



DÉCLARATION DES PERFORMANCES



DoP: 0153

pour système d'injection fischer HT II pour maçonnerie (Chevilles métalliques à injection pour maçonnerie) – FR

1. Code d'identification unique du produit type: **DoP: 0153**
2. Usage(s) prévu(s): **Ancrages de maçonnerie pour lesquels des exigences de résistance mécanique et de stabilité ainsi que de sécurité d'utilisation doivent être remplies. Ils servent à fixer et/ou ancrer des éléments structuraux (contribuant à la stabilité des systèmes) ou des éléments lourds, voir annexe, en particulier annexes B 1 - B 10**
3. Fabricant: **fischerwerke GmbH & Co. KG, Klaus-Fischer-Straße 1, 72178 Waldachtal, Allemagne**
4. Mandataire: --
5. Système(s) d'évaluation et de vérification de la constance des performances: **1**
6. Document d'évaluation européen: **EAD 330076-00-0604**

Évaluation technique européenne: **ETA-12/0554; 2018-09-11**

Organisme d'évaluation technique: **DIBt**

Organisme(s) notifié(s): **1343 – MPA Darmstadt**

7. Performance(s) déclarée(s):

Résistance mécanique et stabilité (BWR 1)

- Valeurs caractéristiques de résistance: Voir annexe, en particulier annexes C 1 - C 8
- Déplacements: Voir annexe, en particulier annexe C 5

Protection contre le feu (BWR 2)

- Réaction au feu: La cheville remplit les exigences de la classe A 1

Hygiène, santé et protection de l'environnement (BWR 3)

- Contenu, émission et / ou libération de substances dangereuses: **NPD**

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

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

Signé pour le fabricant et en son nom par:

Andreas Bucher, Dipl.-Ing.

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

Tumlingen, 2018-11-18

- Cette déclaration des performances a été émise en différentes langues. En cas de divergences d'interprétation, la version anglaise prévaut toujours.

- L'annexe contient des informations volontaires et complémentaires en langue anglaise dépassant les exigences légales (spécifiées en langage neutre).

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

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

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

The product description is given in Annex A.

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

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

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

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

Essential characteristic	Performance
Characteristic values for resistance	See Annexes C 1 to C 8
Displacements	See Annex C 5

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1

3.3 Hygiene, health and the environment (BWR 3)

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

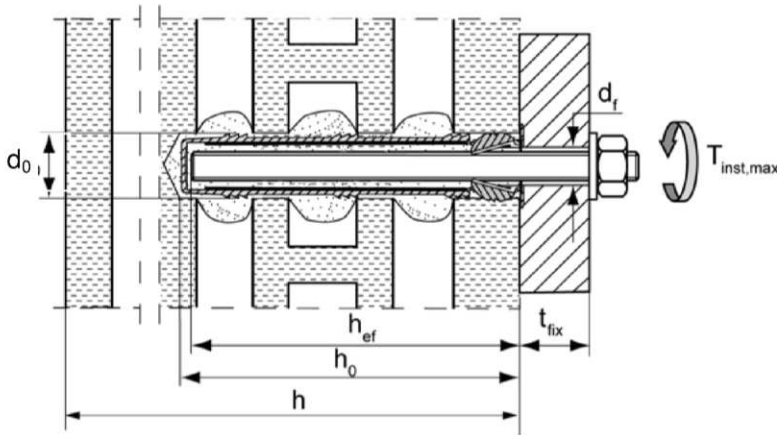
4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

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

The system to be applied is: 1

Installation conditions part 1

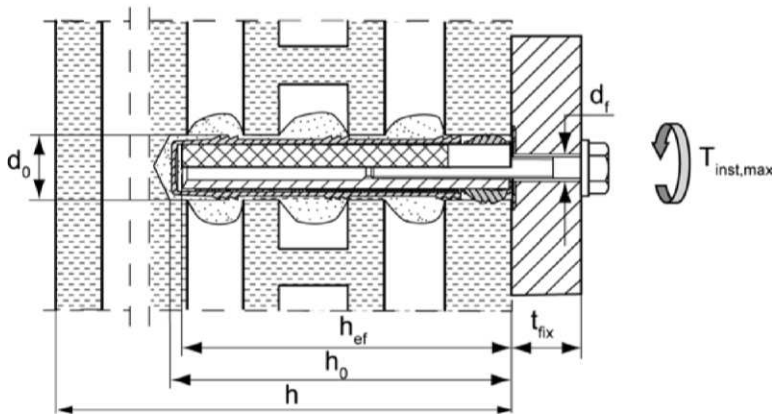
Threaded rods with perforated sleeve FIS H K; Installation in perforated and solid brick masonry



Pre-positioned installation

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

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



Pre-positioned installation

- FIS H 16x85 K – FIS E 11x85 M6 and M8
- FIS H 20x85 K – FIS E 15x85 M10 and M12

h_{ef} = effective anchorage depth
 h_0 = depth of drill hole
 t_{fix} = thickness of fixture
 h = thickness of masonry

d_0 = nominal drill bit diameter
 d_f = diameter of clearance hole in the fixture
 $T_{inst,max}$ = maximum torque moment

fischer Injection system FIS HT II for masonry

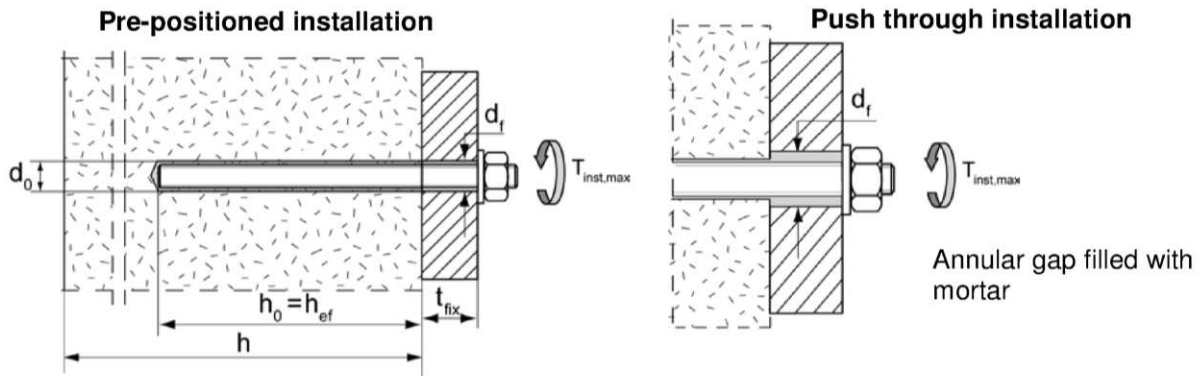
Product description

Installation condition, part 1: in perforated and solid brick masonry

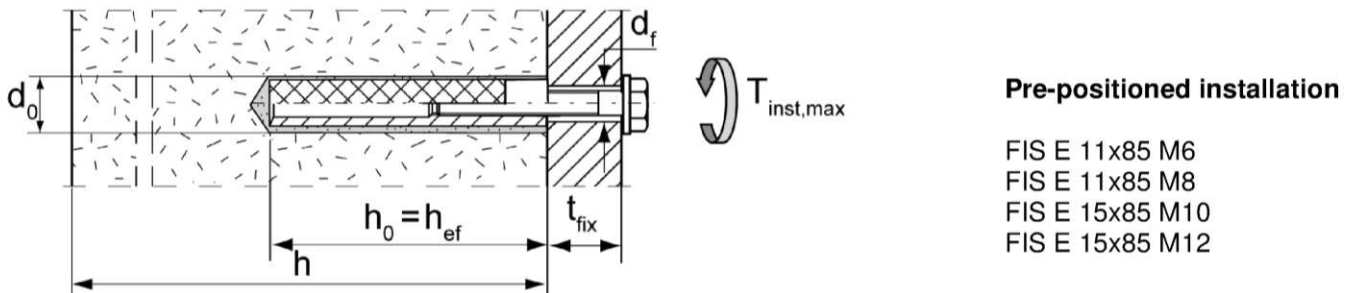
Annex A 1

Installation conditions part 2

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



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



h_{ef} = effective anchorage depth
 h_0 = depth of drill hole
 t_{fix} = thickness of fixture
 h = thickness of masonry

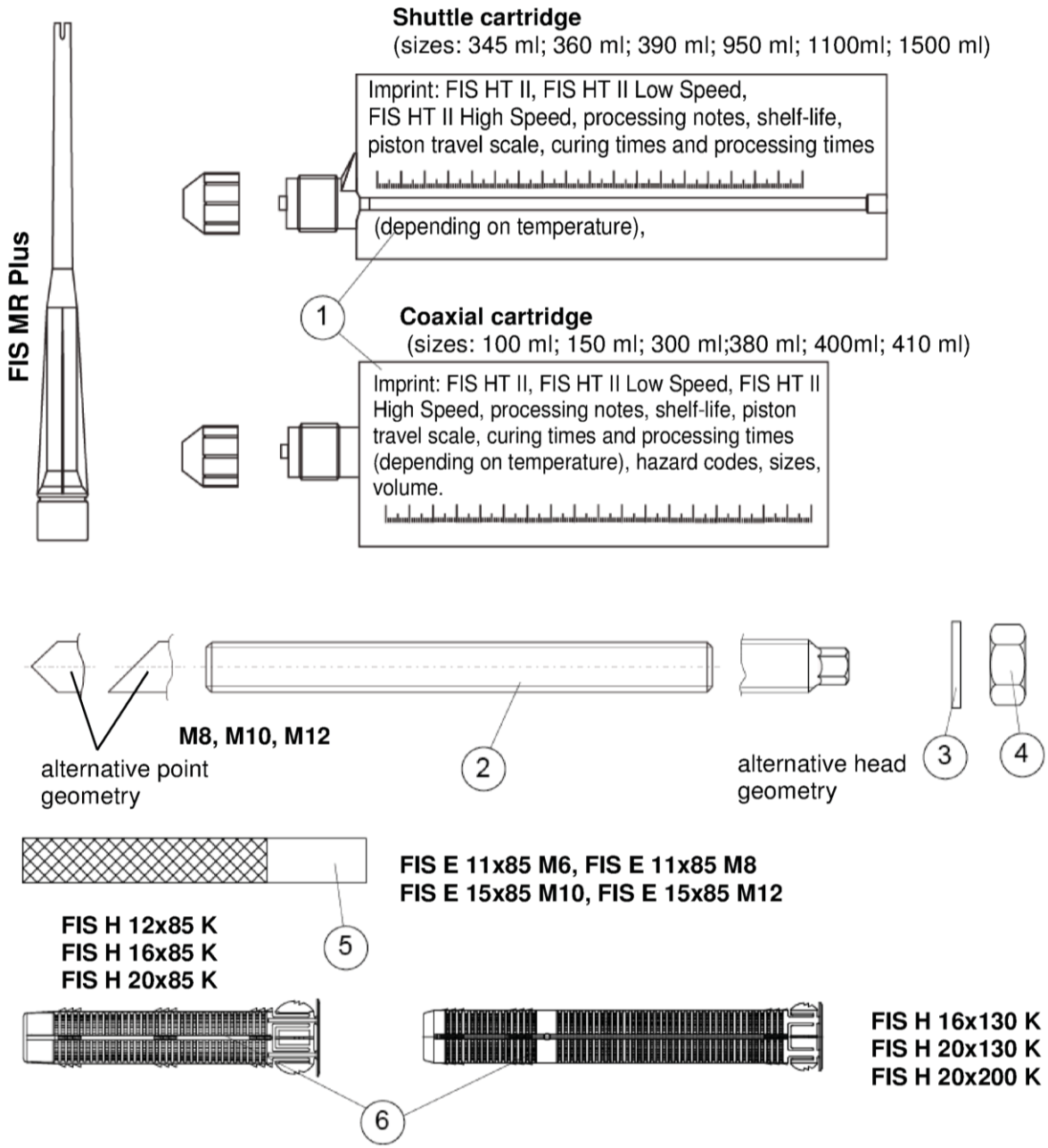
d_0 = nominal drill bit diameter
 d_f = diameter of clearance hole in the fixture
 $T_{inst,max}$ = maximum torque moment

fischer Injection system FIS HT II for masonry

Product description

Installation condition, part 2: in solid brick masonry and autoclaved aerated concrete

Annex A 2



- | | |
|----------------------------|--|
| 1. Mortar cartridge | 4. Hexagon nut |
| 2. Threaded rod | 5. Internal threaded anchor FIS E |
| 3. Washer | 6. Perforated sleeve FIS H K |

fischer Injection system FIS HT II for masonry

Product description

Cartridges, anchor rods, internal threaded anchors, perforated sleeves

Annex A 3

Table A1: Materials

Part	Designation	Material		
1	Mortar cartridge	mortar, hardener; filler		
		Steel, zinc plated	Stainless steel A4	High corrosion-resistant steel C
2	Threaded rod	Property class 5.8 or 8.8; ISO 898-1:2013 zinc plated $\geq 5\mu\text{m}$, EN ISO 4042:1999 A2K or hot-dip galvanised EN ISO 10684:2004 $f_{uk} \leq 1000 \text{ N/mm}^2$ $A_5 > 8\%$	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 $f_{uk} \leq 1000 \text{ N/mm}^2$ $A_5 > 8\%$	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 $f_{uk} \leq 1000 \text{ N/mm}^2$ $A_5 > 8\%$
3	Washer ISO 7089:2000	zinc plated $\geq 5\mu\text{m}$, EN ISO 4042:1999 A2K or hot-dip galvanised 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 $\geq 5\mu\text{m}$, EN 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
	Screw or threaded 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
6	Perforated sleeve FIS H K	PP / PE		

fischer Injection system FIS HT II for masonry

Product description
Materials

Annex A 4

Specifications of intended use

Anchorage subject to:

- Static and quasi-static loads

Base materials:

- Solid brick masonry (Use category b) and autoclaved aerated concrete (Use category d), acc. to Annex B8.
Note: The characteristic resistance is also valid for larger brick sizes and higher compressive strength of the masonry unit.
- Hollow brick masonry (use category c), according to Annex B8
- 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 Technical Report TR 053 under consideration of the β -factor according to Annex C6, Table C4

Temperature Range:

- From - 40°C to +80°C (max. short term temperature +80°C and max. long term temperature +50°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
(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 Injection system FIS HT II for masonry

Intended Use
Specifications

Annex B 1

Specifications of intended use

Design:

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

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

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

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

- 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:

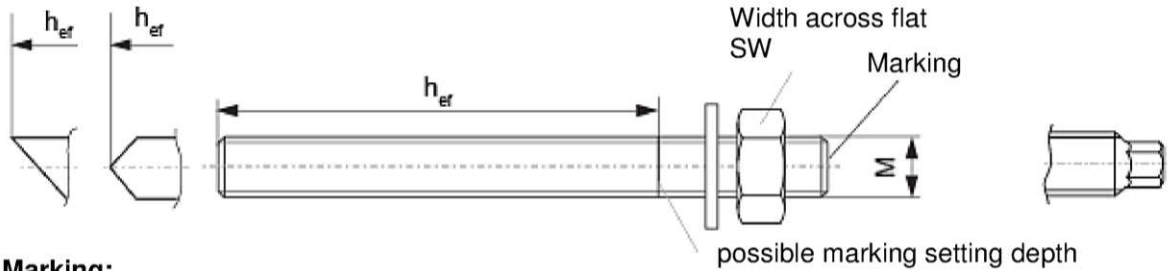
- Category d/d: -Installation and use in dry structures
- Category w/w: -Installation and use in dry and wet structures
- Hole drilling by hammer drill mode
- In case of aborted hole: The hole shall be filled with mortar
- Bridging of unbearing layer (e.g. plaster) see Annex B 4 (Table B1.3)
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site
- Fastening screws or threaded 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 B5. Table B3
- 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 A4, Table A1

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

fischer Injection system FIS HT II for masonry	Annex B 2
Intended Use Specifications	



Marking:

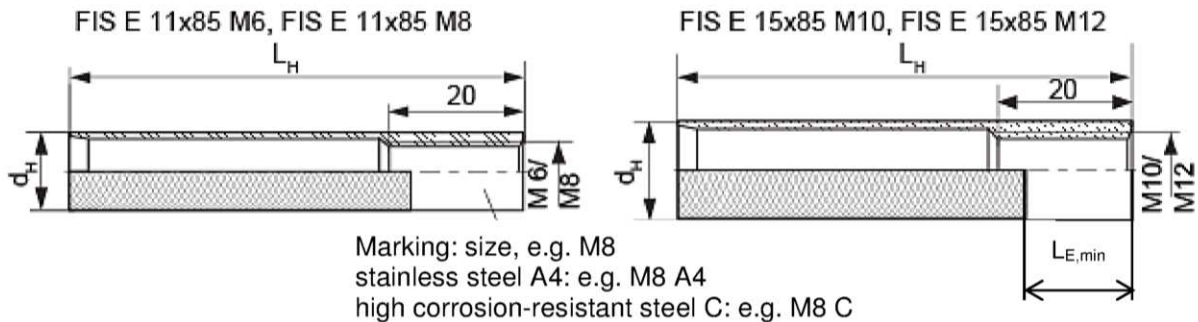
Property class (p.c.) 8.8, Stainless steel A4, p.c. 80 or high corrosion-resistant steel C, p.c. 80: •
 Stainless steel A4, property class 50 and high corrosion-resistant steel C, property class 50: ••

Table B1.1: Installation parameters for threaded rod without perforated sleeve

Size		M8	M10	M12	
Nominal drill hole diameter	$d_{nom}=d_0$ [mm]	10	12	14	
Width across flat	SW [mm]	13	17	19	
Effective anchorage depth ¹⁾	$h_{ef,min}$ [mm]	50			
Depth of drill hole $h_0 = h_{ef}$	$h_{ef,max}$ [mm]	h-30 and ≤ 200 mm			
Effective anchorage depth AAC	$h_{ef,min}$ [mm]	100			
	$h_{ef,max}$ [mm]	120			
Maximum torque moment	$T_{inst,max}$ [Nm]	10			
Max. torque moment for autoclaved aerated concrete	$T_{inst,max}$ [Nm]	1	2		
Diameter of clearance hole in the fixture	Pre-position anchorage	$d_f \leq$ [mm]	9	12	14
	Push through anchorage	$d_f \leq$ [mm]	11	14	16

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

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

Table B1.2: Installation parameters for internal threaded anchor FIS E without perforated sleeve

Size FIS E		11x85 M6	11x85 M8	15x85 M10	15x85 M12
diameter of internal threaded anchor	d_H [mm]	11		15	
Nominal drill hole diameter	$d_{nom}=d_0$ [mm]	14		18	
Depth of drill hole	h_0 [mm]	85			
Effective anchorage depth	$L_H=h_{ef}$ [mm]	85			
Maximum torque moment	$T_{inst,max}$ [Nm]	4	10		
Max. torque moment for autoclaved aerated concrete	$T_{inst,max}$ [Nm]	1		2	
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	7	9	12	14
	Screw-in depth	$L_{E,min}$ [mm]	6	8	10

fischer Injection system FIS HT II for masonry

Intended Use
 Installation parameters, part 1

Annex B 3

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

Marking: size
 $D_{\text{Sleeve}} \times L_{\text{Sleeve}}$
 e.g. 16x85

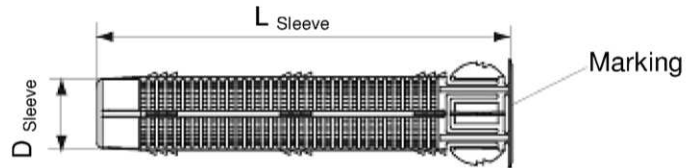


Table B1.3: Installation parameters (threaded rod and internal threaded anchor with perforated sleeve; only pre-positioned anchorage)

Size FIS H...K	12x85	16x85	16x130 ²⁾	20x85	20x130 ²⁾	20x200 ²⁾
Nominal drill hole diameter ($d_0 = D_{\text{Sleeve}}$) $d_{\text{nom}}=d_0$ [mm]	12	16		20		
Depth of drill hole h_0 [mm]	90	90	135	90	135	205
Effective anchorage depth ¹⁾ $h_{\text{ef,min}}$ [mm]	85	85	110	85	110	180
$h_{\text{ef,max}}$ [mm]	85	85	130	85	130	200
Size of threaded rod [-]	M8	M8, M10		M12		
Size of internal threaded anchor [-]	----	11x85	----	15x85	----	----
Maximum torque moment threaded rod and internal threaded anchor $T_{\text{inst,max}}$ [mm]	2					

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

²⁾ Bridging of unbearing layer (e.g. plaster) possible

fischer Injection system FIS HT II for masonry

Intended Use
 Installation parameters, part 2

Annex B 4

Cleaning brush BS (Steel brush)



Only for solid bricks and autoclaved aerated concrete

Table B2: Parameters of steel brush

Drill hole diameter	d_0	[mm]	10	12	14	16	18	20
Brush diameter	$d_{b,nom}$	[mm]	11	14	16	20	20	25

Table B3: Maximum processing time of the mortar and minimum curing time

(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} [minutes]		
	FIS HT II High Speed ³⁾	FIS HT II ²⁾	FIS HT II Low Speed ²⁾
±0	3 hours	24 hours	
>±0 to +5	90	3 hours	6 hours
>+5 to +10	45	90	3 hours
>+10 to +20	30	60	2 hours
>+20 to +30		45	60
>+30 to +40		35	30

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

¹⁾ For wet bricks the curing time must be doubled

²⁾ Minimum cartridge temperature +5°C

³⁾ Minimum cartridge temperature ±0°C

fischer Injection system FIS HT II for masonry

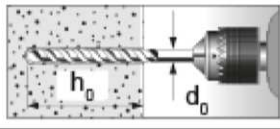
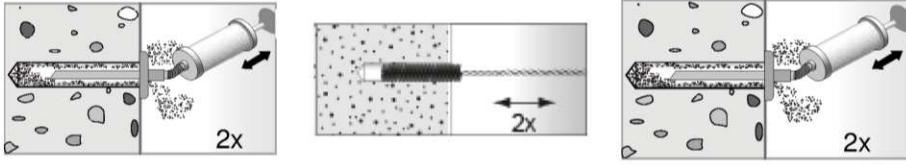
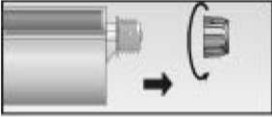
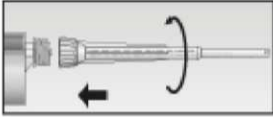
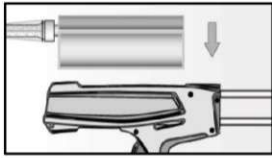
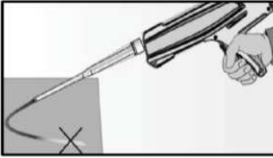
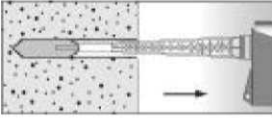
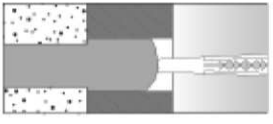
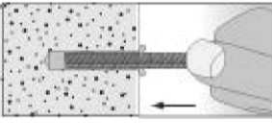

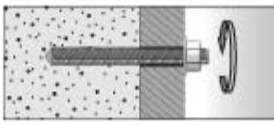
Intended Use

Steel brush
Processing times and curing times

Annex B 5

Installation instructions Part 1

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

1		<p>Drill the hole. Depth of drill hole h_0 and drill hole diameter d_0 see Table B1.1 or B1.2</p>		
2		<p>Blow out the drill hole two times. Brush the drill hole two times (see Table B2) and blow out two times again</p>		
3		<p>Remove sealing cap</p>		<p>Screw on the static mixer (the spiral in the static mixer must be clearly visible)</p>
4		<p>Place the cartridge into a suitable dispenser.</p>		<p>Press out approximately 10 cm of material until the mortar is permanent-ly grey in colour. Mortar which is not grey in colour will not cure and must be disposed off.</p>
5		<p>Fill approximately 2/3 of the drill hole with mortar. Always begin from the bottom of the hole to eliminate voids¹⁾.</p>		<p>For push through installation (not FIS E) fill the annular gap also with mortar.</p>
6		<p>Only use clean and oil-free anchor elements. Mark the threaded rod for setting depth. Press the threaded rod or internal threaded anchor FIS E down to the bottom of the hole, turning it slightly by hand while doing. After inserting the anchor element, excess mortar must emerge around the anchor element.</p>		
7		<p>Do not touch. Minimum curing time t_{cure} see Table B3</p>		<p>Mounting the fixture $T_{inst,max}$ see Table B1.1 or B1.2</p>

¹⁾ For the exact quantity of mortar see manufacturer`s specification.

fischer Injection system FIS HT II for masonry

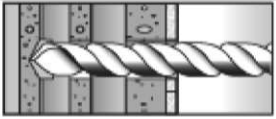
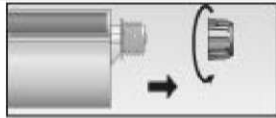
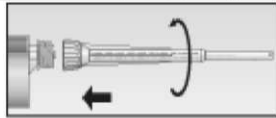
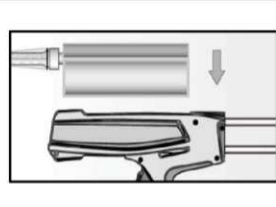
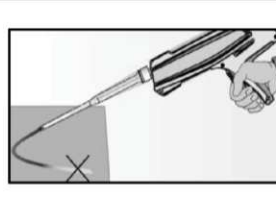
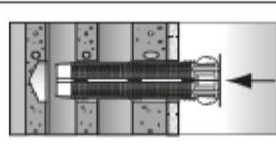
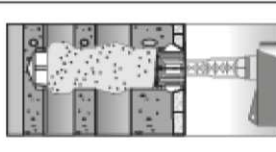
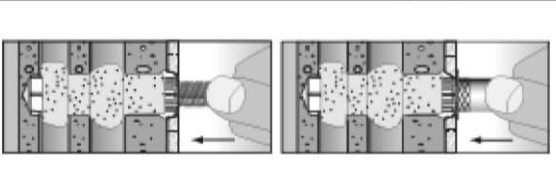


Intended use

Installation instructions part 1 in solid brick and autoclaved aerated concrete

Annex B 6

Installation instructions Part 2

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

1		<p>Drill the hole (hammer drill). Depth of drill hole h_0 and drill hole diameter d_0 see Table B1.3</p>	<p>When install perforated sleeves in solid bricks or solid areas of hollow bricks, also clean the hole by blowing out and brushing</p>	
2		<p>Remove the sealing cap</p>		<p>Screw on the static mixer (the spiral in the static mixer must be clearly visible)</p>
3		<p>Place the cartridge into a suitable dispenser</p>		<p>Press out approximately 10 cm of material until the mortar is permanently grey in colour. Mortar which is not grey in colour will not cure and must be disposed off</p>
4		<p>Insert the perforated sleeve flush with the surface of the masonry or plaster .</p>		<p>Fill the perforated sleeve completely with mortar beginning from the bottom of the hole¹⁾.</p>
5		<p>Only use clean and oil-free anchor elements. Mark the threaded rod for setting depth. Insert the threaded rod or the internal threaded anchor FIS E by hand using light turning motions until reaching the setting depth marking (threaded rod) or flush with the surface (internal threaded anchor).</p>		
6	 <p>Do not touch. Minimum curing time t_{cure} see Table B3</p>	 <p>Mounting the fixture. $T_{\text{inst,max}}$ see Table B1.3</p>		

¹⁾ For the exact quantity of mortar see manufacturer's specification.

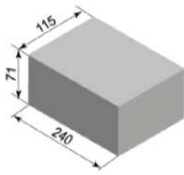


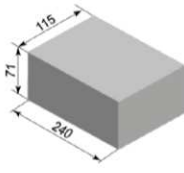
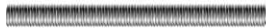

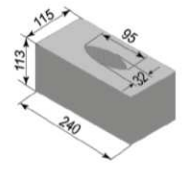


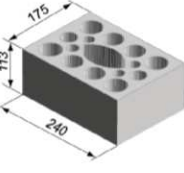


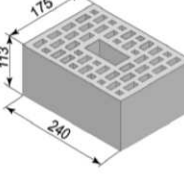


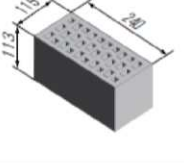


fischer Injection system FIS HT II for masonry

Intended use

Installation instructions part 2 in hollow brick masonry

Annex B 7

Table B5.1: Allocation of anchor rods¹⁾, perforated sleeves¹⁾²⁾ and perforated or solid bricks

Kind of masonry	Brick	Valid anchor rods, internal threaded rods and perforated sleeves	
Brick No. 1 Solid brick Mz according to EN 771-2 $\rho \geq 1,8$ [kg/dm ³] $fb \geq 10$ or 20 [N/mm ²]		 	M8; M10; M12 FIS E 11x85
Brick No. 2 Solid sand-lime brick according to EN 771-2 $\rho \geq 1,8$ [kg/dm ³] $fb \geq 10$ or 20 [N/mm ²]		 	M8; M10; M12 FIS E 11x85
Brick No. 3 Solid sand-lime brick according to EN 771-2 $\rho \geq 1,8$ [kg/dm ³] $fb \geq 10$ or 20 [N/mm ²]		 	FIS H 12x85 K FIS H 16x85 K FIS H 20x85 K FIS H 16x130 K FIS H 20x130 K
Brick No. 4 Sand-lime hollow brick according to EN 771-2 $\rho \geq 1,4$ [kg/dm ³] $fb \geq 12$ or 20 [N/mm ²]		 	FIS H 12x85 K FIS H 16x85 K FIS H 20x85 K FIS H 16x130 K FIS H 20x130 K
Brick No. 5 Perforated brick HLz according to EN 771-1 $\rho \geq 0,9$ [kg/dm ³] $fb \geq 10$ [N/mm ²]		 	FIS H 12x85 K FIS H 16x85 K FIS H 20x85 K FIS H 16x130 K FIS H 20x130 K
Brick No. 6 Perforated brick HLz according to EN 771-1 $\rho \geq 1,4$ [kg/dm ³] $fb \geq 20$ [N/mm ²]		 	FIS H 12x85 K FIS H 16x85 K FIS H 20x85 K

¹⁾ Other combinations can be used after job site tests acc. to TR 053.

²⁾ Sleeve/anchor rod combination see table B1.3

The β - factor for this job site tests are given in Table C4

Imaging of the bricks are not scaled

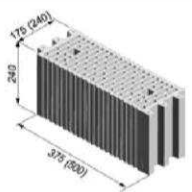
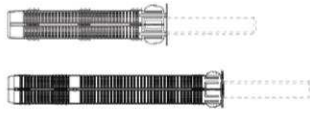
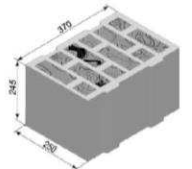
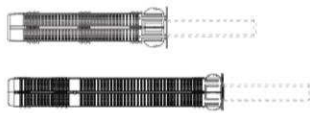
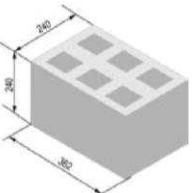
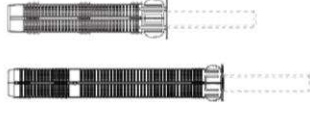
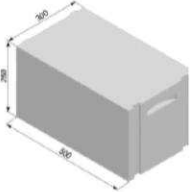
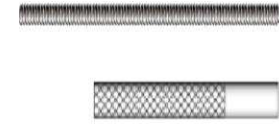
fischer Injection system FIS HT II for masonry

Intended Use

Allocation of anchor rods, perforated sleeves and bricks, part 1

Annex B 9

Table B5.2: Allocation of anchor rods¹⁾, perforated sleeves¹⁾²⁾ and perforated or solid bricks

Kind of masonry	Brick	Valid anchor rods internal threaded rods and perforated sleeves	
Brick No. 7 Perforated brick HLz according to EN 771-1 $\rho \geq 1,0$ [kg/dm ³] $f_b \geq 10$ [N/mm ²]			FIS H 12x85 K FIS H 16x85 K FIS H 20x85 K FIS H 20x130 K
Brick No. 8 Perforated brick HLz filled with mineral wool according to EN 771-1 $\rho \geq 0,6$ [kg/dm ³] $f_b \geq 8$ [N/mm ²]			FIS H 12x85 K FIS H 16x85 K FIS H 20x85 K FIS H 16x130 K FIS H 20x130 K FIS H 20x200 K
Brick-No. 9 Light-weight concrete hollow block Hbl according to EN 771-1 $\rho \geq 1,0$ [kg/dm ³] $f_b \geq 4$ [N/mm ²]			FIS H 12x85 K FIS H 16x85 K FIS H 20x85 K FIS H 16x130 K FIS H 20x130 K
Brick No. 10 Autoclaved aerated concrete block $\rho \geq 0,35, 0,5$ or $0,65$ [kg/dm ³] $f_b \geq 2, 4$ or 6 [N/mm ²]			M8; M10; M12
			FIS E 11x85 M6 FIS E 11x85 M8 FIS E 15x85 M10 FIS E 15x85 M12

¹⁾ Other combinations can be used after job site tests acc. to TR 053.

²⁾ Sleeve/anchor rod combination see table B1.3

The β - factor for this job site tests are given in Table C4

Imaging of the bricks are not scaled

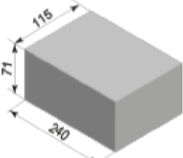
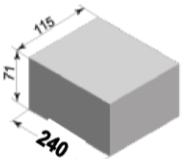
fischer Injection system FIS HT II for masonry

Intended use

Allocation of anchor rods, perforated sleeves and bricks, part 2

Annex B 10

Table C1.1: Characteristic values of resistance under tension loads and under shear loads

Brick	Density ρ [kg/dm ³] - Compressive strength f_b [N/mm ²]	Perforated sleeve FIS H...K	Anchor size or screw size in internal threaded anchor	Effective anchorage depth		Characteristic resistance [kN]		
				$h_{ef,min}$ [mm]	$h_{ef,max}$ [mm]	N_{Rk}		V_{Rk}
						Temp. 50/80°C		All categories
				d/d	w/w			
 No.1 Solid brick Mz	$\rho \geq 1,8$ $f_b \geq 10$	without	M8	50	200	4,0	2,5	2,5
			M10	50	79	3,5	2,0	4,0
			M10	80	199	5,0	3,0	
			M10	200	200	8,5	7,5	8,5
			M12	50	79	3,0	2,0	4,0
			M12	80	199	5,5	3,5	
			M12	200	200	8,0	5,0	8,5
	FIS E11x85 M6/ M8,		85	85	5,5	3,5	2,5	
	$\rho \geq 1,8$ $f_b \geq 20$		M8	50	200	5,5	3,5	4,0
			M10	50	79	5,0	3,0	6,0
			M10	80	199	7,0	4,5	
			M10	200	200	8,5	8,5	8,5
			M12	50	79	4,5	3,0	5,5
			M12	80	199	8,0	5,0	
M12		200	200	8,5	7,0	8,5		
FIS E11x85 M6/ M8,	85	85	8,0	5,0	4,0			
 No.2 Solid sand-lime brick	$\rho \geq 1,8$ $f_b \geq 10$	without	M8	50	200	2,5	1,5	4,0
			M10	50	79			
			M10	80	199			
			M10	200	200	8,5	6,0	5,0
			M12	50	79	2,5	1,5	
			M12	80	199			
			M12	200	200	8,5	6,5	3,0
	FIS E11x85 M6/ M8,		85	85	2,5	1,5	3,0	
	$\rho \geq 1,8$ $f_b \geq 20$		M8	50	200	3,5	2,0	5,5
			M10	50	79			
			M10	80	199			
			M10	200	200	8,5	8,5	7,0
			M12	50	79	3,5	2,0	
			M12	80	199			
M12		200	200	8,5	8,5	4,0		
FIS E11x85 M6/ M8,	85	85	3,5	2,0	4,0			

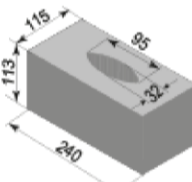
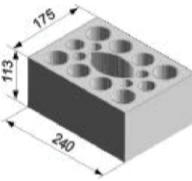
Imaging of the bricks are not scaled

fischer Injection system FIS HT II for masonry**Performances**

Characteristic values of resistance under tension loads and under shear loads, part 1

Annex C 1

Table C1.2: Characteristic values of resistance under tension loads and under shear loads

Brick	Density ρ [kg/dm ³] - Compressive strength f_b [N/mm ²]	Perforated sleeve FIS H...K	Anchor size or screw size in internal threaded anchor	Effective anchorage depth		Characteristic resistance [kN]		
				$h_{ef,min}$ [mm]	$h_{ef,max}$ [mm]	N _{Rk}		V _{Rk}
						Temp. 50/80°C		
						d/d	w/w	All categories
 <p>No.3 Solid sand-lime brick</p>	$\rho \geq 1,8$ $f_b \geq 10$	12x85	M8	85	85	6,0	3,5	3,0
		16x85	FIS E 11x85 M6	85	85	3,5	2,0	
		16x85	M8/M10, FIS E 11x85 M8	85	85	3,5	2,0	3,5
		20x85	M12, FIS E 15x85	85	85	8,5	6,5	
		16x130	M8/M10	110	130	3,5	2,0	
		20x130	M12	110	130	7,0	4,5	
	$\rho \geq 1,8$ $f_b \geq 20$	12x85	M8	85	85	8,5	5,0	4,5
		16x85	FIS E 11x85 M6	85	85	5,5	3,0	
		16x85	M8/M10, FIS E 11x85 M8	85	85	5,5	3,0	5,5
		20x85	M12, FIS E 15x85	85	85	8,5	8,5	
		16x130	M8/M10	110	130	5,0	3,0	
		20x130	M12	110	130	8,5	6,0	
 <p>No.4 Sand-lime hollow brick</p>	$\rho \geq 1,4$ $f_b \geq 12$	12x85	M8	85	85	2,5	2,5	2,5
		16x85	FIS E 11x85 M6	85	85	3,0	2,5	
		16x85	M8/M10, FIS E 11x85 M8	85	85	3,0	2,5	4,5
		20x85	M12, FIS E 15x85	85	85	3,5	3,0	4,5
		16x130	M8/M10	110	130			
		20x130	M12	110	130			
	$\rho \geq 1,4$ $f_b \geq 20$	12x85	M8	85	85	4,5	4,0	4,5
		16x85	FIS E 11x85 M6	85	85	5,0	4,0	4,0
		16x85	M8/M10, FIS E 11x85 M8	85	85	5,0	4,5	7,5
		20x85	M12, FIS E 15x85	85	85	6,0	5,5	7,5
		16x130	M8/M10	110	130			
		20x130	M12	110	130			

Imaging of the bricks are not scaled

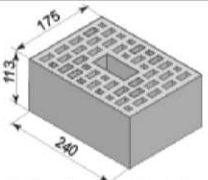
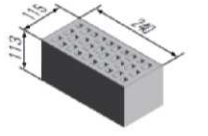
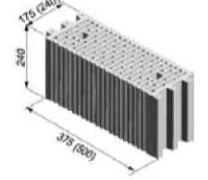
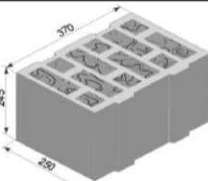
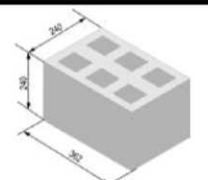
fischer Injection system FIS HT II for masonry

Performances

Characteristic values of resistance under tension loads and under shear loads, part 2

Annex C 2

Table C1.3: Characteristic values of resistance under tension loads and under shear loads

Brick	Density ρ [kg/dm ³] - Compressive strength f_b [N/mm ²]	Perforated sleeve FIS H...K	Anchor size or screw size in internal threaded anchor	Effective anchorage depth		Characteristic resistance [kN]		
				$h_{ef,min}$ [mm]	$h_{ef,max}$ [mm]	N _{Rk}		V _{Rk}
						Temp. 50/80°C		
				d/d	w/w	All categories		
 <p>No.5 Perforated brick</p>	$\rho \geq 0,9$ $f_b \geq 10$	12x85	M8	85	85	4,0	3,5	4,0
		16x85	FIS E 11x85 M6	85	85	3,5	3,5	4,0
		16x85	M8/M10, FIS E 11x85 M8	85	85	3,5	3,5	5,5
		20x85	M12, FIS E 15x85	85	85	5,0	4,5	6,0
		16x130	M8/M10	110	130	5,0	4,5	5,5
		20x130	M12	110	130	5,0	4,5	6,0
 <p>No.6 Perforated brick</p>	$\rho \geq 1,4$ $f_b \geq 20$	12x85	M8	85	85	4,0	3,5	7,5 (5,5) ¹⁾
		16x85	FIS E 11x85 M6	85	85	2,5		4,0
		16x85	M8/M10, FIS E 11x85 M8	85	85	2,5		4,5
		20x85	M12, FIS E 15x85	85	85	3,0		8,5 (5,5) ¹⁾
 <p>No.7 Perforated brick</p>	$\rho \geq 1,0$ $f_b \geq 10$	12x85	M8	85	85	0,9		1,2
		16x85	M8/M10, FIS E 11x85	85	85	2,5		
		20x85	M12, FIS E 15x85	85	85	2,5		
		16x130	M8/M10	110	130			1,5
		20x130	M12	110	130	3,5	3,0	1,5
 <p>No.8 Perforated brick</p>	$\rho \geq 0,6$ $f_b \geq 8$	12x85	M8	85	85	2,0	2,0	2,5
		16x85	FIS E 11x85 M6	85	85	2,0	1,5	2,5
		16x85	M8/M10, FIS E 11x85 M8	85	85	2,0	1,5	3,0
		20x85	M12, FIS E 15x85	85	85	2,0	2,0	1,5
		16x130	M8/M10	130	130	3,0	2,5	3,0
		20x130	M12	110	130	2,0	2,0	1,5
		20x200	M12	180	200	3,0	3,0	1,5
 <p>No.9 Light-weight concrete hollow block</p>	$\rho \geq 1,0$ $f_b \geq 4$	12x85	M8	85	85	3,0		2,0
		16x85	M8/M10, FIS E 11x85	85	85			
		20x85	M12, FIS E 15x85	85	85			
		16x130	M8/M10	110	130			
		20x130	M12	110	130			

¹⁾ Characteristic value of pushing out of one brick $V_{Rk,pb} = 5,5$ kN

Imaging of the bricks are not scaled

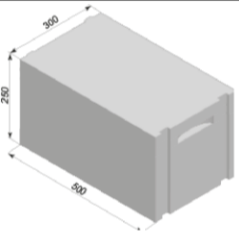
fischer Injection system FIS HT II for masonry

Performances

Characteristic values of resistance under tension loads and under shear loads, part 3

Annex C 3

Table C1.4: Characteristic values of resistance under tension loads and under shear loads

Brick	Density ρ [kg/dm ³] - Compressive strength f_b [N/mm ²]	Perforated sleeve FIS H...K	Anchor size or screw size in internal threaded anchor	Effective anchorage depth		Characteristic resistance [kN]			
				$h_{ef,min}$ [mm]	$h_{ef,max}$ [mm]	Temp. 50/80°C		All categories	
						d/d	w/w		
									N _{Rk}
 <p>No.10 Autoclaved Aerated concrete block</p>	$\rho \geq 0,35$ $f_b \geq 2$	without	M8	100	120	1,5		1,2	
			M10	100	120			1,2	
			M12	100	120			1,5	
			FIS E 11x85 FIS E 15x85	85				1,2	
	$\rho \geq 0,5$ $f_b \geq 4$	without	M8	100	120	2,0		2,5	
			M10	100	120			2,0	
			M12	100	120	2,0		2,5	
			FIS E 11x85 FIS E 15x85	85				2,0	2,0
	$\rho \geq 0,65$ $f_b \geq 6$	without	M8	100	120	3,5	3,0		3,0
			M10	100	120				3,0
			M12	100	120	5,0	4,5		3,5
			FIS E 11x85 FIS E 15x85	85					3,5

Imaging of the bricks are not scaled

fischer Injection system FIS HT II for masonry

Performances

Characteristic values of resistance under tension loads and under shear loads, part 4

Annex C 4

Table C2: Characteristic bending moments for threaded rods

Size				M8	M10	M12
Characteristic bending moment $M_{Rk,s}$	Zinc-plated steel	Property class	5.8 [Nm]	19	37	65
			8.8 [Nm]	30	60	105
	Stainless steel A4	Property class	50 [Nm]	19	37	65
			70 [Nm]	26	52	92
			80 [Nm]	30	60	105
	High corrosion-resistant steel C	Property class	50 [Nm]	19	37	65
			70 ¹⁾ [Nm]	26	52	92
			80 [Nm]	30	60	105

¹⁾ $f_{uk} = 700 \text{ N/mm}^2$; $f_{yk} = 560 \text{ N/mm}^2$

Table C2.1: Characteristic bending moments for internal threaded anchors FIS E

Size FIS E				11x85 M6	11x85 M8	15x85 M10	15x85 M12
Characteristic bending moments $M_{Rk,s}$	zinc plated steel,	Property class of screw	5.8 [Nm]	8	19	37	65
			8.8 [Nm]	12	30	60	105
	stainless steel A4	Property class of screw	70 [Nm]	11	26	52	92
			high corrosion resistant steel C	Property class of screw	70 [Nm]	11	26

Tabelle C3: Displacements under tension loads and shear loads

Material	N [kN]	δN_0 [mm]	δN_∞ [mm]	V [kN]	δV_0 [mm]	δV_∞ [mm]
solid units and autoclaved aerated concrete	$\frac{N_{Rk}}{1,4 * \gamma_M}$	0,03	0,06	$\frac{V_{Rk}}{1,4 * \gamma_M}$	0,59	0,88
hollow units	$\frac{N_{Rk}}{1,4 * \gamma_M}$	0,03	0,06	$\frac{V_{Rk}}{1,4 * \gamma_M}$	1,71	2,56

fischer Injection system FIS HT II for masonry

Performances

Characteristic bending moments; displacements

Annex C 5

Table C4: β - factor for job site tests according to TR 053

Using categories		w/w	d/d
Temperature range [°C]		50/80	50/80
Brick	Size ¹⁾		
Solid brick	M8	0,57	0,96
	M10	0,59	
	M12 FIS E 11x85 FIS E 15x85	0,60	
Hollow brick	All sizes	0,86	0,96
Autoclaved aerated concrete	All size	0,73	0,81

fischer Injection system FIS HT II for masonry

Performances
 β - factors for job site tests

Annex C 6

Table C5: Edge distance and spacing

Direction to bed joint		⊥			∥		Group factor				Min. thickness of the masonry members [mm]
Brick No.	h _{ef} [mm]	C _{cr} = C _{min}	s _{min}	s _{cr}	s _{min}	s _{cr}	⊥		∥		
		[mm]	[mm]	[mm]	[mm]	[mm]	α _{g,N}	α _{g,V}	α _{g,N}	α _{g,V}	
1	50	100	75	60 ¹⁾	150	2	2	1,5	1,4	h _{ef} + 30 (≥ 80)	
	80	100	75	60 ¹⁾	240	2	2	1,5	1,4		
	200	150	75		240	2					
2	50	100	75		240	2					
	80	100	75		240	2					
	200	150	75		240	2					
3	85	100	115		240	2					
	130	100	115		240	2					
4	all sizes	100	115	100	240	2	2	1,5	1,5		
5	all sizes	100	115		240	2					
6	all sizes	100	115		240	2					
7	all sizes	100	100	240	100	$\frac{375}{(500)^2}$	1	1	1	1	
8	all sizes	120	245		250	2					
9	all sizes	80	240		365	2					
10	all sizes	100	250		300	2					

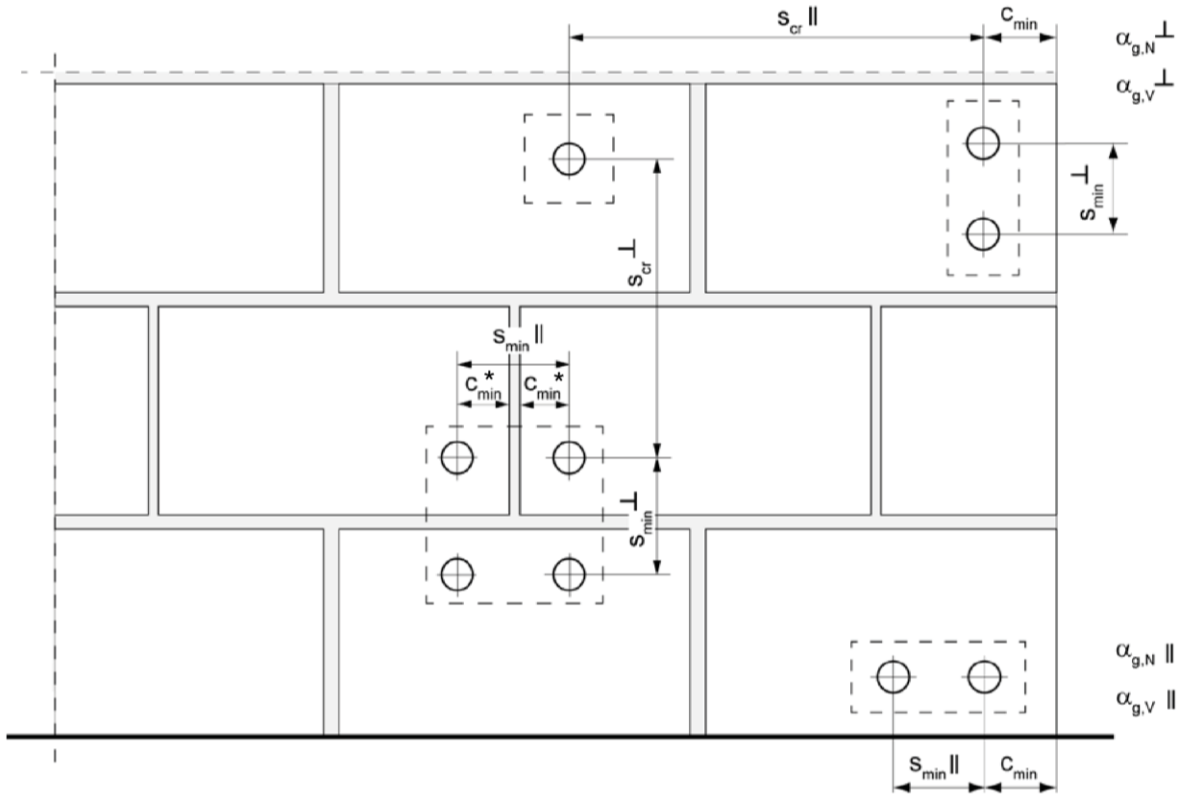
¹⁾ only valid for tension loads, for shear loads $s_{min} \parallel = s_{cr} \parallel$

²⁾ spacing depending on brick dimension, brick dimension see table B4, brick 7

fischer Injection system FIS HT II for masonry

Performances
Edge distance and spacing

Annex C 7



* Only, if joints are visible and vertical joints are not 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 tension load parallel to bed joint
- $\alpha_{g,V \parallel}$ = Group factor for shear load parallel to bed joint
- $\alpha_{g,N \perp}$ = Group factor for tension load vertical to bed joint
- $\alpha_{g,V \perp}$ = Group factor for shear load vertical to bed joint

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

For $s_{min} \leq s \leq s_{cr}$ α_g according to table C5

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

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

fischer Injection system FIS HT II for masonry

Annex C 8

Performances

Definition of minimum edge distance, minimum spacing and group factors



DÉCLARATION DES PERFORMANCES



DoP: 0163

pour système d'injection fischer FIS HT II (Scellement chimique pour utilisation dans le béton) – FR

1. Code d'identification unique du produit type: **DoP: 0163**
2. Usage(s) prévu(s): **Cheville de fixation dans du béton fissuré ou non fissuré, voir annexe, en particulier annexes B 1 - B 8**
3. Fabricant: **fischerwerke GmbH & Co. KG, Klaus-Fischer-Straße 1, 72178 Waldachtal, Allemagne**
4. Mandataire: --
5. Système(s) d'évaluation et de vérification de la constance des performances: **1**
6. Document d'évaluation européen: **ETAG 001; 2013-04**
Évaluation technique européenne: **ETA-12/0556; 2017-12-04**
Organisme d'évaluation technique: **DIBt**
Organisme(s) notifié(s): **1343 – MPA Darmstadt**

7. Performance(s) déclarée(s):

Résistance mécanique et stabilité (BWR 1), Sécurité pendant l'utilisation (BWR 4)

- **Valeurs caractéristiques sous charge statique et quasi-statique, Déplacements: Voir annexe, en particulier annexes C 1 - C 6**

Protection contre le feu (BWR 2)

- **Réaction au feu: La cheville remplit les exigences de la classe A 1**
- **Résistance au feu: NPD**

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

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

Signé pour le fabricant et en son nom par:

Andreas Bucher, Dipl.-Ing.

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

Tumlingen, 2017-12-12

- Cette déclaration des performances a été émise en différentes langues. En cas de divergences d'interprétation, la version anglaise prévaut toujours.
- L'annexe contient des informations volontaires et complémentaires en langue anglaise dépassant les exigences légales (spécifiées en langage neutre).

Specific Part

1 Technical description of the product

The fischer injection system FIS HT II is a bonded anchor consisting of a cartridge with injection mortar fischer FIS HT II, FIS HT II High Speed or FIS HT II Low Speed and a steel element.

The steel element is placed into a drilled hole filled with injection mortar and is anchored via the bond between metal part, injection mortar and concrete.

The product description is given in Annex A.

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

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

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

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

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic values for static and quasi-static action, displacements	See Annex C 1 to C 6

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorage 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 in use (BWR 4)

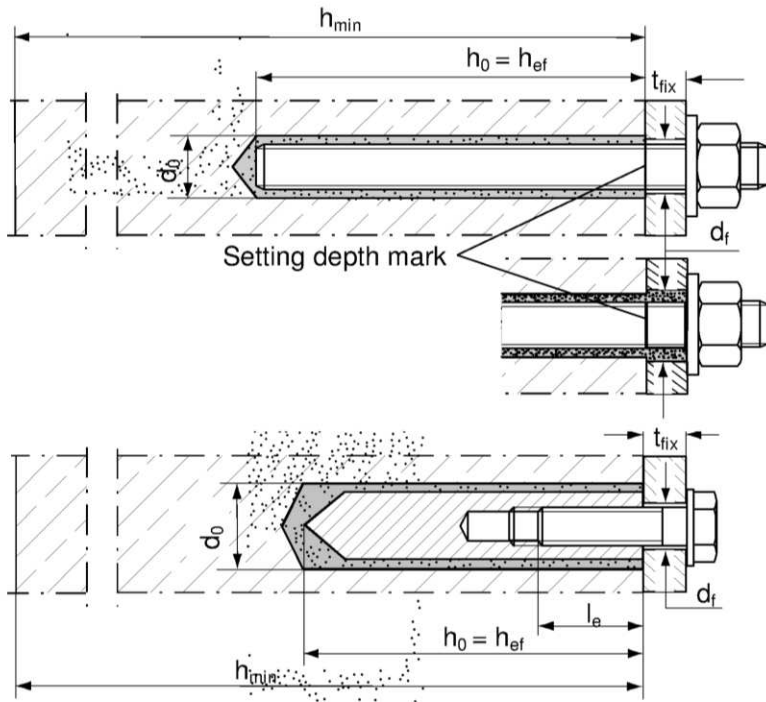
The essential characteristics regarding Safety in use are included under the Basic Works Requirement Mechanical resistance and stability.

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 001, 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: [96/582/EC].

The system to be applied is: 1

Installation conditions



Anchor rod
Pre-positioned anchor

Anchor rod
Push through anchor
(annular gap filled with mortar)

fischer
internal threaded anchor RG MI
Pre-positioned anchor only

fischer injection system FIS HT II

Product description
Installation conditions

Annex A 1

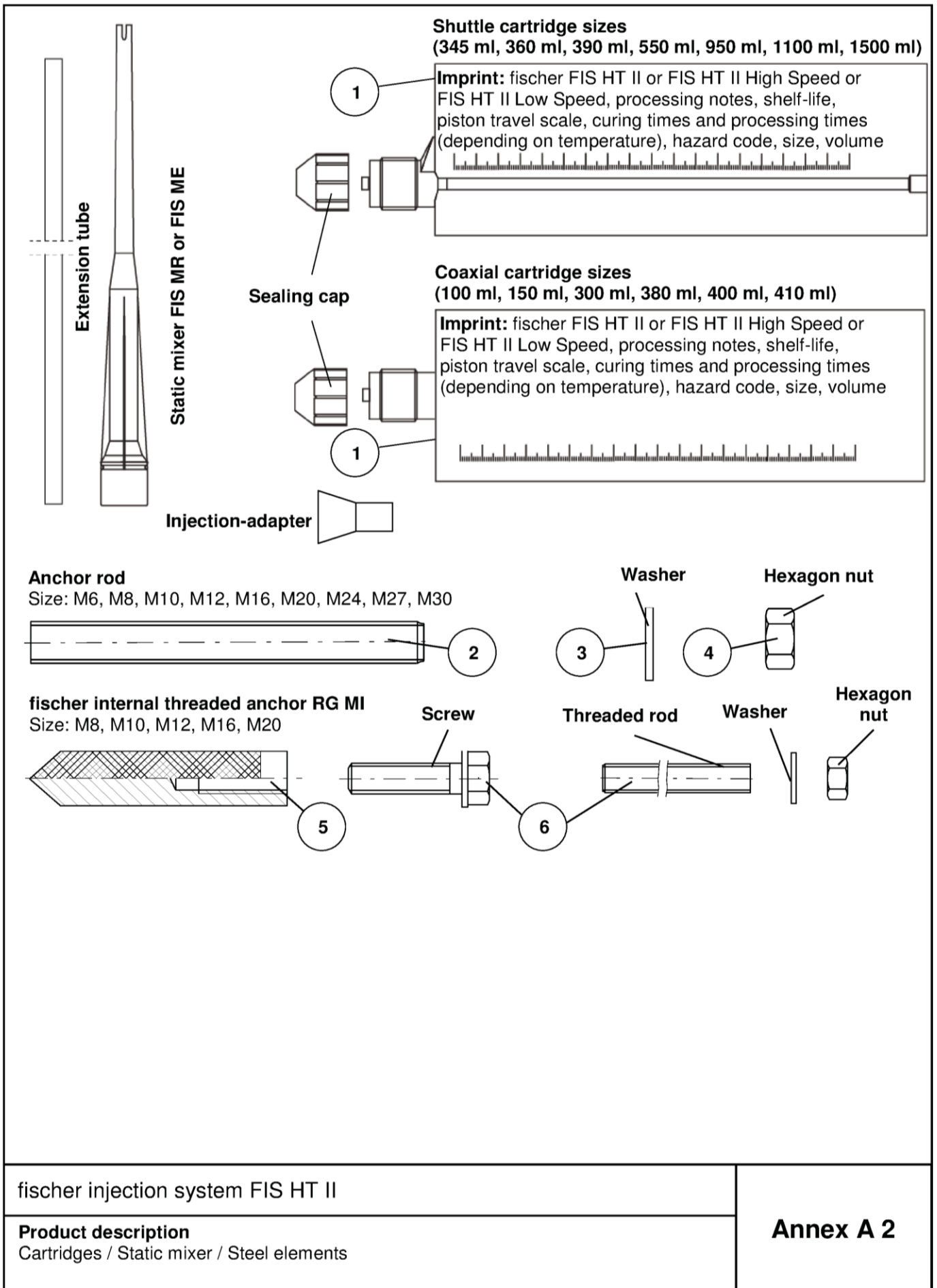






Table A1: Materials				
Part	Designation	Material		
1	Mortar cartridge	Mortar, hardener, filler		
	Steel grade	Steel, zinc plated	Stainless steel A4	High corrosion resistant steel C
2	Anchor rod	Property class 5.8 or 8.8; EN ISO 898-1:2013 zinc plated $\geq 5 \mu\text{m}$, EN ISO 4042:1999 A2K or hot-dip 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, 1.4662, 1.4462 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 EN 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	fischer internal threaded anchor RG MI	Property class 5.8 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
6	Commercial standard screw or anchor / threaded rod for fischer internal threaded anchor RG MI	Property class 5.8 or 8.8; EN ISO 898-1:2013 zinc plated $\geq 5 \mu\text{m}$, ISO 4042:1999 A2K fracture elongation $A_5 > 8 \%$	Property class 70 EN ISO 3506-1:2009 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362 EN 10088-1:2014 fracture elongation $A_5 > 8 \%$	Property class 70 EN ISO 3506-1:2009 1.4565; 1.4529 EN 10088-1:2014 fracture elongation $A_5 > 8 \%$
fischer injection system FIS HT II				Annex A 3
Product description Materials				

Specifications of intended use (part 1)					
Table B1: Overview use and performance categories					
Anchorages subject to		FIS HT II, FIS HT II High Speed or FIS HT II Low Speed with ...			
		Anchor rod 		fischer internal threaded anchor RG MI 	
Hammer drilling with standard drill bit 		all sizes			
Hammer drilling with hollow drill bit (Heller "Duster Expert" or Hilti "TE-CD, TE-YD") 		Nominal drill bit diameter (d_0) 12 mm to 35 mm			
Static and quasi static load, in	uncracked concrete	M6 to M30	Tables: C1, C3, C4, C6	M8 to M20	Tables: C2, C3, C5, C7
	cracked concrete	M10 to M20		not assessed	
Use category	dry or wet concrete	M6 to M30		M8 to M20	
	flooded hole ¹⁾	M12 to M30		M8 to M20	
Installation temperature		-10 °C to +40 °C			
In-service temperature	Temperature range I	-40 °C to +80 °C	(max. long term temperature +50 °C and max. short term temperature +80 °C)		
	Temperature range II	-40 °C to +120 °C	(max. long term temperature +72 °C and max. short term temperature +120 °C)		
¹⁾ Only with coaxial cartridges: 380 ml, 400 ml, 410 ml					
fischer injection system FIS HT II					Annex B 1
Intended Use Specifications (part 1)					

Specifications of intended use (part 2)

Base materials:

- Reinforced or unreinforced normal weight concrete Strength classes C20/25 to C50/60 according to EN 206-1:2000

Use conditions (Environmental conditions):

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

Design:

- Anchorages have to be designed by a responsible engineer with experience of concrete anchor design
- Verifiable calculation notes and drawings are to be prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e. g. position of the anchor relative to reinforcement or to supports, etc.)
- Anchorages under static or quasi-static actions are designed in accordance with EOTA Technical Report TR 029 "Design of bonded anchors" Edition September 2010 or CEN/TS 1992-4: 2009

Installation:

- Anchor installation is to be carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site
- In case of aborted hole: The hole shall be filled with mortar
- Anchorage depth should be marked and adhered to on installation
- Overhead installation is allowed

fischer injection system FIS HT II

Intended Use
Specifications (part 2)

Annex B 2

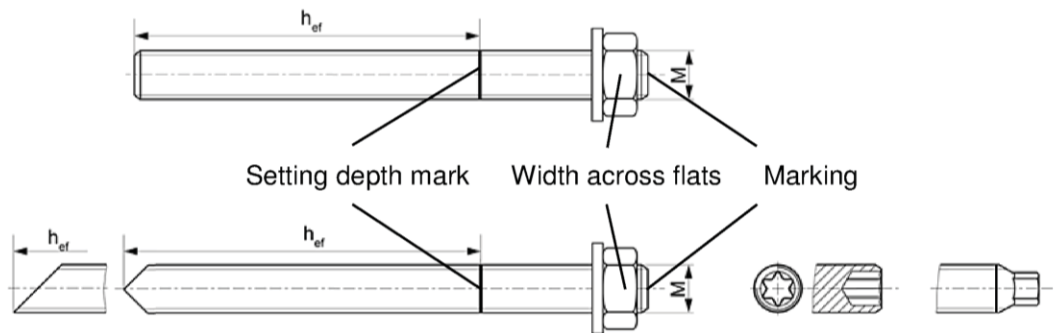
Table B2: Installation parameters for anchor rods

Size		M6	M8	M10	M12	M16	M20	M24	M27	M30
Width across flats	SW	10	13	17	19	24	30	36	41	46
Nominal drill bit diameter	d_0	8	10	12	14	18	24	28	30	35
Drill hole depth	h_0	$h_0 = h_{ef}$								
Effective anchorage depth	$h_{ef,min}$	50	60	60	70	80	90	96	108	120
	$h_{ef,max}$	72	160	200	240	320	400	480	540	600
Minimum spacing and minimum edge distance	s_{min} =	40	40	45	55	65	85	105	125	140
	c_{min}									
Diameter of clearance hole in the fixture ¹⁾	pre-positioned anchorage d_f	7	9	12	14	18	22	26	30	33
	push through anchorage d_f	9	11	14	16	20	26	30	32	40
Minimum thickness of concrete member	h_{min}	$h_{ef} + 30$ (≥ 100)				$h_{ef} + 2d_0$				
Maximum installation torque	$T_{inst,max}$ [Nm]	5	10	20	40	60	120	150	200	300

¹⁾ For larger clearance holes in the fixture see TR 029, 4.2.2.1 or CEN/TS 1992-4-1:2009, 5.2.3.1

Anchor rods:

fischer FIS A



Marking (on random place) fischer anchor rod:

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

Commercial standard threaded rods, washers and hexagon nuts may also be used if the following requirements are fulfilled:

- Materials, dimensions and mechanical properties according Annex A 3, Table A1
- Inspection certificate 3.1 according to EN 10204:2004, the documents have to be stored
- Setting depth is marked

fischer injection system FIS HT II

Intended Use
Installation parameters anchor rods

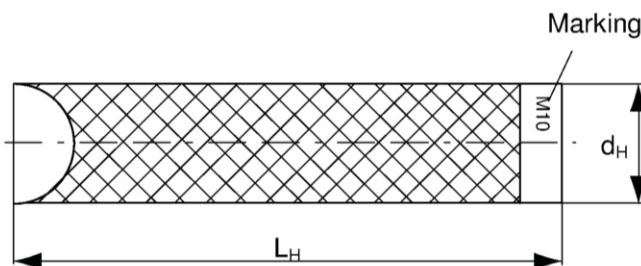
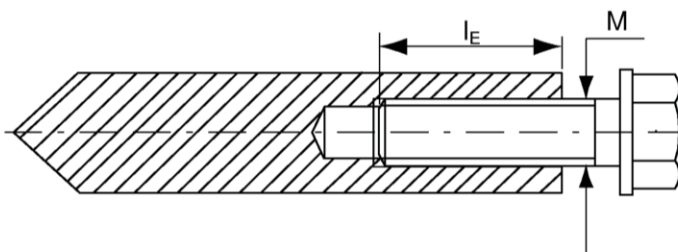
Annex B 3

Table B3: Installation parameters for fischer internal threaded anchors RG MI

Size		M8	M10	M12	M16	M20
Diameter of anchor	d_H	12	16	18	22	28
Nominal drill bit diameter	d_0	14	18	20	24	32
Drill hole depth	h_0	$h_0 = h_{ef} = L_H$				
Effective anchorage depth ($h_{ef} = L_H$)	h_{ef}	90	90	125	160	200
Minimum spacing and minimum edge distance	$s_{min} = c_{min}$	55	65	75	95	125
Diameter of clearance hole in the fixture ¹⁾	d_f	9	12	14	18	22
Minimum thickness of concrete member	h_{min}	120	125	165	205	260
Maximum screw-in depth	$l_{E,max}$	18	23	26	35	45
Minimum screw-in depth	$l_{E,min}$	8	10	12	16	20
Maximum installation torque	$T_{inst,max}$ [Nm]	10	20	40	80	120

¹⁾ For larger clearance holes in the fixture see TR 029, 4.2.2.1 or CEN/TS 1992-4-1: 2009, 5.2.3.1

fischer internal threaded anchor RG MI



Marking: Anchor size
e. g.: **M10**

Stainless steel additional **A4**
e. g.: **M10 A4**

High corrosion resistant steel
additional **C**
e. g.: **M10 C**

Retaining bolt or threaded rods (including nut and washer) must comply with the appropriate material and strength class of Annex A 3, Table A1

fischer injection system FIS HT II

Intended Use
Installation parameters fischer internal threaded anchors RG MI

Annex B 4

Table B4: Diameters of cleaning brush BS (steel brush)

The size of the steel brush refers to the nominal drill bit diameter

Nominal drill bit diameter	d_0	[mm]	8	10	12	14	16	18	20	24	25	28	30	35
Steel brush diameter	d_b		9	11	14	16	20		25	26	27	30	40	

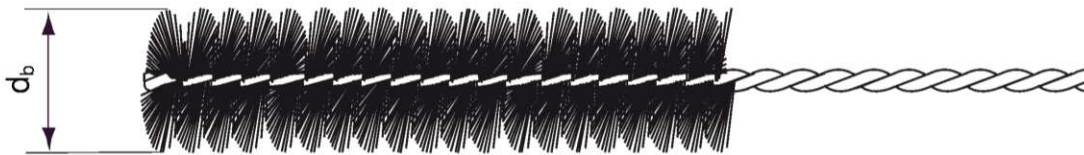


Table B5: Maximum processing time of the mortar and minimum curing time
(During the curing time of the mortar the concrete temperature may not fall below the listed minimum temperature)

System temperature [°C]	Maximum processing time t_{work}			Minimum curing time ¹⁾ t_{cure}		
	FIS HT II High Speed	FIS HT II	FIS HT II Low Speed	FIS HT II High Speed	FIS HT II	FIS HT II Low Speed
-10 to -5	---	---	---	12 h	---	---
> -5 to ± 0	5 min	---	---	3 h	24 h	---
> ± 0 to +5	5 min	13 min	---	3 h	3 h	6 h
> +5 to +10	3 min	9 min	20 min	50 min	90 min	3 h
> +10 to +20	1 min	5 min	10 min	30 min	60 min	2 h
> +20 to +30	---	4 min	6 min	---	45 min	60 min
> +30 to +40	---	2 min	4 min	---	35 min	30 min

¹⁾ In wet concrete or flooded holes the curing times must be doubled

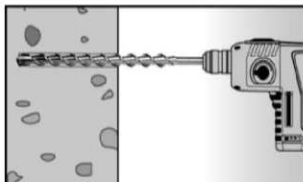
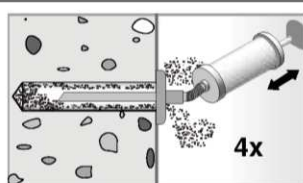
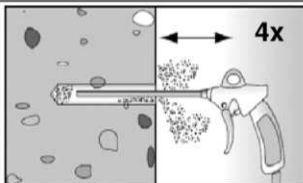
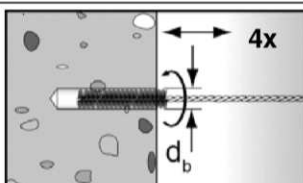
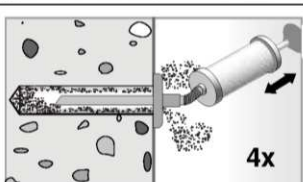
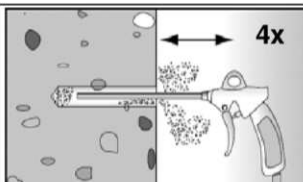
fischer injection system FIS HT II

Intended Use
Cleaning tools
Processing times and curing times

Annex B 5

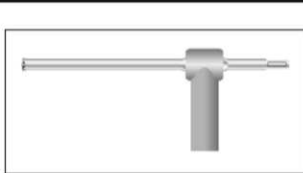
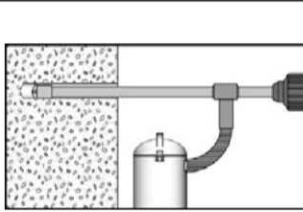
Installation instructions part 1

Drilling and cleaning the hole (hammer drilling with standard drill bit)

1		<p>Drill the hole. Drill hole diameter d_0 and drill hole depth h_0 see Tables B2, B3</p>	
2		<p>Clean the drill hole: For $h_{ef} \leq 12d$ and $d_0 < 18$ mm blow out the hole four times by hand</p>	 <p>For $h_{ef} > 12d$ and / or $d_0 \geq 18$ mm blow out the hole four times with oil-free compressed air ($p \geq 6$ bar)</p>
3		<p>Brush the drill hole four times. For deep holes use an extension. Corresponding brushes see Table B4</p>	
4		<p>Clean the drill hole: For $h_{ef} \leq 12d$ and $d_0 < 18$ mm blow out the hole four times by hand</p>	 <p>For $h_{ef} > 12d$ and / or $d_0 \geq 18$ mm blow out the hole four times with oil-free compressed air ($p \geq 6$ bar)</p>

Go to step 5

Drilling and cleaning the hole (hammer drilling with hollow drill bit)

1		<p>Check a suitable hollow drill (see Table B1) for correct operation of the dust extraction</p>
2		<p>Use a suitable dust extraction system, e. g. Bosch GAS 35 M AFC or a comparable dust extraction system with equivalent performance data</p> <p>Drill the hole with hollow drill bit. The dust extraction system has to extract the drill dust nonstop during the drilling process and must be adjusted to maximum power. Diameter of drill hole d_0 and drill hole depth h_0 see Tables B2, B3</p>

Go to step 5

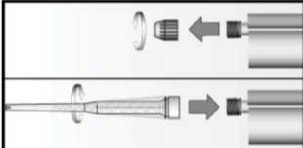
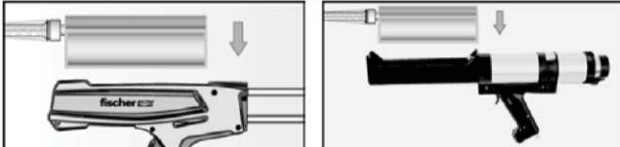

fischer injection system FIS HT II

Intended use
Installation instructions part 1

Annex B 6

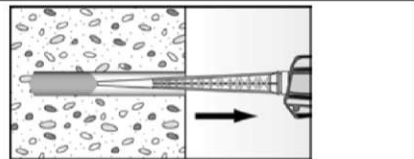
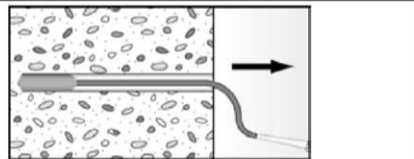
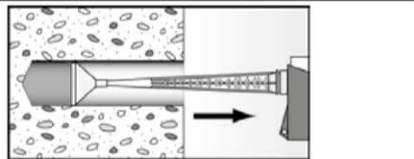
Installation instructions part 2

Preparing the cartridge

5		<p>Remove the sealing cap</p> <p>Screw on the static mixer (the spiral in the static mixer must be clearly visible)</p>
6		<p>Place the cartridge into the dispenser</p>
7		<p>Extrude approximately 10 cm of material until the resin is evenly grey in colour. Do not use mortar that is not uniformly grey</p>

Go to step 8

Mörtelinjektion

8	 <p>Fill approximately 2/3 of the drill hole with mortar. Always begin from the bottom of the hole and avoid bubbles</p>	 <p>For drill hole depth ≥ 150 mm use an extension tube</p>	 <p>For overhead installation, deep holes ($h_0 > 250$ mm) or drill hole diameter ($d_0 \geq 40$ mm) use an injection-adapter</p>
---	--	--	--

Go to step 9

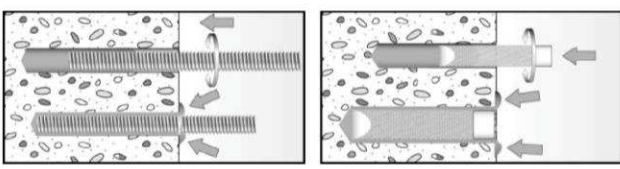
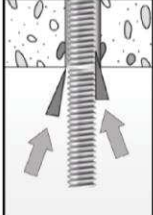
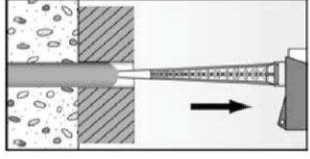

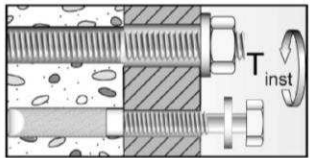
fischer injection system FIS HT II

Intended use
Installation instructions part 2

Annex B 7

Installation instructions part 3

Installation of anchor rods or fischer internal threaded anchors RG MI

<p>9</p>		<p>Only use clean and oil-free anchor elements. Mark the setting depth of the anchor. Push the anchor rod or fischer internal threaded RG MI anchor down to the bottom of the hole, turning it slightly while doing so. After inserting the anchor element, excess mortar must be emerged around the anchor element.</p>
	 <p>For overhead installations support the anchor rod with wedges. (e. g. fischer centering wedges)</p>	 <p>For push through installation fill the annular gap with mortar</p>
<p>10</p>	 <p>Wait for the specified curing time t_{cure} see Table B5</p>	<p>11</p>  <p>Mounting the fixture $T_{inst,max}$ see Tables B2 and B3</p>

fischer injection system FIS HT II

Intended use
Installation instructions part 3

Annex B 8

Table C1: Characteristic values for the steel bearing capacity of anchor rods under tensile / shear load													
Size			M6	M8	M10	M12	M16	M20	M24	M27	M30		
Bearing capacity under tensile load, steel failure													
Charact.bearing capacity $N_{Rk,s}$	Steel zinc plated	Property class	5.8	[kN]	10	19	29	43	79	123	177	230	281
			8.8		16	29	47	68	126	196	282	368	449
	Stainless steel A4 and High corrosion resistant steel C		50		10	19	29	43	79	123	177	230	281
			70		14	26	41	59	110	172	247	322	393
			80		16	30	47	68	126	196	282	368	449
Partial safety factors¹⁾													
Partial safety factor $\gamma_{Ms,N}$	Steel zinc plated	Property class	5.8	[-]	1,50								
			8.8		1,50								
	Stainless steel A4 and High corrosion resistant steel C		50		2,86								
			70		1,50 ²⁾ / 1,87								
			80		1,60								
Bearing capacity under shear load, steel failure													
without lever arm													
Charact.bearing capacity $V_{Rk,s}$	Steel zinc plated	Property class	5.8	[kN]	5	9	15	21	39	61	89	115	141
			8.8		8	15	23	34	63	98	141	184	225
	Stainless steel A4 and High corrosion resistant steel C		50		5	9	15	21	39	61	89	115	141
			70		7	13	20	30	55	86	124	161	197
			80		8	15	23	34	63	98	141	184	225
Ductility factor acc. to CEN/TS 1992-4-5:2009 Section 6.3.2.1			k_2	[-]	1,0								
with lever arm													
Charact. bending moment $M_{Rk,s}$	Steel zinc plated	Property class	5.8	[Nm]	7	19	37	65	166	324	560	833	1123
			8.8		12	30	60	105	266	519	896	1333	1797
	Stainless steel A4 and High corrosion resistant steel C		50		7	19	37	65	166	324	560	833	1123
			70		10	26	52	92	232	454	784	1167	1573
			80		12	30	60	105	266	519	896	1333	1797
Partial safety factors¹⁾													
Partial safety factor $\gamma_{Ms,V}$	Steel zinc plated	Property class	5.8	[-]	1,25								
			8.8		1,25								
	Stainless steel A4 and High corrosion resistant steel C		50		2,38								
			70		1,25 ²⁾ / 1,56								
			80		1,33								
¹⁾ In absence of other national regulations ²⁾ Only for fischer FIS A and RG M made of high corrosion-resistant steel C													
fischer injection system FIS HT II										Annex C 1			
Performances Characteristic steel bearing capacity anchor rods													

Table C2: Characteristic values for the steel bearing capacity of fischer internal threaded anchors RG MI under tensile / shear load									
Size			M8	M10	M12	M16	M20		
Bearing capacity under tensile load, steel failure									
Characteristic bearing capacity with screw	$N_{Rk,s}$	Property class	5.8	[kN]	19	29	43	79	123
			8.8		29	47	68	108	179
		Property class 70	A4		26	41	59	110	172
			C		26	41	59	110	172
Partial safety factors¹⁾									
Partial safety factor	$\gamma_{Ms,N}$	Property class	5.8	[-]	1,50				
			8.8		1,50				
		Property class 70	A4		1,87				
			C		1,87				
Bearing capacity under shear load, steel failure									
without lever arm									
Characteristic bearing capacity with screw	$V_{Rk,s}$	Property class	5.8	[kN]	9,2	14,5	21,1	39,2	62,0
			8.8		14,6	23,2	33,7	54,0	90,0
		Property class 70	A4		12,8	20,3	29,5	54,8	86,0
			C		12,8	20,3	29,5	54,8	86,0
Ductility factor acc. to CEN/TS 1992-4-5:2009 Section 6.3.2.1			k_2	[-]	1,0				
with lever arm									
Characteristic bending moment with screw	$M^0_{Rk,s}$	Property class	5.8	[Nm]	20	39	68	173	337
			8.8		30	60	105	266	519
		Property class 70	A4		26	52	92	232	454
			C		26	52	92	232	454
Partial safety factors¹⁾									
Partial safety factor	$\gamma_{Ms,V}$	Property class	5.8	[-]	1,25				
			8.8		1,25				
		Property class 70	A4		1,56				
			C		1,56				
¹⁾ In absence of other national regulations									
fischer injection system FIS HT II								Annex C 2	
Performances Characteristic steel bearing capacity of fischer internal threaded anchors RG MI									

Table C3: General design factors for the bearing capacity under tensile / shear load; uncracked or cracked concrete												
Size				All sizes								
Bearing capacity under tensile load												
Factors acc. to CEN/TS 1992-4:2009 Section 6.2.2.3												
Uncracked concrete		k_{ucr}	[-]	10,1								
Cracked concrete		k_{cr}		7,2								
Factors for the compressive strength of concrete > C20/25												
Increasing factor for τ_{Rk}	C25/30		Ψ_c	[-]	1,05							
	C30/37				1,10							
	C35/45				1,15							
	C40/50				1,19							
	C45/55				1,22							
	C50/60				1,26							
Splitting failure												
Edge distance	$h / h_{ef} \geq 2,0$		$C_{cr,sp}$	[mm]	1,0 h_{ef}							
	$2,0 > h / h_{ef} > 1,3$				4,6 $h_{ef} - 1,8 h$							
	$h / h_{ef} \leq 1,3$				2,26 h_{ef}							
Spacing		$S_{cr,sp}$	2 $C_{cr,sp}$									
Concrete cone failure acc. to CEN/TS 1992-4-5:2009 Section 6.2.3.2												
Edge distance		$C_{cr,N}$	[mm]	1,5 h_{ef}								
Spacing		$S_{cr,N}$		2 $C_{cr,N}$								
Bearing capacity under shear load												
Installation safety factors												
All installation conditions		$\gamma_2 = \gamma_{inst}$	[-]	1,2								
Concrete pry-out failure												
Factor k acc. to TR029 Section 5.2.3.3 resp. k_3 acc. to CEN/TS 1992-4-5:2009 Section 6.3.3		$k_{(3)}$	[-]	2,0								
Concrete edge failure												
The value of h_{ef} (= l_t) under shear load			[mm]	min (h_{ef} ; 8d)								
Calculation diameters												
Size				M6	M8	M10	M12	M16	M20	M24	M27	M30
Anchor rods		d	[mm]	6	8	10	12	16	20	24	27	30
fischer internal threaded anchors RG MI		d_{nom}		---	12	16	18	22	28	---	---	---
fischer injection system FIS HT II										Annex C 3		
Performances General design factors relating to the characteristic bearing capacity under tensile / shear load												

Table C4: Characteristic values of resistance for anchor rods in hammer drilled holes; uncracked or cracked concrete													
Size	M6	M8	M10	M12	M16	M20	M24	M27	M30				
Combined pullout and concrete cone failure													
Calculation diameter	d	[mm]	6	8	10	12	16	20	24	27	30		
Uncracked concrete													
Characteristic bond resistance in uncracked concrete C20/25													
Hammer-drilling with standard drill bit or hollow drill bit (dry and wet concrete)													
Tem- perature range	I: 50 °C / 80 °C		$\tau_{RK,ucr}$	[N/mm ²]	9,0	11,0	11,0	11,0	10,0	9,5	9,0	8,5	8,5
	II: 72 °C / 120 °C				6,5	9,5	9,5	9,0	8,5	8,0	7,5	7,0	7,0
Hammer-drilling with standard drill bit or hollow drill bit (flooded hole) ¹⁾													
Tem- perature range	I: 50 °C / 80 °C		$\tau_{RK,ucr}$	[N/mm ²]	---	---	---	9,5	8,5	8,0	7,5	7,0	7,0
	II: 72 °C / 120 °C				---	---	---	7,5	7,0	6,5	6,0	6,0	6,0
Installation safety factors													
Dry and wet concrete		$\gamma_2 = \gamma_{inst}$	[-]	1,2									
Flooded hole				---				1,4 ¹⁾					
Cracked concrete													
Characteristic bond resistance in cracked concrete C20/25													
Hammer-drilling with standard drill bit or hollow drill bit (dry and wet concrete)													
Tem- perature range	I: 50 °C / 80 °C		$\tau_{RK,cr}$	[N/mm ²]	---	---	6,0	6,0	6,0	5,5	---	---	---
	II: 72 °C / 120 °C				---	---	5,0	5,0	5,0	5,0	---	---	---
Hammer-drilling with standard drill bit or hollow drill bit (flooded hole) ¹⁾													
Tem- perature range	I: 50 °C / 80 °C		$\tau_{RK,cr}$	[N/mm ²]	---	---	---	5,0	5,0	4,5	---	---	---
	II: 72 °C / 120 °C				---	---	---	4,0	4,0	4,0	---	---	---
Installation safety factors													
Dry and wet concrete		$\gamma_2 = \gamma_{inst}$	[-]	1,2									
Flooded hole				---				1,4 ¹⁾					
¹⁾ Only with coaxial cartridges: 380 ml, 400 ml, 410 ml													
fischer injection system FIS HT II										Annex C 4			
Performances Characteristic values for static or quasi-static action under tensile load for anchor rods (uncracked or cracked concrete)													

Table C5: Characteristic values of resistance for fischer internal threaded anchors RG MI in hammer drilled holes; uncracked concrete									
Size		M8	M10	M12	M16	M20			
Combined pullout and concrete cone failure									
Calculation diameter	d	[mm]	12	16	18	22	28		
Uncracked concrete									
Characteristic bond resistance in uncracked concrete C20/25									
<u>Hammer-drilling with standard drill bit or hollow drill bit (dry and wet concrete)</u>									
Tem- perature range	I: 50 °C / 80 °C		$\tau_{Rk,ucr}$	[N/mm ²]	10,5	10,0	9,5	9,0	8,5
	II: 72 °C / 120 °C								
<u>Hammer-drilling with standard drill bit or hollow drill bit (flooded hole)¹⁾</u>									
Tem- perature range	I: 50 °C / 80 °C		$\tau_{Rk,ucr}$	[N/mm ²]	10,0	9,0	9,0	8,5	8,0
	II: 72 °C / 120 °C								
Installation safety factors									
Dry and wet concrete		$\gamma_2 = \gamma_{inst}$	[-]					1,2	
Flooded hole								1,4 ¹⁾	
¹⁾ Only with coaxial cartridges: 380 ml, 400 ml, 410 ml									
fischer injection system FIS HT II						Annex C 5			
Performances Characteristic values for static or quasi-static action under tensile load for fischer internal threaded anchors RG MI and reinforcing bars (uncracked concrete)									

Table C6: Displacements for anchor rods										
Size		M6	M8	M10	M12	M16	M20	M24	M27	M30
Displacement-Factors for tensile load¹⁾										
Uncracked concrete; Temperature range I, II										
δ_{N0} -Faktor	[mm/(N/mm ²)]	0,09	0,09	0,09	0,10	0,10	0,10	0,10	0,11	0,12
$\delta_{N\infty}$ -Faktor		0,10	0,10	0,10	0,12	0,12	0,12	0,13	0,13	0,14
Cracked concrete; Temperature range I, II										
δ_{N0} -Faktor	[mm/(N/mm ²)]	---	---	0,12	0,12	0,13	0,13	---	---	---
$\delta_{N\infty}$ -Faktor		---	---	0,27	0,30	0,30	0,30	---	---	---
Displacement-Factors for shear load²⁾										
Uncracked or cracked concrete; Temperature range I, II										
δ_{V0} -Faktor	[mm/kN]	0,11	0,11	0,11	0,10	0,10	0,09	0,09	0,08	0,07
$\delta_{V\infty}$ -Faktor		0,12	0,12	0,12	0,11	0,11	0,10	0,10	0,09	0,09
¹⁾ Calculation of effective displacement: $\delta_{N0} = \delta_{N0\text{-Faktor}} \cdot \tau_{Ed}$ $\delta_{N\infty} = \delta_{N\infty\text{-Faktor}} \cdot \tau_{Ed}$ (τ_{Ed} : Design value of the applied tensile stress)					²⁾ Calculation of effective displacement: $\delta_{V0} = \delta_{V0\text{-Faktor}} \cdot V_{Ed}$ $\delta_{V\infty} = \delta_{V\infty\text{-Faktor}} \cdot V_{Ed}$ (V_{Ed} : Design value of the applied shear force)					
Table C7: Displacements for fischer internal threaded anchors RG MI										
Size		M8	M10	M12	M16	M20				
Displacement-Factors for tensile load¹⁾										
Uncracked concrete; Temperature range I, II										
δ_{N0} -Faktor	[mm/(N/mm ²)]	0,10	0,11	0,12	0,13	0,14				
$\delta_{N\infty}$ -Faktor		0,13	0,14	0,15	0,16	0,18				
Displacement-Factors for shear load²⁾										
Uncracked concrete; Temperature range I, II										
δ_{V0} -Faktor	[mm/kN]	0,12	0,12	0,12	0,12	0,12				
$\delta_{V\infty}$ -Faktor		0,14	0,14	0,14	0,14	0,14				
¹⁾ Calculation of effective displacement: $\delta_{N0} = \delta_{N0\text{-Faktor}} \cdot \tau_{Ed}$ $\delta_{N\infty} = \delta_{N\infty\text{-Faktor}} \cdot \tau_{Ed}$ (τ_{Ed} : Design value of the applied tensile stress)					²⁾ Calculation of effective displacement: $\delta_{V0} = \delta_{V0\text{-Faktor}} \cdot V_{Ed}$ $\delta_{V\infty} = \delta_{V\infty\text{-Faktor}} \cdot V_{Ed}$ (V_{Ed} : Design value of the applied shear force)					
fischer injection system FIS HT II									Annex C 6	
Performances Displacements for anchor rods and fischer internal threaded anchors RG MI										



DÉCLARATION DES PERFORMANCES



DoP: 0164

pour système d'injection fischer HT II pour maçonnerie (Chevilles métalliques à injection pour maçonnerie) – FR

1. Code d'identification unique du produit type: **DoP: 0164**
2. Usage(s) prévu(s): **Ancrages de maçonnerie pour lesquels des exigences de résistance mécanique et de stabilité ainsi que de sécurité d'utilisation doivent être remplies. Ils servent à fixer et/ou ancrer des éléments structuraux (contribuant à la stabilité des systèmes) ou des éléments lourds, voir annexe, en particulier annexes B 1 - B 10**
3. Fabricant: **fischerwerke GmbH & Co. KG, Klaus-Fischer-Straße 1, 72178 Waldachtal, Allemagne**
4. Mandataire: --
5. Système(s) d'évaluation et de vérification de la constance des performances: **1**
6. Document d'évaluation européen: **EAD 330076-00-0604**
Évaluation technique européenne: **ETA-12/0554; 2018-09-11**
Organisme d'évaluation technique: **DIBt**
Organisme(s) notifié(s): **1343 – MPA Darmstadt**
7. Performance(s) déclarée(s):
Résistance mécanique et stabilité (BWR 1)
 - Valeurs caractéristiques de résistance: Voir annexe, en particulier annexes C 1 - C 8
 - Déplacements: Voir annexe, en particulier annexe C 5**Protection contre le feu (BWR 2)**
 - Réaction au feu: La cheville remplit les exigences de la classe A 1**Hygiène, santé et protection de l'environnement (BWR 3)**
 - Contenu, émission et / ou libération de substances dangereuses: **NPD**
8. Documentation technique appropriée et/ou documentation technique spécifique: ---

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

Signé pour le fabricant et en son nom par:

Andreas Bucher, Dipl.-Ing.

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

Tumlingen, 2018-11-18

- Cette déclaration des performances a été émise en différentes langues. En cas de divergences d'interprétation, la version anglaise prévaut toujours.

- L'annexe contient des informations volontaires et complémentaires en langue anglaise dépassant les exigences légales (spécifiées en langage neutre).

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

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

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

The product description is given in Annex A.

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

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

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

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

Essential characteristic	Performance
Characteristic values for resistance	See Annexes C 1 to C 8
Displacements	See Annex C 5

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1

3.3 Hygiene, health and the environment (BWR 3)

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

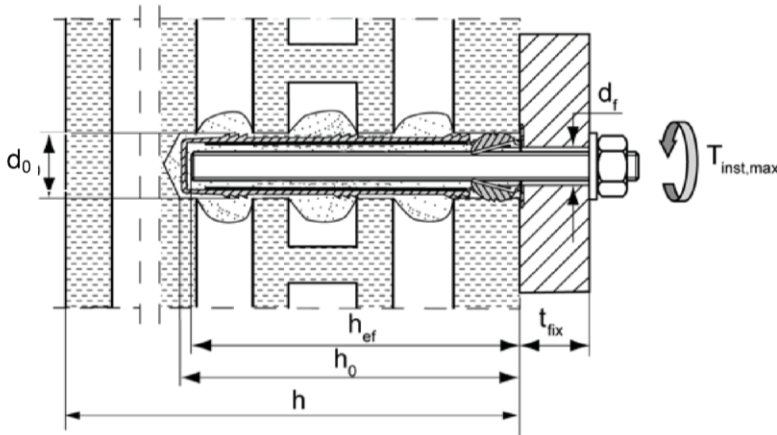
4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

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

The system to be applied is: 1

Installation conditions part 1

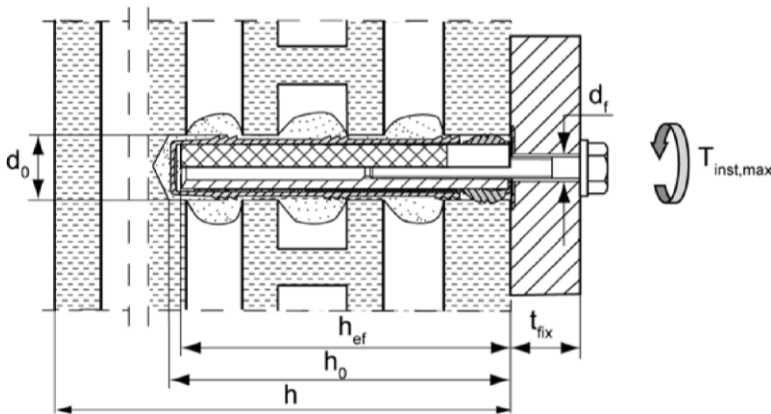
Threaded rods with perforated sleeve FIS H K; Installation in perforated and solid brick masonry



Pre-positioned installation

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

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



Pre-positioned installation

- FIS H 16x85 K – FIS E 11x85 M6 and M8
- FIS H 20x85 K – FIS E 15x85 M10 and M12

h_{ef} = effective anchorage depth
 h_0 = depth of drill hole
 t_{fix} = thickness of fixture
 h = thickness of masonry

d_0 = nominal drill bit diameter
 d_f = diameter of clearance hole in the fixture
 $T_{inst,max}$ = maximum torque moment

fischer Injection system FIS HT II for masonry

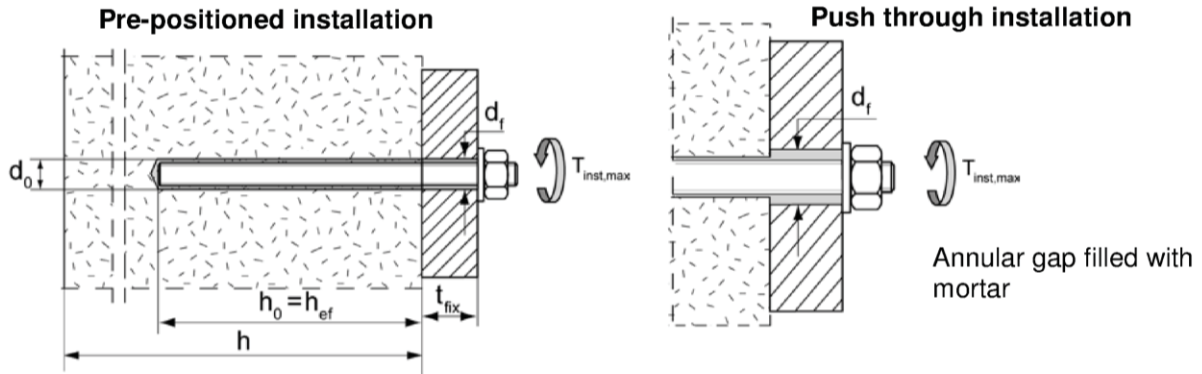
Product description

Installation condition, part 1: in perforated and solid brick masonry

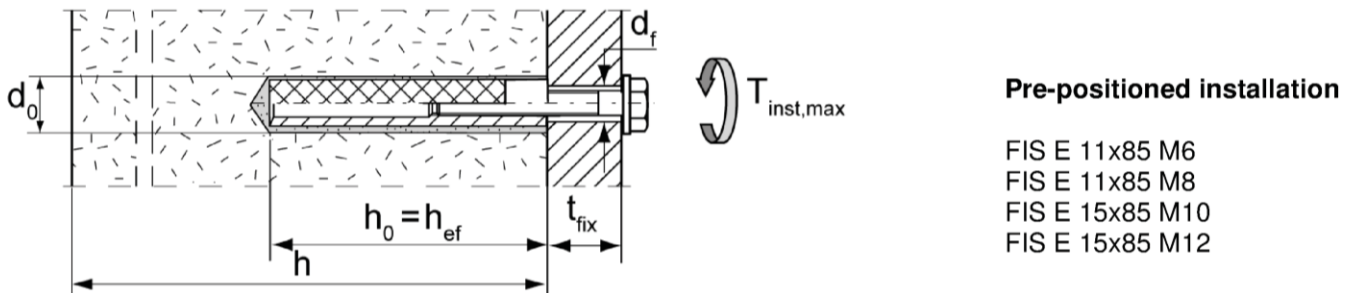
Annex A 1

Installation conditions part 2

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



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



h_{ef} = effective anchorage depth
 h_0 = depth of drill hole
 t_{fix} = thickness of fixture
 h = thickness of masonry

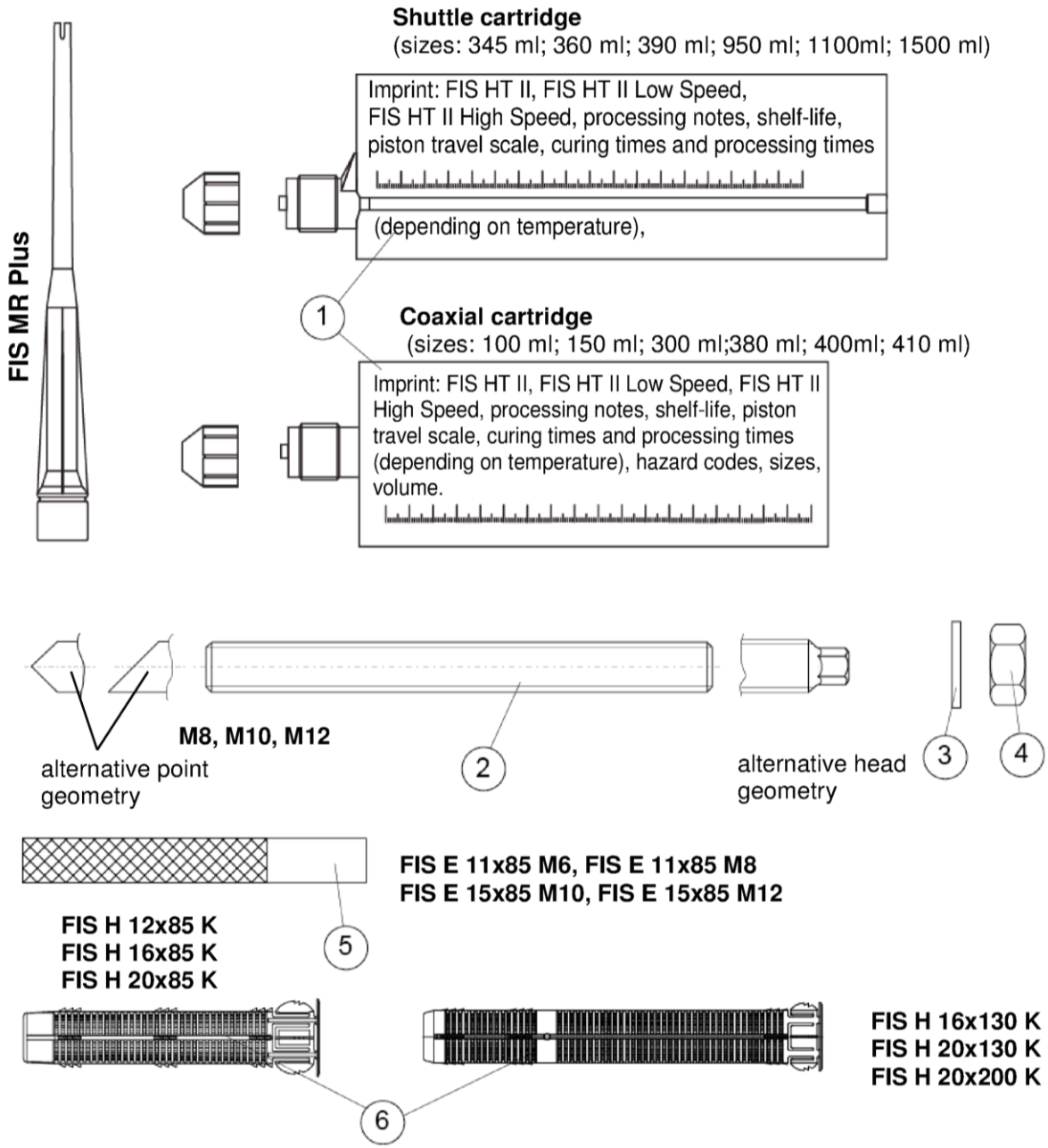
d_0 = nominal drill bit diameter
 d_f = diameter of clearance hole in the fixture
 $T_{inst,max}$ = maximum torque moment

fischer Injection system FIS HT II for masonry

Product description

Installation condition, part 2: in solid brick masonry and autoclaved aerated concrete

Annex A 2



- | | |
|----------------------------|--|
| 1. Mortar cartridge | 4. Hexagon nut |
| 2. Threaded rod | 5. Internal threaded anchor FIS E |
| 3. Washer | 6. Perforated sleeve FIS H K |

fischer Injection system FIS HT II for masonry

Product description

Cartridges, anchor rods, internal threaded anchors, perforated sleeves

Annex A 3

Table A1: Materials

Part	Designation	Material		
1	Mortar cartridge	mortar, hardener; filler		
		Steel, zinc plated	Stainless steel A4	High corrosion-resistant steel C
2	Threaded rod	Property class 5.8 or 8.8; ISO 898-1:2013 zinc plated $\geq 5\mu\text{m}$, EN ISO 4042:1999 A2K or hot-dip galvanised EN ISO 10684:2004 $f_{uk} \leq 1000 \text{ N/mm}^2$ $A_5 > 8\%$	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 $f_{uk} \leq 1000 \text{ N/mm}^2$ $A_5 > 8\%$	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 $f_{uk} \leq 1000 \text{ N/mm}^2$ $A_5 > 8\%$
3	Washer ISO 7089:2000	zinc plated $\geq 5\mu\text{m}$, EN ISO 4042:1999 A2K or hot-dip galvanised 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 $\geq 5\mu\text{m}$, EN 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
	Screw or threaded 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
6	Perforated sleeve FIS H K	PP / PE		

fischer Injection system FIS HT II for masonry

Product description
Materials

Annex A 4

Specifications of intended use

Anchorage subject to:

- Static and quasi-static loads

Base materials:

- Solid brick masonry (Use category b) and autoclaved aerated concrete (Use category d), acc. to Annex B8.
Note: The characteristic resistance is also valid for larger brick sizes and higher compressive strength of the masonry unit.
- Hollow brick masonry (use category c), according to Annex B8
- 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 Technical Report TR 053 under consideration of the β -factor according to Annex C6, Table C4

Temperature Range:

- From - 40°C to +80°C (max. short term temperature +80°C and max. long term temperature +50°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
(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 Injection system FIS HT II for masonry

Intended Use
Specifications

Annex B 1

Specifications of intended use

Design:

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

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

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

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

- 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:

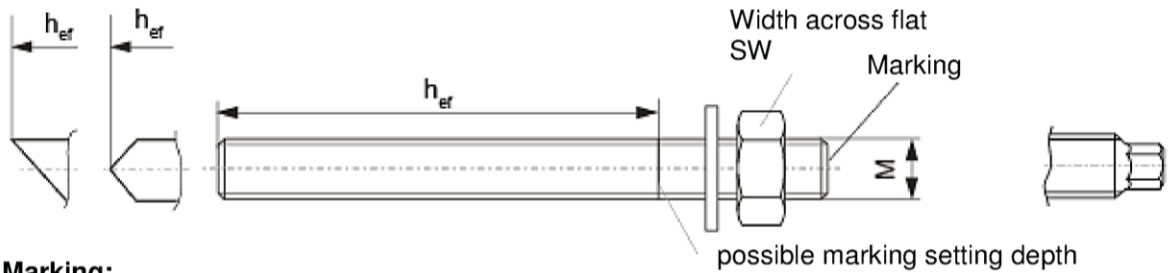
- Category d/d: -Installation and use in dry structures
- Category w/w: -Installation and use in dry and wet structures
- Hole drilling by hammer drill mode
- In case of aborted hole: The hole shall be filled with mortar
- Bridging of unbearing layer (e.g. plaster) see Annex B 4 (Table B1.3)
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site
- Fastening screws or threaded 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 B5. Table B3
- 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 A4, Table A1

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

fischer Injection system FIS HT II for masonry	Annex B 2
Intended Use Specifications	



Marking:

Property class (p.c.) 8.8, Stainless steel A4, p.c. 80 or high corrosion-resistant steel C, p.c. 80: •
 Stainless steel A4, property class 50 and high corrosion-resistant steel C, property class 50: ••

Table B1.1: Installation parameters for threaded rod without perforated sleeve

Size		M8	M10	M12	
Nominal drill hole diameter	$d_{nom}=d_0$ [mm]	10	12	14	
Width across flat	SW [mm]	13	17	19	
Effective anchorage depth ¹⁾	$h_{ef,min}$ [mm]	50			
Depth of drill hole $h_0 = h_{ef}$	$h_{ef,max}$ [mm]	h-30 and ≤ 200 mm			
Effective anchorage depth AAC	$h_{ef,min}$ [mm]	100			
	$h_{ef,max}$ [mm]	120			
Maximum torque moment	$T_{inst,max}$ [Nm]	10			
Max. torque moment for autoclaved aerated concrete	$T_{inst,max}$ [Nm]	1	2		
Diameter of clearance hole in the fixture	Pre-position anchorage	$d_f \leq$ [mm]	9	12	14
	Push through anchorage	$d_f \leq$ [mm]	11	14	16

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

fischer internal threaded anchor FIS E

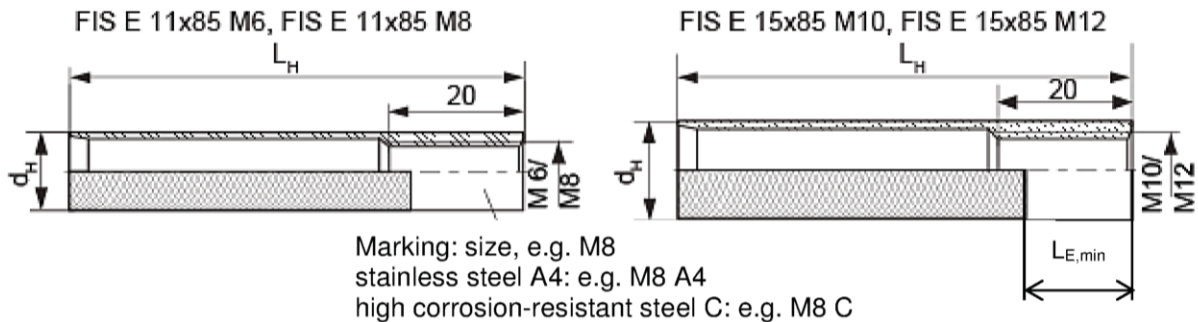


Table B1.2: Installation parameters for internal threaded anchor FIS E without perforated sleeve

Size FIS E		11x85 M6	11x85 M8	15x85 M10	15x85 M12
diameter of internal threaded anchor	d_H [mm]	11		15	
Nominal drill hole diameter	$d_{nom}=d_0$ [mm]	14		18	
Depth of drill hole	h_0 [mm]	85			
Effective anchorage depth	$L_H=h_{ef}$ [mm]	85			
Maximum torque moment	$T_{inst,max}$ [Nm]	4	10		
Max. torque moment for autoclaved aerated concrete	$T_{inst,max}$ [Nm]	1		2	
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	7	9	12	14
	Screw-in depth	$L_{E,min}$ [mm]	6	8	10

fischer Injection system FIS HT II for masonry

Intended Use
 Installation parameters, part 1

Annex B 3

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

Marking: size
 $D_{\text{Sleeve}} \times L_{\text{Sleeve}}$
 e.g. 16x85

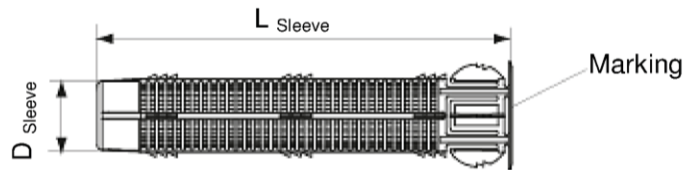


Table B1.3: Installation parameters (threaded rod and internal threaded anchor with perforated sleeve; only pre-positioned anchorage)

Size FIS H...K	12x85	16x85	16x130 ²⁾	20x85	20x130 ²⁾	20x200 ²⁾
Nominal drill hole diameter ($d_0 = D_{\text{Sleeve}}$) $d_{\text{nom}}=d_0$ [mm]	12	16		20		
Depth of drill hole h_0 [mm]	90	90	135	90	135	205
Effective anchorage depth ¹⁾ $h_{\text{ef,min}}$ [mm]	85	85	110	85	110	180
$h_{\text{ef,max}}$ [mm]	85	85	130	85	130	200
Size of threaded rod [-]	M8	M8, M10		M12		
Size of internal threaded anchor [-]	----	11x85	----	15x85	----	----
Maximum torque moment threaded rod and internal threaded anchor $T_{\text{inst,max}}$ [mm]	2					

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

²⁾ Bridging of unbearing layer (e.g. plaster) possible

fischer Injection system FIS HT II for masonry

Intended Use
 Installation parameters, part 2

Annex B 4

Cleaning brush BS (Steel brush)



Only for solid bricks and autoclaved aerated concrete

Table B2: Parameters of steel brush

Drill hole diameter	d_0	[mm]	10	12	14	16	18	20
Brush diameter	$d_{b,nom}$	[mm]	11	14	16	20	20	25

Table B3: Maximum processing time of the mortar and minimum curing time

(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} [minutes]		
	FIS HT II High Speed ³⁾	FIS HT II ²⁾	FIS HT II Low Speed ²⁾
±0	3 hours	24 hours	
>±0 to +5	90	3 hours	6 hours
>+5 to +10	45	90	3 hours
>+10 to +20	30	60	2 hours
>+20 to +30		45	60
>+30 to +40		35	30

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

¹⁾ For wet bricks the curing time must be doubled

²⁾ Minimum cartridge temperature +5°C

³⁾ Minimum cartridge temperature ±0°C

fischer Injection system FIS HT II for masonry

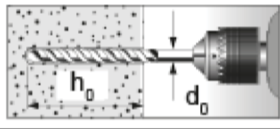
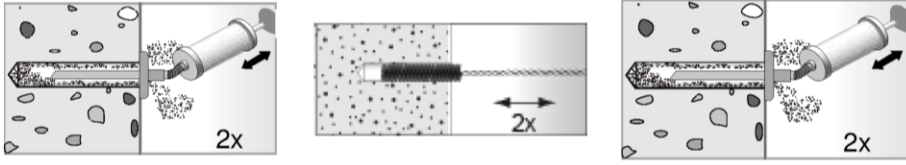
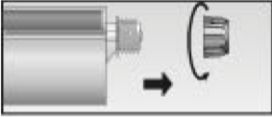
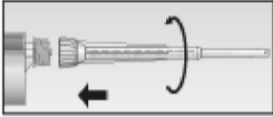
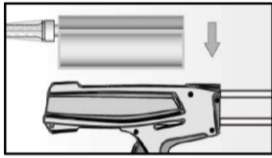
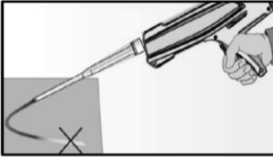
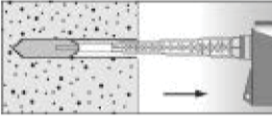

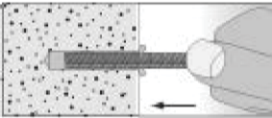

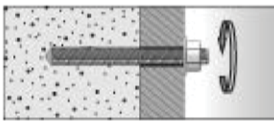
Intended Use

Steel brush
Processing times and curing times

Annex B 5

Installation instructions Part 1

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

1		<p>Drill the hole. Depth of drill hole h_0 and drill hole diameter d_0 see Table B1.1 or B1.2</p>		
2		<p>Blow out the drill hole two times. Brush the drill hole two times (see Table B2) and blow out two times again</p>		
3		<p>Remove sealing cap</p>		<p>Screw on the static mixer (the spiral in the static mixer must be clearly visible)</p>
4		<p>Place the cartridge into a suitable dispenser.</p>		<p>Press out approximately 10 cm of material until the mortar is permanent-ly grey in colour. Mortar which is not grey in colour will not cure and must be disposed off.</p>
5		<p>Fill approximately 2/3 of the drill hole with mortar. Always begin from the bottom of the hole to eliminate voids¹⁾.</p>		<p>For push through installation (not FIS E) fill the annular gap also with mortar.</p>
6		<p>Only use clean and oil-free anchor elements. Mark the threaded rod for setting depth. Press the threaded rod or internal threaded anchor FIS E down to the bottom of the hole, turning it slightly by hand while doing. After inserting the anchor element, excess mortar must emerge around the anchor element.</p>		
7		<p>Do not touch. Minimum curing time t_{cure} see Table B3</p>		<p>Mounting the fixture $T_{inst,max}$ see Table B1.1 or B1.2</p>

¹⁾ For the exact quantity of mortar see manufacturer`s specification.

fischer Injection system FIS HT II for masonry

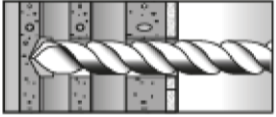
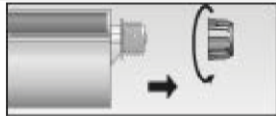
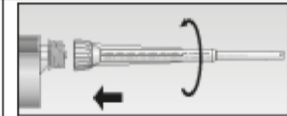
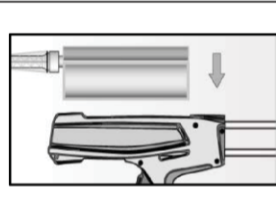
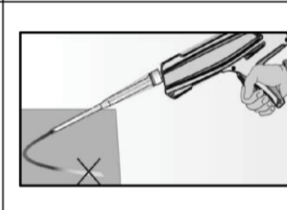
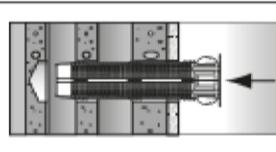
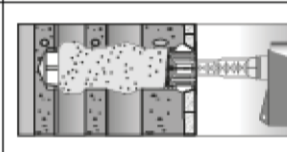
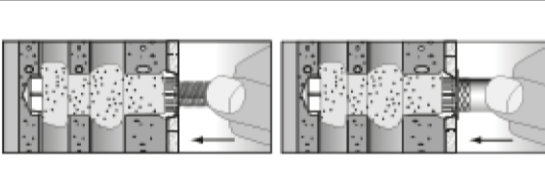


Intended use

Installation instructions part 1 in solid brick and autoclaved aerated concrete

Annex B 6

Installation instructions Part 2

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

1		<p>Drill the hole (hammer drill). Depth of drill hole h_0 and drill hole diameter d_0 see Table B1.3</p>	<p>When install perforated sleeves in solid bricks or solid areas of hollow bricks, also clean the hole by blowing out and brushing</p>
2		<p>Remove the sealing cap</p>	 <p>Screw on the static mixer (the spiral in the static mixer must be clearly visible)</p>
3		<p>Place the cartridge into a suitable dispenser</p>	 <p>Press out approximately 10 cm of material until the mortar is permanently grey in colour. Mortar which is not grey in colour will not cure and must be disposed off</p>
4		<p>Insert the perforated sleeve flush with the surface of the masonry or plaster .</p>	 <p>Fill the perforated sleeve completely with mortar beginning from the bottom of the hole¹⁾.</p>
5		<p>Only use clean and oil-free anchor elements. Mark the threaded rod for setting depth. Insert the threaded rod or the internal threaded anchor FIS E by hand using light turning motions until reaching the setting depth marking (threaded rod) or flush with the surface (internal threaded anchor).</p>	
6	 <p>Do not touch. Minimum curing time t_{cure} see Table B3</p>	 <p>Mounting the fixture. $T_{\text{inst,max}}$ see Table B1.3</p>	

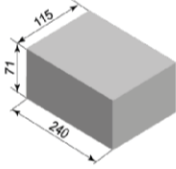
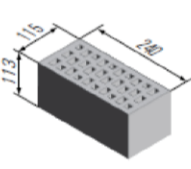
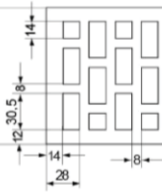
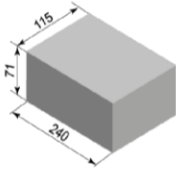
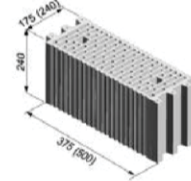
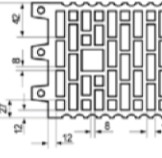
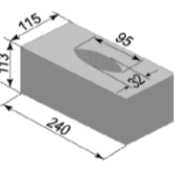
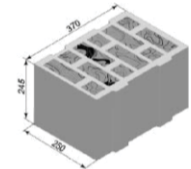
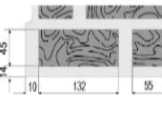
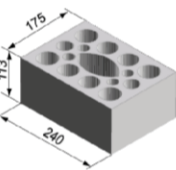
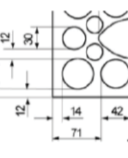
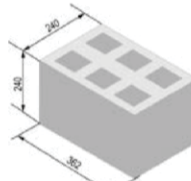
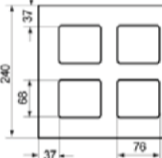
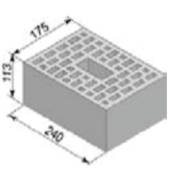
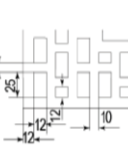
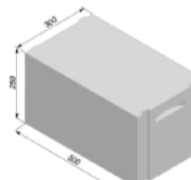
¹⁾ For the exact quantity of mortar see manufacturer`s specification.

fischer Injection system FIS HT II for masonry

Intended use
Installation instructions part 2 in hollow brick masonry

Annex B 7

Table B 4: Summary of bricks and blocks

<p>Brick No. 1 Solid brick Mz according to EN 771-2 $\rho \geq 1,8$ [kg/dm³] $fb \geq 10$ or 20 [N/mm²]</p>			<p>Brick No. 6 Perforated brick HLz according to EN 771-1 $\rho \geq 1,4$ [kg/dm³] $fb \geq 20$ [N/mm²]</p>		
<p>Brick No. 2 Solid sand-lime brick according to EN 771-2 $\rho \geq 1,8$ [kg/dm³] $fb \geq 10$ or 20 [N/mm²]</p>			<p>Brick No. 7 Perforated brick HLz according to EN 771-1 $\rho \geq 1,0$ [kg/dm³] $fb \geq 10$ [N/mm²]</p>		
<p>Brick No. 3 Solid sand-lime brick according to EN 771-2 $\rho \geq 1,8$ [kg/dm³] $fb \geq 10$ or 20 [N/mm²]</p>			<p>Brick No. 8 Perforated brick HLz filled with mineral wool according to EN 771-1 $\rho \geq 0,6$ [kg/dm³] $fb \geq 8$ [N/mm²]</p>		
<p>Brick No. 4 Sand-lime hollow brick according to EN 771-2 $\rho \geq 1,4$ [kg/dm³] $fb \geq 12$ or 20 [N/mm²]</p>			<p>Brick-No. 9 Light-weight concrete hollow block Hbl according to EN 771-1 $\rho \geq 1,0$ [kg/dm³] $fb \geq 4$ [N/mm²]</p>		
<p>Brick No. 5 Perforated brick HLz according to EN 771-1 $\rho \geq 0,9$ [kg/dm³] $fb \geq 10$ [N/mm²]</p>			<p>Brick No. 10 Autoclaved aerated concrete block $\rho \geq 0,35, 0,5$ or 0,65 [kg/dm³] $fb \geq 2, 4$ or 6 [N/mm²]</p>		

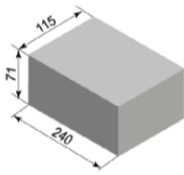
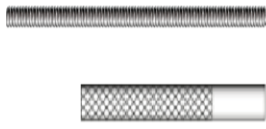
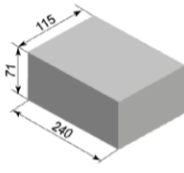
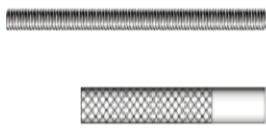
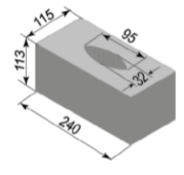
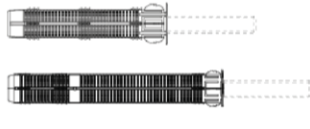
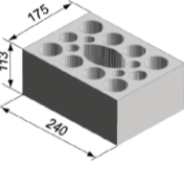
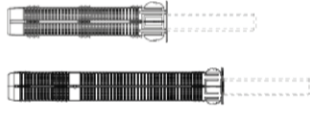
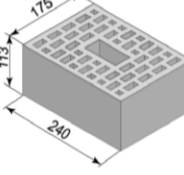
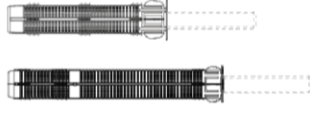
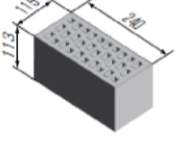

Imaging of the bricks are not scaled

fischer Injection system FIS HT II for masonry

Intended Use
Types and dimensions of blocks and bricks

Annex B 8

Table B5.1: Allocation of anchor rods¹⁾, perforated sleeves¹⁾²⁾ and perforated or solid bricks

Kind of masonry	Brick	Valid anchor rods, internal threaded rods and perforated sleeves	
Brick No. 1 Solid brick Mz according to EN 771-2 $\rho \geq 1,8$ [kg/dm ³] $fb \geq 10$ or 20 [N/mm ²]			M8; M10; M12 FIS E 11x85
Brick No. 2 Solid sand-lime brick according to EN 771-2 $\rho \geq 1,8$ [kg/dm ³] $fb \geq 10$ or 20 [N/mm ²]			M8; M10; M12 FIS E 11x85
Brick No. 3 Solid sand-lime brick according to EN 771-2 $\rho \geq 1,8$ [kg/dm ³] $fb \geq 10$ or 20 [N/mm ²]			FIS H 12x85 K FIS H 16x85 K FIS H 20x85 K FIS H 16x130 K FIS H 20x130 K
Brick No. 4 Sand-lime hollow brick according to EN 771-2 $\rho \geq 1,4$ [kg/dm ³] $fb \geq 12$ or 20 [N/mm ²]			FIS H 12x85 K FIS H 16x85 K FIS H 20x85 K FIS H 16x130 K FIS H 20x130 K
Brick No. 5 Perforated brick HLz according to EN 771-1 $\rho \geq 0,9$ [kg/dm ³] $fb \geq 10$ [N/mm ²]			FIS H 12x85 K FIS H 16x85 K FIS H 20x85 K FIS H 16x130 K FIS H 20x130 K
Brick No. 6 Perforated brick HLz according to EN 771-1 $\rho \geq 1,4$ [kg/dm ³] $fb \geq 20$ [N/mm ²]			FIS H 12x85 K FIS H 16x85 K FIS H 20x85 K

¹⁾ Other combinations can be used after job site tests acc. to TR 053.

²⁾ Sleeve/anchor rod combination see table B1.3

The β - factor for this job site tests are given in Table C4

Imaging of the bricks are not scaled

fischer Injection system FIS HT II for masonry

Intended Use

Allocation of anchor rods, perforated sleeves and bricks, part 1

Annex B 9

Table B5.2: Allocation of anchor rods¹⁾, perforated sleeves¹⁾²⁾ and perforated or solid bricks

Kind of masonry	Brick	Valid anchor rods internal threaded rods and perforated sleeves	
Brick No. 7 Perforated brick HLz according to EN 771-1 $\rho \geq 1,0$ [kg/dm ³] $f_b \geq 10$ [N/mm ²]			FIS H 12x85 K FIS H 16x85 K FIS H 20x85 K FIS H 20x130 K
Brick No. 8 Perforated brick HLz filled with mineral wool according to EN 771-1 $\rho \geq 0,6$ [kg/dm ³] $f_b \geq 8$ [N/mm ²]			FIS H 12x85 K FIS H 16x85 K FIS H 20x85 K FIS H 16x130 K FIS H 20x130 K FIS H 20x200 K
Brick-No. 9 Light-weight concrete hollow block Hbl according to EN 771-1 $\rho \geq 1,0$ [kg/dm ³] $f_b \geq 4$ [N/mm ²]			FIS H 12x85 K FIS H 16x85 K FIS H 20x85 K FIS H 16x130 K FIS H 20x130 K
Brick No. 10 Autoclaved aerated concrete block $\rho \geq 0,35, 0,5$ or $0,65$ [kg/dm ³] $f_b \geq 2, 4$ or 6 [N/mm ²]			M8; M10; M12
			FIS E 11x85 M6 FIS E 11x85 M8 FIS E 15x85 M10 FIS E 15x85 M12

¹⁾ Other combinations can be used after job site tests acc. to TR 053.

²⁾ Sleeve/anchor rod combination see table B1.3

The β - factor for this job site tests are given in Table C4

Imaging of the bricks are not scaled

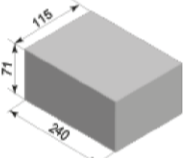
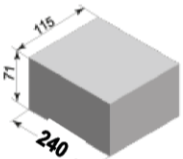
fischer Injection system FIS HT II for masonry

Intended use

Allocation of anchor rods, perforated sleeves and bricks, part 2

Annex B 10

Table C1.1: Characteristic values of resistance under tension loads and under shear loads

Brick	Density ρ [kg/dm ³] - Compressive strength f_b [N/mm ²]	Perforated sleeve FIS H...K	Anchor size or screw size in internal threaded anchor	Effective anchorage depth		Characteristic resistance [kN]		
				$h_{ef,min}$ [mm]	$h_{ef,max}$ [mm]	N_{Rk}		V_{Rk}
						Temp. 50/80°C		All categories
				d/d	w/w			
 <p>No.1 Solid brick Mz</p>	$\rho \geq 1,8$ $f_b \geq 10$	without	M8	50	200	4,0	2,5	2,5
			M10	50	79	3,5	2,0	4,0
			M10	80	199	5,0	3,0	
			M10	200	200	8,5	7,5	8,5
			M12	50	79	3,0	2,0	4,0
			M12	80	199	5,5	3,5	
			M12	200	200	8,0	5,0	8,5
	FIS E11x85 M6/ M8,		85	85	5,5	3,5	2,5	
	$\rho \geq 1,8$ $f_b \geq 20$		M8	50	200	5,5	3,5	4,0
			M10	50	79	5,0	3,0	6,0
			M10	80	199	7,0	4,5	
			M10	200	200	8,5	8,5	8,5
			M12	50	79	4,5	3,0	5,5
			M12	80	199	8,0	5,0	
M12		200	200	8,5	7,0	8,5		
FIS E11x85 M6/ M8,	85	85	8,0	5,0	4,0			
 <p>No.2 Solid sand-lime brick</p>	$\rho \geq 1,8$ $f_b \geq 10$	without	M8	50	200	2,5	1,5	4,0
			M10	50	79			
			M10	80	199			
			M10	200	200	8,5	6,0	5,0
			M12	50	79	2,5	1,5	
			M12	80	199			
			M12	200	200	8,5	6,5	3,0
	FIS E11x85 M6/ M8,		85	85	2,5	1,5	3,0	
	$\rho \geq 1,8$ $f_b \geq 20$		M8	50	200	3,5	2,0	5,5
			M10	50	79			
			M10	80	199			
			M10	200	200	8,5	8,5	7,0
			M12	50	79	3,5	2,0	
			M12	80	199			
M12		200	200	8,5	8,5	4,0		
FIS E11x85 M6/ M8,	85	85	3,5	2,0	4,0			

Imaging of the bricks are not scaled

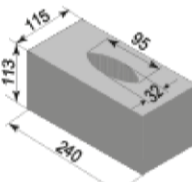
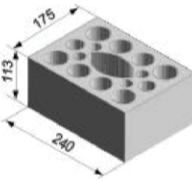
fischer Injection system FIS HT II for masonry

Performances

Characteristic values of resistance under tension loads and under shear loads, part 1

Annex C 1

Table C1.2: Characteristic values of resistance under tension loads and under shear loads

Brick	Density ρ [kg/dm ³] - Compressive strength f_b [N/mm ²]	Perforated sleeve FIS H...K	Anchor size or screw size in internal threaded anchor	Effective anchorage depth		Characteristic resistance [kN]		
				$h_{ef,min}$ [mm]	$h_{ef,max}$ [mm]	N _{Rk}		V _{Rk}
						Temp. 50/80°C		
						d/d	w/w	All categories
 <p>No.3 Solid sand-lime brick</p>	$\rho \geq 1,8$ $f_b \geq 10$	12x85	M8	85	85	6,0	3,5	3,0
		16x85	FIS E 11x85 M6	85	85	3,5	2,0	
		16x85	M8/M10, FIS E 11x85 M8	85	85	3,5	2,0	3,5
		20x85	M12, FIS E 15x85	85	85	8,5	6,5	
		16x130	M8/M10	110	130	3,5	2,0	
		20x130	M12	110	130	7,0	4,5	
	$\rho \geq 1,8$ $f_b \geq 20$	12x85	M8	85	85	8,5	5,0	4,5
		16x85	FIS E 11x85 M6	85	85	5,5	3,0	
		16x85	M8/M10, FIS E 11x85 M8	85	85	5,5	3,0	5,5
		20x85	M12, FIS E 15x85	85	85	8,5	8,5	
		16x130	M8/M10	110	130	5,0	3,0	
		20x130	M12	110	130	8,5	6,0	
 <p>No.4 Sand-lime hollow brick</p>	$\rho \geq 1,4$ $f_b \geq 12$	12x85	M8	85	85	2,5	2,5	2,5
		16x85	FIS E 11x85 M6	85	85	3,0	2,5	
		16x85	M8/M10, FIS E 11x85 M8	85	85	3,0	2,5	4,5
		20x85	M12, FIS E 15x85	85	85	3,5	3,0	4,5
		16x130	M8/M10	110	130			
		20x130	M12	110	130			
	$\rho \geq 1,4$ $f_b \geq 20$	12x85	M8	85	85	4,5	4,0	4,5
		16x85	FIS E 11x85 M6	85	85	5,0	4,0	4,0
		16x85	M8/M10, FIS E 11x85 M8	85	85	5,0	4,5	7,5
		20x85	M12, FIS E 15x85	85	85	6,0	5,5	7,5
		16x130	M8/M10	110	130			
		20x130	M12	110	130			

Imaging of the bricks are not scaled

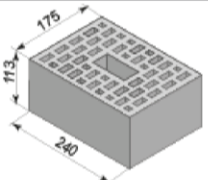
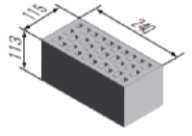
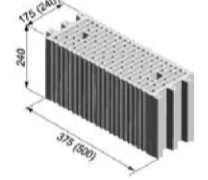
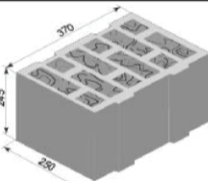
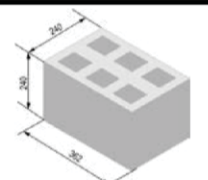
fischer Injection system FIS HT II for masonry

Performances

Characteristic values of resistance under tension loads and under shear loads, part 2

Annex C 2

Table C1.3: Characteristic values of resistance under tension loads and under shear loads

Brick	Density ρ [kg/dm ³] - Compressive strength f_b [N/mm ²]	Perforated sleeve FIS H...K	Anchor size or screw size in internal threaded anchor	Effective anchorage depth		Characteristic resistance [kN]		
				$h_{ef,min}$ [mm]	$h_{ef,max}$ [mm]	N _{Rk}		V _{Rk}
						Temp. 50/80°C		
				d/d	w/w	All categories		
 No.5 Perforated brick	$\rho \geq 0,9$ $f_b \geq 10$	12x85	M8	85	85	4,0	3,5	4,0
		16x85	FIS E 11x85 M6	85	85	3,5	3,5	4,0
		16x85	M8/M10, FIS E 11x85 M8	85	85	3,5	3,5	5,5
		20x85	M12, FIS E 15x85	85	85	5,0	4,5	6,0
		16x130	M8/M10	110	130	5,0	4,5	5,5
		20x130	M12	110	130	5,0	4,5	6,0
 No.6 Perforated brick	$\rho \geq 1,4$ $f_b \geq 20$	12x85	M8	85	85	4,0	3,5	7,5 (5,5) ¹⁾
		16x85	FIS E 11x85 M6	85	85	2,5		4,0
		16x85	M8/M10, FIS E 11x85 M8	85	85	2,5		4,5
		20x85	M12, FIS E 15x85	85	85	3,0		8,5 (5,5) ¹⁾
 No.7 Perforated brick	$\rho \geq 1,0$ $f_b \geq 10$	12x85	M8	85	85	0,9		1,2
		16x85	M8/M10, FIS E 11x85	85	85	2,5		
		20x85	M12, FIS E 15x85	85	85	2,5		
		16x130	M8/M10	110	130			1,5
		20x130	M12	110	130	3,5	3,0	1,5
 No.8 Perforated brick	$\rho \geq 0,6$ $f_b \geq 8$	12x85	M8	85	85	2,0	2,0	2,5
		16x85	FIS E 11x85 M6	85	85	2,0	1,5	2,5
		16x85	M8/M10, FIS E 11x85 M8	85	85	2,0	1,5	3,0
		20x85	M12, FIS E 15x85	85	85	2,0	2,0	1,5
		16x130	M8/M10	130	130	3,0	2,5	3,0
		20x130	M12	110	130	2,0	2,0	1,5
		20x200	M12	180	200	3,0	3,0	1,5
 No.9 Light-weight concrete hollow block	$\rho \geq 1,0$ $f_b \geq 4$	12x85	M8	85	85	3,0		2,0
		16x85	M8/M10, FIS E 11x85	85	85			
		20x85	M12, FIS E 15x85	85	85			
		16x130	M8/M10	110	130			
		20x130	M12	110	130			

¹⁾ Characteristic value of pushing out of one brick $V_{Rk,pb} = 5,5$ kN

Imaging of the bricks are not scaled

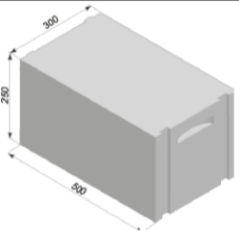
fischer Injection system FIS HT II for masonry

Performances

Characteristic values of resistance under tension loads and under shear loads, part 3

Annex C 3

Table C1.4: Characteristic values of resistance under tension loads and under shear loads

Brick	Density ρ [kg/dm ³] - Compressive strength f_b [N/mm ²]	Perforated sleeve FIS H...K	Anchor size or screw size in internal threaded anchor	Effective anchorage depth		Characteristic resistance [kN]			
				$h_{ef,min}$ [mm]	$h_{ef,max}$ [mm]	Temp. 50/80°C		All categories	
						d/d	w/w		
									N _{Rk}
 <p>No.10 Autoclaved Aerated concrete block</p>	$\rho \geq 0,35$ $f_b \geq 2$	without	M8	100	120	1,5		1,2	
			M10	100	120			1,2	
			M12	100	120			1,5	
			FIS E 11x85 FIS E 15x85	85				1,2	
	$\rho \geq 0,5$ $f_b \geq 4$	without	M8	100	120	2,0		2,5	
			M10	100	120			2,5	
			M12	100	120	2,0		2,5	
			FIS E 11x85 FIS E 15x85	85				2,0	
	$\rho \geq 0,65$ $f_b \geq 6$	without	M8	100	120	3,5	3,0		3,0
			M10	100	120				3,0
			M12	100	120	5,0	4,5		3,5
			FIS E 11x85 FIS E 15x85	85					3,5

Imaging of the bricks are not scaled

fischer Injection system FIS HT II for masonry

Performances

Characteristic values of resistance under tension loads and under shear loads, part 4

Annex C 4

Table C2: Characteristic bending moments for threaded rods

Size				M8	M10	M12
Characteristic bending moment $M_{Rk,s}$	Zinc-plated steel	Property class	5.8 [Nm]	19	37	65
			8.8 [Nm]	30	60	105
	Stainless steel A4	Property class	50 [Nm]	19	37	65
			70 [Nm]	26	52	92
			80 [Nm]	30	60	105
	High corrosion-resistant steel C	Property class	50 [Nm]	19	37	65
			70 ¹⁾ [Nm]	26	52	92
			80 [Nm]	30	60	105

¹⁾ $f_{uk} = 700 \text{ N/mm}^2$; $f_{yk} = 560 \text{ N/mm}^2$

Table C2.1: Characteristic bending moments for internal threaded anchors FIS E

Size FIS E				11x85 M6	11x85 M8	15x85 M10	15x85 M12
Characteristic bending moments $M_{Rk,s}$	zinc plated steel,	Property class of screw	5.8 [Nm]	8	19	37	65
			8.8 [Nm]	12	30	60	105
	stainless steel A4	Property class of screw	70 [Nm]	11	26	52	92
			high corrosion resistant steel C	Property class of screw	70 [Nm]	11	26

Tabelle C3: Displacements under tension loads and shear loads

Material	N [kN]	δN_0 [mm]	δN_∞ [mm]	V [kN]	δV_0 [mm]	δV_∞ [mm]
solid units and autoclaved aerated concrete	$\frac{N_{Rk}}{1,4 * \gamma_M}$	0,03	0,06	$\frac{V_{Rk}}{1,4 * \gamma_M}$	0,59	0,88
hollow units	$\frac{N_{Rk}}{1,4 * \gamma_M}$	0,03	0,06	$\frac{V_{Rk}}{1,4 * \gamma_M}$	1,71	2,56

fischer Injection system FIS HT II for masonry

Performances

Characteristic bending moments; displacements

Annex C 5

Table C4: β - factor for job site tests according to TR 053

Using categories		w/w	d/d
Temperature range [°C]		50/80	50/80
Brick	Size ¹⁾		
Solid brick	M8	0,57	0,96
	M10	0,59	
	M12 FIS E 11x85 FIS E 15x85	0,60	
Hollow brick	All sizes	0,86	0,96
Autoclaved aerated concrete	All size	0,73	0,81

fischer Injection system FIS HT II for masonry

Performances
 β - factors for job site tests

Annex C 6

Table C5: Edge distance and spacing

Direction to bed joint		⊥			∥		Group factor				Min. thickness of the masonry members [mm]
Brick No.	h _{ef} [mm]	C _{cr} = C _{min}	s _{min}	s _{cr}	s _{min}	s _{cr}	⊥		∥		
		[mm]	[mm]	[mm]	[mm]	[mm]	α _{g,N}	α _{g,V}	α _{g,N}	α _{g,V}	
1	50	100	75	60 ¹⁾	150	2	2	1,5	1,4	h _{ef} + 30 (≥ 80)	
	80	100	75	60 ¹⁾	240	2	2	1,5	1,4		
	200	150	75		240	2					
2	50	100	75		240	2					
	80	100	75		240	2					
	200	150	75		240	2					
3	85	100	115		240	2					
	130	100	115		240	2					
4	all sizes	100	115	100	240	2	2	1,5	1,5		
5	all sizes	100	115		240	2					
6	all sizes	100	115		240	2					
7	all sizes	100	100	240	100	$\frac{375}{(500)^2}$	1	1	1	1	
8	all sizes	120	245		250	2					
9	all sizes	80	240		365	2					
10	all sizes	100	250		300	2					

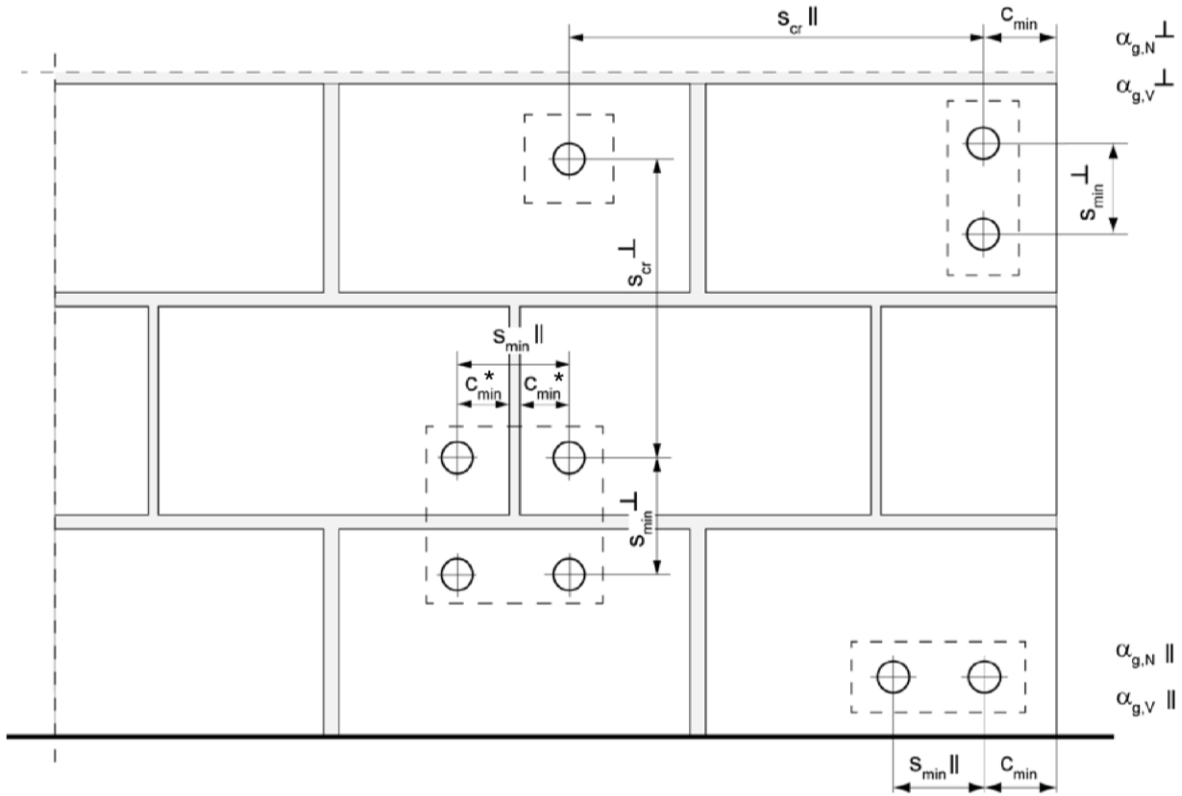
¹⁾ only valid for tension loads, for shear loads $s_{min} \parallel = s_{cr} \parallel$

²⁾ spacing depending on brick dimension, brick dimension see table B4, brick 7

fischer Injection system FIS HT II for masonry

Performances
Edge distance and spacing

Annex C 7



* Only, if joints are visible and vertical joints are not 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 tension load parallel to bed joint
- $\alpha_{g,V \parallel}$ = Group factor for shear load parallel to bed joint
- $\alpha_{g,N \perp}$ = Group factor for tension load vertical to bed joint
- $\alpha_{g,V \perp}$ = Group factor for shear load vertical to bed joint

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

For $s_{min} \leq s \leq s_{cr}$ α_g according to table C5

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

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

fischer Injection system FIS HT II for masonry

Annex C 8

Performances

Definition of minimum edge distance, minimum spacing and group factors

DÉCLARATION DES PERFORMANCES

DoP 0178

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

FR

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



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

-

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

Signé pour le fabricant et en son nom par:

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

Peter Schillinger, Dipl.-Ing.

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

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

Specific Part

1 Technical description of the product

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

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

The product description is given in Annex A.

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

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

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

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

3.1 Mechanical resistance and stability (BWR 1)

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

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1

3.3 Hygiene, health and the environment (BWR 3)

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

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

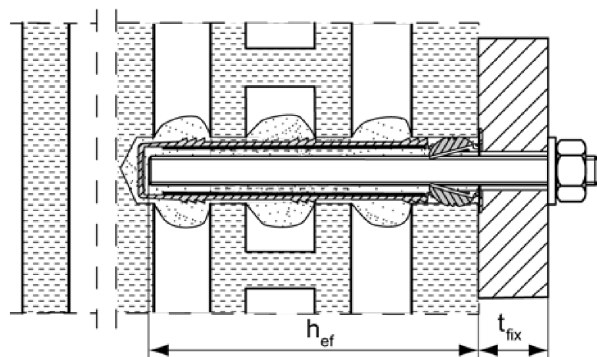
In accordance with the European Assessment Document EAD 330076-00-0604 the applicable European legal act is: [97/177/EC].

The system to be applied is: 1

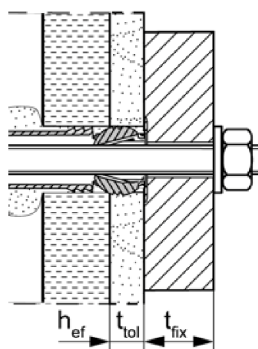
Installation conditions part 1

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

Pre-positioned anchorage:

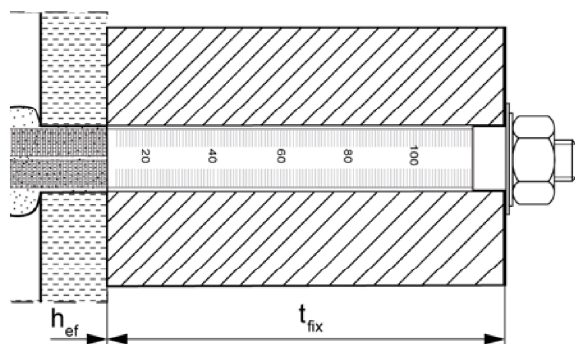


Installation with render bridge

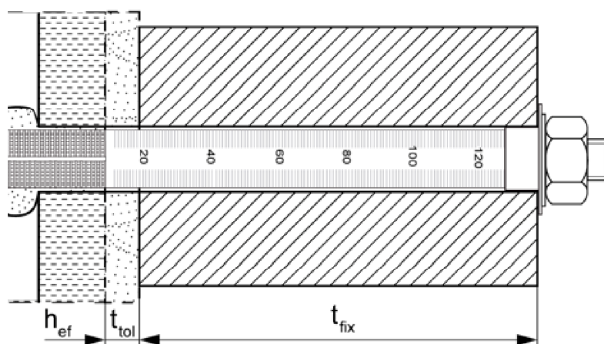


Size of the perforated sleeve: FIS H 12x50 K FIS H 16x85 K FIS H 20x85 K FIS H 20x200 K
 FIS H 12x85 K FIS H 16x130 K FIS H 20x130 K

Push through anchorage:



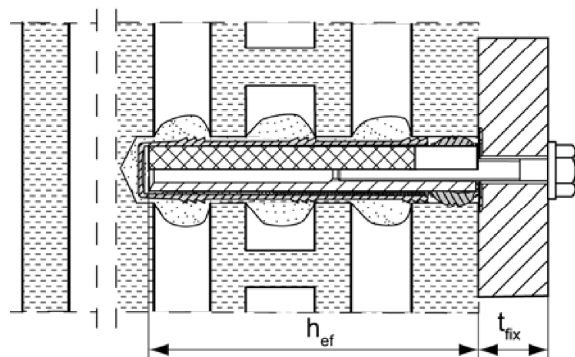
Installation with render bridge



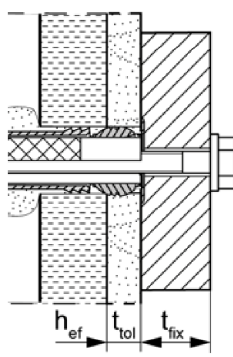
Size of the perforated sleeve: FIS H 18x130/200 K FIS H 22x130/200 K

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

Pre-positioned anchorage:



Installation with render bridge



Pictures not to scale

h_{ef} = effective anchorage depth

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

t_{fix} = thickness of fixture

fischer injektion system FIS HT II masonry

Product description

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

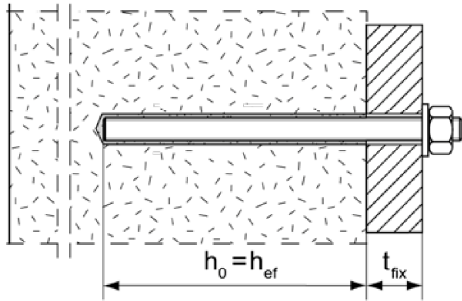
Annex A 1

Appendix 2/ 55

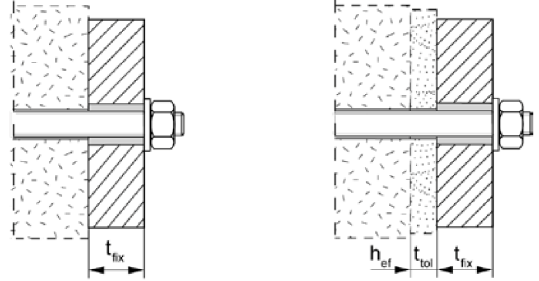
Installation conditions part 2

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

Pre-positioned anchorage:



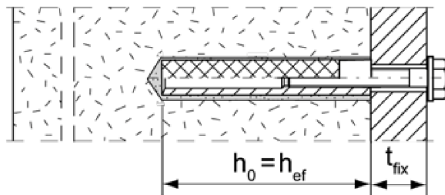
Push through anchorage: Annular gap filled with mortar



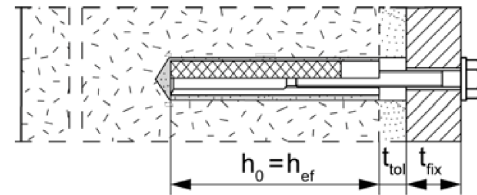
Installation with
render bridge

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

Pre-positioned anchorage:



Installation with render bridge



Pictures not to scale

h_0 = depth of drill hole

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

h_{ef} = effective anchorage depth

t_{fix} = thickness of fixture

fischer injektion system FIS HT II masonry

Product description

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

Annex A 2

Appendix 3/ 55

Overview system components part 1

Mortar cartridge (shuttle cartridge) with sealing cap

1

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

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

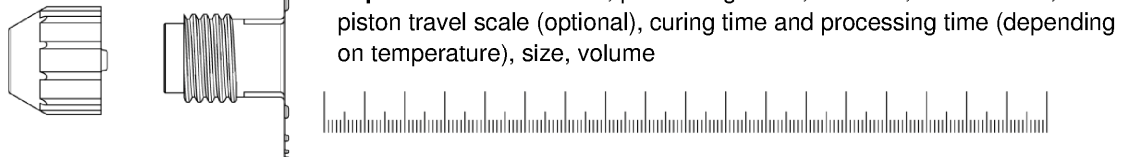


Mortar cartridge (coaxial cartridge) with sealing cap

1

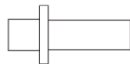
Size: 100 ml, 150 ml, 300 ml, 380 ml, 400 ml, 410 ml

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

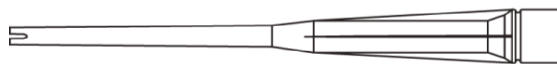


Static mixer MR Plus with injection adapter

Injection adapter



Static mixer



Cleaning brush BS / BSB



Blow-out pump ABG or ABP



Pictures not to scale

fischer injektion system FIS HT II masonry

System description

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

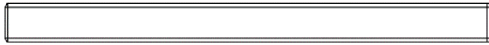
Annex A 3

Appendix 4/ 55

Overview system components part 2

fischer anchor rod

②



Size: M6, M8, M10, M12, M16

Internal threaded anchor FIS E

⑤



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

Perforated sleeve FIS H K

⑦



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

⑦



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

Perforated sleeve FIS H K (push through anchorage)

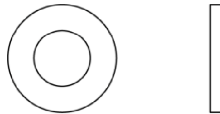
⑦



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

Washer

③



Hexagon nut

④



Pictures not to scale

fischer injektion system FIS HT II masonry

System description

Overview system components part 2: steel parts / perforated sleeve

Annex A 4

Appendix 5/ 55

Table A5.1: Materials

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



fischer injektion system FIS HT II masonry

Product description
Materials**Annex A 5**

Appendix 6/ 55

Specifications of intended use (part 1)

Table B1.1: Overview use and performance conditions

Anchorages subject to		fischer injection system FIS HT II masonry	
Hole drilling with hammer drill mode 		all bricks	
Hole drilling with rotary drill mode 		all bricks	
Static and quasi static load, in masonry		all bricks	
Condition	dry or wet masonry	all bricks	
Installation	Pre-positioned anchorage	Anchor rod or internal threaded anchor (in solid brick masonry)	Perforated sleeve with anchor rod or internal threaded anchor (in perforated and solid brick masonry) Size: FIS H 12x50 K FIS H 12x85 K FIS H 16x85 K FIS H 16x130 K FIS H 20x85 K FIS H 20x130 K FIS H 20x200 K
	Push through anchorage	Anchor rod (in solid brick masonry)	Perforated sleeve with anchor rod (in perforated and solid brick masonry) Size: FIS H 18x130/200 K FIS H 22x130/200 K
Installation conditions	condition d/d	all bricks	
	condition w/d		
	condition w/w		
Installation temperature	0°C to +40°C		
In-service temperature	-40°C to +80°C	max. short term temperature +80 °C and max. long term temperature +50 °C	
	-40°C to +120°C	max. short term temperature +120 °C and max. long term temperature +72 °C	

fischer injektion system FIS HT II masonry

Intended Use
Specifications (part 1)

Annex B 1

Appendix 7/ 55

Specifications of intended use (part 2)

Anchorage subject to:

- Static and quasi-static loads

Base materials:

- Solid brick masonry (masonry group b), acc. to Annex B 13
- Hollow brick masonry (masonry group c), according to Annex B 13
- For minimum thickness of masonry member is $h_{ef}+30\text{mm}$
- Mortar strength class of the masonry M2,5 at minimum according to EN 998-2:2010
- For other bricks in solid masonry, hollow or perforated masonry, the characteristic resistance of the anchor may be determined by job site tests according to Technical Report TR 053, April 2016, Annex C under consideration of the β -factor according to Annex C 36, Table C36.1

Note (only applies to solid bricks):

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

Temperature Range:

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

Use conditions (Environmental conditions):

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

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

fischer injektion system FIS HT II masonry

Intended Use
Specifications (part 2)

Annex B 2

Appendix 8/ 55

Specifications of intended use (part 3)

Design:

- The anchorages have to be designed in accordance with the Technical Report TR054, April 2016, Design method A under the responsibility of an engineer experienced in anchorages and masonry work.

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

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

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

For the Calculation of pulling out a brick under tensile load $N_{Rk,pb}$ or pushing out a brick under shear load $V_{Rk,pb}$ see Technical Report TR 054, April 2016.

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

Factors for job site tests and displacements see Annex C36

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

Installation:

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

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

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

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

fischer injektion system FIS HT II masonry

Intended Use
Specifications (part 3)

Annex B 3

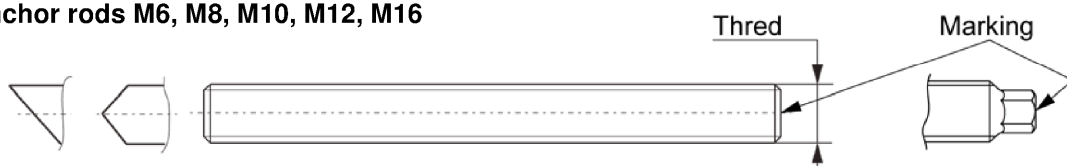
Appendix 9/ 55

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

Anchor rod	Thread	M6	M8	M10	M12	M16
Nominal drill hole diameter	d_0 [mm]	8	10	12	14	18
Effective anchorage depth h_{ef} 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 M6, M8, M10, M12, M16



Marking:

Property class 8.8, stainless steel A4 property class 80 and

high corrosion resistant steel C property class 80: •

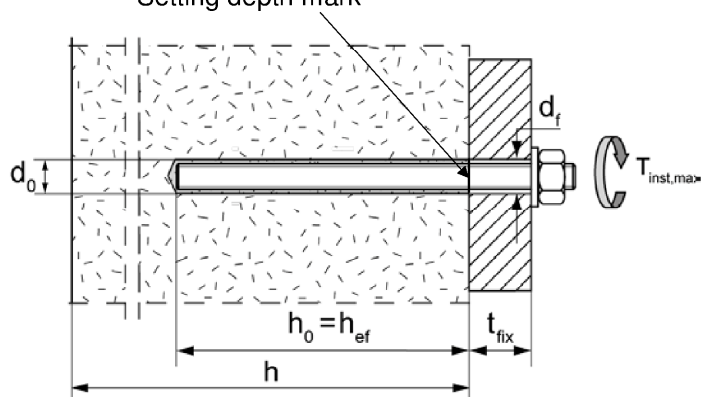
Stainless steel A4 property class 50 and high corrosion resistant steel C property class 50: ••

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

Installation conditions:

Anchor rod in cylindrical drill hole

Setting depth mark



Pictures not to scale

fischer injektion system FIS HT II masonry

Intended Use

Installation parameters for anchor rods without perforated sleeve

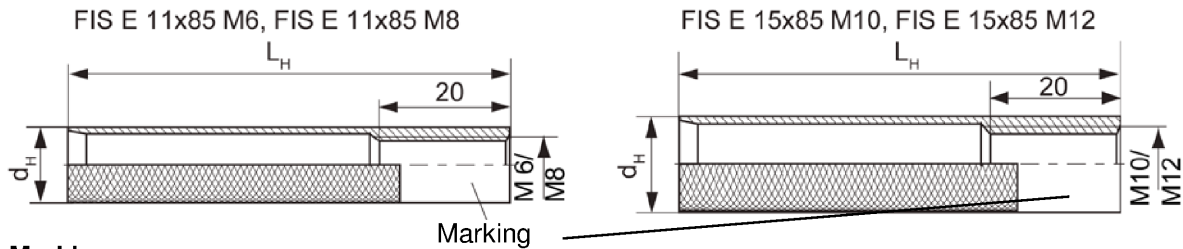
Annex B 4

Appendix 10/ 55

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

Internal threaded anchor FIS E		11x85 M6	11x85 M8	15x85 M10	15x85 M12
Diameter of anchor	d_H [mm]	11		15	
Nominal drill hole diameter	d_0 [mm]	14		18	
Length of anchor	L_H [mm]	85			
Effective anchorage depth	$h_0 = h_{ef}$ [mm]	85			
Effective anchorage depth h_{ef} in AAC (conical drill hole)	h_0 [mm]	100		-	
	h_{ef} [mm]	85			
Diameter of cleaning brush	$d_b \geq$ [mm]	see Table B8.1			
Maximum installation torque	$T_{inst,max}$ [Nm]	see parameters of brick			
Diameter of clearance hole in the fixture	d_f [mm]	7	9	12	14
Screw-in depth	$l_{E,min}$ [mm]	6	8	10	12
	$l_{E,max}$ [mm]	60			

fischer Internal threaded anchor FIS E

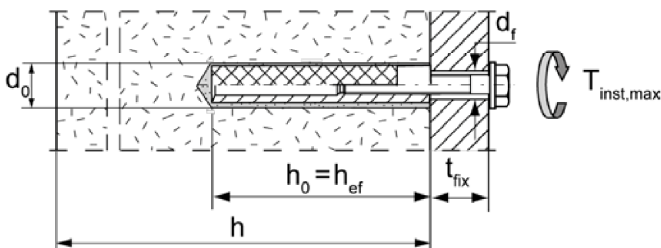


Marking:

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

Installation conditions:

Internal threaded anchor in cylindrical drill hole



Pictures not to scale

fischer injektion system FIS HT II masonry

Intended Use

Installation parameters for anchor rods without perforated sleeve

Annex B 5

Appendix 11/ 55

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

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

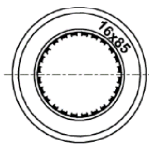
²⁾ Bridging of unbearing layer (e.g. plaster) is possible. When reducing the effective anchorage depth $h_{\text{ef, min}}$, the values of the next shorter perforated sleeve of the same diameter must be used. The smaller value of characteristic resistance must be taken.

Perforated sleeve

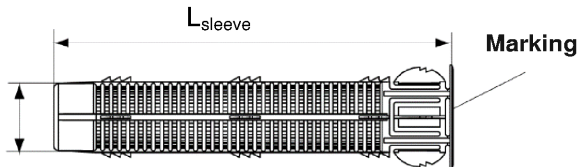
FIS H 12x50 K; FIS H 12x85 K; FIS H 16x85 K; FIS H 16x130 K;
FIS H 20x85 K; FIS H 20x130 K; FIS H 20x200 K

Marking:

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

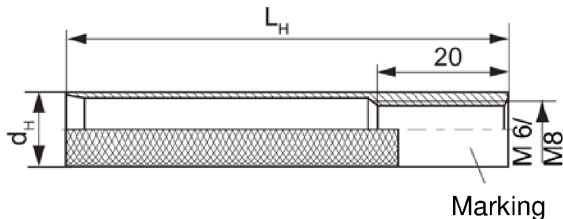


$D_{\text{sleeve, nom}}$

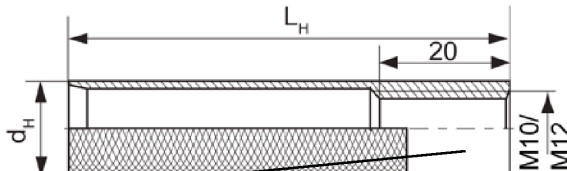


fischer Internal threaded anchor FIS E

FIS E 11x85 M6, FIS E 11x85 M8

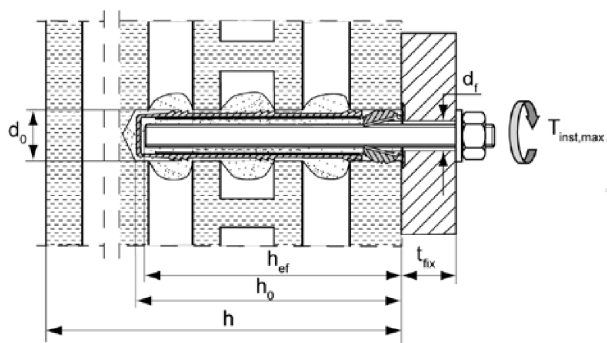


FIS E 15x85 M10, FIS E 15x85 M12

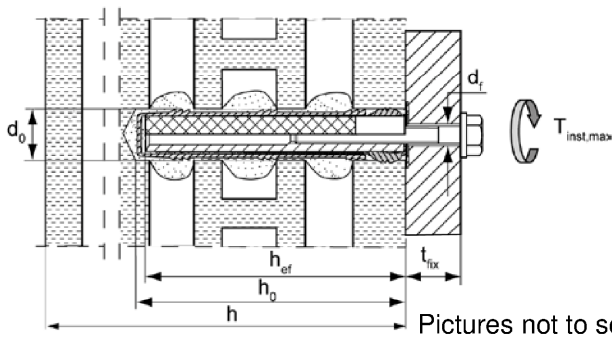


Installation conditions:

Anchor rod with perforated sleeve



Internal threaded anchor with perforated sleeve



Pictures not to scale

fischer injektion system FIS HT II masonry

Intended Use

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

Annex B 6

Appendix 12/ 55

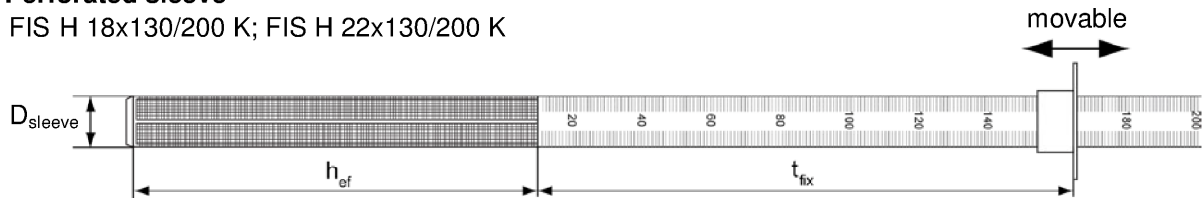
Table B7.1: Installation parameters for anchor rods with perforated sleeves (push through anchorage)

Perforated sleeve FIS H K		18x130/200		22x130/200	
Nominal sleeve diameter	$D_{\text{sleeve, nom}}$ [mm]	16		20	
Nominal drill hole diameter	d_0 [mm]	18		22	
Depth of drill hole	h_0 [mm]	135 + t_{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	M16	
Maximum installation torque	$T_{\text{inst, max}}$ [Nm]	see parameters of brick			
Thickness of fixture	$t_{\text{fix, max}}$ [mm]	200			

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

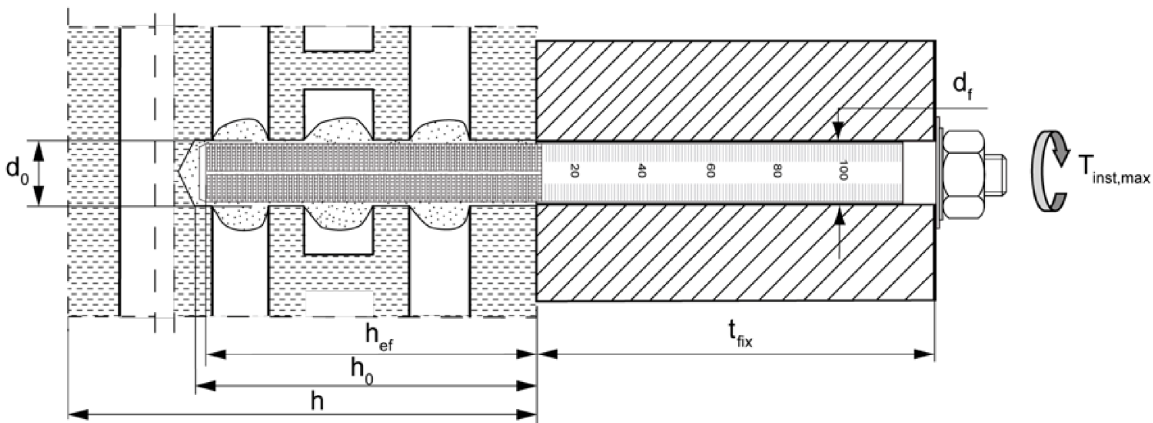
Perforated sleeve

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 HT II masonry

Intended Use

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

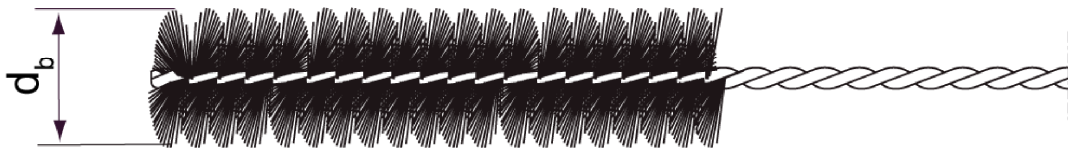
Annex B 7

Appendix 13/ 55

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

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

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



Only for solid bricks and solid areas in perforated bricks

Table B8.2: Maximum processing times and minimum curing times
(During the curing time of the mortar the masonry temperature may not fall below the listed minimum temperature)

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

¹⁾ For wet bricks the curing time must be doubled

²⁾ Minimum cartridge temperature +5°C

Pictures not to scale

fischer injektion system FIS HT II masonry

Intended use

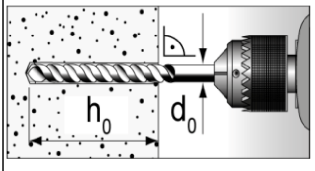
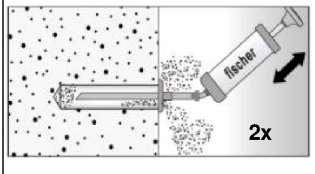
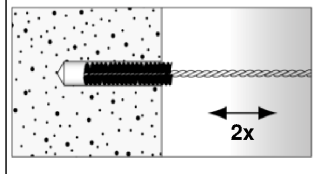
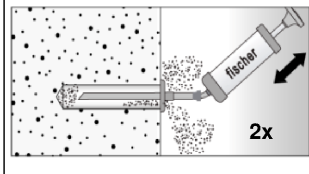
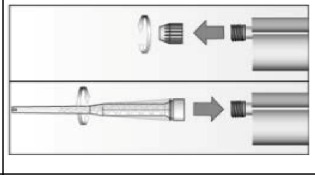

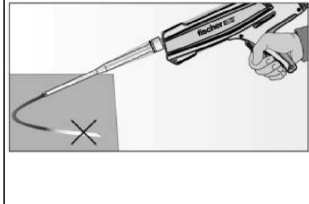
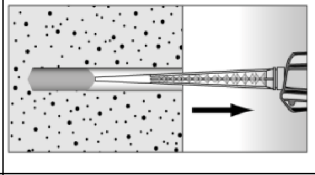
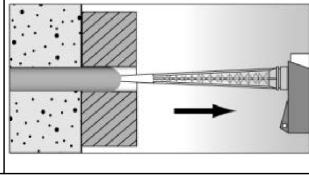
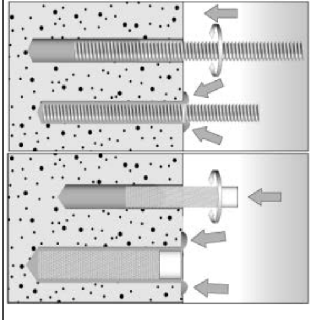

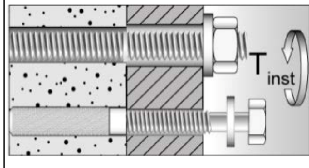
Cleaning brush (steel brush)
Maximum processing times and minimum curing times

Annex B 8

Appendix 14/ 55

Installation instruction part 1

Installation in solid brick (without perforated sleeve)

1		<p>Drill the hole (drilling method see Annex C of the respective brick) depth of drill hole h_0 and drill hole diameter d_0 see Tables B4.1; B5.1</p>	
2			 <p>Blow out the drill hole twice. Brush twice and blow out twice again.</p>
3		<p>Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible)</p>	
4		<p>Place the cartridge into a suitable dispenser</p>	 <p>Press out approximately 10 cm of mortar until the resin is permanently grey in colour. Mortar which is not grey in colour will not cure and must be disposed of.</p>
5		<p>Fill approximately 2/3 of the drill hole with mortar beginning from the bottom of the hole¹⁾. Avoid bubbles!</p>	 <p>For push through anchorage fill the annular clearance with mortar.</p>
6		<p>Only use clean and oil-free anchor elements. Mark the anchor rod for setting depth. Insert the anchor rod or internal threaded anchor FIS E by hand using light turning motions. When reaching the setting depth marking, excess mortar must emerge from the mouth of the drill hole.</p>	
7		<p>Do not touch. Minimum curing time see Table B8.2</p>	 <p>Mounting the fixture. $T_{inst,max}$ see parameter of brick.</p>

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

fischer injektion system FIS HT II masonry

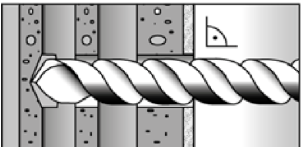
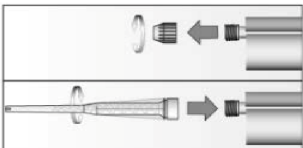


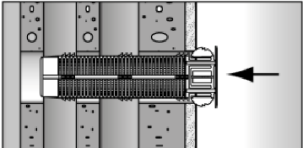
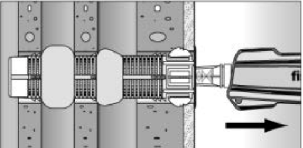
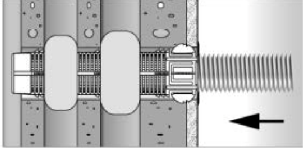

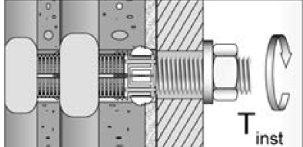
Intended use
Installation instruction (without perforated sleeve) part 1

Annex B 9

Appendix 15/ 55

Installation instruction part 2

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

1		<p>Drill the hole (drilling method see Annexes C). depth of drill hole h_0 and drill hole diameter d_0 see Table B6.1</p>	<p>When install perforated sleeves in solid bricks or solid areas of hollow bricks, also clean the hole by blowing out and brushing.</p>
2		<p>Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible)</p>	
3		<p>Place the cartridge into a suitable dispenser.</p>	 <p>Press out approximately 10 cm of mortar until the resin is permanently grey in colour. Mortar which is not grey in colour will not cure and must be disposed of.</p>
4		<p>Insert the perforated sleeve flush with the surface of the masonry or plaster.</p>	 <p>Fill the perforated sleeve completely with mortar beginning from the bottom of the hole¹⁾.</p>
5		<p>Only use clean and oil-free anchor elements. Mark the anchor rod for setting depth. Insert the anchor rod or the internal threaded anchor FIS E by hand using light turning motions until reaching the setting depth marking (anchor rod) or flush with the surface (internal threaded anchor).</p>	
6		<p>Do not touch. Minimum curing time see Table B8.2</p>	 <p>Mounting the fixture. $T_{inst,max}$ see parameter of brick.</p>

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

fischer injektion system FIS HT II masonry

Intended use

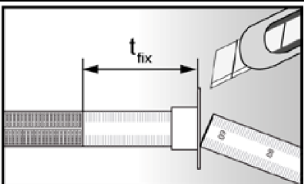
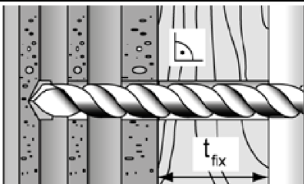
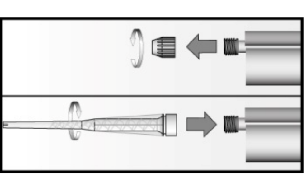
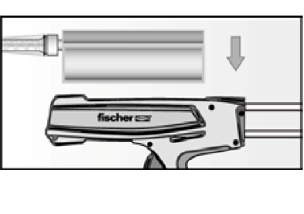
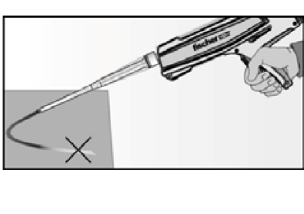
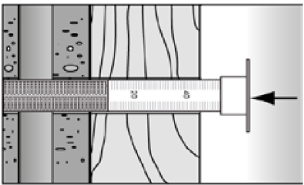
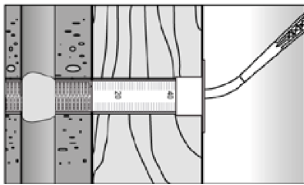
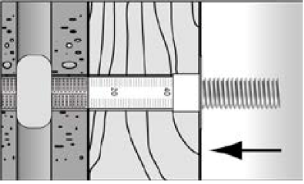
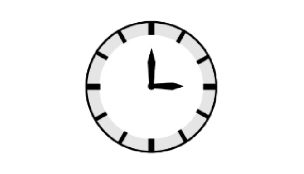
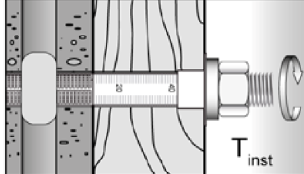
Installation instruction (with perforated sleeve) part 2

Annex B 10

Appendix 16/ 55

Installation instruction part 3

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

1		<p>Push the movable stop up to the correct thickness of fixture and cut the overlap.</p>		<p>Drill the hole through the fixture. Depth of drill hole ($h_0 + t_{fix}$) and drill hole diameter see Table B7.1</p>
2		<p>Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible)</p>		
3		<p>Place the cartridge into a suitable dispenser.</p>		<p>Press out approximately 10 cm of mortar until the resin is permanently grey in colour. Mortar which is not grey in colour will not cure and must be disposed of.</p>
4		<p>Insert the perforated sleeve flush with the surface of the fixture into the drill hole.</p>		<p>Fill the sleeve with mortar beginning from the bottom of the hole.¹⁾ For deep drill holes use an extension tube.</p>
5		<p>Only use clean and oil-free anchor elements. Mark the anchor rod for setting depth. Insert the anchor rod or the internal threaded anchor FIS E by hand using light turning motions until reaching the setting depth marking (anchor rod) or flush with the surface (internal threaded anchor).</p>		
6		<p>Do not touch. Minimum curing time see Table B8.2</p>		<p>Mounting the fixture. $T_{inst,max}$ see parameter of brick.</p>

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

Table B12.1: Overview of controlled bricks

Kind of masonry	Brick format [mm]	Compressive strength f_b N/mm ²	Producing country	Density ρ [kg/dm ³]	Annex
Solid brick Mz					
Solid brick Mz	2DF $\geq 240 \times 115 \times 113$	10 - 16	Germany	$\geq 1,8$	C4/C5
Solid sand- lime brick KS / perforated Sand- lime brick KSL					
Solid sand- lime brick KS	NF $\geq 240 \times 115 \times 71$	12 - 28	Germany	$\geq 2,0$	C6/C7
Solid sand- lime brick KS	8DF $\geq 250 \times 240 \times 240$	10 - 28	Germany	$\geq 2,0$	C8/C9
Perforated Sand- lime brick KSL	3DF $240 \times 175 \times 113$	8 - 20	Germany	$\geq 1,4$	C10 – C13
Vertical perforated brick HLz					
Vertical perforated brick HLz	$375 \times 240 \times 237$	4 - 12	Germany	$\geq 1,0$	C14/C15
	2DF $240 \times 115 \times 113$	6 - 28	Germany	$\geq 1,4$	C16/C17
	$500 \times 200 \times 315$	4 - 8	France	$\geq 0,6$	C18 – C21
	$500 \times 200 \times 300$	4 - 10	France	$\geq 0,7$	C22 – C25
	$500 \times 200 \times 315$	2 - 8	France	$\geq 0,7$	C26 – C29
	$560 \times 200 \times 275$	4 - 8	France	$\geq 0,7$	C30/C31
Light-weight concrete hollow block Hbl					
Light-weight concrete hollow block Hbl	$500 \times 200 \times 200$	2 - 6	France	$\geq 1,0$	C32/C33
Light-weight concrete solid block Vbl					
Light-weight concrete solid block Vbl	$\geq 372 \times 300 \times 254$	2	Germany	$\geq 0,6$	C34/C35

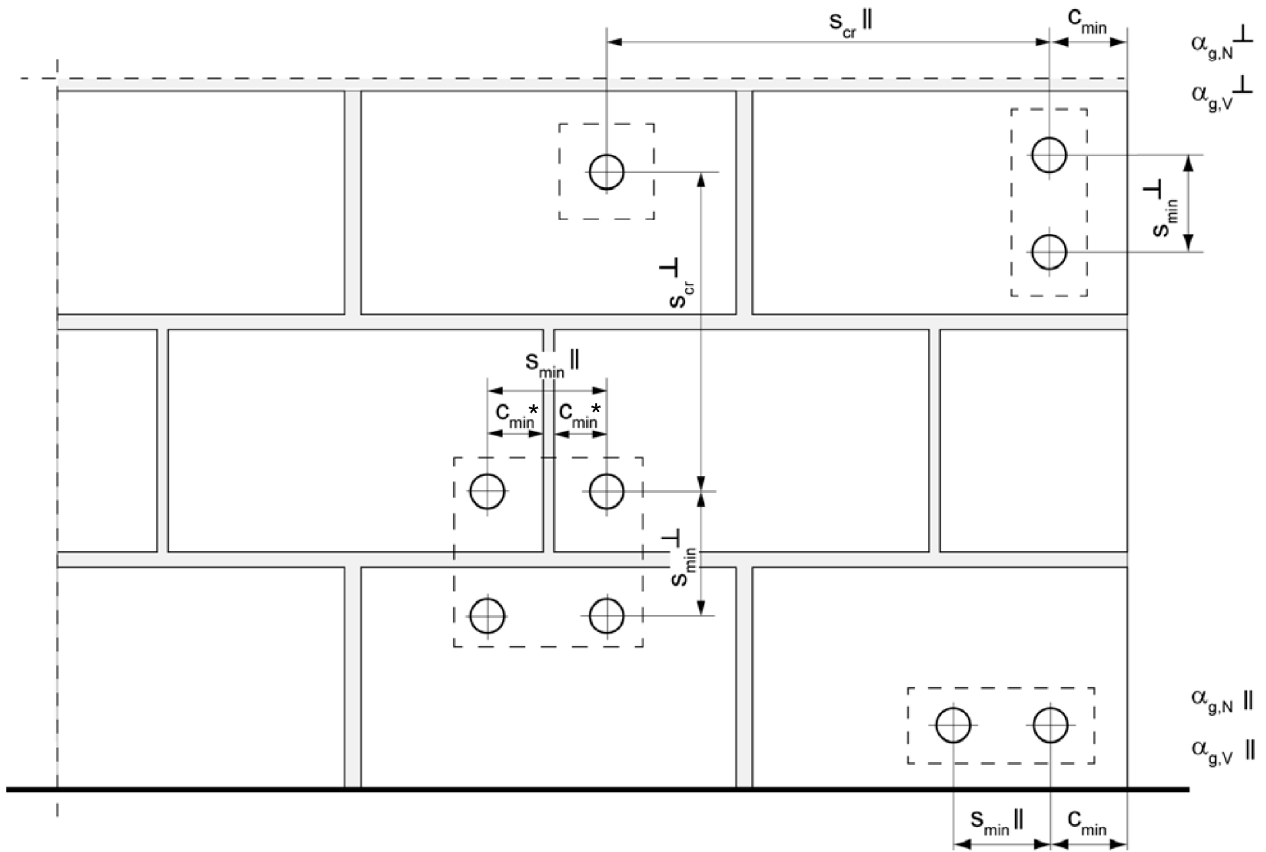
fischer injektion system FIS HT II masonry

Intended use
 Overview of controlled bricks

Annex B 12

Appendix 18/ 55

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 HT II masonry

Intended use
Spacing and edge distance

Annex B 13

Appendix 19/ 55

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 $N_{Rk,s}$	Steel zinc plated	Property class	4.6	8	15(13)	23(21)	34	63
			4.8	8	15(13)	23(21)	34	63
			5.8	10	18(17)	29(27)	42	78
			8.8	16	29(27)	46(43)	67	125
	Stainless steel A4 and High corrosion resistant steel C		50	10	18	29	42	78
			70	14	26	41	59	110
			80	16	29	46	67	125
Partial safety factors ¹⁾								
Partial safety factor $\gamma_{Ms,N}$	Steel zinc plated	Property class	4.6	2				
			4.8	1,50				
			5.8	1,50				
			8.8	1,50				
	Stainless steel A4 and High corrosion resistant steel C		50	2,86				
			70	1,50 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

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

fischer injektion system FIS HT II masonry

Performance

Characteristic steel bearing capacity of anchor rods

Annex C 1

Appendix 20/ 55

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 $V_{Rk,s}$	Steel zinc plated	4.6	[kN]	4	7(6)	12(10)	17	31
		4.8		4	7(6)	12(10)	17	31
		5.8		5	9(8)	15(13)	21	39
		8.8		8	15(13)	23(21)	34	63
	Stainless steel A4 and High corrosion resistant steel C	50		5	9	15	21	39
		70		7	13	20	30	55
		80		8	15	23	34	63
		with lever arm						
Characteristic bending moment $M_{Rk,s}$	Steel zinc plated	4.6	[Nm]	6	15(13)	30(27)	52	133
		4.8		6	15(13)	30(27)	52	133
		5.8		8	19(16)	37(33)	65	166
		8.8		12	30(26)	60(53)	105	266
	Stainless steel A4 and High corrosion resistant steel C	50		7	19	37	65	166
		70		10	26	52	92	232
		80		12	30	60	105	266
		Partial safety factors¹⁾						
Partial safety factor $\gamma_{Ms,V}$	Steel zinc plated	4.6	[-]	1,67				
		4.8		1,25				
		5.8		1,25				
		8.8		1,25				
	Stainless steel A4 and High corrosion resistant steel C	50		2,38				
		70		1,25 ²⁾ / 1,56				
		80		1,33				

¹⁾ In absence of other national regulations

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

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

fischer injektion system FIS HT II masonry

Performance
Characteristic steel bearing capacity of anchor rods

Annex C 2

Appendix 21/ 55

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

fischer internal threaded anchor FIS E				M6	M8	M10	M12	
Bearing capacity under tensile load, steel failure								
Characteristic resistance with screw	$N_{Rk,s}$	Property class 5.8	[kN]	10	18	29	42	
		Property class 70		A4	14	26	41	59
		C		14	26	41	59	
Partial safety factors¹⁾								
Partial safety factor	$\gamma_{Ms,N}$	Property class 5.8	[-]	1,50				
		Property class 70		A4	1,87			
		C		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	21	
		Property class 70		A4	7	13	20	30
		C		C	7	13	20	30
with lever arm								
Characteristic bending moment	$M_{Rk,s}$	Property class 5.8	[Nm]	8	19	37	65	
		Property class 70		A4	11	26	52	92
		C		C	11	26	52	92
Partial safety factors¹⁾								
Partial safety factor	$\gamma_{Ms,V}$	Property class 5.8	[-]	1,25				
		Property class 70		A4	1,56			
		C		C	1,56			

¹⁾ In absence of other national regulations

fischer injektion system FIS HT II masonry

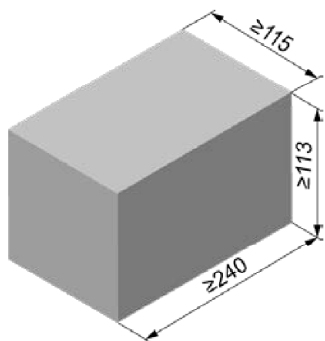
Performance

Characteristic steel bearing capacity of fischer internal threaded anchor FIS E

Annex C 3

Appendix 22/ 55

Solid brick Mz, 2DF, EN 771-1



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

Table C4.1: Installation parameters

Anchor rod	M6	M8	M10	M12	M16	-		-			
Internal threaded anchor FIS E	-	-	-	-	-	M6	M8	M10	M12		
	11x85		15x85								
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}					60						
Spacing	$s_{min} \parallel$					120					
	$s_{cr} \parallel$					240					
	$s_{cr} \perp = s_{min} \perp$					115					
Drilling method											
Hammer drilling with hard metal hammer drill											

Table C4.2: Group factors

Anchor rods	M6	M8	M10	M12	M16	-		-			
Internal threaded anchor FIS E	-	-	-	-	-	M6	M8	M10	M12		
	11x85		15x85								
Group factor	$\alpha_{q,N} \parallel$					1,5					
	$\alpha_{q,V} \parallel$					1,4					
	$\alpha_{q,N} \perp$					2					
	$\alpha_{q,V} \perp$										

fischer injektion system FIS HT II masonry

Performance

Solid brick Mz, 2DF, dimensions, installation parameters

Annex C 4

Appendix 23/ 55

Solid brick Mz, 2DF, EN 771-1

Table C5.1: Characteristic resistance under tensile load

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

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

compressive strength f_b	condition		Effective anchorage depth h_{ef} [mm]																					
			50						100						85									
10N/mm ²	w/w	w/d	1,5	2,5	1,5	2,5	1,5	3	2	3,5	2	3,5	2						1,5					
	d/d		3	4,0	3,0	4,0	3,0	4,5	3	5,5	3	5,5	3						3					
16N/mm ²	w/w	w/d	2,5	4	2,5	4	2,5	4,5	3,5	5,5	3,5	5,5	3,5						2,5					
	d/d		4,5	7,0	4,5	7,0	4,5	7,5	5,5	8	5,5	8	5,5						4,5					

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

Table C5.2: Characteristic resistance under shear load

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

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

compressive strength f_b	condition		Effective anchorage depth h_{ef} [mm]																									
			≥ 50						85																			
10N/mm ²	w/w	w/d	2,5		3,0		3,0		3,5		3,0		2,5		3,0		3,0		3,0		3,0		3,5		2,5		3,0	
	d/d																											
16N/mm ²	w/w	w/d	4,0		5,0		5,5		5,5		5,0		4,0		5,0		5,0		5,0		5,0		6,0		4,0		5,0	
	d/d																											

Factor for job site tests and displacements see annex C36

fischer injektion system FIS HT II masonry

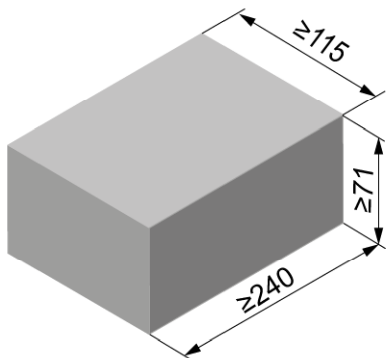
Performance

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

Annex C 5

Appendix 24/ 55

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



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

Table C6.1: Installation parameters

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

Table C6.2: Group factors

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

fischer injektion system FIS HT II masonry

Performances

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

Annex C 6

Appendix 25/ 55

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

Table C7.1: Characteristic resistance under tensile load

Anchor rod		M6		M8		M10		M12		M16		-		-			
Internal threaded anchor FIS E		-		-		-		-		-		M6		M8			
												11x85		15x85			
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)																	
compressive strength f_b	condition		Effective anchorage depth h_{ef} [mm]														
			50	100	50	100	50	100	200	50	100	200	50	100	200	85	85
12N/mm 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 C7.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C36

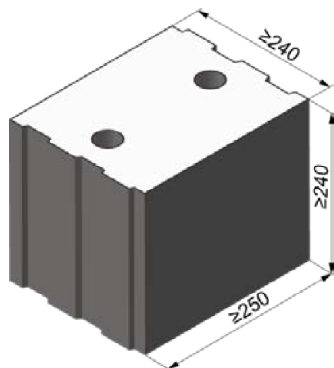
fischer injektion system FIS HT II masonry

Performances

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

Annex C 7

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		

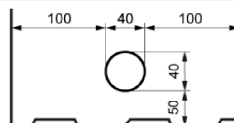


Table C8.1: Installation parameters

Anchor rod	M6	M8	M10	M12	M16	-		-			
Internal threaded anchor FIS E	-	-	-	-	-	M6	M8	M10	M12		
	11x85		15x85								
Anchor rod and internal threaded anchor FIS E without perforated sleeve											
Effective anchorage depth h_{ef} [mm]	50	100	50	100	50	100	50	100	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}					60						
Spacing	$s_{min} \parallel$					80					
	$s_{cr} \parallel$					250					
	$s_{min} \perp$					80					
	$s_{cr} \perp$					240					
	Drilling method										
Hammer drilling with hard metal hammer drill											

Table C8.2: Group factors

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

fischer injektion system FIS HT II masonry

Performance

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

Annex C 8

Appendix 27/ 55

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

Table C9.1: Characteristic resistance under tensile load

Anchor rod		M6	M8	M10	M12	M16	-		-		M8	M10	-	
Internal threaded anchor FIS E		-	-	-	-	-	M6	M8	M10	M12	-	-	M6	M8
							11x85		15x85				11x85	
Perforated sleeve FIS H K		-	-	-	-	-	-	-	16x85					
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)														
compressive strength f_b	condition		Effective anchorage depth h_{ef} [mm]											
			≥ 50						85					
10N/mm 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 C9.2: Characteristic resistance under shear load

Anchor rod		M6	M8	M10	M12	M16	-		-		M8	M10	-	
Internal threaded anchor FIS E		-	-	-	-	-	M6	M8	M10	M12	-	-	M6	M8
							11x85		15x85				11x85	
Perforated sleeve FIS H K		-	-	-	-	-	-	-	16x85					
Shear load V_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C and 72/120°C)														
compressive strength f_b	condition		Effective anchorage depth h_{ef} [mm]											
			≥ 50						85					
10N/mm 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 C36

fischer injektion system FIS HT II masonry

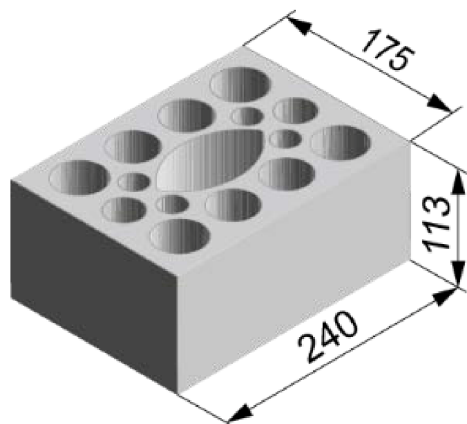
Performance

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

Annex C 9

Appendix 28/ 55

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



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

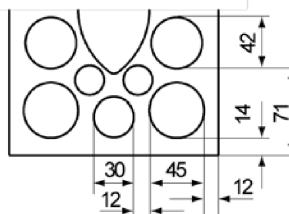


Tabelle C10.1: Installation parameters (Pre-positioned anchorage with perforated sleeve FIS HK)

Anchor rod	M6	M8	M6	M8	-	M8	M10	M8	M10	-	M12	M16	M12	M16	
Internal threaded anchor FIS E	-		-		M6	M8	-		-		M10	M12	-		
					11x85						15x85				
Perforated sleeve FIS H K	12x50		12x85		16x85				16x130		20x85			20x130	
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} $					100									
	$s_{cr} $ [mm]					240									
	$s_{min} \perp$					115									
	$s_{cr} \perp$					115									
Drilling method															
Hammer drilling with hard metal hammer drill															

Table C10.2: Group factors

Anchor rod	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} = \alpha_{q,V} $	[-]				1,5									
	$\alpha_{q,N} \perp = \alpha_{q,V} \perp$					2,0									

fischer injektion system FIS HT II masonry

Performance

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

Annex C 10

Appendix 29/ 55

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

Table C11.1: Installation parameters
(Push through anchorage with perforated sleeve FIS HK)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x130/200		22x130/200
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		
	$s_{cr} \parallel$ [mm]	240		
	$s_{min} \perp$	115		
	$s_{cr} \perp$	115		
Drilling method				
Hammer drilling with hard metal hammer drill				

Table C11.2: Group factors

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

fischer injektion system FIS HT II masonry

Performance

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

Annex C 11

Appendix 30/ 55

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

Table C12.1: Characteristic resistance under tensile load (Pre-positioned anchorage)

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

Table C12.2: Characteristic resistance under tensile load (Push through anchorage)

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

Factor for job site tests and displacements see annex C36

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

fischer injektion system FIS HT II masonry

Performance

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

Annex C 12

Appendix 31/ 55

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

Table C13.1: Characteristic resistance under shear load (Pre-positioned anchorage)

Anchor rod	M6	M8	M6	M8	-	M8	M10	M8	M10	-	M12	M16	M12	M16	
Internal threaded anchor FIS E	-		-		M6	M8	-		-		M10	M12	-		
					11x85						15x85				
Perforated sleeve FIS H K	12x50		12x85		16x85			16x130		20x85			20x130		
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 C13.2: 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 C36

fischer injektion system FIS HT II masonry

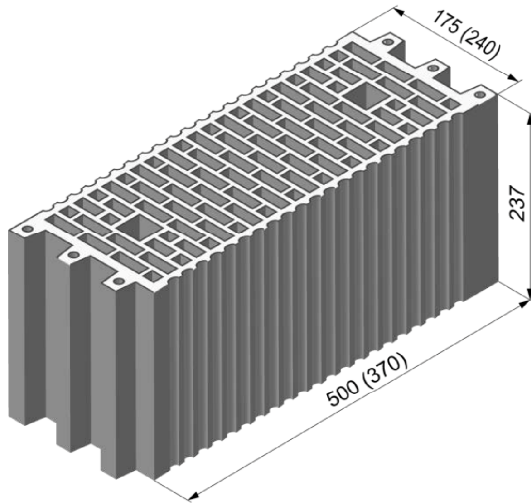
Performances

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

Annex C 13

Appendix 32/ 55

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



Vertical perforated brick HLz, form B, EN 771-1			
Producer	e.g. Wienerberger, Poroton		
Nominal dimensions [mm]	length L	width W	height H
	500	175	237
Density ρ [kg/dm ³]	370	240	237
	$\geq 1,0$		
Compressive strength f_b [N/mm ²]	4 / 6 / 8 / 10 / 12		
Standard or annex	EN 771-1		

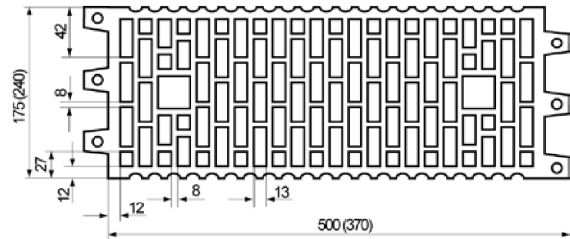


Table C14.1: Installation parameters

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

Table C14.2: Group factors

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

fischer injektion system FIS HT II masonry

Performance

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

Annex C 14

Appendix 33/ 55

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

Table C15.1: Characteristic resistance under tensile load

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

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

Table C15.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C36

fischer injektion system FIS HT II masonry

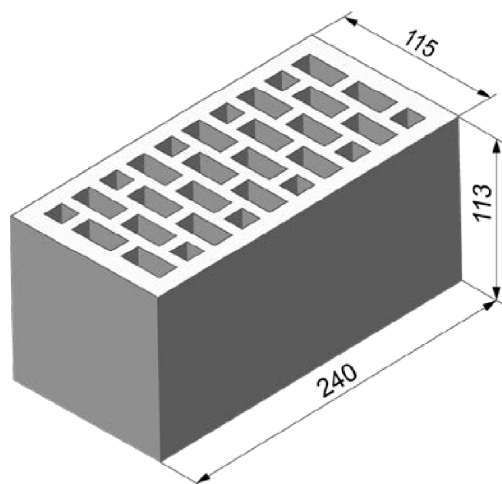
Performance

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

Annex C 15

Appendix 34/ 55

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



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

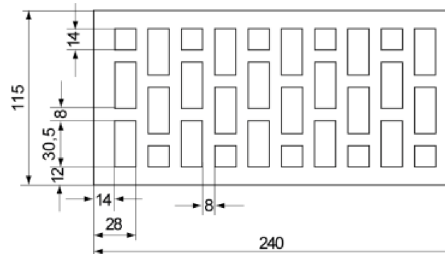


Table C16.1: Installation parameters

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

Table C16.2: Group factors

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

fischer injektion system FIS HT II masonry

Performances

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

Annex C 16

Appendix 35/ 55

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

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

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

Table C17.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C36

fischer injektion system FIS HT II masonry

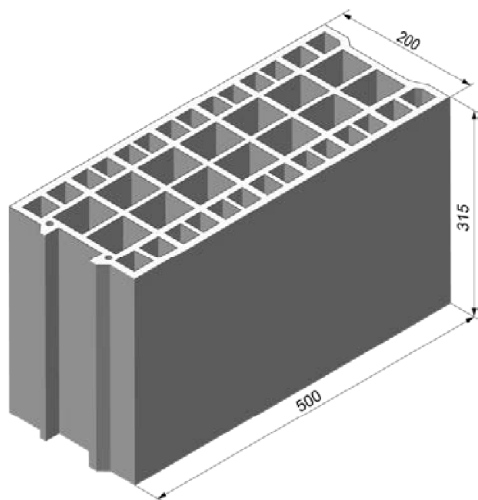
Performance

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

Annex C 17

Appendix 36/ 55

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



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

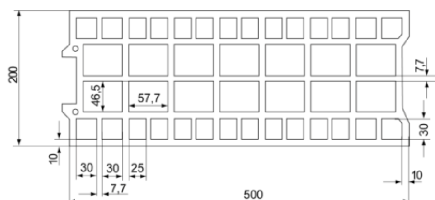


Table C18.1: Installation parameters
(Pre-positioned anchorage with perforated sleeve FIS HK)

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

Table C18.2: Group factors

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

fischer injektion system FIS HT II masonry

Performance

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

Annex C 18

Appendix 37/ 55

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

Table C19.1: Installation parameters
(Push through anchorage with perforated sleeve FIS HK)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x130/200		22x130/200
Anchor rod with perforated sleeve FIS H K				
Max. installation torque	$T_{inst,max}$ [Nm]	2		
General installation parameters				
Edge distance	c_{min}	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 C19.2: Group factors

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

fischer injektion system FIS HT II masonry

Performance

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

Annex C 19

Appendix 38/ 55

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

Table C20.1: Characteristic resistance under tensile load (Pre-positioned anchorage)

Anchor rod	M6	M8	M6	M8	-	M8	M10	M8	M10	-	M12	M16	M12	M16	
Internal threaded anchor FIS E	-		-		M6	M8	-		-		M10	M12	-		
					11x85						15x85				
Perforated sleeve FIS H K	12x50		12x85		16x85			16x130		20x85			20x130		
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)															
compressive strength f_b	condition														
4 N/mm ²	w/w	w/d	0,5		1,5			0,75		1,5		1,5			
	d/d		0,6		1,5			0,9		1,5		2,0			
6 N/mm 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 C20.2: Characteristic resistance under tensile load (Push through anchorage)

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

Factor for job site tests and displacements see annex C36

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

fischer injektion system FIS HT II masonry

Performance

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

Annex C 20

Appendix 39/ 55

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

Table C21.1: Characteristic resistance under shear load (Pre-positioned anchorage)

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

Table C21.2: Characteristic resistance under shear load (Push through anchorage)

Anchor rod	M10		M12		M16	
Perforated sleeve FIS H K	18x130/200				22x130/200	
Shear load V_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C and 72/120°C)						
compressive strength f_b	condition					
4 N/mm 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 C36

fischer injektion system FIS HT II masonry

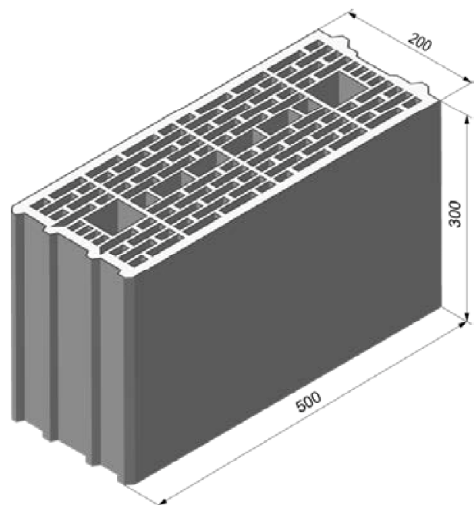
Performance

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

Annex C 21

Appendix 40/ 55

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



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

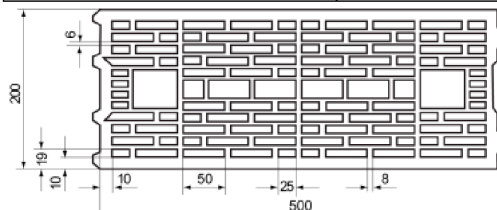


Table C22.1: Installation parameters
(Pre-positioned anchorage with perforated sleeve FIS HK)

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

Table C22.2: Group factors

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

fischer injektion system FIS HT II masonry

Performance

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

Annex C 22

Appendix 41/ 55

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

Table C23.1: Installation parameters
(Push through anchorage with perforated sleeve FIS HK)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x130/200		22x130/200
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
	$s_{cr \parallel}$			500
	$s_{min \perp} = s_{cr \perp}$			300
Drilling method				
Hammer drilling with hard metal hammer drill				

Table C23.2: Group factors

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

fischer injektion system FIS HT II masonry

Performance

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

Annex C 23

Appendix 42/ 55

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

Table C24.1: Characteristic resistance under tensile load (Pre-positioned anchorage)

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

Table C24.2: Characteristic resistance under tensile load (Push through anchorage)

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

Factor for job site tests and displacements see annex C36

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

fischer injektion system FIS HT II masonry

Performances

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

Annex C 24

Appendix 43/ 55

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

Table C25.1: Characteristic resistance under shear load (Pre-positioned anchorage)

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

Table C25.2: Characteristic resistance under shear load (Push through anchorage)

Anchor rod	M10		M12		M16	
Perforated sleeve FIS H K	18x130/200				22x130/200	
Shear load V_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C and 72/120°C)						
compressive strength f_b	condition					
4 N/mm 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 C36

fischer injektion system FIS HT II masonry

Performance

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

Annex C 25

Appendix 44/ 55

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

Table C27.1: Installation parameters
(Push through anchorage with perforated sleeve FIS HK)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x130/200		22x130/200
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
	$s_{cr} \parallel$			500
	$s_{min} \perp$			100
	$s_{cr} \perp$			315
Drilling method				
Hammer drilling with hard metal hammer drill				

Table C27.2: Group factors

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

fischer injektion system FIS HT II masonry

Performance

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

Annex C 27

Appendix 46/ 55

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

Table C28.1: Characteristic resistance under tensile load (Pre-positioned anchorage)

Anchor rod	M6	M8	M6	M8	-	M8	M10	M8	M10	-	M12	M16	M12	M16
Internal threaded anchor FIS E	-		-		M6	M8	-		-		M10	M12	-	
					11x85						15x85			
Perforated sleeve FIS H K	12x50		12x85		16x85			16x130		20x85			20x130	
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)														
compressive strength f_b	condition													
2 N/mm 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 C28.2: Characteristic resistance under tensile load (Push through anchorage)

Anchor rod	M10		M12		M16	
Perforated sleeve FIS H K	18x130/200				22x130/200	
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)						
compressive strength f_b	condition					
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 C36

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

fischer injektion system FIS HT II masonry

Performance

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

Annex C 28

Appendix 47/ 55

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

Table C29.1: Characteristic resistance under shear load (Pre-positioned anchorage)

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

Table C29.2: Characteristic resistance under shear load (Push through anchorage)

Anchor rod	M10		M12		M16	
Perforated sleeve FIS H K	18x130/200				22x130/200	
Shear load V_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C and 72/120°C)						
compressive strength f_b	condition					
2 N/mm 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 C36

fischer injektion system FIS HT II masonry

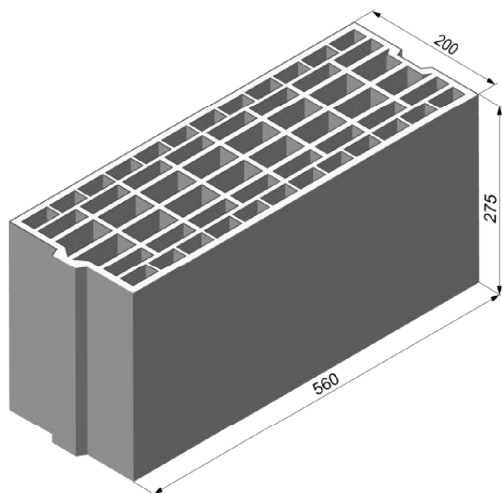
Performance

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

Annex C 29

Appendix 48/ 55

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



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

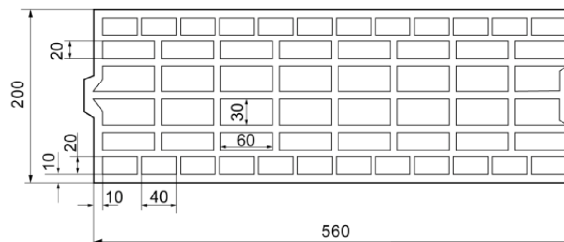


Table C30.1: Installation parameters

Anchor rod	M8	M10	M10	M12	M12	M16	M16
Perforated sleeve FIS H K	16x130		18x130/200		20x130		22x130/200
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 $S_{min} \parallel = S_{cr} \parallel$	560						
	$S_{min} \perp = S_{cr} \perp$	275					
Drilling method							
Hammer drilling with hard metal hammer drill							

Table C30.2: Group factors

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

fischer injektion system FIS HT II masonry

Performance

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

Annex C 30

Appendix 49/ 55

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

Table C31.1: Characteristic resistance under tensile load

Anchor rod	M8	M10	M10	M12	M12	M16	M16	
Perforated sleeve FIS H K	16x130		18x130/200		20x130		22x130/200	
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)								
compressive strength f_b	condition							
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 C31.2: Characteristic resistance under shear load

Anchor rod	M8	M10	M10	M12	M12	M16	M16	
Perforated sleeve FIS H K	16x130		18x130/200		20x130		22x130/200	
Shear load V_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C and 72/120°C)								
compressive strength f_b	condition							
4 N/mm 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 C36

fischer injektion system FIS HT II masonry

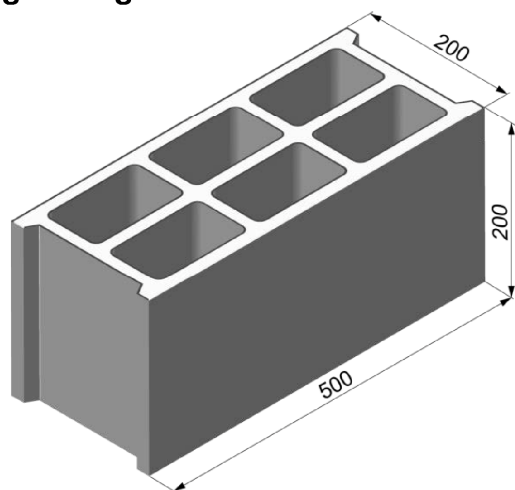
Performance

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

Annex C 31

Appendix 50/ 55

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



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

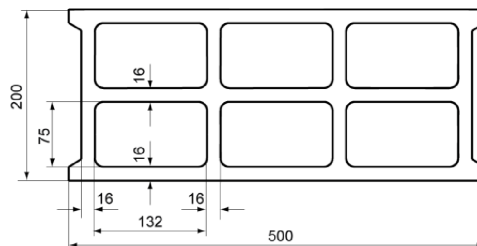


Table C32.1: Installation parameters

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

Table C32.2: Group factors

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

fischer injektion system FIS HT II masonry

Performance

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

Annex C 32

Appendix 51/ 55

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

Table C33.1: Characteristic resistance under tensile load

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

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

compressive strength f_b	condition		
2 N/mm ²	w/w	w/d	0,4
	d/d		0,5
4 N/mm ²	w/w	w/d	0,9
	d/d		0,9
6 N/mm ²	w/w	w/d	1,2
	d/d		1,5

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

Table C33.2: Characteristic resistance under shear load

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

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

compressive strength f_b	condition		
2 N/mm ²	w/w	w/d	0,9
	d/d		
4 N/mm ²	w/w	w/d	1,5
	d/d		
6 N/mm ²	w/w	w/d	2,5
	d/d		

Factor for job site tests and displacements see annex C36

fischer injektion system FIS HT II masonry

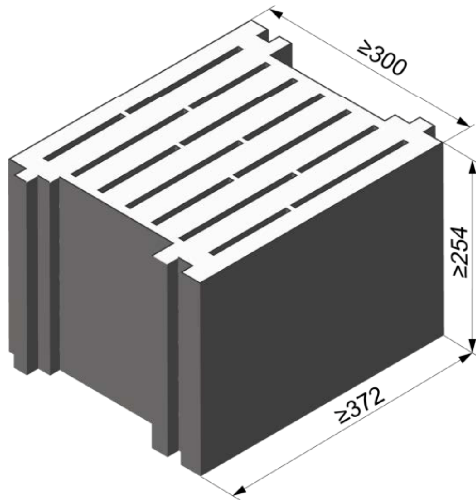
Performance

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

Annex C 33

Appendix 52/ 55

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



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

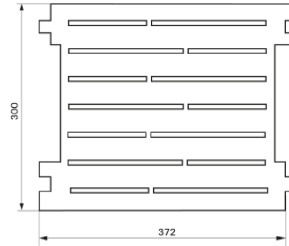


Table C34.1: Installation parameters

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

Table C34.2: Group factors

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

fischer injektion system FIS HT II masonry

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

Annex C 34

Appendix 53/ 55

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

Table C35.1: Characteristic resistance under tensile load

Anchor rod	M8	M10	M10	M12	M12	M16	M16	M12	M16	
Perforated sleeve FIS H K	16x130		18x130/200		20x130		22x130/200		20x200	
Tensile load N_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)										
compressive strength f_b	condition									
2 N/mm 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 C35.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C36

fischer injektion system FIS HT II masonry

Performance

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

Annex C 35

Appendix 54/ 55

β-factors for job site tests; displacements

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

condition		w/w and w/d		d/d	
temperature range		50/80	72/120	50/80	72/120
Material	Size				
solid units	M6	0,55	0,46	0,96	0,80
	M8	0,57	0,51		
	M10	0,59	0,52		
	M12 FIS E 11x85	0,6	0,54		
	M16 FIS E 15x85	0,62	0,52		
	16x85	0,55	0,46		
hollow units	all sizes	0,86	0,72	0,96	0,8

Table C36.2: Displacements

Material	N [kN]	δN ₀ [mm]	δN _∞ [mm]	V [kN]	δV ₀ [mm]	δV _∞ [mm]
solid units 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 DF annex C 4 - C 5	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	0,74	1,48	$\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$	1,23	1,85
solid brick Ks NF annex C 6 / C 7	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	0,2	0,4	$\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$	0,91	1,37
brick Annex C 32 / C 33	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	0,03	0,06	$\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$	6,44	9,66

fischer injektion system FIS HT II masonry

Performance
β-factors for job site tests; displacements

Annex C 36

Appendix 55/ 55