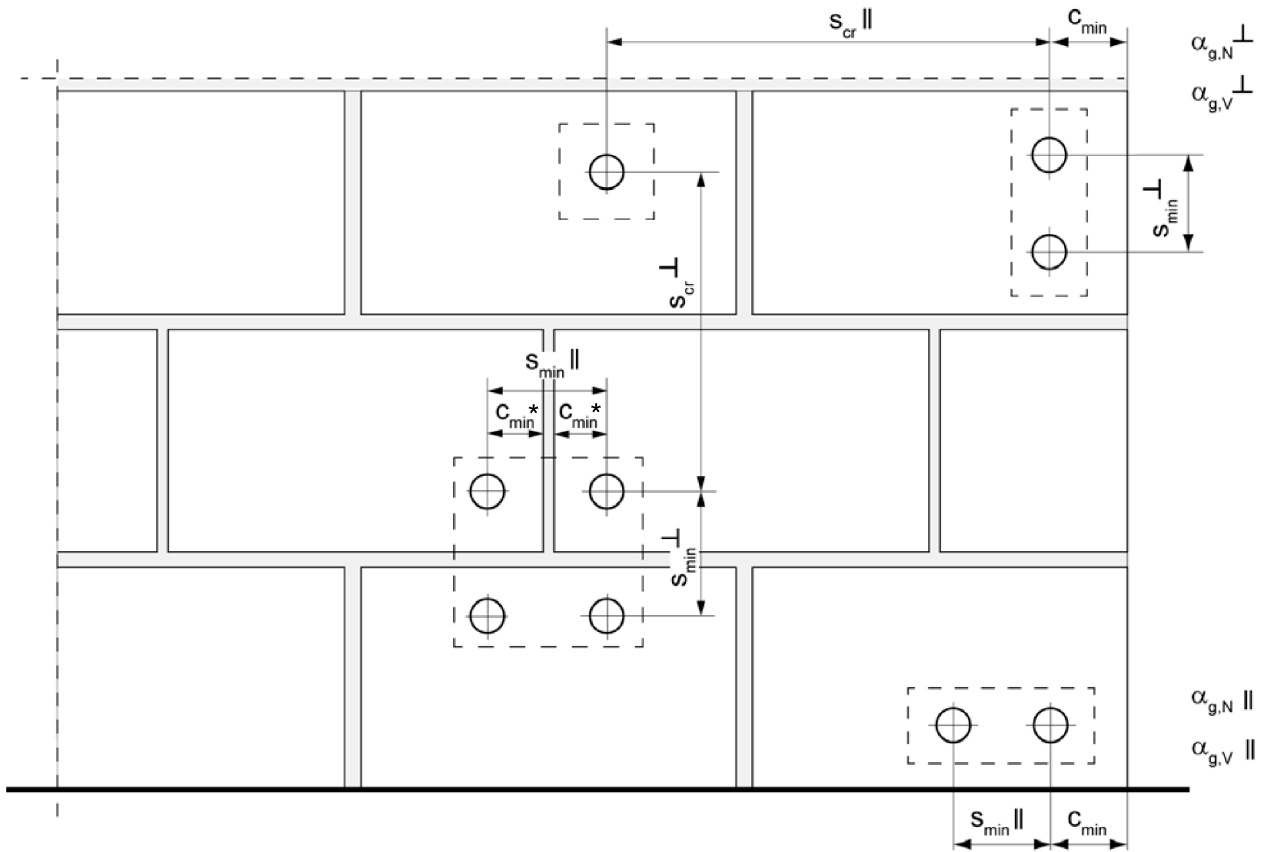
fischer injektion system FIS HT II masonry

**Intended use**  
Overview of controlled bricks

**Annex B 12**

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# Spacing and edge distance



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

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

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

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

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

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

fischer injektion system FIS HT II masonry

**Intended use**  
Spacing and edge distance

**Annex B 13**

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**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	Property class	4.6	8	15(13)	23(21)	34	63
			4.8	8	15(13)	23(21)	34	63
			5.8	10	18(17)	29(27)	42	78
			8.8	16	29(27)	46(43)	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	Property class	4.6	2				
			4.8	1,50				
			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

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

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

fischer injektion system FIS HT II masonry

**Performance**

Characteristic steel bearing capacity of anchor rods

**Annex C 1**

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**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(6)	12(10)	17	31
		4.8		4	7(6)	12(10)	17	31
		5.8		5	9(8)	15(13)	21	39
		8.8		8	15(13)	23(21)	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(13)	30(27)	52	133
		4.8		6	15(13)	30(27)	52	133
		5.8		8	19(16)	37(33)	65	166
		8.8		12	30(26)	60(53)	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

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

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

fischer injektion system FIS HT II masonry

**Performance**  
Characteristic steel bearing capacity of anchor rods

**Annex C 2**

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**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 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 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 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 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 C		1,56			

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

fischer injektion system FIS HT II masonry

**Performance**

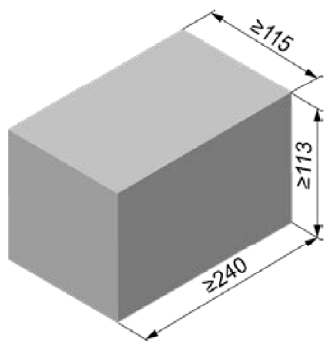
Characteristic steel bearing capacity of fischer internal threaded anchor FIS E

**Annex C 3**

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# 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 C4.1:** 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 C4.2:** 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 HT II masonry

**Performance**

Solid brick Mz, 2DF, dimensions, installation parameters

**Annex C 4**

Appendix 23/ 55

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

**Table C5.1:** 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		15x85				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 $f_b$	condition		Effective anchorage depth $h_{ef}$ [mm]													
			50						85							
10N/mm <sup>2</sup>	w/w	w/d	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	w/d	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 C5.2:** 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		15x85				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 $f_b$	condition		Effective anchorage depth $h_{ef}$ [mm]												
			≥ 50						85						
10N/mm <sup>2</sup>	w/w	w/d	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														
16N/mm <sup>2</sup>	w/w	w/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
	d/d														

Factor for job site tests and displacements see annex C36

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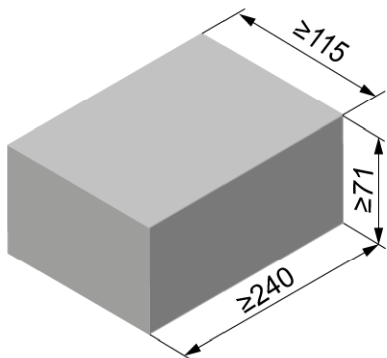
**Performance**

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

**Annex C 5**

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## 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 C6.1:** Installation parameters

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	100	50	100	50	100	50	100	50	100	85		85		
					200		200		200						
Max. installation torque $T_{inst,max}$ [Nm]	3		5		15		15		25		3	5	15		
General installation parameters															
Edge distance $c_{min}$	60														
Spacing	$s_{min} \parallel$	80													
	$s_{cr} \parallel$	$3x h_{ef}$													
	$s_{min} \perp$	$3x h_{ef}$													
	$s_{cr} \perp$	$3x h_{ef}$													
Drilling method															
Hammer drilling with hard metal hammer drill															

**Table C6.2:** Group factors

Anchor rod	M6		M8		M10		M12		M16		-		-		
Internal threaded anchor 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													

fischer injektion system FIS HT II masonry

### Performances

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

**Annex C 6**

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

**Table C7.1:** 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 $f_b$	condition		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	w/d	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	w/d	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	w/d	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 C7.2:** 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 $f_b$	condition		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	w/d	1,5	3,0	1,5	3,0	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	1,2		
20N/mm <sup>2</sup>	w/w	w/d	2,5	4,0	2,5	4,0	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	1,5		
28N/mm <sup>2</sup>	w/w	w/d	3,0	4,5	3,0	4,5	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	1,5		

Factor for job site tests and displacements see annex C36

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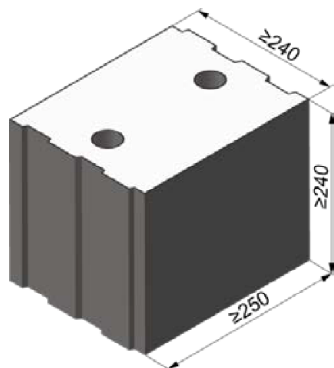
**Performances**

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

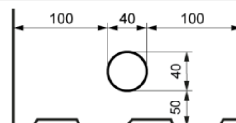
**Annex C 7**

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# 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 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	$s_{min} \parallel$					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 C8.2:** Group factors

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

fischer injektion system FIS HT II masonry

**Performance**

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

**Annex C 8**

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

**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
							11x85		15x85				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 $f_b$	condition		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		
	d/d		5,0	7,0	7,0	7,0	5,5	5,0	5,5	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		
	d/d		7,5	10,0	10,0	10,0	7,5	7,5	7,5	11,0	7,5	11		
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		
	d/d		8,5	12,0	12,0	12,0	11,0	8,5	11,0	12,0	8,5	12		

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
							11x85		15x85				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 $f_b$	condition		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 C36

fischer injektion system FIS HT II masonry

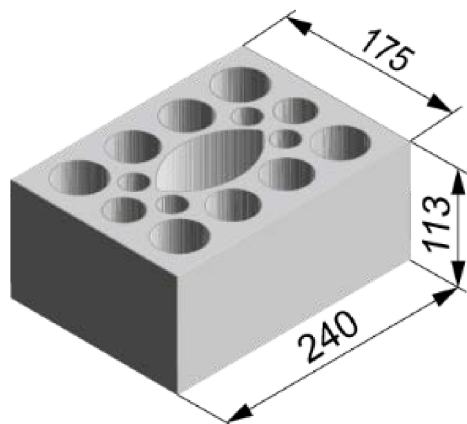
**Performance**

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

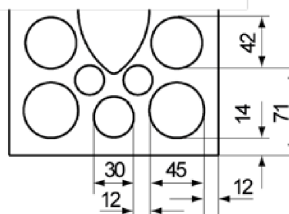
**Annex C 9**

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# 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 C10.1:** 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	-	-	-	
					11x85					15x85					
Perforated sleeve FIS H K	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 C10.2:** 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	-	-	-	
					11x85					15x85					
Perforated sleeve FIS H K	12x50		12x85		16x85			16x130		20x85			20x130		
Group factors	$\alpha_{q,N} \parallel = \alpha_{q,V} \parallel$					1,5									
	$\alpha_{q,N} \perp = \alpha_{q,V} \perp$					2,0									

fischer injektion system FIS HT II masonry

**Performance**

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

**Annex C 10**

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

**Table C11.1:** 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		
	$s_{cr} \parallel$ [mm]	240		
	$s_{min} \perp$	115		
	$s_{cr} \perp$	115		
<b>Drilling method</b>				
Hammer drilling with hard metal hammer drill				

**Table C11.2:** Group factors

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

fischer injektion system FIS HT II masonry

**Performance**

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

**Annex C 11**

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

**Table C12.1:** 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	
	d/d		1,5			2,0			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	
	d/d		2,0			2,5			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	
	d/d		2,5			3,0			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	
	d/d		3,5			4,0			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	
	d/d		4,5			5,0			6,0		6,0			6,0	

**Table C12.2:** 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 C36

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

fischer injektion system FIS HT II masonry

### Performance

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

### Annex C 12

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

**Table C13.1:** 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 C13.2:** 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 C36

fischer injektion system FIS HT II masonry

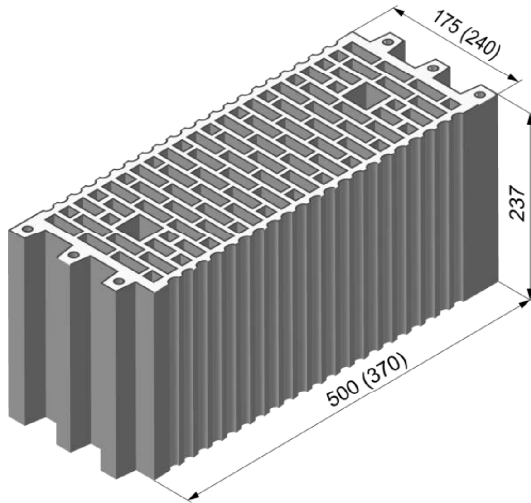
**Performances**

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

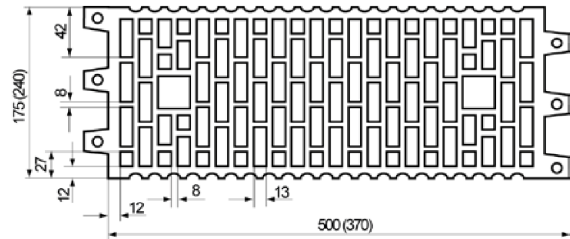
**Annex C 13**

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# 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
Density $\rho$ [kg/dm <sup>3</sup> ]	370	240	237
	$\geq 1,0$		
Compressive strength $f_b$ [N/mm <sup>2</sup> ]	4 / 6 / 8 / 10 / 12		
Standard or annex	EN 771-1		



**Table C14.1:** Installation parameters

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	
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	$c_{min}$		100											
Spacing	$s_{min \parallel}$	[mm]	100											
	$s_{cr \parallel}$		500 (370)											
	$s_{min \perp}$		100											
	$s_{cr \perp}$		240											
<b>Drilling method</b>														
Hammer drilling with hard metal hammer drill														

**Table C14.2:** 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		
					11x85						15x85			
Perforated sleeve FIS H K	12x50		12x85		16x85			16x130		20x85			20x130	
Group factors	$\alpha_{q,N \parallel} = \alpha_{q,v \parallel}$	$\alpha_{q,N \perp} = \alpha_{q,v \perp}$	[-]		1									

fischer injektion system FIS HT II masonry	<b>Annex C 14</b> Appendix 33/ 55
<b>Performance</b> Vertical perforated brick HLz, form B, dimensions, installation parameters	

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

**Table C15.1:** 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 $f_b$	condition													
	w/w	w/d	0,3			0,9			1,2					
4 N/mm <sup>2</sup>	d/d		0,4			0,9			1,2					
	w/w	w/d	0,5			1,5			2,0					
6 N/mm <sup>2</sup>	d/d		0,6			1,5			2,0					
	w/w	w/d	0,75			2,0			2,5					
8 N/mm <sup>2</sup>	d/d		0,75			2,0			2,5					
	w/w	w/d	0,9			2,5			3,0					
10 N/mm <sup>2</sup>	d/d		0,9			2,5			3,5					
	w/w	w/d	0,9			3,0			3,5					
12 N/mm <sup>2</sup>	d/d		1,2			3,0			4,0					

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

**Table C15.2:** 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 $f_b$	condition													
	w/w	w/d	0,5			0,6			0,5			0,6		
4 N/mm <sup>2</sup>	d/d		0,5			0,6			0,5			0,6		
	w/w	w/d	0,75			0,9			0,75			0,9		
6 N/mm <sup>2</sup>	d/d		0,75			0,9			0,75			0,9		
	w/w	w/d	0,9			1,2			0,9			1,2		
8 N/mm <sup>2</sup>	d/d		0,9			1,2			0,9			1,2		
	w/w	w/d	1,2			1,5			1,2			1,5		
10 N/mm <sup>2</sup>	d/d		1,2			1,5			1,2			1,5		
	w/w	w/d	1,5			2,0			1,5			2,0		
12 N/mm <sup>2</sup>	d/d		1,5			2,0			1,5			2,0		

Factor for job site tests and displacements see annex C36

fischer injektion system FIS HT II masonry

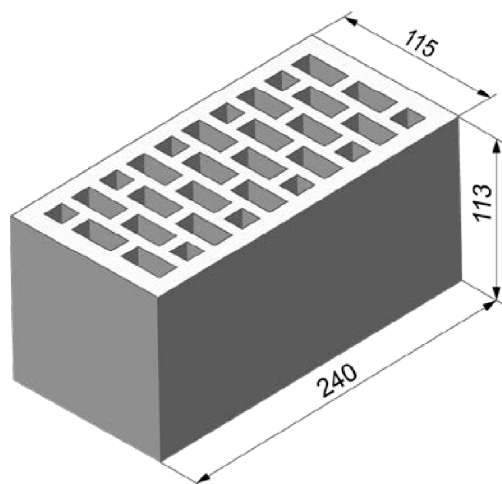
**Performance**

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

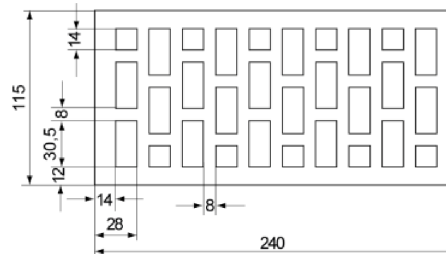
**Annex C 15**

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## 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 C16.1:** 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										
General installation parameters											
Edge distance $C_{min}$	80										
Spacing $S_{cr \parallel} = S_{min \parallel}$ [mm]	240										
	$S_{cr \perp} = S_{min \perp}$	115									
Drilling method											
Hammer drilling with hard metal hammer drill											

**Table C16.2:** 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	$\alpha_{q,N \parallel}$	[-]	2								
	$\alpha_{q,V \parallel}$										
	$\alpha_{q,N \perp}$										
	$\alpha_{q,V \perp}$										

fischer injektion system FIS HT II masonry

### Performances

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

**Annex C 16**

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**Vertical perforated brick HLz, 2DF, EN 771-1**
**Table C17.1:** 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 $f_b$	condition										
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 C17.2:** 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 $f_b$	condition										
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										
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										
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										
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										
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										

Factor for job site tests and displacements see annex C36

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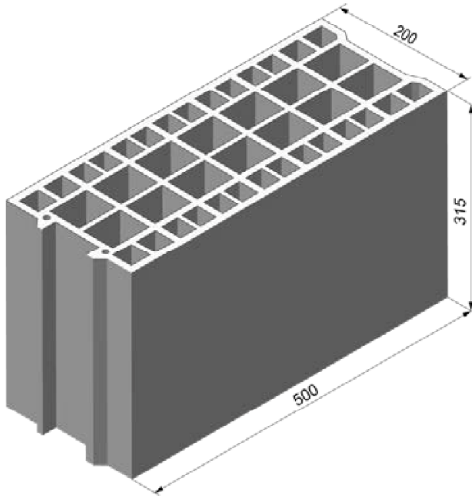
**Performance**

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

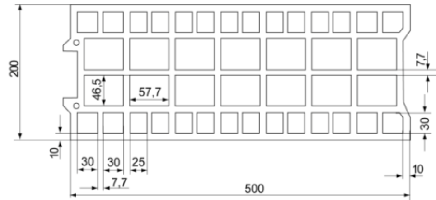
**Annex C 17**

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# 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 C18.1:** 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	-	
					11x85						15x85			
Perforated sleeve FIS H K	12x50		12x85		16x85			16x130		20x85			20x130	
Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K														
Max. installation torque	$T_{inst,max}$	[Nm]	2											
General installation parameters														
Edge distance	$c_{min}$	[mm]	120											
Spacing	$s_{min \parallel}$		120											
	$s_{cr \parallel}$		500											
	$s_{min \perp} = s_{cr \perp}$		315											
Drilling method														
Hammer drilling with hard metal hammer drill														

**Table C18.2:** 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	-	
					11x85						15x85			
Perforated sleeve FIS H K	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											

fischer injektion system FIS HT II masonry

**Performance**

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

**Annex C 18**

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

**Table C19.1:** 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 C19.2:** 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

fischer injektion system FIS HT II masonry

**Performance**

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

**Annex C 19**

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

**Table C20.1:** 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 $f_b$	condition													
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 C20.2:** 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 $f_b$	condition					
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 C36

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

fischer injektion system FIS HT II masonry

**Performance**

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

**Annex C 20**

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

**Table C21.1:** 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 $f_b$	condition													
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 C21.2:** 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 $f_b$	condition					
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 C36

fischer injektion system FIS HT II masonry

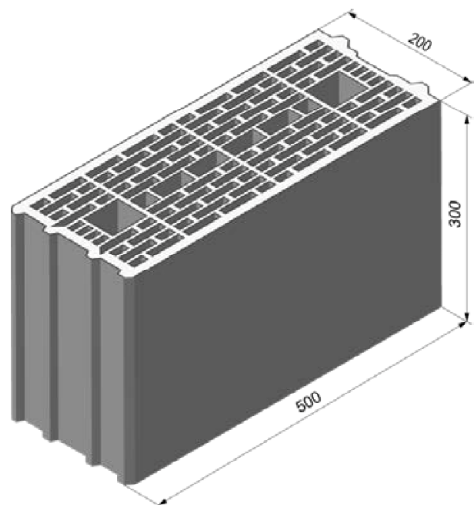
**Performance**

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

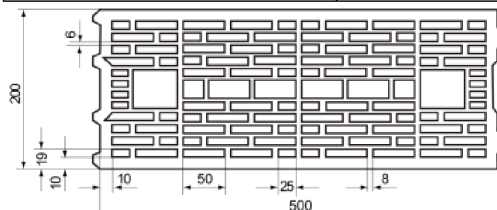
**Annex C 21**

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## 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 C22.1:** 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	-	
					11x85						15x85			
Perforated sleeve FIS H K	12x50		12x85		16x85			16x130		20x85			20x130	
Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K														
Max. installation torque	$T_{inst,max}$	[Nm]	2											
General installation parameters														
Edge distance	$c_{min}$	[mm]	50					80			50	80		
Spacing	$s_{min \parallel}$		100											
	$s_{cr \parallel}$		500											
	$s_{min \perp} = s_{cr \perp}$		300											
Drilling method														
Hammer drilling with hard metal hammer drill														

**Table C22.2:** 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	-	
					11x85						15x85			
Perforated sleeve FIS H K	12x50		12x85		16x85			16x130		20x85			20x130	
Group factors	$\alpha_{q,N \parallel}$	[-]	1,4											
	$\alpha_{q,V \parallel}$		2											
	$\alpha_{q,N \perp} = \alpha_{q,V \perp}$													

fischer injektion system FIS HT II masonry

### Performance

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

**Annex C 22**

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

**Table C23.1:** 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 C23.2:** 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
	$\alpha_{q,N \perp} = \alpha_{q,V \perp}$			

fischer injektion system FIS HT II masonry

**Performance**

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

**Annex C 23**

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

**Table C24.1:** 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 $f_b$	condition													
	w/w	w/d	0,5			0,6			1,2		0,75		1,5	
4 N/mm <sup>2</sup>	d/d		0,6			0,75			1,2		0,9		1,5	
	w/w	w/d	0,75			0,9			1,5		1,2		2,0	
6 N/mm <sup>2</sup>	d/d		0,9			1,2			2,0		1,2		2,5	
	w/w	w/d	0,9			1,2			2,0		1,5		2,5	
8 N/mm <sup>2</sup>	d/d		1,2			1,5			2,5		1,5		3,0	
	w/w	w/d	1,2			1,5			2,5		2,0		3,5	
10 N/mm <sup>2</sup>	d/d		1,5			2,0			3,0		2,0		4,0	

**Table C24.2:** 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 $f_b$	condition					
	w/w	w/d	1,2		1,5	
4 N/mm <sup>2</sup>	d/d		1,2		1,5	
	w/w	w/d	1,5		2,0	
6 N/mm <sup>2</sup>	d/d		2,0		2,5	
	w/w	w/d	2,0		2,5	
8 N/mm <sup>2</sup>	d/d		2,5		3,0	
	w/w	w/d	2,5		3,5	
10 N/mm <sup>2</sup>	d/d		3,0		4,0	

Factor for job site tests and displacements see annex C36

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

fischer injektion system FIS HT II masonry

### Performances

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

**Annex C 24**

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

**Table C25.1:** 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 $f_b$	condition													
4 N/mm <sup>2</sup>	w/w	w/d	0,9	1,2	0,9	1,2	0,6	2,0	0,6					
	d/d													
6 N/mm <sup>2</sup>	w/w	w/d	1,2	1,5	1,2	1,5	0,9	3,0	0,9					
	d/d													
8 N/mm <sup>2</sup>	w/w	w/d	1,5	2,0	1,5	2,0	1,2	4,0	1,2					
	d/d													
10 N/mm <sup>2</sup>	w/w	w/d	2,0	3,0	2,0	3,0	1,5	5,0	1,5					
	d/d													

**Table C25.2:** 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 $f_b$	condition					
4 N/mm <sup>2</sup>	w/w	w/d	0,6			
	d/d					
6 N/mm <sup>2</sup>	w/w	w/d	0,9			
	d/d					
8 N/mm <sup>2</sup>	w/w	w/d	1,2			
	d/d					
10 N/mm <sup>2</sup>	w/w	w/d	1,5			
	d/d					

Factor for job site tests and displacements see annex C36

fischer injektion system FIS HT II masonry

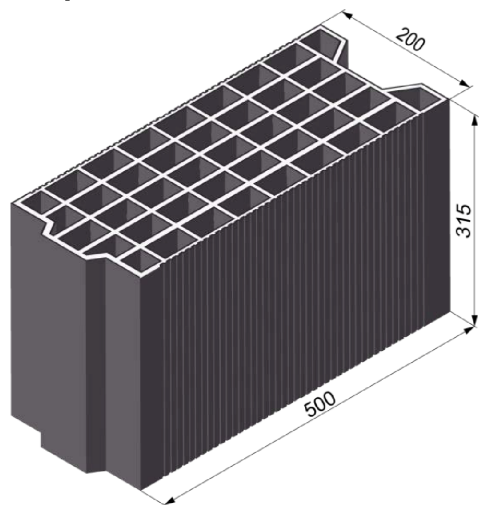
**Performance**

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

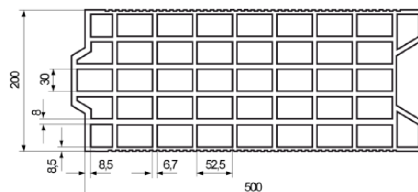
**Annex C 25**

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## 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 C26.1:** 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	-	
	-		-		11x85		-		-		15x85		-	
Perforated sleeve FIS H K	12x50		12x85		16x85			16x130		20x85			20x130	

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

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

### General installation parameters

Edge distance	$c_{min}$	50				80				50				80			
Spacing	$s_{min}   $	100															
	$s_{cr}   $ [mm]	500															
	$s_{min} \perp$	100															
	$s_{cr} \perp$	315															

### Drilling method

Hammer drilling with hard metal hammer drill

**Table C26.2:** 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	-		
	-		-		11x85		-		-		15x85		-		
Perforated sleeve FIS H K	12x50		12x85		16x85			16x130		20x85			20x130		
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 HT II masonry

### Performance

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

**Annex C 26**

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

**Table C27.1:** 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
	$s_{cr} \parallel$ [mm]			500
	$s_{min} \perp$			100
	$s_{cr} \perp$			315
<b>Drilling method</b>				
Hammer drilling with hard metal hammer drill				

**Table C27.2:** 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

fischer injektion system FIS HT II masonry

**Performance**

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

**Annex C 27**

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

**Table C28.1:** 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 $f_b$	condition													
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 C28.2:** 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 $f_b$	condition					
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 C36

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

fischer injektion system FIS HT II masonry

**Performance**

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

**Annex C 28**

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

**Table C29.1:** 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 $f_b$	condition													
2 N/mm <sup>2</sup>	w/w	w/d	0,3	0,6	0,3	0,6	0,6	0,6	0,9	0,75				
	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	1,5				
	d/d													
6 N/mm <sup>2</sup>	w/w	w/d	0,9	2,0	0,9	2,0	1,5	1,5	3,0	2,0				
	d/d													
8 N/mm <sup>2</sup>	w/w	w/d	1,5	2,5	1,5	2,5	2,0	2,0	4,0	3,0				
	d/d													

**Table C29.2:** 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 $f_b$	condition					
2 N/mm <sup>2</sup>	w/w	w/d	0,6		0,75	
	d/d					
4 N/mm <sup>2</sup>	w/w	w/d	1,2		1,5	
	d/d					
6 N/mm <sup>2</sup>	w/w	w/d	1,5		2,0	
	d/d					
8 N/mm <sup>2</sup>	w/w	w/d	2,0		3,0	
	d/d					

Factor for job site tests and displacements see annex C36

fischer injektion system FIS HT II masonry

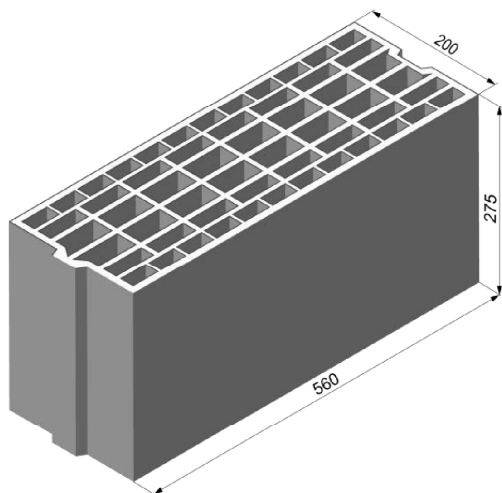
**Performance**

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

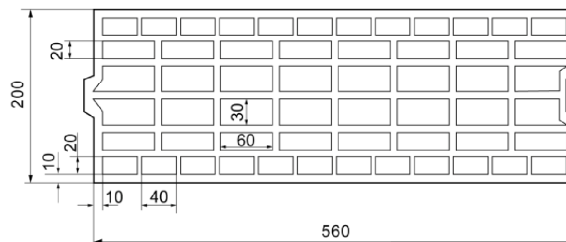
**Annex C 29**

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# 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 C30.1:** 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 $S_{min} \parallel = S_{cr} \parallel$	560						
	$S_{min} \perp = S_{cr} \perp$	275					
<b>Drilling method</b>							
Hammer drilling with hard metal hammer drill							

**Table C30.2:** Group factors

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

fischer injektion system FIS HT II masonry

**Performance**

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

**Annex C 30**

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

**Table C31.1:** 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 $f_b$	condition							
	w/w	w/d	0,9			1,2		
4 N/mm <sup>2</sup>	d/d		1,2			1,5		
	w/w	w/d	1,5			2,0		
6 N/mm <sup>2</sup>	d/d		1,5			2,0		
	w/w	w/d	2,0			2,5		
8 N/mm <sup>2</sup>	d/d		2,5			3,0		

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

**Table C31.2:** 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 $f_b$	condition							
	w/w	w/d				0,9		
4 N/mm <sup>2</sup>	d/d					0,9		
	w/w	w/d				1,5		
6 N/mm <sup>2</sup>	d/d					1,5		
	w/w	w/d				2,0		
8 N/mm <sup>2</sup>	d/d					2,0		

Factor for job site tests and displacements see annex C36

fischer injektion system FIS HT II masonry

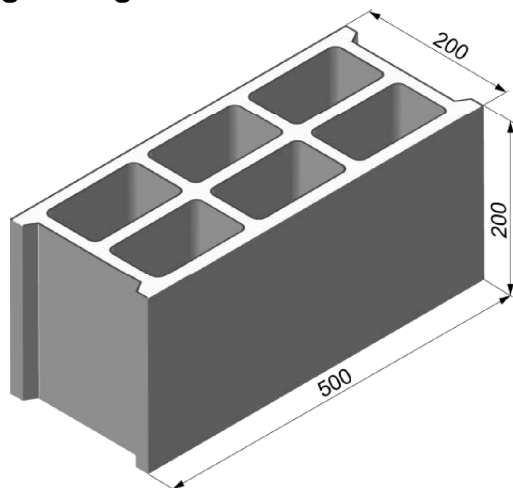
**Performance**

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

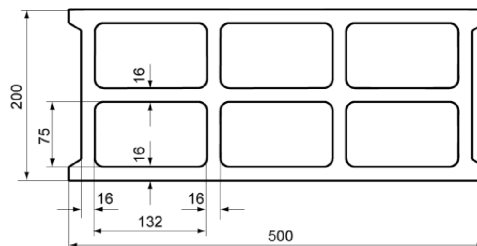
**Annex C 31**

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



Light-weight concrete hollow block Hbl, EN 771-3			
Producer	e.g. Sepa Papaing		
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 C32.1:** Installation parameters

Anchor rod	M6	M8	M6	M8	-	M8	M10	M8	M10	M10	M12	-	M12	M16	
Internal threaded anchor FIS E	-		-		M6	M8	-		-		-		M10	M12	-
					11x85								15x85		-
Perforated sleeve FIS H K	12x50		12x85		16x85			16x130		18x130/200		20x85			
Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K															
Max. installation torque $T_{inst,max}$ [Nm]	1				2										
General installation parameters															
Edge distance $c_{min}$					100										
Spacing	$s_{min} \parallel = s_{cr} \parallel$ [mm]				500										
	$s_{min} \perp = s_{cr} \perp$				200										
Drilling method															
Hammer drilling with hard metal hammer drill															

**Table C32.2:** Group factors

Anchor rod	M6	M8	M6	M8	-	M8	M10	M8	M10	M10	M12	-	M12	M16	
Internal threaded anchor FIS E	-		-		M6	M8	-		-		-		M10	M12	-
					11x85								15x85		-
Perforated sleeve FIS H K	12x50		12x85		16x85			16x130		18x130/200		20x85			
Group factors	$\alpha_{q,N} \parallel$	[-]	2												
	$\alpha_{q,V} \parallel$														
	$\alpha_{q,N} \perp$														
	$\alpha_{q,V} \perp$														

fischer injektion system FIS HT II masonry

### Performance

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

**Annex C 32**

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

**Table C33.1:** Characteristic resistance under tensile load

Anchor rod	M6	M8	M6	M8	-	M8	M10	M8	M10	M10	M12	-	M12	M16	
Internal threaded anchor FIS E	-		-		M6	M8	-		-		-		M10	M12	-
					11x85								15x85		-
Perforated sleeve FIS H K	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 $f_b$	condition		
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 C33.2:** Characteristic resistance under shear load

Anchor rod	M6	M8	M6	M8	-	M8	M10	M8	M10	M10	M12	-	M12	M16	
Internal threaded anchor FIS E	-		-		M6	M8	-		-		-		M10	M12	-
					11x85								15x85		-
Perforated sleeve FIS H K	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 $f_b$	condition		
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 C36

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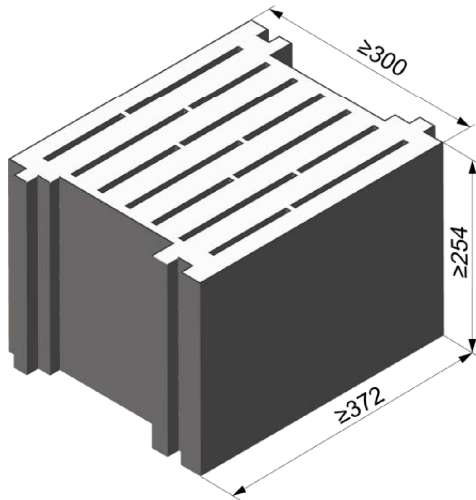
**Performance**

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

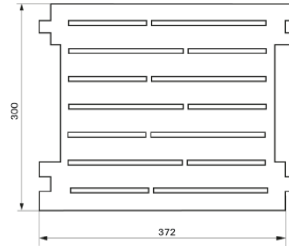
**Annex C 33**

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# 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 C34.1:** 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
<b>Anchor rod 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]	370							
	$s_{min \perp} = s_{cr \perp}$	250							
<b>Drilling method</b>									
Hammer drilling with hard metal hammer drill									

**Table C34.2:** 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	$\alpha_{q,N \parallel}$	[-]	2						
	$\alpha_{q,V \parallel}$								
	$\alpha_{q,N \perp}$								
	$\alpha_{q,V \perp}$								

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**Performance**

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

**Annex C 34**

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

**Table C35.1:** 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	
<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 $f_b$	condition									
2 N/mm <sup>2</sup>	w/w	w/d	2,0			2,5			3,0	
	d/d		2,0			3,0			4,0	

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

**Table C35.2:** 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	
<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 $f_b$	condition									
2 N/mm <sup>2</sup>	w/w	w/d	4,5				6,5			
	d/d									

Factor for job site tests and displacements see annex C36

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**Performance**

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

**Annex C 35**

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## β-factors for job site tests; displacements

**Table C36.1:** β-factors for job site tests

condition		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 FIS E 11x85	0,6	0,54		
	M16 FIS E 15x85	0,62	0,52		
	16x85	0,55	0,46		
hollow units	all sizes	0,86	0,72	0,96	0,8

**Table C36.2:** Displacements

Material	N [kN]	δN <sub>0</sub> [mm]	δN <sub>∞</sub> [mm]	V [kN]	δV <sub>0</sub> [mm]	δV <sub>∞</sub> [mm]
solid units h <sub>ef</sub> =100m	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	0,03	0,06	$\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$	0,82	0,88
hollow units	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	0,48	0,06	$\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$	1,71	2,56
solid brick Mz DF annex C 4 - C 5	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	0,74	1,48	$\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$	1,23	1,85
solid brick Ks NF annex C 6 / C 7	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	0,2	0,4	$\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$	0,91	1,37
brick Annex C 32 / C 33	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	0,03	0,06	$\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$	6,44	9,66

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

**Annex C 36**

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