



DECLARATION OF PERFORMANCE

DoP 0381

for fischer injection system FIS V Plus (Metal injection anchors for use in masonry)

ΕN

Unique identification code of the product-type:

2. Intended use/es: Post-installed fastening in masonry units, see appendix, especially annexes B1 - B22.

3. Manufacturer: fischerwerke GmbH & Co. KG, Otto-Hahn-Straße 15, 79211 Denzlingen, Germany

4. Authorised representative:

5. System/s of AVCP: 1

6. European Assessment Document: EAD 330076-01-0604-v01, Edition 03/2024

European Technical Assessment: ETA-20/0729; 2025-02-03

Technical Assessment Body: DIBt- Deutsches Institut für Bautechnik

Notified body/ies:

7. Declared performance/s:

Mechanical resistance and stability (BWR 1)

Characteristic resistance for static and quasi-static loading:

- 1 Characteristic resistance to steel failure of a single anchor under tension loading: See appendix, especially annexes C1, C3
- 2 Characteristic resistance to steel failure of a single anchor under shear loading with and without level arm: See appendix, especially annexes C2, C3
- 3 Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading, Reduction factor: See appendix, especially annexes C5, C7, C9, C11, C13, C15, C17, C19, C22, C26, C29, C31, C34, C38, C42, C46, C50, C54, C58, C62, C65, C67, C70, C74, C78, C82, C85, C88, C92, C95, C97, C100, C103, C106, C109, C112, C115, C117, C120, C122, C123
- 4 Characteristic resistance to local brick failure or brick breakout failure of a single anchor under shear loading: See appendix, especially annexes C5, C7, C9, C11, C13, C15, C17, C19, C23, C27, C29, C31, C35, C39, C43, C47, C51, C55, C59, C63, C65, C68, C71, C75, C79, C83, C85, C89, C93, C95, C97, C101, C103, C107, C109, C113, C115, C117, C120, C122
- 5 Characteristic resistance to brick breakout failure of an anchor group under tension loading: See appendix, especially annexes B21, B22, C4, C6, C8, C10, C12, C14, C16, C18, C20, C21, C24, C25, C28, C30, C32, C33, C36, C37, C40, C41, C44, C45, C48, C49, C52, C53, C56, C57, C60, C61, C64, C66, C69, C72, C73, C76, C77, C80, C81, C84, C86, C87, C90, C91, C94, C96, C98, C99, C102, C104, C105, C108, C110, C111, C114, C116, C119, C121
- 6 Characteristic resistance to local brick failure or brick breakout failure of an anchor group under shear loading: See appendix, especially annexes B21, B22, C4, C6, C8, C10, C12, C14, C16, C18, C20, C21, C24, C25, C28, C30, C32, C33, C36, C37, C40, C41, C44, C45, C48, C49, C52, C53, C56, C57, C60, C61, C64, C66, C69, C72, C73, C76, C77, C80, C81, C84, C86, C87, C90, C91, C94, C96, C98, C99, C102, C104, C105, C108, C110, C111, C114, C116, C119, C112
- 7 Edge distances, spacing, member thickness: See appendix, especially annexes B21, B22, C4, C6, C8, C10, C12, C14, C16, C18, C20, C21, C24, C25, C28, C30, C32, C33, C36, C37, C40, C41, C44, C45, C48, C49, C52, C53, C56, C57, C60, C61, C64, C66, C69, C72, C73, C76, C77, C80, C81, C84, C86, C87, C90, C91, C94, C96, C98, C99, C102, C104, C105, C108, C110, C111, C114, C116, C118, C121
- 8 Displacements under tension and shear loading: see appendix, especially annex C123
- 9 Maximum installation torque: See appendix, especially annexes C4, C6, C8, C10, C12, C14, C16, C18, C20, C21, C24, C25, C28, C30, C32, C33, C36, C37, C40, C41, C44, C45, C48, C49, C52, C53, C56, C57, C60, C61, C64, C66, C69, C72, C73, C76, C77, C80, C81, C84, C86, C87, C90, C91, C94, C96, C98, C99, C102, C104, C105, C108, C110, C111, C114, C116, C118, C121

Characteristic resistance and displacements for seismic loading:

- 10 Resistance to tension load, displacements: NPD
- 11 Resistance to shear load, displacements: NPD
- 12 Factor annular gap: NPD

Safety in case of fire (BWR 2)

- 13 Reaction to fire: Class (A1)
- 14 Resistance to fire under tension and shear loading with and without level arm, minimum edge distances and spacing: see appendix, especially annexes C124-C127

Hygiene, health and the environment (BWR 3)

15 Content, emission and/or release of dangerous substances: NPD

 Appropriate Technical Documentation and/or Specific – Technical Documentation:

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

Med

Dr. Ronald Mihala, Head of Development and Production Management

Dieter Pfaff, Head of International Production Federation and Quality Management

Tumlingen, 2025-02-17

This DoP has been prepared in different languages. In case there is a dispute on the interpretation the English version shall always prevail.

The Appendix includes voluntary and complementary information in English language exceeding the (language-neutrally specified) legal requirements.

Fischer DATA DOP_ECs_V100.xlsm 1/1



Translation guidance Essential Characteristics and Performance Parameters for Annexes

Me	echanical resistance and stability (BWR 1)	
Ch	aracteristic resistance for static and quasi-static loading:	
1	Characteristic resistance to steel failure of a single anchor under tension loading:	N _{Rk,s} [kN]
2	Characteristic resistance to steel failure of a single anchor under shear loading with and without level arm:	V _{Rk,s} [kN], M ⁰ _{Rk,s} [Nm]
3	Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading, Reduction factor:	N _{Rk,p} ; N _{Rk,b} ; [kN] N _{Rk,p,c} ; N _{Rk,b,c} [kN], β [-]
4	Characteristic resistance to local brick failure or brick breakout failure of a single anchor under shear loading:	$V_{Rk,b}$; $V_{Rk,c,II}$; $V_{Rk,c,\perp}$ [kN]
5	Characteristic resistance to brick breakout failure of an anchor group under tension loading:	N ^g _{Rk} [kN], α _{g,N} [-]
6	Characteristic resistance to local brick failure or brick breakout failure of an anchor group under shear loading:	$ \begin{array}{c} V^{g}_{Rk,b}; \ V^{g}_{Rk,c,ll}; \ V^{g}_{Rk,c,\perp} \ [kN]; \\ \alpha_{g,V,ll}; \ \alpha_{g,V,\perp} \ [-] \end{array} $
7	Edge distances, spacing, member thickness:	c_{cr} ; s_{cr} ; c_{min} ; $s_{min,II}$; $s_{min,L}$; h_{min} [mm]
8	Displacements under tension and shear loading:	$\delta_{N0}; \delta_{N\infty}; \delta_{V0}; \delta_{V\infty} [mm]$
9	Maximum installation torque:	max. T _{inst} [Nm]
Ch	l aracteristic resistance and displacements for seismic loading:	l
10	Resistance to tension load, displacements:	$N_{Rk,s,eq}$; $N_{Rk,eq}$ [kN], $\alpha_{N,seis}$ [-]; $\delta_{N,eq}$ [mm]
11	Resistance to shear load, displacements:	$V_{Rk,s,eq}$; $V_{Rk,b,eq}$ [kN], $\alpha_{V,seis}$ [-]; $\delta_{V,eq}$ [mm]
12	Factor annular gap:	α _{gap} [-]
Sa	fety in case of fire (BWR 2)	
13	Reaction to fire:	-
14	Resistance to fire under tension and shear loading with and without level arm, minimum edge distances and spacing:	$N_{Rk,s,fi}$; $N_{Rk,p,fi}$; $[kN]$, $N_{Rk,b,fi}$; $N_{g_{k,b,fi}}$; $N_{g_{k,b,fi}}$; $N_{g_{k,s,fi}}$; N_{g_{k,s,f
Ну	giene, health and the environment (BWR 3)	<u> </u>
15	Content, emission and/or release of dangerous substances:	-

Specific part

1 Technical description of the product

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

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

The product description is given in Annex A.

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

The performances given in Section 3 are only valid if the fastener 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 fastener of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

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

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance for static and quasi-static loading	See Annexes B4 to B7, B21, B22, C1 to C123
Characteristic resistance and displacements for seismic loading	No performance assessed

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire under tension and shear loading with and without lever arm. Minimum edge distances and spacing	See Annex C124 to C127

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

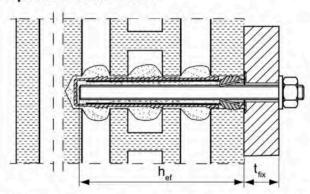
In accordance with the European Assessment Document EAD 330076-01-0604-v01 the applicable European legal act is: [97/177/EC].

The system to be applied is: 1

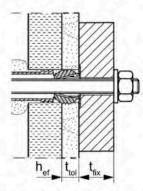
Installation conditions part 1

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

Pre-positioned installation:



Installation with render bridge



Size of the perforated sleeve:

FIS H 12x50 K

FIS H 16x85 K

FIS H 20x85 K

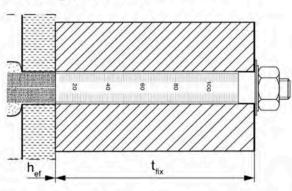
FIS H 20x200 K

FIS H 12x85 K

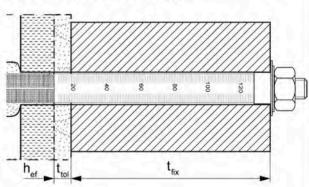
FIS H 16x130 K

FIS H 20x130 K

Push through installation:



Installation with render bridge



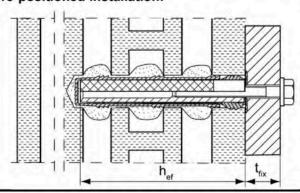
Size of the perforated sleeve:

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 installation:



Figures not to scale

hef = effective anchorage depth

t_{fix} = thickness of fixture

ttol = thickness of unbearing layer (e.g. plaster)

fischer injection system FIS V Plus for masonry

Product description

Installation conditions part 1,

Anchor rods and internal threaded anchor with perforated sleeve

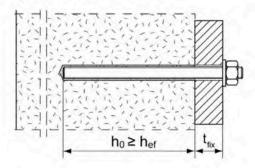
Annex A1

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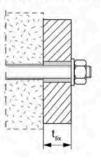
Installation conditions part 2

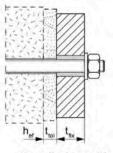
Anchor rods without perforated sleeve FIS H K; installation in solid brick masonry and autoclaved aerated concrete

Pre-positioned installation:



Push through installation: Annular gap filled with mortar

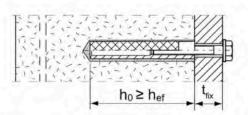




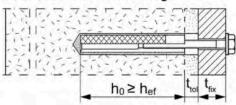
Installation with render bridge

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

Pre-positioned installation:



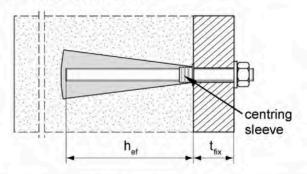
Installation with render bridge



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

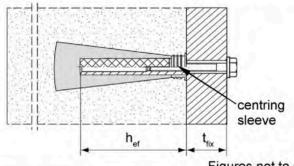
Pre-positioned installation:

anchor rods M8, M10, M12



Pre-positioned installation:

Internal threaded anchor FIS E 11x85 M6 / M8



Figures not to scale

ho = depth of drill hole

ttol = thickness of unbearing layer (e.g. plaster)

hef = effective anchorage depth

t_{fix} = thickness of fixture

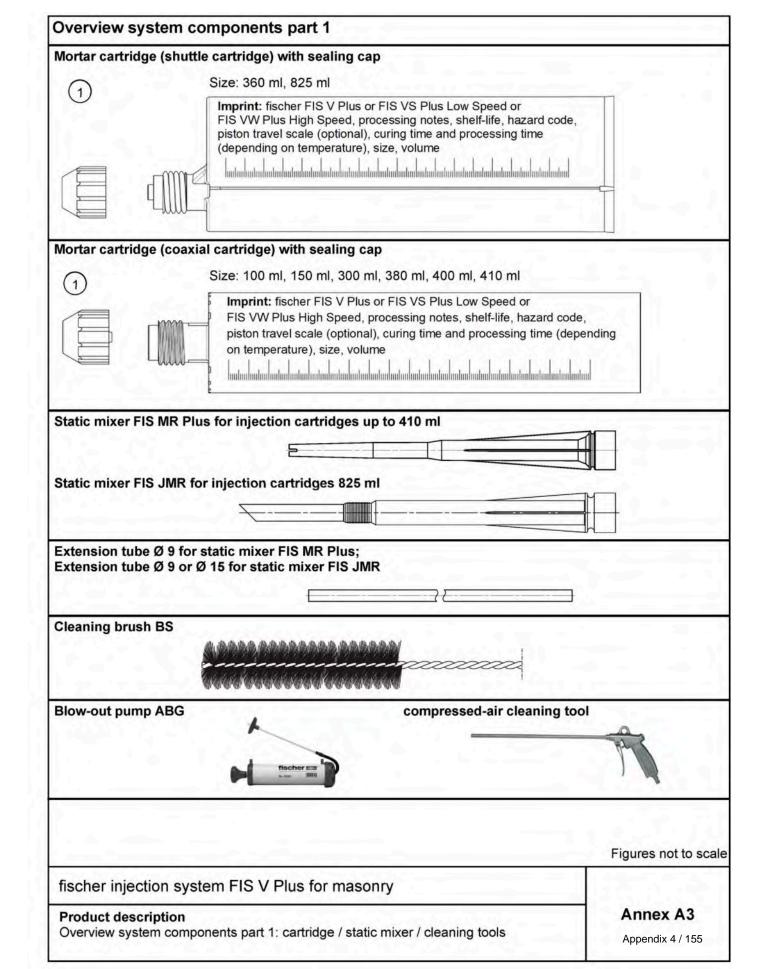
fischer injection system FIS V Plus for masonry

Product description

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

Annex A2

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Overview system components part	4		
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	Size:	FIS H 12x50 K FIS H 12x85 K FIS H 16x85 K FIS H 20x85 K	1
	Size:	FIS H 16x130 K FIS H 20x130 K FIS H 20x200 K	
Perforated sleeve FIS H K (push through in	stallation)		
7			Size: FIS H 18x130/200 K FIS H 22x130/200 K
Washer			
3			
Hexagon nut			
Injection adapter	centring sle	eve PBZ	
	7		
Special conic drill bit PBB			
			Figures not to scale
fischer injection system FIS V Plus for	r masonry		
Product description Overview system components part 2: steel participation adapter / centring sleeve	arts / perforated	d sleeve / conical drill bit /	Annex A4 Appendix 5 / 155

Part	Designation		Material	
1	Mortar cartridge		Mortar, hardener; filler	
		Steel	Stainless steel R	High corrosion resistant stee
		zinc plated	acc. to EN 10088-1:2023 Corrosion resistance class CRC III acc. to EN 1993-1-4:2006+A1:2015	acc. to EN 10088-1:2023 Corrosion resistance class CRC V acc. to EN 1993-1-4:2006+A1:2015
2	Anchor rod	Property class 4.6; 4.8; 5.8 or 8.8; EN ISO 898-1: 2013 zinc plated ≥ 5µm, ISO 4042:2022 or hot-dip galvanised EN ISO 10684:2004+AC:2009 fuk ≤ 1000 N/mm² A₅ > 8% fracture elongation	Property class 50, 70 or 80 EN ISO 3506-1:2020 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; 1.4062; 1.4662; 1.4462; EN 10088-1:2023 f _{uk} ≤ 1000 N/mm ² A ₅ > 8% fracture elongation	Property class 50 or 80 EN ISO 3506-1:2020 or property class 70 with f_{yk} = 560 N/mm ² 1.4565; 1.4529 EN 10088-1:2023 $f_{uk} \le 1000$ N/mm ² A ₅ > 8% fracture elongation
3	Washer ISO 7089:2000	zinc plated ≥ 5µm, ISO 4042:2022 or hot-dip galvanised EN ISO 10684:2004+AC:2009	1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; EN 10088-1:2023	1.4565;1.4529 EN 10088-1:2023
4	Hexagon nut	Property class 5 or 8; EN ISO 898-2:2022 zinc plated ≥ 5µm, ISO 4042:2022 or hot-dip galvanised EN ISO 10684:2004+AC:2009	Property class 50, 70 or 80 EN ISO 3506-2:2020 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; EN 10088-1:2023	Property class 50, 70 or 80 EN ISO 3506-2:2020 1.4565; 1.4529 EN 10088-1:2023
5	Internal threaded anchor FIS E	Property class 5.8; EN 10277-1:2018 zinc plated ≥ 5µm, ISO 4042:2022	Property class 70 EN ISO 3506-1:2020 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; EN 10088-1:2023	Property class 70 EN ISO 3506-1:2020 1.4565; 1.4529 EN 10088-1:2023
6	Commercial standard screw or threaded rod for internal threaded anchor FIS E	Property class 4.6, 5.8 or 8.8; EN ISO 898-1:2013 zinc plated ≥ 5µm, ISO 4042:2022	Property class 70 EN ISO 3506-1:2020 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; EN 10088-1:2023	Property class 70 EN ISO 3506-1:2020 1.4565; 1.4529 EN 10088-1:2023
7	Perforated sleeve and centring sleeve		PP / PE	

fischer injection	system FIS \	/ Plus	for masonry
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Specifications of intended use part 1

Table B1.1: Overview use and performance categories

tary drill mode	without C28 to	bricks; C48, C75 to C78 bricks			
cial conic drill bit					
	Only C1	18 to C100			
atatio lead		18 to C122			
static load, nry	all I	bricks			
der tension and	C124 to C127 (Applies only to	o the conditions of dry masonry)			
Pre-positioned installation	Anchor rod or internal threaded anchor (in solid brick masonry and autoclaved aerated concrete)	Perforated sleeve with anchor rod or internal threaded anchor (in perforated and solid brick masonry) 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 installation	Anchor rod; use only in cylindrical drill hole (in solid brick masonry and autoclaved aerated concrete)	Perforated sleeve with anchor rod (in perforated and solid brick masonry) Size: FIS H 18x130/200 K FIS H 22x130/200 K			
(dry/dry)					
(wet/dry) conditions w/w	all I	bricks			
(wet/wet)	D2 (days yeard and	havinantal installation)			
ire					
Temperature range Tb	-40 °C to +80 °C (max. sho	ort term temperature +80 °C g term temperature +50 °C)			
Temperature range Tc	-40 °C to +120 °C (max. short term temperature +120 °C; max. long term temperature +72 °C)				
	Push through installation Push through installation Conditions d/d (dry/dry) Conditions w/d (wet/dry) Conditions w/w (wet/wet) Ire Temperature range Tb Temperature	Anchor rod or internal threaded anchor (in solid brick masonry and autoclaved aerated concrete) Anchor rod; use only in cylindrical drill hole (in solid brick masonry and autoclaved aerated concrete) Anchor rod; use only in cylindrical drill hole (in solid brick masonry and autoclaved aerated concrete) conditions d/d (dry/dry) conditions w/d (wet/dry) conditions w/w (wet/wet) D3 (downward and Ti_min = -10 °C to +80 °C (max. sho max. long) Temperature range Tb Temperature -40 °C to +80 °C (max. sho max. long)			

Specifications of intended use part 2

Anchorages subject to:

- · Static and quasi-static loads
- · Exposure to fire

Base materials:

- Solid brick masonry (base material group b) and autoclaved aerated concrete (base material group d), acc. to Annex B13 / B14.
- Hollow brick masonry (base material group c), according to Annex B13 / B14.
- For minimum thickness of masonry member is hef+30mm.
- Mortar strength class of the masonry M2,5 at minimum according to EN 998-2:2016.
- 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 (not for bricks under fire exposure) according to EOTA Technical Report TR 053:2022-07 under consideration of the β-factor according to Annex C123, Table C123.1.

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

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

Temperature Range:

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

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions (zinc plated steel, stainless steel or high corrosion resistant steel)
- For all other conditions according to EN 1993-1-4:2015 corresponding to corrosion resistance classes to Annex A5, Table A5.1.

fischer injection system FIS V Plus for masonry

Specifications part 2

Specifications of intended use part 3 continued Design:

 The anchorages have to be designed in accordance with EOTA Technical Report TR 054:2023-12 (included the dimensioning for fire exposure), Design method A under the responsibility of a designer experienced in anchorages and masonry work.

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

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

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

For the calculation of pulling out a brick under tension loading **N**_{Rk,pb} or pushing out a brick under shear loading **V**_{Rk,pb} see EOTA Technical Report TR 054:2023-12.

N_{Rk,s}, V_{Rk,s} and M⁰_{Rk,s} see annexes C1-C3.

Factors for job site tests and displacements see annex C123.

 Verifiable calculation notes and drawings have to be prepared taking into 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 to be indicated on the design drawings.

Installation:

- · Conditions d/d: Installation and use in dry structures.
- · Conditions w/w:- Installation and use in dry and wet structures.
- · Conditions 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 injection mortar FIS V Plus.
- Bridging of unbearing layer (e.g., plaster) is permitted for masonry with solid bricks and cylindrical drill hole. At perforated brick masonry see Annex B6, 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 mentioned in Annex A5, Table A5.1.
- Minimum curing time see Annex B8, 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 A5, Table A5.1

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

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

fischer injection system FIS V Plus for masonry

Intended Use

Specifications part 3 continued

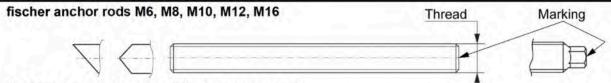
Annex B3

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

Anchor rod	Thread	M6	M8	M10	M12	M16	
Nominal drill hole diameter	d ₀ [mm]	8	10	12	14	18	
Effective anchorage depth hef1	h _{0,min} ≥ h _{ef,min} [mm]		100				
in AAC cylindrical drill hole	h _{0,max} ≥h _{ef,max} [mm]	200					
	h _o [mm]	7 - 1		h _{ef} + 5			
Effective anchorage depth her in AAC conical drill hole	h _{ef,1} [mm]	땅석		75			
III /V/O comear ariii noic	h _{ef,2} [mm]			95			
Effective anchorage depth hef1)	h _{ef,min} [mm]	50					
in solid brick (depth of drill hole $h_0 \ge h_{ef}$)	h _{ef,max} [mm]	h-30, ≤200					
Diameter of clearance pre-	positioning d _f ≤[mm]	7	9	12	14	18	
hole in the fixture pu	sh through d _f ≤[mm]	9	11	14	16	20	
Diameter of cleaning brush d _b ≥[mm] Maximum installation torque T _{inst} [Nm]				see Table B8.	1		
			see p	parameters of	brick		

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



Marking (on random place) fischer anchor rod:

Steel zinc plated PC ¹⁾ 8.8	• or +	Steel hot-dip galvanised PC1) 8.8	•
High corrosion resistant steel HCR PC1) 50	•	High corrosion resistant steel HCR PC ¹⁾ 70	
High corrosion resistant steel HCR PC ¹⁾ 80	(Stainless steel R property class 50	~
Stainless steel R property class 80	*		

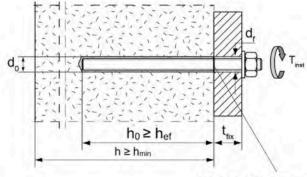
Alternatively: Colour coding according to DIN 976-1: 2016;

property class 4.6 marking according to EN ISO 898-1:2013

1) PC = property class

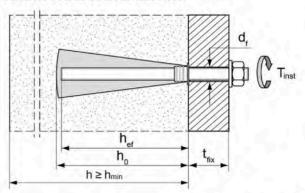
Installation conditions:

Anchor rod in cylindrical drill hole



Setting depth mark

Anchor rod in conical drill hole



Figures not to scale

fischer injection system FIS V Plus for masonry

Intended Use

Installation parameters for anchor rods without perforated sleeve

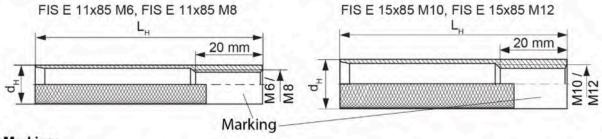
Annex B4

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

Internal threaded anchor FIS E		11x85 M6	11x85 M8	15x85 M10	15x85 M12	
Diameter of anchor	d _H [mm]	11 15			5	
Nominal drill hole diameter	d₀ [mm]	14 18			8	
Length of anchor	L _H [mm]	85				
Effective anchorage depth	h₀ ≥ hef [mm]	85				
Effective anchorage depth hef	h ₀ [mm]	100				
in AAC (conical drill hole)	h _{ef} [mm]	85				
Diameter of cleaning brush	d _b ≥[mm]		see Ta	ble B8.1		
Maximum installation torque	T _{inst} [Nm]	see parameters of brick				
Diameter of clearance hole in the fixture	d _f [mm]	7	9	12	14	
Correct in doubt	I _{E,min} [mm]	6	8	10	12	
Screw-in depth	I _{E,max} [mm]	60				

fischer Internal threaded anchor FIS E

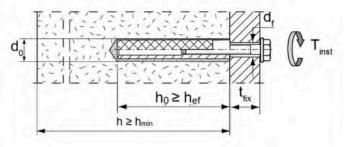


Marking:

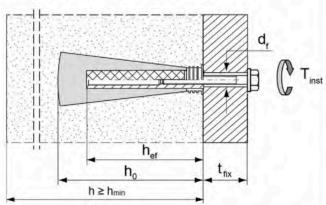
Size, e.g. M8, Stainless steel: R, e.g. M8 R, High corrosion resistant steel: HCR, e.g. M8 HCR

Installation conditions:

Internal threaded anchor in cylindrical drill hole



Internal threaded anchor in conical drill hole



Figures not to scale

fischer injection system FIS V Plus for masonry

Intended Use

Installation parameters for internal threaded rods FIS E without perforated sleeve

Annex B5

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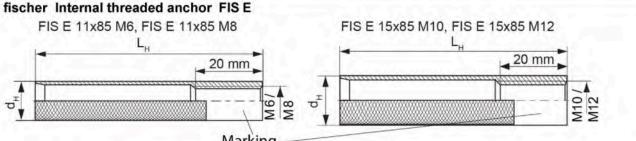
Table B6.1: Installation parameters for anchor rods and internal threaded anchors FIS E with perforated sleeves (pre-positioned installation)

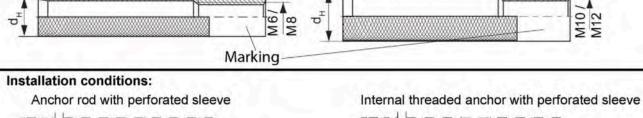
perforated sleeve FIS H K		12x50	12x85 ²⁾	16x85	16x130 ²⁾	20x85	20x130 ²⁾	20x200 ²⁾
Nominal drill hole diameter d ₀ = D _{sleeve,nom}	do [mm]		12		16		20	
Depth of drill hole	h ₀ [mm]	55	90	90	135	90	135	205
Effective analysis and death	hef.min [mm]	50	65	85	110	85	110	180
Effective anchorage depth	hef.max [mm]	50	85	85	130	85	130	200
Size of threaded rod			M6 and M8 M8 and		and M10 M12 and		112 and M	16
Size of internal threaded ancho	or FIS E		4	11x85	-	15x85	(- C	
Diameter of cleaning brush¹) d _b ≥[mm]		see Table B8.1					- = 4	
Maximum installation torque T _{inst} [Nm]				see pa	arameters o	of brick		

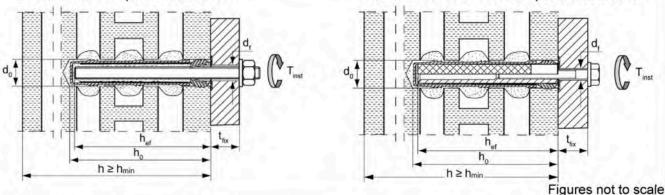
¹⁾ Only for solid areas in hollow bricks and solid bricks.

²⁾ Bridging of unbearing layer (e.g. plaster) is possible. When reducing the effective anchorage depth hef, min, the values of the next shorter perforated sleeve of the same diameter must be used. The smaller value of charastereristic resistance must be taken.









fischer injection system FIS V Plus for masonry

Intended Use

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

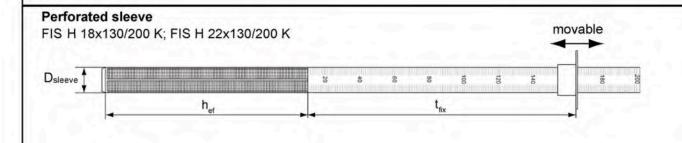
Annex B6

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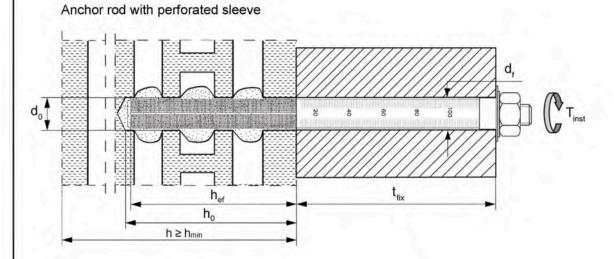
Table B7.1: Installation parameters for anchor rods with perforated sleeves (push through installation)

Perforated sleeve FIS H K		18x1	22x130/200		
Nominal sleeve diameter	D _{sleeve,nom} [mm]		20		
Nominal drill hole diameter	d ₀ [mm]	1	8	22	
Depth of drill hole	h ₀ [mm]		135		
Effective anchorage depth	h _{ef} [mm]	≥130			
Diameter of cleaning brush 1)	d _b ≥ [mm]		see Table B8.1	J	
Size of threaded rod	[-]	M10	M12	M16	
Maximum installation torque T _{inst} [Nr		see parameters of brick			
Thickness of fixture	t _{fix,max} [mm]	200			

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



Installation conditions:



Figures not to scale

Intended Use

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

Annex B7

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Table B8.1:	Parameters of t	he clea	aning bru	ish BS (steel bru	sh with	steel bris	stles)	
The size of the clea	aning brush refers t	o the dr	ill hole dia	meter	<u> </u>				1
Drill hole diameter	d ₀ [mm]	8	10	12	14	16	18	20	22
Brush diameter	d _b [mm]	9	11	14	16	20	20	25	25



Only for solid bricks and autoclaved aerated concrete or solid areas of perforated bricks and hollow blocks

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]		Maximo	um processing t _{work}	time ²⁾	Minimum curing time 1), 2) t _{cure}			
		FIS VW Plus High Speed	FIS V Plus	FIS VS Plus Low Speed	FIS VW Plus High Speed	FIS V Plus	FIS VS Plus 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⁾ For wet bricks the curing time must be doubled.

Figures not to scale

fischer injection system FIS V Plus for masonry	
Intended Use	Annex B8
Cleaning brush (steel brush)	Appendix 14 / 155
Maximum processing times and minimum curing times	Appendix 147 100

²⁾ Minimum cartridge temperature +5°C.

Installation instruction part 1 Installation in solid brick and autoclaved aerated concrete (without perforated sleeve) Drill the hole (drilling method see Annex C of the respective brick) depth of drill hole h₀ and drill hole diameter d₀ see Table B4.1; B5.1. Blow out the drill hole twice. Brush twice and blow out twice again. Remove the sealing cap. Screw on the static mixer. (the spiral in the static 3 mixer must be clearly visible). Press out approximately 10 cm of mortar until the resin is permanently grey Place the cartridge into 4 in colour. Mortar which is a suitable dispenser. not grey in colour will not cure and must be disposed of. Fill approximetly 2/3 of the drill hole with mortar For push through beginning from the installation fill the annular 5 bottom of the hole1). clearance with mortar. Avoid bubbles! Only use clean and oil-free metal parts. 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. Do not touch. Mounting the fixture. Minimum curing time see max Tinst see parameter of Table B8.2. brick in Annex C. 1) Exact volume of mortar see manufacturer's specification. fischer injection system FIS V Plus for masonry

Intended Use

Installation instruction (without perforated sleeve) part 1

Annex B9

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Installation instruction part 2

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

Drill the hole (drilling method see Annex C of the respective brick). depth of drill hole ho and drill hole diameter do see Table B6.1

When install perforated sleeves in solid bricks or solid areas of hollow bricks, also clean the hole by blowing out and brushing.

2



Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible).



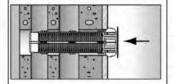


Place the cartridge into a suitable dispenser.

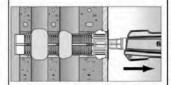


Press out approximately 10 cm of mortar until the resin is permanently grey in colour. Mortar which is not grey in colour will not cure and must be disposed of.



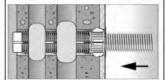


Insert the perforated sleeve flush with the surface of the masonry or plaster.



Fill the perforated sleeve completely with mortar beginning from the bottom of the hole1).



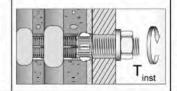


Only use clean and oil-free metal parts. Mark the ancher rod for setting depth. Insert the anchor rod or the internal threaded anchor FIS E by hand using light turning motions until reaching the setting depth marking (anchor rod) or flush with the surface (internal threaded anchor).





Do not touch. Minimum curing time see Table B8.2



Mounting the fixture. max Tinst see parameter of brick in Annex C.

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

fischer injection system FIS V Plus for masonry

Intended Use

Installation instruction (with perforated sleeve) part 2

Annex B10

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

fischer injection system FIS V Plus for masonry

Intended Use

Installation instruction (with perforated sleeve) part 3

Annex B11

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Installation instruction part 4 Installation in autoclaved aerated concrete with special conic drill bit PBB (pre-positioned installation) Position the movable drill bit arrester on the used drill hole depth (see **Table B4.1**). 1 For this, unlock the clamp screw and slide the arrester. Now fix the clamp screw. h_o = 100 mm Drill the cylindrical hole with rotating drill until the arrester contact the material 2 surface (drilling method see Annex C of the respective brick). Deviate the working power drill circulate to generate an conic undercut in the 3 material. Blow out the drill hole four times. 4 Remove the sealing cap. Screw on the static mixer. 5 (the spiral in the static mixer must be clearly visible). Press out approximately 10 cm of mortar until the Place the cartridge into resin is permanently grey in 6 a suitable dispenser. colour. Mortar which is not grey in colour will not cure and must be disposed of. Put the center sleeve into the drill hole and Fill the drill hole with 7 adapt the injection injection mortar. adapter onto the static mixer. Only use clean and oil-free metal parts. Mark the anchor rod for setting depth. Insert the anchor rod or internal threaded anchor 8 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. Do not touch. Mounting the fixture. max Tinst see parameter 9 Minimum curing time see Table B8.2. of brick in Annex C. fischer injection system FIS V Plus for masonry Annex B12 Intended Use

Installation instruction for autoclaved aerated concrete with special conic drill bit PBB

(pre-positioned installation) part 4

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Kind of masonry	Brick format [mm]	strongth		Mean gross density ρ [kg/dm³]	Annex
		Solid brick Mz			
	NF ≥240x115x71	15 / 25 / 35	Germany	≥1,8	C4 - C7
Solid brick Mz	2DF ≥240x115x113	12,5 / 20	Germany	≥1,8	C8 / C9
Solid Brick Wiz	≥ 245x118x54	12,5 / 25	Italy	≥1,8	C10 / C11
	≥ 230x108x55	12,5 / 25	Denmark	≥1,8	C12 / C13
Solid calcium sil	icate (sand- lime) bric	k KS / perforated calcius	m silicate (sa	nd- lime) bric	k KSL
	NF ≥240x115x71	15 / 25 / 35	Germany	≥2,0	C14 / C15
Solid calcium silicate	8DF ≥ 250x240x240	12,5 / 25 / 35	Germany	≥2,0	C16 / C17
brick KS	≥ 997x214x538	12,5 / 25 & 45	Netherlands	≥1,8 & ≥2,2	C18 / C19
	≥ 240x115x113	12,5 / 25	Germany	≥1,8	C20 - C2
Perforated calcium silicate brick KSL	3DF 240x175x113	10 / 12,5 / 15 / 20 / 25	Germany	≥1,4	C24 - C2
	Vertic	al perforated brick HLz			
	370x240x237	5 / 7,5 / 10 / 12,5 / 15	Germany	≥1,0	C28 / C2
	500x175x237	5 / 7,5 / 10 / 12,5 / 15	Germany	≥1,0	C28 / C2
	2DF 240x115x113	7,5 / 12,5 / 20 / 25 / 35	Germany	≥1,4	C30 / C3
	248x365x248	5 / 7,5 / 10	Germany	≥0,6	C32 - C3
	248x365x249	10 / 12,5 / 15	Germany	≥0,7	C36 - C3
	248x365x249	5/8	Germany	≥0,5	C40 - C4
	248x425x248	5/8/10	Germany	≥0,8	C44 - C4
	248x425x248	5 / 7,5 / 10	Germany	≥0,8	C48 - C5
	500x200x315	5 / 7,5 / 10	Germany	≥0,6	C52 - C5
Vertical perforated	500x200x300	5 / 7,5 / 10 / 12,5	France	≥0,7	C56 - C5
brick HLz	500x200x315	2,5 / 5 / 7,5 / 10	France	≥0,7	C60 - C6
	560x200x275	5/8/10	France	≥0,7	C64 / C6
	255x120x118	2,5 / 5 / 8 / 10 / 12,5 / 15	Italy	≥1,0	C66 - C6
	275x130x94	7,5 / 10 / 15 / 20 / 25	Spain	≥0,8	C69 / C7
	220x190x290	7,5 / 10 / 12,5	Portugal	≥0,7	C72 - C7
	253x300x240	2,5 / 5 / 8	Austria	≥0,8	C76 - C7
	250x440x250	8 / 10 / 12,5	Austria	≥0,7	C80 - C8
	230x108x55	2,5/5/8/10	Denmark	≥1,4	C84 / C8
	365x248x245	10	Austria	≥0,6	C86 / C8
	240x175x113	12,5	Germany	≥0,9	C90 / C93

fischer injection	system	FIS V	Plus	for	masonry
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Intended Use Overview of assessed bricks part 1

Kind of masonry	Brick format [mm]	Mean compressive Main country o strength origin [N/mm²]		Mean gross density ρ [kg/dm³]	Annex	
	Hori	zontal perforated	brick LLz			
Horizontal perforated	248x78x250	2,5 / 5 / 8	Italy	≥0,7	C94 / C95	
brick LLz	128x88x275	2,5	Spain	≥0,8	C96 / C97	
	Light-we	eight concrete ho	llow block Hbl			
	362x240x240	2,5 / 5	Germany	≥1,0	C98 - C101	
Light-weight concrete hollow block Hbl	500x200x200	2,5/5/8	France	≥1,0	C102 / C103	
Hollow block Hbi	440x215x215	5 / 8 / 10 / 12,5	Ireland	≥1,2	C104 - C107	
	Light-w	eight concrete so	olid block Vbl			
	≥ 372x300x254	2,5	Germany	≥0,6	C108 / C109	
Light-weight concrete	≥ 250x240x239	5/8/10	Germany	≥1,6	C110 - C113	
solid block Vbl	≥ 440x100x215	5 / 8 / 10 / 12,5	Ireland	≥2,0	C114 / C115	
	≥ 440x95x215	7,5 / 10 / 12,5 / 15	England	≥2,0	C116 / C117	
	Autoc	laved aerated con	crete (AAC)			
PP2 / AAC		2,5	Germany	0,35	C118 - C122	
PP4 / AAC	1 = 1 ·	5	Germany	0,5	C118 - C122	
PP6 / AAC		8	Germany	0,65	C118 - C122	

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Intended Use Overview of assessed bricks part 2

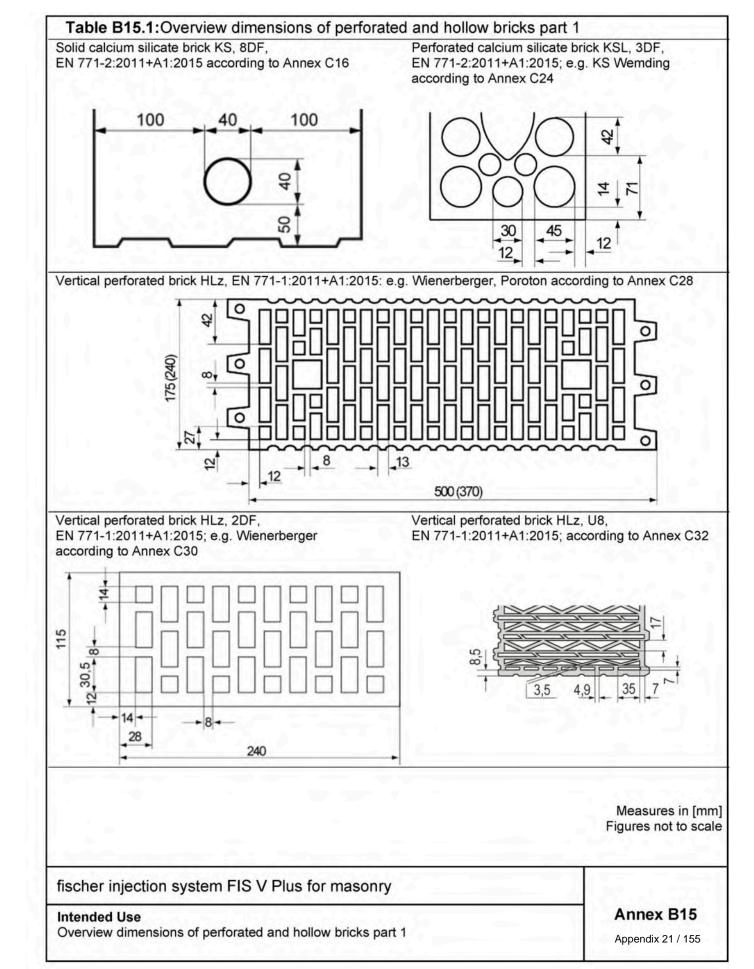
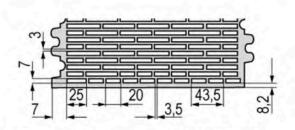
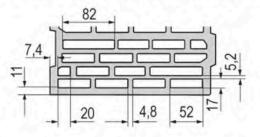


Table B16.1:Overview dimensions of perforated and hollow bricks part 2

Vertical perforated brick HLz, T10, T11, EN 771-1:2011+A1:2015; according to Annex C36

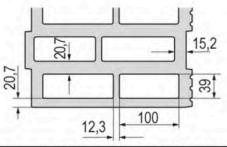
Vertical perforated brick HLz, T7 PF, filled with perlit, EN 771-1:2011+A1:2015; according to Annex C40

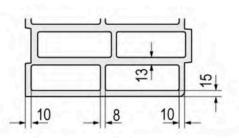




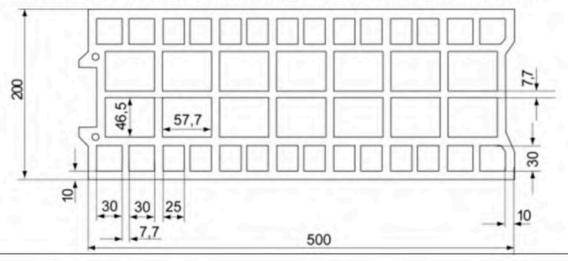
Vertical perforated brick HLz, T9 MW, filled with mineral wool, EN 771-1:2011+A1:2015; according to Annex C44

Vertical perforated brick HLz, FZ 7, filled with mineral wool, EN 771-1:2015; according to Annex C48





Vertical perforated brick HLz, EN 771-1:2011+A1:2015; e.g. Bouyer Leroux; According to Annex C52



Measures in [mm] Figures not to scale

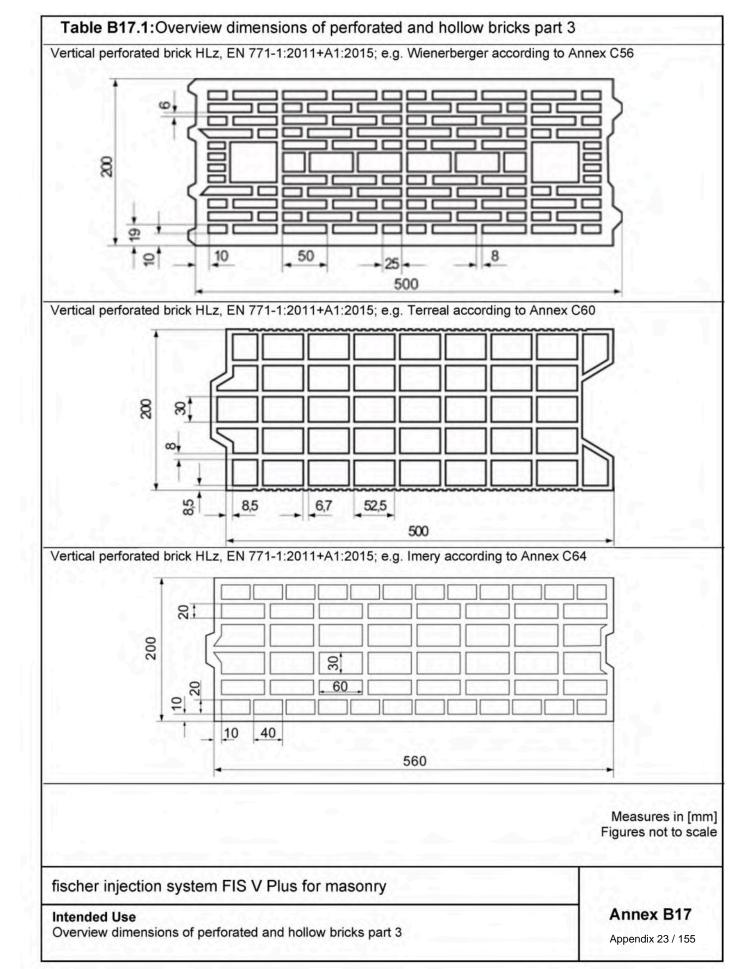
fischer injection system FIS V Plus for masonry

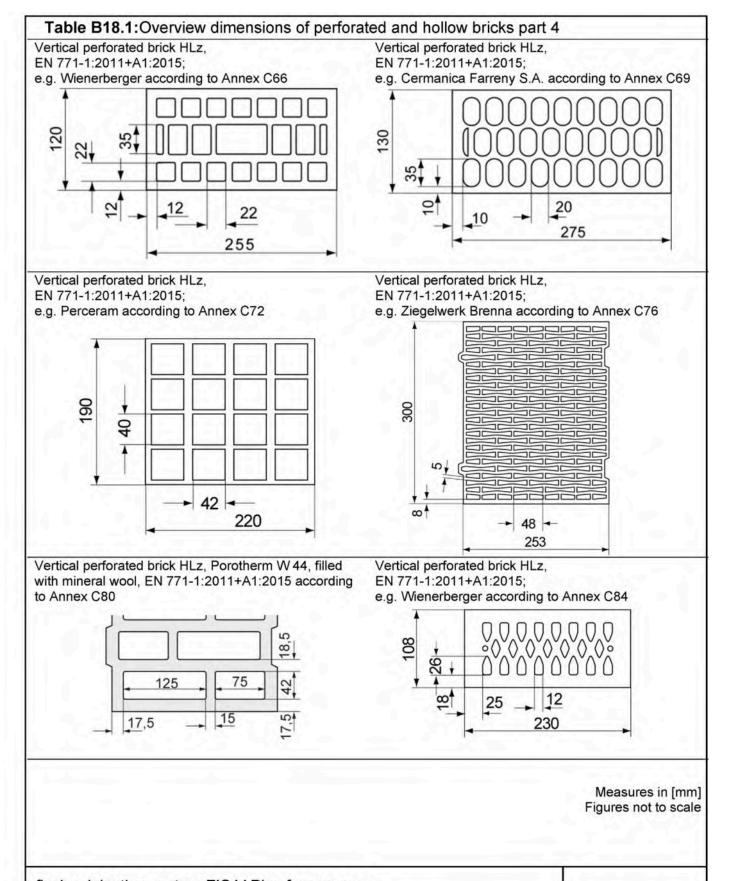
Intended Use

Overview dimensions of perforated and hollow bricks part 2

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Intended Use

Overview dimensions of perforated and hollow bricks part 4

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Table B19.1:Overview dimensions of perforated and hollow bricks part 5 Vertical perforated brick filled with mineral wool, Vertical perforated brick HLz, EN 771-1:2011+A1:2015; according to Annex C86 EN 771-1:2011+A1:2015; e.g. Wienerberger according to Annex C90 18, 97 128 16,5 8,0 7,5 14 11 240 Horizontal perforated brick LLz, Horizontal perforated brick LLz, EN 771-1:2011+A1:2015; according to Annex C94 EN 771-1:2011+A1:2015; e.g. Cermanica Farreny S.A according to Annex C96 40 248 128 Light-weight concrete hollow block Hbl, Light-weight concrete hollow block Hbl, EN 771-3:2011+A1:2015; according to Annex C98 EN 771-3:2011+A1:2015; e.g. Sepa according to Annex C102 200 240 89 16 16 76 132 37 500 362 Measures in [mm] Figures not to scale

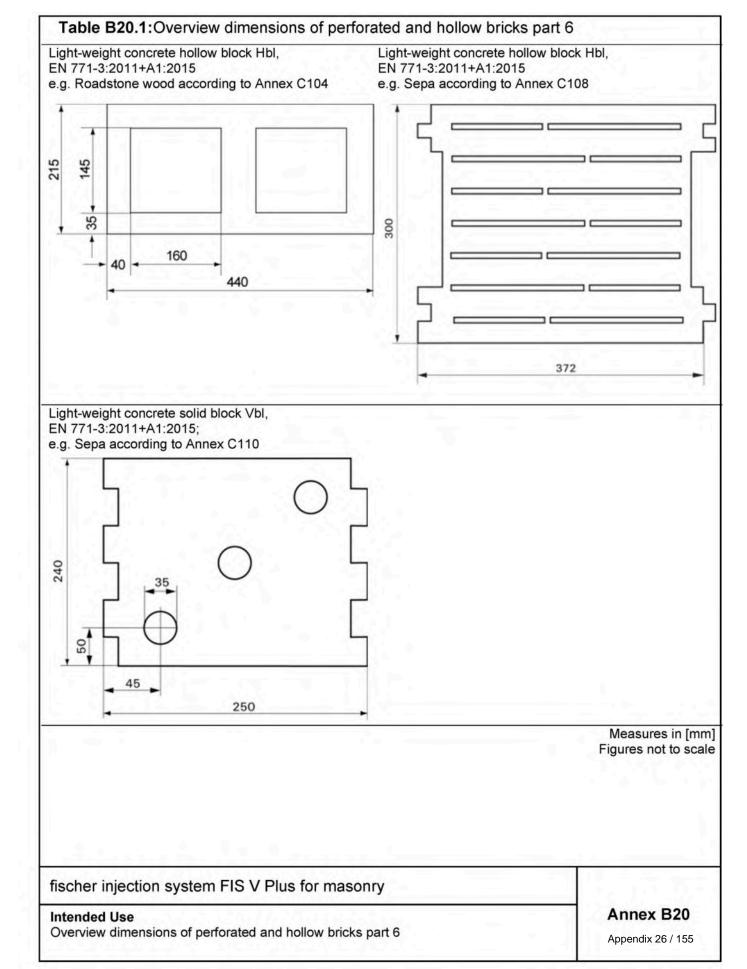
fischer injection system FIS V Plus for masonry

Intended Use

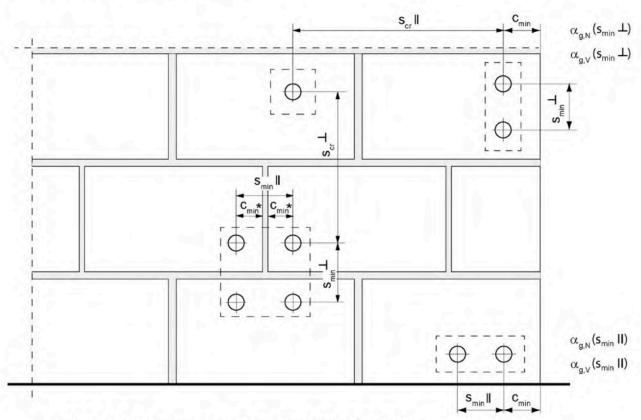
Overview dimensions of perforated and hollow bricks part 5

Annex B19

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Spacing and edge distance part 1



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

s_{min} II = Minimum spacing parallel to horizontal joint

 s_{min} = Minimum spacing perpendicular to horizontal joint

s_{cr} II = Characteristic spacing parallel to horizontal joint

 s_{cr}^{\perp} = Characteristic spacing perpendicular to horizontal joint

 $c_{cr} = c_{min}$ = Edge distance

 $\alpha_{g,N}$ (s_{min} II) = Group factor for tension load, anchor group parallel to horizontal joint

 $\alpha_{g,V}$ (s_{min} II) = Group factor for shear load, anchor group parallel to horizontal joint

 $\alpha_{g,N}$ (s_{min} \perp) = Group factor for tension load, anchor group perpendicular to horizontal joint

 $\alpha_{g,V}(s_{min}^{\perp})$ = Group factor for shear load, anchor group perpendicular to horizontal joint

Figures not to scale

fischer injection system FIS V Plus for masonry

Intended Use

Spacing and edge distance part 1

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Spacing and edge distance part 2

For $s \ge s_{cr}$: $\alpha_g = 2$

For $s_{min} \le s < s_{cr}$: α_g according to installation parameters of brick Annex C

Group of 2 anchors

$$N^{g}_{Rk} = \alpha_{g,N} \cdot N_{Rk}$$
; $V^{g}_{Rk,b} = V^{g}_{Rk,c,II} = V^{g}_{Rk,c,\perp} = \alpha_{g,V} \cdot V_{Rk}$

Group of 4 anchors

$$N^{g}_{Rk} = \alpha_{g,N} (s_{min}II) \cdot \alpha_{g,N} (s_{min}\bot) \cdot N_{Rk}$$
;

$$V^{g}_{Rk,b} = V^{g}_{Rk,c,II} = V^{g}_{Rk,c,\perp} = \alpha_{g,V} \; (s_{min}II) \bullet \alpha_{g,V} \; (s_{min}^{\perp}) \bullet V_{Rk}$$

with N_{Rk} and $\alpha_{g,N}$ depending on s_{min}II or s_{min} \perp acc. to Annex C

with V_{Rk} and $\alpha_{g,V}$ depending on $s_{min}II$ or $s_{min}\bot$ acc. to Annex C

fischer injection system FIS V Plus for masonry

Spacing and edge distance part 2

Annex B22

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Table C1.1: Characteristic resistance to steel failure under tension loading of fischer anchor rods and standard threaded rods

Anchor rod / standard threaded rod					M6	M8 ³⁾	M10 ³⁾	M12	M16	
Chara	acteristic resistar	ice to steel	failure	under	tension l	oading				
	Otaal airea aletad		4.6		8,0	14,6(13,2)	23,2(21,4)	33,7	62,8	
v			4.8		8,0	14,6(13,2)	23,2(21,4)	33,7	62,8	
stic NRK,	Steel zinc plated	'	5.8		10,0	18,3(16,6)	29,0(26,8)	42,1	78,5	
ce		Property	8.8	ri. NII	16,0	29,2(26,5)	46,4(42,8)	67,4	125,6	
Characteristic resistance N _{Rk,s}	Stainless steel R and High corrosion resistant steel HCR	CONTRACTOR OF THE PARTY OF THE	50	[kN]	10,0	18,3	29,0	42,1	78,5	
			70		14,0	25,6	40,6	59,0	109,9	
			80		16,0	29,2	46,4	67,4	125,6	
Partia	al factors 1)									
12.			4.6	File	2,00					
	Steel zinc plated		4.8		1,50					
tors	Steel Zilic plated		5.8		1,50					
al faci Yms,N	<u> </u>	Property	8.8	.,	1,50					
Partial factors	Stainless steel R and	class	50	[-]	2,86					
	High corrosion resistant steel HCR		70		1,502) / 1,87					
			80		1,60					

¹⁾ In absence of other national regulations

fischer injection system	FIS V Plus for	masonry
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Characteristic resistance to steel failure under tension loading of fischer anchor rods and standard threaded rods

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

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

Table C2.1: Characteristic resistance to steel failure under shear loading of fischer anchor rods and standard threaded rods

Anchor rod / standard threaded rod					M6	M8 ³⁾	M10 ³⁾	M12	M16	
Chara	acteristic resistar	nce to steel	failure	under	shear loa	ding				
witho	out lever arm		087						N-708	
			4.6		4,8	8,7(7,9)	13,9(12,8)	20,2	37,6	
	Steel zinc plated		4.8		4,8	8,7(7,9)	13,9(12,8)	20,2	37,6	
	Steel Zille plated		5.8	L A.	6,0	10,9(9,9)	17,4(16,0)	25,2	47,1	
steri		Property	8.8	[kN]	8,0	14,6(13,2)	23,2(21,4)	33,7	62,8	
Characteristic esistance VRK.	Stainless steel R and	class	50	[KIA]	5,0	9,1	14,5	21,0	39,2	
res c	High corrosion		70		7,0	12,8	20,3	29,5	54,9	
	resistant steel HCR		80		8,0	14,6	23,2	33,7	62,8	
with I	lever arm									
e	Steel zinc plated	Property class	4.6		6,1	14,9(12,9)	29,9(26,5)	52,3	132,9	
tan			4.8	h bill	6,1	14,9(12,9)	29,9(26,5)	52,3	132,9	
Sis			5.8		7,6	18,7(16,1)	37,3(33,2)	65,4	166,2	
ristic re M ⁰ Rk,s			8.8	[Nm]	12,2	29,9(25,9)	59,8(53,1)	104,6	265,9	
erist Mº	Stainless steel R and		50		7,6	18,7	37,3	65,4	166,2	
Characteristic resistance M ^o Rk,s	High corrosion		70		10,6	26,2	52,3	91,5	232,6	
Č	resistant steel HCR		80		12,2	29,9	59,8	104,6	265,9	
Partia	al factors1)		34.							
			4.6		1,67					
	Steel zinc plated		4.8	J. File	1,25					
tors	Steel Zille plated		5.8	1839	1,25					
al fac		Property	8.8	[-]			1,25			
Partial factors	Stainless steel R and	class	50	11			2,38			
ď	High corrosion resistant steel		70				1,25 ²⁾ / 1,56			
	HCR		80		1,33					

¹⁾ In absence of other national regulations

fischer injection system FIS V Plus for masonry

Performance

Characteristic resistance to steel failure under shear loading of fischer anchor rods and standard threaded rods

Annex C2

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

³⁾ Values in brackets are valid for undersized threaded rods with smaller stress area A_s for hot-dip galvanised standard threaded rods (M8 resp. M10) according to EN ISO 10684:2004+AC:2009.

		rnal threa		anono.							
fischer interna	101111111111111111111111111111111111111	7170,711073173			M6	M8	M10	M12			
Characteristic anchor FIS E v				under	ension loadi	ng, decisive val	ues of internal t	threaded			
		Property class		14,6	23,2	33,7					
Characteristic resistance	N _{Rk,s}	Property class	5.8	[kN]	10,0	18,3	29,0	42,1			
		Property class 70	R		14,0 14,0	25,6 25,6	40,6 40,6	59,0 59,0			
Partial factors)		TION		14,0	20,0	40,0	33,0			
		Property class	4.6			2,	00				
Partial factors	γMs,N	Property class	5.8	[-]		1,	50				
		Property class 70	R		1,87 1,87						
Charactaristic	rasistar		-		hoor loading			roaded anal			
FIS E with scre			lanure	under	silear loauliig	g; decisive value	es of internal th	reaueu anci			
without lever a	rm					2		1			
		Property class	4.6		4,8	8,7	13,9	20,2			
Characteristic resistance	V _{Rk,s}	Property class	5.8	[kN]	5	9	15	21			
		Property	R	() <u>(</u>	7,0	12,8	20,3	29,5			
		class 70	HCR		7,0	12,8	20,3	29,5			
with lever arm											
		Property class	4.6		6,1	14,9	29,9	52,3			
Characteristic resistance	M ⁰ Rk,s	Property class	5.8	[Nm]	7,6	18,7	37,3	65,4			
		Property	R		10,6	26,2	52,3	91,5			
		class 70	HCR		10,6	26,2	52,3	91,5			
Partial factors	,										
		Property	4.6			1,	67				
	γMs,∨	Property class	5.8	[-]	1,25						
Partial factors		Property	R	RC ALP	1,56 1,56						

fischer injection system FIS V Plus	for masonry
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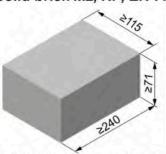
Performance

Characteristic resistance to steel failure under tension / shear loading of internal threaded anchors FIS E

Annex C3

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Solid brick Mz, NF, EN 771-1:2011+A1:2015



Producer	e.g. Wienerberger					
Naminal dissensions	[mana]	length L	width W	height H		
Nominal dimensions	[mm]	≥ 240	≥ 115	≥ 71		
Mean gross dry density ρ	[kg/dm ³]	≥ 1,8				
Mean compressive strength / Min. compressive strength single brick 1)	[N/mm ²]	15 / 12 or 25 / 20 or 35 / 28				
Standard or annex		EN 771-1:2011+A1:2015				

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

Anchor rod			M6	M8	M10	M12				
			1457			76.13	M6	M8	M10	M12
Internal threaded ar		- 5.9	10.53	4.7	113	(85	15x85			
Anchor rod and interr	nal threaded anche	or FIS E with	nout perfor	ated sleev	e		200		7 T	
			50	50	50	50	1		35 10 00 -2)	
Effective anchorage depth	hef	[mm]	80	80	80	80	85			
	Tree Village		200	200	200	200				
Max. installation torque	max T _{inst}	[Nm]	4		10		4	115	10	
General installation p	arameters									
Edge distance	Cmin = Ccr			1	00		100			
Smin II,N 6 her=200 smin II,N [mm] 24		50			_2)					
				60						
		[mm]			_2)					
			240					2	40	
	Scr II		1.0	2	40		240			-
	S _{cr} ⊥ = S _{min} ⊥			75				75		

Drilling method

Hammer drilling with hard metal hammer drill

Table C4.2: Group factors

Anchor rods Internal threaded anchor FIS E			M6	M8	M10	M12	T-6-7-5					
					17. PH		M6	M8	M10	M12		
							11:	k 85	15)	x85		
Edge distance	Cmin				100		3- 10					
	α _{a.N} (S _{min} II)					1,5						
	α _{g,V} (S _{min} II)					2,0						
	h _{ef} =200 α _{g,N} (s _{min} II)					1,5						
	hef=200 αg,v (Smin II)	[mm] [-]				2,0						
Group factor -	α _{g,N} (S _{min} ⊥)		2,0									
4	α _{g,V} (S _{min} ⊥)					2,0				= {		
	h _{ef} =200 α _{q,N} (s _{min} ⊥)		2,0									
	h _{ef} =200 α _{a,V} (s _{min} ⊥)		2,0									

fischer injection system FIS V Plus for masonry

Performance

Solid brick Mz, NF, dimensions, installation parameters for edge distance c=100mm, Group factors

Annex C4

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¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

²⁾ No performance assessed

Solid brick Mz, NF, EN 771-1:211+A1:2015

Table C5.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading for edge distance c=100mm

Anchor rod		M6	M8		M10	1	M12					the title		
Internal threaded and	h FIG F	7 34								M6	M8	M10	M12	
Internal threaded anchor FIS E										11x85		15x85		
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_F$	Rk,p,c = NRk,b,c	[kN];	tempe	rature	range	50/80	°C 2)							
Mean compressive Use			Effe	ctive a	nchora	ge de	pth hef	[mm]		÷	55			
strength / Min. compressive strength single brick 1)	con- ditions	≥50	≥50	50	80	200	50	80	200			85		
45 / 40 N/2	w/w w/d	2,5	2,5	2,0	3,0	7,5	2,0	3,5	5,0			3,5		
15 / 12 N/mm ²	d/d	4,0	4,0	3,5	5,0	12,0	3,0	5,5	8,0	,0 5,5		5,5	,5	
25 / 20 N/mm²	w/w w/d	3,5	3,5	3,0	4,5	11,0	3,0	5,0	7,0			5,0		
25 / 20 N/mm ²	d/d	5,5	5,5	5,0	7,0	12,0	4,5	8,0	11,5			3,0		

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C5.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading for edge distance c=100mm

Anchor rod		M6	M8	M	10	M	12					
	L FIO F		1721			A		M6	M8	M10	M12	
Internal threaded anchor FIS E		37/	152					11x	85	15x85		
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V$	Rk,c,⊥ [kN];	temper	ature ra	ange 50/8	30°C and	72/120°C			-3	47	<u> </u>	
Mean compressive strength / Min.	Use		1 1	E	ffective ar	nchorage	depth hef[r	mm]				
compressive strength single brick 1)	con- ditions	≥50	≥50	≥50	200	≥50 200		85				
15 / 12 N/mm²	w/w w/d	2,5	2,5	4,0	8,5	4,0	11,5	11.5		2,5		
	d/d	2,0	2,0	1,0	0,0	1,0	11,0					
25 / 20 N/mm²	w/w w/d d/d	4,0	4,0	6,0	12,0	5,5	12,0		4,	4,0		

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

fischer injection system FIS V Plus for masonry

Performance

Solid brick Mz, NF, Characteristic resistance under tension and shear loading, edge distance c=100mm

Annex C5

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²⁾ For temperature range 72/120°C: NRk (72/120°C) = 0,83 · NRk (50/80°C).

Solid brick Mz, NF, EN 771-1:2011+A1:2015 Table C6.1: Installation parameters for edge distance c=60mm Anchor rod M6 **M8** M₁₀ M12 M16 M10 M12 M6 **M8** Internal threaded anchor FIS E 11x85 15x85 Anchor rod and internal threaded anchor FIS E without perforated sleeve 50 50 50 50 50 Effective [mm] 100 100 100 100 100 85 hef anchorage depth 200 200 200 200 200 Max. installation max T_{inst} [Nm] 4 10 4 10 torque General installation parameters Edge distance Cmin = Ccr 60 Edge distance 60 Cmin hef=200 80 Smin II,N hef=200 smin II,N [mm] 80 80 Smin II,V Spacing Scr II 3x hef 80 Smin 1 3x hef Scr 1 **Drilling method** Hammer drilling with hard metal hammer drill Group factors Table C6.2: Anchor rods **M6 M8** M₁₀ M12 M16 M6 **M8** M10 M12 Internal threaded anchor FIS E 11x85 15x85 Edge 60 Cmin [mm] distance ag,N (Smin II) 0.6 αg, V (Smin II) 1,3 hef=200 ag,N (Smin II) 1,4 Group hef=200 ag,v (smin II) 1,5 [-] factor αg,N (Smin ⊥) 0,3 1,3 αg, v (Smin ⊥) hef=200 $\alpha_{g,N}$ (Smin \perp) 2,0 hef=200 $\alpha_{g,V}$ ($s_{min} \perp$) 1,1 fischer injection system FIS V Plus for masonry Annex C6 Performance Solid brick Mz, NF, dimensions, installation parameters, edge distance c=60mm, Group Appendix 34 / 155 factors

Solid brick Mz, NF, EN 771-1:2011+A1:2015

Table C7.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading for edge distance c=60mm

Anchor rod			N	16	N	18	130	M10		3	M12			M16	44	2 1-6-0- 100				
Internal threaded ar	chor				It											M6	M8	M10	M12	
FIS E											3	24				11:	k 85	15	k 85	
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,b}$	Rk,p,c	= N _{Rk}	,b,c [k	(N]; t	emp	eratı	ire ra	ange	50/8	0°C	3)	, of (7	78	. 7				, Z (
Mean compressive strength / Min.	U	se						Effec	tive a	ncho	orage	dep	th he	[mm]					
compressive strength single brick 1)	1 to 10 2 35 3	on- ons	50	100	50	100	50	100	200	50	100	200	50	100	200		8	5		
15 / 12 N/mm ²	w/w	w/d	1	,5	2,0	2,0	2,0	2,5	_2)	2,0	2,5	_2)	2,0	5,5	_2)			.2)		
15 / 12 N/IIIII	d	/d	2	,5	3,0	4,0	3,0	4,0	9,5	3,0	4,0	9,5	3,0	8,5	9,5		-	2)		
25 / 20 N/mm²	w/w	w/d	2	,0	2,5	3,0	2,5	3,5	_2)	3,0	3,5	_2)	3,0	7,5	_2)			2)		
25 / 20 N/IIIII	4	/d	3	5	15	5.5	15	5.5	12	15	5.5	12	15	12	12	9	- 0.4	2)		

4.0

5,5 6,5 5,5 6,5 12 5,5 6,5 12

3.5

4.0

M12

2.5 5.0

3.5

5,5

12 12

M16

3.0

35 / 28 N/mm²

Anchor rod

2.5

4,0

M6

3.0

M8

4.0

w/w w/d

d/d

Table C7.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading for edge distance c=60mm

M10

Internal threaded an	chor	L							1					7	M8 (85	M10	M12 x85
$V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V_{Rk,c,ll}$	/ _{Rk,c,⊥} [kN]; ten	pera	ture	rang	je 50)/80°(Cano	72/	120°	С		120		W		
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions	50	100	50	100		Effec 100		ΙΚά						8	35	3
15 / 12 N/mm²	w/w	1,2	2,5	1,2	3,0	2,0	3,0	1,5	1,5	3,0	3,0	0,6	3,0	4,5		_2)	
25 / 20 N/mm ²		15	35	15	15	20	15	25	20	15	15	00	15	60		2)	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

2.0 | 4.0 | 2.0 | 5.0 | 3.5 | 5.0 | 3.0

35 / 28 N/mm²

distance c=60mm

Factor for job site tests and displacements see annex C123.

d/d

fischer injection system FIS V Plus for masonry	
Performance Solid brick Mz, NF, Characteristic resistance under tension and shear loading, edge	1

Annex C7

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_2)

_2)

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

²⁾ No performance assessed.

³⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

²⁾ No performance assessed.

Solid brick Mz, 2DF, EN 771-1:2011+A1:2015 Producer Nominal dimensions Mean gross dry density ρ [kg/dm³] Mean compressive strength / Min. $[N/mm^2]$ compressive strength single brick 1) Standard or annex

Table (20 1.	Installation paramete	rc
l'able (JO. 1.	Installation parameter	SIS

Anchor rod		N	16	N	18	M	10	M	12	M	16		V-Y		-
		-	-	7					5.61			M6	M8	M10	M12
Internal threaded anchor	FISE		12.4			1 6						11)	(85	15:	x85
Anchor rod and internal t	hreade	d and	chor F	IS E	witho	ut pe	rforat	ed sl	eeve						
Effective anchorage depth hef	[mm]	50	100	50	100	50	100	50	100	50	100		8	35	
Max. instal- lation torque max T _{inst}	[Nm]		4				1	0		7		4		10	
Anchor rod and internal t	hreade	d and	chor F	IS E	with p	erfor	ated s	sleev	e FIS	H 16	(85 K				
Effective anchorage depth hef	[mm]		2)		88	5			2			8	5	II a	2)
Max. instal- lation torque max T _{inst}	[Nm]	_2)						4	10						
General installation para	meters	3 =	- 47							-		· A			
Edge distance c _{min} = c _{cr}								(30						= 1
S _{min} II	f1							1	20						
Spacing s _{cr} II	[mm]							2	40						-1
$s_{cr} \perp = s_{min} \perp$								1	15						

Drilling method

Hammer drilling with hard metal hammer drill

Table C8.2: Group factors

Anchor ro	ods	M6	M8	M10	M12	M16			-67	-
Indonesia I Ale				10.71	F-777		M6	M8	M10	M12
internal tr	readed anchor FIS E						11:	x85	15:	x85
	αg,N (Smin II)				1,5					
Group	α _{g,V} (s _{min} II)				1,4					
factor	α _{g,N} (S _{min} ⊥) [-]				2,0					
	α _{g,V} (S _{min} ⊥)				2,0					

fischer injection system FIS V Plus for masonry

Performance

Solid brick Mz, 2DF, dimensions, installation parameters, Group factors

Annex C8

e.g. Wienerberger width W

≥ 115

≥ 1,8

12,5 / 10 or 20 / 16

EN 771-1:2011+A1:2015

length L

≥ 240

[mm]

height H

≥ 113

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¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

²⁾ No performance assessed.

Solid brick Mz, 2DF, EN 771-1:2011+A1:2015

Table C9.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod	M6	M8	M10	M12	M16	4		M8	M10	IH-A
Internal threaded anchor FIS E			15.3			M6 M8	M10 M12	-		M6 M8
Perforated sleeve FIS H K		•	7.	C.	15.7				16x	1.5.

Mean compressive	U	se						Effe	ectiv	e and	hora	ge dept	h h _{ef} [mm]	
strength / Min. compressive strength single brick ¹⁾	0.7575	on- ons	50	100	50	100	50	100	50	100	50	100	85	
•	w/w	w/d	1,5	2,5	1,5	2,5	1,5	3,0	2,0	3,5	2,0	3,5	2,0	1,5
	d	/d	3,0	4,0	3,0	4,0	3,0	4,5	3,0	5,5	3,0	5,5	3,0	3,0
20 / 40 N/2	w/w	w/d	2,5	4,0	2,5	4,0	2,5	4,5	3,5	5,5	3,5	5,5	3,5	2,5
20 / 16 N/mm ²	d	/d	4.5	7.0	4.5	7.0	4.5	7.5	5.5	8.0	5.5	8.0	5.5	4.5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C9.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod	M6	M8	M10	M12	M16					M8	M10	
Internal threaded anchor FIS E	- 1-3-	100				M6 N		70/11/1			3	M6 M8
anchor FIS E		15	122			11x8	35	15x	85		15.4	11x85
Perforated sleeve FIS H K				3.5		-					16x	85

Mean compressive	Use			Effe	ective and	horage d	epth h	n _{ef} [m	im]					
strength / Min. compressive strength single brick ¹⁾	con- ditions			≥ 50						85	5			
12,5 / 10 N/mm²	w/w w/d d/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
20 / 16 N/mm²	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

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

fischer injection system FIS V Plus for masonry	fischer in	jection s	ystem F	FIS VI	Plus	for I	masonry
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Performance

Solid brick Mz, 2DF, Characteristic resistance under tension and shear loading

Annex C9

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²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Solid brick Mz, EN 771-1:2011+A1:2015 Producer e.g. Nigra length L width W height H Nominal dimensions [mm] ≥ 245 ≥ 118 ≥ 54 Mean gross dry density ρ [kg/dm³] ≥ 1,8 Mean compressive strength / Min. [N/mm²] 12,5 / 10 or 25 / 20 compressive strength single brick 1) Standard or annex EN 771-1:2011+A1:2015

Table C10.1: Installation parameters

Anchor rod		N	16	N	18	M	10	M	12	M	16	3			
Internal threaded anchor							001		3.77			M6	M8	M10	M12
FIS E	44.											11:	x85	153	x85
Anchor rod and internal	thread	ed ar	nchor	FIS E	with	out pe	erforat	ed sl	eeve						
Effective anchorage depth hef	[mm]	50	100	50	100	50	100	50	100	50	100		8	35	Ż
Max. installation torque max T _{inst}	[Nm]		4				1	0	-			4	E	10	a i
General installation para	meters	;													
Edge distance c _{min} = c _{cr}	10	60													
Ser II = Smin II	[mm]	m] 245													
Spacing $s_{cr} \perp = s_{min} \perp$								6	0						

Drilling method

Hammer drilling with hard metal hammer drill

Table C10.2: Group factors

Anchor rods		M6	M8	M10	M12	M16			4.6.4	
Internal threa	aded anchor				7.7.37		M6	M8	M10	M12
IS E		1 2 2					11x85		15x85	
Group factor	$\begin{array}{c} \alpha_{g,N} \; (s_{min} \; II) \\ \hline \alpha_{g,V} \; (s_{min} \; II) \\ \hline \alpha_{g,N} \; (s_{min} \; \bot) \end{array} \; [\text{-}]$				2					
	αg,v (Smin 丄)									

fischer injection system FIS V Plus for masonry

Performance

Solid brick Mz, dimensions, installation parameters, Group factors

Annex C10

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¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Solid brick Mz, EN 771-1:2011+A1:2015

Table C11.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod		= 11	M6 M8 M10 M				M16			12.0	
	-10 -		1000	MILA			7777	M6	M8	M10	M12
Internal threaded anchor	FIS E						L Pay	11x85		15	x85
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c}$	= N _{Rk,1}	b,c [kN	N]; tempe	rature rang	ge 50/80°C	2)					
Mean compressive strength/	е			Effective ar	nchorage de	epth hef [m	ım]				
Min. compressive strength single brick 1)	Min. compressive strength con-				≥ 50				8	35	
40 F / 40 N/2	w/w	w/d	0,60	0,90	0,75	0,75	0,75	0,60		0,75	
12,5 / 10 N/mm²	d/	d	1,20	1,50	1,20	1,20	1,20	1,20		1,20	4
05 / 00 N/2	w/w	w/d	0,90	1,50	1,20	1,20	1,20	0,90	1.0	1,20	ч
25 / 20 N/mm ²	d/	d	1,50	2,50	2,00	2,00	2,00	1,50		2,00	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C11.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod		M6 M8 M10 M12 N		M16	6 -					
Internal threaded anche	or EIC E		Take 1		Treat.		M6	M8	M10	M12
internal threaded anche	or FIS E		Let les				11:	x85	15)	k 85
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk}$,c,⊥ [kN]; tem	perature	range 50/8	0°C and 72	2/120°C					
Mean compressive strength / Min.	Use			Effective ar	nchorage d	epth hef [m	nm] 	T	5	7
compressive strength	con-			> 50				9	35	

Mean compressive strength / Min. compressive strength single brick 1)	Use con- dition		Effective anchorage depth h _{ef} [mm] ≥ 50 85										
12,5 / 10 N/mm ²	w/w v	w/d	2,0	3,0	4,0	4,5	5,5	2.0	3,0	4.0	4,5		
12,57 10 14/11111	d/d		2,0	3,0	4,0	4,5	5,5	2,0	5,0	4,0	7,5		
25 / 20 N/mm²	w/w v	w/d	2.5	4.0	5,5	6,0	8,0	2.5	4.0	5.5	60		
25 / 20 N/mm ²	d/d		2,5	4,0	5,5	0,0	0,0	2,5	4,0	5,5	6,0		

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

fischer injection sy	ystem FIS V Plus	for masonry
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Performance

Solid brick Mz, Characteristic resistance under tension and shear loading

Annex C11

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²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Producer Nominal dimensions Mean gross dry dens Mean compressive strengt Standard or annex

Producer		e.g.	Wienerbe	erger	
Naminal dissersions	[mana]	length L	width W	height H	
Nominal dimensions	[mm]	≥ 230	≥ 108	≥ 55	
Mean gross dry density ρ	[kg/dm ³]				
Mean compressive strength / Min. compressive strength single brick 1)	[N/mm ²]	12,5	/ 10 or 25	/ 20	
Standard or annex		EN 771	-1:2011+/	1:2015	

Table C12.1: Installation parameters

Anchor rod		N	16	IV	18	M	10	M	12	M	16				
Internal threaded anchor		L	45.00			100		TT.				M6	M8	M10	M12
FIS E						•						11x85		15x85	
Anchor rod and internal	thread	ed ar	chor	FIS E	with	out pe	rfora	ted sl	eeve						14.3
Effective anchorage depth hef	[mm]	50	90	50	90	50	90	50	90	50	90		8	35	
Max. installation torque max T _{inst}	[Nm]		4 10 4						10						
General installation para	meters	•													
Edge distance c _{min} = c _{cr}								6	0						-4
Species Scr II = Smin II	[mm]		230												
Spacing $s_{cr} \perp = s_{min} \perp$		60													
Drilling mothed															

Drilling method

Hammer drilling with hard metal hammer drill

Table C12.2: Group factors

Anchor rods			M6	M8	M10	M12	M16	-			
Internal threaded anchor FIS E		3/1	57.8			V 5 7		M6	M8	M10	M12
					T. See			11x85		15x85	
Group factor	$\begin{array}{c} \alpha_{g,N} \ (s_{min} \ II) \\ \alpha_{g,V} \ (s_{min} \ II) \\ \alpha_{g,N} \ (s_{min} \ \bot) \\ \alpha_{g,V} \ (s_{min} \ \bot) \end{array}$	[-]				2		1			7

fischer injection system FIS V Plus for masonry

Performance

Solid brick Mz, dimensions, installation parameters, Group factors

Annex C12

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¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Solid brick Mz, EN 771-1:2011+A1:2015

Table C13.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod			M6	M8	M10	M12	M16		•				
Internal threaded anch	or EIC	_					200	M6	M8	M10	M12		
internal threaded and	IOI FIS			11x85		15:	x85						
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk}$,p,c = N _R	k,b,c [k]	N]; tempe	rature rang	ge 50/80°C	2)		7_		LA.Y			
Mean compressive strength / Min.	11 14 137	se on-	Effective anchorage depth hef [mm]										
compressive strength single brick 1)	100.0	ons			≥ 50				8	35			
12,5 / 10 N/mm ²	w/w	w/d	0,60	0,90	0,75	0,75	0,75		0,	75			
12,5 / 10 N/mm	d	/d	1,20	1,50	1,20	1,20	1,20	,20 1,20					
25 / 20 N/mm²	w/w	w/d	0,90	1,50	1,20	1,20	1,20		1,	20			
25 / 20 N/mm²			1.50	2.50	2.00	2.00	2.00		2	00	- 1		

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C13.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

M10

M12

M16

M8

M6

Internal threaded anchor FIS E	or EIC E						M6	M8	M10	M12
internal threaded and	IOI FIS E						11:	x85		
$V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V_R$	k,c,⊥ [kN]; tem	perature r	ange 50/8	0°C and 72	2/120°C					
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions			Effective ar ≥ 50	nchorage de	epth h _{ef} [m	nm]	8	35	Ž
12,5 / 10 N/mm²	w/w w/d d/d	2,0	3,0	4,0	4,5	5,5	2,0	3,0	4,0	4,5
25 / 20 N/mm ²	w/w w/d	2,5	4,0	5,5	6,0	8,0	2,5	4,0	5,5	6,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Anchor rod

Solid brick Mz, Characteristic resistance under tension and shear loading

Annex C13

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²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Solid calcium silicate brick KS, NF, EN 771-2:2011+A1:2015 115 Producer width W height H length L Nominal dimensions [mm] ≥ 240 ≥ 115 ≥71 Mean gross dry density p [kg/dm³] ≥ 1,8 Mean compressive strength / Min. $[N/mm^2]$ 15 / 12 or 25 / 20 or 35 / 28 compressive strength single brick 1)

Table C14.1: Installation parameters

Standard or annex

Anchor rod		M6		M8		M10	M12		M	M16 -			BY ST		
Internal thread	ed anchor		150		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							M6	M8	M10	M12
FIS E				3								11x85		153	x85
Anchor rod and	d internal	thread	ed a	nchor	FIS E	with	out perfora	ted slee	ve	ĄĄ					
Effective	67.4	f1		400		400	50 100	50 1	00	50	100		-		
anchorage depth hef		[mm]	50	100	50	100	200	200		2	00	8	5	8	5
Max. installation torque	max T _{inst}	[Nm]	m] 3 5		5	15	15		25		3 5		1	5	
General install	ation para	meters	3		2.4							Æ			
Edge distance	C _{min} = C _{cr}							60							
	Smin II			_			_	80						-	2.
<u> </u>	Scr II	[mm]					80								
Spacing —	S _{min} \bot							3x he	f						
	S _{cr} ⊥			3x h _{ef}											

Drilling method

Hammer drilling with hard metal hammer drill

Table C14.2: Group factors

Anchor rod			M6	M8	M10	M12	M16				-
Internal threa	aded anchor				117.07	Dec 57	1,000	M6	M8	M10	M12
FIS E				10:41		- 1		11:	x85	153	x85
	α _{g,N} (s _{min} II)	di				0,7					
	α _{g,V} (S _{min} II)		6 4			1,3			-		
Group factor	α _{g,N} (s _{min} ⊥)	[-]				2,0					
	α _{g,} ∨ (s _{min} ⊥)					2,0					

fischer injection system FIS V Plus for masonry

Performance

Solid calcium silicate brick KS, NF, dimensions, installation parameters, Group factors

Annex C14

EN 771-2:2011+A1:2015

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¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength...

Solid calcium silicate brick KS, NF, EN 771-2:2011+A1:2015

Table C15.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod	M6	M8	M10	M12	M16		10	13.	
Internal threaded anchor FIS E	7.0	7.	7.5	150.0	Type of	M6	M8	M10	
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,p,c}$	Rk,b,c [kN];	temperati		80°C ²⁾			Y		

Mean compressive	U	se						Effec	tive a	anch	orag	e dep	th h	f [mn	n]		
strength / Min. compressive strength single brick 1)	1 12007	ditions	50	100	50	100	50	100	200	50	100	200	50	100	200	85	85
45 / 42 N/mam 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
15 / 12 N/mm²	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
25 / 20 N/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
25 / 20 N/mm	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
25 / 20 N/mm²	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
35 / 28 N/mm ²	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

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C15.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod		M6	M8	M10	M12	M16	1 2			
Internal threaded ar	nchor			1.05				M8 x85	M10	M12
$V_{Rk} = V_{Rk,b} = V_{Rk,c,li} =$	V _{Rk,c,⊥} [kN	l]; temper	ature rang	ge 50/80°C ar	nd 72/120°C					
Mean compressive	Llea			Effective a	anchorage dep	th hef [mm]				

Mean compressive	Use	1				Ef	fective a	nchor	age dep	th hef[r	nm]		
strength / Min. compressive strength single brick 1)	con- ditions	50	100	50	100	50	≥100	50	≥100	50	≥100	85	85
15 / 12 N/mm²	w/w w/d d/d	1,5	3,0	1,5	3,0	1,2	2,0	1,2	2,0	1,2	2,0	1,2	1,2
25 / 20 N/mm²	w/w w/d d/d	2,5	4,0	2,5	4,0	1,5	3,0	1,5	3,0	1,5	3,0	1,5	1,5
35 / 28 N/mm²	w/w w/d d/d	3,0	4,5	3,0	4,5	1,5	3,5	1,5	3,5	1,5	3,5	1,5	1,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

fischer injection system FIS V Plus for mas	onry
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Performance

Solid calcium silicate brick KS, NF, Characteristic resistance under tension and shear loading

Annex C15

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²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Solid calcium silicate brick KS, 8DF, EN 771-2:2011+A1:2015 Producer width W height H length L Nominal dimensions [mm] ≥ 250 ≥ 240 ≥ 240 Mean gross dry density p [kg/dm³] ≥ 2.0 Mean compressive strength / Min. [N/mm²] 12,5 / 10 or 25 / 20 or 35 / 28 compressive strength single brick 1) Standard or annex EN 771-2:2011+A1:2015 Dimension see also Annex B15 Table C16.1: Installation parameters Anchor rod M₆ **M8** M10 M₁₂ M16 M8 M10 M12 M6 Internal threaded anchor FIS E 11x85 15x85 Anchor rod and internal threaded anchor FIS E without perforated sleeve Effective 50 100 50 100 50 100 100 85 hef [mm] 50 100 anchorage depth Max. installation max Tinst [Nm] 4 10 10 4 torque Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H 16x85 K Effective hef [mm] 85 85 anchorage depth _2) _2) _2) Max. installation max T_{inst} [Nm] 10 4 10 torque General installation parameters Edge distance Cmin = Ccr 60 80 Smin II scr II [mm] 3x hef Spacing 80 Smin 1 3x hef Scr 1 **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. 2) No performance assessed. Table C16.2: Group factors Anchor rods M6 M12 M16 **M8** M10 M6 **M8** M10 M12 Internal threaded anchor FIS E 11x85 15x85 Ola N (Smin II) 1.5 1,2 Group ag. v (Smin II) [-] factors α_{a,N} (Smin ⊥) 1.5 αa, v (Smin ⊥) 1,2

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Performance

Solid calcium silicate brick KS, 8DF, dimensions, installation parameters, Group factors

Annex C16

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Solid calcium silicate brick KS, 8DF, EN 771-2:2011+A1:2015

Table C17.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod	M6	M8	M10	M12	M16	Le l	- 1	1114		M8	M10	11.
Internal threaded		11.5	100.41	The N	115.50	M6	M8	M10	M12	Teal	15,0	M6 M8
anchor FIS E			1878	15	116-11	11x85		15x85			11.5	11x85
Perforated sleeve FIS H K		13	199	10-					41		16x8	5

 $N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C 2)

Mean compressive strength / Min. compressive strength	Use con-			≥ 50	Effect	tive and	horage d	epth h _{ef} [mm]	111	
single brick 1)	ditions									
40 F (40 N/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
12,5 / 10 N/mm ²	d/d	5,0	7,0	7,0	7,0	5,5	5,0	5,5	8,0	5,0 8,0
OF 100 M/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
25 / 20 N/mm ²	d/d	7,5	10,0	10,0	10,0	7,5	7,5	7,5	11,0	7,5 11
25 / 20 N/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
35 / 28 N/mm ²	d/d	8,5	12,0	12,0	12,0	11,0	8,5	11,0	12,0	8,5 12

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C17.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod	M6	M8	M10	M12	M16	II va	150	i i i	- 1	M8	M10	10.4
Internal threaded		150	lion.	15.6		M6	M8	M10	M12	11.1	0.00	M6 M8
anchor FIS E	9 9 16.	100	(5.0)	1.24	2.0	11x85		15x85			IIE.	11x85
Perforated sleeve FIS H K		(4)	3.5			10	-		-		16x8	5

Mean compressive strength / Min.	Use		Effectiv	e anchorage de	epth hef [mm]		
compressive strength single brick 1)	con- ditions		≥ 50		85		
12,5 / 10 N/mm²	w/w w/d d/d	2,5	4,5	2,5	4,5	4,5	2,5 4,5
25 / 20 N/mm²	w/w w/d d/d	4,0	6,5	4,0	6,5	6,5	4,0 6,5
35 / 28 N/mm ²	w/w w/d d/d	5,0	9,0	5,0	9,0	9,0	5,0 9,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

fischer injection system FIS V Plus for mason	fischer in	iection s	vstem F	FIS V	Plus	for	masonr	V
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Performance

Solid calcium silicate brick KS, 8DF, Characteristic resistance under tension and shear loading

Annex C17

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²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Solid calcium silicate brick KS, EN 771-2:2011+A1:2015 Producer e.g. Calduran width W height H length L Nominal dimensions [mm] ≥ 997 ≥ 214 ≥ 538 2.2 [kg/dm3] 1.8 Mean gross dry density ρ Mean compressive strength / Min. 12,5 / 10 or [N/mm²] 45 / 36 compressive strength single brick 1) 25 / 20 Standard or annex EN 771-2:2011+A1:2015 214 Installation parameters Table C18.1: Anchor rod **M6 M8** M10 M12 M16 M6 **M8** M10 M12 Internal threaded anchor FIS E 11x85 15x85 Anchor rod and internal threaded anchor FIS E without perforated sleeve Effective 50 100 50 100 50 100 50 100 50 100 85 hef [mm] anchorage depth Max. installation max Tinst [Nm] 4 4 10 10 torque General installation parameters Edge distance 75 Cmin = Ccr Scr II = Smin II [mm] 3x hef Spacing Scr 1 = Smin 1 3x hef **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C18.2: Group factors Anchor rod M₆ **M8** M₁₀ M12 M16 M10 M12 M6 **M8** Internal threaded anchor FIS E 11x85 15x85 ag,N (Smin II) $\alpha_{g,V}$ (Smin II) Group 2 [-] factors αg,N (Smin ⊥) αg, V (Smin ⊥) fischer injection system FIS V Plus for masonry Annex C18 Performance Solid calcium silicate brick KS, dimensions, installation parameters, Group factors

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Solid calcium silicate brick KS, EN 771-2:2011+A1:2015

Table C19.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod			N	/ 16	N	18	M1	0	M	12	M	16	D. Problem		A C.	
Internal threaded and	chor	9.7	13					Jul					M6	M8	M10	M12
FIS E					1.5							41	11)	(85	15	x85
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N$	Rk,p,c =	N _{Rk,b}	,c [kN	l]; tem	perat	ure rai	nge 50)/80°C	2)	-45	10.0					
Mean compressive	Us	se	17	6		E	ffectiv	e anc	horag	e dept	h hef[mm]				
strength / Min. compressive strength single brick 1) Use con- ditions		n-	50	100	50	100	50	100	50	100	50	100			85	
40 5 / 40 11/2	w/w	w/d	4	,0	4,0	7,0	5,0	6,0	5,0	6,0	5,5	7,5	5 5,5			
12,5 / 10 N/mm ² d/d		/d	7	',0	7,0	12,0	8,0	9,5	8,0	10,0	9,0	11,5	,5 9,0			
25 / 20 N/2	w/w	w/d	5	5,5	6,0	10,0	7,0	8,5	7,0	9,0	8,0	11,0	15		3,0	
25 / 20 N/mm ²		-											1			

8,0

| 10,5 | 12,0 | 11,5 | 12,0 | 11,0 | 12,0 | 12,0 | 12,0 |

12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 |

12,0 | 11,5 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0

12,0

12.0

12,0

8,5

4,5

8,0

d/d

w/w w/d

d/d

45 / 36 N/mm²

Table C19.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod		M6	M8	M10	M12	M16		•		
Internal threaded anchor FIS E		17.5					M6	M8	M10	M12
							11x85		15x85	
V _{Rk} = V _{Rk,b} = V _{Rk,c,II} = 1	V _{Rk,c,⊥} [kN];	temperatu	re range 50	0/80°C and	72/120°C			-	0	
Mean compressive	Use	Effective anchorage depth hef [mm]								

Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions			Effective an ≥ 50	chorage de	oth h _{ef} [mm]	8	35	3
12,5 / 10 N/mm ²	w/w w/d d/d	3,0	5,0	5,5	4,0	4,0	3,0	5,0	5,5	4,0
25 / 20 N/mm²	w/w w/d d/d	4,5	7,0	7,5	6,0	6,0	4,5	7,0	7,5	6,0
45 / 36 N/mm²	w/w w/d d/d	4,5	9,0	11,0	12,0	12,0	4,5	9,0	11,0	12,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Solid calcium silicate brick KS, EN 771-2:2011+A1:2015 115 Producer width W length L height H Nominal dimensions [mm] ≥ 240 ≥ 115 ≥ 113 Mean gross dry density ρ [kg/dm³] 1.8 Mean compressive strength / Min. [N/mm²] 12,5 / 10 or 25 / 20 compressive strength single brick 1) 240 Standard or annex EN 771-2:2011+A1:2015 **Table C20.1:** Installation parameters (Pre-positioned installation with perforated sleeve FIS H K) M10 Anchor rod M₆ **M8** M8 M8 M10 M12 M16 M12 M16 **M8** M10 M12 M6 Internal threaded anchor FIS E 15x85 11x85 Perforated sleeve FIS H K 12x85 16x85 16x130 20x85 20x130 Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K Max. installation max Tinst [Nm] 2 4 torque General installation parameters Edge distance Cmin = Ccr 100 Smin II Scr II [mm] 255 255 Spacing 255 390 390 Smin 1 Scr 1 **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C20.2: Group factors Anchor rod M₆ **M8 M8** M₁₀ **M8** M10 M12 M16 M12 M16 Perforated sleeve FIS H K 12x85 16x85 16x130 20x85 20x130 $\alpha_{g,N}$ (smin II) = $\alpha_{g,V}(s_{min} II)$ Group [-] 2 factors $\alpha_{g,N}$ ($s_{min} \perp$) = $\alpha_{g,V}$ (Smin \perp) fischer injection system FIS V Plus for masonry

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Solid calcium silicate brick KS, EN 771-2:2011+A1:2015

Table C21.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod	14.6		M10	M12	M16			
Perforated sleeve FIS H K			18x13	0/200	22×130/200			
Anchor rod with	perforat	ed sleeve	FIS H K					
Max. installation torque	max T _{inst}	[Nm]	4					
General installa	tion para	neters						
Edge distance	C _{min} = C _{cr}			100	V			
	Smin II		390					
Ci	Scr II	[mm]		390				
Spacing	S _{min} ⊥			390				
	S _{cr} ⊥			1.0				
5 // /								

Drilling method

Hammer drilling with hard metal hammer drill

Table C21.2: Group factors

Anchor ro	d	M10	M12	M16
Perforated	I sleeve FIS H K	18x13	0/200	22x130/200
Group factors	$\frac{\alpha_{g,N} (s_{min} II)}{\alpha_{g,N} (s_{min} \bot)}$ $\frac{\alpha_{g,N} (s_{min} \bot)}{\alpha_{g,N} (s_{min} \bot)}$ [-]		2	

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Performance

Solid calcium silicate brick KS, dimensions, installation parameters, Group factors

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Solid calcium silicate brick, EN 771-2:2011+A1:2015

Table C22.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod	M6	M8	1.3	HOL I	M8	M10	M8	M10	1 B.,	•	M12	M16	M12	M16
Internal threaded anchor FIS E		NT.	M6	M8) Fc			NV.	M10	M12			612	
			11x85		115 2 4				15x85		10 2 1		13.7	
Perforated sleeve FIS H K	12:	x85	1	16	x85	0.4	16)	(130		20	x85	- 4	20x	130

Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions						
12,5 / 10 N/mm ²	w/w	3,5	2,0	2.0	2.0	6.5	4.5
12,5 / 10 N/IIIII-	d/d	6,0	4,0	3,5	3,5	10,5	7,0
05 / 00 11/2	w/w	5.0	3,0	3.0	3,0	9.5	6,0
25 / 20 N/mm ²	d/d	8,5	5,5	5,5	5,5	12,0	10,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C22.2: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS	знк	18x13	0/200	22x130/200
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,b}$	$R_{k,p,c} = N_{Rk,b,c}$	[kN]; temperatur	e range 50/80°C 2)	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions			
12,5 / 10 N/mm ²	w/w	2	.0	4.5
12,5 / 10 14/11111	d/d	3	5	7,0
25 / 20 N/mm ²	w/w	3	.0	6,0
25 / 20 N/IIIII	d/d	5	.5	10,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

fischer injection system FIS V Plus for masonry	
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Solid calcium silicate brick KS, Characteristic resistance under tension loading

²⁾ For temperature range 72/120°C no performance assessed.

²⁾ For temperature range 72/120°C no performance assessed.

Table C23.1:	Characteristic resistance to local brick failure or brick edge failure of a single
	anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8			M8	M10	M8	M10	7		M12	M16	M12	M16
Internal threaded anchor FIS E			M6	M8 1x85						M12 x85				
Perforated sleeve FIS H K	12:	x85	He	16	x85	1	16)	(130	1 2	20	x85		20x	130

Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		
12,5 / 10 N/mm ²	w/w	2.0	2.5
12,57 10 14/111111	d/d	3,0	3,5
25 / 20 N/mm² W/W	4.0	2.6	
25 / 20 N/IIIII	d/d	4,0	5,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C23.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS	SHK	18x13	0/200	22x130/200
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V$	Rk,c,⊥ [kN]; te	mperature range	50/80°C 2)	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions			
12,5 / 10 N/mm ²	w/w d/d		3,5	
25 / 20 N/mm ²	w/w d/d		5,5	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Solid calcium silicate brick KS, Characteristic resistance under shear loading

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²⁾ For temperature range 72/120°C no performance assessed.

²⁾ For temperature range 72/120°C no performance assessed.

Perforated calcium silicate brick KSL, 3DF, EN 771-2:2011+A1:2015 Producer width W length L height H Nominal dimensions [mm] 240 175 113 Mean gross dry density p [kg/dm³] ≥ 1.4 Mean compressive strength / Min. 10 / 8 or 12.5 / 10 or 15 / 12 [N/mm²] compressive strength single brick 1) or 20 / 16 or 25 / 20 Standard or annex EN 771-2:2011+A1:2015 Dimension see also 4 2 Annex B15 Table C24.1: Installation parameters (Pre-positioned installation with perforated sleeve FIS H K) M8 M10 M8 M10 M12 M16 M12 M16 Anchor rod M6 M8 M6 M8 M6 M8 M10 M12 Internal threaded anchor FIS E 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 max Tinst [Nm] torque General installation parameters Edge distance 60 80 Cmin = Ccr Smin II 100 Scr II [mm] 240 Spacing 115 Smin 1 115 Scr 1 **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C24.2: Group factors M8 M10 M8 M10 M12 M16 M12 M16 Anchor rod M6 M8 M6 **M8** M10 M12 M6 M8 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 16x85 20x85 12x50 12x85 16x130 20x130 $\alpha_{g,N}$ (s_{min} II) = 1,5 ag, v (Smin II) Group [-] factors $\alpha_{g,N}$ (Smin \perp) = 2,0 αg, v (Smin ⊥) fischer injection system FIS V Plus for masonry Annex C24 Performance Perforated calcium silicate brick KSL, 3DF, dimensions, installation parameters, Group Appendix 52 / 155

factors

Perforated calcium silicate brick KSL, 3DF, EN 771-2:2011+A1:2015

Table C25.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod		2 3 E	M10	M12	M16
Perforated slee	erforated sleeve FIS H K			0/200	22x130/200
Anchor rod wit	h perforat	ed sleeve	FIS H K		
Max. installation torque	max T _{inst}	[Nm]			
General installa	ation para	meters			
Edge distance	C _{min} = C _{cr}			80	
	s _{min} II			100	
Caraina	S _{cr} II	[mm]		240	
Spacing	Smin⊥			115	
	S _{cr} ⊥			115	n:

Drilling method

Hammer drilling with hard metal hammer drill

Table C25.2: Group factors

Anchor ro	od	M10	M12	M16
Perforated	d sleeve FIS H K	18x13	0/200	22x130/200
Group	$\alpha_{g,N}$ (S _{min} II) $\alpha_{g,V}$ (S _{min} II)		1,5	
factors	$\frac{\alpha_{g,N} (s_{min} \perp)}{\alpha_{g,V} (s_{min} \perp)} [-]$		2,0	

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Perforated calcium silicate brick KSL, 3DF, dimensions, installation parameters, Group factors

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Perforated calcium silicate brick KSL, 3DF, EN 771-2:2011+A1:2015

Table C26.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod		M6 M8	M6 M8		M8 M10	M8 M10		M12 M1	6 M12 M16
Internal threaded anchor FIS E Perforated sleeve FIS H K			3.5	M6 M8		357	M10 M12 15x85		
		12x50	12x85	16	x85	16x130	20:	x85	20x130
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,}$	p,c = NRk,b,c [k	N]; tem	perature	range 5	0/80°C 2)				
Mean compressive strength/ Min. comp. strength single brick ¹⁾	Use con- ditions						2 1		
10 / 8 N/mm²	w/w w/d d/d	1.5 1,5			2,0	2,0 2,5	2,0 2,5		2,0
12,5 / 10 N/mm ²	w/w w/d d/d		2,0		2.0 2,5	2.5 3,0		.5 ,0	2,5 3,0
15 / 12 N/mm²	w/w w/d d/d		2,5	_	2.5 3,0	3,0 3,5		,0 ,5	3,0 3,5
20 / 16 N/mm ²	w/w w/d d/d		3.0 3,5	- 3	3.5 1,0	4.5 4,5	4	.5 ,5	4.5 4,5
25 / 20 N/mm²	w/w w/d d/d		,0	-	1.5 5,0	5,5 6,0	5	,5 ,0	5,5 6,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Characteristic resistance to pull-out failure or brick breakout failure of a Table C26.2: single anchor under tension loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS I	ł K	18x*	130/200	22x130/200
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,}$	p,c = NRk,b,c [kN]]; temperature	e range 50/80°C 2)	
Mean compressive strength / Min. comp. strength single brick 1)	Use con- ditions			
10 / 8 N/mm ²	w/w w/d			2.0
10 / 6 14/11111	d/d			2,5
12,5 / 10 N/mm ²	w/w w/d			2.5
12,57 10 14/111111	d/d			3,0
15 / 12 N/mm ²	w/w w/d			3,0
15 / 12 N/IIIII	d/d			3,5
20 / 16 N/mm ²	w/w w/d			4,5
20 / 10 N/mm	d/d			4,5
25 / 20 N/mm ²	w/w w/d			5,5
25 / 20 N/mm-	d/d			6,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Performance

Perforated calcium silicate brick KSL, 3DF, Characteristic resistance under tension loading

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²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Perforated calcium silicate brick KSL, 3DF, EN 771-2:2011+A1:2015

Table C27.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8	Lab	-	M8	M10	M8	M10	. E. + C.)	M12 M1	M12 M16
Internal threaded anchor FIS E	1				M6	M8 x85					M10 M12		A-3
Perforated sleeve FIS H K	12:	x50	12:	x85		16:	x85		16)	(130	20	x85	20x130

							.01.00	10%100			
$V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V_{Rk,c,ll}$	/Rk,c,⊥ [kN];	tem	pera	ture i	range	50/8	0°C and 72	/120°C			
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions									V	
10 / 8 N/mm ²	w/w w/d d/d	u	1,5					3,0	2,5	3,0	2,5
12,5 / 10 N/mm²	w/w w/d d/d			2,0				3,	5		5
15 / 12 N/mm²	w/w w/d d/d			2,5		3		4,5	4,0	4,5	4,0
20 / 16 N/mm²	w/w w/d d/d	3,0	3,5	3,0	3,5	3,0		6,0	5,5	6,0	5,5
25 / 20 N/mm²	w/w w/d d/d	4,0	4,5	4,0	4,5	4,0		7,5	6,5	7,5	6,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C27.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS	SHK	18x13	18x130/200 22x130/20	
$V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V$	Rk,c,⊥ [kN]; te	mperature range	50/80°C and 72/120°C	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions			
10 / 8 N/mm ²		3	.0	2,5
12,5 / 10 N/mm ²	w/w	3	.5	3,5
15 / 12 N/mm ²	w/d	4	.5	4,0
20 / 16 N/mm ²	d/d	6	.0	5,5
25 / 20 N/mm ²		7	.5	6,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Perforated calcium silicate brick KSL, 3DF, Characteristic resistance under sheal loading	Appendix 55 / 155

Vertical perforated brick HLz, EN 771-1:2011+A1:2015 Producer e.g. Wienerberger, Poroton length L width W height H Nominal dimensions [mm] 500 175 237 370 240 237 Mean gross dry density p ≥ 1.0 [kg/dm³] Mean compressive strength / Min. 5/4 or 7,5/6 or 10/8 or [N/mm²] compressive strength single brick 1) 12,5 / 10 or 15 / 12 Standard or annex EN 771-1:2011+A1:2015 Dimension see also Annex B15 500 (370) Table C28.1: Installation parameters M12 M16 M12 M16 Anchor rod M8 M10 M8 M10 M6 M8 M6 **M8** M10 M12 M6 M8 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 20x85 12x50 12x85 16x85 16x130 20x130 Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K Max. installation max Tinst [Nm] torque General installation parameters Edge distance 100 Cmin = Ccr 100 Smin II 500 (370) Scr II [mm] Spacing 100 Smin 1 Scr 1 240 **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C28.2: Group factors M6 M8 M8 M10 M8 M10 M12 M16 M12 M16 Anchor rod M6 **M8** M10 M12 M6 **M8** Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 20x130 $\alpha_{g,N}$ (Smin II) = αg, ∨ (Smin II) Group [-] factors $\alpha_{g,N}$ ($s_{min} \perp$) = αg, v (Smin ⊥) fischer injection system FIS V Plus for masonry Annex C28 Performance Vertical perforated brick HLz, dimensions, installation parameters, Group factors Appendix 56 / 155

Vertical perforated brick HLz, EN 771-1:2011+A1:2015

Table C29.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod	M6	M8	M6	M8	1.10	M8	M10	M8	M10	19.00	M12 M1	6 M12 M16
Internal threaded	717				M6 M8					M10 M12		
anchor FIS E					11x85					15x85		
Perforated sleeve FIS H K	12x	50	12x	85	16	x85		16x	130	20:	x85	20x130

$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk}$	Use				
Mean compressive strength / Min. comp.	con				
strength single brick 1)	ditio	V. CH., YHI			
5 / 4 N/mm ²	w/w	w/d	0,30	0.90	1,20
5 / 4 N/IIIII	d/c		0,40	0,90	1,20
7,5 / 6 N/mm ²	w/w	w/d	0.50	1,50	2.00
7,576 14/111111	d/c		0,60	1,50	2,00
10 / 8 N/mm ²	w/w	w/d	0,75	2.00	2,50
10 / 6 N/IIIII	d/c		0,75	2,00	2,50
12,5 / 10 N/mm ²	w/w	w/d	0,90	2,50	3,00
12,5 / 10 14/111111-	d/c		0,90	2,50	3,50
15 / 12 N/mm ²	w/w	w/d	0,90	3.00	3,50
15 / 12 N/mm-	d/c	10.00	1,20	3,00	4,00

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C29.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod	M6	M8	M6	M8	1.1		M8	M10	M8	M10		-	M12 M	16 M1	2 M16
Internal threaded anchor FIS E					M6	M8 c85						M12 x85	.		
Perforated sleeve FIS H K	12x	50	12	x85		16	x85		16x	130	fa.	20:	x85	20	x130

$V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V_{Rk}$,c,⊥ [kN]; tempe	rature range 50/80°C and	172/120°C	- Similar	
Mean compressive strength / Min. comp. strength single brick ¹⁾	Use con- ditions				
5 / 4 N/mm ²		0,50	0,60	0,50	0,60
7,5 / 6 N/mm ²] _{w/w} [0,75	0,90	0,75	0,90
10 / 8 N/mm ²	w/d	0,90	1,20	0,90	1,20
12,5 / 10 N/mm ²	d/d	1,20	1,50	1,20	1,50
15 / 12 N/mm ²		1,50	2,00	1,50	2,00

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Performance

Vertical perforated brick HLz, Characteristic resistance under tension and shear loading

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²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Vertical perforated brick HLz, 2DF, EN 771-1:2011+A1:2015 Producer e.g. Wienerberger length L width W height H Nominal dimensions [mm] 240 115 113 Mean gross dry density p [kg/dm³] ≥ 1.4 Mean compressive strength / Min. 7,5 / 6 or 12,5 / 10 or 20 / 16 [N/mm²] compressive strength single brick 1) or 25 / 20 or 35 / 28 Standard or annex EN 771-1:2011+A1:2015 Dimension see also Annex B15 Table C30.1: Installation parameters Anchor rod **M6 M8** M₁₀ M12 M16 **M8 M6 M8** M₆ M10 M12 **M8** Internal threaded anchor FIS E 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 max Tinst [Nm] 2 torque General installation parameters Edge distance Cmin = Ccr 80 240 Scr II = Smin II [mm] Spacing 115 Scr 1 = Smin 1 **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C30.2: Group factors Anchor rod M10 M12 M16 M6 **M8 M6 M8 M8 M8** M10 M12 M₆ Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 16x85 20x85 12x85 ag,N (Smin II) $\alpha_{g,V}$ (smin II) Group 2 [-] factors αg,N (Smin ⊥) $\alpha_{g,V}$ (Smin \perp) fischer injection system FIS V Plus for masonry Annex C30 Performance Vertical perforated brick HLz, 2DF, dimensions, installation parameters, Group factors Appendix 58 / 155

Vertical perforated brick HLz, 2DF, EN 771-1:2011+A1:2015

Table C31.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod	M6	M8	M6	M8	-	-	M8	M10	3 7		M12	M16
Internal threaded anchor FIS E					M6	M8 x85			M10	M12		
Perforated sleeve FIS H K	12x	50	12	x85		16	5x85			20:	x85	

remorated sieeve i io ii it			12700	12,00	10,000	20,000
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} =$	N _{Rk,b,c}	[kN]; to	emperatur	e range 50/80)°C ²⁾	
Mean compressive strength / Min. compressive strength single brick 1)	cc	se on- ons			V X	
7,5 / 6 N/mm ²	w/w	w/d	0.75	0.90	0.75	0.90
7,57 6 14/11111	d	/d	0,75	1,20	0,75	0,90
12,5 / 10 N/mm ²	w/w	w/d	1,20	1.50	1,20	1,50
12,57 10 14/111111	d	/d	1,20	2,00	1,20	1,50
20 / 16 N/mm ²	w/w	w/d	2,00	2.50	2.00	2,00
20 / 16 N/IIIII	d	/d	2,00	3,00	2,00	2,50
25 / 20 N/mm ²	w/w	w/d	2,50	3,50	2,50	3,00
29 / 20 N/IIIII	d	/d	2,50	4,00	2,50	3,00
35 / 28 N/mm ²	w/w	w/d	3.00	5.00	3.50	4.00
35 / 26 N/IIIII	d.	/d	3,50	5,50	3,50	4,50

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C31.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod	M6	M8	M6	M8	1		M8	M10			M12	M16
Internal threaded anchor FIS E			Į į		M6	M8 x85			M10	M12 x85		
Perforated sleeve FIS H K	12:	x50	12	x85	15	1	6x85		7	20:	x85	

Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions							
7,5 / 6 N/mm ²	10	1,2	1,5	1,2	2,0	1,2	1,5	2,5
12,5 / 10 N/mm ²	w/w	2,0	2,5	2,0	4,0	2,0	2,5	4,5
20 / 16 N/mm ²	w/d	3,0	3,5	3,0	6,0	3,0	3,5	7,0
25 / 20 N/mm ²	d/d	4,0	4,5	4,0	7,5	4,0	4,5	8,5
35 / 28 N/mm ²		5,0	6,5	5,0	9,5	5,0	6,5	12,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Performance

Vertical perforated brick HLz, 2DF,

Characteristic resistance under tension and shear loading

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²⁾ For temperature range 72/120°C: N_{Rk (72/120°C)} = 0,83 · N_{Rk (50/80°C)}.

Vertical perforated brick HLz, U8, EN 771-1:2011+A1:2015 Producer e.g. Wienerberger length L width W height H Nominal dimensions [mm] 248 365 248 Mean gross dry density p [kg/dm³] 0,6 Mean compressive strength / Min. $[N/mm^2]$ 5/4 or 7,5/6 or 10/8 compressive strength single brick 1) Standard or annex EN 771-1:2011+A1:2015 Dimension see also Annex B15 35 3.5 Table C32.1: Installation parameters (Pre-positioned installation with perforated sleeve FIS H K) M8 M10 M8 M10 M12 M16 M12 M16 M12 M16 Anchor rod M6 M8 M6 M8 M10 M12 M6 M8 Internal threaded anchor FIS E 11x85 15x85 20x130 20x200 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K Max. installation max Tinst [Nm1] 3 3 5 5 3 torque General installation parameters Edge distance Cmin = Ccr 60 80 Smin II 250 Scr II [mm] Spacing 80 Smin 1 Scr 1 250 **Drilling method** Rotary drilling with carbide drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C32.2: Group factors M8 M10 M8 M10 M12 M16 M12 M16 M12 M16 Anchor rod M6 M8 M6 M8 M10 M12 M6 M8 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 20x130 20x200 12x50 12x85 16x85 16x130 20x85 1.3 ag,N (Smin II) 1,2 ag. v (Smin II) Group [-] factors αg,N (Smin ⊥) 1,3 1.0 αg, V (Smin ⊥) fischer injection system FIS V Plus for masonry Annex C32 Performance Vertical perforated brick HLz, U8, dimensions, installation parameters, Group factors Appendix 60 / 155

Vertical perforated brick HLz, U8, EN 771-1:2011+A1:2015

Table C33.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod			M10	M12	M16
Perforated sle	eve FIS H I	<	18x13	30/200	22x130/200
Anchor rod wi	th perforat	ed sleeve	FIS H K		
Max. installatio torque	n max T _{inst}	[Nm]		5	
General instal	lation para	meters			
Edge distance	C _{min} = C _{cr}			60	
	S _{min} II			80	
Ci	Scr II	[mm]		250	
Spacing —	S _{min} ⊥			80	
XXX	S _{cr} ⊥			250	

Drilling method

Rotary drilling with carbide drill

Table C33.2: Group factors

Anchor ro	d	M10	M12	M16		
Perforated	d sleeve FIS H K	18x13	18x130/200			
	α _{g,N} (s _{min} II)		1,3			
Group	α _{g,V} (S _{min} II)		1,2			
factors	$\alpha_{g,N}$ (Smin \perp) [-]		1,3			
	α _{g,V} (s _{min} ⊥)		1,0	T		

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Performance

Vertical perforated brick HLz, U8, dimensions, installation parameters, Group factors

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Vertical perforated brick HLz, U8, EN 771-1:2011+A1:2015

Table C34.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8	(A)	M8 M10	M8 M10	100	M12 M16	M12 M16	M12 M16
Internal threaded anchor FIS E					M6 M8			M10 M12			
Perforated sleeve FIS H K	12x	50	12x	85	16)	85	16x130	20:	k85	20x130	20x200

Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		
5 / 4 N/mm ²	w/w w/d	1,2	1,2
5 / 4 N/MM	d/d	1,2	1,5
7,5 / 6 N/mm ²	w/w w/d	1,5	1,5
7,5 / 6 N/IIIII	d/d	1,5	1,5
10 / 8 N/mm²	w/w w/d	1,5	2,0
10 / 6 N/IIIII	d/d	2,0	2,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C34.2: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

Anchor rod Perforated sleeve FIS H K		M10	M12	M16
		18x13	0/200	22x130/200
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = I$	NRk,b,c [kN]; te	mperature rang	je 50/80°C ²⁾	
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions			
E / 4 N/2	w/w w/d		1,2	
5 / 4 N/mm²	d/d		1,5	
7,5 / 6 N/mm²	w/w w/d		1,5	
	d/d		1,5	
10 / 8 N/mm ²	w/w w/d		2,0	
10 / 8 N/MM-	d/d		2,0	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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²⁾ For temperature range 72/120°C: N_{Rk (72/120°C)} = 0,83 · N_{Rk (50/80°C)}.

²⁾ For temperature range 72/120°C: N_{Rk (72/120°C)} = 0,83 · N_{Rk (50/80°C)}.

Vertical perforated brick HLz, U8, EN 771-1:2011+A1:2015

Table C35.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8		M8	V110	M8 M10		M12 M16	M12 M16	M12 M16
Internal threaded anchor FIS E			2		M6 M8				M10 M12 15x85			
Perforated sleeve FIS H K	12x	50	12x	85	16:	x85		16x130	20:	x85	20x130	20x200

$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [k	N]; temperature range 50	0/80°C and 72/120°C
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions	
5 / 4 N/mm²	w/w w/d d/d	1,2
7,5 / 6 N/mm²	w/w w/d d/d	1,5
10 / 8 N/mm²	w/w w/d d/d	1,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C35.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod Perforated sleeve FIS H K		M10	M12	M16
		18x13	0/200	22x130/200
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [I	(N]; temperate	ure range 50/80	°C and 72/120°C	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions			
5 / 4 N/mm²	w/w w/d d/d		1,2	V
7,5 / 6 N/mm²	w/w w/d d/d		1,5	
10 / 8 N/mm²	w/w w/d d/d	1,5		

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Performance

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

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Vertical perforated brick HLz, T10, T11, EN 771-1:2011+A1:2015 Producer e.g. Wienerberger length L width W height H Nominal dimensions [mm] 248 365 249 Mean gross dry density p [kg/dm³] 0.7 Mean compressive strength / Min. 10 / 8 or 12.5 / 10 or [N/mm²] compressive strength single brick 1) 15/12 Standard or annex EN 771-1:2011+A1:2015 Dimension see also Annex B16 Table C36.1: Installation parameters (Pre-positioned installation with perforated sleeve FIS H K) M8 M10 M8 M10 M12 M16 M12 M16 M12 M16 M6 M8 M6 M8 Anchor rod M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 20x130 20x200 Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K Max. installation 5 3 5 max Tinst [Nm] 3 torque General installation parameters Edge distance Cmin = Ccr 60 Smin II 80 Scr II [mm] 250 Spacing 80 Smin 1 250 Scr 1 **Drilling method** Rotary drilling with carbide drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C36.2: Group factors M8 M10 M8 M10 M12 M16 M12 M16 M12 M16 Anchor rod M6 M8 M6 M8 M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 20x130 20x200 12x50 12x85 16x85 16x130 20x85 1,7 ag,N (Smin II) ag, v (Smin II) 0,5 Group [-] factors 1,3 αg,N (Smin ⊥) 0.5 αg, V (Smin ⊥) fischer injection system FIS V Plus for masonry Annex C36 Performance Vertical perforated brick HLz, T10, T11, dimensions, installation parameters, Group Appendix 64 / 155 factors

Vertical perforated brick HLz, T10, T11, EN 771-1:2011+A1:2015

Table C37.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod Perforated sleeve FIS H K		M10	M12	M16			
		18x13	0/200	22x130/200			
perforat	ed sleeve	FIS H K					
max T _{inst}	[Nm]						
ion para	meters						
C _{min} = C _{cr}			60				
Smin II			80				
Scr II	[mm]		250	-			
s _{min} ⊥		7	80				
S _{cr} ⊥		250					
	max T _{inst} tion para c _{min} = c _{cr} s _{min} II s _{cr} II	max T _{inst} [Nm] tion parameters C _{min} = C _{cr} S _{min} II S _{cr} II [mm] S _{min} ⊥	perforated sleeve FIS H K max T _{inst} [Nm] tion parameters c _{min} = c _{cr} s _{min} II s _{cr} II [mm]	re FIS H K perforated sleeve FIS H K max T _{inst} [Nm] 5 tion parameters c _{min} = c _{cr} s _{min} II s _{cr} II [mm] 250 80			

Drilling method

Rotary drilling with carbide drill

Table C37.2: Group factors

Anchor rod		M10	M12	M16			
Perforated	d sleeve FIS H K	18x13	30/200	22x130/200			
	α _{g,N} (s _{min} II)		1,7				
Group	αg, v (Smin II)		0,5	0,5			
factors $\alpha_{g,N} (s_{min} \perp)$ [-]		1,3					
	α _{g,V} (s _{min} ⊥)	0,5					

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

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Vertical perforated brick HLz, T10, T11, EN 771-1:2011+A1:2015

Table C38.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8	150,4002	M8 N	110	M8	M10	OL+CI.	M12	M16 N	112 M16	M12 M16
Internal threaded anchor FIS E					M6 M8					M10 M12 15x85	H			
Perforated sleeve FIS H K	12:	x50	12x	85	16:	x85		16x	130	20	(85	2	20x130	20x200

Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		
10 / 8 N/mm²	w/w w/d	1,5	1,5
	d/d	1,5	2,0
12,5 / 10 N/mm²	w/w w/d	1,5	2,0
	d/d	2,0	2,0
15 / 12 N/mm²	w/w w/d	2,0	2,0
	d/d	2,0	2,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C38.2: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

Anchor rod Perforated sleeve FIS H K		M10	M12	M16
		18x1	30/200	22x130/200
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} =$	N _{Rk,b,c} [kN];	temperature	range 50/80°C 2)	
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		-	
	w/w w/d		1,5	1,5
10 / 8 N/mm ²	d/d		2,0	2,0
42 F / 40 N/mm²	w/w w/d		2,0	2,0
12,5 / 10 N/mm ²	d/d		2,0	2,0
15 / 12 N/mm²	w/w w/d		2,0	2,0
	d/d		2,5	2,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Performance

Vertical perforated brick HLz, T10, T11, Characteristic resistance under tension loading

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²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

²⁾ For temperature range 72/120°C: N_{Rk (72/120°C)} = 0,83 · N_{Rk (50/80°C)}.

Vertical perforated brick HLz, T10, T11, EN 771-1:2011+A1:2015

Table C39.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8	M6 M8	0.00	M8	M10	M8 M10		M12 M16	M12 M16	M12M16
Internal threaded anchor FIS E				M6 M8	-			M10M12	(4)		-
Perforated sleeve FIS H K	12x	50	12x85	16	x85	n)	16x130	20:	x85	20x130	20x200

Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions			
10 / 8 N/mm²	w/w w/d	0,9	1,5	2,0
12,5 / 10 N/mm²	w/w w/d	0,9	1,5	2,0
15 / 12 N/mm²	w/w w/d	1,2	2,0	2,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C39.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod Perforated sleeve FIS H K		M10	M12	M16
		18x13	0/200	22x130/200
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [F	N]; temperati	ure range 50/80	°C and 72/120°C	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions			
10 / 8 N/mm²	w/w w/d		2,0	
12,5 / 10 N/mm ²	w/w w/d d/d	1,	5	2,0
15 / 12 N/mm²	w/w w/d d/d	2,	0	2,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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

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Vertical perforated brick HLz, T7 PF, filled with perlit, EN 771-1:2011+A1:2015 Producer e.g. Wienerberger length L width W height H Nominal dimensions [mm] 248 365 249 Mean gross dry density p [kg/dm³] 0,5 Mean compressive strength / Min. [N/mm²] 5/4 or 8/6 compressive strength single brick 1) Standard or annex EN 771-1:2011+A1:2015 365 Dimension see also Annex B16 4.8 20 52 Table C40.1: Installation parameters (Pre-positioned installation with perforated sleeve FIS H K) M8 M10 M8 M10 M12 M16 M12 M16 M12 M16 Anchor rod M6 M8 M6 M8 M10 M12 M6 M8 Internal threaded anchor FIS E 11x85 15x85 20x130 20x200 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K Max. installation max Tinst [Nm] 2 2 5 torque General installation parameters Edge distance Cmin = Ccr 60 80 Smin II 250 Scr II [mm] Spacing 80 Smin 1 Scr 1 250 **Drilling method** Rotary drilling with carbide drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C40.2: Group factors M8 M10 M8 M10 M12 M16 M12 M16 M12 M16 M6 M8 M6 M8 Anchor rod M10 M12 M6 M8 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 16x85 20x85 20x130 20x200 12x50 12x85 16x130 1.1 ag,N (Smin II) 1,2 ag, v (Smin II) Group [-] factors 1,1 αg,N (Smin ⊥) 1,2 αg, v (Smin ⊥) fischer injection system FIS V Plus for masonry Annex C40 Performance Vertical perforated brick HLz, T7 PF, filled with perlite, Appendix 68 / 155 dimensions, installation parameters, Group factors

Vertical perforated brick HLz, T7 PF, filled with perlite, EN 771-1:2011+A1:2015

Table C41.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod	Anchor rod		M16							
Perforated sleeve FIS H K		(18x13	0/200	22x130/200					
Anchor rod w	ith perforat	ed sleeve l	IS H K							
Max. installation	max T _{inst}	[Nm]	5							
General instal	lation para	meters								
Edge distance	C _{min} = C _{cr}									
	s _{min} II		80							
Ci	s _{cr} II	[mm]	250							
Spacing —	s _{min} ⊥		80							
A T	Scr ⊥		250							

Table C41.2: Group factors

Rotary drilling with carbide drill

Anchor ro	Anchor rod		M16					
Perforated	d sleeve FIS H K	18x13	18x130/200 22					
	α _{g,N} (s _{min} II)		1,1	0 2 11 2 1				
Group	αg, v (Smin II)	1,2						
Group factors	$\alpha_{g,N}$ ($s_{min} \perp$) [-]	1,1						
	α _{g,V} (S _{min} ⊥)	1,2						

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Performance

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

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Vertical perforated brick HLz, T7 PF, filled with perlite, EN 771-1:2011+A1:2015

Table C42.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod	M6 M8	M6	M8		2	M8	M10	M8	M10		M12	M16	M12 M16	M12 M16
Internal threaded anchor FIS E				M6						M10 M12				
Perforated sleeve FIS H K	12x50	12x	85		16)	k 85		16x	130	202	k 85		20x130	20x200

Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions					
5 / 4 N/mm²	w/w w/d	1,2	1,2	1,2	1,2	2,0
	d/d	1,5	1,5	1,5	1,5	2,0
8 / 6 N/mm²	w/w w/d	1,5	1,5	1,5	1,5	2,5
	d/d	1,5	2,0	1,5	2,0	3,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C42.2: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

Anchor rod		M10	M12	M16		
Perforated sleeve FIS H K		18x13	0/200	22x130/200		
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = I$	NRk,b,c [kN]; te	mperature rang	je 50/80°C ²⁾	a restricted in		
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions					
5 / 4 N/mm²	w/w w/d		2	1,2		
	d/d	1,	5	1,5		
8 / 6 N/mm²	w/w w/d	1,	5	1,5		
	d/d	2,	0	2,0		

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Performance
Vertical perforated brick HLz, T7 PF, filled with perlite,
Characteristic resistance under tension loading

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²⁾ For temperature range 72/120°C: $N_{Rk (72/120^{\circ}C)} = 0.83 \cdot N_{Rk (50/80^{\circ}C)}$.

²⁾ For temperature range 72/120°C: $N_{Rk}(72/120^{\circ}C) = 0.83 \cdot N_{Rk}(50/80^{\circ}C)$.

Vertical perforated brick HLz, T7 PF, filled with perlite, EN 771-1:2011+A1:2015

Table C43.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8			M8 M10	M8 M10	JJ. (2)	M12M16	M12 M16	M12 M16
Internal threaded anchor FIS E			3		M6	M8			M10 M12	- 7		
Perforated sleeve FIS H K	12:	x50	12x	85		16>	85	16x130	20x	(85	20x130	20x200

i ciloratea diceve i lo il it		ILAGO ILAG	O TOXOO	100100	LUXUU	LOX 100 LOXLOO					
V _{Rk} = V _{Rk,b} = V _{Rk,c,II} = V _{Rk,c,⊥} [kN]; temperature range 50/80°C and 72/120°C											
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions										
5 / 4 N/mm²	w/w w/d d/d	0,9	1,5			1,2					
8 / 6 N/mm²	w/w w/d d/d	1,2	2,0			1,5					

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C43.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K	A	18x13	0/200	22x130/200
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [k	N]; temperati	ure range 50/80	0°C and 72/120°C	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions			
5 / 4 N/mm²	w/w w/d d/d	1,	5	1,2
8 / 6 N/mm²	w/w w/d d/d	2,	0	1,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Performance	YE WAS A STATE OF

Vertical perforated brick HLz, T7 PF, filled with perlite, Characteristic resistance under shear loading Annex C43

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Vertical perforated brick HLz, T9 MW, filled with mineral wool, EN 771-1:2011+A1:2015 Producer e.g. Wienerberger length L width W height H Nominal dimensions [mm] 248 425 248 Mean gross dry density p [kg/dm³] 0,8 Mean compressive strength / Min. [N/mm²] 5/4 or 8/6 or 10/8 compressive strength single brick 1) Standard or annex EN 771-1:2011+A1:2015 15,2 Dimension see also 8 Annex B16 20, 33 100 12,3 Table C44.1: Installation parameters (Pre-positioned installation with perforated sleeve FIS H K) M8 M10 M8 M10 M12 M16 M12 M16 M12 M16 Anchor rod M6 M8 M6 M8 M10 M12 M6 M8 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 20x130 20x200 Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K Max. installation max Tinst [Nm] 5 3 3 5 torque General installation parameters Edge distance Cmin = Ccr 60 Smin II 80 250 Scr II [mm] Spacing 80 Smin 1 Scr 1 250 **Drilling method** Rotary drilling with carbide drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C44.2: Group factors M12 M16 M12 M16 M12 M16 M8 M10 M8 M10 Anchor rod M6 **M8** M6 **M8** M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 20x130 20x200 1.3 ag,N (Smin II) ag, v (Smin II) 1,2 Group [-] factors αg,N (Smin ⊥) 0,6 1,2 αg, V (Smin ⊥) fischer injection system FIS V Plus for masonry Annex C44 Performance Vertical perforated brick HLz, T9 MW, filled with mineral wool, dimensions, installation Appendix 72 / 155 parameters, Group factors

Vertical perforated brick HLz, T9 MW, filled with mineral wool, EN 771-1:2011+A1:2015

Table C45.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod			M10	M12	M16
Perforated sl	rforated sleeve FIS H K			0/200	22x130/200
Anchor rod v	vith perforat	ed sleeve	FIS H K		
Max. installati torque	on max T _{inst}	[Nm]		5	
General insta	Illation para	meters			
Edge distance	c _{min} = c _{cr}			60	
	Smin II			80	
Ci	Scr II	[mm]		250	
Spacing —	S _{min} ⊥			80	
X. T	S _{cr} ⊥			250	
Drilling meth	od			- 312	

Table C45.2: Group factors

Rotary drilling with carbide drill

Anchor ro	d	M10	M12	M16		
Perforated	I sleeve FIS H K	18x13	18x130/200 22			
	α _{g,N} (s _{min} II)		1,3			
Group	α _{g,V} (S _{min} II)		1,2			
Group factors	$\alpha_{g,N}$ (Smin \perp) [-]		0,6			
	α _{g,} ∨ (s _{min} ⊥)		1,2			

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

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Vertical perforated brick HLz, T9 MW, filled with mineral wool, EN 771-1:2011+A1:2015

Table C46.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod		M6	M8	M6	M8	5		M8 M10	M8 N	V110	(m- e	M12 M16	M12 M16	M12 M16
Internal threaded anchor FIS E Perforated sleeve FIS H K		N				M6					M10 M12			
		12x50		12x85				85	16x130				20x130	20x200
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = 1$	NRk,b,c [kN]	; ten	npe	ratu	re r	ange	e 50	/80°C 2)					
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		È	Ĭ										
5 / 4 N/mm²	w/w w/d		1	5			2,	0	3,	0	2	,5	4	,0
5 / 4 N/MM-	d/d		2	0			2,	5	3,	0	2	,5	4	,5
8 / 6 N/mm²	w/w w/d		2	0			2,	5	3,	5	3	,0	5	,0
	d/d		2	0			3,	0	4,	0	3	,0	5	,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

3.0

4,0

4.5

3.5

6,0

6,5

10 / 8 N/mm²

w/w w/d

d/d

Table C46.2: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

2,5

2.5

Anchor rod	-	M10	M12	M16
Perforated sleeve FIS H K		18x130/200		22x130/200
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = 1$	N _{Rk,b,c} [kN]; te	mperature rang	ge 50/80°C ²⁾	
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		. 20.	
E / 4 N/mm²	w/w w/d		3,0	4,0
5 / 4 N/mm²	d/d		3,0	4,5
0.10.1/2	w/w w/d		3,5	5,0
8 / 6 N/mm²	d/d	- (4,0	5,5
10 / 8 N/mm²	w/w w/d		4,0	6,0
10 / 8 N/mm²	d/d		4,5	6,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

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²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Vertical perforated brick HLz, T9 MW, filled with mineral wool, EN 771-1:2011+A1:2015

Table C47.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8		00	M8	M10	M8	M10	1.040	M12 N	/116	M12	M16	M12 M16
Internal threaded					M6	M8					M10 M12				V	Y D
anchor FIS E						11x85			DE A		15x85			VG.		
Perforated sleeve FIS H K	12)	(50	12	x85	16x85		6x85 1		16x	130	20:	k85	1	20x1	130	20x200

Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions					
5 / 4 N/mm²	w/w w/d d/d	2,0	2,0	2,5	2,0	1,5
8 / 6 N/mm²	w/w w/d d/d	2,5	2,5	3,0	2,5	2,0
10 / 8 N/mm²	w/w w/d d/d	2,5	3,0	4,0	3,0	2,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C47.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x130	0/200	22x130/200
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [I	(N]; temperat	ure range 50/80	°C and 72/120°C	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions			
5 / 4 N/mm²	w/w w/d d/d	2,5	5	2,0
8 / 6 N/mm²	w/w w/d d/d	3,0		2,5
10 / 8 N/mm²	w/w w/d d/d	4,0		3,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

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Vertical perforated brick HLz, T9 MW, filled with mineral wool; Characteristic resistance under shear loading	Appendix 75 / 155

Vertical perforated brick HLz, FZ 7, filled with mineral wool, EN 771-1:2011+A1:2015 Producer e.g. Wienerberger length L width W height H Nominal dimensions [mm] 248 425 248 0.8 Mean gross dry density p [kg/dm³] Mean compressive strength / Min. [N/mm²]5/4 or 7,5/6 or 10/8 compressive strength single brick 1) Standard or annex EN 771-1:2011+A1:2015 425 Dimension see also 13 Annex B16 Table C48.1: Installation parameters (Pre-positioned installation with perforated sleeve FIS H K) M8 M10 M8 M10 Anchor rod M6 M8 M6 M8 M12 M16 M12 M16 M12 M16 M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 20x130 20x200 12x85 16x85 16x130 20x85 Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K Max. installation max Tinst [Nm] 2 2 5 torque General installation parameters Edge distance Cmin = Ccr 60 80 Smin II 250 Scr II [mm] Spacing 80 Smin 1 250 Scr 1 **Drilling method** Rotary drilling with carbide drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C48.2: Group factors Anchor rod M6 **M8** M6 M8 M8 M10 M8 M10 M12 M16 M12 M16 M12 M16 M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 20x130 20x200 1.9 ag,N (Smin II) 0,9 ag, v (Smin II) Group [-] factors 1.0 αg,N (Smin ⊥) 0.7 αg, v (Smin ⊥) fischer injection system FIS V Plus for masonry Annex C48 Performance Vertical perforated brick HLz, FZ 7, filled with mineral wool; Appendix 76 / 155 dimensions, installation parameters, Group factors

Vertical perforated brick HLz, FZ 7, filled with mineral wool, EN 771-1:2011+A1:2015

Table C49.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod			M10	M12	M16		
Perforated slee	Perforated sleeve FIS H K		18x13	30/200	22x130/200		
Anchor rod wit	h perfora	ed sleeve	FIS H K				
Max. installation torque	T _{inst}	[Nm]		5			
General installa	ation para	meters					
Edge distance	C _{min} = C _c			60			
	s _{min} I			80	<u> </u>		
Ci	Scr I	[mm]	250				
Spacing —	S _{min} J	KOL		80			
V	Scr J						
Drilling method							

Table C49.2: Group factors

Rotary drilling with carbide drill

Anchor ro	d	M10	M10 M12				
Perforated	d sleeve FIS H K	18x13	30/200	22x130/200			
	α _{g,N} (s _{min} II)		1,9				
Group	αg, v (Smin II)	0,9					
Group factors	$\alpha_{g,N}$ ($s_{min} \perp$) [-]	1,0					
	α _{g,} ∨ (s _{min} ⊥)	0,7					

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

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Vertical perforated brick HLz, FZ 7, filled with mineral wool, EN 771-1:2011+A1:2015

Table C50.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod		M6	M8	M6	M8		M8 M	10	M8 M1	-	M12 M16	M12 M16	M12 M16
Internal threaded anchor FIS E		3	Y			M6 M8	-			M10 M12	-		
Perforated sleeve FIS H K		12	x50	12x85		163	x85		16x13	20	20x85		20x200
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = 1$	NRk,b,c [kN]	; ter	npe	ratu	ire r	ange 50)/80°C	; 2)			-		
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		5										
E / A N/mm²	w/w w/d	0,0	60	0,	75	1,	50		2,00	1,	20	2,00	2,00
5 / 4 N/mm²	d/d	0,0	60	0,	90	1,	50		2,00	1,	50	2,00	2,50
7,5 / 6 N/mm² w/w w	w/w w/d	0,	75	0,	90	1,	50		2,00	1,	50	2,50	2,50
	d/d	0,	90	0,	90	2,0	00		2,50	2,	00	2,50	3,00
10 / 8 N/mm²	w/w w/d	0,9	90	1,	20	2,0	00		2,50	2,	00	2,50	3,00
	-17-1					-			0.00	-		0.00	0.50

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

2,00

3.00

2.00

3.00

d/d

0.90

Table C50.2: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

1,20

Anchor rod		M10	M12	M16	
Perforated sleeve FIS H K		18x130	/200	22x130/200	
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = 1$	N _{Rk,b,c} [kN]; te	mperature rang	e 50/80°C 2)		
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions	10	0		
5 / 4 N/mm²	w/w w/d	2,0		2,0	
5 / 4 N/MM-	d/d	2,0		2,0	
7.5./.C. N/2	w/w w/d	2,0		2,5	
7,5 / 6 N/mm ²	d/d	2,5		2,5	
10 / 8 N/mm ²	w/w w/d	2,5		2,5	
10 / 8 N/mm²	d/d	3,0		3,0	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

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²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Vertical perforated brick HLz, FZ 7, filled with mineral wool, EN 771-1:2011+A1:2015

Table C51.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8			M8 N	V110	M8 M1	-	M12 M16	M12 M16	M12 M16
Internal threaded anchor FIS E					M6		Į.	J		M10 M12			
Perforated sleeve FIS H K	123	c50	12	x85	IQ.	16)	(85		16x130	20	x85	20x130	20x200

Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions			
5 / 4 N/mm²	w/w w/d	1,2	1,5	1,5
7,5 / 6 N/mm²	w/w w/d d/d	1,5	2,0	1,5
10 / 8 N/mm²	w/w w/d	1,5	2,5	2,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C51.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x	130/200	22x130/200
$V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V_{Rk,c,\perp}$	N]; temper	ature range	50/80°C and 72	/120°C
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions			
5 / 4 N/mm²	w/w w/d d/d			1,5
7,5 / 6 N/mm²	w/w w/d d/d			2,0
10 / 8 N/mm²	w/w w/d d/d	<u> </u>		2,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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

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Vertical perforated brick HLz, EN 771-1:2011+A1:2015 Producer e.g. Bouyer Leroux length L width W height H Nominal dimensions [mm] 500 200 315 Mean gross dry density p [kg/dm³] ≥ 0.6 Mean compressive strength / Min. 5/4 or 7,5/6 or 10/8 [N/mm²] compressive strength single brick 1) Standard or annex EN 771-1:2011+A1:2015 Dimension see also Annex B16 **Table C52.1:** Installation parameters (Pre-positioned installation with perforated sleeve FIS H K) M8 M10 M8 M10 M12 M16 M12 M16 Anchor rod M6 **M8** M6 **M8** M6 M8 M10 M12 Internal threaded anchor FIS E 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 max Tinst [Nm] 2 torque General installation parameters Edge distance 120 Cmin = Ccr Smin II 120 [mm] 500 Spacing 315 Smin 1 = Scr 1 **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C52.2: Group factors Anchor rod M6 **M8** M6 M8 M8 M10 M8 M10 M12 M16 M12 M16 M6 **M8** M10 M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 20x130 1,3 Olg, N (Smin II) 1.7 Oca. V (Smin II) Group [-] factors αg,N (Smin ⊥) 2.0 αg, v (Smin ⊥) fischer injection system FIS V Plus for masonry Annex C52 Performance Vertical perforated brick HLz, dimensions, installation parameters, Group factors Appendix 80 / 155

Table C53.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H	K	18x13	0/200	22x130/200
Anchor rod with perfora	ated sleeve	FIS H K		
Max. installation max T _{in}	st [Nm]		2	
General installation par	ameters			
Edge distance c _{min} = c	cr		120	
Smin			120	7.0
Spacing S _{cr}	II [mm]		500	
e . l = e	1		315	

Drilling method

Hammer drilling with hard metal hammer drill

Table C53.2: Group factors

Anchor ro	d	M10	M12	M16		
Perforated	d sleeve FIS H K	18x13	30/200	22x130/200		
	α _{g,N} (s _{min} II)		1,3			
Group	α _{g,V} (s _{min} II)		1,7			
factors	$\frac{\alpha_{g,N} (s_{min} \perp)}{\alpha_{g,N} (s_{min} \perp)}$		2,0			

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Table C54.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8		ğ	M8	M10	M8	M10		M12 M	16 M12 M16
Internal threaded		37	18		М6	M8					M10 M12		Y I S
anchor FIS E	days: 3	20	l K		11x	85					15x85	I KE	
Perforated sleeve FIS H K	12	x50	12	k 85	1	16	x85		16	k130	20:	k85	20x130

Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions					
5 / 4 N/mm ²	w/w w/d	0,50	1,50	0,75	1,50	1,50
5 / 4 N/IIIII	d/d	0,60	1,50	0,90	1,50	2,00
7. F. I. C. N./2	w/w w/d	0,75	2,00	1,20	2,00	2,50
7,5 / 6 N/mm ²	d/d	0,90	2,50	1,20	2,50	2,50
10 / 8 N/mm ²	w/w w/d	0,90	3,00	1,50	3,00	3,50
10 / 8 N/MM-	d/d	1,20	3,00	2,00	3,00	3,50

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C54.2: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

Anchor rod		M10	M12	M16	
Perforated sleeve FIS H K		18x130/	200	22x130/200	
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} =$	NRk,b,c [kN]; t	temperature rang	e 50/80°C 2)		
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions				
5 / 4 N/mm ²	w/w w/d	0,75		1,50	
5 / 4 N/Mm-	d/d	0,90	¢ — — — — — Ł	2,00	
7,5 / 6 N/mm ²	w/w w/d	1,20		2,50	
7,5 / 6 N/MIII-	d/d	1,20		2,50	
40 / 9 N/mm²	w/w w/d	1,50		3,50	
10 / 8 N/mm ²	d/d	2,00		3,50	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

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²⁾ For temperature range 72/120°C: N_{Rk (72/120°C)} = 0,83 · N_{Rk (50/80°C)}.

²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Table C55.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8	h.		M8	M10	M8	M10	-		M12	M16	M12 M16
Internal threaded anchor FIS E					M6	M8 <85					M10	M12 x85			
Perforated sleeve FIS H K	12	x50	12	k 85		16	x85		16	(130	X	20	x85		20x130

Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions					8
5 / 4 N/mm²	w/w w/d d/d	1,5	0,9	1,5	2,5	0,9
7,5 / 6 N/mm²	w/w w/d d/d	2,5	1,5	2,5	3,5	1,5
10 / 8 N/mm²	w/w w/d d/d	3,5	2,0	3,5	4,5	2,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C55.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x13	0/200	22x130/200
$V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V_{Rk,c,\perp}$	kN]; tempera	ture range 50/8	0°C and 72/120°C	
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions			
5 / 4 N/mm²	w/w w/d d/d		0,9	
7,5 / 6 N/mm²	w/w w/d d/d		1,5	
10 / 8 N/mm²	w/w w/d d/d	-	2,0	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Vertical perforated brick HLz, EN 771-1:2011+A1:2015 Producer e.g. Wienerberger length L width W height H Nominal dimensions [mm] 500 200 300 Mean gross dry density p [kg/dm³] ≥ 0.7 Mean compressive strength / Min. 5/4 or 7.5/6 or 10/8 [N/mm²] compressive strength single brick 1) 12,5 / 10 Standard or annex EN 771-1:2011+A1:2015 Dimension see also Annex B17 Table C56.1: Installation parameters (Pre-positioned installation with perforated sleeve FIS H K) M8 M10 M8 M10 M12 M16 M12 M16 Anchor rod M6 **M8** M6 **M8** M6 M8 M10 M12 Internal threaded anchor FIS E 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 max Tinst [Nm] 2 torque General installation parameters Edge distance 50 80 50 80 Cmin = Ccr Smin II 100 [mm] 500 Scr II Spacing 300 Smin 1 = Scr 1 **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C56.2: Group factors Anchor rod M8 M8 M10 M8 M10 M12 M16 M12 M16 M6 **M8** M6 M6 M8 M10 M12 Internal threaded anchor FIS E 15x85 11x85 Perforated sleeve FIS H K 20x85 20x130 12x50 12x85 16x85 16x130 1.4 ag,N (Smin II) ag, v (Smin II) Group [-] factors 2 αg,N (Smin ⊥) αg, v (Smin ⊥) fischer injection system FIS V Plus for masonry Annex C56 Performance

Vertical perforated brick HLz, dimensions, installation parameters, Group factors

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Table C57.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod	M10	M12	M16				
Perforated sleeve FIS H K	1	18x130/200 22x130/200					
Anchor rod with perforate	d sleeve FIS H K	Village					
Max. installation torque max T _{inst} [Nm]	2					
General installation param	eters						
Edge distance c _{min} = c _{cr}		80					
S _{min} II		100	L*				
Spacing S _{cr} II	mm]	500	Y				
$s_{min} \perp = s_{cr} \perp$		300					

Drilling method

Hammer drilling with hard metal hammer drill

Table C57.2: Group factors

Anchor ro	d	M10	M12	M16
Perforated	d sleeve FIS H K	18x13	30/200	22x130/200
	α _{g,N} (S _{min} II)		1,4	
Group factors	α _{g,V} (s _{min} II)	3		
factors	α _{g,N} (S _{min} ⊥) [-]		2	
	α _{g,} ∨ (s _{min} ⊥)			

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Vertical perforated brick HLz, dimensions, installation parameters, Group factors

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Table C58.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8		00	M8	M10	M8	M10	1 = -		M12	M16	M12	M16
Internal threaded		61			M6	M8		. 1			M10	M12				
anchor FIS E	- 4 2		N.		11)	c85			11.1		15)	(85	LA.			
Perforated sleeve FIS H K	12:	x50	12)	(85		16	x85	Se i	16)	(130	91.	20)	(85		20x	130

r entitated sieeve i io ii it		12700	12,000	10,000	107130	20,00	20X 130
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} =$	NRk,b,c [kN]; tempe	rature ran	ge 50/80°C 2)			
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions						
5 / 4 N/mm ²	w/w w/d	0,5	50	0,60	1,20	0,75	1,50
5 / 4 N/IIIII	d/d	0,6	30	0,75	1,20	0,90	1,50
7 E / C N/mm²	w/w w/d	0,7	75	0,90	1,50	1,20	2,00
7,5 / 6 N/mm ²	d/d	0,9	90	1,20	2,00	1,20	2,50
10 / 8 N/mm²	w/w w/d	0,9	90	1,20	2,00	1,50	2,50
10 / 6 N/MM-	d/d	1,2	20	1,50	2,50	1,50	3,00
42 F / 40 N/mm²	w/w w/d	1,2	20	1,50	2,50	2,00	3,50
12,5 / 10 N/mm ²	d/d	1,5	50	2,00	3,00	2,00	4,00

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C58.2: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x1	30/200	22x130/200
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} =$	N _{Rk,b,c} [kN]	temperature	range 50/80°C 2)	
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions			
5 / 4 N/mm ²	w/w w/d		1,2	1,5
5 / 4 N/Mm	d/d		1,2	1,5
7. F. I. C. N.I	w/w w/d		1,5	2,0
7,5 / 6 N/mm ²	d/d		2,0	2,5
40 / 9 N/mm²	w/w w/d		2,0	2,5
10 / 8 N/mm ²	d/d		2,5	3,0
40 5 / 40 N/mm²	w/w w/d		2,5	3,5
12,5 / 10 N/mm ²	d/d		3,0	4,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

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Performance	Annex C58
Vertical perforated brick HLz, Characteristic resistance under tension loading	Appendix 86 / 155

²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Table C59.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8	ho -c	M8	M10	M8	M10	1 -5	M12 N	/ 116	M12 M16
Internal threaded anchor FIS E				7	M6 M8		31			M10 M12			
Perforated sleeve FIS H K	12	x50	12x	85	10	6x85		16x	130	20	x85		20x130

T CHIOTALCA GICCYC I IO II IX		LANGE	ILAUG		IOAOO	IOXIOO	20,00	LUXIOU
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$	kN]; temp	peratur	e range 5	0/80°C	and 72/1:	20°C		
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions							
5 / 4 N/mm²	w/w w/d d/d	0,9	1,2	0,9	1,2	0,6	2,0	0,6
7,5 / 6 N/mm²	w/w w/d d/d	1,2	1,5	1,2	1,5	0,9	3,0	0,9
10 / 8 N/mm²	w/w w/d d/d	1,5	2,0	1,5	2,0	1,2	4,0	1,2
12,5 / 10 N/mm²	w/w w/d d/d	2,0	3,0	2,0	3,0	1,5	5,0	1,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C59.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x13	0/200	22x130/200
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$	30°C and 72/120°C			
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions			
5 / 4 N/mm²	w/w w/d d/d		0,6	
7,5 / 6 N/mm²	w/w w/d d/d		0,9	
10 / 8 N/mm²	w/w w/d d/d		1,2	
12,5 / 10 N/mm²	w/w w/d d/d		1,5	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

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Performance	Annex C59
Vertical perforated brick HLz, Characteristic resistance under shear loading	Appendix 87 / 155

Vertical perforated brick HLz, EN 771-1:2011+A1:2015 Producer e.g. Terreal length L width W height H Nominal dimensions [mm] 500 200 315 Mean gross dry density p [kg/dm³] ≥ 0.7 Mean compressive strength / Min. 2.5/2 or 5/4 or [N/mm²] compressive strength single brick 1) 7,5/6 or 10/8 Standard or annex EN 771-1:2011+A1:2015 Dimension see also Annex B17 Table C60.1: Installation parameters (Pre-positioned installation with perforated sleeve FIS H K) M8 M10 M8 M10 M12 M16 M12 M16 Anchor rod M6 M8 M6 **M8** M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 16x85 12x50 12x85 16x130 20x85 20x130 Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K Max. installation max Tinst [Nm] 2 torque General installation parameters Edge distance 50 80 50 80 Cmin = Ccr 100 Smin II Scr II [mm] 500 Spacing 100 Smin 1 315 Scr 1 **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C60.2: Group factors M6 M8 M8 M10 M8 M10 M12 M16 M12 M16 Anchor rod M6 **M8** M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 20x130 1,1 ag,N (Smin II) 1,2 Olg. V (Smin II) Group [-] factors $\alpha_{g,N}$ (Smin 上) 1,1 1,2 αg, v (Smin ⊥) fischer injection system FIS V Plus for masonry Annex C60 Performance Vertical perforated brick HLz, dimensions, installation parameters, Group factors Appendix 88 / 155

Table C61.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod			M10	M12	M16
Perforated slee	ve FIS H k	(18x13	0/200	22x130/200
Anchor rod wit	h perforat	ed sleeve	FIS H K	'A''	
Max. installation torque	max T _{inst}	[Nm]		2	
General installa	tion para	meters			
Edge distance	Cmin = Ccr			80	0
	s _{min} II			10	0
0	scr II	[mm]		50	0
Spacing	Smin⊥			10	0
	-	N. Jon V. I.			

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Drilling method

Hammer drilling with hard metal hammer drill

Table C61.2: Group factors

Anchor ro	d	M10	M12	M16	
Perforated	I sleeve FIS H K	18x130/200		22x130/200	
	α _{g,N} (s _{min} II)		1,1		
Group	αg, v (Smin II)		1,2		
factors	$\alpha_{g,N}$ (Smin \perp) [-]		1,1		
	α _{g,V} (s _{min} ⊥)	3	1,2		

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Vertical perforated brick HLz, dimensions, installation parameters, Group factors

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Table C62.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8	504ot	M8	M10	M8	M10	7.5.4.K	M12	M16	M12 M16
Internal threaded anchor FIS E			C		M6 M8					M10 M12			
Perforated sleeve FIS H K	12	x50	12)	(85	10	5x85		16x	130	20	x85		20x130

Mean compressive strength /	Use					
Min. compressive strength single brick 1)	con- ditions					
2,5 / 2 N/mm ²	w/w w/d			0.5		
2,5 / 2 N/IIIII	d/d		0,5	0,6	0,5	0,6
5 / 4 N/mm ²	w/w w/d			0,9		
5 / 4 N/IIIII	d/d	0,9		1,2		
7,5 / 6 N/mm ²	w/w w/d	U-3 -3 -		1,5		
7,5 / 6 N/IIIII	d/d			1,5		
10 / 8 N/mm²	w/w w/d			2.0		
10 / 6 N/MM-	d/d			2,0		

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C62.2: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

Anchor rod		M10	M10 M12 M16			
Perforated sleeve FIS H K		18x	130/200	22x130/200		
Perforated sleeve FIS H K		2)				
Min. compressive strength	con-					
2,5 / 2 N/mm²						
5 / 4 N/mm²						
7,5 / 6 N/mm²				1.5		
10 / 8 N/mm²	w/w w/d d/d					

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

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Vertical perforated brick HLz, Characteristic resistance under tension loading	Appendix 90 / 155

²⁾ For temperature range 72/120°C: NRk (72/120°C) = 0,83 · NRk (50/80°C).

²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Table C63.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8	12.6	Š	M8	M10	M8	M10	14		M12	M16	M12 M16
Internal threaded		667			M6	M8				W	M10	M12	153		
anchor FIS E		1211		11:	k 85		1754	54.	15>	(85	2.30				
Perforated sleeve FIS H K	12	x50	12)	(85	173	16	x85		16	c130	T	20:	x85		20x130

						THE PROPERTY OF STREET		
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$	kN]; temp	erature i	range 5	0/80°C	and 72/12	0°C		
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions				3,			
2,5 / 2 N/mm²	w/w w/d d/d	0,30	0,60	0,3	0,60	0,60	0,90	0,75
5 / 4 N/mm²	w/w w/d d/d	0,75	1,20	0,7	1,20	1,20	2,00	1,50
7,5 / 6 N/mm²	w/w w/d d/d	0,90	2,00	0,9	2,00	1,50	3,00	2,00
10 / 8 N/mm²	w/w w/d d/d	1,50	2,50	1,5	2,50	2,00	4,00	3,00

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C63.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x13	0/200	22x130/200
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$	[kN]; tempera	ture range 50/8	80°C and 72/120°C	
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions			- : : : -
2,5 / 2 N/mm²	w/w w/d d/d	0,6	80	0,75
5 / 4 N/mm²	w/w w/d d/d	1,2	20	1,50
7,5 / 6 N/mm²	w/w w/d d/d	1,5	50	2,00
10 / 8 N/mm²	w/w w/d d/d	2,0	00	3,00

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

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Vertical perforated brick HLz, Characteristic resistance under shear loading	Appendix 91 / 155

Vertical perforated brick HLz, EN 771-1:2011+A1:2015 Producer e.g. Imery width W height H length L Nominal dimensions [mm] 560 200 275 Mean gross dry density ρ [kg/dm³] ≥ 0.7 Mean compressive strength / Min. $[N/mm^2]$ 5/4 or 8/6 or 10/8 compressive strength single brick 1) Standard or annex EN 771-1:2011+A1:2015 Dimension 200 see also Annex B17 Installation parameters **Table C64.1:** Anchor rod **M8** M10 M12 M12 M16 M16 M10 Perforated sleeve FIS H K 22x130/200 16x130 18x130/200 20x130 Anchor rod with perforated sleeve FIS H K Max. installation max Tinst [Nm] 2 torque General installation parameters Edge distance 80 Cmin = Ccr Smin II = Scr II [mm] 560 Spacing 275 Smin \perp = Scr \perp **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C64.2: Group factors Anchor rod **M8** M10 M₁₀ M12 M12 M16 M16 Perforated sleeve FIS H K 16x130 18x130/200 20x130 22x130/200 ag,N (Smin II) ag, v (Smin II) Group 2 [-] factors αg,N (Smin ⊥) αg, v (Smin ⊥) fischer injection system FIS V Plus for masonry Annex C64 Performance Vertical perforated brick HLz, dimensions, installation parameters, Group factors Appendix 92 / 155

Table C65.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

МЛО

Anchor roa		IVI8 IVITU		IVITO	M10 M12		IVITO	IVITO			
Perforated sleeve FIS H K		16x130 18			30/200	20x	130	22x130/200			
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} =$	N _{Rk,b,c} [kN]	; tempe	rature ra	nge 50/80)°C 2)						
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions										
2 (4))(w/w w/d		0,9		- 4	1,2					
5 / 4 N/mm ²	d/d		1,2	2, 4	- 11	1,5					
w/w w/d			1,5	j		2,0					
8 / 6 N/mm ²	d/d		1,5	i -		2,0					
40.40.00	w/w w/d		2,0)			2,5				
10 / 8 N/mm ²	414										

^{2,5} 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

d/d

Characteristic resistance to local brick failure or brick edge failure of a single Table C65.2: anchor under shear loading

Anchor rod		IVI8	M10	M10	IVI12	IVI12	M16	W16
Perforated sleeve FIS H K		16>	130	18x13	30/200	20x	130	22x130/200
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$	kN]; tempe	rature i	range 50/	80°C and	72/120°C		3 8 - 2	
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions							
5 / 4 N/mm²	w/w w/d	Ξ			0	,9		
8 / 6 N/mm²	w/w w/d				1	,5		
10 / 8 N/mm²	w/w w/d			7.3	2	,0		

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Anchor rod

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²⁾ For temperature range 72/120°C: NRk (72/120°C) = 0,83 · NRk (50/80°C).

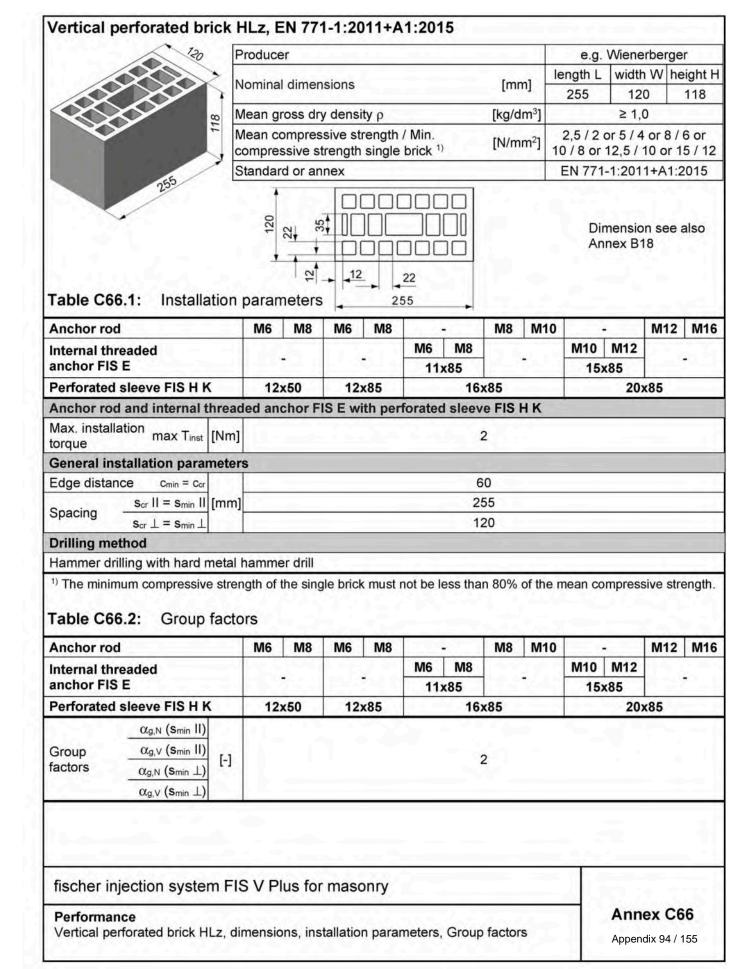


Table C67.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod	M6	M8	M6	M8	0.0		M8 M10				M12	M16
Internal threaded		M.A.		N.		M8			M10	M12		10
anchor FIS E						11x85			15x85			
Perforated sleeve FIS H K	12	12x50 12x85		16x85				20x85				

i dilorated biceve i le ii it		IZAGO	IZAGO	1000	20,00
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} =$	N _{Rk,b,c} [kN];	temperat	ure range 50	/80°C 1)	
Mean compressive strength / Min. compressive strength single brick ²⁾	Use con- ditions				
2,5 / 2 N/mm ²	w/w w/d	0,40		0,50	_3)
2,5 / 2 N/IIIII-	d/d	0,50		0,50	_3)
5 / 4 N/mm²	w/w w/d	0,90		0,90	0,50
	d/d	0,90		1,20	0,50
8 / 6 N/mm ²	w/w w/d	1,20		1,50	0,75
o / o iv/iiiiii	d/d	1,50		1,50	0,75
10 / 8 N/mm ²	w/w w/d	1,50		2,00	0,90
TO / O N/IIIII	d/d	2,00		2,00	0,90
12,5 / 10 N/mm ²	w/w w/d	2,00		2,50	1,20
12,5 / 10 N/IIIII	d/d	2,50		2,50	1,20
15 / 12 N/mm²	w/w w/d	2,50		3,00	1,50
19 / 12 N/IIIII	d/d	3,00		3,50	1,50

¹⁾ For temperature range 72/120°C: NRk (72/120°C) = 0,83 · NRk (50/80°C).

Factor for job site tests and displacements see annex C123.

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Vertical perforated brick HLz, Characteristic resistance under tension loading

²⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

³⁾ No performance assessed.

Table C68.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod	M6	M8	M6	M8	100	12	M8	M8 M10				M16
Internal threaded						M8			M10	M12	1	
anchor FIS E						11x85			15x85			
Perforated sleeve FIS H K	12	x50	12	x85	16>		x85		20:		x85	

					23367	
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$	kN]; temp	eratu	re ran	ge 50/	80°C an	nd 72/120°C
Mean compressive strength / Min. compressive strength single brick 1)	Use con- dition					
2,5 / 2 N/mm²	w/w w/d d/d	0,60	0,75	0,60	0,75	0,90
5 / 4 N/mm²	w/w w/d d/d	1,20	1,50	1,20	1,50	2,00
8 / 6 N/mm²	w/w w/d d/d	2,00	2,00	2,00	2,00	2,50
10 / 8 N/mm²	w/w w/d d/d	2,50	3,00	2,50	3,00	3,50
12,5 / 10 N/mm²	w/w w/d d/d	3,00	3,50	3,00	3,50	4,50
15 / 12 N/mm²	w/w w/d d/d	4,00	4,50	4,00	4,50	5,50

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Vertical perforated brick HLz, Characteristic resistance under shear loading

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Vertical perforated brick HLz, EN 771-1:2011+A1:2015 Producer e.g. Cermanica Farreny S.A. width W length L height H Nominal dimensions [mm] 275 130 Mean gross dry density p [kg/dm³] ≥ 0.8 Mean compressive strength / Min. 7,5 / 6 or 10 / 8 or 15 / 12 or [N/mm²] compressive strength single brick 1) 20 / 16 or 25 / 20 Standard or annex EN 771-1:2011+A1:2015 130 Dimension see also Annex B18 275 Table C69.1: Installation parameters Anchor rod **M8 M8** M10 M12 M16 **M6 M6 M8** M12 **M6 M8** M10 Internal threaded anchor FIS E 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 max Tinst [Nm] torque General installation parameters Edge distance 120 Cmin = Ccr 100 275 Scr II = Smin II [mm] Spacing 95 Scr 1 = Smin 1 **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C69.2: Group factors Anchor rod M10 M12 M16 M6 **M8 M6 M8 M8 M8** M10 M12 M₆ Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 16x85 20x85 12x85 ag,N (Smin II) ag, v (Smin II) Group 2 [-] factors αg,N (Smin ⊥) $\alpha_{g,V}$ (Smin \perp) fischer injection system FIS V Plus for masonry Annex C69 Performance Vertical perforated brick HLz, dimensions, installation parameters, Group factors Appendix 97 / 155

Table C70.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod	M6	M8	M6	M8					M8	M10			M12	M16
Internal threaded anchor FIS E					M6	M8 x85			M10	M12 x85				
Perforated sleeve FIS H K	12	x50	12	x85		16:	x85		143	20:	x85			

Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		
7,5 / 6 N/mm ²	w/w w/d	0,40	0,90
7,5 / 6 N/IIIII	d/d	0,40	0,90
10 / 8 N/mm ²	w/w w/d	0,50	1,20
TO / 6 IN/IIIIII	d/d	0,60	1,20
15 / 12 N/mm ²	w/w w/d	0,75	1,50
15 / 12 N/IIIII	d/d	0,90	2,00
20 / 16 N/mm ²	w/w w/d	0,90	2,00
20 / 16 N/IIIII	d/d	1,20	2,50
25 / 20 N/mm ²	w/w w/d	1,20	3,00
25 / 20 N/IIIII	d/d	1,50	3,00

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

fischer injection system FIS V Plus for masonry

Vertical perforated brick HLz, Characteristic resistance under tension loading

²⁾ For temperature range 72/120°C: N_{Rk (72/120°C)} = 0,83 · N_{Rk (50/80°C)}.

Table C71.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod	M6 M8 M6 M8 -			M8	M10	5-43	14	M12	M16			
Internal threaded anchor FIS E					M6 M8					M10 M12		
Perforated sleeve FIS H K	12	x50	12:	x85	56		x85		10.		x85	

$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$	kN]; tempe	rature range 50/80°	C and 72/120°C
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		
7,5 / 6 N/mm²	w/w w/d d/d	1,2	1,2
10 / 8 N/mm²	w/w w/d d/d	1,5	1,5
15 / 12 N/mm²	w/w w/d d/d	2,0	2,5
20 / 16 N/mm²	w/w w/d d/d	3,0	3,0
25 / 20 N/mm²	w/w w/d d/d	4,0	4,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

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Vertical perforated brick HLz, Characteristic resistance under tension loading	Appendix 99 / 155

Vertical perforated brick HLz, EN 771-1:2011+A1:2015 Producer e.g. Perceram width W | height H length L Nominal dimensions [mm] 220 190 290 Mean gross dry density p [kg/dm³] ≥ 0.7 Mean compressive strength / Min. [N/mm²] 7,5 / 6 or 10 / 8 or 12,5 / 10 compressive strength single brick 1) Standard or annex EN 771-1:2011+A1:2015 Dimension see also 40 Annex B18 42 -Table C72.1: Installation parameters (Pre-positioned installation with perforated sleeve FIS H K) M8 M10 M8 M10 M12 M16 M12 M16 Anchor rod M6 **M8** M6 M8 M6 M8 M10 M12 Internal threaded anchor FIS E 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 max Tinst [Nm] 2 torque General installation parameters Edge distance Cmin = Ccr 110 Smin II = Scr II [mm] 220 Spacing 290 Smin \perp = Scr \perp **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C72.2: Group factors Anchor rod M8 M10 M8 M10 M12 M16 M12 M16 M6 **M8** M6 **M8** M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 20x130 ag,N (Smin II) ag, v (Smin II) Group 2 [-] factors ag,N (Smin 1) αg, v (Smin ⊥) fischer injection system FIS V Plus for masonry Annex C72 Performance

Vertical perforated brick HLz, dimensions, installation parameters, Group factors

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Table C73.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H I	<	18x13	0/200	22x130/200
Anchor rod with perforat	ed sleeve	FIS H K		
Max. installation torque max T _{inst}	[Nm]	W314	2	
General installation para	meters			
Edge distance c _{min} = c _{cr}			110	Yar and the second
Smin II = Scr II	[mm]		220	
Spacing $s_{min} \perp = s_{cr} \perp$			290	

Drilling method

Hammer drilling with hard metal hammer drill

Table C73.2: Group factors

Anchor ro	d	M10	M12	M16
Perforated	I sleeve FIS H K	18x13	30/200	22x130/200
Group factors	$\frac{\alpha_{g,N} (s_{min} II)}{\alpha_{g,V} (s_{min} II)}$ $\frac{\alpha_{g,N} (s_{min} \bot)}{\alpha_{g,V} (s_{min} \bot)}$ [-]	<i>y</i>	2	

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Vertical perforated brick HLz, dimensions, installation parameters, Group factors

Table C74.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8		I	N8	M10	M8	M10	-	M12	M16	M12 M16
Internal threaded anchor FIS E		51			M6 N	-	7				M10 M12			
Perforated sleeve FIS H K	12	x50	12	x85		16x	85	7-1	16)	c130		x85		20x130

Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions						
7,5 / 6 N/mm ²	w/w w/d	0,3	1,2	1,2	1,5	1,2	1,5
7,5 / 6 N/mm	d/d	0,4	1,5	1,5	1,5	1,5	1,5
40 / 0 N/mm²	w/w w/d	0,5	1,5	1,5	2,0	1,5	2,0
10 / 8 N/mm²	d/d	0,5	2,0	2,0	2,5	2,0	2,5
40 5 / 40 N/mm²	w/w w/d	0,6	2,0	2,0	2,5	2,0	2,5
12,5 / 10 N/mm ²	d/d	0,6	2,5	2,5	3,0	2,5	3,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C74.2: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x13	30/200	22x130/200
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} =$	NRk,b,c [kN]; t	emperature ra	nge 50/80°C ²⁾	
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions			
7,5 / 6 N/mm ²	w/w w/d		1,5	
7,5 7 6 N/IIIII	d/d		1,5	
10 / 8 N/mm ²	w/w w/d		2,0	
10 / O N/IIIII	d/d		2,5	
12,5 / 10 N/mm ²	w/w w/d		2,5	
12,5 / 10 N/IIIII'	d/d		3,0	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

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²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Table C75.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8	130	· (1	M8	M10	M8	M10			M12	M16	M12 N	116
Internal threaded anchor FIS E					223.5	M8 x85			K		M10	0.00 0.00				
Perforated sleeve FIS H K	12:	x50	12	k 85		16	x85	40	162	c130		20:	x85		20x1	30

Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions						
7,5 / 6 N/mm²	w/w w/d d/d	1,5	1,5	1,5	2,5	1,5	2,0
10 / 8 N/mm²	w/w w/d d/d	2,0	2,0	2,0	3,5	2,0	3,0
12,5 / 10 N/mm²	w/w w/d d/d	2,5	3,0	3,0	4,5	3,0	3,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C75.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x	130/200	22x130/200
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$	[kN]; tempe	rature range (50/80°C and 72/120°C	
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions			
7,5 / 6 N/mm²	w/w w/d d/d		2,0	
10 / 8 N/mm²	w/w w/d d/d		3,0	
12,5 / 10 N/mm²	w/w w/d d/d		3,5	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Vertical perforated brick HLz, Characteristic resistance under shear loading

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Producer		e.g. Zie	egelwerk	Brenna
Naminal dimensions	[mana]	length L	width W	height H
Nominal dimensions	[mm]	253	300	240
Mean gross dry density ρ	[kg/dm ³]		≥ 0,8	
Mean compressive strength / Min. compressive strength single brick 1)	[N/mm ²]	2,5 / 2	or 5 / 4 c	or 8 / 6
Standard or annex		EN 771	-1:2011+/	41:2015

Dimension see also Annex B18

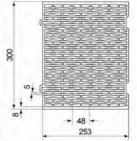


Table C76.1: Installation parameters

(Pre-positioned installation with perforated sleeve FIS H K)

Anchor rod	M6	M8	M6	M8	East	-	M8	M10	M8	M10	1.5	-	M12	M16	M12	M16
Internal threaded anchor FIS E				Ý	M6	M8 x85	Z				111111	M12 x85				
Perforated sleeve FIS H K	12:	x50	12:	x85	'ně	16:	x85		16>	130		20	x85		20x	130

1	Max. installation torque		[N/m-1]	2
l t	torque	max Tinst	[[NM]	2

General installation parameters

Edge dista	nce c _{min} = c _{cr}	60	
Canaina	s _{min} II = s _{cr} II [mm]	255	
Spacing	S _{min} ⊥ = S _{cr} ⊥	240	

Drilling method

Hammer drilling with hard metal hammer drill

Table C76.2: Group factors

αg,N (Smin ⊥) αg, v (Smin ⊥)

Anchor ro	d	M6	M8	M6	M8		5.3	M8	M10	M8	M10	2.04	43	M12	M16	M12 M
Internal th	readed			1		M6	M8			13		M10 N	V 112			1 2 3 3
anchor FI	SE					11:	x85			b IC		15x8	35	P.		44.
Perforated	d sleeve FIS H K	12	x50	12	x85		16:	x85		162	(130		20:	x85		20x13
	α _{g,N} (s _{min} II)															
Group	α _{g,V} (s _{min} II)	1								,						
factors	CON (Smin 1)	1														

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Vertical perforated brick HLz, dimensions, installation parameters, Group factors

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¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C77.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod Perforated sleeve FIS H K		M10	M12	M16
		18x13	30/200	22x130/200
Anchor rod with perfora	ted sleeve	FIS H K		
Max. installation T _{inst}	[Nm]			2
General installation para	meters			
Edge distance c _{min} = c _o	r			60
Spacing s _{min} II = s _{cr} I	[mm]		2	255
Spacing			4.74	

240

Drilling method

Hammer drilling with hard metal hammer drill

 $s_{min} \perp = s_{cr} \perp$

Table C77.2: Group factors

Anchor rod		M10	M12	M16
Perforated	sleeve FIS H K	18x13	0/200	22x130/200
Group factors	$\frac{\alpha_{g,N} (Smin \ II)}{\alpha_{g,N} (Smin \ II)}$ $\frac{\alpha_{g,N} (Smin \ \bot)}{\alpha_{g,V} (Smin \ \bot)}$ [-]		2	

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Table C78.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8		9	M8	M10	M8	M10	23.E	M12	M16	M12 M16
Internal threaded anchor FIS E		-			M6	M8 (85			K		M10 M1	2		
Perforated sleeve FIS H K	12	x50	12)	k 85	16		x85	X 4	16)	(130	2	0x85		20x130

Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions						
2,5 / 2 N/mm ²	w/w w/d	_3)	0,50	0,50	0,40	0,50	0,40
	d/d	0,30	0,50	0,50	0,50	0,50	0,50
5 / 4 N/mm²	w/w w/d	0,50	0,90	0,90	0,90	0,90	0,90
	d/d	0,60	0,90	0,90	0,90	0,90	0,90
8 / 6 N/mm²	w/w w/d	0,75	1,50	1,50	1,20	1,50	1,20
	d/d	0,90	1,50	1,50	1,50	1,50	1,50

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Characteristic resistance to pull-out failure or brick breakout failure of a Table C78.2: single anchor under tension loading (Push through installation)

Anchor rod		M10	M12	M16	
Perforated sleeve FIS H K	18x	130/200	22x130/200		
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} =$	NRk,b,c [kN];	temperature	range 50/80°C	2)	
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions				
2,5 / 2 N/mm ²	w/w w/d			0,4	
	d/d			0,5	
5 / 4 N/mm ²	w/w w/d	-		0,9	
5 / 4 N/MM-	d/d	-		0,9	
0.10.11	w/w w/d			1,2	
8 / 6 N/mm ²	d/d	8 , 1 ,		1,5	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

³⁾ No performance assessed.

²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Table C79.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8	ь.	W. J.	M8	M10	M8	M10	-1,		M12	M16	M12 M16
Internal threaded anchor FIS E					M6	M8	8		MILE		M10	M12			
			1.30		11)	(85			15x	85					
Perforated sleeve FIS H K	12	x50	12	x85	III	16	x85	Yes I	16	c130	M	20:	x85		20x130

Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		
2,5 / 2 N/mm ²	w/w w/d d/d	0,5	0,6
5 / 4 N/mm²	w/w w/d d/d	0,9	1,2
8 / 6 N/mm²	w/w w/d d/d	1,5	1,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C79.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x13	0/200	22x130/200
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$	kN]; tempera	ature range 50/	80°C and 72/120°C	
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions			
2,5 / 2 N/mm²	w/w w/d d/d	0,	5	0,6
5 / 4 N/mm²	w/w w/d d/d	0,	9	1,2
8 / 6 N/mm²	w/w w/d d/d	1,	5	1,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Vertical perforated brick HLz, Characteristic resistance under shear loading	Appendix 107 / 155

Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool, EN 771-1:2011+A1:2015 Producer e.g. Wienerberger length L width W height H Nominal dimensions [mm] 250 440 250 Mean gross dry density p 0,7 [kg/dm³] Mean compressive strength / Min. [N/mm²] 8 / 6 or 10 / 8 or 12,5 / 10 compressive strength single brick 1) Standard or annex EN 771-1:2011+A1:2015 18,5 Dimension see also Annex B18 125 17,5 Table C80.1: Installation parameters (Pre-positioned installation with perforated sleeve FIS H K) M8 M10 M8 M10 M12 M16 M12 M16 M12 M16 Anchor rod M6 M8 M6 M8 M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 20x130 20x200 Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K Max. installation max Tinst [Nm] 2 5 2 5 6 torque General installation parameters Edge distance Cmin = Cor 60 80 Smin II 250 Scr II [mm] Spacing 80 Smin 1 250 Scr 1 **Drilling method** Rotary drilling with carbide drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C80.2: Group factors Anchor rod M6 **M8** M6 M8 M8 M10 M8 M10 M12 M16 M12 M16 M12 M16 M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 20x130 20x200 1.3 ag,N (Smin II) ag,v (Smin II) 1,3 Group [-] factors αg,N (Smin ⊥) 0.8 1.3 αg, v (Smin ⊥) fischer injection system FIS V Plus for masonry Annex C80 Performance Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool; Appendix 108 / 155 dimensions, installation parameters, Group factors

Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool, EN 771-1:2011+A1:2015

Table C81.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod			M10	M12 M16			
Perforated sl	eeve FIS H I	<	18x1	130/200 22x130/200			
Anchor rod w	ith perforat	ed sleeve	FIS H K		Z - Y LU AL		
Max. installation	on max T _{inst}	[Nm]	5	6			
General insta	llation para	meters		<u> </u>			
Edge distance	C _{min} = C _{cr}	公从他			60		
	Smin II				80		
Ci	S _{cr} II	[mm]		2	50		
Spacing —	S _{min} ⊥				80		
	S _{cr} ⊥			2	50		

Drilling method

Rotary drilling with carbide drill

Table C81.2: Group factors

Anchor ro	d		M10	M12	M16	
Perforated	sleeve FIS H K		18x13	22x130/200		
4-	α _{g,N} (s _{min} II)	-111		1,3		
Group	$\alpha_{\text{g,V}}$ (s _{min} II)			1,3		
factors	αg,N (Smin ⊥)	[-]		0,8		
	α _{g,} ∨ (s _{min} ⊥)			1,3		

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Performance

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

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Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool, EN 771-1:2011+A1:2015

Table C82.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8		M	M10	M8 M1	0 -	M12 M1	6 M12	M16	M12 M16
Internal threaded anchor FIS E		Ŋ		I	M6 M				M10 M12		-	V	
Perforated sleeve FIS H K	12:	c50	12	x85	16	x85		16x13	20:	x85	20x1	130	20x200

N _{Rk} = N _{Rk,p} = N _{Rk,b} = N _{Rk,p,c} = I Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions					
8 / 6 N/mm²	w/w w/d	0,75	1,50	1,20	1,50	2,50
	d/d	0,90	1,50	1,20	1,50	2,50
40.40.44 2	w/w w/d	0,90	1,50	1,20	1,50	2,50
10 / 8 N/mm²	d/d	0,90	2,00	1,50	2,00	3,00
12,5 / 10 N/mm²	w/w w/d	0,90	2,00	1,50	2,00	3,00
	d/d	1,20	2,00	1,50	2,00	3,50

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C82.2: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x13	0/200	22x130/200
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = 1$	N _{Rk,b,c} [kN]; te	mperature rang	ge 50/80°C ²⁾	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions			
8 / 6 N/mm ²	w/w w/d		1,5	X
o / o N/mm²	d/d		1,5	
40 / 9 N/mm²	w/w w/d		1,5	
10 / 8 N/mm ²	d/d		2,0	
42 5 / 40 N/mm²	w/w w/d		2,0	
12,5 / 10 N/mm ²	d/d		2,0	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

fischer injection system FIS V Plus for masonry	
Performance	Annex C82
Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool, Characteristic resistance under tension loading	Appendix 110 / 155

²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool, EN 771-1:2011+A1:2015

Table C83.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8	1995	M8	M10	M8 M10		M12 M16	M12 M16	M12 M16
Internal threaded anchor FIS E			İş		M6 M8	E.			M10 M12 15x85			Tak
Perforated sleeve FIS H K	12	x50	12	x85	16	x85	. 1	16x130	20:	x85	20x130	20x200

Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions					
8 / 6 N/mm²	w/w w/d d/d	0,9	1,2	0,9	1,2	1,2
10 / 8 N/mm ²	w/w w/d d/d	0,9	1,5	0,9	1,5	1,2
12,5 / 10 N/mm²	w/w w/d d/d	1,2	1,5	1,2	1,5	1,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C83.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS	SHK	18x13	0/200	22x130/200
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V$	Rk,c,⊥ [kN]; ter	nperature range	50/80°C and 72/120°C	
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions			
8 / 6 N/mm²	w/w w/d d/d	1,	2	1,2
10 / 8 N/mm²	w/w w/d d/d	1,	5	1,5
12,5 / 10 N/mm²	w/w w/d d/d	1,	5	1,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

fischer injection system FIS V Plus for masonry	
Performance	Annex C83
Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool; Characteristic resistance under shear loading	Appendix 111 / 155

Vertical perforated brick HLz, EN 771-1:2011+A1:2015 Producer e.g. Wienerberger. length L width W height H Nominal dimensions [mm] 230 108 55 Mean gross dry density p [kg/dm³] ≥ 1.4 Mean compressive strength / Min. 2,5/2 or 5/4 or 8/6 [N/mm²] compressive strength single brick 1) or 10 / 8 Standard or annex EN 771-1:2011+A1:2015 Dimension see also Annex B18 12 230 Installation parameters Table C84.1: Anchor rod **M6 M8** M₆ **M8 M8** M₁₀ M12 M₁₆ M₆ **M8** M10 M12 Internal threaded anchor FIS E 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 max Tinst [Nm] 2 torque General installation parameters Edge distance 60 Cmin = Ccr 80 Smin II 230 Scr II [mm] Spacing 60 Smin 1 60 Scr 1 **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C84.2: Group factors Anchor rod **M8 M8 M8** M10 M12 M16 M6 M₆ M6 **M8** M10 M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 20x85 ag,N (Smin II) ag, v (Smin II) Group [-] 2 factors Olg, N (Smin 1) $\alpha_{g,V}$ (Smin \perp) fischer injection system FIS V Plus for masonry

Performance

Vertical perforated brick HLz, dimensions, installation parameters, Group factors

Annex C84

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Table C85.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading ¹⁾

Anchor rod	M6	M8	M6	M8	JOHN ST						JOHN SH		P. P. B. S. S.		A D. H. A. L. O. L.						M8	M10				M16
Internal threaded anchor FIS E						M6 M8			M10 M12 15x85																	
Perforated sleeve FIS H K	12	x50	12	x85	16>		x85			20:	x85															

Mean compressive strength /	Use				
Min. compressive strength single brick ²⁾	con- ditions	1 -			
2,5 / 2 N/mm ²	w/w w/d	0.30	0.90	0.75	0.50
2,372 14/11111	d/d	0,30	0,90	0,90	0,60
5 / 4 N/mm²	w/w w/d	0.60	1,50	1,50	0.90
3 / 4 N/IIIII	d/d	0,75	2,00	1,50	1,20
8 / 6 N/mm ²	w/w w/d	0,90	2,50	2,50	1,50
O / O N/IIIII	d/d	0,90	3,00	2,50	1,50
10 / 8 N/mm²	w/w w/d	1,20	3,50	3,00	2,00
10 / 6 N/IIIII	d/d	1,50	4,00	3,50	2,50

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

Table C85.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod		M6	M8	M6	M8			M8	M10			M12	M16	
Internal threaded anchor FIS E				15	1500		M6 M8				M10 M12			
Perforated sleeve FIS H K		12:	12x50 12x85		x85	16x85			20x85					
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$	N]; tem	peratu	re ran	ge 50/	80°C a	nd 72	/120°C	3						
Mean compressive strength /	Use				r									

Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		
2,5 / 2 N/mm ²	w/w w/d d/d	0,6	0,4
5 / 4 N/mm²	w/w w/d d/d	1,2	0,9
8 / 6 N/mm²	w/w w/d d/d	1,5	1,2
10 / 8 N/mm²	w/w w/d d/d	2,5	1,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Factor for job site tests and displacements see annex C123.

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Performance

Vertical perforated brick HLz, Characteristic resistance under tension and shear loading

Annex C85

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²⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

³⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Vertical perforated brick HLz filled with mineral wool, EN 771-1:2011+A1:2015 Producer e.g. Wienerberger length L width W height H Nominal dimensions [mm] ≥ 365 ≥ 248 ≥ 245 Mean gross dry density ρ [kg/dm³] 0,6 Mean compressive strength / Min. 10/8 $[N/mm^2]$ compressive strength single brick 1) Standard or annex EN 771-1:2011+A1:2015 Dimension see also Annex B19 18 128 97 8,0 Table C86.1: Installation parameters (Pre-positioned installation with perforated sleeve FIS H K) Anchor rod M₆ **M8 M8** M10 M8 M10 M12 M16 M12 M16 M10 M12 M6 **M8** Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x85 16x85 16x130 20x85 20x130 Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K Max. installation max Tinst [Nm] 2 4 torque General installation parameters Edge distance 100 Cmin = Ccr Smin II 250 Scr II [mm] Spacing Smin 1 245 Scr 1 **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C86.2: Group factors Anchor rod **M6 M8 M8** M₁₀ **M8** M₁₀ M12 M16 M12 M16 Perforated sleeve FIS H K 12x85 16x85 16x130 20x85 20x130 $\alpha_{g,N}$ (s_{min} II) = ag, v (Smin II) Group 2 [-] factors $\alpha_{g,N}$ (Smin \perp) = αg, V (Smin ⊥)

fischer injection system FIS V Plus for masonry

Performance

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

Annex C86

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Vertical perforated brick HLz filled with mineral wool, EN 771-1:2011+A1:2015

Table C87.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod		74 F	M10	M12	M16
Perforated sleev	e FIS H		18x13	0/200	22x130/200
Anchor rod with	perforat	ed sleeve	FIS H K		
Max. installation torque	max T _{inst}				
General installat	ion para	neters			
Edge distance	C _{min} = C _{cr}		Y =		
	S _{min} II	[mm]		250	
Spacing	S _{min} ⊥			245	

Drilling method

Hammer drilling with hard metal hammer drill

Table C87.2: Group factors

Anchor ro	d	M10	M12	M16
Perforated	I sleeve FIS H K	18x13	30/200	22x130/200
Group factors	$\frac{\alpha_{g,N} (Smin \ II)}{\alpha_{g,N} (Smin \ I)}$ $\frac{\alpha_{g,N} (Smin \ \bot)}{\alpha_{g,V} (Smin \ \bot)}$ [-]		2	

fischer injection system FIS V Plus for masonry

Performance

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

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Vertical perforated brick HLz filled with mineral wool, EN 771-1:2011+A1:2015

Table C88.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod	M6	M8			M8 M10		M8 M10		5.2.1		M12	M16	M12	M16	M12	M16
Internal threaded anchor FIS E			M6	M8 x85	Ł			3-4	M10	M12 x85	K		Ď.			
Perforated sleeve FIS H K	12)	(85		16>	85		16x	130		20x	85	- 4	20x	130	20x	200

$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = 1$	NRk,b,c [kN]	; tempe	rature rang	e 50/80°C 2)			
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions						
10 / 8 N/mm²	w/w	2	1,5	2,5	2,0	2,0	3,0
10 / 6 14/111111-	d/d	2	2,0	3,0	2,0	2,0	3,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C88.2: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K	A	18x13	0/200	22x130/200
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = 1$	NRk,b,c [kN];	temperature rai	nge 50/80°C 2)	
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions			
10 / 8 N/mm²	w/w	1.	.5	2.0
10 / 6 N/mm	d/d	2	0	2,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

fischer injection system FIS V Plus for masonry

Performance

Vertical perforated brick HLz filled with mineral wool, Characteristic resistance under tension loading

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²⁾ For temperature range 72/120°C no performance assessed.

²⁾ For temperature range 72/120°C no performance assessed.

Vertical perforated brick HLz filled with mineral wool, EN 771-1:2011+A1:2015

Table C89.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8	18 -		M8	8 M10 M8 M		M8 M10		M10 -		M12 N	/116	M12	M16	M12	M16
Internal threaded anchor FIS E			M6	M8 x85	j				M10	M12 c85							
Perforated sleeve FIS H K	123	k 85	16x		5x85		16x130 20x		85	T)	20x	130	20x	200			

$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$	kN]; tem	perat	ure rang	ge 50/80°C ²⁾					
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions	Ē							
10 / 8 N/mm ²	w/w	2,5	3,0	3,0	3,0	1,5	1,5	1,5	1,5
10 / 6 N/IIIIII	d/d	2,5	3,0	3,0	3,0	1,5	1,5	1,5	1,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C89.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod		M10	M12	M16				
Perforated sleeve FIS H K	2-710	18x13	0/200	22x130/200				
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$	kN]; temper	ature range 50/	80°C 2)					
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions							
10 / 8 N/mm²	w/w	3	.0	1.5				
10 / 6 N/IIIII-	d/d	3	,0	1,5				

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Performance

Vertical perforated brick HLz filled with mineral wool, Characteristic resistance under shear loading

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²⁾ For temperature range 72/120°C no performance assessed.

²⁾ For temperature range 72/120°C no performance assessed.

Vertical perforated brick HLz, EN 771-1:2011+A1:2015 Producer e.g. Wienerberger length L width W height H Nominal dimensions [mm] ≥ 240 ≥ 175 ≥ 113 0.9 Mean gross dry density p [kg/dm³] Mean compressive strength / Min. [N/mm²] 12,5 / 10 compressive strength single brick 1) Standard or annex EN 771-1:2011+A1:2015 Dimension see also Annex B19 Installation parameters Table C90.1: (Pre-positioned installation with perforated sleeve FIS H K) Anchor rod M6 **M8** M8 M₁₀ M8 M10 M12 M16 M12 M16 M10 M12 M6 **M8** Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x85 16x85 16x130 20x85 20x130 Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K Max. installation max Tinst [Nm] 2 torque General installation parameters Cmin = Ccr Edge distance 100 Smin II 240 Scr II [mm] Spacing Smin 1 115 Scr 1 **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C90.2: Group factors Anchor rod M₆ **M8 M8** M10 **M8** M10 M12 M16 M12 M16 Perforated sleeve FIS H K 12x85 16x85 16x130 20x85 20x130 $\alpha_{g,N}$ (Smin II) = ag, v (Smin II) Group [-] factors $\alpha_{g,N}$ ($s_{min} \perp$) = αg, V (Smin ⊥)

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Performance

Vertical perforated brick HLz, dimensions, installation parameters, Group factors

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Table C91.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod			M10	M12	M16
Perforated slee	ve FIS H k	(18x13	0/200	22x130/200
Anchor rod wit	h perforat	ed sleeve	FIS H K	The state of the s	
Max. installation torque	max T _{inst}	[Nm]		4	
General installa	tion para	meters			
Edge distance	Cmin = Ccr			100	*
Cassian	S _{min} II	[mm]		240	
Spacing	s _{min} ⊥			115	

Drilling method

Hammer drilling with hard metal hammer drill

Table C91.2: Group factors

Anchor ro	d	M10	M12	M16
Perforated	I sleeve FIS H K	18x13	30/200	22x130/200
Group factors	$\frac{\alpha_{g,N} (Smin \ II)}{\alpha_{g,V} (Smin \ II)}$ $\frac{\alpha_{g,N} (Smin \ \bot)}{\alpha_{g,V} (Smin \ \bot)}$ [-]		2	

fischer injection system FIS V Plus for masonry

Performance

Vertical perforated brick HLz, dimensions, installation parameters, Group factors

Annex C91

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Table C92.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod	M6	M8	-	r i	M8	M10	M8	M10	1.50		M12	M16	M12	M16
Internal threaded anchor FIS E				6 M8 1x85			- 16x130		M10 M12 15x85					
Perforated sleeve FIS H K	12:	x85	16x		x85	1.4.4					x85	x85		20x130

 $N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C ²⁾ Mean compressive strength/ Use Min. compressive strength consingle brick 1) ditions w/w 3.5 4.0 4.5 4,5 4.0 12,5 / 10 N/mm² d/d 4.5 5.0 5.0 4.0

Table C92.2: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

Anchor rod		M10	M16	
Perforated sleeve FIS H K		18x*	130/200	22x130/200
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} =$	NRk,b,c [kN]	; temperature	e range 50/80°C 2)	
Mean compressive strength/ Min. compressive strength single brick ¹⁾	Use con- ditions			
12,5 / 10 N/mm ²	w/w		4,5	4,0
12,5 / 10 N/IIIII	d/d		5,0	4.0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Vertical perforated brick HLz, Characteristic resistance under tension loading

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¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

²⁾ For temperature range 72/120°C no performance assessed.

²⁾ For temperature range 72/120°C no performance assessed.

Table C93.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8	E 01-		M8	M8 M10 M8 M10		1.20		M12	M16	M12	M16	
Internal threaded anchor FIS E	1117	77	M6 M8			251			M10 M12					
			11x	85	13				15	x85				
Perforated sleeve FIS H K	12:	x85	16:		16x85		16x130		20		x85		20x130	

$V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V_{Rk}$,c,⊥ [kN]; te	mpe	ratur	e ran	ge 50	/80°C	2)								
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions				V										
12,5 / 10 N/mm ²	w/w	4,0	5,5	4,0	5,5	5,5	7,0	5,5	7,0	7,0	6,0	6,0	8,0	6,0	8,0
12,57 10 14/111111	d/d	4,0	5,5	4,0	5,5	5,5	7,0	5,5	7,0	7,0	6,0	6,0	8,0	6,0	8,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C93.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod Perforated sleeve FIS H K		M10	M12	M16
		18x130/200		22x130/200
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk}$,c,⊥ [kN]; tem	perature range	50/80°C 2)	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions			
12,5 / 10 N/mm ²	w/w	7,0	6,0	8,0
	d/d	7.0	6.0	8.0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123

fischer injection system FIS V Plus for masonry

Performance

Vertical perforated brick HLz, Characteristic resistance under shear loading

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²⁾ For temperature range 72/120°C no performance assessed.

²⁾ For temperature range 72/120°C no performance assessed.

Horizontal perforated brick LLz, EN 771-1:2011+A1:2015 Producer width W height H length L Nominal dimensions [mm] 250 78 248 Mean gross dry density ρ [kg/dm³] ≥ 0,7 Mean compressive strength / Min. [N/mm²] 2,5/2 or 5/4 or 8/6 compressive strength single brick 1) 250 Standard or annex EN 771-1:2011+A1:2015 Dimension see also Annex B19

Table C94.1: Installation parameters

Anchor rod Perforated sleeve FIS H K		M6		M8	
		12x50			
Anchor rod with perforate	ed sleeve FIS I	-I K			-
Max. installation max T _{inst}	[Nm]		2	3	
General installation parar	meters				
Edge distance c _{min} = c _{cr}			100		
S _{min} II	Farana 1		75		
Spacing s _{cr} II	[mm]		250		
s _{min} ⊥ = s _{cr} ⊥			250		

Drilling method

Hammer drilling with hard metal hammer drill

Table C94.2: Group factors

Anchor rod		M6	M8	
Perforated sleeve FIS H K		12x50		
	α _{g,N} (s _{min} II)		1,	6
Group $\alpha_{g,V}$ (s _{min} II)	[]	1,	1	
factors	α _{g,N} (S _{min} ⊥) [-]	2,0		
α _{g,V} (s _{min} ⊥)				

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Performance

Horizontal perforated brick LLz, dimensions, installation parameters, Group factors

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¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Horizontal perforated brick LLz, EN 771-1:2011+A1:2015

Table C95.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod		M6	M8
Perforated sleeve FIS H K		12x50	
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} =$	N _{Rk,b,c} [kN]; temp	erature range 50/80°C 2)	
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		
2,5 / 2 N/mm ²	w/w w/d		0,5
	d/d		0,6
F / 4 N/2	w/w w/d		0,9
5 / 4 N/mm ²	d/d		1,2
8 / 6 N/mm²	w/w w/d		1,5
	d/d		1,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength...

Table C95.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod		M6	M8
Perforated sleeve FIS H K		12x50	
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,}$	[kN]; temperature	range 50/80°C and 72/120°C	
Mean compressive strength Min. compressive strength single brick 1)	/ Use con- ditions		
2,5 / 2 N/mm²	w/w w/d d/d	0,5	
5 / 4 N/mm²	w/w w/d d/d	0,9	
8 / 6 N/mm²	w/w w/d d/d	1,5	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Performance

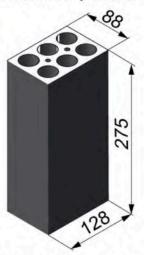
Horizontal perforated brick LLz, Characteristic resistance under tension and shear loading

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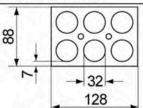
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²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Horizontal perforated brick LLz, EN 771-1:2011+A1:2015



Producer	e.g. Cermanica Farreny S.A.			
Name and discounting	[mm]	length L	width W	height H
Nominal dimensions		275	88	128
Mean gross dry density ρ	≥ 0,8			
Mean compressive strength / Min. compressive strength single brick 1)	2,5 / 2			
Standard or annex	EN 771-1:2011+A1:2015			



Dimension see also Annex B19

Table C96.1: Installation parameters

Anchor rod		- AN I.C.	M6	M8	
Perforated sleeve FIS H K		K	12x50		
Anchor rod with	perfora	ted sleeve FIS	HK		
Max. installation torque	Tinst	[Nm]	2		
General installa	tion para	meters			
Edge distance	C _{min} = C _c	r	6	60	
Smin II			75		
Spacing	S _{cr} I	[mm]	2	75	
	Smin		.7	75	
	S _{cr} _		1	30	

Drilling method

Hammer drilling with hard metal hammer drill

Table C96.2: Group factors

Anchor rod Perforated sleeve FIS H K		M6	M8		
		12x50			
	α _{g,N} (S _{min} II)	1,	3		
Group	$\frac{\alpha_{g,V} (s_{min} II)}{\alpha_{g,N} (s_{min} \bot)} [-]$	1,	5		
factors		1,	3		
	α _{g,} ν (s _{min} ⊥)		1,5		

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Performance

Horizontal perforated brick LLz, dimensions, installation parameters, Group factors

Annex C96

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¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Horizontal perforated brick LLz, EN 771-1:2011+A1:2015

Table C97.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod		M6	M8
Perforated sleeve FIS H K		12x50	
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} =$	N _{Rk,b,c} [kN]; tempe	erature range 50/80°C 2)	
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		
2,5 / 2 N/mm ²	w/w w/d d/d		1,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C97.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod		M6	M8
Perforated sleeve FIS H K		12x50	
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [I	kN]; temperature	range 50/80°C and 72/120°C	C
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		
2,5 / 2 N/mm²	w/w w/d d/d		1,2

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

fischer injection system FIS V Plus for masonry

Performance

Horizontal perforated brick LLz, Characteristic resistance under tension and shear loading

Annex C97

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²⁾ For temperature range 72/120°C: N_{Rk (72/120°C)} = 0,83 · N_{Rk (50/80°C)}.

Light-weight concrete hollow block Hbl, EN 771-3:2011+A1:2015 Producer length L width W height H Nominal dimensions [mm] 362 240 240 Mean gross dry density p [kg/dm³] ≥ 1,0 Mean compressive strength / Min. [N/mm²] 2.5/2 or 5/4 compressive strength single brick 1) Standard or annex EN 771-3:2011+A1:2015 Dimension see also 240 Annex B19 89 76 - 37 -Table C98.1: Installation parameters (Pre-positioned installation with perforated sleeve FIS H K) M6 M8 M8 M10 M8 M10 M12 M16 M12 M16 M12 M16 Anchor rod M6 M8 M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 20x130 20x200 Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K Max. installation max Tinst [Nm] 2 torque General installation parameters Edge distance 60 Cmin = Cor Smin II 100 [mm] Scr II 362 Spacing $s_{min} \perp = s_{cr} \perp$ 240 **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C98.2: Group factors M8 M10 M8 M10 M12 M16 M12 M16 M12 M16 Anchor rod M6 **M8** M6 M8 M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 16x130 20x130 20x200 12x50 12x85 16x85 20x85 1.2 ag,N (Smin II) 1,1 ag, v (Smin II) Group [-] factors αg,N (Smin ⊥) 2,0 αg, V (Smin ⊥) fischer injection system FIS V Plus for masonry Annex C98 Performance Light-weight concrete hollow block Hbl, dimensions, installation parameters, Group Appendix 126 / 155 factors

Table C99.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod	M10	M12	M16			
Perforated sleeve FIS H K	18x1	30/200 22x130/200				
Anchor rod with perforated	sleeve FIS H K					
Max. installation max T _{inst} [N	Nm]	2				
General installation parame	eters					
Edge distance c _{min} = c _{cr}		60				
S _{min} II		100	L.			
Spacing s _{cr} II	nm]	362				
S = S		240				

Drilling method

Hammer drilling with hard metal hammer drill

Table C99.2: Group factors

Anchor ro	d	M10	M12	M16			
Perforated	d sleeve FIS H K	18x13	30/200	22x130/200			
	α _{g,N} (s _{min} II)		1,2				
Group	α _{g,V} (s _{min} II)		1,1	4			
factors	α _{g,N} (S _{min} ⊥) [-]		2,0	; -			
	α _{g,} ν (s _{min} ⊥)		2,0				

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Performance

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

Annex C99

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Table C100.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8			M8 M10	M8 M1	0 -	M12 M16	M12 M16	M12 M16
Internal threaded anchor FIS E			k		M6 N				M10 M12			
Perforated sleeve FIS H K	12)	c50	12	x85	1	6x	85	16x13	0 20	x85	20x130	20x200

Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions			
2.5./.2.11/22222	w/w w/d	1,2	1,5	2,5
2,5 / 2 N/mm ²	d/d	1,2	1,5	2,5
E / A N/2	w/w w/d	2,0	3,0	5,0
5 / 4 N/mm²	d/d	2,5	3,0	5,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C100.2: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

Anchor rod		M10	M12	M16			
Perforated sleeve FIS H K		18x13	18x130/200 22x130/200				
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = 1$	NRk,b,c [kN]; te	emperature ran	ge 50/80°C ²⁾				
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions						
2 E / 2 N/mm²	w/w w/d		1,5				
2,5 / 2 N/mm ²	d/d		1,5				
5 / 4 N/mm ²	w/w w/d		3,0				
5 / 4 N/MM-	d/d		3,0				

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

fischer injection :	system FIS V	Plus for	masonry
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Performance

Light-weight concrete hollow block Hbl, Characteristic resistance under tension loading

Annex C100

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²⁾ For temperature range 72/120°C: $N_{Rk (72/120^{\circ}C)} = 0.83 \cdot N_{Rk (50/80^{\circ}C)}$.

²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Table C101.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8			M8	M10	M8	M10		M12 M16	M12 M16	M12 M16
Internal threaded anchor FIS E			3		M6	1.0.0					M10 M12			
Perforated sleeve FIS H K	12:	(50	12	x85	ik,	16	(85	7	16x	130	20:	x85	20x130	20x200

Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		
2,5 / 2 N/mm²	w/w w/d d/d	0,9	
5 / 4 N/mm²	w/w w/d d/d	2,0	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C101.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x13	0/200	22x130/200
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [k	N]; temperat	ture range 50/80	0°C and 72/120°C	0.00 20 0
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions			
2,5 / 2 N/mm ²	w/w w/d d/d		0,9	
5 / 4 N/mm²	w/w w/d d/d		2,0	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Performance

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

Annex C101

Light-weight concrete hollow block Hbl, EN 771-3:2011+A1:2015 Producer e.g. Sepa width W height H length L Nominal dimensions [mm] 500 200 200 Mean gross dry density p [kg/dm³] ≥ 1,0 Mean compressive strength / Min. [N/mm²] 2.5/2 or 5/4 or 8/6 compressive strength single brick 1) Standard or annex EN 771-1:2011+A1:2015 Dimension see also Annex B19 132 Table C102.1: Installation parameters Anchor rod M8 M10 M8 M10 M10 M12 M12 M16 M6 **M8** M6 M8 M6 M8 M10 M12 Internal threaded anchor FIS E 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 max Tinst [Nm] 1 2 torque General installation parameters Edge distance Cmin = Ccr 100 smin II = scr II [mm] 500 Spacing 200 $s_{min} \perp = s_{cr} \perp$ **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C102.2: Group factors Anchor rod M6 **M8** M6 M8 M8 M10 M8 M10 M10 M12 M12 M16 M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 18x130/200 20x85 ag,N (Smin II) ag, v (Smin II) Group 2 [-] factors αg,N (Smin ⊥) αg, v (Smin ⊥) fischer injection system FIS V Plus for masonry Annex C102 Performance Light-weight concrete hollow block Hbl, dimensions, installation parameters, Group Appendix 130 / 155 factors

Table C103.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod	M6	M8	M6	M8		-11	M8	M10	M8	M10	M10	M12		M12 M16
Internal threaded	7113			1.45		M6	M8	1341			13.4		M10 M12	12 X VI
nchor FIS E	24	L.	31	11x85		Nº SA		1.5				15x85		
Perforated sleeve FIS H K	12)	<50	12	x85		16	x85	U	16>	130	18x13	30/200	20	x85

Mean compressive strength / Min. compressive strength single brick 1)	use con- ditions	
2,5 / 2 N/mm ²	w/w w/d	0,4
	d/d	0,5
E / 4 N/mm²	w/w w/d	0,9
5 / 4 N/mm ²	d/d	0,9
8 / 6 N/mm ²	w/w w/d	1,2
8 / 6 N/MM-	d/d	1,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C103.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod	M6	M8	M6	M8			M8	M10	M8	M10	M10	M12		M12 M16
Internal threaded anchor FIS E					M6	M8 x85							M10 M12 15x85	, 31
Perforated sleeve FIS H K	12	x50	12	x85	Y	16	x85		16x	130	18x13	0/200	20	x85

Mean compressive strength / Min. compressive strength single brick 1)	Use conditions		
2,5 / 2 N/mm ²	w/w w/d d/d	0,9	
5 / 4 N/mm²	w/w w/d d/d	1,5	
8 / 6 N/mm²	w/w w/d d/d	2,5	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

fischer injection	system FIS V Plus for masonry
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Performance

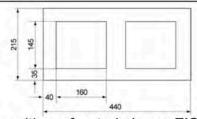
Light-weight concrete hollow block Hbl, Characteristic resistance under tension and shear loading Annex C103

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²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Standard or annex

	Producer	e.g. Roadstone wood					
	Nominal dimensions	[mm]	length L	width W	height H		
Normal differsions	Norminal differisions	[mm]	440	215	215		
	Mean gross dry density ρ	[kg/dm ³]	≥ 1,2				
	Mean compressive strength / Min. compressive strength single brick 1)	[N/mm ²]	5 / 4 or 8 / 6 or 10 / 8 or 12,5 / 10				



Dimension see also Annex B20

EN 771-3:2011+A1:2015

Table C104.1: Installation parameters

(Pre-positioned installation with perforated sleeve FIS H K)

Anchor rod	M6	M8	M6	M8	i c		M8	M10	M8	M10	11.7	M12	M16	M12 M16
Internal threaded anchor FIS E					M6	M8 x85	H				M10			
Perforated sleeve FIS H K	12:	x50	12:	x85		16:	x85		16)	130		x85		20x130

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

Max. installation			
torque	max I inst	[NM]	2

General installation parameters

Edge distance	C _{min} = C _{cr}	110			
Spacing $ \begin{array}{c c} & & & & \\ \hline s_{min} \ II \\ \hline s_{min} \ \bot \\ \hline s_{cr} \ \bot \\ \end{array} $	Smin II	100			
	S _{cr} II [mm]	440			
	S _{min} ⊥	100			
	S _{cr} ⊥	215			

Drilling method

Hammer drilling with hard metal hammer drill

Table C104.2: Group factors

Anchor ro	hor rod		M6	M8	M6	M8		-	M8	M10	M8 M10		13.00	M12 M16 M12		M16
Internal threaded anchor FIS E Perforated sleeve FIS H K						M6 M8		•				M10 M12 15x85	K			
			12x50		12x85		16x		x85		16x130		20x85			20x130
	α _{g,N} (s _{min} II)			1,4												
Group	α _{g,V} (s _{min} II)	f.1		2,0										- 1		
factors	αg,N (Smin 上)	[-]	1,4								-24					
	α _{g,} (S _{min} ⊥)		1,2													

fischer injection system FIS V Plus for masonry

Performance

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

Annex C104

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¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C105.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod	Anchor rod		M10	M12	M16			
Perforated sleeve FIS H K		<	18x13	30/200	22x130/200			
Anchor rod w	ith perforat	ed sleeve	FIS H K					
Max. installation	on max T _{inst}	[Nm]		2				
General insta	llation para	meters						
Edge distance	c _{min} = c _{cr}			110	AT			
	s _{min} II		100					
Ci	Scr II	[mm]		440				
Spacing	s _{min} ⊥			100				
K	Scr ⊥			215	7.			

Drilling method

Hammer drilling with hard metal hammer drill

Table C105.2: Group factors

Anchor ro	d	M10	M12	M16					
Perforated	d sleeve FIS H K	18x13	22x130/200						
	α _{g,N} (s _{min} II)	1,4							
Group	αg, v (Smin II)	2,0							
factors	$\alpha_{g,N}$ (Smin \perp) [-]	1,4							
	α _{g,∨} (s _{min} ⊥)	1,2							

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Performance

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

Annex C105

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Table C106.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod	M6 N	18 M	6 M8			M8	M10	M8	M10	M10	M12	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	M12 M16
Internal threaded		W.		M6	M8						10	M10 M12	M.X.V
anchor FIS E			20	11:	x85	DE V						15x85	
Perforated sleeve FIS H K	12x5	0 1	2x85	LV	16:	x85		162	130	18x13	30/200	20	x85

$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk}$	1			
Mean compressive strength / Min. comp. strength single brick 1)	Use con- ditions		7	
5 / 4 N/mm²	w/w w/d	0,9	1,2	2,0
5 / 4 N/IIIII	d/d	1,2	1,5	2,0
8 / 6 N/mm ²	w/w w/d	1,5	2,0	3,0
o / o IN/IIIIII	d/d	1,5	2,0	3,0
10 / 8 N/mm ²	w/w w/d	2.0	2,5	3,5
10 / 6 N/IIIII-	d/d	2,0	3,0	4,0
12,5 / 10 N/mm ²	w/w w/d	2,5	3.0	4.5
12,5 / 10 14/111111	d/d	3,0	3,5	5,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C106.2: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS	нк	18x1	30/200	22x130/200
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk}$	$_{,p,c} = N_{Rk,b,c} [kN]$]; temperature	range 50/80°C 2)	
Mean compressive strength / Min. comp. strength single brick 1)	Use con- ditions			
5 / 4 N/mm ²	w/w w/d	1	,2	2,0
5 / 4 N/MITI	d/d	1	,5	2,0
8 / 6 N/mm ²	w/w w/d	2	2.0	3,0
O / O IN/IIIII	d/d	2	2,0	3,0
10 / 8 N/mm ²	w/w w/d	2	2.5	3,5
10 / 6 N/mm-	d/d	3	5,0	4,0
42 E / 40 N/mm²	w/w w/d	3	3,0	4,5
12,5 / 10 N/mm ²	d/d	3	5,5	5,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

fischer injection system FIS V Plus for masonry

Performance

Light-weight concrete hollow block Hbl, Characteristic resistance under tension loading

Annex C106

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²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Table C107.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8	M6	M8	HLe	•	M8	M10	M8	M10	100€ E.	M12	M16	M12	M16
Internal threaded			ils.		M6	M8		Y. 1	i Ta		M10 M12		Z 11	17	
anchor FIS E			los	0	11:	x85					15x85				
Perforated sleeve FIS H K	12:	x50	12)	k85	i c	16	x85	7.1	16)	(130	20:	x85	v ji	20x1	130

$V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} =$	V _{Rk,c,}	[kN]; ter	nper	ature	rang	je 50/80°0	C and 72/120°C
Mean compressive strength / Min. compressive strength single brick ¹⁾	Us cor ditio	n-						
5 / 4 N/mm²	w/w		0,75	1,20	0,75	1,20	0,75	1,20
8 / 6 N/mm ²	w/w d/		1,20	2,00	1,20	2,00	1,20	2,00
10 / 8 N/mm ²	w/w	5	1,50	2,50	1,50	2,50	1,50	2,50
12,5 / 10 N/mm ²	w/w		2,00	3,00	2,00	3,00	2,00	3,00

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C107.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FI	SHK	18x1	30/200	22x130/200
$V_{Rk} = V_{Rk,b} = V_{Rk,c,li} = 1$	V _{Rk,c,⊥} [kN]; to	emperature ran	ge 50/80°C and 72/1	20°C
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions			
5 / 4 N/mm ²	w/w w/d d/d			,2
8 / 6 N/mm ²	w/w w/d d/d		2	2,0
10 / 8 N/mm²	w/w w/d d/d	-	2	2,5
12,5 / 10 N/mm²	w/w w/d d/d		3	3,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

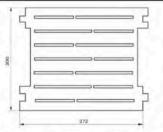
Factor for job site tests and displacements see annex C123.

fischer injection system FIS V Plus for masonry
Performance Light-weight concrete hollow block Hbl, Characteristic resistance under shear loading

Annex C107

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Producer	e.g. Sepa				
Naminal diseasains	[mana]	length L	width W	height H	
Nominal dimensions	[mm]	≥ 372	≥ 300	≥ 254	
Mean gross dry density ρ	[kg/dm ³]		≥ 0,6		
Mean compressive strength / Min. compressive strength single brick 1)	[N/mm ²]		2,5 / 2		
Standard or annex		EN 771	-3:2011+/	A1:2015	



Dimension see also Annex B20

Table C108.1: Installation parameters

Anchor rod		M8	M10	M10	M12	M12	M16	M16	M12	M16
Perforated sleeve FIS H I	K	16	x130	18x13	30/200	20x	130	22x130/200	20x	200
Anchor rod with perforat	ed slee	eve FI	SHK							
$\begin{array}{ll} \text{Max. installation} & \text{max } T_{\text{inst}} \end{array}$	[Nm]						4			
General installation para	meters									
Edge distance c _{min} = c _{cr}		100				1	30			
Smin II = Scr II	[mm]					3	70			
Spacing $s_{min} \perp = s_{cr} \perp$						2	50			

Drilling method

Hammer drilling with hard metal hammer drill

Table C108.2: Group factors

Anchor ro	d		M8	M10	M10	M12	M12	M16	M16	M12	M16
Perforated	sleeve FIS H K		16x	130	18x13	30/200	20x	130	22x130/200	20x	200
Group factors	$\frac{\alpha_{\text{g,N}} \text{ (s_{min} II)}}{\alpha_{\text{g,V}} \text{ (s_{min} II)}}$ $\alpha_{\text{g,N}} \text{ (s_{min} \bot)}$				3 =			2			
	α _{g,} ν (s _{min} ⊥)	-									

fischer injection system FIS V Plus for masonry

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

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¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C109.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod		M8	M10	M10	M12	M12	M16	M16	M12	M16
Perforated sleeve FIS H I	<	162	(130	18x13	30/200	20>	130	22x130/200	20x	200
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c}$	= N _{Rk,b,c} [kN]; te	mperatu	re range	e 50/80°	°C 2)			-	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions									
2,5 / 2 N/mm ²	w/w w/d		2,	0			2	,5	3	,0
2,5 / 2 N/MM	d/d		2	n			3	0	1	0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C109.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod		M8	M10	M10	M12	M12	M16	M16	M12	M16
Perforated sleeve FIS H K		16x130		18x130/200		20x130		22x130/200	20x200	
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,.}$	[kN]; ter	nperat	ure rang	e 50/80°	°C and	72/120°	С			
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions				4		4			
2,5 / 2 N/mm²	w/w w/d d/d			4,	5		2 '	6	,5	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

fischer injection system FIS V Plus for masonry

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Light-weight concrete solid block Vbl, Characteristic resistance under tension and shear loading Annex C109

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²⁾ For temperature range 72/120°C: NRk (72/120°C) = 0,83 · NRk (50/80°C).

Light-weight concrete solid block Vbl, EN 771-3:2011+A1:2015 Producer KLB width W height H length L Nominal dimensions [mm] ≥ 250 ≥ 240 ≥ 239 Mean gross dry density p [kg/dm³] ≥ 1.6 Mean compressive strength / Min. [N/mm²] 5/4 or 8/6 or 10/8 compressive strength single brick 1) Standard or annex EN 771-3:2011+A1:2015 Dimension see also Annex B20 Table C110.1: Installation parameters (Pre-positioned installation with perforated sleeve FIS H K) M8 M10 M8 M10 M12 M16 M12 M16 M12 M16 Anchor rod M6 M8 M6 M8 M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x130 20x200 20x85 Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K Max. installation max Tinst [Nm] torque General installation parameters Edge distance 130 Cmin = Ccr Smin II = Scr II [mm] 250 Spacing Smin \perp = Scr \perp 250 **Drilling method** Hammer drilling with hard metal hammer drill 1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Table C110.2: Group factors M8 M10 M8 M10 M6 M8 M12 M16 M12 M16 M12 M16 Anchor rod M6 **M8** M10 M12 M6 M8 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 20x130 20x200 ag,N (Smin II) ag, v (Smin II) Group [-] 2,0 factors αg,N (Smin 上) αg, v (Smin ⊥) fischer injection system FIS V Plus for masonry Annex C110 Performance

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

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Table C111.1: Installation parameters

(Push through installation with perforated sleeve FIS H K)

Anchor rod		M10	M12	M16
Perforated sleeve FIS H	K	18x13	0/200	22x130/200
Anchor rod with perfora	ted sleeve	FIS H K		
Max. installation max T _{ins}	t [Nm]		2,0	
General installation par	ameters			
Edge distance c _{min} = c	or		130	V
Smin II = Scr	II [mm]		250	7.
Spacing $s_{min} \perp = s_{cr}$			250	-

Drilling method

Hammer drilling with hard metal hammer drill

Table C111.2: Group factors

Anchor ro	d	M10	M12	M16
Perforated	I sleeve FIS H K	18x13	30/200	22x130/200
Group factors	$\frac{\alpha_{g,N} (Smin \ II)}{\alpha_{g,N} (Smin \ I)}$ $\frac{\alpha_{g,N} (Smin \ \bot)}{\alpha_{g,V} (Smin \ \bot)}$ [-]		2,0	

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

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Table C112.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

Anchor rod	3	M6 M8	M6 M8	ro.	WE	M8 M1	M8 N	/110	5.4	M12 M16	M12 M16	M12 M16
Internal threaded anchor FIS E					M8 (85				M10 M12 15x85			
Perforated sleeve FIS H K	950 00	12x50	12x85		162	x85	16x1	30	20x85		20x130	20x200
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c}$	= N _{Rk,b,c} [kN]; te	mperat	ure i	ang	e 50/80°	C 2)					
Mean compressive strength/ Min. compressive strength single brick 1)	Use con- ditions											
5 / 4 N/mm²	w/w w/d	1,2	2,0			2,5				3	3,0	
5 / 4 N/IIIII	d/d	2,0	3,5			4,0				5	5,0	
8 / 6 N/mm ²	w/w w/d	1,5	3,0			4,0				5	5,0	
0 / 0 N/MM*	d/d	3,0	5,0	1		6,5				7	7 ,5	
10 / 8 N/mm²	w/w w/d	2,0	4,0	3 _		5,0				6	5,5	
III / A N/mm-		_	-	•								

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

8,5

9.0

d/d

4.0

Table C112.2: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

7.0

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x1	30/200	22x130/200
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c}$	= N _{Rk,b,c} [kN	; temperature	range 50/80°C 2)	
Mean compressive strength/ Min. compressive strength single brick 1)	Use con- ditions			
5 / 4 N/mm²	w/w w/d	2	2,5	3,0
5 / 4 N/MM-	d/d	- 2	1,0	5,0
8 / 6 N/mm²	w/w w/d	-	1,0	5,0
0 / 6 N/IIIII-	d/d	(5,5	7,5
40 / 0 N/2	w/w w/d		5,0	6,5
10 / 8 N/mm ²	d/d	8	3,5	9,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Table C113.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

Anchor rod	M6	M8	M6 N	18	A come	M8	M10	M8 N	110	Con-	M12 M	16 M12 M16	M12 M16
Internal threaded anchor FIS E		Ŋ	13		M6 M8	N		13	1	M10 M12 15x85			•
Perforated sleeve FIS H K	12:	x50	12x8	35	16	x85		16x1	30	202	(85	20x130	20x200

					200			14.44		
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V$	Rk,c,⊥ [kN];	tem	pera	ture	ran	ge 50	0/80°C ar	nd 72/120	°C	
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions								K= -3	
5 / 4 N/mm²	w/w w/d d/d	2,0	3,0	2,0	3,0	2,0		3,5		4,5
8 / 6 N/mm²	w/w w/d d/d	3,0	4,5	3,0	4,5	3,0		5,5		6,5
10 / 8 N/mm²	w/w w/d d/d	4,0	6,0	4,0	6,0	4,0		7,0		8,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C113.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

Anchor rod		M10	M12	M16
Perforated sleeve FIS	нк	18x13	30/200	22x130/200
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{I}$	Rk,c,⊥ [kN]; ten	perature range	50/80°C and 72/120°C	С
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		4	
5 / 4 N/mm²	w/w w/d d/d	3	,5	4,5
8 / 6 N/mm²	w/w w/d d/d	5	,5	6,5
10 / 8 N/mm²	w/w w/d d/d	7	,0	8,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

fischer injection system FI	S V Plus for masonry
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Performance

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

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Light-weight concrete solid block Vbl, EN 771-3:2011+A1:2015 Producer Roadstone wood width W height H length L Nominal dimensions [mm] ≥ 440 ≥ 100 ≥ 215 ≥ 2.0 Mean gross dry density ρ [kg/dm³] Mean compressive strength / Min. 5/4 or 8/6 or 10/8 [N/mm²] compressive strength single brick 1) or 12,5 / 10 Standard or annex EN 771-3:2011+A1:2015

Table C114.1: Installation parameters

Anchor rod			M	16	N	18	M	10	M12		M16		
Anchor rod wit	thout perfo	rated s	sleeve										
Effective anchorage dept	h h _{ef}	[mm]	50	70	50	70	50	70	50	70	50	70	
Max. installation torque	max T _{inst}	[Nm]		1				1	0			-0.7	
General install	ation para	meters											
Edge distance	C _{min} = C _{cr}						10	00					
	Smin II			75									
_	S _{cr} II	[mm]					3x	h _{ef}					
Spacing —	S _{min} ⊥	11					7	5					
	S _{cr} ⊥						3x	h _{ef}					

Hammer drilling with hard metal hammer drill

Table C114.2: Group factors

Anchor rod			M6	M8	M10	M12	M16
Group factors	α _{g,N} (s _{min} II)				1,6		
	α _{g,V} (s _{min} II)	-			1,3		
	α _{g,N} (S _{min} ⊥)				1,4		
	α _{g,V} (S _{min} ⊥)	'41 F			1,3		

fischer injection system FIS V Plus for masonry

Performance

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

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¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Light-weight concrete solid block Vbl, EN 771-3:2011+A1:2015

Table C115.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod		M6	M8	M10	M12	M16
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c}$	= N _{Rk,b,c} [kl	N]; temperati	ure range 50/80	0°C 2)		
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		Effective	anchorage dept ≥ 50	h h _{ef} [mm]	
5 / 4 N/mm ²	w/w w/d	1,2		1	,2	
5 / 4 N/MM	d/d	2,0		2	,0	
8 / 6 N/mm ²	w/w w/d	1,5	3	2	,0	
8 / 6 N/MM	d/d	3,0		3	,5	
10 / 8 N/mm²	w/w w/d	2,0		2	,5	
10 / 8 N/MM*	d/d	4,0		4	,5	
42 E / 40 N/mm²	w/w w/d	3,0		3	,5	
12,5 / 10 N/mm ²	d/d	5,0		5	,5	

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C115.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod		M6	M8	M10	M12	M16
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,I}$	[kN]; temp	erature rang	ge 50/80°C and	72/120°C		
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions		Effective	anchorage dept ≥ 50	h h _{ef} [mm]	
5 / 4 N/mm²	w/w w/d d/d	1,2	1,5	1,5	1,5	1,5
8 / 6 N/mm²	w/w w/d d/d	2,0	2,0	2,5	2,5	2,5
10 / 8 N/mm²	w/w w/d d/d	2,5	2,5	3,0	3,0	3,5
12,5 / 10 N/mm²	w/w w/d d/d	3,0	3,5	4,0	4,0	4,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Performance	Annex C115
Light-weight concrete solid block Vbl, Characteristic resistance under tension and shear loading	Appendix 143 / 155

²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Light-weight concrete solid block Vbl, EN 771-3:2011+A1:2015

Producer		Tramac					
Naminal dissersions	[mana]	length L	width W	height H			
Nominal dimensions	[mm]	≥ 440	≥ 95	≥ 215			
Mean gross dry density ρ	[kg/dm ³]		≥ 2,0				
Mean compressive strength / Min. compressive strength single brick 1)	[N/mm ²]	7,5 / 6 or	r 10 / 8 or or 15 / 12	12,5 / 10			
Standard or annex		EN 771	-3:2011+/	1:2015			

Table C116.1: Installation parameters

Anchor rod	chor rod M6						M8 M10				M16	
Anchor rod wit	hout perfo	rated s	sleeve									A T
Effective anchorage depti	h _{ef}	[mm]	50	70	50	70	50	70	50	70	50	70
Max. installation torque	max T _{inst}	[Nm]		1				1	0			
General installa	tion para	meters), o									
Edge distance	C _{min} = C _{cr}						6	0				
	Smin II						7	5				
Caratina	Scr II	[mm]					3x	h _{ef}				
Spacing —	Smin \perp						7	5				
	S _{cr} ⊥	20	3x hef									
Drilling method	17.50	7		V 0. 3								

Hammer drilling with hard metal hammer drill

Table C116.2: Group factors

Anchor ro	d		M6	M8	M10	M12	M16
	α _{g,N} (s _{min} II)			ء مالي وا	1,9		
Group	α _{g,V} (s _{min} II)	.,			1,4		
factors	α _{g,N} (s _{min} ⊥)	[-]			1,9		
	α _{g,} ν (s _{min} ⊥)	4			1,4		

fischer injection system FIS V Plus for masonry

Performance

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

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¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Light-weight concrete solid block Vbl, EN 771-3:2011+A1:2015

Table C117.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod	Anchor rod			16	IV	18	M	10	M	12	M	16
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} =$	N _{Rk,b,e}	[kN]	; temp	erature	range	50/80°0	C 2)	<i>\$</i> - • .		A.E.		7-1
Mean compressive strength / Min. compressive strength single brick 1)	co	Use Effective anchorage depth her [mm] contitions 50 70 50 70 50 70 50 70								18	50	70
7. F. / C. N/2	w/w	w/d	1,5	2,0	1,5	2,0	1,5	2,0	1,5	2,0	1,5	2,0
7,5 / 6 N/mm²	d/	d	2,5	3,5	2,5	3,5	2,5	3,5	2,5	3,5	2,5	3,5
40 (0 N/2	w/w	w/d	2,0	2,5	2,0	2,5	2,0	3,0	2,0	3,0	2,0	3,0
10 / 8 N/mm²	d/	d	3,5	4,5	3,5	4,5	3,5	5,0	3,5	5,0	3,5	5,0
40 5 440 144 2	w/w	w/d	2,5	3,5	2,5	3,5	2,5	3,5	2,5	3,5	2,5	3,5
12,5 / 10 N/mm ²	d/	d	4,5	6,0	4,5	6,0	4,5	6,0	4,5	6,0	4,5	6,0
45 / 40 N/2	w/w	w/d	3,0	4,0	3,0	4,0	3,0	4,5	3,0	4,5	3,0	4,5
15 / 12 N/mm²		d	5,0	7,0	5,0	7,0	5,0	7,5	5,0	7,5	5,0	7,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C117.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod	باالمسي	M6	M8	M10	M12	M16
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$	kN]; tempera	ature range	50/80°C and 7	2/120°C		2.30
Mean compressive strength / Min. compressive strength single brick 1)	Use con- ditions		Effective	anchorage dept ≥ 50	th h _{ef} [mm]	
7,5 / 6 N/mm²	w/w w/d d/d	2,0	2,0	2,0	1,5	1,5
10 / 8 N/mm²	w/w w/d d/d	2,5	2,5	3,0	2,5	2,5
12,5 / 10 N/mm²	w/w w/d d/d	3,5	3,5	4,0	3,0	3,0
15 / 12 N/mm²	w/w w/d d/d	4,0	4,0	4,5	3,5	3,5

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

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Performance	

Light-weight concrete solid block Vbl,
Characteristic resistance under tension and shear loading

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²⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

Autoclaved aerated concrete (cylindrical drill hole), EN 771-4:2011+A1:2015



Producer	e.g. Ytong					
Mean gross dry density ρ	[kg/dm ³]	0,35	0,5	0,65		
Mean compressive strength / Min. compressive strength single brick 1)	[N/mm²]	2,5/2	5/4	8/6		
Standard or annex		EN 771	-4:2011+/	1:2015		

Table C118.1: Installation parameters

Anchor rod Internal threaded anchor			N	16	N	18	M	10	M	12	M	16				
					755		ive		F 6277				M6	M8	M10	M12
FIS E								•				11x85		15:	x85	
Anchor ro	od and internal	thread	led ar	nchor	FIS E	with	out pe	erfora	ted sl	eeve						
Effective anchorage depth hef		[mm]	100	200	100	200	100	200	100	200	100	200		8	35	
Max. insta torque	llation max T _{inst}	[Nm]	1	4	1	8	2	12	2	16	2	20		10.		2
General in	nstallation para	meter	s		271											
Edge dista	ance c _{min} = c _{cr}								10	00	-					2.3
	Scr II = Smin II								2	50						
	h _{ef} =200mm s _{min} II	[mm]		80												
	h _{ef} =200mm s _{cr} II								3x	hef						7
Spacing	$s_{cr} \perp = s_{min} \perp$								2	50						
949	h _{ef} =200mm s _{min} ⊥								8	0						
	h _{ef} =200mm s cr ⊥	A		-					3x	hef					5	3.4

Drilling method

Hammer drilling with hard metal hammer drill

fischer injection system FIS V Plus for masonry

Performance

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

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¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C119.1: Group factors for autoclaved aerated concrete (Min. compressive strength single brick = 2 N/mm²)

Anchor	Anchor rod Internal threaded anchor FIS E		chor rod M6 M8 M10 M				M12	M16				
luta was al							M6	M8	M10	M12		
internal	threaded anchor FIS E						11x85		15	x85		
	h _{ef} =200 α _{g,N} (s _{min} II)			1,6			-	1)		1)		
	hef=200 αg, v (Smin II)				_1)		1)					
Group	$\alpha_{g,N} \text{ II}, \alpha_{g,V} (s_{min} \text{ II})$											
factors	h_{ef} =200 $\alpha_{g,N}$ ($s_{min} \perp$) [-]			1,6				1)	100-	1)		
	h _{ef} =200 α _{g,V} (s _{min} ⊥)	÷ -	-	_1) _1)			1)					
	$\alpha_{g,N} \perp$, $\alpha_{g,V}$ ($s_{min} \perp$)											

¹⁾ No performance assessed.

Table C119.2: Group factors for autoclaved aerated concrete (Min. compressive strength single brick = 4 N/mm²)

Anchor	rod	M6	M6 M8 M10 M12 M16												
Intornal	threeded ancher FIC F											M6	M8	M10	M12
internai	threaded anchor FIS E	12.11						x85	15)	(85					
	h _{ef} =200 α _{g,N} (s _{min} II)			0,7			- 10-	1)	- 2	1)					
	h _{ef} =200 α _{gV} (s _{min} II)			2,0			1	1)	-	1)					
Group	αg,N II, αgV (Smin II)				2,0										
factors	$h_{ef}=200 \alpha_{g,N} (s_{min} \perp)$ [-]			0,7				1)	-	1)					
	hef=200 αg, v (Smin ⊥)		1,2					1,2				1)	- 4	1)	
	$\alpha_{g,N} \perp, \alpha_{gV} (s_{min} \perp)$	2,0													

¹⁾ No performance assessed.

Table C119.3: Group factors for autoclaved aerated concrete (Min. compressive strength single brick = 6 N/mm²)

Anchor	rod	M6	M6 M8 M10 M12 M16							
luda un al	threaded such as FIG F			li teri	5 3 4		M6	M8	M10	M12
internai	threaded anchor FIS E						11:	x85	15)	k85
7 - 7	h _{ef} =200 α _{g,N} (s _{min} II)			0,7				1)	-	1)
	h _{ef} =200 α _{g,V} (s _{min} II)			2,0				1)	100	1)
Group	α _{g,N} II, α _{g,V} (s _{min} II)				2,0			7 7		
factors	$\frac{\text{hef}=200 \ \alpha_{g,N} (\mathbf{s}_{min} \perp)}{\text{hef}=200 \ \alpha_{g,N} (\mathbf{s}_{min} \perp)} [-]$			0,7				1)		1)
	h _{ef} =200 α _{g,V} (s _{min} ⊥)			1,2			-	1)		1)
	$\alpha_{g,N} \perp, \alpha_{g,V} (s_{min} \perp)$	2,0								

¹⁾ No performance assessed.

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Hachier	injection	System	1 10 V	i ius	101 111	asoniy

Performance

Autoclaved aerated concrete (cylindrical drill hole), Group factors

Annex C119

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Autoclaved aerated concrete (cylindrical drill hole), EN 771-4:2011+A1:2015

Table C120.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod	M6	M8	M10	M12	M16			- 73	
Internal threaded						M6	M8	M10	M12
anchor FIS E						11:	x85	15	x85

Mean compressive	Use	F.				Effe	ctive a	ancho	rage	depth I	nef [mm]		
strength / Min. compressive strength single brick ²⁾	con- ditions	100	200	100	200	100	200	100	200	100	200	8	5
0.5.10.11/2	w/w w/d	1,2	1,2	1,5	2,0	1,5	3,0	1,5	3,0	2,0	3,0	1,5	1,5
2,5 / 2 N/mm ²	d/d	1,5	3,0	1,5	3,0	1,5	3,5	2,0	4,0	2,0	4,0	1,5	1,5
F / 4 N/2	w/w w/d	1,2	_1)	2,0	1,5	2,5	3,5	2,5	3,5	2,0	3,5	2,0	1,5
5 / 4 N/mm ²	d/d	1,5	_1)	2,0	3,0	3,0	5,0	2,5	5,0	2,0	5,0	2,0	1,5
0.10 N/2	w/w w/d	1,5	_1)	3,0	2,5	4,5	5,0	4,5	7,0	3,0	8,5	3,5	2,5
8 / 6 N/mm ²	d/d	1,5	_1)	3,5	4,0	5,0	7,0	5,0	9,0	3,0	11,5	3,5	2,5

¹⁾ No performance assessed.

Anchor rod

M6

Table C120.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

M10

M12

M16

Internal threaded	- 1							3	5,17			M6	M8		M12
anchor FIS E					Y							113	x85	15	x85
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,.}$	[kN]; te	mper	ature	rang	e 50/8	30°C	and 7	2/120	°C						
Mean compressive	Use				50.5	Effect	ive an	chora	ge de	pth h	f [mm]	. 7		71
strength / Min. compressive strength single brick ²⁾	con- ditions	100	200	100	200	100	200	100	200	100	200		8	5	
2,5 / 2 N/mm ²	w/w w/d d/d	1,2	1,2	1,2	1,2	1,2	1,2	1,5	1,2	1,2	1,2		1,2	o ji	1,5
5 / 4 N/mm²	w/w w/d d/d	2,0	_1)	2,5	2,0	2,0	2,0	2,5	2,0	2,0	2,0		2,0	3.	2,5
8 / 6 N/mm²	w/w w/d d/d	2,5	_1)	3,0	2,5	3,0	3,0	3,5	4,0	4,5	4,5		2,5		3,5

¹⁾ No performance assessed.

Factor for job site tests and displacements see annex C123.

fischer injection system FIS V Plus for masonry

Performance

Autoclaved aerated concrete (cylindrical drill hole), Characteristic resistance under tension and shear loading Annex C120

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²⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

³⁾ For temperature range 72/120°C: N_{Rk} (72/120°C) = 0,83 · N_{Rk} (50/80°C).

²⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength

Autoclaved aerated concrete (conical drill hole with special drill bit PBB), EN 771-4:2011+A1:2015



Producer		e		
Mean gross dry density ρ	[kg/dm ³]	0,35	0,5	0,65
Mean compressive strength / Min. compressive strength single brick 1)	[N/mm ²]	2,5/2	5/4	8/6
Standard or annex		EN 771-	4:2011+/	1:2015

Table C121.1: Installation parameters

Anchor rod		N	18	M	10	M12			
Internal threaded	55.3							M6	M8
anchor FIS E							E 33.7	112	x85
Anchor rod and inte	rnal thread	ed anchor	FIS E with	out perfora	ted sleeve				
Effective anchorage depth	h _{ef} [mm]	75	95	75	95	75	95	8	35
Max. installation max	Tinst [Nm]				2				
General installation	parameters				Y		Y - 2-2-	<u> </u>	
Edge distance cmi	n = Ccr	120	150	120	150	120	150	1:	50
Species Scr =	s _{min} II [mm]	240	300	240	300	240	300	30	00
Spacing $s_{cr} \perp =$	S _{min} ⊥	240	250	240	250	240	250	2	50

Drilling method

Hammer drilling with hard metal hammer drill

Table C121.2: Group factors

Anchor ro	od	N	18	M10		M12			-
Internal th	readed		I TO THE Y				V Ass	M6	M8
anchor FI	SE							112	x85
.) %	αg,N (Smin II)								
Group	$\alpha_{g,V}$ (s _{min} II) [-]				2				
factors	αg,N (Smin ⊥)								
	α _{g,V} (s _{min} 上)								

fischer injection system FIS V Plus for masonry

Performance

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

Annex C121

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¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Autoclaved aerated concrete (conical drill hole with special drill bit PBB), EN 771-4:2011+A1:2015

Table C122.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Anchor rod		N	18	M	10	M	12		
Internal threaded	- 5		flug 15	r saai			3.3.3	M6	M8
anchor FIS E								11:	x85
$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} =$	NRk,b,c [kN];	tempera	ature rang	e 50/80°C	2)			4.6	
Mean compressive strength /	Use	15.3		Effective a	nchorage o	depth hef[n	nm]		1
Min. compressive strength single brick 1)	con- ditions	75	95	75	95	75	95	8	35
0.5./.0.81/2	w/w w/d	2,0	2,5	2,0	2,5	2,0	2,5	2	,0
2,5 / 2 N/mm ²	d/d	2,0	2,5	2,0	2,5	2,0	2,5	2	,0
F / 4 N/2	w/w w/d	3,0	3,5	3,0	3,5	3,0	3,5	3	,0
5 / 4 N/mm²	d/d	3,0	3,5	3,0	3,5	3,0	3,5	3	,0
0.10.11/2	w/w w/d	3,5	4,0	3,5	4,0	3,5	4,0	3	,5
8 / 6 N/mm ²	d/d	4,0	4,5	4,0	4.5	4,0	4,5	4	,0

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Table C122.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod		N	18	M	10	M12		i Boin				
Internal threaded		134.0	12.71	TAK	No.	1 3 4	100	M6	M8			
anchor FIS E	2.94							11x85				
$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$	kN]; tempe	; temperature range 50/80°C and 72/120°C										
Mean compressive strength /	Use			Effective a	nchorage o	depth hef [n	nm]		77			
Min. com-pressive strength single brick 1)	con- ditions	75	95	75	95	75	95	8	35			
2 5 / 2 N/mm²	w/w w/d				2.5			*******				
2,5 / 2 N/mm ²	d/d				2,5							
5 / 4 N/mm²	w/w w/d				1.5				-			
5 / 4 N/mm²	d/d				4,5							
9 / 6 N/mm² w/w w/d												
8 / 6 N/mm² d/d		6,0										

¹⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

	fischer inie	ction system	FIS V Plus	for masonry
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Performance

Autoclaved aerated concrete (conical drill hole with special drill bit PBB), Characteristic resistance under tension and shear loading Annex C122

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²⁾ For temperature range 72/120°C: N_{Rk (72/120°C)} = 0,83 · N_{Rk (50/80°C)}.

β -factors for job site tests; displacements

Table C123.1: β-factors for job site tests

use conditions		w/w a	nd w/d	d	I/d			
emperature range [°C]		50/80	72/120	50/80	72/120			
Material	Size	β-factors						
	M6	0,55	0,46					
	M8	0,57	0,51					
IV a Car 0	M10	0,59	0,52					
solid units	M12 FIS E 11x85	0,60	0,54	0,96	0,80			
3.1	M16 FIS E 15x85	0,62	0,52					
A -44	FIS H 16x85 K	0,55	0,46		1000			
hollow units	all sizes	0,86	0,72	0,96	0,80			
Autoclaved aerated concrete cylindrical drill hole	all sizes	0,73	0,73	0,81	0,81			
Autoclaved aerated concrete conical drill hole	all sizes	0,66	0,59	0,73	0,66			

Table C123.2: Displacements

Material	N [kN]	δN ₀ [mm]	δN∞ [mm]	V [kN]	δV ₀ [mm]	δV∞ [mm]
solid units and autoclaved aerated concrete her=100mm	N _{Rk} 1,4 * γ _{Mm}	0,03	0,06	V _{Rk} 1,4 * γ _{Mm}	0,82	0,88
hollow units	N _{Rk} 1,4 * γ _{Mm}	0,48	0,06	V _{Rk} 1,4 * γ _{Mm}	1,71	2,56
solid brick Mz NF Annex C4 - C7	N _{Rk} 1,4 * γ _{Mm}	0,74	1,48	V _{Rk} 1,4 * γ _{Mm}	1,23	1,85
solid brick KS NF Annex C14 / C15	N _{Rk} 1,4 * γ _{Mm}	0,20	0,40	V _{Rk} 1,4 * γ _{Mm}	0,91	1,37
AAC h _{ef} =200 mm Annex C118 - C120	N _{Rk} 1,4 * γ _{Mm}	1,03	2,06	VRk 1,4 * γмm	1,25	1,88
brick Annex C102 / C103	N _{Rk} 1,4 * γ _{Mm}	0,03	0,06	1,4 * 7Mm	6,44	9,66

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

fischer injection system FIS	V Plus for masonry

Performance

β-factors for job site tests; displacements

Annex C123

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Chracteristic values under tension and shear loading under fire exposure (single anchor)

Table C124.1: Chracteristic values under tension and shear loading under fire exposure; considering all failure modes

Brick			N	lid bri lz, NF acc. to nex (;)	silic KS,	d calc ate b NF, a nnex	rick acc.	calci brick	rforat um si KSL nnex	licate acc.	pe brick	ertica rforat HLz nnex	ted , acc.	pe brick	/ertice erforate HLz nnex	ted , acc.	co	oclave ncrete Annex	e, acc	. to
strengt	mp. stre		≥ 1	5/≥	12	≥ 1	5/≥	12	2	10 / ≥	8 :	2	5/≥	4	2	7,5/	≥ 6		≥ 2,5	5/≥2	
Size		(M8	M10	M12	M8	M8	M8	M8	M10	M12	M8	M10	M12	M8	M10	M12	M8	M10	M12	M16
Perfora	ated Sle	eeve		7-					16x	130	16x1 30	16x	130	20x 130	16	x85	20x 85			216	
for bric	ated Sle dging of ring laye		I				3				1			20x 200	16x	130	20x 130				
hef		[mm]		≥ 80	69	is	≥ 50			≥ 130			≥ 130)		≥ 85	i e	HE	≥ 1	100	
Chara	cteristi	c resi	stand	e to	failu	re ur	der	tens	on lo	adin	g				4			i (e.e.			
1	R30			0,82		1	0,32		1,07	1,09	1,10		0,31		0,28	0,30	0,35	0,84	0,82	0,80	0,80
NRk,s,fi = NRk,p,fi = NRk,p,fi = NRk,p,fi = 100 NRk	R60	FLAIT	100	0,73		111	0,31		0,66	0,61	0,56	1	0,22		0,19	0,22	0,22	0,71	0,67	0,63	0,63
ZRK,	R90	[kN]	A.J.	0,64	Y E	lin	0,29		0,25	0,13	_ 1)	13.	0,13	Ká	0,10	0,10	0,10	0,58	0,51	0,45	0,45
	R120	je V		0,59			0,28		_ 1)	_1)	_ 1)		_1)		_1)	_1)	_ 1)	_1)	_ 1)	_1)	_ 1)
Chara	cteristi	c resi	stand	e to	failu	re ur	der	shea	r loa	ding	2)			- 7			45	4		5 44	
withou	ıt lever	arm					V.									- 1					701
	R30	701)	153	0,82		12	0,32		1,07	1,09	1,10	TY	0,31		0,28	0,30	0,35	1,10	1,75	2,54	4,74
V _{Rk,s,fi}	R60	TLAIT.	II.	0,73			0,31		0,66	0,61	0,56		0,22		0,19	0,22	0,22	0,86	1,37	1,99	3,71
>	R90	[kN]		0,64		1	0,29		0,25	0,13	_ 1)		0,13		0,10	1000	0,10	4.76	0,99	1,44	2,68
	R120		HEL	0,59	91		0,28		_ 1)	-1)	_ 1)		_ 1)	4.6	- 1)	_ 1)	_ 1)	_ 1)	- 1)	_ 1)	_ 1)
with le	ever arr	n		-3																	
	R30		0,83	1,05	1,27	0,33	0,42	0,50	1,09	1,40	1,71	0,32	0,40	0,48	0,29	0,39	0,54	1,12	2,26	3,95	10,0
k,s,fi	R60	[Nim]	0,74	0,93	1,13	0,31	0,39	0,47	0,67	0,78	0,86	0,22	0,28	0,34	0,19	0,28	0,34	0,87	1,77	3,20	7,87
M ⁰ Rk,s,fi	R90	[Nm]	0,65	0,82	0,99	0,29	0,37	0,44	0,26	0,17	_ 1)	0,13	0,16	0,20	0,10	0,12	0,15	0,63	1,28	2,24	5,69
	R120		0,60	0,76	0,92	0,28	0,35	0,43	_ 1)	_ 1)	_ 1)	- 1)	_1)	_ 1)	_1)	_ 1)	_ 1)	_ 1)	_ 1)	_ 1)	_ 1)
Gener	al insta	llatio	n Par	ame	ters																
Edge distant	ce ^{Ccr,fi}	[mm]		100			60			80	D.		80	54	12	100	Si		20	00	
and spacin	g S _{cr,fi}	funul		320	Ę		200	녜		520			340			520			40	00	

¹⁾ No performance assessed.

In absence of national regulations, the recommended partial factor $\gamma_{M,fi}$ = 1,0.

fischer injection system FIS V Plus for masonry	
Performance Characteristic values under tension and shear loading under fire exposure (single anchor)	Annex C124 Appendix 152 / 155

 $^{^{2)}}$ $V_{Rk,b,fi} = N_{Rk,b,fi}$

³⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Chracteristic values under tension loading under fire exposure (anchor group)

Table C125.1: Characteristic values under tension loading under fire exposure; brick breakout failure ³⁾

	2.00				N	18			M	10	13	L T	M	12	3		M1	6	1
Brick	Mean compressive strength / Min. comp. strength single brick 2)	h _{ef}	Spacing		N ⁹ Rk,b,fi(90)		N ⁹ Rk,b,fi(120)	514	N ³ Rk,b,fi(90)	N.0	N°RK, b, fi(120)	DIA.	N°Rk,b,fi(90)	, T	N ⁹ Rk,b,fi(120)	N ⁹ Rk,b,fi(90)		N ⁹ Rk,b,ff(120)	
No. of	anchors in a g	roup:		2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4
[-]	[N/mm ²]	[mm]	[-]								[k	N]						7	
Solid brick MZ, NF acc.	≥ 15 / ≥ 12	≥ 80	S _{cr,fi} II	1,1	2,1	0,8	1,7	1,3	2,5	1,0	2,0	1,5	2,9	1,2	2,4		_ 1		
to Annex C4	10,112	- 00	Scr,fi ⊥	1,4	-,	1,1		1,7	,0	1,3	2,0	2,0	_,,	1,6	_, .				
Solid calcium silicate brick	≥ 15 / ≥ 12	≥ 50	S _{cr,fi} II	0,3	0.6	0,2	0.5	0,3	0.6	0,2	0.5	0,3	0.6	0,2	0.5	15	_ 1		
KS, NF, acc. to Annex C14	210/212	_ 00	S _{cr,fi} ⊥	0,9	0,0	0,7	1000	0,9	0,0	0,7	0,5	0,9	0,0	0,7	0,0				
Perforated calcium silicate		≥ 130	Scr,fi II	1,4	2,7	1,1	2,2	1,4	2,7	1,1	2,2	1,4	2,7	1,1	2,2		_ 1		
brick KSL, acc. to Annex C24	210720	_ 100	Scr,fi ⊥	1,8	_,,	1,5		1,8		1,5	-,-	1,8	2,,	1,5	-,-				
Vertical perforated	≥ 7,5/≥ 6	≥ 85	Scr,fi II	0,4	0.9	0,4	0,7	0,4	0,9	0,4	0.7	0,5	1,1	0,4	0.9	1	_ 1	S	
brick HLz, acc. to Annex C30			Scr,fi ⊥	0,4		0,4	100	0,4		0,4		0,5		0,4					
Vertical perforated	≥5/≥4	≥ 130	S _{cr,fi} II	0,4	0,4	0,3	0,3	0,4	0,4	0,3	0,3	0,5	0,5	0,4	0.4	1.7	_ 1		
brick HLz, acc. to Annex C28	23/24	2 130	Scr,fi ⊥	0,4	0,4	0,3	1000	0,4	0,4	0,3	0,5	0,5	0,5	0,4	0,4	K.	200		
	Ancho	r rod		Ā	N	18	51		M	10	7.		M	12		1	M1	6	
Autoclaved	≥ 2,5/≥ 2	≥ 100	Scr,fi II	1,1	2,1	0,8	17 /	1,1	2,1	0,8	1,7	1,1	2,1	0,8	1,7	1,4	2,8	1,1	2,2
aerated concrete acc.			Scr,fi ⊥	1,1	-,	0,8		1,1	-	8,0		1,1	7	0,8	.,.	1,4		1,1	7
to Annex C118	Internal to		ed		11x8	5 M	8	1	5x8	5 M1	0	1	5x8	5 M1	2		-		
	≥ 2,5/≥ 2	≥ 85	Scr,fi II	0,9	1,8	0,7	1,4	0,9	1,8	0,7	1,4	0,9	1,8	0,7	1,4		_ 1		T
			Scr,fi ⊥	0,9	',"	0,7	.,	0,9	,,,,	0,7		0,9	,,,	0,7					

¹⁾ No performance assessed.

In absence of national regulations, the recommended partial factor $\gamma_{M,f} = 1,0$.

fischer injection	system FIS	V Plus for	masonry

Performance

Chracteristic values under tension loading under fire exposure (anchor group)

Annex C125

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²⁾ The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

³⁾ All other proofs have to be conducted with the single anchor in accordance with TR 054.

Spacing and edge distance under fire exposure (anchor group)

Table C126.1: Spacing and Edge distance under fire exposure, brick breackout failure

Solid brick MZ, NF acc. to Annex C4

mean compressive strength / Min. compressive strength single brick ≥ 15 / ≥ 12 N/mm²

Anchor rod			N	18	M	10	M12	
Effective anchorage depth	hef		80	200	80	200	80	200
Characteristic analism	Scr,fi II	[1	80	320	80	320	80	320
Characteristic spacing	Scr,fi ⊥	[mm] -	100	100	100	100	100	100
Edge distance	C _{cr} ,fi		160	400	160	400	160	400

Solid calcium silicate brick KS, NF, acc.to Annex C14

mean compressive strength / Min. compressive strength single brick ≥ 15 / ≥ 12 N/mm²

Anchor rod	Anchor rod M8		18	M	10	M12		
Effective anchorage depth	hef		50	100	50	200	50	200
Characteristic encoins	Scr,fi II	[mana]	107	107	107	107	107	107
Characteristic spacing	Scr,fi ⊥	[mm]	200	400	200	800	200	800
Edge distance	C _{cr} ,fi		100	200	100	400	100	400

Perforated calcium silicate brick KSL, acc. to Annex C24

mean compressive strength / Min. compressive strength single brick ≥ 10 / ≥ 8 N/mm²

Anchor rod / perforate	d sleev	е	M8 / 16x130	M10 / 16x130	M12 / 20x130
Effective anchorage depth	hef	3	130	130	130
Characteristic associate	Scr,fi II	[]	133	133	133
Characteristic spacing	Scr,fi ⊥	[mm]	153	153	153
Edge distance	Ccr,fi		260	260	260

Vertical perforated brick HLz, acc. to Annex C30

mean compressive strength / Min. compressive strength single brick ≥ 7,5 / ≥ 6 N/mm²

Anchor rod / perforated sleeve		е	M8 / 16x85	M10 / 16x85	M12 / 20x85
Effective anchorage depth	hef		85	85	85
Characteristic analisa	Scr,fi II	[mana]	320	320	320
Characteristic spacing	Scr,fi ⊥	[mm]	153	153	153
Edge distance	C _{cr} ,fi		170	170	170

Vertical perforated brick HLz, acc. to Annex C28

mean compressive strength / Min. compressive strength single brick ≥ 5 / ≥ 4 N/mm²

Anchor rod / perforate	d sleev	е	M8 / 16x130	M10 / 16x130	M12 / 20x130
Effective anchorage depth	hef		130	130	130
Characteristic exeries	Scr,fi II	[man]	133	133	133
Characteristic spacing	Scr,fi 1	[mm]	133	133	133
Edge distance	Ccr,fi		260	260	260

fischer injection system FIS V Plus for masonry

Performance

Spacing and edge distance under fire esposure (anchor group)

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Spacing and edge distance under fire exposure (anchor group)

Table C127.1: Spacing and Edge distance under fire exposure, brick breackout failure

Autoclaved aerated concrete acc. to Annex C118

mean compressive strength / Min. compressive strength single brick ≥ 2,5 / ≥ 2 N/mm²

Anchor rod		M8		M10		M12		M16		
Effective anchorage depth	hef		100	200	100	200	100	200	100	200
Characteristic spacing	Scr,fi II	[mm]	333	107	333	107	333	107	333	107
	Scr,fi ⊥		333	107	333	107	333	107	333	107
Edge distance	C cr,fi		200	400	200	400	200	400	200	400

Autoclaved aerated concrete acc. to Annex C118 mean compressive strength / Min. compressive strength single brick \geq 2,5 / \geq 2 N/mm²

Internal threaded anchor FIS E			11x85 M8	15x85 M10	15x85 M12	
Effective anchorage depth	hef		85	85	85	
Characteristic spacing	Scr,fi II	[]	333	333	333	
	Scr,fi ⊥	[mm]	333	333	333	
Edge distance	C _{cr,fi}		170	170	170	

fischer injection system FIS V Plus for masonry

Performance

Spacing and edge distance under fire esposure (anchor group)

Annex C127

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