

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
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★ Designated
according to
Article 29 of Regula-
tion (EU) No 305/2011
and member of EOTA
(European Organi-
sation for Technical
Assessment)
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European Technical Assessment

ETA-10/0383
of 6 October 2017

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the
European Technical Assessment:

Trade name of the construction product

Product family
to which the construction product belongs

Manufacturer

Manufacturing plant

This European Technical Assessment
contains

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

This version replaces

Deutsches Institut für Bautechnik

fischer injection system FIS V for use in
masonry

Injection system for use in masonry

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

fischerwerke

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

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

ETA-10/0383 issued on 17 June 2015

European Technical Assessment

ETA-10/0383

English translation prepared by DIBt

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Specific part**1 Technical description of the product**

The fischer injection system FIS V for masonry is a bonded anchor (injection type) consisting of a mortar cartridge with injection mortar fischer FIS V, FIS VS and FIS VW, a perforated sieve sleeve and an anchor rod with hexagon nut and washer or an internal threaded rod in the range of M6 to M16. The steel elements are made of zinc coated steel, stainless steel or high corrosion resistant steel.

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

The product description is given in Annex A.

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

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

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

3 Performance of the product and references to the methods used for its assessment**3.1 Mechanical resistance and stability (BWR 1)**

Essential characteristic	Performance
Characteristic resistance for tension and shear loads	See Annex C 1 – C 109
Displacements under shear and tension loads	See Annex C 110
Reduction Factor for job site tests (β -Factor)	See Annex C 110
Edge distances and spacing	See Annex C 3 – C 109

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorages satisfy requirements for Class A1
Resistance to fire	No performance assessed

3.3 Hygiene, health and the environment (BWR 3)

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

3.4 Safety and accessibility in use (BWR 4)

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

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

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

The system to be applied is: 1

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

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

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

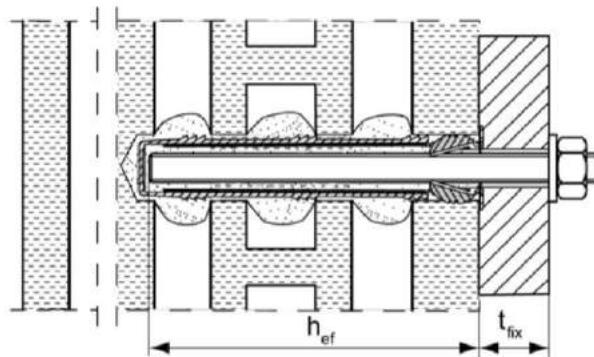
BD Dipl.-Ing. Andreas Kummerow
Head of Department

Begläubigt:
Baderschneider

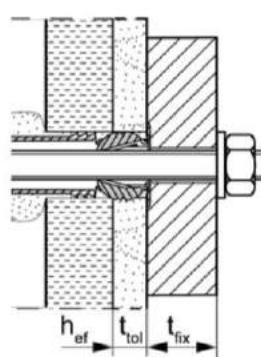
Installation conditions part 1

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

Pre-positioned anchorage:



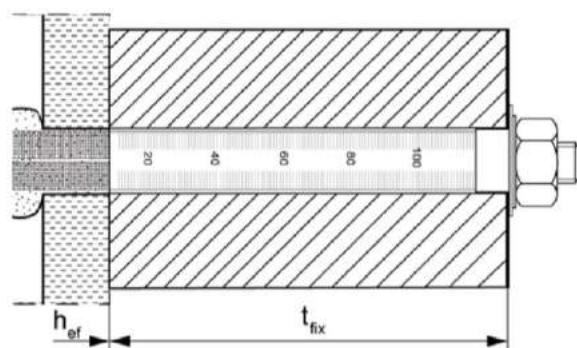
Installation with render bridge



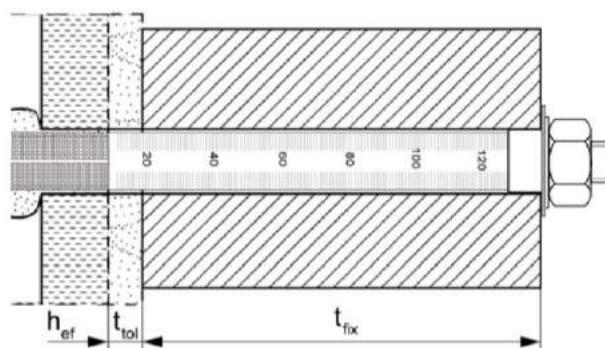
Size of the perforated sleeve:

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

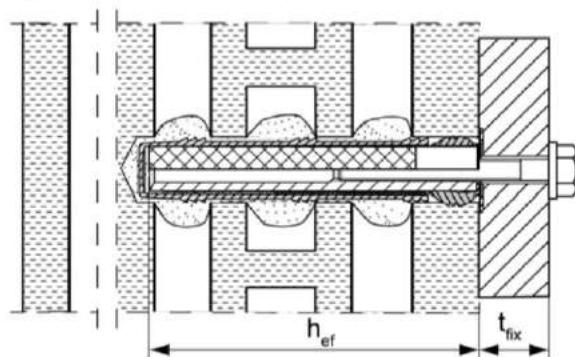


Size of the perforated sleeve:

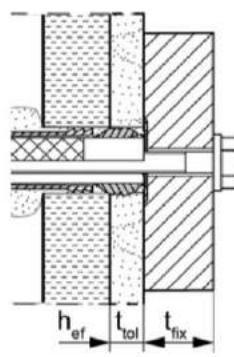
FIS H 18x130/200 K FIS H 22x130/200 K

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_{fix} = thickness of fixture

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

fischer injektion system FIS V masonry

Product description

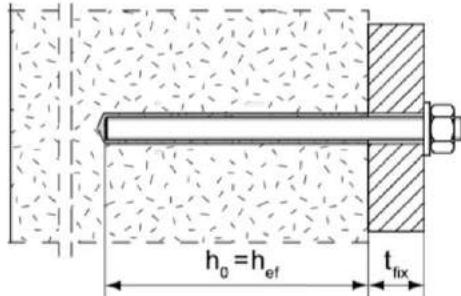
Installation conditions part 1,
Anchor rods and internal threaded anchor with perforated sleeve

Annex A 1

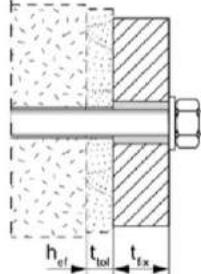
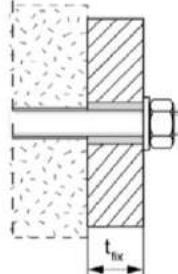
Installation conditions part 2

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

Pre-positioned anchorage:



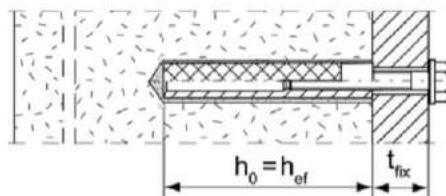
Push through anchorage: Annular gap filled with mortar



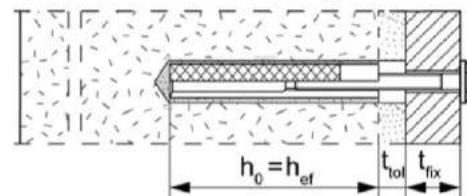
Installation with render bridge

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

Pre-positioned anchorage:



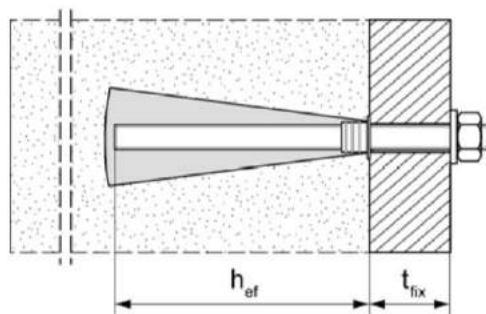
Installation with render bridge



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

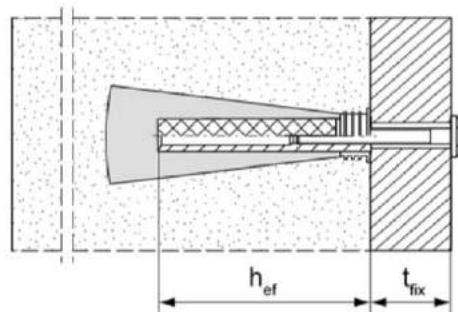
Pre-positioned anchorage:

anchor rods M8, M10, M12



Pre-positioned anchorage:

Internal threaded anchor FIS E 11x85 M6 / M8



Pictures not to scale

h_0 = depth of drill hole

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

h_{ef} = effective anchorage depth

t_{fix} = thickness of fixture

fischer injektion system FIS V masonry

Product description

Installation conditions part 2,

Anchor rods and internal threaded anchor without perforated sleeve

Annex A 2

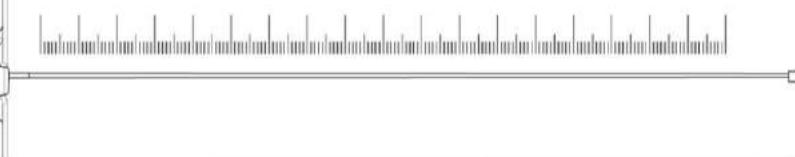
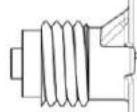
Overview system components part 1

Mortar cartridge (shuttle cartridge) with sealing cap

1

Size: 360 ml, 585 ml, 950 ml

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

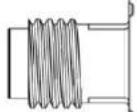
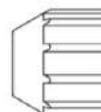


Mortar cartridge (coaxial cartridge) with sealing cap

1

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

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



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

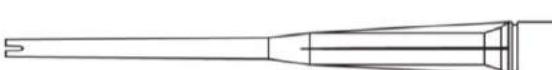
center sleeve



Injection adapter



Static mixer



Cleaning brush BS / BSB



Blow-out pump ABG or ABP



Pictures not to scale

fischer injektion system FIS V masonry

System description

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

Annex A 3

Overview system components part 2

fischer anchor rod

(2)



Size: M6, M8, M10, M12, M16

Internal threaded anchor FIS E

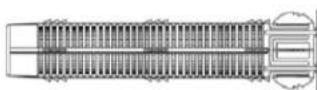
(5)



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

Perforated sleeve FIS H K

(7)



Size: FIS H 12x50 K
FIS H 12x85 K
FIS H 16x85 K
FIS H 20x85 K

(7)



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

Perforated sleeve FIS H K (push through anchorage)

(7)



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

Washer

(3)



Hexagon nut

(4)



Pictures not to scale

fischer injektion system FIS V masonry

System description

Overview system components part 2: steel parts / perforated sleeve

Annex A 4

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 V masonry				
Product description Materials				Annex A 5

Specifications of intended use (part 1)

Table B1.1: Overview use and performance categories

Anchorage subject to		fischer injection system FIS V masonry	
Hole drilling with hammer drill mode —————		all bricks; without C26 to C45, C73 to C76	
Hole drilling with rotary drill mode —————		all bricks	
Static and quasi static load, in masonry		all bricks	
Use category	dry or wet masonry	all bricks	
Installation	Pre-positioned anchorage	Anchor rod (in solid brick masonry and autoclaved aerated concrete)	Perforated sleeve (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 and autoclaved aerated concrete)	Perforated sleeve (in perforated and solid brick masonry) Size: FIS H 18x130/200 K FIS H 22x130/200 K
Installation conditions	category d/d	all bricks	
	category w/d		
	category w/w		
Installation temperature	-10°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 V masonry			
Intended Use Specifications (part 1)			Annex B 1

Specifications of intended use (part 2)

Anchors subject to:

- Static and quasi-static loads

Base materials:

- Solid brick masonry (Use category b) and autoclaved aerated concrete (Use category d), acc. to Annex B 13 / B 14
- Hollow brick masonry (use category c), according to Annex B 13 / B 14
- For minimum thickness of masonry member is $h_{ef}+30\text{mm}$
- Mortar strength class of the masonry M2,5 at minimum according to EN 998-2:2010
- For other bricks in solid masonry, hollow or perforated masonry and autoclaved aerated concrete, the characteristic resistance of the anchor may be determined by job site tests according to ETAG 029, Annex B under consideration of the β -factor according to Annex C 110, Table C110.1

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

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

Temperature Range:

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

Use conditions (Environmental conditions):

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

Note: Particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used)

fischer injektion system FIS V masonry

Intended Use
Specifications (part2)

Annex B 2

Specifications of intended use (part 2)

Design:

- The anchorages have to be designed in accordance with the ETAG 029, Annex C, Design method A under the responsibility of an engineer experienced in anchorages and masonry work.

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

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

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

For the Calculation of pulling out a brick under tensile load $N_{Rk,pb}$ or pushing out a brick under shear load $V_{Rk,pb}$ see ETAG 029, Annex C.

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

Factors for job site tests and displacements see Annex C110

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

Installation:

- Category d/d: - Installation and use in dry structures
- Category w/w: - Installation and use in dry and wet structures
- Category w/d: - Installation in wet structures and use in dry structures
- Hole drilling see Annex C (drilling method)
- In case of aborted hole: The hole shall be filled with mortar
- Bridging of unbearing layer (e.g. plaster) see Annex B 6, Table B6.1
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site
- Fastening screws or anchor rods (including nut and washer) must comply with the appropriate material and property class of the fischer internal threaded anchor FIS E.
- minimum curing time see Annex B 8, Table B8.2
- Commercial standard threaded rods, washers and hexagon nuts may also be used if the following requirements are fulfilled:

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

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

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

fischer injektion system FIS V masonry

Intended Use
Specifications (part2)

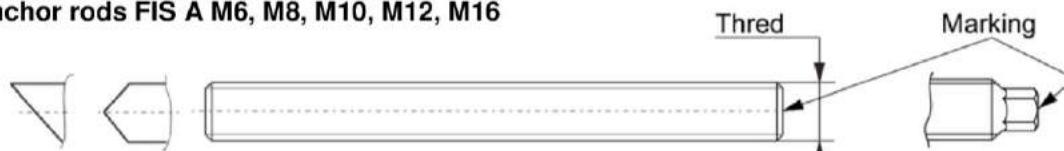
Annex B 3

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

Anchor rod	Thread	M6	M8	M10	M12	M16
Nominal drill hole diameter	d_0 [mm]	8	10	12	14	18
Effective anchorage depth $h_{ef}^{1)}$ in AAC cylindrical drill hole	$h_0 = h_{ef,min}$ [mm]			100		
Effective anchorage depth $h_{ef}^{1)}$ in AAC conical drill hole	$h_{ef,min}$ [mm]		80			
	$h_{ef,max}$ [mm]	-	75			
Effective anchorage depth $h_{ef}^{1)}$ 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		

¹⁾ $h_{ef,min} \leq h_{ef} \leq h_{ef,max}$ is possible.

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



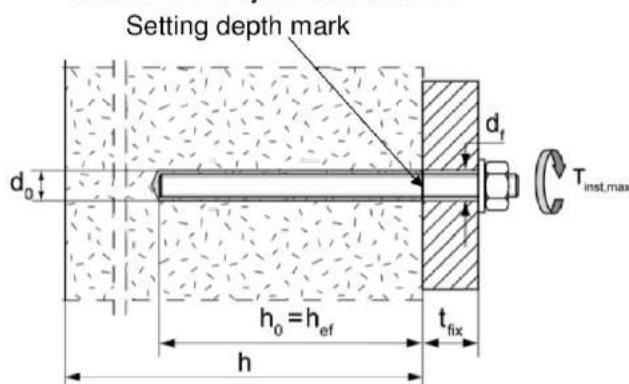
Marking:

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

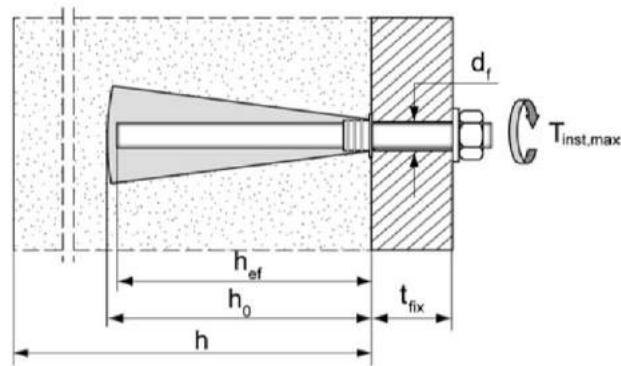
Stainless steel A4 property class 50 and high corrosion resistant steel C property class 50: ••
Or colour coding according to DIN 976-1:2016-09, property class 4.6 marking according to EN ISO 898-1:2013

Installation conditions:

Anchor rod in cylindrical drill hole



Anchor rod in conical drill hole



Pictures not to scale

fischer injektion system FIS V masonry

Intended Use

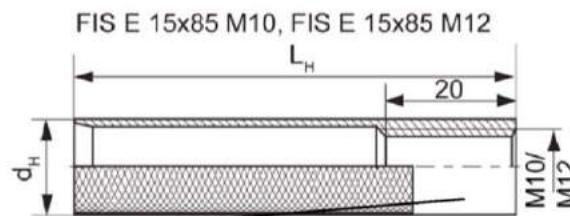
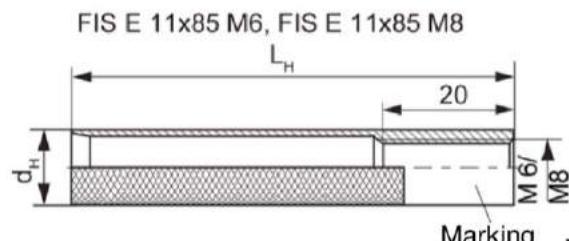
Installation parameters for anchor rods without perforated sleeve

Annex B 4

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

Internal threaded anchor FIS E	11x85 M6	11x85 M8	15x85 M10	15x85 M12
Diameter of anchor d_H [mm]	11		15	
Nominal drill hole diameter d_0 [mm]		14		18
Length of anchor L_H [mm]			85	
Effective anchorage depth $h_0 = h_{ef}$ [mm]			85	
Effective anchorage depth h_{ef} [mm] 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

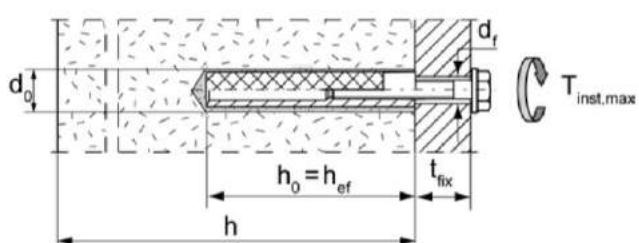


Marking:

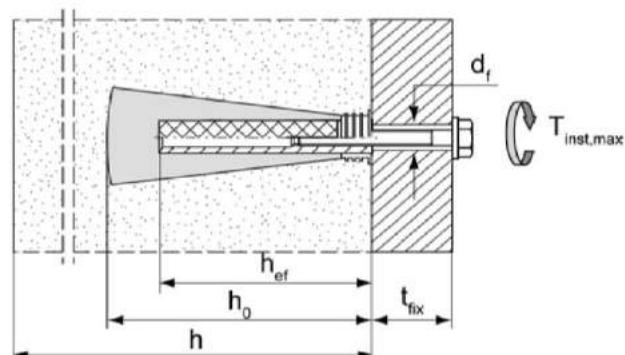
Size, e.g. **M8**, Stainless steel: A4, e.g. **M8 A4**, High corrosion-resistant steel: C, e.g. **M8 C**

Installation conditions:

Internal threaded anchor in cylindrical drill hole



Internal threaded anchor in conical drill hole



Pictures not to scale

fischer injektion system FIS V masonry

Intended Use

Installation parameters for internal threaded rods FIS E without perforated sleeve

Annex B 5

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

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

¹⁾ Only for solid areas in hollow bricks and solid bricks.

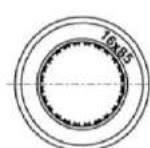
²⁾ Bridging of unbearing layer (e.g. plaster) is possible. When reducing the effective anchorage depth $h_{\text{ef,min}}$, the values of the next shorter perforated sleeve of the same diameter must be used. The smaller value of characteristic resistance must be taken.

Perforated sleeve

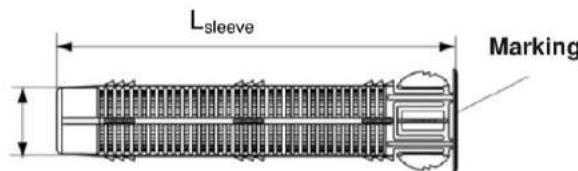
FIS H 12x50 K; FIS H 12x85 K; FIS H 16x85 K; FIS H 16x130 K;
FIS H 20x85 K; FIS H 20x130 K; FIS H 20x200 K

Marking:

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

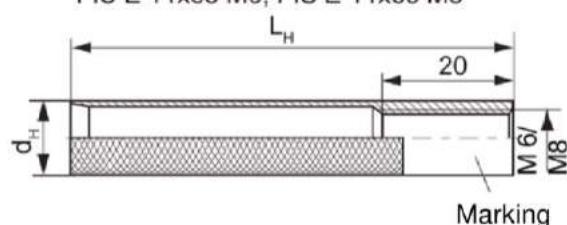


$D_{\text{ sleeve,nom }}$

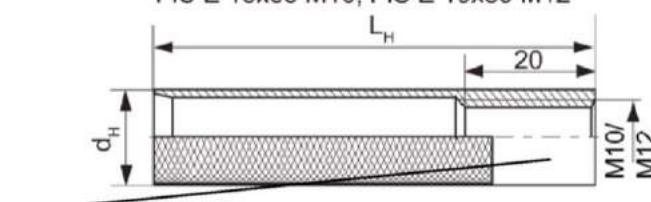


fischer Internal threaded anchor FIS E

FIS E 11x85 M6, FIS E 11x85 M8

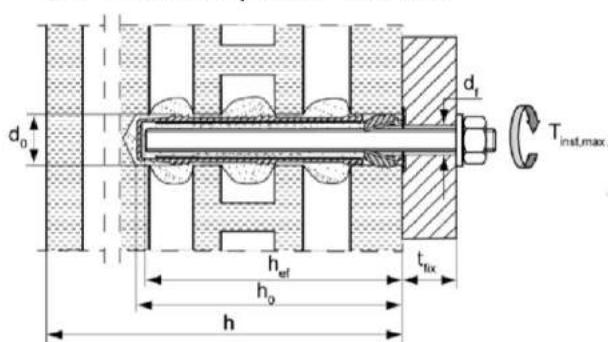


FIS E 15x85 M10, FIS E 15x85 M12

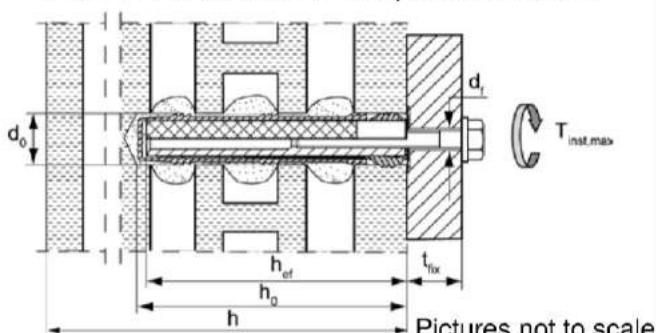


Installation conditions:

Anchor rod with perforated sleeve



Internal threaded anchor with perforated sleeve



fischer injektion system FIS V masonry

Intended Use

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

Annex B 6

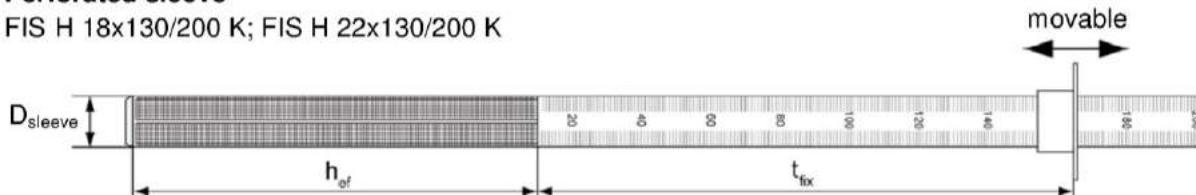
Table B7.1: Installation parameters for anchor rods with perforated sleeves (push through anchorage)

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

¹⁾ Only for solid areas in hollow bricks and solid bricks.

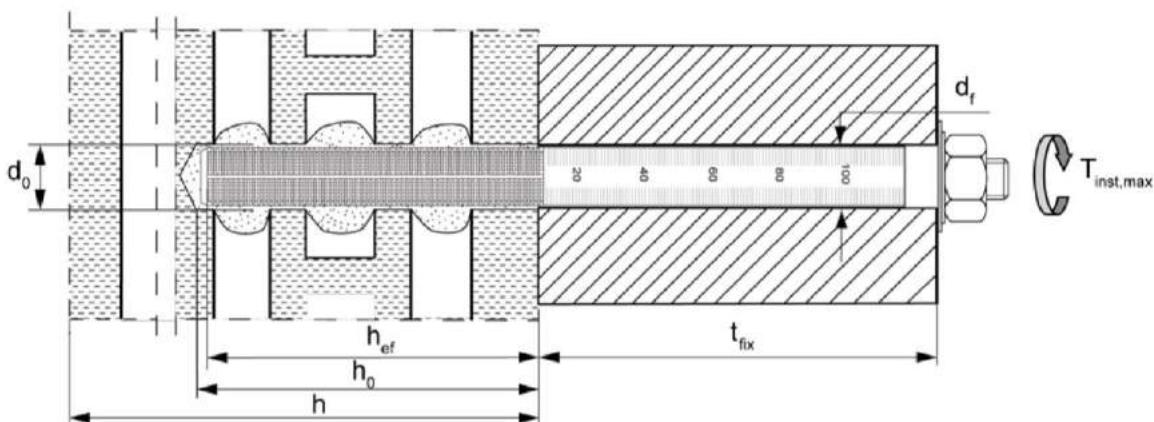
Perforated sleeve

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



Installation conditions:

Anchor rod with perforated sleeve



Pictures not to scale

fischer injektion system FIS V masonry

Intended Use

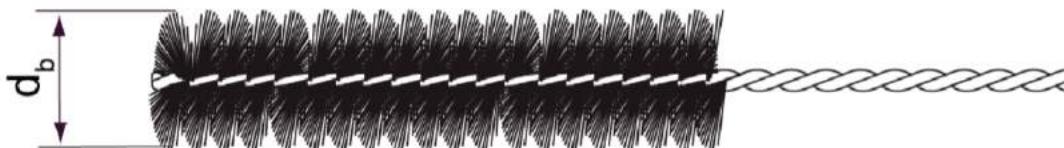
Installation parameters for anchor rods with perforated sleeves (push through anchorage)

Annex B 7

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

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

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



Only for solid bricks and autoclaved aerated concrete

Table B8.2: Maximum processing times and minimum curing times

(During the curing time of the mortar the masonry temperature may not fall below the listed minimum temperature)

Temperature at anchoring base [°C]	Minimum curing time ¹⁾ t_{cure}		
	FIS VW High Speed ³⁾	FIS V ²⁾	FIS VS Low Speed ²⁾
-10 to -5	12 h	-	-
>-5 to ±0	3 h	24 h	-
±0 to +5	3 h	3 h	6 h
>+5 to +10	50 min	90 min	3 h
>+10 to +20	30 min	60 min	2 h
>+20 to +30	-	45 min	60 min
>+30 to +40	-	35 min	30 min

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

¹⁾ For wet bricks the curing time must be doubled

²⁾ Minimum cartridge temperature +5°C

³⁾ Minimum cartridge temperature ±0°C

Pictures not to scale

fischer injektion system FIS V masonry

Intended use

Cleaning brush (steel brush)

Maximum processing times and minimum curing times

Annex B 8

Installation instruction part 1

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

1		Drill the hole (drilling method see Annex C of the respective brick) depth of drill hole h_0 and drill hole diameter d_0 see Table B4.1; B5.1
2		Blow out the drill hole twice. Brush twice and blow out twice again.
3		Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible)
4		Place the cartridge into a suitable dispenser
5		Fill approximately 2/3 of the drill hole with mortar beginning from the bottom of the hole ¹⁾ . Avoid bubbles!
6		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.
7		Do not touch. Minimum curing time see Table B8.2

¹⁾ Exact volume of mortar see manufacturer's specification.

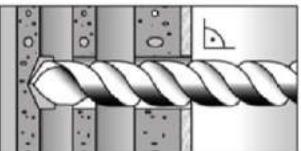
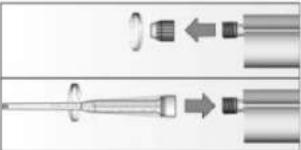
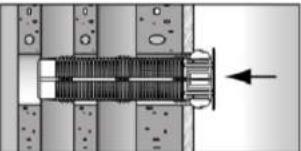
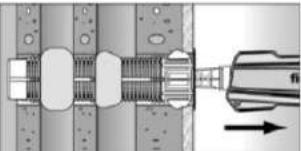
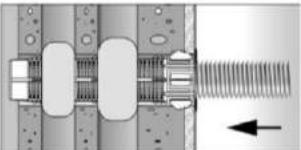
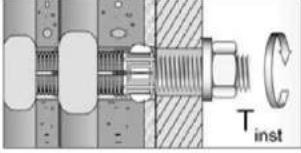
fischer injektion system FIS V masonry

Intended use
Installation instruction (without perforated sleeve) part 1

Annex B 9

Installation instruction part 2

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

1		Drill the hole (drilling method see Annex C of the respective brick). depth of drill hole h_0 and drill hole diameter d_0 see Table B6.1	When install perforated sleeves in solid bricks or solid areas of hollow bricks, also clean the hole by blowing out and brushing.
2		Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible)	
3		Place the cartridge into a suitable dispenser.	 Press out approximately 10 cm of mortar until the resin is permanently grey in colour. Mortar which is not grey in colour will not cure and must be disposed of.
4		Insert the perforated sleeve flush with the surface of the masonry or plaster.	 Fill the perforated sleeve completely with mortar beginning from the bottom of the hole ¹⁾ .
5		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).	
6		Do not touch. Minimum curing time see Table B8.2	 Mounting the fixture. $T_{inst,max}$ see parameter of brick.

¹⁾ Exact volume of mortar see manufacturer's specification.

fischer injektion system FIS V masonry

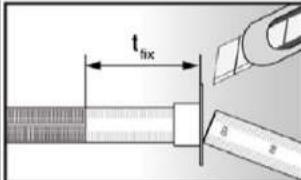
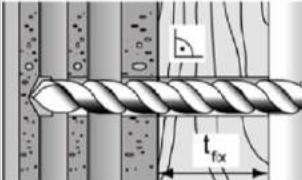
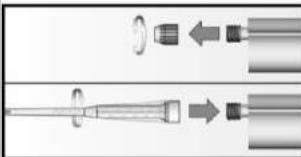
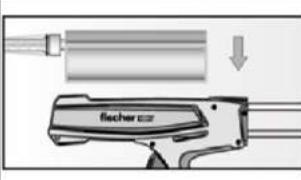
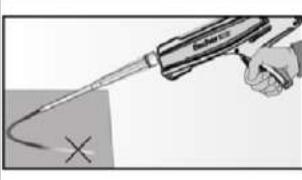
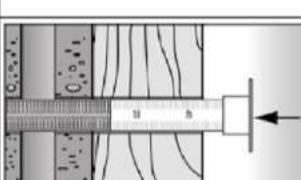
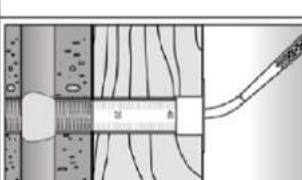
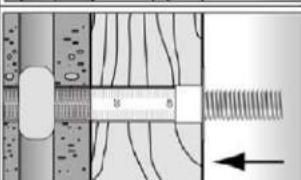
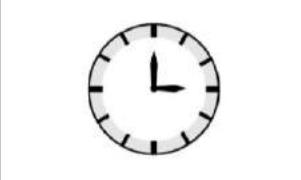
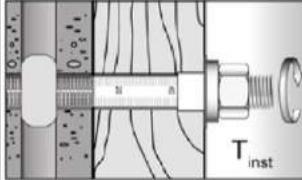
Intended use

Installation instruction (with perforated sleeve) part 2

Annex B 10

Installation instruction part 3

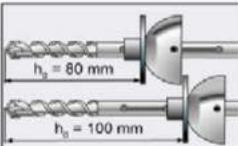
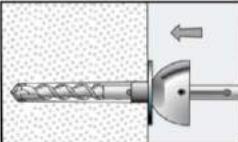
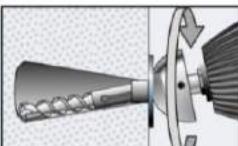
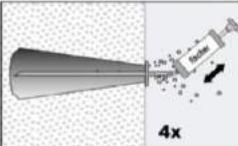
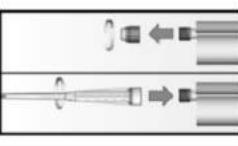
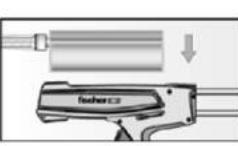
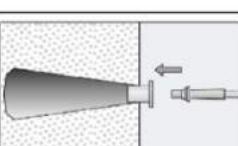
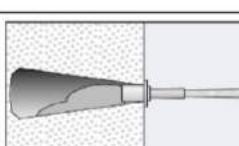
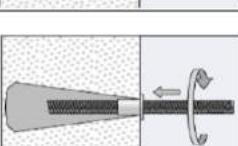
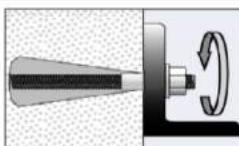
Installation in perforated or solid brick with perforated sleeve (push through anchorage)

1		Push the movable stop up to the correct thickness of fixture and cut the overlap.		Drill the hole through the fixture. Depth of drill hole ($h_0 + t_{fix}$) and drill hole diameter see Table B7.1
2		Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible)		
3		Place the cartridge into a suitable dispenser.		Press out approximately 10 cm of mortar until the resin is permanently grey in colour. Mortar which is not grey in colour will not cure and must be disposed of.
4		Insert the perforated sleeve flush with the surface of the fixture into the drill hole.		Fill the sleeve with mortar beginning from the bottom of the hole. ¹⁾ For deep drill holes use an extension tube.
5		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).		
6		Do not touch. Minimum curing time see Table B8.2		Mounting the fixture. $T_{inst,max}$ see parameter of brick.

¹⁾ Exact volume of mortar see manufacturer's specification.

Installation instruction part 4

Installation in autoclaved aerated concrete with special conic drill bit PBB
(pre-positioned anchorage)

1		Position the movable drill bit arrester on the used drill hole depth. For this, unlock the clamp screw and slide the arrester. Now fix the clamp screw.		
2		Drill the cylindrical hole with rotating drill until the arrester contact the material surface. (drilling method see Annex C of the respective brick)		
3		Deviate the working power drill circulate to generate a conic undercut in the material.		
4		Blow out the drill hole four times.		
5		Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible)		
6		Place the cartridge into a suitable dispenser.		Press out approximately 10 cm of mortar until the resin is permanently grey in colour. Mortar which is not grey in colour will not cure and must be disposed of.
7		Put the center sleeve into the drill hole and adapt the injection adapter onto the static mixer.		Fill the drill hole with injection mortar.
8		Only use clean and oil-free anchor elements. Mark the anchor rod for setting depth. Insert the anchor rod or internal threaded anchor FIS E by hand using light turning motions. When reaching the setting depth marking, excess mortar must emerge from the mouth of the drill hole.		
9		Do not touch. Minimum curing time see Table B8.2		Mounting the fixture. $T_{inst,max}$ see parameter of brick.

fischer injektion system FIS V masonry

Intended use

Installation instruction for autoclaved aerated concrete with special conic drill bit PBB
(pre-positioned anchorage) part 4

Annex B 12

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

Kind of masonry	Brick format [mm]	Compressive strength f_b N/mm ²	Producing country	Density ρ [kg/dm ³]	Annex
Solid brick Mz					
Solid brick Mz	NF ≥240x115x71	12 - 20	Germany	≥1,8	C4 - C7
	2DF ≥240x115x113	10 - 16	Germany	≥1,8	C8/C9
	≥ 245x118x54	10 - 20	Italy	≥1,8	C10/C11
	≥ 230x108x55	10 - 20	Denmark	≥1,8	C12/C13
Solid sand- lime brick KS / perforated Sand- lime brick KSL					
Solid sand- lime brick KS	NF ≥240x115x71	12 - 28	Germany	≥2,0	C14/C15
Solid sand- lime brick KS	8DF ≥ 250x240x240	10 - 28	Germany	≥2,0	C16/C17
Solid sand- lime brick KS	≥ 997x214x538	10 - 36	Netherlands	≥1,8	C18/C19
Perforated Sand- lime brick KSL	3DF 240x175x113	8 - 20	Germany	≥1,4	C20 - C23
Vertical perforated brick HLz					
Vertical perforated brick HLz	375x240x237	4 - 12	Germany	≥1,0	C24/C25
	500x175x237	4 - 12	Germany	≥1,0	C24/C25
	2DF 240x115x113	6 - 28	Germany	≥1,4	C26/C27
	248x365x248	4 - 8	Germany	≥0,6	C28 - C31
	248x365x249	8 - 12	Germany	≥0,7	C32 - C35
	248x365x249	4 - 6	Germany	≥0,5	C36 - C39
	248x425x248	4 - 8	Germany	≥0,8	C40 - C43
	248x425x248	4 - 8	Germany	≥0,6	C44 - C47
	500x200x315	4 - 8	France	≥0,6	C48 - C51
	500x200x300	4 - 10	France	≥0,7	C52 - C55
	500x200x315	2 - 8	France	≥0,7	C56 - C59
	560x200x275	4 - 8	France	≥0,7	C60/C61
	255x120x118	2 - 12	Italy	≥1,0	C62 - C64
	275x130x94	6 - 20	Spain	≥0,8	C65/C66
	220x190x290	6 - 10	Portugal	≥0,7	C67 - C70
	253x300x240	2 - 6	Austria	≥0,8	C71 - C74
	250x440x250	6 - 10	Austria	≥0,7	C75 - C78
	230x108x55	2 - 8	Denmark	≥1,4	C79/C80
Horizontal perforated brick LLz					
Horizontal perforated brick LLz	248x78x250	2 - 6	Italy	≥0,7	C81/C82
	128x88x275	2	Spain	≥0,8	C83/C84
Light-weight concrete hollow block Hbl					
Light-weight concrete hollow block Hbl	362x240x240	2 - 4	Germany	≥1,0	C85 - C88
	500x200x200	2 - 6	France	≥1,0	C89/C90
	440x215x215	4 - 10	Ireland	≥1,2	C91 - C94
fischer injektion system FIS V masonry					
Intended use Overview of controlled bricks (part 1)					
Annex B 13					

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

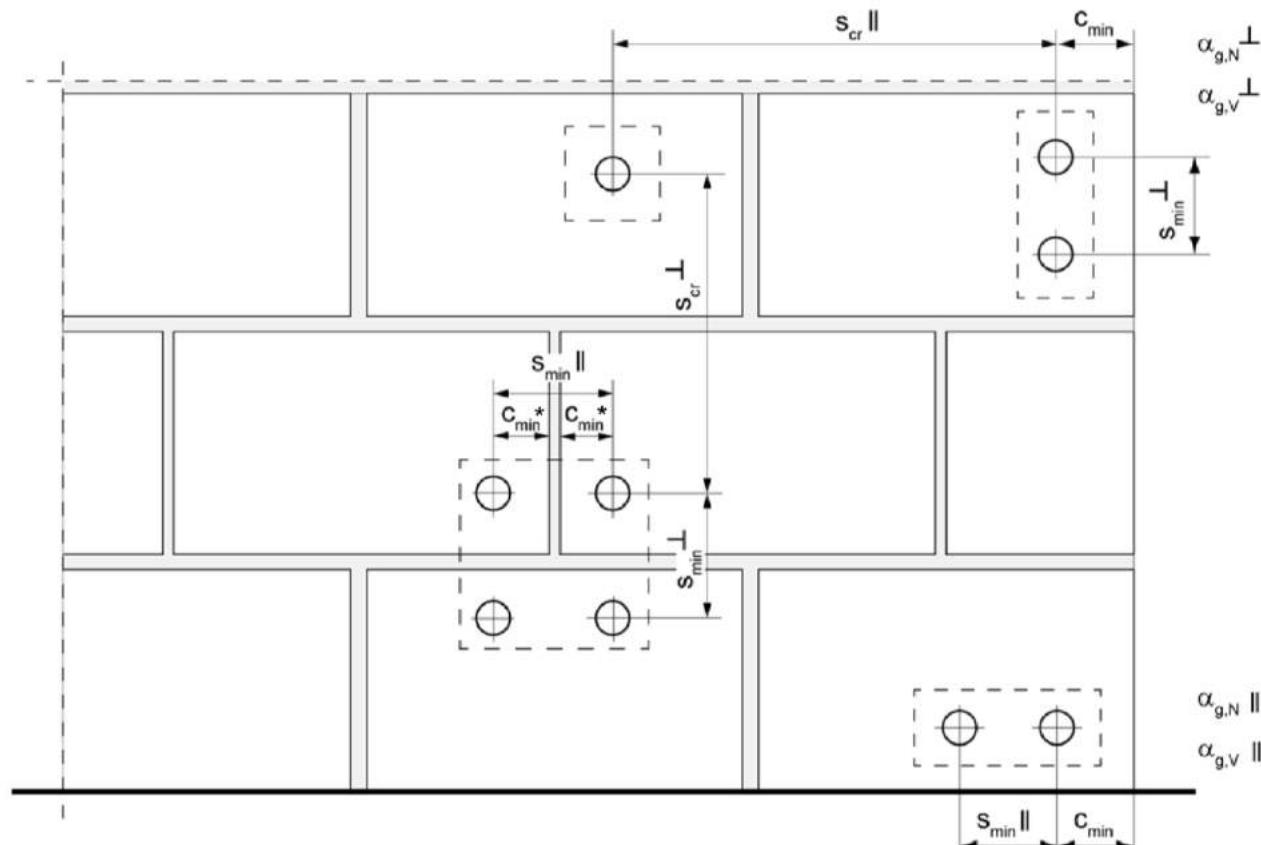
Kind of masonry	Brick format [mm]	Compressive strength f_b N/mm ²	Producing country	Density ρ [kg/dm ³]	Annex
Light-weight concrete solid block Vbl					
Light-weight concrete solid block Vbl	≥ 372x300x254	2	Germany	≥0,6	C95/C96
	≥ 250x240x239	4 - 8	Germany	≥1,6	C97 - C100
	≥ 440x100x215	4 - 10	Ireland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

fischer injektion system FIS V masonry

Intended use
Overview of controlled bricks (part 2)

Annex B 14

Spacing and edge distance



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

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

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

For $s_{\min} \leq s < s_{cr}$ α_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 V masonry

Intended use
Spacing and edge distance

Annex B 15

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

Anchor rod		M6	M8	M10	M12	M16
Bearing capacity under tensile load, steel failure						
Characteristic resistance $N_{Rk,s}$	Property class	4.6	8	15	23	34
		4.8	8	15	23	34
		5.8	10	18	29	42
		8.8	16	29	46	67
		50	10	18	29	42
		70	14	26	41	59
		80	16	29	46	67
						125

Partial safety factors ¹⁾

Partial safety factor $\gamma_{Ms,N}$	Property class	4.6		2		
		4.8		1,5		
		5.8		1,50		
		8.8		1,50		
		50		2,86		
		70		1,50 ²⁾ / 1,87		
		80		1,60		

¹⁾ In absence of other national regulations

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

fischer injektion system FIS V masonry

Performances

Characteristic steel bearing capacity of anchor rods

Annex C 1

English translation prepared by DIBt

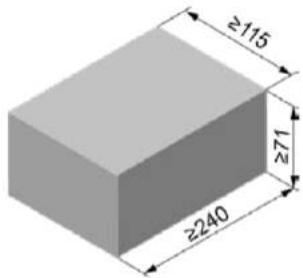
Table C2.1: Characteristic values for the **steel bearing capacity of anchor rods under shear load**

Anchor rod		M6	M8	M10	M12	M16		
Bearing capacity under shear load, steel failure								
without lever arm								
Characteristic resistance $V_{Rk,s}$	Property class	4.6 4.8 5.8 8.8 50 70 80	[kN]	4 4 5 8 5 7 8	7 7 9 15 9 13 15	12 12 15 23 15 20 23	17 17 21 34 21 30 34	31 31 39 63 39 55 63
with lever arm								
Characteristic bending moment $M_{Rk,s}$	Property class	4.6 4.8 5.8 8.8 50 70 80	[Nm]	6 6 8 12 7 10 12	15 15 19 30 19 26 30	30 30 37 60 37 52 60	52 52 65 105 65 92 105	133 133 166 266 166 232 266
Partial safety factors¹⁾								
Partial safety factor $\gamma_{M,V}$	Property class	4.6 4.8 5.8 8.8 50 70 80	[-]				1,67 1,25 1,25 1,25 2,38 $1,25^2) / 1,56$ 1,33	
¹⁾ In absence of other national regulations								
²⁾ Only for fischer FIS A made of high corrosion-resistant steel C								
fischer injektion system FIS V masonry								
Performances Characteristic steel bearing capacity of anchor rods								
Annex C 2								

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

fischer internal threaded anchor FIS E			M6	M8	M10	M12				
Bearing capacity under tensile load, steel failure										
Characteristic resistance with screw $N_{Rk,s}$	Property class	5.8	[kN]	10	18	29				
	Property class	A4		14	26	41				
	Property class 70	C		14	26	41				
Partial safety factors¹⁾										
Partial safety factor $\gamma_{Ms,N}$	Property class	5.8	[-]	1,50						
	Property class	A4		1,87						
	Property class 70	C		1,87						
Bearing capacity under shear load, steel failure										
without lever arm										
Characteristic resistance with screw $V_{Rk,s}$	Property class	5.8	[kN]	5	9	15				
	Property class	A4		7	13	20				
	Property class 70	C		7	13	20				
with lever arm										
Characteristic bending moment $M_{Rk,s}$	Property class	5.8	[Nm]	8	19	37				
	Property class	A4		11	26	52				
	Property class 70	C		11	26	52				
Partial safety factors¹⁾										
Partial safety factor $\gamma_{Ms,V}$	Property class	5.8	[-]	1,25						
	Property class	A4		1,56						
	Property class 70	C		1,56						
¹⁾ In absence of other national regulations										
fischer injektion system FIS V masonry										
Performances Characteristic steel bearing capacity of fischer internal threaded anchor RG MI					Annex C 3					

Solid brick Mz, NF, EN 771-1



Solid brick Mz, NF, EN 771-1		
Producer	e.g. Wienerberger	
Nominal dimensions [mm]	length L	width W
≥ 240	≥ 115	≥ 71
Density ρ [kg/dm ³]	≥ 1,8	
Compressive strength f_b [N/mm ²]	12 / 20	
Standard or annex	EN 771-1	

Table C4.1: Installation parameters for edge distance c=100mm

Anchor rod			M6	M8	M10	M12	-	-			
Internal threaded anchor FIS E			-	-	-	-	M6	M8			
Anchor rod and internal threaded anchor FIS E without perforated sleeve											
Effective anchorage depth h_{ef}	h_{ef}	[mm]	50	50	50	50	85				
80			80	80	80	80					
200			200	200	200	200					
Max. installation torque $T_{inst,max}$		[Nm]	4	10			4	10			
General installation parameters											
Edge distance c_{min}	Spacing	[mm]	100				100				
Edge distance $h_{ef}=200$ c_{min}			150				-				
$s_{min} \parallel, N$			60				60				
$h_{ef}=200 s_{min} \parallel, N$			240				-				
$s_{min} \parallel, v$			240				240				
$s_{cr} \parallel$			240				240				
$s_{cr} \perp = s_{min} \perp$			75				75				
Drilling method											

Hammer drilling with hard metal hammer drill

Table C4.2: Group factors

Anchor rods			M6	M8	M10	M12	-	-
Internal threaded anchor FIS E			-	-	-	-	M6	M8
Edge distance c_{min}								
Group factor	[mm]	[-]	100					
			1,5					
			2,0					
			1,5					
			2,0					
			2,0					
			2,0					
			2,0					

fischer injektion system FIS V masonry

Performances

Solid brick Mz, NF, dimensions, installation parameters c=100mm

Annex C 4

Solid brick Mz, NF, EN 771-1

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

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

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

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

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

Factor for job site tests and displacements see annex C110

fischer injektion system FIS V masonry

Performances

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

Annex C 5

Solid brick Mz, NF, EN 771-1

Table C6.1: Installation parameters for edge distance c=60mm

Anchor rod	M6	M8	M10	M12	M16	-	-	
Internal threaded anchor FIS E	-	-	-	-	-	M6	M8	
Anchor rod and internal threaded anchor FIS E without perforated sleeve								
Effective anchorage depth h_{ef}	[mm]	50	50	50	50	50	85	
		100	100	100	100	100		
		200	200	200	200	200		
Max. installation torque $T_{inst,max}$	[Nm]	4		10		4	10	
General installation parameters								
Edge distance c_{min}	[mm]				60			
Edge distance c_{min} $h_{ef}=200$					60			
$s_{min} \parallel, N$					80			
$h_{ef}=200 s_{min} \parallel, N$					80			
$s_{min} \parallel, V$					80			
$s_{cr} \parallel$					3x h_{ef}			
$s_{min} \perp$					80			
$s_{cr} \perp$					3x h_{ef}			
Drilling method								
Hammer drilling with hard metal hammer drill								

Table C6.2: Group factors

Anchor rods	M6	M8	M10	M12	M16	-	-	
Internal threaded anchor FIS E	-	-	-	-	-	M6	M8	
Edge distance								
Group factor	[-]	c_{min}	[mm]		60			
		$\alpha_{q,N} \parallel$			0,6			
		$\alpha_{q,V} \parallel$			1,3			
		$h_{ef}=200 \alpha_{q,N} \parallel$			1,4			
		$h_{ef}=200 \alpha_{q,V} \parallel$			1,5			
		$\alpha_{q,N} \perp$			0,3			
		$\alpha_{q,V} \perp$			1,3			
		$h_{ef}=200 \alpha_{q,N} \perp$			2,0			
		$h_{ef}=200 \alpha_{q,V} \perp$			1,1			
fischer injektion system FIS V masonry								
Performances Solid brick Mz, NF, dimensions, installation parameters c=60mm						Annex C 6		

Solid brick Mz, NF, EN 771-1

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

Anchor rod		M6	M8	M10			M12			M16			-	-		
Internal threaded anchor FIS E		-	-	-			-			-			M6	M8	M10	M12
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)																
compressive strength f _b	use category	50	100	50	100	50	100	200	50	100	200	50	100	200	85	
12N/mm ²	w/w	1,5	2,0	2,0	2,0	2,5	-	2,0	2,5	-	2,0	5,5	-	-	-	
	d/d	2,5	3,0	4,0	3,0	4,0	9,5	3,0	4,0	9,5	3,0	8,5	9,5	-	-	
20N/mm ²	w/w	2,0	2,5	3,0	2,5	3,5	-	3,0	3,5	-	3,0	7,5	-	-	-	
	d/d	3,5	4,5	5,5	4,5	5,5	12	4,5	5,5	12	4,5	12	12	-	-	
28N/mm ²	w/w	2,5	3,0	4,0	3,0	4,0	-	3,5	4,0	-	3,5	9,0	-	-	-	
	d/d	4,0	5,5	6,5	5,5	6,5	12	5,5	6,5	12	5,5	12	12	-	-	

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

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

Anchor rod		M6	M8	M10			M12			M16			-	-		
Internal threaded anchor FIS E		-	-	-			-			-			M6	M8	M10	M12
Shear load V_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C and 72/120°C)																
compressive strength f _b	use category	50	100	50	100	50	100	200	50	100	200	50	100	200	85	
12N/mm ²	w/w	1,2	2,5	1,2	3,0	2,0	3,0	1,5	1,5	3,0	3,0	0,6	3,0	4,5	-	
	d/d	1,5	3,5	1,5	4,5	3,0	4,5	2,5	2,0	4,5	4,5	0,9	4,5	6,0	-	
20N/mm ²	w/w	2,0	4,0	2,0	5,0	3,5	5,0	3,0	2,5	5,0	5,0	1,2	5,0	7,5	-	
	d/d	2,0	4,0	2,0	5,0	3,5	5,0	3,0	2,5	5,0	5,0	1,2	5,0	7,5	-	

Factor for job site tests and displacements see annex C110

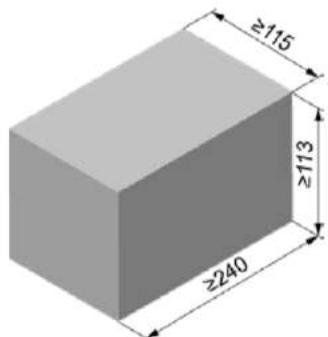
fischer injektion system FIS V masonry

Performances

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

Annex C 7

Solid brick Mz, 2DF, EN 771-1



Solid brick Mz, 2DF, EN 771-1		
Producer	e.g. Wienerberger	
Nominal dimensions [mm]	length L	width W
≥ 240	≥ 115	≥ 113
Density ρ [kg/dm ³]	≥ 1,8	
Compressive strength f_b [N/mm ²]	10 / 16	
Standard or annex	EN 771-1	

Table C8.1: Installation parameters

Anchor rod	M6	M8	M10	M12	M16	-	-							
Internal threaded anchor FIS E	-	-	-	-	-	M6	M10							
Anchor rod and internal threaded anchor FIS E without perforated sleeve														
Effective anchorage depth h_{ef} [mm]	50	100	50	100	50	100	85							
Max. installation torque $T_{\text{inst,max}}$ [Nm]	4			10		4	10							
Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H 16x85 K														
Effective anchorage depth h_{ef} [mm]			85			85								
Max. installation torque $T_{\text{inst,max}}$ [Nm]			10			4	10							
General installation parameters														
Edge distance c_{\min}	[mm]	60												
$s_{\min \parallel}$		120												
$s_{cr \parallel}$		240												
$s_{cr \perp} = s_{\min \perp}$		115												
Drilling method														
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	M10	
						11x85	15x85	
Group factor	$\alpha_{q,N \parallel}$ $\alpha_{q,v \parallel}$ $\alpha_{q,N \perp}$ $\alpha_{q,v \perp}$	[-]	1,5					
			1,4					
			2					
fischer injektion system FIS V masonry								
Performances Solid brick Mz, 2DF, dimensions, installation parameters						Annex C 8		

Solid brick Mz, 2DF, EN 771-1

Table C9.1: Characteristic resistance under tensile load

Anchor rod	M6	M8	M10	M12	M16	-	-	M8	M10	-
Internal threaded anchor FIS E	-	-	-	-	-	M6	M8	M10	M12	M6 M8 11x85
						11x85	15x85			
Perforated sleeve FIS H K	-	-	-	-	-	-	-	-	-	16x85
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)										
compressive strength f_b	use category	50	100	50	100	50	100	50	100	Effective anchorage depth h_{ef} [mm]
10N/mm ²	w/w	1,5	2,5	1,5	2,5	1,5	3	2	3,5	2
	d/d	3	4,0	3,0	4,0	3,0	4,5	3	5,5	3
16N/mm ²	w/w	2,5	4	2,5	4	2,5	4,5	3,5	5,5	3,5
	d/d	4,5	7,0	4,5	7,0	4,5	7,5	5,5	8	5,5
Factor for temperature range 72/120°C: 0,83										

Table C9.2: Characteristic resistance under shear load

Anchor rod	M6	M8	M10	M12	M16	-	-	M8	M10	-	
Internal threaded anchor FIS E	-	-	-	-	-	M6	M8	M10	M12	M6 M8 11x85	
						11x85	15x85				
Perforated sleeve FIS H K	-	-	-	-	-	-	-	-	-	16x85	
Shear load V_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C and 72/120°C)											
compressive strength f_b	use category	Effective anchorage depth h_{ef} [mm]					85				
10N/mm ²	w/w	2,5	3,0	3,0	3,5	3,0	2,5	3,0	3,0	3,0	3,5
	d/d						3,0	3,0	3,0	3,0	2,5
16N/mm ²	w/w	4,0	5,0	5,5	5,5	5,0	4,0	5,0	5,0	5,0	6,0
	d/d						5,0	5,0	5,0	5,0	4,0
Factor for job site tests and displacements see annex C110											

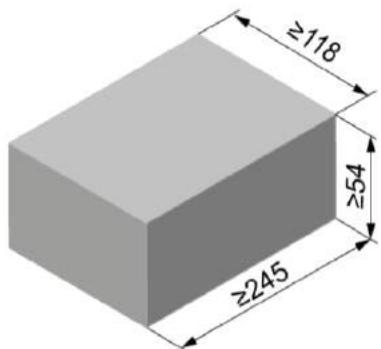
fischer injektion system FIS V masonry

Performances

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

Annex C 9

Solid brick Mz, EN 771-1



Solid brick Mz, EN 771-1		
Producer	e.g. Nigra	
Nominal dimensions [mm]	length L ≥ 245	width W ≥ 118
Density ρ [kg/dm ³]	≥ 1,8	
Compressive strength f_b [N/mm ²]	10 / 20	
Standard or annex	EN 771-1	

Table C10.1: Installation parameters

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

Table C10.2: Group factors

Anchor rods	M6	M8	M10	M12	M16	-	-
Internal threaded anchor FIS E	-	-	-	-	-	M6	M8
Group factor	$\alpha_{g,N} \parallel$ $\alpha_{g,V} \parallel$ $\alpha_{g,N} \perp$ $\alpha_{g,V} \perp$	[-] 2					
fischer injektion system FIS V masonry							
Performances Solid brick Mz, dimensions, installation parameters							Annex C 10

Solid brick Mz, EN 771-1

Table C11.1: Characteristic resistance under tensile load

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

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

Table C11.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C110

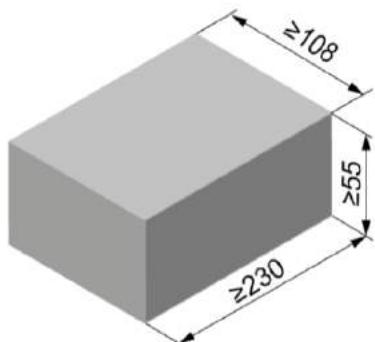
fischer injektion system FIS V masonry

Performances

Solid brick Mz, Characteristic resistance under tensile and shear load

Annex C 11

Solid brick Mz, EN 771-1



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

Table C12.1: Installation parameters

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

Table C12.2: Group factors

Anchor rods	M6	M8	M10	M12	M16	-	-
Internal threaded anchor FIS E	-	-	-	-	-	M6	M10
Group factor	$\alpha_{g,N} \parallel$ $\alpha_{g,V} \parallel$ $\alpha_{g,N} \perp$ $\alpha_{g,V} \perp$	[-] 2					
fischer injektion system FIS V masonry							
Performances Solid brick Mz, dimensions, installation parameters							Annex C 12

Solid brick Mz, EN 771-1

Table C13.1: Characteristic resistance under tensile load

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

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

Table C13.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C110

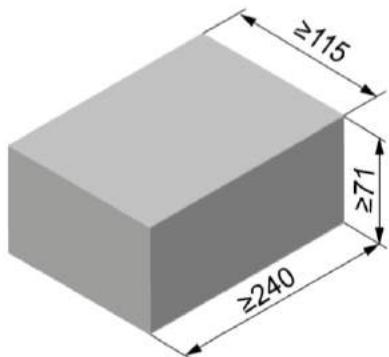
fischer injektion system FIS V masonry

Performances

Solid brick Mz, Characteristic resistance under tensile and shear load

Annex C 13

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



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

Table C14.1: Installation parameters

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

Table C14.2: Group factors

Anchor rod	M6	M8	M10	M12	M16	-	-	
Internal threaded anchor FIS E	-	-	-	-	-	M6	M10	
						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 V masonry								
Performances Solid sand-lime brick KS, NF, dimensions, installation parameters						Annex C 14		

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

Table C15.1: Characteristic resistance under tensile load

Anchor rod		M6		M8		M10		M12		M16		-		-													
Internal threaded anchor FIS E		-		-		-		-		-		M6		M10													
												11x85		15x85													
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)																											
compressive strength f_b	use category	Effective anchorage depth h_{ef} [mm]																									
		50	100	50	100	50	100	200	50	100	200	50	100	200	85	85											
12N/mm ²	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 ²	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 ²	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 C15.2: Characteristic resistance under shear load

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

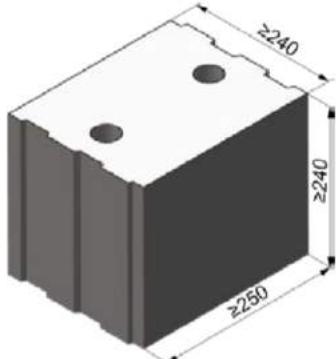
Factor for job site tests and displacements see annex C110

fischer injektion system FIS V masonry

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

Annex C 15

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



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

Producer	-		
Nominal dimensions [mm]	length L	width W	height H
≥ 250	≥ 240	≥ 240	
Density ρ [kg/dm ³]	≥ 2,0		
Compressive strength f_b [N/mm ²]	10 / 20 / 28		
Standard or annex	EN 771-2		

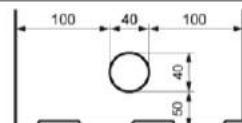


Table C16.1: Installation parameters

Anchor rod	M6	M8	M10	M12	M16	-	-
Internal threaded anchor FIS E	-	-	-	-	-	M6	M10
						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	85
Max. installation torque $T_{inst,max}$ [Nm]	4				10			4	10

Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H 16x85 K

Effective anchorage depth h_{ef} [mm]		85		85	
Max. installation torque $T_{inst,max}$ [Nm]		10		4	10

General installation parameters

Edge distance c_{min}	[mm]	60
$s_{min \parallel}$		80
$s_{cr \parallel}$		250
$s_{min \perp}$		80
$s_{cr \perp}$		240

Drilling method

Hammer drilling with hard metal hammer drill

Table C16.2: Group factors

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

fischer injektion system FIS V masonry

Performances

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

Annex C 16

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

Table C17.1: Characteristic resistance under tensile load

Anchor rod	M6	M8	M10	M12	M16	-	-	M8	M10	-	
Internal threaded anchor FIS E	-	-	-	-	-	M6	M8	M10	M12	M6 M8 11x85	
						11x85	15x85				
Perforated sleeve FIS H K	-	-	-	-	-	-	-			16x85	
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)											
compressive strength f_b	use category	Effective anchorage depth h_{ef} [mm]					85				
10N/mm ²	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 ²	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 ²	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 C17.2: Characteristic resistance under shear load

Anchor rod	M6	M8	M10	M12	M16	-	-	M8	M10	-	
Internal threaded anchor FIS E	-	-	-	-	-	M6	M8	M10	M12	M6 M8 11x85	
						11x85	15x85				
Perforated sleeve FIS H K	-	-	-	-	-	-	-			16x85	
Shear load V_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C and 72/120°C)											
compressive strength f_b	use category	Effective anchorage depth h_{ef} [mm]					85				
10N/mm ²	w/w	w/d	2,5	4,5			2,5	4,5		4,5	2,5 4,5
	d/d										
20N/mm ²	w/w	w/d	4,0	6,5			4,0	6,5		6,5	4,0 6,5
	d/d										
28N/mm ²	w/w	w/d	5,0	9,0			5,0	9,0		9,0	5,0 9,0
	d/d										

Factor for job site tests and displacements see annex C110

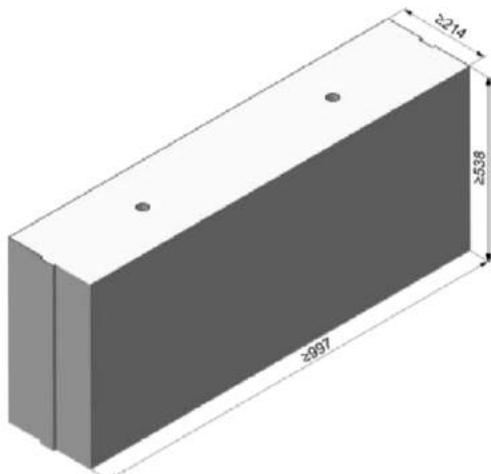
fischer injektion system FIS V masonry

Performances

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

Annex C 17

Solid sand-lime brick KS, EN 771-2



Solid sand-lime brick KS, EN 771-2		
Producer	e.g. Calduran	
Nominal dimensions [mm]	length L ≥ 997	width W ≥ 214
Density ρ [kg/dm³]	1,8	2,2
Compressive strength f_b [N/mm²]	10 / 20	36
Standard or annex	EN 771-2	



Table C18.1: Installation parameters

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

Table C18.2: Group factors

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

fischer injektion system FIS V masonry

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

Annex C 18

Solid sand-lime brick KS, EN 771-2

Table C19.1: Characteristic resistance under tensile load

Anchor rod		M6	M8	M10	M12	M16	-	-			
Internal threaded anchor FIS E		-	-	-	-	-	M6	M8	M10	M12	
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)											
compressive strength f_b	use category	50	100	50	100	50	100	50	100	50	85
10N/mm^2	w/w	w/d	4,0	4,0	7,0	5,0	6,0	5,0	6,0	5,5	7,5
	d/d		7,0	7,0	12,0	8,0	9,5	8,0	10,0	9,0	11,5
20N/mm^2	w/w	w/d	5,5	6,0	10,0	7,0	8,5	7,0	9,0	8,0	11,0
	d/d		8,5	10,5	12,0	11,5	12,0	11,0	12,0	12,0	12,0
36N/mm^2	w/w	w/d	4,5	8,0	12,0	11,5	12,0	12,0	12,0	12,0	12,0
	d/d		8,0	12,0	12,0	12,0	12,0	12,0	12,0	12,0	12,0

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

Table C19.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C110

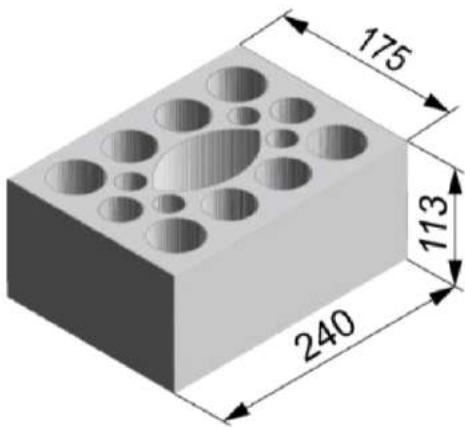
fischer injektion system FIS V masonry

Performances

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

Annex C 19

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



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

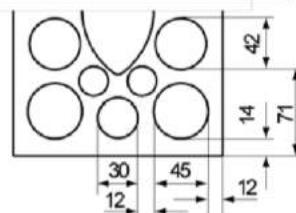


Tabelle C20.1: Installation parameters
(Pre-positioned anchorage with perforated sleeve FIS HK)

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				

Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS HK

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

General installation parameters

Edge distance	c_{min}	60	80
Spacing	$s_{min \parallel}$ $s_{cr \parallel}$ [mm]	100	
	$s_{min \perp}$	240	
	$s_{cr \perp}$	115	
		115	

Drilling method

Hammer drilling with hard metal hammer drill

Table C20.2: 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				

Group factors	$\alpha_{q,N} \parallel = \alpha_{q,V} \parallel$ $\alpha_{q,N} \perp = \alpha_{q,V} \perp$	[\cdot]	1,5
			2,0

fischer injektion system FIS V masonry

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

Annex C 20

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

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

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

Table C21.2: Group factors

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

fischer injektion system FIS V masonry

Performances

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

Annex C 21

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

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

Anchor rod	M6	M8	M6	M8	-	M8	M10	M8	M10	-	M12	M16	M12	M16
Internal threaded anchor FIS E	-	-	-	-	M6	M8	-	-	-	M10	M12	-	-	-
					11x85					15x85				
Perforated sleeve FIS H K	12x50	12x85			16x85		16x130		20x85		20x130			
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)														
compressive strength f_b	use category													
8 N/mm ²	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 ²	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 ²	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 ²	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 ²	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 C22.2: Characteristic resistance under tensile load (Push through anchorage)

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

Factor for job site tests and displacements see annex C110

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

fischer injektion system FIS V masonry

Performances

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

Annex C 22

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

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

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

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

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

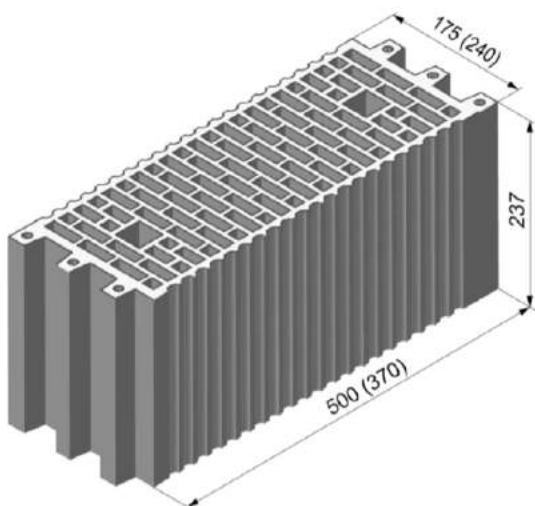
Factor for job site tests and displacements see annex C110

fischer injektion system FIS V masonry

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

Annex C 23

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



Vertical perforated brick HLz, form B, EN 771-1		
Producer	e.g. Wienerberger, Poroton	
Nominal dimensions [mm]	length L	width W
	500	175
	370	240
Density ρ [kg/dm ³]	$\geq 1,0$	
Compressive strength f_b [N/mm ²]	4 / 6 / 8 / 10 / 12	
Standard or annex	EN 771-1	

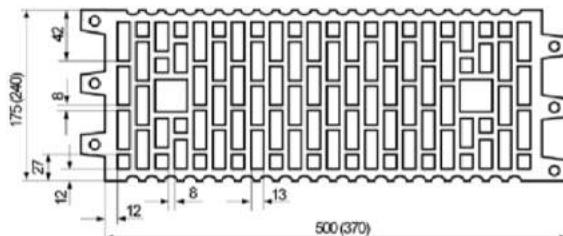


Table C24.1: Installation parameters

Anchor rod	M6	M8	M6	M8	-	M8	M10	M8	M10	-	M12	M16	M12	M16
Internal threaded anchor FIS E	-	-	-	-	M6	M8	-	-	-	M10	M12	-	-	-
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]	100
$s_{min \parallel}$		100
$s_{cr \parallel}$		500 (370)
$s_{min \perp}$		100
$s_{cr \perp}$		240

Drilling method

Hammer drilling with hard metal hammer drill

Table C24.2: Group factors

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

Group factors $\alpha_{g,N} \parallel = \alpha_{g,v} \parallel$ $\alpha_{g,N} \perp = \alpha_{g,v} \perp$	[-]	1

fischer injektion system FIS V masonry

Performances

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

Annex C 24

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

Table C25.1: Characteristic resistance under tensile load

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

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

Table C25.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C110

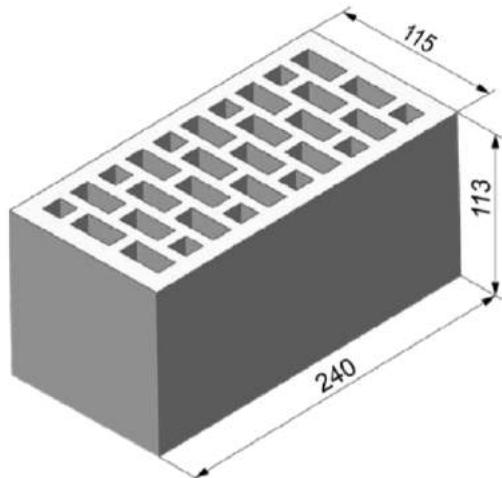
fischer injektion system FIS V masonry

Performances

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

Annex C 25

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



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

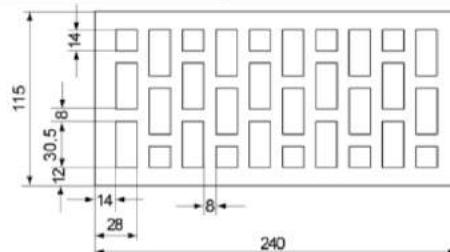


Table C26.1: Installation parameters

Anchor rod	M6	M8	M6	M8	-	M8	M10	-	M12	M16									
Internal threaded anchor FIS E	-	-	-	-	M6 M8	-	M10 M12	-	-	-									
Perforated sleeve FIS H K	12x50	12x85	16x85	16x85	11x85	15x85	20x85	20x85	20x85	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}	[mm]	80																	
Spacing $s_{cr \parallel} = s_{min \parallel}$		240																	
$s_{cr \perp} = s_{min \perp}$		115																	
Drilling method																			
Hammer drilling with hard metal hammer drill																			

Table C26.2: Group factors

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

fischer injektion system FIS V masonry

Performances

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

Annex C 26

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

Table C27.1: Characteristic resistance under tensile load

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

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

Table C27.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C110

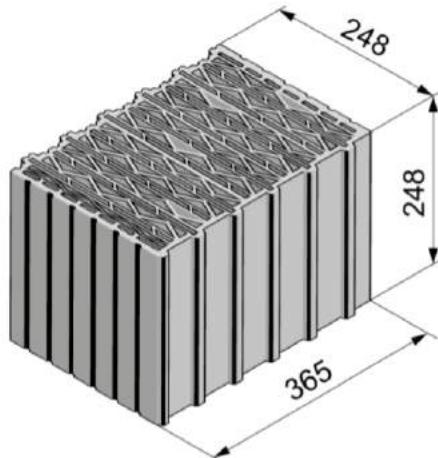
fischer injektion system FIS V masonry

Performances

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

Annex C 27

Vertical perforated brick HLz, U8, EN 771-1



Vertical perforated brick HLz, U8, EN 771-1		
Producer	-	
Nominal dimensions [mm]	length L	width W
	248	365
Density ρ [kg/dm ³]	0,6	
Compressive strength f_b [N/mm ²]	4 / 6 / 8	
Standard or annex	EN 771-1	

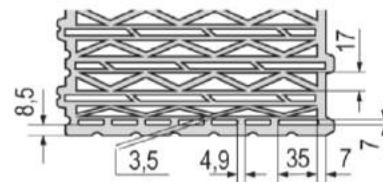


Table C28.1: Installation parameters
(Pre-positioned anchorage with perforated sleeve FIS HK)

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

Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS HK

Max. installation torque	$T_{inst,max}$ [Nm]	3	5	3	5	3	5								5	
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General installation parameters

Edge distance	c_{min}	$s_{min} \parallel$ $s_{cr} \parallel$ [mm] $s_{min} \perp$ $s_{cr} \perp$	60
	$s_{min} \parallel$		80
Spacing	$s_{cr} \parallel$		250
	$s_{min} \perp$		80
	$s_{cr} \perp$		250

Drilling method

Rotary drilling with carbide drill

Table C28.2: Group factors

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

fischer injektion system FIS V masonry

Performances

Vertical perforated brick HLz, U8, dimensions, installation parameters

Annex C 28

Vertical perforated brick HLz, U8, EN 771-1

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

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

Table C29.2: Group factors

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

Vertical perforated brick HLz, U8, EN 771-1

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

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

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

compressive strength f_b	use category	w/w	w/d	1,2													
4 N/mm ²		w/w	w/d	1,2													
		d/d	d/d	1,2													1,5
6 N/mm ²		w/w	w/d	1,5													1,5
		d/d	d/d	1,5													1,5
8 N/mm ²		w/w	w/d	1,5													2,0
		d/d	d/d	2,0													2,0

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

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

Factor for job site tests and displacements see annex C110

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

fischer injektion system FIS V masonry

Performances

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

Annex C 30

Vertical perforated brick HLz, U8, EN 771-1

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

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

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

compressive strength f_b	use category		
4 N/mm ²	w/w	w/d	1,2
	d/d		
6 N/mm ²	w/w	w/d	1,5
	d/d		
8 N/mm ²	w/w	w/d	1,5
	d/d		

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

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

Factor for job site tests and displacements see annex C108

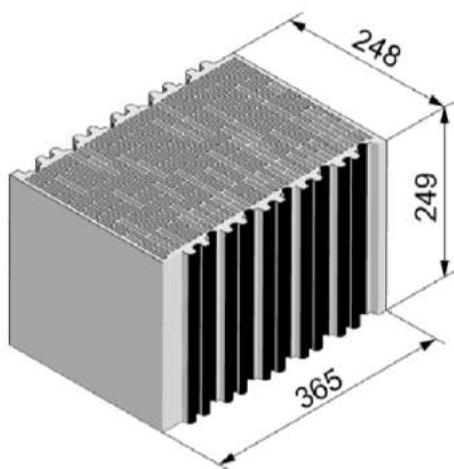
fischer injektion system FIS V masonry

Performances

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

Annex C 31

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



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

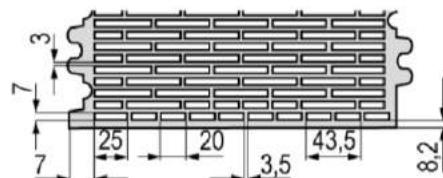


Table C32.1: Installation parameters
(Pre-positioned anchorage with perforated sleeve FIS HK)

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

Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS HK

Max. installation torque $T_{inst,max}$ [Nm]	3	5	3	5
General installation parameters				
Edge distance c_{min}	[mm]	60		
$s_{min \parallel}$		80		
$s_{cr \parallel}$		250		
Spacing $s_{min \perp}$		80		
$s_{cr \perp}$		250		

Drilling method

Rotary drilling with carbide drill

Table C32.2: Group factors

Anchor rod	M6	M8	M6	M8	-	M8	M10	M8	M10	-	M12	M16	M12	M16	M12	M16
Internal threaded anchor FIS E	-	-	-	-	M6 M8	-	-	-	-	M10 M12	-	-	-	-	-	-
Perforated sleeve FIS HK	12x50	12x85	16x85	16x130	16x130	20x85	20x130	20x130	20x200	20x200						
Group factors	$\alpha_{q,N} \parallel$ $\alpha_{q,V} \parallel$ $\alpha_{q,N} \perp$ $\alpha_{q,V} \perp$	[\cdot]	1,7	0,5	1,3	0,5										

fischer injektion system FIS V masonry

Performances

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

Annex C 32

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

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

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

Table C33.2: Group factors

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

fischer injektion system FIS V masonry

Performances

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

Annex C 33

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

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

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

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

compressive strength f_b	use category	w/w	w/d	1,5													
8 N/mm ²		w/w	w/d	1,5													
		d/d		1,5													2,0
10 N/mm ²		w/w	w/d	1,5													2,0
		d/d		2,0													2,0
12 N/mm ²		w/w	w/d	2,0													2,0
		d/d		2,0													2,5

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

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

Factor for job site tests and displacements see annex C110

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

fischer injektion system FIS V masonry

Performances

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

Annex C 34

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

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

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

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

compressive strength f_b	use category							
8 N/mm ²	w/w	w/d	0,9			1,5		
	d/d							
10 N/mm ²	w/w	w/d	0,9			1,5		
	d/d							
12 N/mm ²	w/w	w/d	1,2			2,0		
	d/d							

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

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

Factor for job site tests and displacements see annex C110

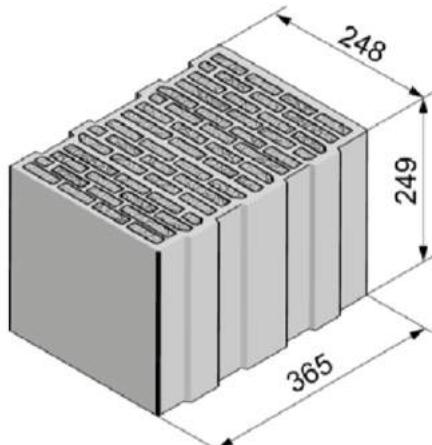
fischer injektion system FIS V masonry

Performances

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

Annex C 35

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



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

Producer	-		
Nominal dimensions [mm]	length L	width W	height H
248	365	249	
Density ρ [kg/dm ³]	0,5		
Compressive strength f_b [N/mm ²]	4 / 6		
Standard or annex	EN 771-1		

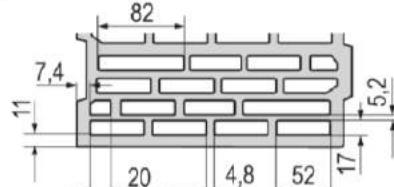


Table C36.1: Installation parameters
(Pre-positioned anchorage with perforated sleeve FIS HK)

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

Ankerstangen und Innengewindeanker FIS E mit Injektionsanker-Hülse FIS HK

Max. installation torque	$T_{inst,max}$ [Nm]	2	5	2	5
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General installation parameters

Edge distance	c_{min}	[mm]	60
	$s_{min \parallel}$		80
Spacing	$s_{cr \parallel}$		250
	$s_{min \perp}$		80
	$s_{cr \perp}$		250

Drilling method

Rotary drilling with carbide drill

Table C36.2: Group factors

Anchor rod	M6	M8	M6	M8	-	M8	M10	M8	M10	-	M12	M16	M12	M16	M12	M16
Internal threaded anchor FIS E	-	-	-	-	M6	M8	-	-	-	M10	M12	-	-	-	-	-
Perforated sleeve FIS HK	12x50	12x85	16x85	16x130	20x85	20x130	20x200									
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 V masonry

Performances

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

Annex C 36

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

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

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

Table C37.2: Group factors

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

fischer injektion system FIS V masonry

Performances

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

Annex C 37

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

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

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

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

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

Factor for job site tests and displacements see annex C110

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

fischer injektion system FIS V masonry

Performances

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

Annex C 38

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

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

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

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

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

Factor for job site tests and displacements see annex C110

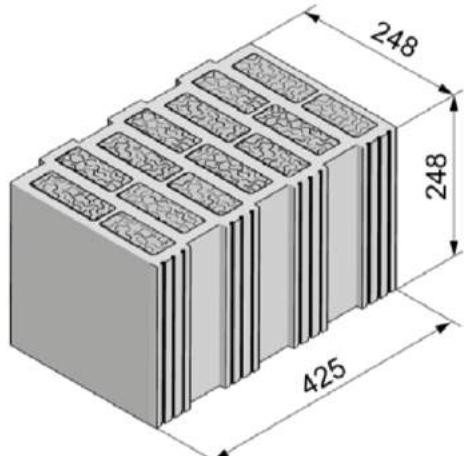
fischer injektion system FIS V masonry

Performances

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

Annex C 39

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



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

Producer	-		
Nominal dimensions [mm]	length L	width W	height H
	248	425	248
Density ρ [kg/dm ³]	0,8		
Compressive strength f_b [N/mm ²]	4 / 6 / 8		
Standard or annex	EN 771-1		

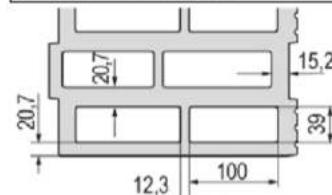


Table C40.1: Installation parameters
(Pre-positioned anchorage with perforated sleeve FIS HK)

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

Table C40.2: Group factors

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

fischer injektion system FIS V masonry

Performances

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

Annex C 40

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

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

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

Table C41.2: Group factors

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

fischer injektion system FIS V masonry

Performances

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

Annex C 41

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

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

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

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

compressive strength f_b	use category							
4 N/mm²	w/w	w/d	1,5		2,0		3,0	
	d/d		2,0		2,5		3,0	
6 N/mm²	w/w	w/d	2,0		2,5		3,5	
	d/d		2,0		3,0		4,0	
8 N/mm²	w/w	w/d	2,5		3,0		4,0	
	d/d		2,5		3,0		4,5	

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

Anchor rod	M10		M12		M16				
Perforated sleeve FIS H K	18x130/200				22x130/200				
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)									
compressive strength f_b	use category								
4 N/mm²	w/w	w/d	3,0		4,0				
	d/d		3,0		4,5				
6 N/mm²	w/w	w/d	3,5		5,0				
	d/d		4,0		5,5				
8 N/mm²	w/w	w/d	4,0		6,0				
	d/d		4,5		6,5				

Factor for job site tests and displacements see annex C110

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

fischer injektion system FIS V masonry

Performances

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

Annex C 42

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

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

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

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

compressive strength f_b	use category								
4 N/mm^2	w/w	w/d	2,0	2,0		2,5	2,0		1,5
	d/d								
6 N/mm^2	w/w	w/d	2,5	2,5		3,0	2,5		2,0
	d/d								
8 N/mm^2	w/w	w/d	2,5	3,0		4,0	3,0		2,5
	d/d								

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

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

Factor for job site tests and displacements see annex C110

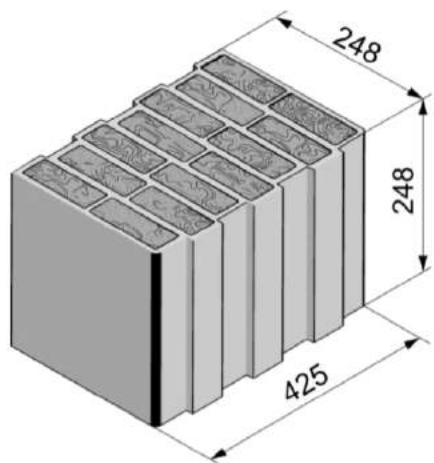
fischer injektion system FIS V masonry

Performances

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

Annex C 43

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



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

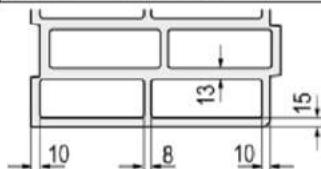


Table C44.1: Installation parameters
(Pre-positioned anchorage with perforated sleeve FIS HK)

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

Table C44.2: Group factors

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

fischer injektion system FIS V masonry

Performances

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

Annex C 44

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

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

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

Table C45.2: Group factors

Anchor rod	M10	M12	M16
Perforated sleeve FIS HK	18x130/200		22x130/200
Group factors	[-]	1,9	
		0,9	
		1,0	
		0,7	

fischer injektion system FIS V masonry

Performances

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

Annex C 45

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

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

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

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

compressive strength f_b	use category	w/w	w/d	0,6	0,75	1,5	2,0	1,2	2,0	2,0
4 N/mm ²	w/w	w/d	0,6	0,9	1,5	2,0	1,2	2,0	2,0	2,0
	d/d									
6 N/mm ²	w/w	w/d	0,75	0,9	1,5	2,0	1,5	2,5	2,5	2,5
	d/d									
8 N/mm ²	w/w	w/d	0,9	1,2	2,0	2,5	2,0	2,5	3,0	3,0
	d/d									

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

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

Factor for job site tests and displacements see annex C110

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

fischer injektion system FIS V masonry

Performances

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

Annex C 46

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

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

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

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

compressive strength f_b	use category	w/w	w/d	d/d	1,2	1,5	1,5	1,5
4 N/mm ²	w/w	w/d						
	d/d							
6 N/mm ²	w/w	w/d			1,5	2,0	2,0	1,5
	d/d							
8 N/mm ²	w/w	w/d			1,5	2,5	2,5	2,0
	d/d							

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

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

Factor for job site tests and displacements see annex C110

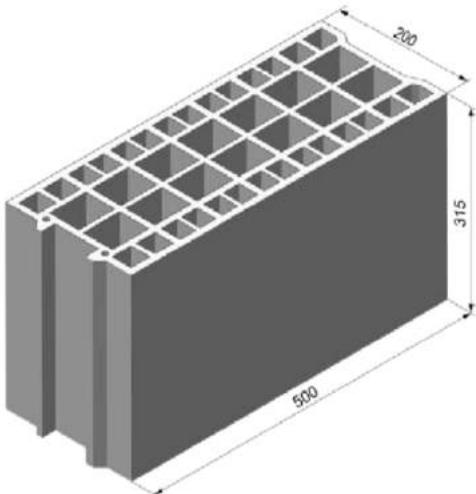
fischer injektion system FIS V masonry

Performances

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

Annex C 47

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



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

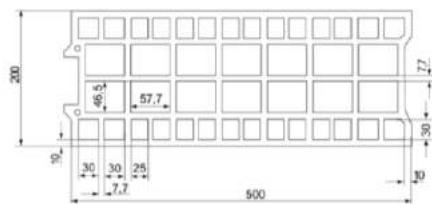


Table C48.1: Installation parameters
(Pre-positioned anchorage with perforated sleeve FIS HK)

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					
$s_{min \parallel}$										120					
Spacing $s_{cr \parallel}$										500					
$s_{min \perp} = s_{cr \perp}$										315					
Drilling method															
Hammer drilling with hard metal hammer drill															

Table C48.2: 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 V masonry

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

Annex C 48

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

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

Anchor rod	M10	M12	M16	
Perforated sleeve FIS HK	18x130/200		22x130/200	
Anchor rod with perforated sleeve FIS HK				
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 C49.2: Group factors

Anchor rod	M10	M12	M16
Perforated sleeve FIS HK	18x130/200		22x130/200
Group factors	[-]	1,3	
		1,7	
		2	

fischer injektion system FIS V masonry

Performances

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

Annex C 49

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

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

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

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

compressive strength f_b	use category	w/w	w/d	0,5	1,5	0,75	1,5	1,5	1,5
4 N/mm ²	w/w	w/d	0,6		1,5	0,9		1,5	2,0
	d/d								
6 N/mm ²	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 ²	w/w	w/d	0,9		3,0	1,5		3,0	3,5
	d/d		1,2		3,0	2,0		3,0	3,5

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

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

Factor for job site tests and displacements see annex C110

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

fischer injektion system FIS V masonry

Performances

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

Annex C 50

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

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

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

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

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

Factor for job site tests and displacements see annex C110

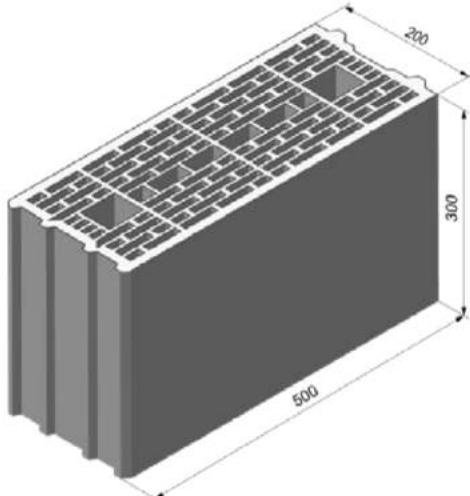
fischer injektion system FIS V masonry

Performances

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

Annex C 51

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



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

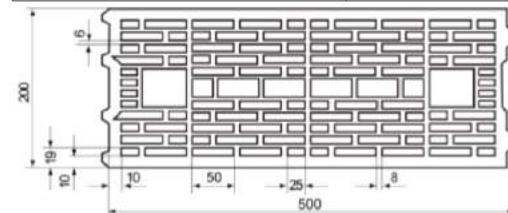


Table C52.1: Installation parameters
(Pre-positioned anchorage with perforated sleeve FIS HK)

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	
$s_{min \parallel}$										100					
Spacing $s_{cr \parallel}$										500					
$s_{min \perp} = s_{cr \perp}$										300					
Drilling method															
Hammer drilling with hard metal hammer drill															

Table C52.2: 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 V masonry

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

Annex C 52

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

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

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

Table C53.2: Group factors

Anchor rod	M10	M12	M16
Perforated sleeve FIS HK	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 V masonry

Performances

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

Annex C 53

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

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

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

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

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

Factor for job site tests and displacements see annex C110

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

fischer injektion system FIS V masonry

Performances

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

Annex C 54

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

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

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

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

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

Factor for job site tests and displacements see annex C110

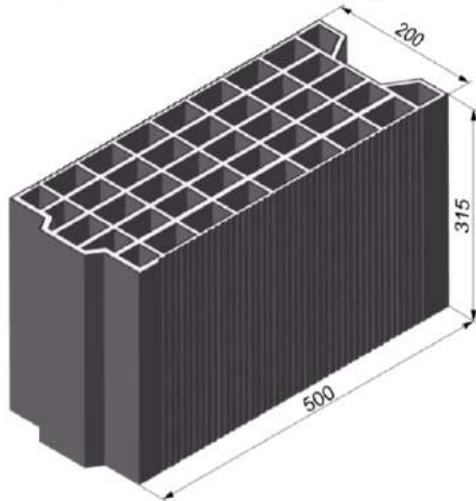
fischer injektion system FIS V masonry

Performances

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

Annex C 55

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



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

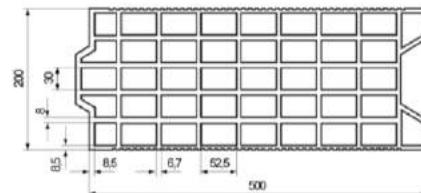


Table C56.1: Installation parameters
(Pre-positioned anchorage with perforated sleeve FIS HK)

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 HK	12x50	12x85			16x85	16x130			20x85		20x130			
Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS HK														
Max. installation torque	$T_{inst,max}$ [Nm]										2			
General installation parameters														
Edge distance	c_{min}					50				80		50		80
Spacing	$s_{min \parallel}$									100				
	$s_{cr \parallel}$	[mm]								500				
	$s_{min \perp}$									100				
	$s_{cr \perp}$									315				
Drilling method														
Hammer drilling with hard metal hammer drill														

Table C56.2: 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 HK	12x50	12x85			16x85	16x130			20x85		20x130			
Group factors	$\alpha_{q,N \parallel}$									1,1				
	$\alpha_{q,V \parallel}$									1,2				
	$\alpha_{q,N \perp}$									1,1				
	$\alpha_{q,V \perp}$									1,2				

fischer injektion system FIS V masonry

Performances

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

Annex C 56

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

Table C57.1: Installation parameters
(Push through anchorage with perforated sleeve FIS HK)

Anchor rod	M10	M12	M16
Perforated sleeve FIS H K	18x130/200		22x130/200
Anchor rod with perforated sleeve FIS H K			
Max. installation torque $T_{inst,max}$ [Nm]		2	
General installation parameters			
Edge distance c_{min}		80	
Spacing $s_{min \parallel}$		100	
Spacing $s_{cr \parallel}$ [mm]		500	
Spacing $s_{min \perp}$		100	
Spacing $s_{cr \perp}$		315	
Drilling method			
Hammer drilling with hard metal hammer drill			

Table C57.2: 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 V masonry

Performances

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

Annex C 57

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

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

Anchor rod	M6	M8	M6	M8	-	M8	M10	M8	M10	-	M12	M16	M12	M16
Internal threaded anchor FIS E	-	-		M6 M8 11x85	-	-	-	-	M10 M12 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													
2 N/mm ²	w/w	w/d								0,5				
	d/d					0,5				0,6	0,5			0,6
4 N/mm ²	w/w	w/d								0,9				
	d/d		0,9							1,2				
6 N/mm ²	w/w	w/d								1,5				
	d/d									1,5				
8 N/mm ²	w/w	w/d								2,0				
	d/d									2,0				

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

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

Factor for job site tests and displacements see annex C110

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

fischer injektion system FIS V masonry

Performances

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

Annex C 58

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

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

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

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

Anchor rod	M10	M12	M16	
Perforated sleeve FIS H K	18x130/200		22x130/200	
Shear load V_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C and 72/120°C)				
compressive strength f_b	use category			
2 N/mm ²	w/w	w/d	0,6	0,75
	d/d			
4 N/mm ²	w/w	w/d	1,2	1,5
	d/d			
6 N/mm ²	w/w	w/d	1,5	2,0
	d/d			
8 N/mm ²	w/w	w/d	2,0	3,0
	d/d			

Factor for job site tests and displacements see annex C110

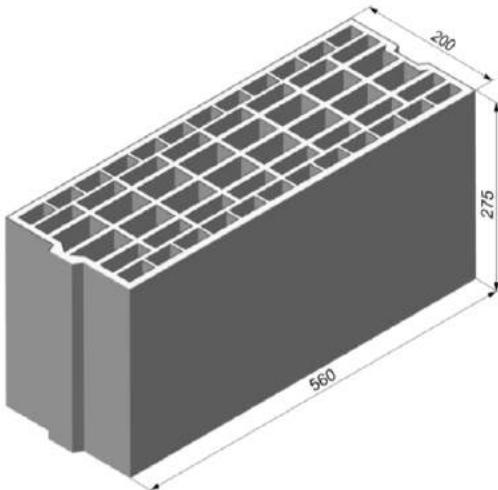
fischer injektion system FIS V masonry

Performances

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

Annex C 59

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



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

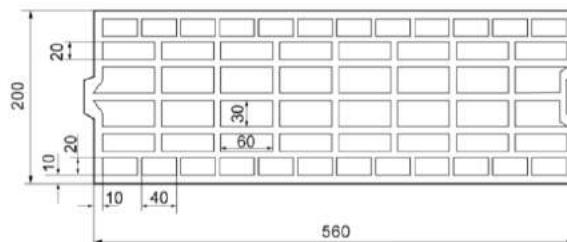


Table C60.1: Installation parameters

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

Table C60.2: Group factors

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

Performances

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

Annex C 60

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

Table C61.1: Characteristic resistance under tensile load

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

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

Table C61.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C110

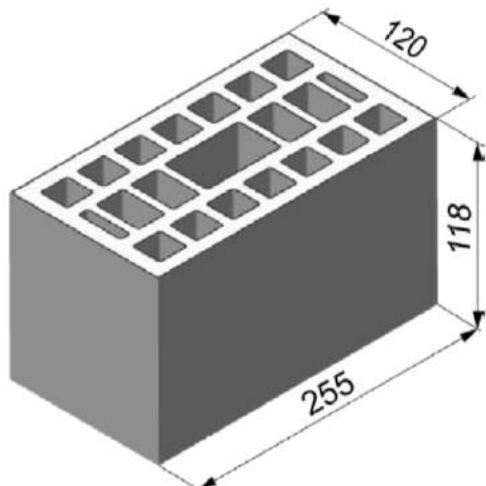
fischer injektion system FIS V masonry

Performances

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

Annex C 61

Vertical perforated brick HLz, EN 771-1



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

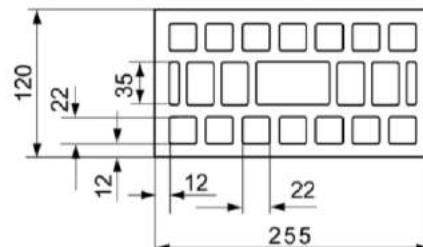


Table C62.1: Installation parameters

Anchor rod	M6	M8	M6	M8	-	M8	M10	-	M12	M16									
Internal threaded anchor FIS E	-	-	-	-	M6 M8	-	M10 M12	-	-	-									
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}	[mm]				60													
Spacing	$s_{cr \parallel} = s_{min \parallel}$					255													
	$s_{cr \perp} = s_{min \perp}$					120													
Drilling method																			
Hammer drilling with hard metal hammer drill																			

Table C62.2: Group factors

Anchor rod	M6	M8	M6	M8	-	M8	M10	-	M12	M16
Internal threaded anchor FIS E	-	-	-	-	M6 M8	-	M10 M12	-	-	-
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 V masonry

Performances

Vertical perforated brick HLz, dimensions, installation parameters

Annex C 62

Vertical perforated brick HLz, EN 771-1

Table C63.1: Characteristic resistance under tensile load

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

Factor for job site tests and displacements see annex C110

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

fischer injektion system FIS V masonry

Performances

Vertical perforated brick HLz, Characteristic resistance under tensile load

Annex C 63

Vertical perforated brick HLz, EN 771-1

Table C64.1: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C110

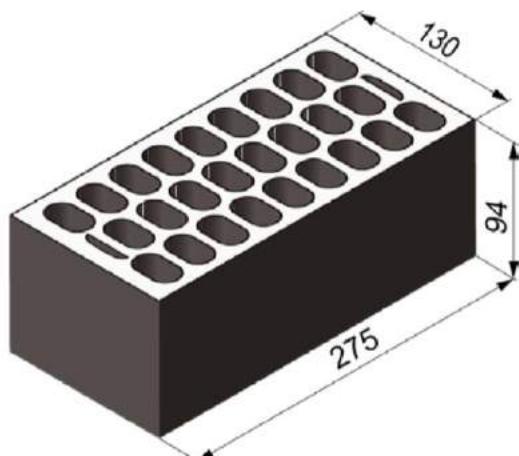
fischer injektion system FIS V masonry

Performances

Vertical perforated brick HLz, Characteristic resistance under shear load

Annex C 64

Vertical perforated brick HLz, EN 771-1



Vertical perforated brick HLz, EN 771-1		
Producer	e.g. Cermanica Farreny S.A.	
Nominal dimensions [mm]	length L	width W
	275	130
Density ρ [kg/dm ³]	$\geq 0,8$	
Compressive strength f_b [N/mm ²]	6 / 8 / 12 / 16 / 20	
Standard or annex	EN 771-1	

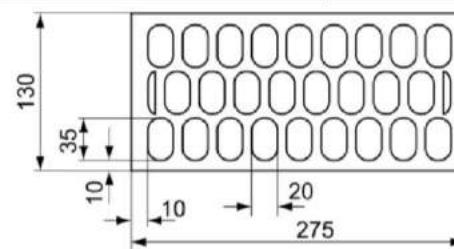


Table C65.1: Installation parameters

Anchor rod	M6	M8	M6	M8	-	M8	M10	-	M12	M16										
Internal threaded anchor FIS E	-	-	-	-	M6 M8	-	M10 M12	-	-	-										
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}	$s_{cr} \parallel = s_{min} \parallel$ [mm]	$s_{cr} \perp = s_{min} \perp$	100				120													
Spacing			275				95													
Drilling method																				
Hammer drilling with hard metal hammer drill																				

Table C65.2: Group factors

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

fischer injektion system FIS V masonry

Performances

Vertical perforated brick HLz, dimensions, installation parameters

Annex C 65

Vertical perforated brick HLz, EN 771-1

Table C66.1: Characteristic resistance under tensile load

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

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

Table C66.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C110

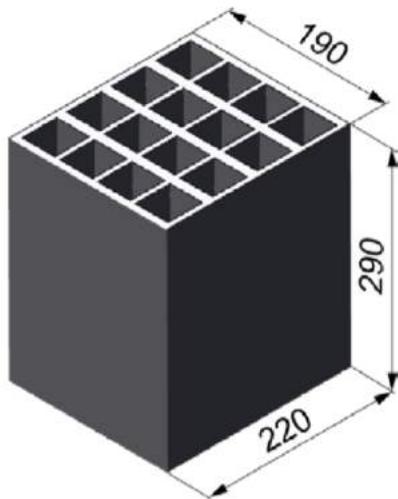
fischer injektion system FIS V masonry

Performances

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

Annex C 66

Vertical perforated brick HLz, EN 771-1



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

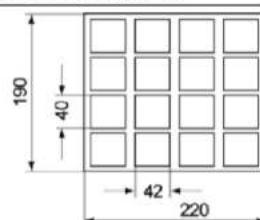


Table C67.1: Installation parameters
(Pre-positioned anchorage with perforated sleeve FIS HK)

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 HK	12x50	12x85			16x85		16x130			20x85		20x130			
Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS HK															
Max. installation torque $T_{inst,max}$ [Nm]										2					
General installation parameters															
Edge distance c_{min}	[mm]									110					
Spacing $s_{min \parallel} = s_{cr \parallel}$										220					
$s_{min \perp} = s_{cr \perp}$										290					
Drilling method															
Hammer drilling with hard metal hammer drill															

Table C67.2: 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 HK	12x50	12x85			16x85		16x130			20x85		20x130		
Group factors	$\alpha_{q,N} \parallel$ $\alpha_{q,V} \parallel$ $\alpha_{q,N} \perp$ $\alpha_{q,V} \perp$	[-]								2				

fischer injektion system FIS V masonry

Performances

Vertical perforated brick HLz, dimensions, installation parameters

Annex C 67

Vertical perforated brick HLz, EN 771-1

Table C68.1: Installation parameters
(Push through anchorage with perforated sleeve FIS HK)

Anchor rod	M10	M12	M16
Perforated sleeve FIS HK	18x130/200		22x130/200
Anchor rod with perforated sleeve FIS HK			
Max. installation torque	$T_{inst,max}$ [Nm]		2
General installation parameters			
Edge distance	c_{min}	110	
Spacing	$s_{min \parallel} = s_{cr \parallel}$ [mm] $s_{min \perp} = s_{cr \perp}$	220	290
Drilling method			
Hammer drilling with hard metal hammer drill			

Table C68.2: Group factors

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

Vertical perforated brick HLz, EN 771-1

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

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

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

compressive strength f_b	use category	w/w	w/d	0,3	1,2	1,2	1,5	1,2	1,5
6 N/mm ²	w/w	w/d	0,4	1,5	1,5	1,5	1,5	1,5	1,5
	d/d								
8 N/mm ²	w/w	w/d	0,5	1,5	1,5	2,0	1,5	2,0	2,0
	d/d								
10 N/mm ²	w/w	w/d	0,6	2,0	2,0	2,5	2,0	2,0	2,5
	d/d								

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

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

Factor for job site tests and displacements see annex C110

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

fischer injektion system FIS V masonry

Performances

Vertical perforated brick HLz, Characteristic resistance under tensile load

Annex C 69

Vertical perforated brick HLz, EN 771-1

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

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

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

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

Factor for job site tests and displacements see annex C110

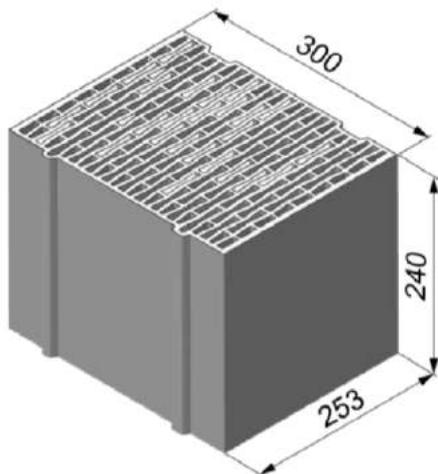
fischer injektion system FIS V masonry

Performances

Vertical perforated brick HLz, Characteristic resistance under shear load

Annex C 70

Vertical perforated brick HLz, EN 771-1



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

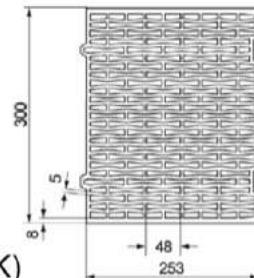


Table C71.1: Installation parameters
(Pre-positioned anchorage with perforated sleeve FIS HK)

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

Table C71.2: Group factors

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

fischer injektion system FIS V masonry

Performances

Vertical perforated brick HLz, dimensions, installation parameters

Annex C 71

Vertical perforated brick HLz, EN 771-1

Table C72.1: Installation parameters
(Push through anchorage with perforated sleeve FIS HK)

Anchor rod	M10	M12	M16
Perforated sleeve FIS HK	18x130/200		22x130/200
Anchor rod with perforated sleeve FIS HK			
Max. installation torque	$T_{inst,max}$ [Nm]		2
General installation parameters			
Edge distance	c_{min}	60	
Spacing	$s_{min \parallel} = s_{cr \parallel}$ [mm]	255	
	$s_{min \perp} = s_{cr \perp}$	240	
Drilling method			
Hammer drilling with hard metal hammer drill			

Table C72.2: Group factors

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

fischer injektion system FIS V masonry

Performances

Vertical perforated brick HLz, dimensions, installation parameters

Annex C 72

Vertical perforated brick HLz, EN 771-1

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

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

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

compressive strength f_b	use category	w/w	w/d	-	0,5	0,5	0,4	0,5	0,4
2 N/mm²	w/w	w/d	-	0,5	0,5	0,4	0,5	0,4	0,4
	d/d		0,3	0,5	0,5	0,5	0,5	0,5	0,5
4 N/mm²	w/w	w/d	0,5	0,9	0,9	0,9	0,9	0,9	0,9
	d/d		0,6	0,9	0,9	0,9	0,9	0,9	0,9
6 N/mm²	w/w	w/d	0,75	1,5	1,5	1,5	1,2	1,5	1,2
	d/d		0,9	1,5	1,5	1,5	1,5	1,5	1,5

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

Anchor rod	M10	M12	M16		
Perforated sleeve FIS H K	18x130/200		22x130/200		
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)					
compressive strength f_b	use category				
	w/w	w/d	0,4		
2 N/mm²	d/d		0,5		
	w/w	w/d	0,9		
4 N/mm²	d/d		0,9		
	w/w	w/d	1,2		
6 N/mm²	d/d		1,5		

Factor for job site tests and displacements see annex C110

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

fischer injektion system FIS V masonry

Performances

Vertical perforated brick HLz, Characteristic resistance under tensile load

Annex C 73

Vertical perforated brick HLz, EN 771-1

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

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

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

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

Factor for job site tests and displacements see annex C110

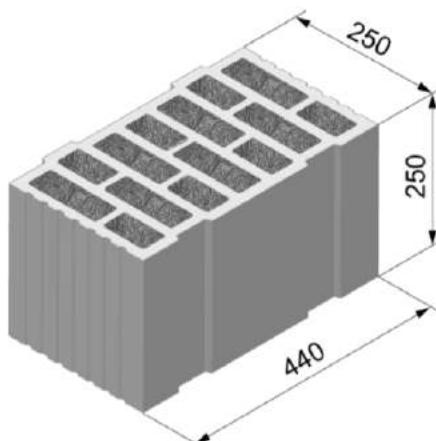
fischer injektion system FIS V masonry

Performances

Vertical perforated brick HLz, Characteristic resistance under shear load

Annex C 74

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



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

Producer	-		
Nominal dimensions [mm]	length L	width W	height H
	250	440	250
Density ρ [kg/dm ³]	0,7		
Compressive strength f_b [N/mm ²]	6 / 8 / 10		
Standard or annex	EN 771-1		

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

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

Table C75.2: Group factors

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

fischer injektion system FIS V masonry

Performances

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

Annex C 75

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

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

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

Table C76.2: Group factors

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

fischer injektion system FIS V masonry

Performances

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

Annex C 76

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

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

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

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

compressive strength f_b	use category	w/w	w/d	0,75	1,5	1,2			1,5		2,5
6 N/mm ²	w/w	w/d	0,9	1,5	1,2			1,5		2,5	
	d/d										
8 N/mm ²	w/w	w/d	0,9	1,5	1,2			1,5		2,5	
	d/d			0,9	2,0	1,5			2,0		3,0
10 N/mm ²	w/w	w/d	0,9	2,0	1,5			2,0		3,0	
	d/d			1,2	2,0	1,5			2,0		3,5

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

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

Factor for job site tests and displacements see annex C110

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

fischer injektion system FIS V masonry

Performances

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

Annex C 77

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

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

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

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

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

Factor for job site tests and displacements see annex C110

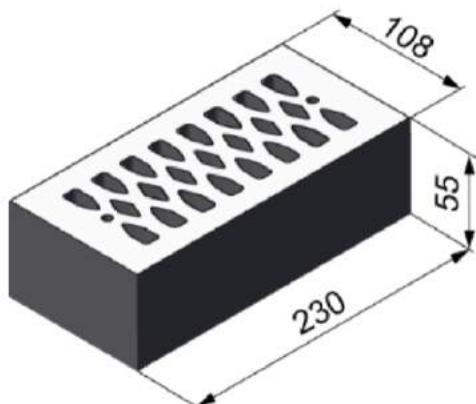
fischer injektion system FIS V masonry

Performances

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

Annex C 78

Vertical perforated brick HLz, EN 771-1



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

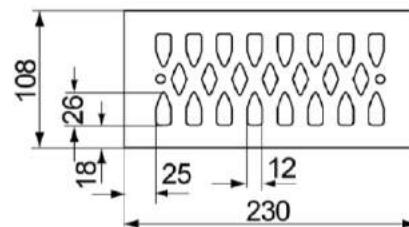


Table C79.1: Installation parameters

Anchor rod	M6	M8	M6	M8	-	M8	M10	-	M12	M16
Internal threaded anchor FIS E	-	-	-	-	M6 M8	-	-	M10 M12	-	-
Perforated sleeve FIS H K	12x50	12x85	16x85	20x85	11x85	15x85				
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}							60			
Spacing $s_{min \parallel}$							80			
							230			
							60			
							60			

Drilling method

Hammer drilling with hard metal hammer drill

Table C79.2: Group factors

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

fischer injektion system FIS V masonry

Performances

Vertical perforated brick HLz, dimensions, installation parameters

Annex C 79

Vertical perforated brick HLz, EN 771-1

Table C80.1: Characteristic resistance under tensile load ¹⁾

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

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

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

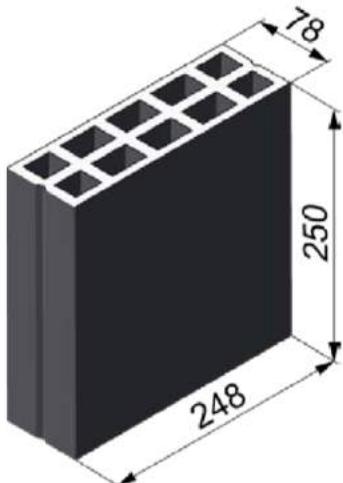
Table C80.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C110

fischer injektion system FIS V masonry	Annex C 80
Performances Vertical perforated brick HLz, Characteristic resistance under tensile and shear load	Annex C 80

Horizontal perforated brick LLz, EN 771-1



Horizontal perforated brick LLz, EN 771-1			
Producer	-		
Nominal dimensions [mm]	length L		width W
	250		78
Density ρ [kg/dm ³]	$\geq 0,7$		
Compressive strength f_b [N/mm ²]	2 / 4 / 6		
Standard or annex	EN 771-1		

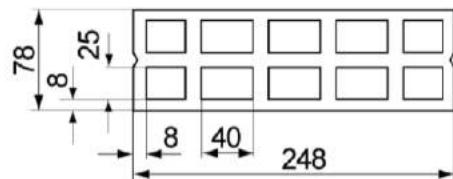


Table C81.1: Installation parameters

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

Table C81.2: Group factors

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

fischer injektion system FIS V masonry

Performances
Horizontal perforated brick LLz, dimensions, installation parameters

Annex C 81

Horizontal perforated brick LLz, EN 771-1

Table C82.1: Characteristic resistance under tensile load

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

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

Table C82.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C110

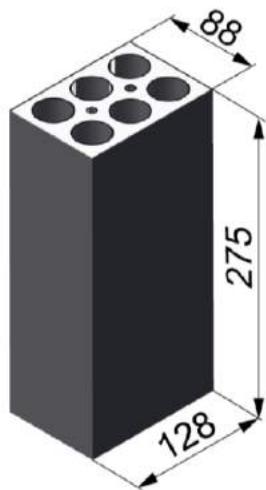
fischer injektion system FIS V masonry

Performances

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

Annex C 82

Horizontal perforated brick LLz, EN 771-1



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

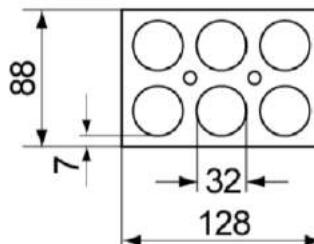


Table C83.1: Installation parameters

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

Table C83.2: Group factors

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

fischer injektion system FIS V masonry

Performances
Horizontal perforated brick LLz, dimensions, installation parameters

Annex C 83

Horizontal perforated brick LLz, EN 771-1

Table C84.1: Characteristic resistance under tensile load

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

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

Table C84.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C110

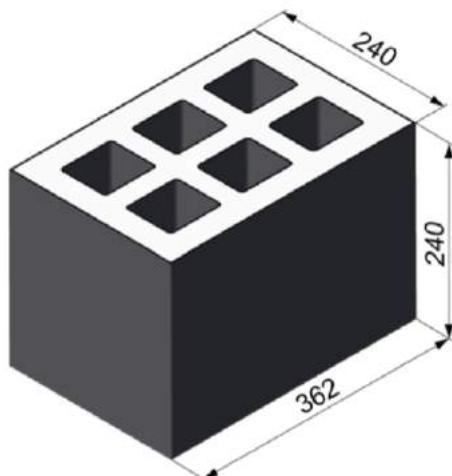
fischer injektion system FIS V masonry

Performances

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

Annex C 84

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



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

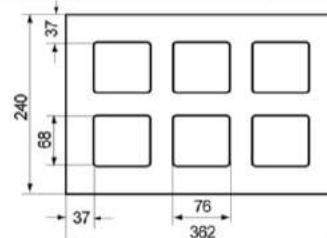


Table C85.1: Installation parameters
(Pre-positioned anchorage with perforated sleeve FIS HK)

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

Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS HK

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

General installation parameters

Edge distance c_{min}	[mm]	60
$s_{min \parallel}$		100
Spacing $s_{cr \parallel}$		362
$s_{min \perp} = s_{cr \perp}$		240

Drilling method

Hammer drilling with hard metal hammer drill

Table C85.2: Group factors

Anchor rod	M6	M8	M6	M8	-	M8	M10	M8	M10	-	M12	M16	M12	M16	M12	M16	
Internal threaded anchor FIS E	-	-	-	-	M6 M8	-	-	-	-	M10 M12	-	-	-	-	-	-	
Perforated sleeve FIS HK	12x50	12x85	16x85	16x130	20x85	20x130	20x200										
Group factors	$\alpha_{q,N} \parallel$	[-]	1,2														
	$\alpha_{q,V} \parallel$		1,1														
	$\alpha_{q,N} \perp$		2,0														
	$\alpha_{q,V} \perp$																

fischer injektion system FIS V masonry

Performances

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

Annex C 85

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

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

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

Table C86.2: Group factors

Anchor rod	M10	M12	M16
Perforated sleeve FIS HK	18x130/200		22x130/200
Group factors	[-]	1,2	
		1,1	
			2,0

fischer injektion system FIS V masonry

Performances

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

Annex C 86

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

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

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

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

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

Factor for job site tests and displacements see annex C110

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

fischer injektion system FIS V masonry

Performances

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

Annex C 87

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

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

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

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

Anchor rod	M10	M12	M16	
Perforated sleeve FIS H K	18x130/200	22x130/200		
Shear load V_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C and 72/120°C)				
compressive strength f_b	use category			
2 N/mm ²	w/w	w/d		
	d/d			
4 N/mm ²	w/w	w/d		
	d/d			

Factor for job site tests and displacements see annex C110

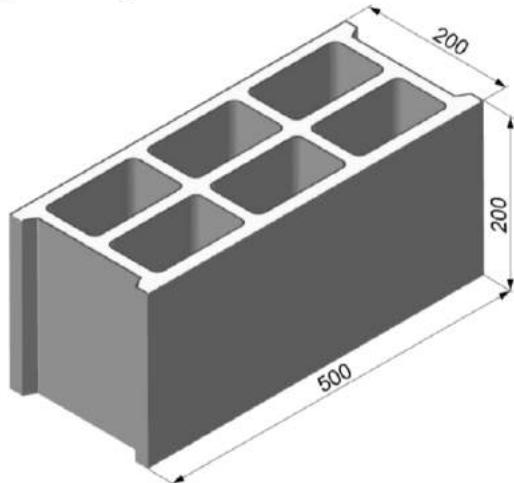
fischer injektion system FIS V masonry

Performances

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

Annex C 88

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



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

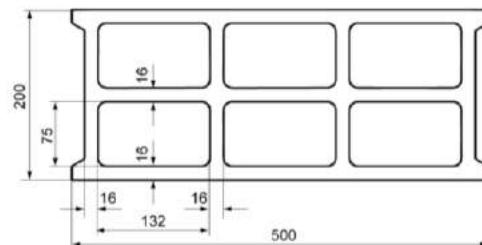


Table C89.1: Installation parameters

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			
											200			
Drilling method														
Hammer drilling with hard metal hammer drill														

Table C89.2: 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	$\alpha_{q,N} \parallel$ $\alpha_{q,V} \parallel$ $\alpha_{q,N} \perp$ $\alpha_{q,V} \perp$	[\cdot]									2			

fischer injektion system FIS V masonry

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

Annex C 89

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

Table C90.1: Characteristic resistance under tensile load

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 HK	12x50	12x85			16x85		16x130	18x130/200			20x85			
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)														
compressive strength f_b	use category													
2 N/mm ²	w/w	w/d												
	d/d													
4 N/mm ²	w/w	w/d												
	d/d													
6 N/mm ²	w/w	w/d												
	d/d													

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

Table C90.2: 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 HK	12x50	12x85			16x85		16x130	18x130/200			20x85			
Shear load V_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C and 72/120°C)														
compressive strength f_b	use category													
2 N/mm ²	w/w	w/d												
	d/d													
4 N/mm ²	w/w	w/d												
	d/d													
6 N/mm ²	w/w	w/d												
	d/d													

Factor for job site tests and displacements see annex C110

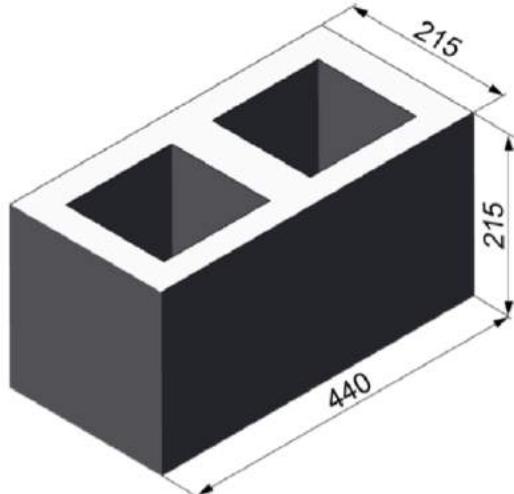
fischer injektion system FIS V masonry

Performances

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

Annex C 90

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



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

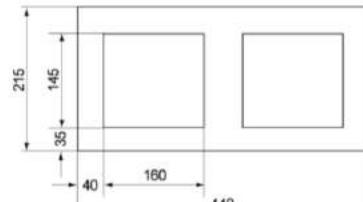


Table C91.1: Installation parameters
(Pre-positioned anchorage with perforated sleeve FIS HK)

Anchor rod	M6	M8	M6	M8	-	M8	M10	M8	M10	-	M12	M16	M12	M16																										
Internal threaded anchor FIS E	-	-	-	-	M6	M8	-	-	-	M10	M12	-	-	-																										
					11x85					15x85																														
Perforated sleeve FIS HK	12x50		12x85		16x85		16x130		20x85		20x130																													
Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS HK																																								
Max. installation torque $T_{inst,max}$ [Nm]	2																																							
General installation parameters																																								
Edge distance c_{min}	[mm]	110																																						
$s_{min \parallel}$		100																																						
$s_{cr \parallel}$		440																																						
$s_{min \perp}$		100																																						
$s_{cr \perp}$		215																																						
Drilling method																																								
Hammer drilling with hard metal hammer drill																																								

Table C91.2: Group factors

Anchor rod	M6	M8	M6	M8	-	M8	M10	M8	M10	-	M12	M16	M12	M16												
Internal threaded anchor FIS E	-	-	-	-	M6	M8	-	-	-	M10	M12	-	-	-												
					11x85					15x85																
Perforated sleeve FIS HK	12x50		12x85		16x85		16x130		20x85		20x130															
Group factors																										
$\alpha_{q,N \parallel}$	1,4																									
	$\alpha_{q,V \parallel}$																									
	$\alpha_{q,N \perp}$																									
	$\alpha_{q,V \perp}$																									

fischer injektion system FIS V masonry

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

Annex C 91

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

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

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

Table C92.2: Group factors

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

fischer injektion system FIS V masonry

Performances

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

Annex C 92

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

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

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

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

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

Factor for job site tests and displacements see annex C110

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

fischer injektion system FIS V masonry

Performances

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

Annex C 93

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

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

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

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

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

Factor for job site tests and displacements see annex C110

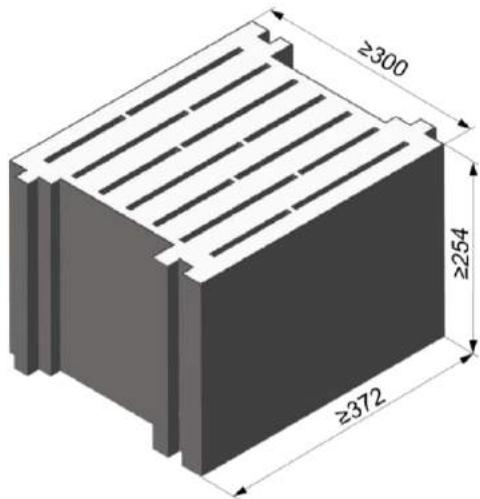
fischer injektion system FIS V masonry

Performances

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

Annex C 94

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



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

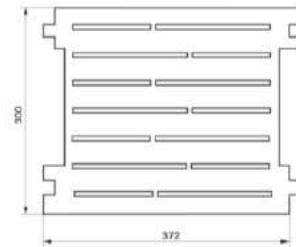


Table C95.1: Installation parameters

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

Table C95.2: Group factors

Anchor rod	M8	M10	M10	M12	M12	M16	M16	M12	M16
Perforated sleeve FIS H K	16x130		18x130/200		20x130		22x130/200		20x200
Group factors	$\alpha_{q,N \parallel}$ $\alpha_{q,V \parallel}$ $\alpha_{q,N \perp}$ $\alpha_{q,V \perp}$	[\cdot]				2			
fischer injektion system FIS V masonry									

Performances

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

Annex C 95

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

Table C96.1: Characteristic resistance under tensile load

Anchor rod		M8	M10	M10	M12	M12	M16	M16	M12	M16
Perforated sleeve FIS H K		16x130	18x130/200		20x130		22x130/200		20x200	
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)										
compressive strength f_b	use category									
2 N/mm^2	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 C96.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C110

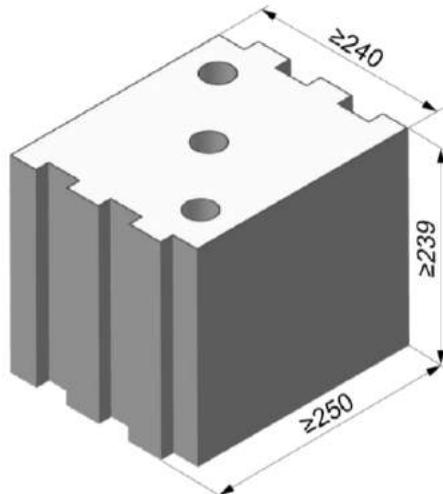
fischer injektion system FIS V masonry

Performances

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

Annex C 96

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



Light-weight concrete solid block Vbl, EN 771-3		
Producer	KLB	
Nominal dimensions [mm]	length L	width W
	≥ 250	≥ 240
Density ρ [kg/dm ³]	≥ 1,6	
Compressive strength f_b [N/mm ²]	4 / 6 / 8	
Standard or annex	EN 771-3	

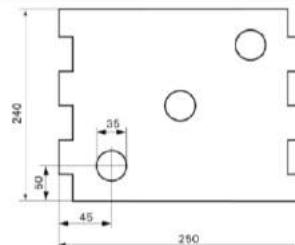


Table C97.1: Installation parameters
(Pre-positioned anchorage with perforated sleeve FIS HK)

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

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

Max. installation torque $T_{inst,max}$ [Nm]	4
--	---

General installation parameters

Edge distance c_{min}	[mm]	130
Spacing $s_{min \parallel} = s_{cr \parallel}$		250
Spacing $s_{min \perp} = s_{cr \perp}$		250

Drilling method

Hammer drilling with hard metal hammer drill

Table C97.2: Group factors

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

fischer injektion system FIS V masonry

Performances

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

Annex C 97

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

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

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

Table C98.2: Group factors

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

fischer injektion system FIS V masonry

Performances

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

Annex C 98

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

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

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

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

compressive strength f_b	use category	w/w	w/d	1,2	2,0	2,5	3,0
4 N/mm ²	w/w	w/d	2,0	3,5	4,0	5,0	
	d/d	d/d	3,0	5,0	6,5	7,5	
6 N/mm ²	w/w	w/d	1,5	3,0	4,0	5,0	
	d/d	d/d	2,0	4,0	5,0	6,5	
8 N/mm ²	w/w	w/d	2,0	4,0	5,0	6,5	
	d/d	d/d	4,0	7,0	8,5	9,0	

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

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

Factor for job site tests and displacements see annex C110

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

fischer injektion system FIS V masonry

Performances

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

Annex C 99

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

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

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

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

compressive strength f_b	use category														
4 N/mm^2	w/w	w/d	2,0			3,0	2,0	3,0	2,0	3,5			4,5		
	d/d														
6 N/mm^2	w/w	w/d	3,0			4,5	3,0	4,5	3,0	5,5			6,5		
	d/d														
8 N/mm^2	w/w	w/d	4,0			6,0	4,0	6,0	4,0	7,0			8,5		
	d/d														

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

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

Factor for job site tests and displacements see annex C110

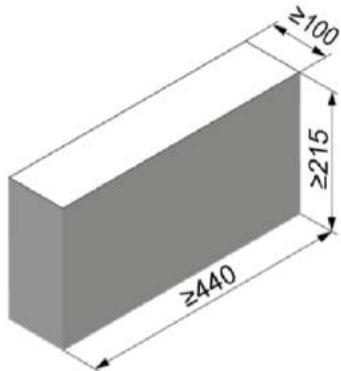
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Performances

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

Annex C 100

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



Light-weight concrete solid block Vbl, EN 771-3		
Producer	Roadstone wood	
Nominal dimensions [mm]	length L ≥ 440	width W ≥ 100
Density ρ [kg/dm ³]		≥ 2,0
Compressive strength f_b [N/mm ²]		4 / 6 / 8 / 10
Standard or annex	EN 771-3	

Table C101.1: Installation parameters

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

Table C101.2: Group factors

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

fischer injektion system FIS V masonry

Performances

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

Annex C 101

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

Table C102.1: Characteristic resistance under tensile load

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

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

Table C102.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C110

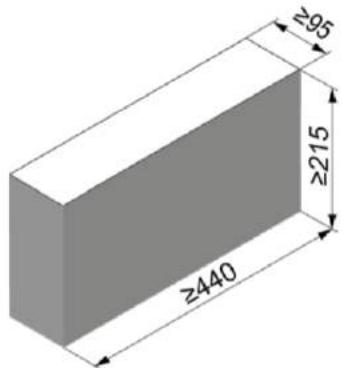
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Performances

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

Annex C 102

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



Light-weight concrete solid block Vbl, EN 771-3		
Producer	Tramac	
Nominal dimensions [mm]	length L	width W
	≥ 440	≥ 95
Density ρ [kg/dm ³]	≥ 2,0	
Compressive strength f_b [N/mm ²]	6 / 8 / 10 / 12	
Standard or annex	EN 771-3	

Table C103.1: Installation parameters

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

Table C103.2: Group factors

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

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Performances

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

Annex C 103

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

Table C104.1: Characteristic resistance under tensile load

Anchor rod		M6		M8		M10		M12		M16									
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)																			
compressive strength f_b	use category	Effective anchorage depth h_{ef} [mm]																	
6 N/mm²	w/w	50	70	50	70	50	70	50	70	50	70								
	d/d	2,5	3,5	2,5	3,5	2,5	3,5	2,5	3,5	2,5	3,5								
8 N/mm²	w/w	2,0	2,5	2,0	2,5	2,0	3,0	2,0	3,0	2,0	3,0								
	d/d	3,5	4,5	3,5	4,5	3,5	5,0	3,5	5,0	3,5	5,0								
10 N/mm²	w/w	2,5	3,5	2,5	3,5	2,5	3,5	2,5	3,5	2,5	3,5								
	d/d	4,5	6,0	4,5	6,0	4,5	6,0	4,5	6,0	4,5	6,0								
12 N/mm²	w/w	3,0	4,0	3,0	4,0	3,0	4,5	3,0	4,5	3,0	4,5								
	d/d	5,0	7,0	5,0	7,0	5,0	7,5	5,0	7,5	5,0	7,5								

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

Table C104.2: Characteristic resistance under shear load

Anchor rod		M6		M8		M10		M12		M16									
Shear load V_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C and 72/120°C)																			
compressive strength f_b	use category	Effective anchorage depth h_{ef} [mm] ≥ 50																	
6 N/mm²	w/w	2,0	2,0	2,0	2,0	2,0	2,0	1,5	1,5	1,5	1,5								
	d/d																		
8 N/mm²	w/w	2,5	2,5	2,5	2,5	3,0	3,0	2,5	2,5	2,5	2,5								
	d/d																		
10 N/mm²	w/w	3,5	3,5	3,5	3,5	4,0	4,0	3,0	3,0	3,0	3,0								
	d/d																		
12 N/mm²	w/w	4,0	4,0	4,0	4,0	4,5	4,5	3,5	3,5	3,5	3,5								
	d/d																		

Factor for job site tests and displacements see annex C110

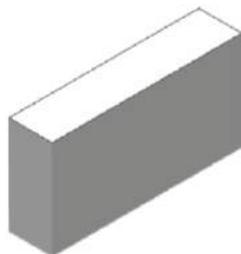
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Performances

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

Annex C 104

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



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

Table C105.1: Installation parameters

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

11x85 15x85

Anchor rod and internal threaded anchor FIS E without perforated sleeve

Effective anchorage depth h_{ef} [mm]	100	200	100	200	100	200	100	200	100	200	85
Max. installation torque $T_{inst,max}$ [Nm]	1	4	1	8	2	12	2	16	2	20	1

General installation parameters

Edge distance c_{min}	[mm]	100
$s_{cr \parallel} = s_{min \parallel}$		250
$h_{ef}=200\text{mm}$		80
$s_{cr \perp} = s_{min \perp}$		250
$h_{ef}=200\text{mm}$		80
$s_{cr \perp} = s_{min \perp}$		

Drilling method

Hammer drilling with hard metal hammer drill

fischer injektion system FIS V masonry

Performances

Autoclaved aerated concrete (cylindrical drill hole), dimensions, installation parameters

Annex C 105

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

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

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

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

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

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

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Performances

Autoclaved aerated concrete (cylindrical drill hole), Group factors

Annex C 106

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

Table C107.1: Characteristic resistance under tensile load

Anchor rod		M6		M8		M10		M12		M16		-	-	
Internal threaded anchor FIS E		-	-	-	-	-	-	-	-	M6	M8	M10	M12	
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)														
compressive strength f_b	use category	100	200	100	200	100	200	100	200	100	200	85	Effective anchorage depth h_{ef} [mm]	
2 N/mm²	w/w	w/d	1,2	1,2	1,5	2,0	1,5	3,0	1,5	3,0	2,0	3,0	1,5	1,5
	d/d		1,5	3,0	1,5	3,0	1,5	3,5	2,0	4,0	2,0	4,0	1,5	1,5
4 N/mm²	w/w	w/d	1,2	-	2,0	1,5	2,5	3,5	2,5	3,5	2,0	3,5	2,0	1,5
	d/d		1,5	-	2,0	3,0	3,0	5,0	2,5	5,0	2,0	5,0	2,0	1,5
6 N/mm²	w/w	w/d	1,5	-	3,0	2,5	4,5	5,0	4,5	7,0	3,0	8,5	3,5	2,5
	d/d		1,5	-	3,5	4,0	5,0	7,0	5,0	9,0	3,0	11,5	3,5	2,5

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

Table C107.2: Characteristic resistance under shear load

Anchor rod		M6		M8		M10		M12		M16		-	-	
Internal threaded anchor FIS E		-	-	-	-	-	-	-	-	M6	M8	M10	M12	
Shear load V_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C and 72/120°C)														
compressive strength f_b	use category	100	200	100	200	100	200	100	200	100	200	85	Effective anchorage depth h_{ef} [mm]	
2 N/mm²	w/w	w/d	1,2	1,2	1,2	1,2	1,2	1,2	1,5	1,2	1,2	1,2	1,2	1,5
	d/d													
4 N/mm²	w/w	w/d	2,0	-	2,5	2,0	2,0	2,0	2,5	2,0	2,0	2,0	2,0	2,5
	d/d													
6 N/mm²	w/w	w/d	2,5	-	3,0	2,5	3,0	3,0	3,5	4,0	4,5	4,5	2,5	3,5
	d/d													

Factor for job site tests and displacements see annex C110

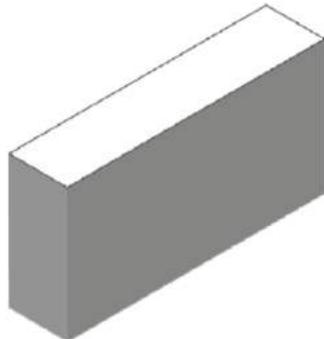
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Performances

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

Annex C 107

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



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

Table C108.1: Installation parameters

Anchor rod	M8	M10	M12	-
Internal threaded anchor FIS E	-	-	-	M6 M8 11x85
Anchor rod and internal threaded anchor FIS E without perforated sleeve				
Effective anchorage depth h_{ef} [mm]	75	95	75	95
Max. installation torque $T_{\text{inst,max}}$ [Nm]			2	
General installation parameters				
Edge distance c_{\min}	120	150	120	150
Spacing $s_{\text{cr II}} = s_{\min \parallel}$ [mm]	240	300	240	300
$s_{\text{cr } \perp} = s_{\min \perp}$	240	250	240	250
Drilling method				
Hammer drilling with hard metal hammer drill				

Table C108.2: Group factors

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

fischer injektion system FIS V masonry

Performances

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

Annex C 108

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

Table C109.1: Characteristic resistance under tensile load

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

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

Table C109.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C110

fischer injektion system FIS V masonry	Annex C 109
Performances Autoclaved aerated concrete (conical drill hole with special drill bit PBB), Characteristic resistance under tensile and shear load	

β-factors for job site tests; displacements

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

use category		w/w and w/d		d/d	
temperature range		50/80	72/120	50/80	72/120
Material	Size				
solid units	M6	0,55	0,46	0,96	0,80
	M8	0,57	0,51		
	M10	0,59	0,52		
	M12 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
Autoclaved aerated concrete cylindrical drill hole	all sizes	0,73	0,73	0,81	0,81
Autoclaved aerated concrete conical drill hole	all sizes	0,66	0,59	0,73	0,66

Table C110.2: Displacements

Material	N [kN]	δN_0 [mm]	δN_∞ [mm]	V [kN]	δV_0 [mm]	δV_∞ [mm]
solid units and autoclaved aerated concrete $h_{ef}=100m$	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	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 NF annex C 4 - C 7	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	0,74	1,48	$\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$	1,23	1,85
solid brick Ks NF annex C 14 / C 15	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	0,2	0,4	$\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$	0,91	1,37
AAC $h_{ef}=200$ mm annex C 105 - C 107	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	1,03	2,06	$\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$	1,25	1,88
brick Annex C 89 / C 90	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	0,03	0,06	$\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$	6,44	9,66

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

fischer injektion system FIS V masonry	Annex C 110
Performances β-factors for job site tests; displacements	