



Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments



European Technical Assessment

ETA-20/0729 of 31 October 2023

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the Deutsches Institut für Bautechnik **European Technical Assessment:** fischer injection system FIS V Plus for masonry Trade name of the construction product Product family Metal Injection anchors for use in masonry to which the construction product belongs fischerwerke GmbH & Co. KG Manufacturer Otto-Hahn-Straße 15 79211 Denzlingen DEUTSCHLAND Manufacturing plant fischerwerke This European Technical Assessment 155 pages including 3 annexes which form an integral contains part of this assessment 330076-01-0604, Edition 10/2022 This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of This version replaces ETA-20/0729 issued on 26 November 2020



European Technical Assessment ETA-20/0729 English translation prepared by DIBt

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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 B 4 to B 7, B 21, B 22, C 1 to C 123
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 C 124



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Hygiene, health and the environment (BWR 3) 3.3

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 the applicable European legal act is: [97/177/EC].

The system to be applied is: 1

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

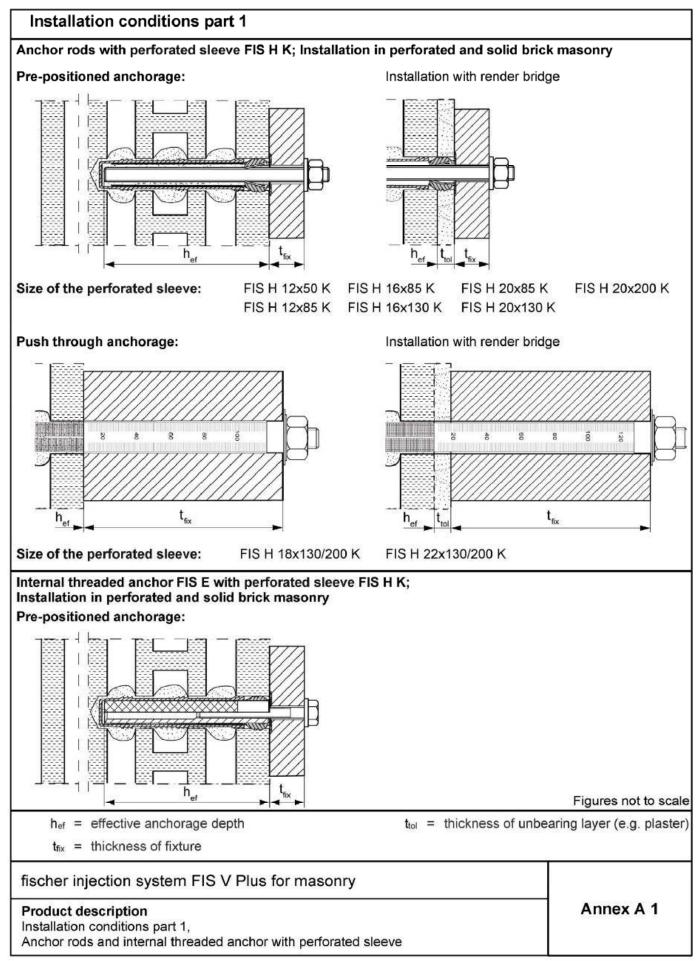
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Deutsches Institut für Bautechnik.

Issued in Berlin on 31 October 2023 by Deutsches Institut für Bautechnik

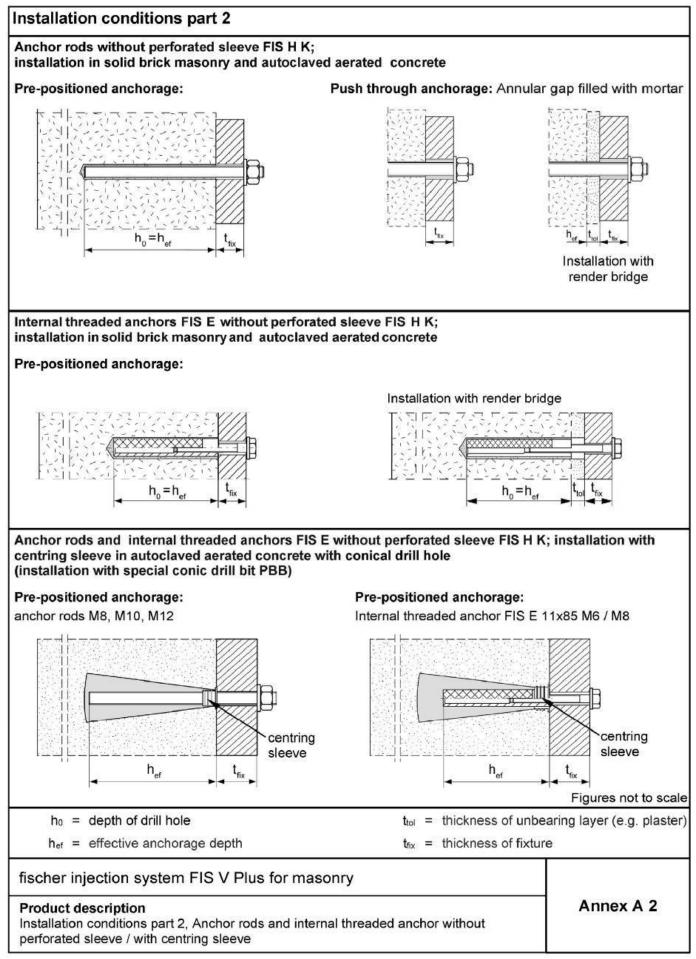
Dipl.-Ing. Beatrix Wittstock Head of Section

beglaubigt: Baderschneider











Overview system components part 1	
Mortar cartridge (shuttle cartridge) with sealing cap	
Size: 360 ml, 825 ml	
Imprint: fischer FIS V Plus or FIS VS Plus Low Speed or FIS VW Plus High Speed, processing notes, shelf-life, hazard code, piston travel scale (optional), curing time and processing time (depending on temperature), size, volume	
Mortar cartridge (coaxial cartridge) with sealing cap	
Size: 100 ml, 150 ml, 300 ml, 380 ml, 400 ml, 410 ml	
Imprint: fischer FIS V Plus or FIS VS Plus Low Speed or FIS VW Plus High Speed, processing notes, shelf-life, hazard code, piston travel scale (optional), curing time and processing time (dependent on temperature), size, volume	ending
Static mixer FIS MR Plus for injection cartridges up to 410 ml	ж —
Static mixer FIS JMR for injection cartridges 825 ml	<u> </u>
Extension tube Ø 9 for static mixer FIS MR Plus; Extension tube Ø 9 or Ø 15 for static mixer FIS JMR	
······································	
Cleaning brush BS	
Blow-out pump AB-G compressed-air cleaning to	ol
	PAR
Tischer Eus Junia Mill	
	Figures not to scale
fischer injection system FIS V Plus for masonry	
Product description Overview system components part 1: cartridge / static mixer / cleaning tools	Annex A 3



Overv	view system components part	2		
fische	r anchor rod			
2		Size:	M6, M8, M10, M12, M16	
Interna	al threaded anchor FIS E			
5		Size:	11x85 M6 / M8 15x85 M10 / M12	
Perfor	ated sleeve FIS H K	101		
7		Size:	FIS H 12x50 K FIS H 12x85 K FIS H 16x85 K FIS H 20x85 K	
7		Size	FIS H 16x130 K FIS H 20x130 K FIS H 20x200 K	
Perfor	ated sleeve FIS H K (push through a	nchorage)		
0				Size: FIS H 18x130/200 K FIS H 22x130/200 K
Washe	er	\bigcirc		
3		\bigcirc		
Hexag	on nut	\wedge		
4		(\bigcirc)		
Injectio	on adapter	centring sle	eve PBZ	
		$\overline{7}$		
Specia	I conic drill bit PBB			
	-ANNANA-	MB C		
ficeh	or injection system EIS V Dive fo	macan		Figures not to scale
Produ Overv	er injection system FIS V Plus fo Ict description iew system components part 2: steel p on adapter / centring sleeve		d sleeve / conical drill bit /	Annex A 4



	Designation		Material	
1	Mortar cartridge		Mortar, hardener; filler	
		Steel	Stainless steel R	High corrosion resistant ste HCR
		zinc plated	acc. to EN 10088-1:2014 Corrosion resistance class CRC III acc. to EN 1993-1-4:2006+A1:2015	acc. to EN 10088-1:2014 Corrosion resistance class CRC V acc. to EN 1993-1-4:2006+A1:201
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 f _{uk} ≤ 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 10088-1:2014 f _{uk} ≤ 1000 N/mm ² A ₅ > 8% fracture elongation	$\begin{array}{c} \mbox{Property class} \\ 50 \mbox{ or } 80 \\ \mbox{EN ISO } 3506-1:2020 \\ \mbox{or property class } 70 \\ \mbox{with } f_{yk} = 560 \ \mbox{N/mm}^2 \\ 1.4565; \ 1.4529 \\ \mbox{EN } 10088-1:2014 \\ \ f_{uk} \leq 1000 \ \mbox{N/mm}^2 \\ \mbox{A}_5 > 8\% \ \mbox{fracture elongatio} \end{array}$
3	Washer ISO 7089:2000	zinc plated ≥ 5μm, 1.4401; 1.4404; ISO 4042:2018 1.4578; 1.4571; E or hot-dip galvanised 1.4439; 1.4362; EN 10088-1:2014		1.4565;1.4529 EN 10088-1:2014
4	Hexagon nut	Property class 5 or 8; EN ISO 898-2:2012 zinc plated ≥ 5µm, ISO 4042:2018 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 10088-1:2014	Property class 50, 70 or 8 EN ISO 3506-2:2020 1.4565; 1.4529 EN 10088-1:2014
5	Internal threaded anchor FIS E	Property class 5.8; EN 10277-1:2008-06 zinc plated ≥ 5µm, ISO 4042:2018	Property class 70 EN ISO 3506-1:2020 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; EN 10088-1:2014	Property class 70 EN ISO 3506-1:2020 1.4565; 1.4529 EN 10088-1:2014
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 4042:2018	Property class 70 EN ISO 3506-1:2020 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; EN 10088-1:2014	Property class 70 EN ISO 3506-1:2020 1.4565; 1.4529 EN 10088-1:2014
7	Perforated sleeve and centring sleeve			



	ect to	fischer injection system FIS V Plus for masonry			
	hammer drill mode	all bricks; without C 28 to C 48, C 75 to C 78			
	th rotary drill mode	all bricks			
Hole drilling with	special conic drill bit	Only C 118 to C 122			
	uasi static load, asonry	all	bricks		
	e under tension and r loading	and C 124 (Applies only to the conditions of dry masonry)			
nstallation	Pre-positioned anchorage	Anchor rod or internal threaded anchor (in solid brick masonry and autoclaved aerated concrete)	Perforated sleeve with ancho or internal threaded ancho (in perforated and solid brie masonry) Size: FIS H 12x50 K FIS H 12x85 K FIS H 16x85 K FIS H 16x130 k FIS H 20x85 K FIS H 20x130 k FIS H 20x200 k		
	Push through anchorage			sleeve with anchor roo rated and solid brick masonry) FIS H 18x130/200 F FIS H 22x130/200 F	
nstallation and use conditions	conditions d/d (dry/dry) conditions w/d (wet/dry) conditions w/w (wet/wet)	all	bricks		
nstallation direct	, ,	D3 (downward and	horizontal insta	allation)	
nstallation tempe	erature	T _{i,min} = −10 °C	to T _{i,max} = +40	°C	
n-service	Temperature range Tb		ort term temper g term tempera		
emperature	Temperature range Tc	-40 °C to +120 °C (max. short term temperature +120 °C; max. long term temperature +72 °C)			



Specifications of intended use part 2

Anchorages subject to:

- · Static and quasi-static loads
- · Resistance to fire under tension and shear loading

Base materials:

- Solid brick masonry (base material group b) and autoclaved aerated concrete (base material group d), acc. to Annex B 13 / B 14.
- Hollow brick masonry (base material group c), according to Annex B 13 / B 14
- 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, Annex B under consideration of the β-factor according to Annex C 123, 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 A 5, Table A5.1.

fischer injection system FIS V Plus for masonry

Intended Use Specifications part 2 Annex B 2



Specifications of intended use part 2 continued Design:

 The anchorages have to be designed in accordance with EOTA Technical Report TR 054:2022-07 (included the dimensioning for fire exposure), Design method A under the responsibility of an engineer experienced in anchorages and masonry work.

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

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

 $V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$

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 054:2022-07.

NRk,s, VRk,s and MORk,s see annexes C 1-C 3

Factors for job site tests and displacements see annex C 123.

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

Installation:

- · 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 mortar.
- Bridging of unbearing layer (e.g., plaster) masonry with solid bricks and cylindrical drill hole. At perforated brick masonry see Annex B 6, Table B6.1.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Fastening screws or anchor rods (including nut and washer) must comply with the appropriate material and property class of the fischer internal threaded anchor FIS E.
- Minimum curing time see Annex B 8, Table B8.2.
- Commercial standard threaded rods, washers and hexagon nuts may also be used if the following requirements are fulfilled:

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

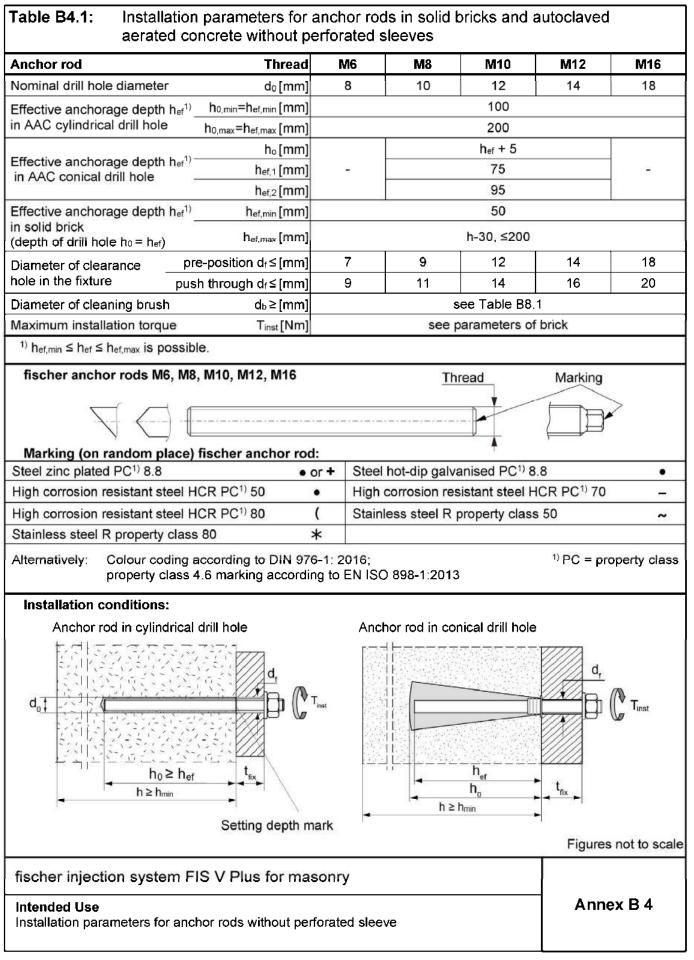
fischer injection system FIS V Plus for masonry

Intended Use

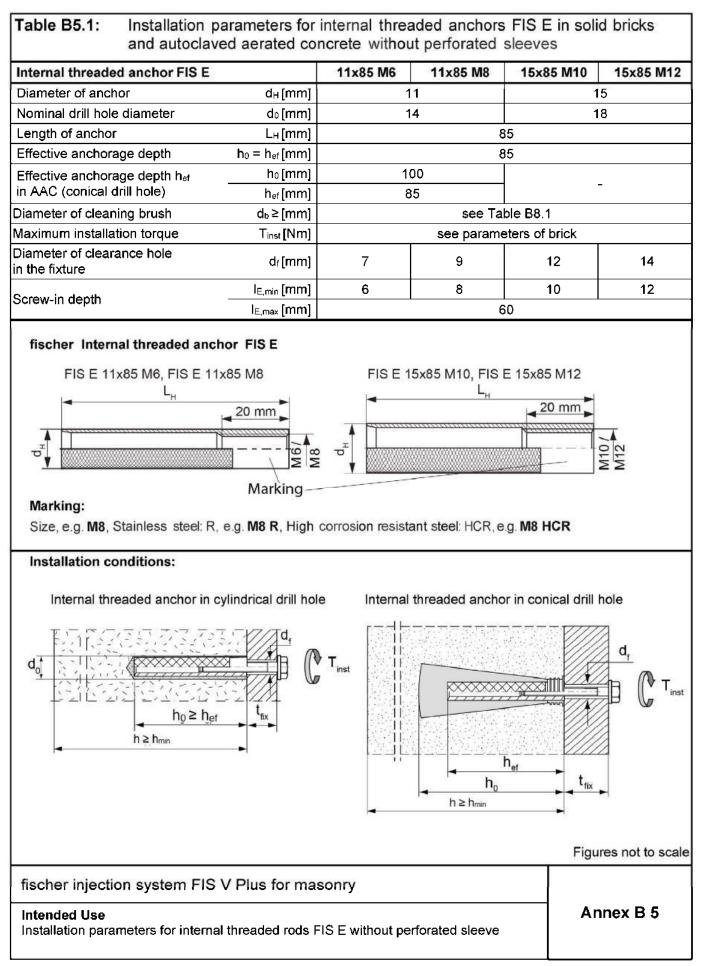
Specifications part 2 continued

Annex B 3

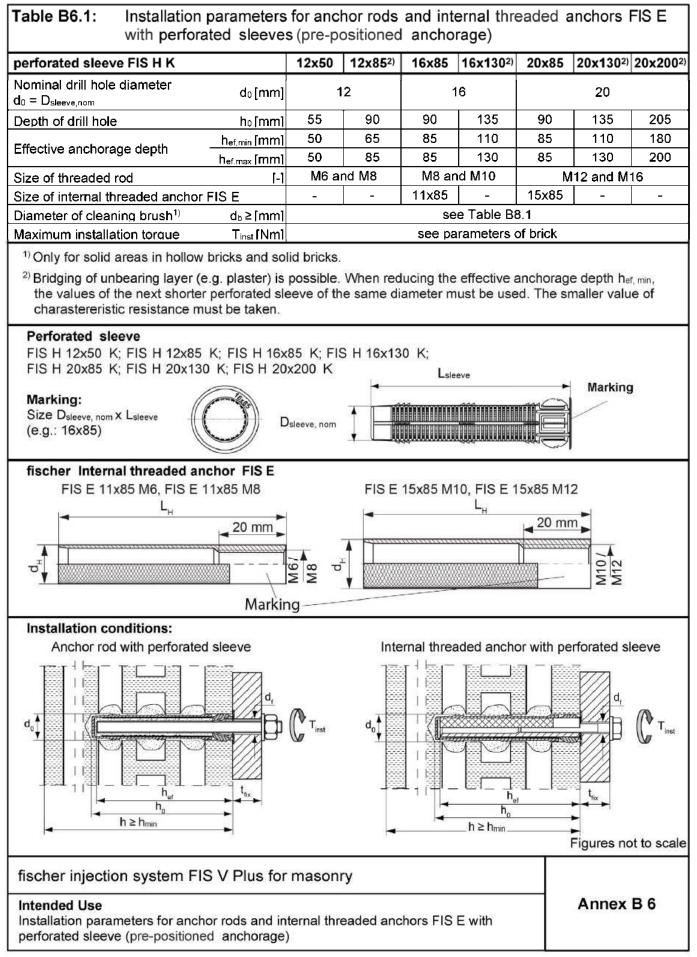






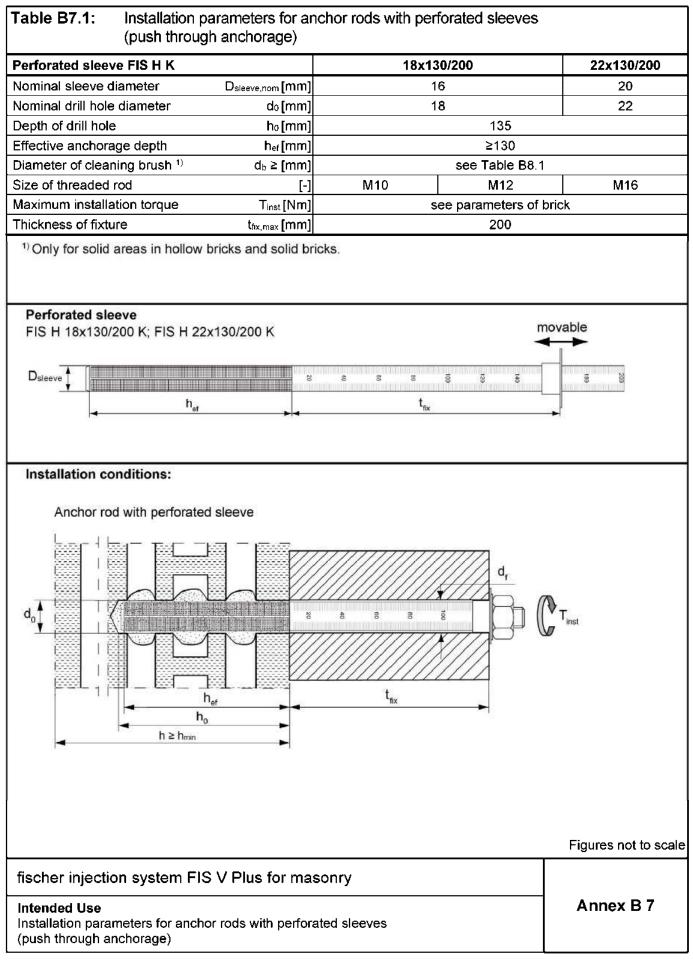






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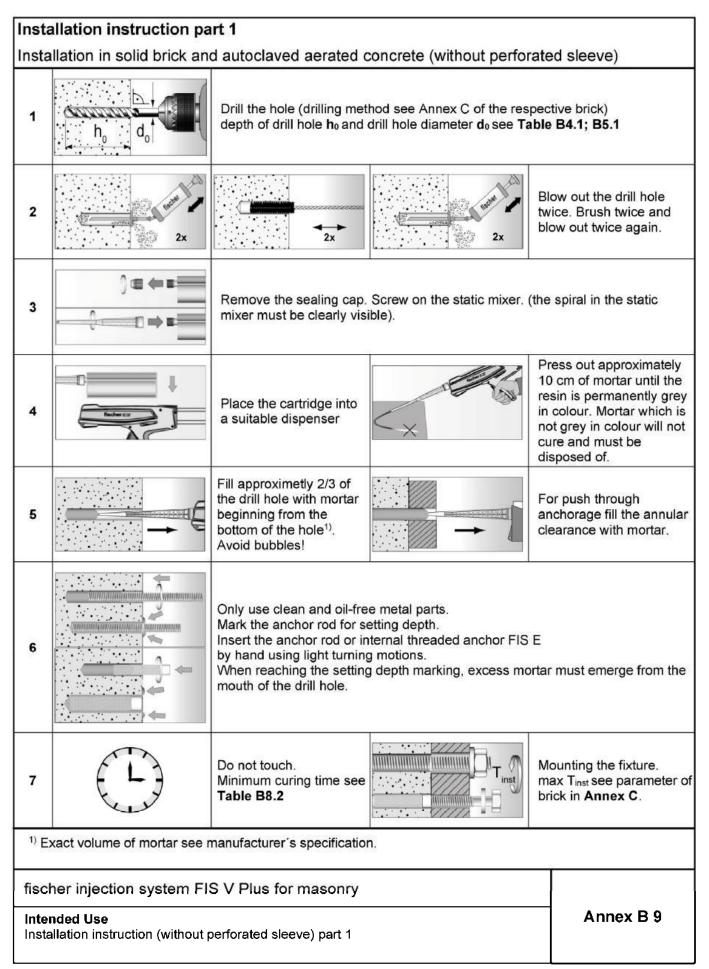






	e dian		er	orush refers to t d₀[mm]	8 10		14 16	18 2	20 22
Brush d	iamet			d₀[mm]	9 11		16 20		25 25
Table	ح B8.2	•	and Maxii	hollow blocks	sing times a	red aerated con nd minimum mortar the m	curing times		
Тал		4		v the listed n Maxim	ninimum tem		Minir	num curing tim	e ^{1), 2)}
	npera horing				t _{work}			t _{cure}	
	[°C			FIS VW Plus High Speed	FIS V Plus	FIS VS Plus Low Speed	FIS VW Plus High Speed	FIS V Plus ⁾	FIS VS Plu Low Spee
	-10 to	<u> </u>	-5	>5 min	-	-	12 h	-	-
	-5 to		0	5 min	>13 min	-	3 h	24 h	-
>	0 to		5	5 min	13 min	>20 min	3 h	3 h	6 h
>	5 to		10	3 min	9 min	20 min	50 min	90 min	3 h
>	10 to	2	20	1 min	5 min	10 min	30 min	60 min	2 h
>	20 to	2	30	-	4 min	6 min	-	45 min	60 min
>	30 to	5	40	-	2 min	4 min	-	35 min	30 min
-/ WIINI		Jan	linge (el	mperature +5°C	<i>.</i> .				
fische	r inje	cti	on syst	em FIS V PI	us for masor	۱ry		Figu	es not to sca

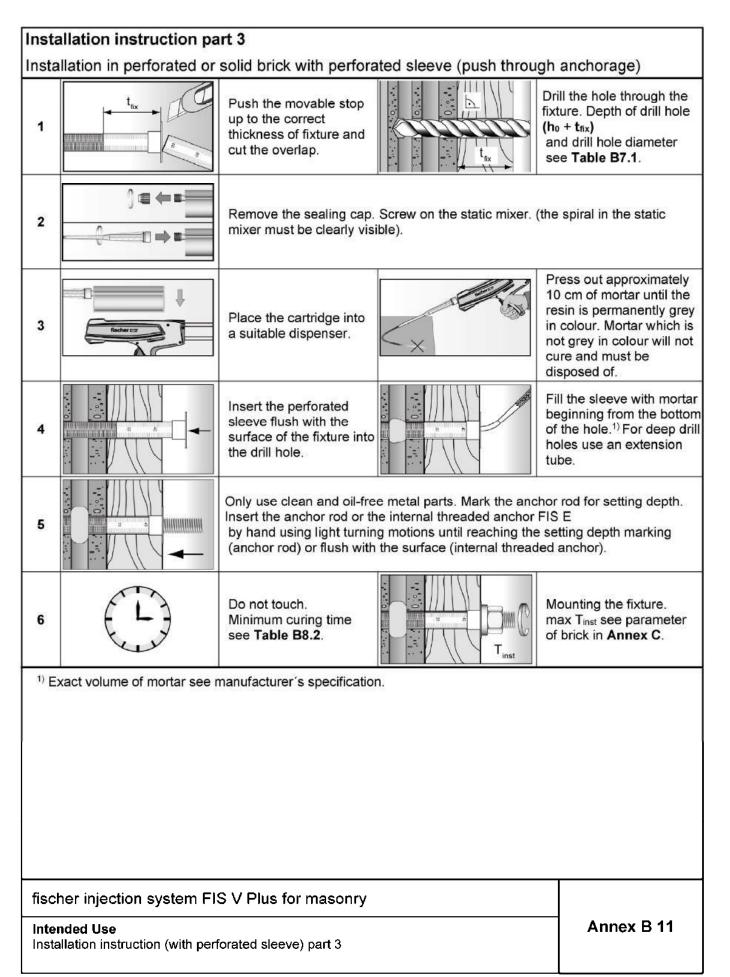






Installation instruction part 2 Installation in perforated or solid brick with perforated sleeve (pre-positioned anchorage)							
$1 \qquad \qquad$							
2 Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible).							
3		Place the cartridge into a suitable dispenser.	×	Press out approximately 10 cm of mortar until the resin is permanently grey in colour. Mortar which is not grey in colour will not cure and must be disposed of.			
4		Insert the perforated sleeve flush with the surface of the masonry or plaster.		Fill the perforated sleeve completely with mortar beginning from the bottom of the hole ¹⁾ .			
5 Only use clean and oil-free 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).							
6		Do not touch. Minimum curing time see Table B8.2		Mounting the fixture. max T _{inst} see parameter of brick in Annex C .			
¹⁾ E>	xact volume of mortar see r	nanufacturer's specificatior	י ז.				
fisch	her injection system FI	S V Plus for masonry					
Intended Use Ann Installation instruction (with perforated sleeve) part 2							







Insta	allation instruction pa Ilation in autoclaved a positioned anchorage)	erated concrete with s	pecial conic drill bit PE	3B		
1	h ₀ = 100 mm	Position the movable drill bit arrester on the used drill hole depth (see Table B4.1). For this, unlock the clamp screw and slide the arrester. Now fix the clamp screw.				
2		Drill the cylindrical hole with rotating drill until the arrester contact the material surface (drilling method see Annex C of the respective brick).				
3		Deviate the working power drill circulate to generate an conic undercut in the material.				
4	4x	Blow out the drill hole four times.				
5		Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible).				
6	C	Place the cartridge into a suitable dispenser. Press out approxima 10 cm of mortar unti resin is permanently colour. Mortar which grey in colour will no and must be dispose				
7		Put the center sleeve into the drill hole and adapt the injection adapter onto the static mixer.		Fill the drill hole with injection mortar.		
8			FIS E by hand using ligh When reaching the settir	setting depth. internal threaded anchor		
9		Do not touch. Minimum curing time see Table B8.2 .		Mounting the fixture. max T _{inst} see parameter of brick in Annex C .		
fiscl	her injection system FI	S V Plus for masonry				
Inter Insta	nded Use Illation instruction for autoc positioned anchorage) part	aved aerated concrete wit	th special conic drill bit PB	Annex B 12		
66.23				8.06.04-134/23		



Table B13.1: Over	view of assessed br	icks part 1			
Kind of masonry	Brick format [mm]			Mean gross density ρ [kg/dm³]	Annex
		Solid brick Mz			
	NF ≥240x115x7	71 12 / 20 / 28	Germany	≥1,8	C 4 – C 7
Solid brick Mz	2DF ≥240x115x11	10 / 16	Germany	≥1,8	C 8 / C 9
Solid Drick Wiz	≥ 245x118x	54 10 / 20	Italy	≥1,8	C 10 / C 11
	≥ 230x108x5	55 10 / 20	Denmark	≥1,8	C 12 / C 13
Solid calcium sili	cate (sand- lime) brick	KS / perforated calciu	ım silicate (sa	nd- lime) brid	k KSL
	NF ≥240x115x7	71 12 - 28	Germany	≥2,0	C 14 / C 15
Solid calcium silicate brick KS	8DF ≥ 250x240x24	10 - 28	Germany	≥2,0	C 16 / C 17
	≥ 997x214x53	38 10 - 36	Netherlands	≥1,8	C 18 / C 19
	≥ 240x115x11	10 / 20	Germany	≥1,8	C 20 – C 23
Perforated calcium silicate brick KSL	3DF 240x175x11	8 - 20	Germany	≥1,4	C 24 – C 27
	Vertica	I perforated brick HLz	:		
	370x240x23	37 4 - 12	Germany	≥1,0	C 28 / C 29
	500x175x23	37 4 - 12	Germany	≥1,0	C 28 / C 29
	2DF 240x115x11	13 6 - 28	Germany	≥1,4	C 30 / C 31
	248x365x24	18 4 - 8	Germany	≥0,6	C 32 – C 35
	248x365x24	19 8 - 12	Germany	≥0,7	C 36 – C 39
	248x365x24	19 4/6	Germany	≥0,5	C 40 – C 43
	248x425x24	18 4 - 8	Germany	≥0,8	C 44 – C 47
	248x425x24	18 4 - 8	Germany	≥0,8	C 48 – C 51
	500x200x31	15 4 - 8	Germany	≥0,6	C 52 – C 55
Vertical perforated	500x200x30	0 4 - 10	France	≥0,7	C 56 – C 59
brick HLz	500x200x31	15 2 - 8	France	≥0,7	C 60 – C 63
	560x200x27	75 4 - 8	France	≥0,7	C 64 / C 65
	255x120x11	18 2 - 12	Italy	≥1,0	C66 - C68
	275x130x9	94 6 - 20	Spain	≥0,8	C 69 / C 71
	220x190x29	90 6 - 10	Portugal	≥0,7	C 72 – C 75
	253x300x24	10 2-6	Austria	≥0,8	C 76 – C 79
	250x440x28	50 6 - 10	Austria	≥0,7	C 80 – C 83
	230x108x5	55 2-8	Denmark	≥1,4	C 84 / C 85
	365x248x24	15 8	Austria	≥0,6	C 86 / C 89
	240x175x11	13 10	Germany	≥0,9	C 90 / C 93

fischer injection system FIS V Plus for masonry

Intended Use

Overview of assessed bricks part 1

Annex B 13

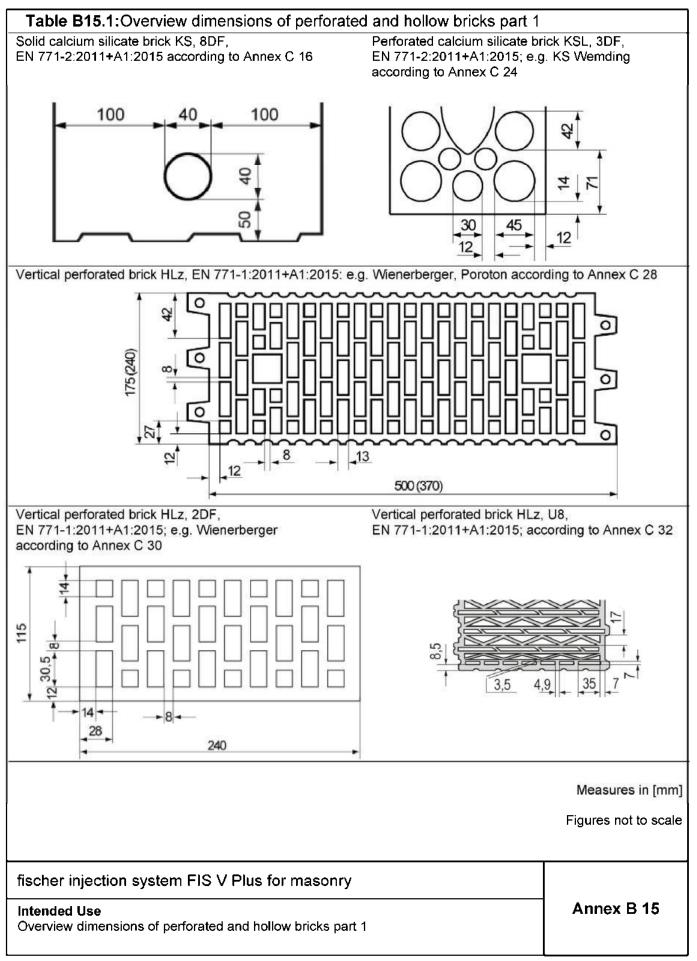


Table B14.1: Overview of assessed bricks part 2								
Kind of masonry	Brick format [mm]	Mean compressive strength [N/mm ²]	Main country of origin	Mean gross density ρ [kg/dm³]	Annex			
Horizontal perforated brick LLz								
Horizontal perforated	248x78x250	2 - 6	Italy	≥0,7	C 94 / C 95			
brick LLz	128x88x275	2	Spain	≥0,8	C 96 / C 97			
	Light-wei	ght concrete ho	llow block Hbl					
	362x240x240	2/4	Germany	≥1,0	C 98 – C 101			
Light-weight concrete hollow block Hbl	500x200x200	2 - 6	France	≥1,0	C 102 / C 103			
HOHOW BIOCK HE	440x215x215	4 - 10	Ireland	≥1,2	C 104 – C 107			
	Light-we	ight concrete s	olid block Vbl					
	≥ 372x300x254	2	Germany	≥0,6	C 108 / C 109			
Light-weight concrete	≥ 250x240x239	4 - 8	Germany	≥1,6	C 110 – C 113			
solid block Vbl	≥ 440x100x215	4 - 10	Ireland	≥2,0	C 114 / C 115			
	≥ 44 0x95x215	6 - 12	England	≥2,0	C 116 / C 117			
	Autocla	ved aerated co	ncrete (AAC)					
PP2 / AAC	-	2	Germany	0,35	C 118 – C 122			
PP4 / AAC	-	4	Germany	0,5	C 118 – C 122			
PP6 / AAC	-	6	Germany	0,65	C 118 – C 122			

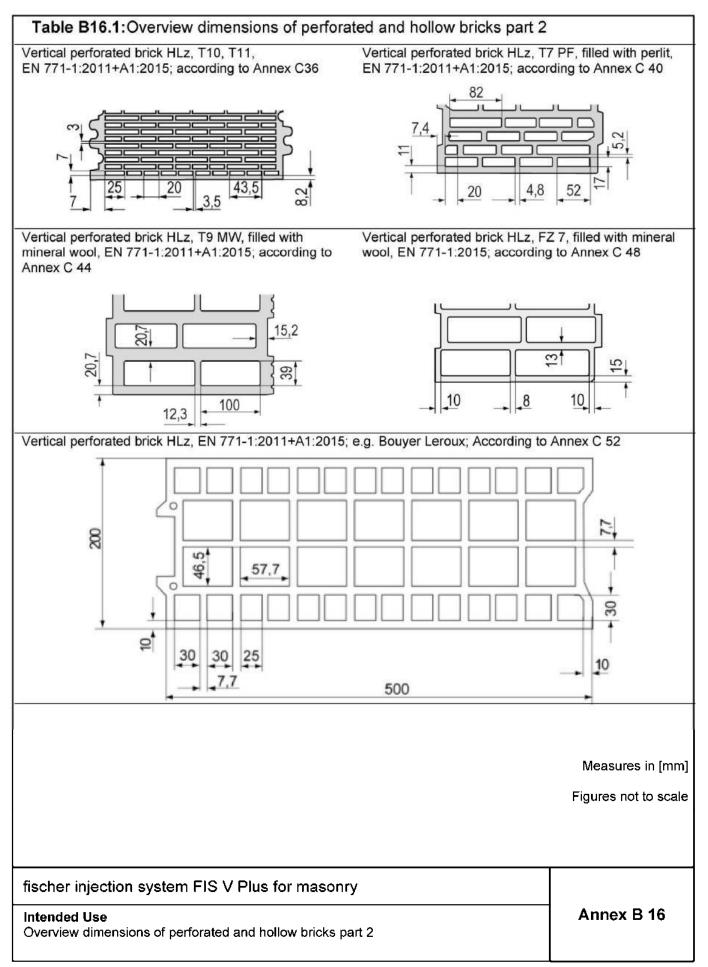
fischer injection system FIS V Plus for masonry

Intended Use Overview of assessed bricks part 2 Annex B 14

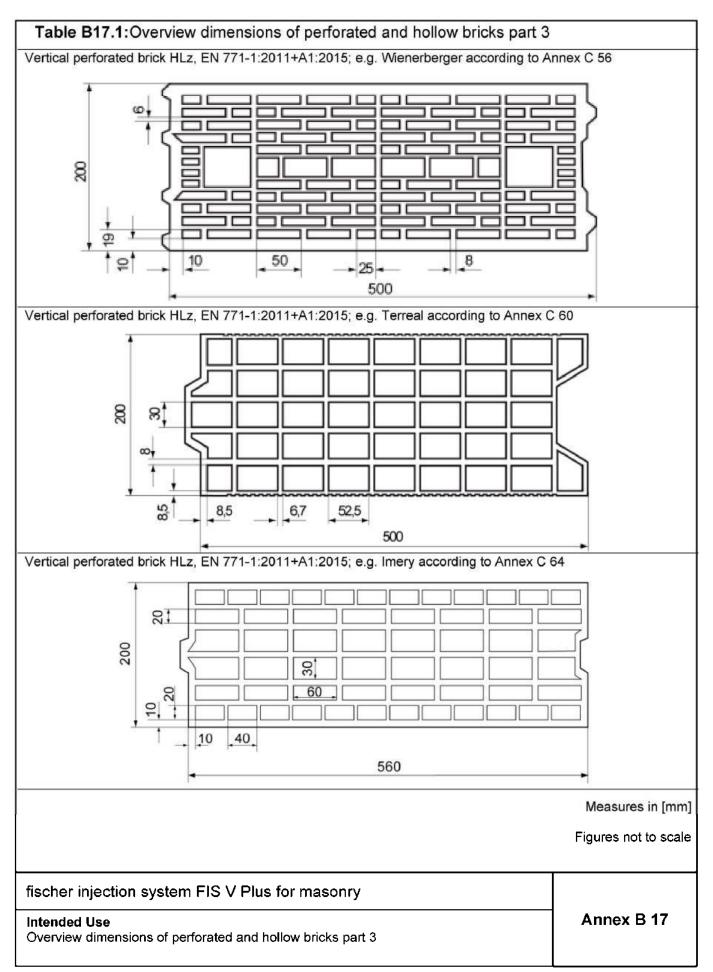




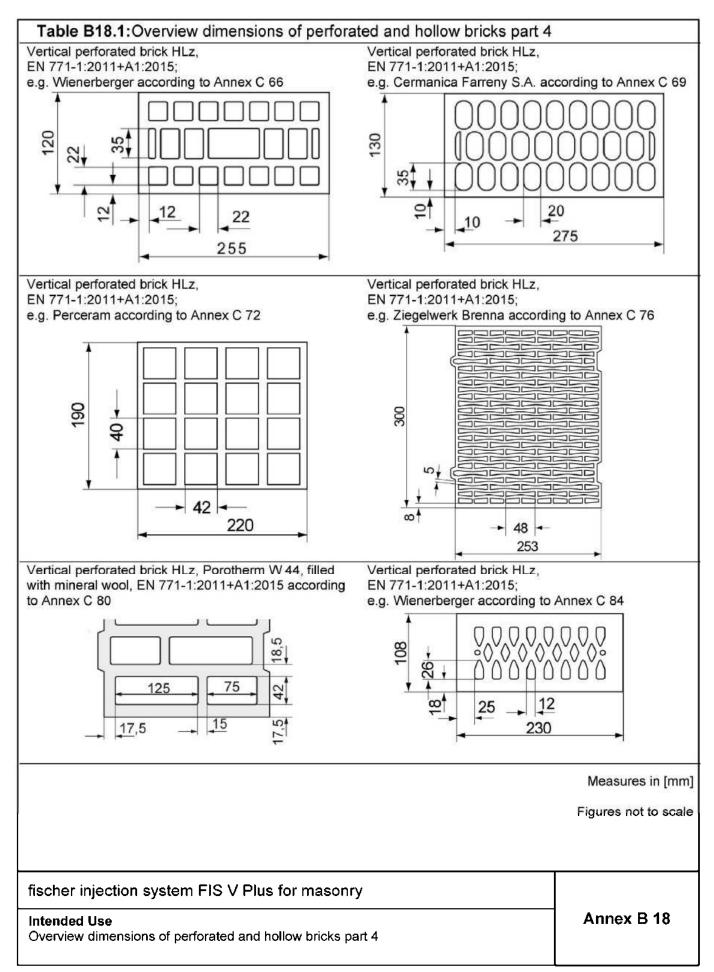




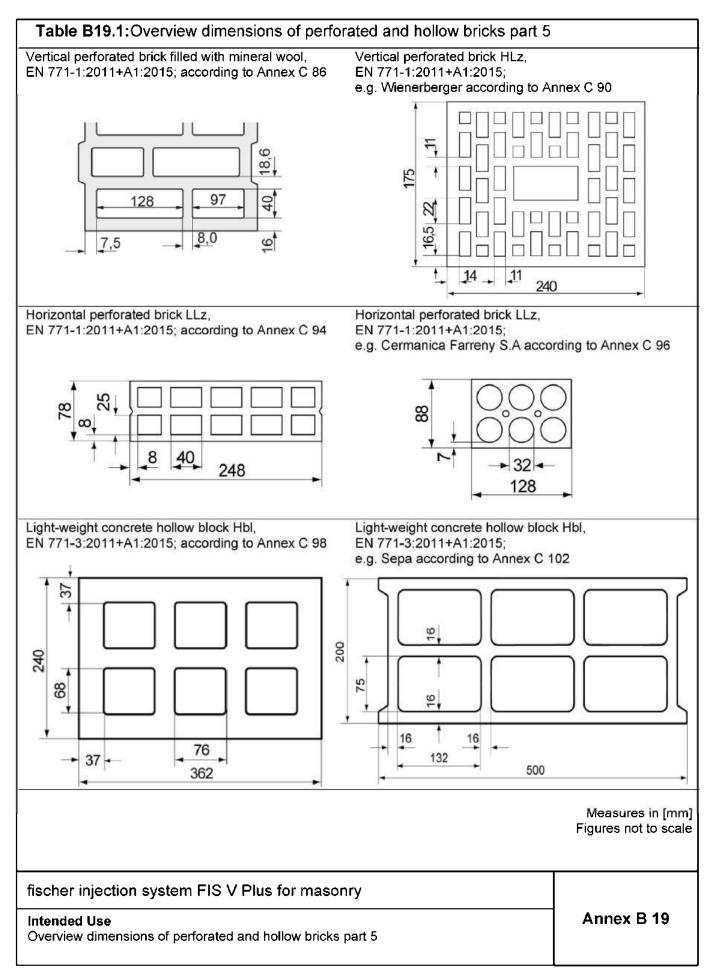




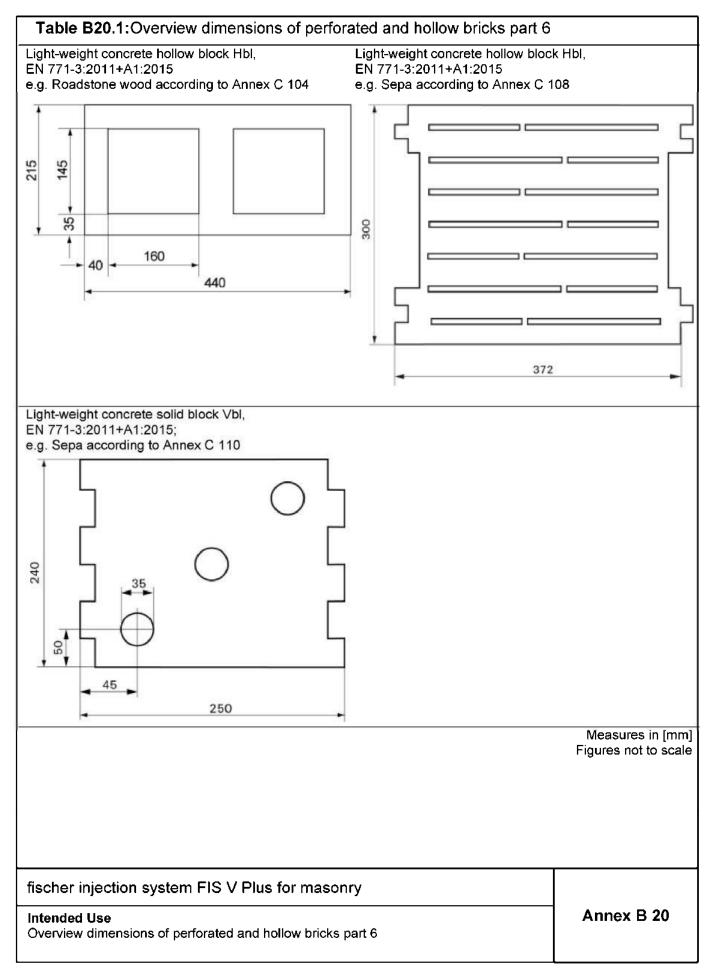














Spacing and edge dista	nce part 1	
	s _{cr} II c	ⁱⁱⁿ → α _{g,N} (s _{min} ⊥)
!		$= - \alpha_{g,v} (s_{\min} \perp)$
		$\alpha_{g,N}(s_{min} I)$ $\alpha_{g,V}(s_{min} I)$
I.	s _{min} II _ C _n	nin 🛌
* Only, if vertical jo	pints are not completely filled with mortar	
	Ainimum spacing parallel to horizontal joint Ainimum spacing perpendicular to horizontal joint	
	Characteristic spacing parallel to horizontal joint	
	Characteristic spacing perpendicular to horizontal joint	
	Edge distance	
	Group factor for tension load, anchor group parallel to horizo	
	Group factor for shear load, anchor group parallel to horizont Group factor for tension load, anchor group perpendicular to	
$\alpha_{g,N}(s_{min}-) = j(s_{min}-s_{min})$	pint	
	Group factor for shear load, anchor group perpendicular to h pint	orizontal
		Figures not to scale
fischer injection system	FIS V Plus for masonry	
Intended Use Spacing and edge distance p	art 1	Annex B 21



Spacing and edge distance part 2	
For $s \ge s_{cr}$: $\alpha_g = 2$	
For $s_{min} \le s \le s_{cr}$: α_g according to installation parameters of brick Annex (>
Group of 2 anchors	
$\mathbf{N}^{g}_{Rk} = \alpha_{g,N} \cdot \mathbf{N}_{Rk}$; $\mathbf{V}^{g}_{Rk,b} = \mathbf{V}^{g}_{Rk,c,H} = \mathbf{V}^{g}_{Rk,c,\perp} = \alpha_{g,V} \cdot \mathbf{V}_{Rk}$	
Group of 4 anchors	
$N^{g}_{Rk} = \alpha_{g,N} (S_{min} II) \cdot \alpha_{g,N} (S_{min}^{\perp}) \cdot N_{Rk};$	
$V^{g}_{Rk,b} = V^{g}_{Rk,c,II} = V^{g}_{Rk,c,\perp} = \alpha_{g,V} (SminII) \bullet \alpha_{g,V} (Smin^{\perp}) \bullet V_{Rk}$	
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 sminII or smin [⊥] acc. to Annex C	
ischer injection system FIS V Plus for masonry	
Intended Use	Annex B 22
Spacing and edge distance part 2	



Anch	or rod / standard	threaded r	od		M6	M8 ³⁾	M10 ³⁾	M12	M16			
hara	acteristic resistar	nce to steel	failure	unde	r tension l	oading						
			4.6		8,0	14,6(13,2)	23,2(21,4)	33,7	62,8			
Ø	Steel zinc plated		4.8		8,0	14,6(13,2)	23,2(21,4)	33,7	62,8			
NRK	Steel Zille plated		5.8		10,0	18,3(16,6)	29,0(26,8)	42,1	78,5			
ja e		Property	8.8	[kN]	16,0	29,2(26,5)	46,4(42,8)	67,4	125,6			
unaractenstic esistance N _{Rkis}	Stainless steel R and	class	50	[]	10,0	18,3	29,0	42,1	78,5			
g	High corrosion resistant steel		70		14,0	25,6	40,6	59,0	109,9			
	HCR		80		16,0	29,2	46,4	67,4	125,6			
artia	al factors 1)	1										
Stainless ste and and			4.6				2,00					
	Steel zinc plated		4.8				1,50					
	-		5.8	-	1,50							
	Stainless steel R	Property class	8.8 50	- [-] -	2,86							
	and High corrosion		70				1,50 ²⁾ / 1,87					
	resistant steel HCR		80	_			1,60					
36	andard threaded ro				0004.2004							

fischer injection system FIS V Plus for masonry

Performance

Characteristic resistance to steel failure of a single anchor under tension loading of fischer anchor rods and standard threaded rods

Annex C 1



Table C2.1:Characteristic resistance to steel failure of a single anchor under shearIoading with and without lever arm of fischer anchor rods and standardthreaded rods

Anch	or rod / standard	threaded re	od		M6	M8 ³⁾	M10 ³⁾	M12	M16			
Chara	acteristic resistar	ice to steel	failure	unde	r shear loa	ding			-			
witho	out lever arm											
			4.6		4,8	8,7(7,9)	13,9(12,8)	20,2	37,6			
in in	Steel zinc plated		4.8		4,8	8,7(7,9)	13,9(12,8)	20,2	37,6			
istic V _{Rk}	Steel Zille plated		5.8		6,0	10,9(9,9)	17,4(16,0)	25,2	47,1			
cteri		Property	8.8	[kN]-	8,0	14,6(13,2)	23,2(21,4)	33,7	62,8			
harac	Steel zinc plated Stainless steel R Stainless steel R and High corrosion resistant steel HCR	class	50		5,0	9,1	14,5	21,0	39,2			
C Se			70		7,0	12,8	20,3	29,5	54,9			
			80		8,0	14,6	23,2	33,7	62,8			
with	ever arm					-						
99		Property class	4.6		6,1	14,9(12,9)	29,9(26,5)	52,3	132,9			
stan	Steel zinc plated		4.8		6,1	14,9(12,9)	29,9(26,5)	52,3	132,9			
			5.8		7,6	18,7(16,1)	37,3(33,2)	65,4	166,2			
rístic re M ⁰ _{Rks}			8.8	[Nm]-	12,2	29,9(25,9)	59,8(53,1)	104,6	265,9			
Characteristic resistance M ⁰ _{Rks}	Stainless steel R and		50		7,6	18,7	37,3	65,4	166,2			
araci	High corrosion		70		10,6	26,2	52,3	91,5	232,6			
Ğ	resistant steel HCR		80		12,2	29,9	59,8	104,6	265,9			
Partia	al factors ¹⁾											
			4.6				1,67					
	Steel zinc plated		4.8		1,25							
tors	Green zinte plated		5.8				1,25					
al fac Y ^{Ms,V}		Property	8.8	[-]			1,25					
Partial factors Y ^{Ms,V}	Stainless steel R and	class	50				2,38					
പ്	High corrosion resistant steel		70				1,25 ²⁾ / 1,56					
	HCR		80				1,33					

¹⁾ In absence of other national regulations

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.

fischer injection system FIS V Plus for masonry

Performance

Characteristic resistance to steel failure of a single anchor under shear loading with and without lever arm of fischer anchor rods and standard threaded rods

Annex C 2



fischer internal	thread	ed anchor	FIS E		M6	M8	M10	M12				
Characteristic r screw/threaded		ice to steel	failure	undert	ension load	ing, decisive val	ues of sleev	e and				
		Property class	4.6		8,0	14,6	23,2	33,7				
Characteristic resistance with screw	NRKs	Property class	5.8	[kN]	10,0	18,3	29,0	42,1				
with sciew		Property	R		14,0	25,6	40,6	59,0				
Destin Life at a set		class 70	HCR		14,0	25,6	40,6	59,0				
Partial factors ¹⁾		Property	4.6			2,	00					
Partial factors	γMs,N	Property class	5.8	[-]	1,50							
		Property	R				87					
		class 70				55.46	87					
Characteristic r screw/threaded		ice to steel	failure	under	shear loadin	g; decisive value	es of sleeve a	and				
without lever ar												
		Property class	4.6		4,8	8,7	13,9	20,2				
Characteristic resistance with screw		Property class	5.8	[kN]	5	9	15	21				
		Property	R		7,0	12,8	20,3	29,5				
		class 70	HCR		7,0	12,8	20,3	29,5				
with lever arm				r								
	M ⁰ rk,s	Property class	4.6		6,1	14,9	29,9	52,3				
Characteristic resistance		Property R	[Nm]	7,6	18,7	37,3	65,4					
				10,6	26,2	52,3	91,5					
		class 70	HCR		10,6	26,2	52,3	91,5				
Partial factors ¹⁾						1,'	67					
Partial factors ¹⁾		Property class	4.6				1,25					
Partial factors ¹⁾ Partial factors	γMs,V		4.6 5.8	[-]		1,:	25					
		class Property		[-]			25 56					



	\$115	Producer	JCer							berger	ŭ.
	10				n]	length L width W					
		Nominal dimens	ions						71		
	<i>11</i> ≤	Mean gross dry	lensity ρ [kg/dm ³]					2-1 12N2.0			
		Mean compress	ive strengt		[NI/m			15 /	12 or 2 35 / 2	25 / 20	
	2240	Min. compressiv	-	single bri	CK ¹			1 774	1. SW/2011255 2513	150	
Table C4.1:	-	Standard or ann	2010 J. C.	noo o-1(0000		Er	N //1-	1:2011	+A1:20	J15
	installation p	arameters for e	-		1			4			
Anchor rod			M6	M8	M10	М	12		-		
Internal threa	ded anchor FIS E			•	-			M6 11	M8 x85	M10 15	M12 (85
Anchor rod and	d internal threaded	anchor FIS E wit	hout perfor	ated sleev	'e						
			50	50	50	5	0				
Effective anchorage depth	hef	[mm]	80	80	80	8	0		8	5	
anonorage depti		43 85	200	200	200	20	00				
Max. installation torque	max T _{inst}	[Nm]	4		10			4		10	
General installa	ation parameters	37									
Edge distance	C _{min} =	Ccr		1	00				1	00	
Edge distance h	ef=200 cmin =	Dor		1	_2)						
-	Smin	II, N		e	60	60					
_	h _{ef} =200 s _{min}	<u> </u>		2							
Spacing	Smin	ll,v		2	240						
_	S	or II		2				40			
	s _{cr} ⊥ = s _m	in ⊥		7	75				7	5	
Drilling method	4										
-											
Hammer drilling	with hard metal ham				000/ -64						
Hammer drilling ¹⁾ The cor	with hard metal ham mpressive strength		k must not l	pe less that	ın 80% of ti	ne m	ean c	compre	essive s	strength	1.
Hammer drilling ¹⁾ The cor ²⁾ No perfe	with hard metal ham mpressive strength prmance assessed	of the single bricl	k must not l	oe less tha	ın 80% of ti	n e m	ean c	compre	essive s	strength	1.
Hammer drilling ¹⁾ The cor ²⁾ No perfo Table C4.2:	with hard metal ham mpressive strength	of the single bricl	1	1	1			compre	essive s	strength	l.
Hammer drilling ¹⁾ The cor ²⁾ No perfe	with hard metal ham mpressive strength prmance assessed	of the single bricl	k must not t M6	De less tha	n 80% of ti M10		ean c		-	-	
Hammer drilling ¹⁾ The cor ²⁾ No performance Table C4.2: Anchor rods	with hard metal ham mpressive strength prmance assessed	of the single bricl	1	1	1			M6	- M8	M10	M12
Hammer drilling ¹⁾ The cor ²⁾ No perfo Table C4.2: Anchor rods Internal threa	with hard metal ham mpressive strength ormance assessed Group factor	of the single brick	1	1	1	М	12	M6	-	M10	
Hammer drilling ¹⁾ The cor ²⁾ No perfo Table C4.2: Anchor rods Internal threa	with hard metal ham mpressive strength ormance assessed Group factor ded anchor FIS E	of the single brick S	1	1	1	M 100	12	M6	- M8	M10	M12
Hammer drilling ¹⁾ The cor ²⁾ No perform Table C4.2: Anchor rods Internal thread	with hard metal ham mpressive strength ormance assessed Group factor ded anchor FIS E αα.Ν (Smin	of the single brick	1	1	1	M 100 1,5	12	M6	- M8	M10	M12
Hammer drilling ¹⁾ The cor ²⁾ No performance Table C4.2: Anchor rods	with hard metal ham mpressive strength ormance assessed Group factor ded anchor FIS E α _{a.N} (smin α _{g.v} (smin	of the single brick S Cmin [mm] [1]) [1])	1	1	1	M 100 1,5 2,0	12	M6	- M8	M10	M12
Hammer drilling ¹⁾ The cor ²⁾ No perform Table C4.2: Anchor rods Internal thread	with hard metal ham mpressive strength ormance assessed Group factor ded anchor FIS E α _{a.N} (smin α _{g,V} (Smin her=200 α _{g,N} (Smin	of the single brick	1	1	1	M 100 1,5 2,0 1,5	12	M6	- M8	M10	M12
Hammer drilling ¹⁾ The cor ²⁾ No perform Table C4.2: Anchor rods Internal thread	with hard metal ham mpressive strength ormance assessed Group factor ded anchor FIS E α _{a.N} (smin α _{g.V} (smin h _{ef} =200 α _{g.V} (smin h _{ef} =200 α _{g.V} (smin	of the single brick S Cmin [mm] [I] []] []] []] []]	1	1	1	M 1,5 2,0 1,5 2,0	12	M6	- M8	M10	M12
Hammer drilling ¹⁾ The cor ²⁾ No perfor Table C4.2: Anchor rods Internal thread Edge distance	with hard metal ham mpressive strength ormance assessed Group factor ded anchor FIS E α _{a.N} (Smin α _{g.V} (Smin h _{ef} =200 α _{g.V} (Smin α _{q.N} (Smin α _{q.N} (Smin	of the single brick S Cmin [mm] []) []) []) []) []) [-]	1	1	1	M 100 1,5 2,0 1,5 2,0 2,0	12	M6	- M8	M10	M12
Hammer drilling ¹⁾ The cor ²⁾ No perfor Table C4.2: Anchor rods Internal thread Edge distance	with hard metal ham mpressive strength ormance assessed Group factor ded anchor FIS E α _{a.N} (Smin h _{ef} =200 α _{g,N} (Smin h _{ef} =200 α _{g,V} (Smin α _{a,N} (Smin α _{g,V} (Smin	of the single brick S Cmin [mm]))))))))) 	1	1	1	M 100 1,5 2,0 2,0 2,0 2,0	12	M6	- M8	M10	M12
Hammer drilling ¹⁾ The cor ²⁾ No perfo Table C4.2: Anchor rods Internal thread Edge distance	with hard metal ham mpressive strength ormance assessed Group factor ded anchor FIS E α _{a.N} (smin α _{g.V} (smin h _{ef} =200 α _{g.V} (smin α _{q.V} (smin α _{g.V} (smin α _{g.V} (smin α _{g.V} (smin α _{g.V} (smin	of the single brick S Cmin [mm] []) []) []) []) []) []) []) []) [])])])])])	1	1	1	M 100 1,5 2,0 1,5 2,0 2,0 2,0 2,0	12	M6	- M8	M10	M12
Hammer drilling ¹⁾ The con ²⁾ No performable C4.2: Anchor rods Internal thread Edge distance	with hard metal ham mpressive strength ormance assessed Group factor ded anchor FIS E α _{a.N} (Smin h _{ef} =200 α _{g,N} (Smin h _{ef} =200 α _{g,V} (Smin α _{a,N} (Smin α _{g,V} (Smin	of the single brick S Cmin [mm] []) []) []) []) []) []) []) []) [])])])])])	1	1	1	M 100 1,5 2,0 2,0 2,0 2,0	12	M6	- M8	M10	M12
Hammer drilling ¹⁾ The cor ²⁾ No perfor Table C4.2: Anchor rods Internal thread Edge distance Group factor	with hard metal ham mpressive strength ormance assessed Group factor ded anchor FIS E α _{a.N} (Smin α _{g.V} (Smin h _{ef} =200 α _{g.V} (Smin α _{g.V} (Smin α _{g.V} (Smin h _{ef} =200 α _{g.V} (Smin h _{ef} =200 α _{g.V} (Smin h _{ef} =200 α _{g.V} (Smin	of the single brick S Cmin [mm] II) II) II) II) I) ⊥) ⊥) ⊥)	M6 -	1	1	M 100 1,5 2,0 1,5 2,0 2,0 2,0 2,0	12	M6	- M8	M10	M12
Hammer drilling ¹⁾ The cor ²⁾ No perfor Table C4.2: Anchor rods Internal thread Edge distance Group factor	with hard metal ham mpressive strength ormance assessed Group factor ded anchor FIS E α _{a.N} (smin α _{g.V} (smin h _{ef} =200 α _{g.V} (smin α _{q.V} (smin α _{g.V} (smin α _{g.V} (smin α _{g.V} (smin α _{g.V} (smin	of the single brick S Cmin [mm] II) II) II) II) I) ⊥) ⊥) ⊥)	M6 -	1	1	M 100 1,5 2,0 1,5 2,0 2,0 2,0 2,0	12	M6	- M8	M10	M12
Hammer drilling ¹⁾ The cor ²⁾ No perfor Table C4.2: Anchor rods Internal thread Edge distance Group factor	with hard metal ham mpressive strength ormance assessed Group factor ded anchor FIS E α _{a.N} (smin α _{g,V} (smin her=200 α _{g,V} (smin α _{a,V} (smin α _{a,V} (smin her=200 α _{a,V} (smin her=200 α _{a,V} (smin her=200 α _{a,V} (smin her=200 α _{a,V} (smin	of the single brick S Cmin [mm] II) II) II) II) I) ⊥) ⊥) ⊥)	M6 -	1	1	M 100 1,5 2,0 1,5 2,0 2,0 2,0 2,0	12	M6	- M8 x85	M10	M12 (85



or FIS E = N _{Rk,p} = I and use of Use	- N _{Rk,b} = conditi	- N _{Rk,p,c} :	= NRkh	-			-	-	M6	M8	M10		
= N _{Rk,p} = I and use o Use	N _{Rk,b} = conditi	N _{Rk,p,c} :	= NRkh	FL-813					11-0	25		E0E	
and use o	N _{Rk,b} = conditi	NRk,p,c	= NRkh								11x85 15x		
102103		011 44/44	, w/d,	,c [KN] d/d; (t	depen emper	ature	on the range	mean 50/80°	compr C) ²⁾	essiv	/e		
102103	Effective anchorage depth h _{ef} [m						ge de	oth h _{ef} [mm]				
con- ditions	≥50	≥50	50	80	200	50	80	200	85				
w/w w/d	2,5	2,5	2,0	3,0	7,5	2,0	3,5	5,0		3	3,5		
d/d	4,0	4,0	3,5	5,0	12,0	3,0	5,5	8,0		5	5,5		
w/w w/d	3,5	3,5	3,0	4,5	11,0	3,0	5,0	7,0		5,0			
d/d	5,5	5,5	5,0	7,0	12,0	4,5	8,0	11,5		8	3,0		
	IAIO	INIO		UTW			14112		M6	- M	8 M	- 10 M12	
or FIS E	-	-		-			-					15x85	
										rengt	th f _b ;		
	/w, w/a	, a/a; (tempe										
		1	ĺ				ge de	sur ner L		nul			
ditions	≥50	≥50	≥50)	200	≥5	D	200	85				
w/w w/d d/d	2,5	2,5	4,0	•	8,5	4,0		11,5		:	2,5		
w/w w/d d/d	4,0	4,0	6,0		12,0	5,5	5	12,0			4,0		
rength of t	the sing	le brick	must n	ot be l	ess tha	n 80%	of the	mean c	ompres	sive s	streng	gth.	
and displ	laceme	nts see	anne	x C 12	3.								
	d/d w/w w/d d/d rength of f nge 72/12 acteristi or or FIS or FIS v/rength w/w Use con- ditions w/w w/w w/d d/d rength of f	d/d4,0w/ww/d3,5d/d5,5rength of the sing nge 72/120°C: Nacteristic resis or under sheaM6or FIS E- $V_{Rk,b} = V_{Rk,c,II} = V$ idition w/w, w/dUse con- ditions 250 w/ww/dd/d4,0d/d4,0	d/d4,04,0w/ww/d3,53,5d/d5,55,5rength of the single brick nge 72/120°C: NRk (72/124)acteristic resistance for under shear loadM6M6M8or FIS E/Rk,bVRk,c,IIVRk,c,L [Iudition w/w, w/d, d/d; (rUse con- ditions ≥ 50 ≥ 50 ≥ 50 w/ww/d4,0d/d4,0d/d4,0d/dfor the single brick	d/d4,04,03,5w/ww/d3,53,0d/d5,55,55,0rength of the single brick must n nge 72/120°C: NRk (72/120°C) = 0acteristic resistance to loc or under shear loading foM6M8or FIS E-/Rk,bVRk,c,II = VRk,c,⊥ [kN] de idition w/w, w/d, d/d; (tempeUse con- ditions≥50≥50≥50w/ww/d4,04,06,0w/ww/d4,04,06,0w/ww/dbr fit he single brick must n	d/d4,04,03,55,0w/ww/d3,53,53,04,5d/d5,55,55,07,0rength of the single brick must not be I nge 72/120°C: NRk (72/120°C) = 0,83 · Nacteristic resistance to local br or under shear loading for edgM6M8M10or FIS E/Rk,b= VRk,c,II = VRk,c,⊥ [kN] dependingEffectUse con- ditions≥50≥50≥50w/ww/d2,52,54,0w/ww/d4,04,06,0rength of the single brick must not be I	d/d4,04,03,55,012,0w/ww/d3,53,53,04,511,0d/d5,55,55,07,012,0rength of the single brick must not be less tha nge 72/120°C:NRk (72/120°C) = 0,83 · NRk (50/80'acteristic resistance to local brick fail or under shear loading for edge distanceM6M8M10or FIS E/Rk,b= V_{Rk,c,II = V_{Rk,c,L} [kN] depending on the idition w/w, w/d, d/d; (temperature rangeUse con- ditions ≥ 50 ≥ 50 ≥ 50 w/ww/d2,52,54,08,5w/ww/d4,04,06,012,0	d/d 4,0 3,5 5,0 12,0 3,0 w/w w/d 3,5 3,5 3,0 4,5 11,0 3,0 d/d 5,5 5,5 5,0 7,0 12,0 4,5 rength of the single brick must not be less than 80% nge 72/120°C: NRk (72/120°C) = 0,83 · NRk (50/80°C). NRk (50/80°C). acteristic resistance to local brick failure of or under shear loading for edge distance M6 M8 M10 or FIS E - - /Rk,b = V_{Rk,c,II} = V_{Rk,c,L} [kN] depending on the methodition w/w, w/d, d/d; (temperature range 50/80) Use con- ditions ≥ 50 ≥ 50 ≥ 200 ≥ 50 w/w w/d 2,5 2,5 4,0 8,5 4,0 w/w w/d 4,0 4,0 6,0 12,0 5,5 rength of the single brick must not be less than 80% 50 50 50 50	d/d 4,0 3,5 5,0 12,0 3,0 5,5 w/w w/d 3,5 3,5 3,0 4,5 11,0 3,0 5,0 d/d 5,5 5,5 5,0 7,0 12,0 4,5 8,0 rength of the single brick must not be less than 80% of the nge 72/120°C: NRk (72/120°C) = 0,83 · NRk (50/80°C). acteristic resistance to local brick failure or brick for under shear loading for edge distance c=100 M6 M8 M10 M12 or FIS E - - - //Rk,b = VRk,c,II = VRk,c,⊥ [kN] depending on the mean condition w/w, w/d, d/d; (temperature range 50/80°C and the distance c=50 200 ≥50 Use Effective anchorage depending on the mean condition w/w, w/d, d/d; (temperature range 50/80°C and the distance c=50 200 ≥50 w/w w/d 2,5 2,5 4,0 8,5 4,0 w/w w/d 4,0 4,0 6,0 12,0 5,5 rength of the single brick must not be less than 80% of the 5,5 5,5 5,5 5,5	d/d 4,0 3,5 5,0 12,0 3,0 5,5 8,0 w/w w/d 3,5 3,5 3,0 4,5 11,0 3,0 5,0 7,0 d/d 5,5 5,5 5,0 7,0 12,0 4,5 8,0 11,5 rength of the single brick must not be less than 80% of the mean completer render of the single brick must not be less than 80% of the mean completer shear loading for edge distance c=100mm M6 M8 M10 M12 or under shear loading for edge distance c=100mm M6 M8 M10 M12 or FIS E - - - $V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,L} [kN]$ depending on the mean compressidition w/w, w/d, d/d; (temperature range 50/80°C and 72/12 Use Effective anchorage depth her [I con- 250 250 200 250 200 w/w w/d 2,5 2,5 4,0 8,5 4,0 11,5 w/w w/d 4,0 6,0 12,0 5,5 12,0 rength of the single brick must not be less than 80% of the mean completer of the single brick must not be less than 80% of the mean completer of the single brick must no	d/d 4,0 3,5 5,0 12,0 3,0 5,5 8,0 w/w w/d 3,5 3,5 3,0 4,5 11,0 3,0 5,0 7,0 d/d 5,5 5,5 5,0 7,0 12,0 4,5 8,0 11,5 rength of the single brick must not be less than 80% of the mean compressinge 72/120°C: NRk (72/120°C) = 0,83 · NRk (50/80°C). Arc (50/80°C). acteristic resistance to local brick failure or brick edge failue or under shear loading for edge distance c=100mm M6 M12 or rFIS E - - - - M6 11: /Rk,b = V_{Rk,c,ll} = V_{Rk,c,l	d/d4,04,03,55,012,03,05,58,05w/ww/d3,53,53,04,511,03,05,07,05d/d5,55,55,07,012,04,58,011,55rength of the single brick must not be less than 80% of the mean compressive single 72/120°C:NRk (72/120°C) = 0,83 · NRk (50/80°C).Acteristic resistance to local brick failure or brick edge failure of or under shear loading for edge distance c=100mmM6M8M10M12-or FIS EM6M/Rk,bVRk,c,II= VRk,c,L[kN] depending on the mean compressive strengt of this size strengt of dition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)Use con- ditions ≥ 50 ≥ 50 ≥ 200 ≥ 50 200 w/ww/d2,52,54,08,54,011,5w/ww/d4,06,012,05,512,04rength of the single brick must not be less than 80% of the mean compressive strengt	d/d 4,0 4,0 3,5 5,0 12,0 3,0 5,5 8,0 5,5 w/w w/d 3,5 3,0 4,5 11,0 3,0 5,0 7,0 5,0 d/d 5,5 5,5 5,0 7,0 12,0 4,5 8,0 11,5 8,0 rength of the single brick must not be less than 80% of the mean compressive strenginge 72/120°C: NRk (72/120°C) = 0,83 · NRk (50/80°C). acteristic resistance to local brick failure or brick edge failure of a site or under shear loading for edge distance c=100mm M6 M8 M10 M12 - or FIS E - - - M6 M8 M Itinon w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) 200 85 W/w w/d 2,5 2,5 4,0 8,5 4,0 11,5 2,5 Use con- ditions ≥ 50 ≥ 50 ≥ 20	

Performance

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

Annex C 5



Solid b	rick Mz, NF, El	N 771	-1:2011+	A1:2015							
Table C	6.1: Installa	ation	paramete	ers for edge	e distance	e c=60mm					
Anchor	rod		M6	M8	M10	M12	M16		-		-
1000000000	threaded anchor	8	-	-	_		-	M6	M8		M12
FIS E								11:	x85	15	x85
Anchor	rod and internal t	thread		1	1	1	an an age	1			
Effective			50	50	50	50	50	_	-		
anchorag	ge depth h _{ef}	[mm]	100	100	100	100	100	_	8	85	
			200	200	200	200	200	-	I		
Max. inst torque	max Tinst	<u>, 1</u> 2 - 51	4		1	0		4		10	
	installation para	meters	5			(chindren)					
Edge dis						60					
Edge dis h _{ef} =200	tance _{Cmin}					60					
	Smin II,N	4 4				80					
.	h _{ef} =200 s _{min} II, _N	[mm]				80					
Spacing ⁻	s _{min} Ⅱ,v					80					
0paoling .	s _{er} II					3x h _{ef}					
-	S _{min} ⊥					80					
	S _{cr} ⊥					3x h _{ef}					
Drilling r											
Hammer	drilling with hard r	metal ł	nammer dri	ll							
Table C	:6.2: Group	facto	rs								
Anchor	rods		M6	M8	M10	M12	M16		-		-
Internal	threaded anchor							M6	M8	M10	M12
FIS E			-	-	-	-	-	11:	x85	15	x85
Edge distance	Cmin	[mm]				60					
	α _{g,N} (s min II)					0,6					
	α _{g,V} (S _{min} Ⅱ)	[1,3					
<u>h</u>	$_{ m ef}$ =200 $lpha_{ m g,N}$ (Smin II)					1,4					
Group h	ef=200 αg,v (s min II)					1,5					
factor	$\alpha_{g.N}$ (Smin \perp)	[-]				0,3					
-	$\alpha_{g,V}(\mathbf{S}_{\min}\perp)$	ŀ				1,3					
	er=200 α _{g,N} (Smin ⊥)	Ī				2,0					
	er=200 αg,∨ (Smin ⊥)	ŀ				1,1					
fischer	injection syste	m FIS	S V Plus f	or masonr	у						

Performance

Solid brick Mz, NF, dimensions, installation parameters c=60mm

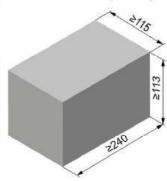
Annex C 6



or = N _{Rk,p} and us Use con- ditions w w/d d/d w w/d d/d w w/d d/d trength sessed ange 72 acteria	= NRH e cor 50 1 2 2 3 3 2 2 4 of the 2/120° stic r	100 ,5 ,5 ,5 ,5 ,5 ,0 single C: Nf	50 2,0 3,0 2,5 4,5 3,0 5,5 e bric	(w, w 100 2,0 4,0 3,0 5,5 4,0 6,5 ck mu	//d, d 50 2,0 3,0 2,5 4,5 3,0 5,5 st no	/d; (t Effec 100 2,5 4,0 3,5 5,5 4,0 6,5 t be l	depe emp tive a 200 _2) 9,5 _2) 12 _2) 12	endin eratu 50 2,0 3,0 4,5 3,5 5,5	2,5 4,0 3,5 4,0 6,5	1200 -2) 9,5 -2) 12 -2) 12 -2) 12	50/8 th het 50 2,0 3,0 4,5 3,5 5,5	0°C) [mm 100 5,5 8,5 7,5 12 9,0 12	200	M6 11)	<85 re 8 -	- M10 15x 5 2) 2) 2) 2) 2) 2) 2) 2)
= N _{Rk,p} and us con- ditions w w/d d/d d/d d/d trength sessed ange 72	e cor 50 1 2 2 3 2 4 0f the 2/120° stic r	100 ,5 ,5 ,5 ,5 ,5 ,0 single C: Nf	50 2,0 3,0 2,5 4,5 3,0 5,5 e brid	(w, w 100 2,0 4,0 3,0 5,5 4,0 6,5 ck mu	//d, d 50 2,0 3,0 2,5 4,5 3,0 5,5 st no	/d; (t Effec 100 2,5 4,0 3,5 5,5 4,0 6,5 t be l	emp tive a 200 -2) 9,5 -2) 12 -2) 12	eratu 50 2,0 3,0 4,5 3,5 5,5	2,5 4,0 3,5 4,0 6,5	1200 -2) 9,5 -2) 12 -2) 12 -2) 12	50/8 th het 50 2,0 3,0 4,5 3,5 5,5	0°C) [mm 100 5,5 8,5 7,5 12 9,0 12	3) 2000 22) 9,5 22) 12 22) 12 22)	11)	<85 re 8 -	15x 5 2) 2) 2) 2)
and us Use con- ditions w w/d d/d w w/d d/d trength sessed ange 72	e cor 50 1 2 2 3 2 4 0f the 2/120° stic r	100 ,5 ,5 ,5 ,5 ,5 ,0 single C: Nf	50 2,0 3,0 2,5 4,5 3,0 5,5 e brid	(w, w 100 2,0 4,0 3,0 5,5 4,0 6,5 ck mu	//d, d 50 2,0 3,0 2,5 4,5 3,0 5,5 st no	/d; (t Effec 100 2,5 4,0 3,5 5,5 4,0 6,5 t be l	emp tive a 200 -2) 9,5 -2) 12 -2) 12	eratu 50 2,0 3,0 4,5 3,5 5,5	2,5 4,0 3,5 4,0 6,5	1200 -2) 9,5 -2) 12 -2) 12 -2) 12	50/8 th het 50 2,0 3,0 4,5 3,5 5,5	0°C) [mm 100 5,5 8,5 7,5 12 9,0 12	3) 2000 22) 9,5 22) 12 22) 12 22)	essiv		2) 2) 2) 2) 2)
con- ditions w w/d d/d w w/d d/d trength sessed ange 72	1 2 3 2 2 4 0f the 2/120°	,5 ,5 ,5 ,5 ,5 ,0 single	2,0 3,0 2,5 4,5 3,0 5,5 e bric	2,0 4,0 3,0 5,5 4,0 6,5	50 2,0 3,0 2,5 4,5 3,0 5,5 st no	100 2,5 4,0 3,5 5,5 4,0 6,5 t be l	200 _2) 9,5 _2) 12 _2) 12	50 2,0 3,0 3,0 4,5 3,5 5,5	100 2,5 4,0 3,5 5,5 4,0 6,5	200 _2) 9,5 _2) 12 _2) 12	50 2,0 3,0 3,0 4,5 3,5 5,5	100 5,5 8,5 7,5 12 9,0 12	200 _2) 9,5 _2) 12 _2)			2) 2) 2) 2) 2)
d/d w w/d d/d trength sessed ange 72	2 2 3 2 4 of the 2/120°	,5 ,0 ,5 ,5 ,0 Single	3,0 2,5 4,5 3,0 5,5 e bric	4,0 3,0 5,5 4,0 6,5	3,0 2,5 4,5 3,0 5,5 ist no	4,0 3,5 5,5 4,0 6,5 t be l	9,5 - ²⁾ 12 - ²⁾ 12	3,0 3,0 4,5 3,5 5,5	4,0 3,5 5,5 4,0 6,5	9,5 _2) 12 _ ²⁾ 12	3,0 3,0 4,5 3,5 5,5	8,5 7,5 12 9,0 12	9,5 _2) 12 _2)			2) 2) 2)
w w/d d/d w w/d trength sessed ange 72	2 3 2 4 of the 2/120°	,0 ,5 ,0 single C: N _f	2,5 4,5 3,0 5,5 e bric	3,0 5,5 4,0 6,5 ck mu	2,5 4,5 3,0 5,5 ist no	3,5 5,5 4,0 6,5 t be l	_2) 12 _ ²⁾ 12	3,0 4,5 3,5 5,5	3,5 5,5 4,0 6,5	_2) 12 _2) 12	3,0 4,5 3,5 5,5	7,5 12 9,0 12	_2) 12 _2)		-	2) 2)
w w/d d/d trength sessed ange 72 acteri	2 of the 2/120° stic r	,5 ,0 single C: N _f	3,0 5,5 e bric	4,0 6,5 ck mu	4,5 3,0 5,5 ist no	4,0 6,5 t be l	- ²⁾ 12	3,5 5,5	4,0 6,5	- ²⁾ 12	3,5 5,5	9,0 12	_2)			
d/d trength sessed ange 72	4 of the 2/120° stic r	,0 single C: N _f	5,5 e brid	6,5 ck mu	5,5 ist no	6,5 t be l	12	5,5	6,5	12	5,5	12				21
trength sessed ange 72 acteri	of the 120° stic r	single C: N _f	e brid	ck mu	ist no	t be l		,	ŕ		,		12			2)
		hear										lge 1	failu	re of	fas	ingle
	N	16	N	18		M10			M12			M16		-	-	-
or		-		-		-			-			-		M6		M1 0 15x
V _{Rk,b} = ' ndition	V _{Rk,c,ll} w/w,	= V _R w/d,	^{k,c,⊥} d/d;	[kN] (terr	depe	endir ture	ig on rang	the e 50	mea /80°C	n coi ; and	mpre 1 72/*	essiv 120°(re str C)			154
Use con- litions	50					Effec 	tive a	incho	orage 	dep	th h _{ef}	[mm]		8	5
	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)
w/d	1,5	3,5	1,5	4,5	3,0	4,5	2,5	2,0	4,5	4,5	0,9	4,5	6,0		-	2)
d/d	2,0	4,0	2,0	5,0	3,5	5,0	3,0	2,5	5,0	5,0	1,2	5,0	7,5		-	2)
s and d	splac						3.									
	V _{Rk,b} = V dition Use con- itions w/w w/d d/d rength sessed. and di	$ \frac{V_{Rk,b} = V_{Rk,c,II}}{dition w/w,} $ Use con- itions 50 w/w 1,2 w/w 1,5 d/d 2,0 rength of the sessed. and displace em FIS V	$\frac{1}{\sqrt{Rk,b}} = \sqrt{Rk,c,II} = \sqrt{Rk}$ dition w/w, w/d, Use con- tions 50 100 w/w 1,2 2,5 w/w 1,5 3,5 d/d 2,0 4,0 rength of the single sessed. and displacement em FIS V Plus	$\frac{-}{\frac{1}{2}}$ $\frac{-}{\frac{1}{2}$	$\frac{1}{\sqrt{Rk,b}} = \sqrt{Rk,c,II} = \sqrt{Rk,c,\perp} [kN]$ dition w/w, w/d, d/d; (tem Use con- tions 50 100 50 100 w/w w/d 1,2 2,5 1,2 3,0 w/w w/d 1,5 3,5 1,5 4,5 d/d 2,0 4,0 2,0 5,0 rength of the single brick musessed. and displacements see an em FIS V Plus for mas	$\frac{1}{\sqrt{Rk,b}} = \sqrt{Rk,c,II} = \sqrt{Rk,c,\perp} [kN] dependent dition w/w, w/d, d/d; (temperative) Use con- tions 50 100 50 100 50 w/w w/d d/d 1,5 3,5 1,5 4,5 3,0 2,0 4,0 2,0 5,0 3,5 rength of the single brick must not sessed. and displacements see annex em FIS V Plus for masonry$	$\frac{1}{\sqrt{Rk,b}} = \sqrt{Rk,c,II} = \sqrt{Rk,c,\perp} [kN] dependind dition w/w, w/d, d/d; (temperature) Use Con- tions 50 100 50 100 50 100 w/w w/d d/d 1,5 3,5 1,5 4,5 3,0 4,5 2,0 4,0 2,0 5,0 3,5 5,0 rength of the single brick must not be I sessed. and displacements see annex C 12 em FIS V Plus for masonry$	$\frac{1}{\sqrt{Rk,b}} = V_{Rk,c,II} = V_{Rk,c,\perp} [kN] depending on dition w/w, w/d, d/d; (temperature range) Use Con-tions 50 100 50 100 50 100 200 100 200 100 200 100 200 100 10$	$\frac{1}{\sqrt{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp} [kN] depending on the dition w/w, w/d, d/d; (temperature range 50)Use Effective anchorsection of the solution of the single brick must not be less than a sessed.The sessed of the single brick must not be less than a sessed.The sessed of the single brick must not be less than a sessed.The sessed of the single brick must not be less than a sessed.The sessed of the single brick must not be less than a sessed.The sessed of the single brick must not be less than a sessed.The sessed of the single brick must not be less than a sessed.The sessed of the single brick must not be less than a set of the singl$	$\frac{1}{4000} = \frac{1}{1000} = 1$	$\frac{1}{\sqrt{Rk,b}} = V_{Rk,c,II} = V_{Rk,c,\perp} [kN] depending on the mean condition w/w, w/d, d/d; (temperature range 50/80°C and Use Effective anchorage depression of the single state of the single state of the single brick must not be less than 80% of the sessed. and displacements see annex C 123.$	$\frac{1}{2} + \frac{1}{2} + \frac{1}$	$\frac{1}{2,0} = \frac{1}{2,0} = \frac{1}$	$\frac{1}{2} + \frac{1}{2} + \frac{1}$	Image: Non-triangle intermeter inte	$\frac{1}{2} + \frac{1}{2} + \frac{1}$



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



Producer		e.g.	Wienerbe	rger
Nominal dimensions	[man]	length L	width W	height H
Nominal dimensions	[mm]	≥ 240	≥ 115	≥ 113
Mean gross dry density ρ	[kg/dm ³]	0	≥ 1,8	
Mean compressive strength / Min. compressive strength single brick ¹⁾	[N/mm ²]	12,5	/ 10 or 20	/ 16
Standard or annex		EN 771	-1:2011+/	1:2015

Table C8.1: Installation parameters

Anchor rod		M6	Ν	/18	M1	10	М	12	M	16	1		
Internal threaded enclose Cl											M6	M8	M10 M12
Internal threaded anchor FI	IS E	32 0 4			3. 5	8	,	84	9		11>	(85	15x85
Anchor rod and internal thr	readed	d ancho	FIS E	witho	ut per	forat	ed sle	eve					8.5
Effective hef [r	mm]	50 10	50	100	50	100	50	100	50	100		8	5
Max. instal- lation torque max T _{inst} [I	[Nm]	4				1	0				4		10
Anchor rod and internal thr	readed	d ancho	FIS E	with p	perfora	ated s	sleev	e FIS	H 16>	85 K			
Effective anchorage depth h _{ef} [n	mm]	_2)		8	5			_2	9		8	5	_2)
Max. instal- lation torque max T _{inst} [N	Nm]	/		1	0			-	1		4	10	/
General installation parame	eters												
Edge distance c _{min} = c _{cr}							e	60					
Smin II	mm] -						1	20					
							1						
Spacings _{cr} II	1						2	40					
Spacing $\frac{s_{cr} \text{ II}}{s_{cr} \perp = s_{min} \perp}$								40 15					
Spacing $s_{cr} \perp = s_{min} \perp$													
Spacing $s_{cr} \perp = s_{min} \perp$ Drilling method Hammer drilling with hard me	etal ha						1	15					
Spacing scr II	etal ha oth of the	he single		ust no	t be les	ss tha	1	15	e mea	n com	pressiv	ve stre	ength.
Spacing $s_{or} \parallel$ $s_{or} \perp = s_{min} \perp$ Drilling method Hammer drilling with hard me 1) The compressive streng 2) No performance assess	etal ha oth of the	he single			t be les M11		1	15 o of the	e mea		pressiv	ve stre	ength.
Spacing sor II $s_{or} \perp = s_{min} \perp$ Drilling method Hammer drilling with hard me 1) The compressive streng 2) No performance assess Table C8.2: Group fa Anchor rods	etal ha th of th sed.	he single	brick m				1 n 80%	15 o of the			pressiv	ve stre	ength. - M10 M12
Spacing sor II $s_{or} \perp = s_{min} \perp$ Drilling method Hammer drilling with hard me 1) The compressive streng 2) No performance assess Table C8.2: Group fa Anchor rods	etal ha th of th sed.	he single	brick m				1 n 80%	15 o of the				M8	-
Spacing sor II $s_{or} \perp = s_{min} \perp$ Drilling method Hammer drilling with hard me 1) The compressive streng 2) No performance assess Table C8.2: Group fa Anchor rods	etal ha th of th sed.	he single	brick m				1 n 80% M'	15 o of the			M6	M8	- M10 M1
Spacing $s_{or} \parallel r$ $s_{or} \perp = s_{min} \perp$ Drilling method Hammer drilling with hard me ¹⁾ The compressive streng ²⁾ No performance assess Table C8.2: Group fa Anchor rods Internal threaded anchor FI $\alpha_{g,N} (s_{min} \parallel)$ Group $\alpha_{g,N} (s_{min} \parallel)$	etal ha oth of th sed. actors	he single	brick m				1 n 80% M [*] -	15 • of the 12			M6	M8	- M10 M1
Spacing sor II sor $\perp = s_{min} \perp$ Drilling method Hammer drilling with hard me 1) The compressive streng 2) No performance assess Table C8.2: Group fa Anchor rods Internal threaded anchor FI Group factor $\alpha_{g,N} (s_{min} II)$ $\alpha_{g,N} (s_{min} II)$	etal ha th of th sed.	he single	brick m				1 n 80% M ⁻ - 1 1	15 o of the 12 ,5			M6	M8	- M10 M1
Spacing sor II sor $\perp = s_{min} \perp$ Drilling method Hammer drilling with hard me 1) The compressive streng 2) No performance assess Table C8.2: Group fa Anchor rods Internal threaded anchor FI Group $\alpha_{g,N} (s_{min} I)$ $\alpha_{g,N} (s_{min} I)$	etal ha oth of th sed. actors	he single	brick m				1 n 80% M ⁻ - 1 1	15 • of the • • • •			M6	M8	- M10 M1
Spacing sor II sor $\perp = s_{min} \perp$ Drilling method Hammer drilling with hard me 1) The compressive streng 2) No performance assess Table C8.2: Group fa Anchor rods Internal threaded anchor FI Group factor $\alpha_{g,N} (s_{min} II)$ $\alpha_{g,N} (s_{min} II)$	etal ha oth of th sed. actors	he single 5 <u>M6</u> -	M	8	M1(1 n 80% M ⁻ - 1 1	15 • of the • • • •			M6	M8	- M10 M1



	2DF, El	N 77	1-1:	201	1+A	1:20)15											
	Charact					-			failu	re or	bric	k br	eak	out f	ailur	e of	a	
Anchor rod		N	16	M	8	М	10	M	12	М	16	-		-	•	M8	M10	-
Internal threaded anchor FIS E			-	-	-		-		-		-	M6 11x		M10 15>		-	-	M6 M8 11x85
Perforated sleeve FIS H K			-	-	-		-		-		-	_		-	•		16x	35
Tension resistance strength f _b ; Installa															pres	sive		
Mean compressive strength / Min. com-	Use con-										ge de	pth h	lef [m	m]				
pressive strength single brick ¹⁾	ditions	50	100				100		100		100				85			
12,5 / 10 N/mm²	w/w w/d d/d	l 1,5 3,0	2,5 4,0		2,5 4,0	1,5 3,0			3,5 5,5	2,0 3,0	3,5 5,5			2,0 5,0			1,5 3,0	
20 / 16 N/mm ²	w/w w/c d/d		4 ,0 7,0	2,5 4,5	4 ,0 7,0	2,5 4,5			5,5 8,0		5,5 8,0			5 5,5			2,5 4,5	
 The compression For temperature 		gth of	the s	ingle	bric	c mus	t not	be le	ss th	an 80	% of t	he m			ressiv	/e str		
a	Charact	unde	er sh	ear	load	ling				1		orick	edę	ge fa	ilure			-
Anchor rod		Λ	A6	M	8	M	10	M	12	M	16	-					M10	
Internal threaded anchor FIS E			-		-				ā.			M6 11x		M10 15>				M6 M8 11x85
Perforated sleeve FIS H K					-		-		-		-	-	·	2	8		16x	85
Shear resistance Ve Installation and use																ngth	fь;	
Mean compressive strength / Min. com-	Use con-							ective	e and	hora	ge de	pth h	n _{ef} [m	im]		5		
pressive strength single brick ¹⁾	ditions					2	50								85)		
	<u> </u>	-	1															
12,5 / 10 N/mm²	w/w w/c d/d	1 2	,5	3,	,0	3	,0	3	5,5	3	,0	2,5	3,0	3,0	3,0	3,0	3,5	2,5 3,0
12,5 / 10 N/mm ² 20 / 16 N/mm ²		1	,5 ,0	3, 5,			,0 ,5		5 5,5		,0 ,0			3,0 5,0				2,5 3,0 4,0 5,0
	d/d w/w w/c d/d ive streng tests and	d dis	,0 the s place	5, ingle ment	0 brick ts se	5 « mus e anr	,5 It not l nex C	5 be le	,5 ss tha	5	,0	4,0	5,0	5,0	5,0	5,0	6,0	4,0 5,0



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

2118	Producer			e.g. Nigra	D.
		[mm]	length L	width W	height H
	Nominal dimensions	[mm]	≥ 245	≥ 118	≥ 54
>Ed	Mean gross dry density ρ	[kg/dm ³]		≥ 1,8	
	Mean compressive strength / Min. compressive strength single brick ¹⁾	[N/mm ²]	12,5	/ 10 or 25	/ 20
2245	Standard or annex		EN 771	-1:2011+/	1:2015

Table C10.1: Installation parameters

Anchor rod			N	16	N	18	M	10	M	12	M	16				-
Internal threade	d anchor	0											M6	M8	M10	M12
FIS E				.		-8 -8			33	.	1		11:	k85	15	x85
Anchor rod and	internal	thread	ed ar	nchor	FIS E	with	out pe	rforat	ted sl	eeve						
Effective anchorage depth	h _{ef}	[mm]	50	100	50	100	50	100	50	100	50	100		8	35	
Max. installation torque	max T _{inst}	[Nm]		4				1	0				4		10	
General installa	tion para	meters	3													
Edge distance	Cmin = Ccr								6	0						
Scr	II = s _{min} II	[mm]							24	45						
Spacing	$\perp = s_{min} \perp$								6	0						
Drilling method		• •	T.													

Hammer drilling with hard metal hammer drill

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

Table C10.2: Group factors

Anchor rods	M6	M8	M10	M12	M16	· ·	-		-
nternal threaded anchor	-	-	-	-	-	M6	M8	M10	
FIS E						11)	(85	15	x85
α _{g,N} (s _{min} II)									
Group factor $\frac{\alpha_{g,V}(\mathbf{s}_{\min} \mathbf{I})}{(\mathbf{s}_{\min} \mathbf{I})}$ [-]				2					
$\alpha_{g,N}$ (Smin \perp)				L					
$lpha_{ extsf{g}, extsf{V}}$ (Smin ot)									
fischer injection system F	IS V Plus	for mason	ry						
Performance Solid brick Mz, dimensions, in:	stallation par	ameters				A	nnex	x C 1	0



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 M6 **M**8 M10 M12 M16 Anchor rod M10 M12 M6 M8 Internal threaded anchor FIS E 11x85 15x85 Tension resistance $N_{Rk} = N_{Rk,p} = N_{Rk,p} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN] depending on the mean compressive strength f_b; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C)²⁾ Effective anchorage depth hef [mm] Mean compressive Use strength / Min. comconpressive strength single 85 ≥ 50 ditions brick 1) 0,75 0,60 0,90 0,75 0,75 0,75 0,60 w/w w/d 12,5 / 10 N/mm² 1,20 1,20 1,20 d/d 1,50 1,20 1,20 1,20 w/w w/d 0,90 1,50 1,20 1,20 1,20 0.90 1,20 25 / 20 N/mm² 2,00 1,50 2,50 2,00 2,00 1,50 2,00 d/d 1) The compressive strength of the single brick must not be less than 80% of the mean compressive strength. 2) For temperature range 72/120°C: NRk (72/120°C) = 0,83 · NRk (50/80°C). Characteristic resistance to local brick failure or brick edge failure of a single Table C11.2: anchor under shear loading Anchor rod M6 M8 M10 M12 M16 M6 | M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Shear resistance V_{Rk} = V_{Rk,b} = V_{Rk,c,I} = V_{Rk,c,⊥} [kN] depending on the mean compressive strength f_b; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Effective anchorage depth hef [mm] Mean compressive Use strength / Min. comconpressive strength single 85 ≥ 50 ditions brick ¹⁾ w/d w/w 12,5 / 10 N/mm² 2,0 3,0 4,0 4,5 5,5 2,0 3,0 4.0 4,5 d/d w/w w/d 25 / 20 N/mm² 6,0 2,5 4.0 5.5 6,0 5.5 8.0 2.5 4.0 d/d The 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 C 123. fischer injection system FIS V Plus for masonry Annex C 11 Performance Solid brick Mz, Characteristic resistance under tension and shear loading



Solid brick Mz, EN 771-1:2011+A1:2015 Producer e.g. Wienerberger \$100 length L width W height H Nominal dimensions [mm] ≥ 230 ≥ 108 ≥ 55 Mean gross dry density p [kg/dm³] ≥ 1,8 ≥55 Mean compressive strength / Min. $[N/mm^2]$ 12,5 / 10 or 25 / 20 compressive strength single brick 1) Standard or annex EN 771-1:2011+A1:2015 2230 Table C12.1: Installation parameters Anchor rod M6 **M8** M10 M12 M16 2 -M10 M12 M6 **M**8 Internal threaded anchor . --. -FIS E 11x85 15x85 Anchor rod and internal threaded anchor FIS E without perforated sleeve Effective [mm] 50 90 50 90 50 90 50 90 50 90 85 hef a danth

anchorage depth					
$\begin{array}{l} \text{Max. installation} \\ \text{torque} \end{array} \text{max } T_{\text{inst}} \end{array}$	[Nm]	4	10	4	10
General installation para	meters	i			
Edge distance c _{min} = c _{cr}			60		
Spacing Scr II = Smin II	[mm]		230		
Spacing $s_{cr} \perp = s_{min} \perp$			60		
Drilling method					
Line and the line of the line of					

Hammer drilling with hard metal hammer drill

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

Table C12.2: Group factors

Anchor rods	M6	M8	M10	M12	M16		-	-	
Internal threaded anchor	_	_	_	_	_	M6	M8	M10	M12
FIS E	-	-	-	-	-	11	(85	15x	85
$\begin{array}{c} \begin{array}{c} \alpha_{g,N} (s_{min} \ II) \\ \hline \alpha_{g,V} (s_{min} \ II) \\ \hline \alpha_{g,N} (s_{min} \ \bot) \\ \hline \alpha_{g,V} (s_{min} \ \bot) \end{array} \end{array} [-]$				2					
αg,v (S min⊥)									
fischer injection system FI		for mason	ry						
Performance						A	nne>	(C 12	2



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 M6 **M**8 M10 M12 M16 Anchor rod M10 M12 M6 | M8 Internal threaded anchor FIS E 11x85 15x85 Tension resistance $N_{Rk} = N_{Rk,p} = N_{Rk,p} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN] depending on the mean compressive strength fb; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C)²⁾ Effective anchorage depth hef [mm] Mean compressive Use strength / Min. comconpressive strength single 85 ≥ 50 ditions brick 1) 0,60 0,90 0.75 0,75 0,75 0.75 w/w w/d 12,5 / 10 N/mm² 1,20 1,50 1,20 1,20 1,20 1,20 d/d 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 d/d 1) The 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}). Characteristic resistance to local brick failure or brick edge failure of a single Table C13.2: anchor under shear loading Anchor rod M6 **M**8 M10 M12 M16 M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Shear resistance V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V_{Rk,c,⊥} [kN] depending on the mean compressive strength f_b; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive Effective anchorage depth hef [mm] Use strength / Min. comconpressive strength single ≥ 50 85 ditions brick¹⁾ w/w w/d 12,5 / 10 N/mm² 2,0 3,0 4,0 4,5 5,5 2,0 3,0 4.0 4,5 d/d w/w w/d 25 / 20 N/mm² 2.5 4.0 5.5 6.0 8.0 2.54.0 5.5 6.0 d/d The 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 C 123. fischer injection system FIS V Plus for masonry Annex C 13 Performance Solid brick Mz, Characteristic resistance under tension and shear loading



Produc Nomina Mean g Mean c compre Standa	al dim gross	ensions								-		
Mean g Mean c compre	gross	ensions										
Mean c compre		Choice	5			[mn	n]	length	_	dth W	-	ht H
Mean c compre		مام . مام م	- 11			- 	- 31	≥ 240		: 115	2	71
compre						[kg/di	m°j		1	≥ 1,8		
Standa				ingle brick ¹)	[N/n	nm²]	15 / 1	2 or 2	5 / 20	or 35	/ 28
	rd or	annex						EN 7	71-2:	2011+	A1:20	15
				M10	M	12	N	16				
		IVIO	_	WITU	IVI	12	IV	110	MG	Mg	M10	M12
		1 7 3						-	3.202028			
aded and	bor F	EIS E w	ithe	ut perforat	ted sl	eve	-		112		102	
							50	100				
m] 50 1	100	50 1	00	200				-	8	5	8	5
m] 3		5		15	1	5	2	25	3	5	1	5
ers												
					105							
m]						12						
					3X	Nef						
al hamme	r drill											
h of the sin		rick mus	st no	t be less tha	an 80%	5 of the	e mea	in comj	pressiv	/e stre	ength.	
M6		M8		M10	M	12	N	16				
									M6	M8	M10	M12
-		-		-		•		-	11)	(85	15>	(85
					0	7						
,					1	3						
]						3 0						
	M6 aded and m] 50 m] 50 m] 3 ters m] al hamme h of the sin ctors	M6 	al hammer drill h of the single brick mus	M6 M8 - - eaded anchor FIS E witho m] 50 100 50 100 m] 3 5 5 ters - - - m] - - - at hammer drill - - - to f the single brick must no - - ctors - - -	M6 M8 M10 - - - eaded anchor FIS E without perforat - - m] 50 100 50 100 m] 50 100 50 100 m] 3 5 15	M6 M8 M10 M - - - - - eaded anchor FIS E without perforated slopen of the single brick must not be less than 80% of the single brick must n	M6 M8 M10 M12 - - - - eaded anchor FIS E without perforated sleeve - - m] 50 100 50 100 200 200 m] 50 100 50 100 200 200 m] 3 5 15 15 15 ters 60 80 m] 80 3x hef 3x hef 3x hef 3x hef al hammer drill - - h of the single brick must not be less than 80% of the sectors 60 M6 M8 M10 M12	M6 M8 M10 M12 M - - - - - eaded anchor FIS E without perforated sleeve - - - m] 50 100 50 100 50 100 50 m] 50 100 50 100 50 100 200 2 m] 3 5 15 15 15 2 ters 60 80 <th>M6 M8 M10 M12 M16 - - - - - eaded anchor FIS E without perforated sleeve - - - m] 50 100 50 100 50 100 m] 50 100 50 100 50 100 200 200 m] 3 5 15 15 25 5 ters 60 m] 3x hef 3x hef 3x hef al hammer drill hof the single brick must not be less than 80% of the mean composite ctors</th> <th>M6 M8 M10 M12 M16 M6 Image: Second Sec</th> <th>M6 M8 M10 M12 M16 - eaded anchor FIS E without perforated sleeve - - - - M6 M8 m] 50 100 50 100 50 100 50 100 85 m] 50 100 50 100 50 100 200 200 200 85 m] 3 5 15 15 25 3 5 60 80 3x hef 3x hef 3x hef 3x hef 3x hef 60 3x hef 3x hef 3x hef 60 3x hef 50 100 100 100 100 30 30 100 30 5</th> <th>$\begin{tabular}{ c c c c c } \hline M6 & M8 & M10 & M12 & M16 & - & & & \\ \hline M6 & M8 & M10 & 11x85 & 155 \\ \hline \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$</th>	M6 M8 M10 M12 M16 - - - - - eaded anchor FIS E without perforated sleeve - - - m] 50 100 50 100 50 100 m] 50 100 50 100 50 100 200 200 m] 3 5 15 15 25 5 ters 60 m] 3x hef 3x hef 3x hef al hammer drill hof the single brick must not be less than 80% of the mean composite ctors	M6 M8 M10 M12 M16 M6 Image: Second Sec	M6 M8 M10 M12 M16 - eaded anchor FIS E without perforated sleeve - - - - M6 M8 m] 50 100 50 100 50 100 50 100 85 m] 50 100 50 100 50 100 200 200 200 85 m] 3 5 15 15 25 3 5 60 80 3x hef 3x hef 3x hef 3x hef 3x hef 60 3x hef 3x hef 3x hef 60 3x hef 50 100 100 100 100 30 30 100 30 5	$\begin{tabular}{ c c c c c } \hline M6 & M8 & M10 & M12 & M16 & - & & & \\ \hline M6 & M8 & M10 & 11x85 & 155 \\ \hline \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$



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		-		÷
Internal threaded anchor	-			a si		M6	M8	M10	M12
FIS E	-	- I				11:	x85	15)	x85

Tension resistance $N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN] depending on the mean compressive strength f_b; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C)²⁾

Mean compressive	υ	se						Effec	tive a	anch	orage	e dep	th h	ef (mn	n]		
strength / Min. com- pressive strength single brick ¹⁾	co	on- ons	50	100	50	100	50	100	200	50	100	200	50	100	200	85	85
15 / 12 N/mm ²	w/w	w/d	2,0	3,0	2,5	4,5	2,5	3,5	7,0	2,5	3,0	6,5	2,5	3,5	8,0	2,5	2,5
15/12 N/MM-	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
25720 N/ININ-	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 / 29 N/mm ²	w/w	w/d	3,5	5,0	4,0	8,0	4,5	5,5	12	4,5	5,0	11	4,5	5,5	12	4,5	4,5
35 / 28 N/mm²	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 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).

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

			01100		a a n i j	2									
Anchor rod		Γ	/ 6	N	/18	М	10	N	12	М	16	-		-	1
Internal threaded a	nchor											M6	M8	M10	M12
FIS E			.					1				11x	85	15x	85
Shear resistance V _R Installation and use												treng	th f	»;	
Mean compressive	Use					Eff	fective a	nchor	age dep	th h _{ef} [n	nm]				
strength / Min. com- pressive strength single brick 1)	con- ditions	50	100	50	100	50	≥100	50	≥100	50	≥100	8	5	8	5
15 / 12 N/mm ²	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/mm ²	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 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 C 123.

fischer injection system FIS V Plus for masonry

Performance

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

Annex C 15



Solid calcium silicat	e bric	k KS	, 8D	F, EN	771	-2:20)11+/	A1:20	015						
42.40					Pro	oduce	r								
	>	Nomi	nol dir	nensio					Imm	1	length	L w	idth W	heig	ght H
	1	Norm	nardir	nensio	JIIS				[mm	ъ.,	≥ 250		≥ 240	≥ :	240
	340			s dry d		2000			[kg/dr	n ³]			≥ 2,0		
	22			oressiv e stre)	[N/m	m²]	12,5 / 1	10 or :	25 / 20) or 35	5/28
	>	Stand	lard o	r anne	x						EN 7	71-2:	2011+	A1:20	15
2250					ŀ	100	40	100			Dimens		ee also	þ	
\sim							\bigcirc			1	Annex	B 15			
Table C16.1: Instal	ation	para	mete	rs	L	~		لـــــــــــــــــــــــــــــــــــــ							
Anchor rod		N	16	M	8	М	10	М	12	Ν	116		-		-
Internal threaded ancho	r										-	M6	M8		M12
FIS E				FIO F								11	x85	15	x85
Anchor rod and internal	thread	led ar	ichor	FISE	witho	out pe	rforat	ed sl	eeve		1				
anchorage depth ^{h_{ef}}	[mm]	50	100	50	100	50	100	50	100	50	100		8	5	
Max. installation max T _{ins}	[Nm]	4	4				1	0				4		10	
Anchor rod and internal	thread	led ar	nchor	FIS E	with	perfo	rated	sleev	e FIS	H 16	x85 K	F		r	
Effective anchorage depth hef	[mm]		2)		8	5			_2	2)		ε	85		2)
Max. installation max T _{ins}	[Nm]	-			1	0			850	0		4	10	n 03 5	
General installation para	meter	s													
Edge distance c _{min} = c _o	r								0						
Smin	-								0						
Spacing	I [mm]								h _{ef} 0						
<u> </u>	-								h _{ef}						
Drilling method															
Hammer drilling with hard	metal	hamm	er dril	I											
1) The compressive str	ength o	f the s	ingle t	orick m	nust no	t be le	ess tha	ın 80%	6 of the	e mea	an com	pressi	ve stre	ength	
2) No performance asse	ssed														
Table C16.2: Group	o facto	ors													
Anchor rods		N	16	M	8	М	10	М	12	N	116		-		•
Internal threaded ancho FIS E	г		-	.	-		-		-		-	M6	M8		M12
	1							1	,5				x85	152	(85
<u>ααν (Smin II</u> Group α _{a.V} (Smin II	3								, <u>3</u> ,2						
factors $\alpha_{q.N}$ (s _{min} \perp	-1 1-1								, <u>-</u> ,5						
α _{α.V} (S min ⊥								1	,2						
fischer injection syste	em Els	SVE	Plus f	or ma	sonr	v									
		~ * 1				J								• •	
Performance Solid calcium silicate bric	k KS, 8	BDF, d	limens	sions,	install	ation	param	eters				А	nne>	(C1)	b
											L				



Anchor rod		M6	M8	M10	M12	M16	-		-	M8	M10		-
Internal threaded							M6	M8	M10 M12			M6	M
anchor FIS E		-	-	-	-	-	11)	(85	15x85	-	-	11;	x85
Perforated sleeve FIS H K		-	-	-	-	-			-	5	16x8	5	
Tension resistance NRk strength fb; Installation										essiv	e		
Mean compressive	Use						1.1	-	h _{ef} [mm]				
strength / Min. com- pressive strength single brick ¹⁾	con- ditions			≥ 50					85				
40.5 (40 N/m m ²	w/w w/d	3,0	4,0	4,5	4,5	3,5	3,0		3,5	4	,5	3,0	4,
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
25 / 20 N/mm²	w/w w/d	4,5	6,0	6,0	6,0	5,0	4,5		5,0	6	,5	4,5	<u> </u>
29720 M/IIIII	d/d	7,5	10,0	10,0	10,0	7,5	7,5		7,5	11	1,0	7,5	
		5,0	0 0								E.	5,0	
	ange 72/1: racteristi	8,5 the sing 20°C: N c resis	NRk (72/12 stance	₀∘c) = 0, e to loc	83 · Nr	k (50/80°C).	the me	7,0 11,0 an compres edge failu	12 sive s	_	8,5 h.	12
¹⁾ The compressive s ²⁾ For temperature ra Table C17.2: Chai anch	d/d trength of t ange 72/1	8,5 the sing 20°C: N c resis r shea	12,0 Jle brick NRk (72/12 stance	12,0 must n ₀°c) = 0, e to loc ing	12,0 ot be le 83 · NR cal brid	11,0 ss than ĸ (50/80°C ck failu	8,5 80% of).	the me	11,0 an compres	12 sive s re of	2,0 trengti a sir	8,5 h.	12
¹⁾ The compressive s ²⁾ For temperature ra Table C17.2: Chai	d/d trength of t ange 72/12 racteristi	8,5 the sing 20°C: N c resis	12,0 Je brick NRk (72/12 stance ar load	12,0 must n ₀°c) = 0, to loc	12,0 ot be le 83 · N _R	11,0 ss than k (50/80°C	8,5 80% of).	the me	11,0 an compres	12 sive s	2,0 trengt	8,5 h.	12
 The compressive s For temperature ratio Table C17.2: Chain anch Anchor rod 	d/d trength of t ange 72/12 racteristi	8,5 the sing 20°C: N c resis r shea	12,0 Je brick NRk (72/12 stance ar load	12,0 must n ₀°c) = 0, e to loc ing	12,0 ot be le 83 · NR cal brid	11,0 ss than ĸ (50/80°C ck failu	8,5 80% of). Jre or t M6	the me orick ε	11,0 an compres edge failu	12 sive s re of	2,0 trengti a sir	8,5 h. n gle	- -
 The compressive s For temperature ratio Table C17.2: Chain anch Anchor rod Internal threaded 	d/d trength of t ange 72/12 racteristi	8,5 the sing 20°C: N c resis r shea	12,0 Je brick NRk (72/12 stance ar load	12,0 must n ₀°c) = 0, e to loc ing	12,0 ot be le 83 · NR cal brid	11,0 ss than ĸ (50/80°C ck failu	8,5 80% of). Jre or t M6	the me orick ε - -	11,0 an compres edge failu - M10 M12	12 sive s re of	2,0 trengti a sir	8,5 h. ngle M6 11	12 - M8
 The compressive s For temperature ratio Table C17.2: Chain anch Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H K Shear resistance V_{Rk} = 1 	d/d trength of f ange 72/1 racteristi nor unde	8,5 the sing 20°C: N c resis r shea M6 - -	12,0 Je brick NRk (72/12 stance ar load M8 - - (Rk,c,1 []	12,0 must n o°c) = 0, to loc ing M10 - -	12,0 ot be le 83 · NR cal brid M12 - -	11,0 ss than k (50/80°C ck failu M16 - - - g on th	8,5 80% of). Jre or b M6 11) e mean	the me Drick e M8 x85 - comp	11,0 an compres edge failu - M10 M12 15x85 - ressive str	12 sive s re of M8 -	2,0 trengti a sir M10 - 16x8	8,5 h. ngle M6 11	- -
 ¹⁾ The compressive s ²⁾ For temperature ratio Table C17.2: Chain anch Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H K Shear resistance V_{Rk} = 1 Installation and use con Mean compressive 	d/d trength of ange 72/1 racteristi nor unde VRk,b = VRI ndition w/	8,5 the sing 20°C: N c resis r shea M6 - -	12,0 Je brick NRk (72/12 stance ar load M8 - - (Rk,c,1 []	12,0 must n o°c) = 0, to loc ing M10 - -	12,0 ot be le 83 · NR cal brid M12 - - pending ature r	11,0 ss than (50/80°C ck failu M16 - - - g on th ange 5	8,5 80% of) Jre or t M6 11; e mean 0/80°C	the me Drick e M8 x85 - comp and 72	11,0 an compres edge failu - M10 M12 15x85 - ressive str	12 sive s re of M8 -	2,0 trengti a sir M10 - 16x8	8,5 h. ngle M6 11	- -
 ¹⁾ The compressive s ²⁾ For temperature ratio Table C17.2: Chain anch Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H K Shear resistance V_{Rk} = 1 	d/d trength of f ange 72/1 racteristi nor unde	8,5 the sing 20°C: N c resis r shea M6 - -	12,0 Je brick NRk (72/12 stance ar load M8 - - (Rk,c,1 []	12,0 must n o°c) = 0, to loc ing M10 - -	12,0 ot be le 83 · NR cal brid M12 - - pending ature r	11,0 ss than (50/80°C ck failu M16 - - - g on th ange 5	8,5 80% of) Jre or t M6 11; e mean 0/80°C	the me Drick e M8 x85 - comp and 72	11,0 an compres edge failu - M10 M12 15x85 - ressive str z/120°C)	12 sive s re of M8 -	2,0 trengti a sir M10 - 16x8	8,5 h. ngle M6 11	- -
 ¹⁾ The compressive s ²⁾ For temperature ratio Table C17.2: Chain anch Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H K Shear resistance V_{Rk} = 1 Installation and use con Mean compressive strength / Min. compressive personal for the strength single 	d/d trength of f ange 72/1: racteristi nor unde V _{Rk,b} = V _{RI} ndition w/ Use con-	8,5 the sing 20°C: N c resis r shea M6 - -	12,0 Je brick NRk (72/12 stance ar load M8 - - (Rk,c,1 []	12,0 must n o°c) = 0, e to loc ing M10 - - cN] dep temper ≥ 50	12,0 ot be le 83 · NR cal brid M12 - - pending ature r	11,0 ss than (50/80°C ck failu M16 - - - g on th ange 5	8,5 80% of) Jre or t M6 11; e mean 0/80°C	the me Drick e M8 x85 - comp and 72	11,0 an compres edge failu - M10 M12 15x85 - ressive str :/120°C) her[mm]	12 sive s re of M8 -	2,0 trengti a sir M10 - 16x8	8,5 h. ngle M6 11	- Ma ×85
 ¹⁾ The compressive s ²⁾ For temperature ratio Table C17.2: Chain anch Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H K Shear resistance V_{Rk} = 1 Installation and use con Mean compressive strength / Min. compressive strength single brick ¹) 	d/d trength of f ange 72/1: racteristi nor unde V _{Rk,b} = V _{Ri} dition w/ Use con- ditions w/w w/d	8,5 the sing 20°C: N c resis r shea M6 - - - k,c,II = V /w, w/d	12,0 Je brick NRk (72/12 stance ar load M8 - - (Rk,c,1 []	12,0 must n o°c) = 0, e to loc ing M10 - - (N] dep temper ≥ 50 4	12,0 ot be le 83 · NR cal brid M12 - - ending ature r	11,0 ss than (50/80°C ck failu M16 - - - g on th ange 5	8,5 80% of ,, ure or b M6 11, 0/80°C chorage	the me Drick e M8 x85 - comp and 72	11,0 an compres edge failu - M10 M12 15x85 - ressive str :/120°C) her[mm] 85	12 sive s re of M8 - rengtl	2,0 trengt a sir M10 - 16x8	8,5 h. ngle 11, 55	12

fischer injection system FIS V Plus for masonry

Performance

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

Annex C 17



				Pre	oduce	r					e.g	. Caldu	an
42	Nomir	al dir	nensi	ons				[mn	n] -	length	_	width W	
2214					0.02			~	· · · ·	≥ 997	_	≥ 214	≥ 538
				lensity ve stre	20155	Min		[kg/di		1, 12,5 /	8	or	2,2
2538				ngth s)	[N/n	nm²]	25/			45 / 36
	Stand	ard or	anne	ex						EN 7	71-2	2:2011+	A1:2015
2997	214	-		0		997		0		[
Fable C18.1: Installation	parar	nete	rs		-								2
Anchor rod	M	6	N	18	M	10	М	12	N	16		-	-
Internal threaded anchor FIS E		8	3	-	,		2	-		-	M6	M8 1x85	M10 M1: 15x85
Anchor rod and internal threa	ded an	chor	FIS E	witho	out pe	rforat	ed sl	eeve			-	1205	15205
Effective hef [mm		100	50	100	50	100	50	100	50	100		8	5
Max. installation max T _{inst} [Nm	-			0 A		1	0				4		10
General installation paramete Edge distance cmin = ccr	rs						7	5					
Sec II = Smin II [mm	1							h _{ef}					
Spacing $\frac{s_{cr} \perp s_{min} \perp}{s_{cr} \perp s_{min} \perp}$							3x	h _{ef}					
Drilling method	\$1.												
Hammer drilling with hard metal				nust no	t be le	ess tha	n 80%	6 of the	e mea	in comp	oress	sive stre	ngth.
¹⁾ The compressive strength Table C18.2: Group fact		-											
¹⁾ The compressive strength Table C18.2: Group fact Anchor rod		6	N	18	M	10	М	12	N	16		-	-
¹⁾ The compressive strength Table C18.2: Group fact Anchor rod Internal threaded anchor	ors	6	N	18	M	10	M	12 -	N	- -	M6		- M10 M1
¹⁾ The compressive strength Table C18.2: Group fact Anchor rod	ors	6	N	-	<u>.</u>			12 -	M	-		- M8 1x85	- M10 M1 15x85



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 **M**8 M6 M10 M12 M16 Anchor rod M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Tension resistance N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c} [kN] depending on the mean compressive strength f_b; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C)²⁾ Effective anchorage depth hef [mm] Mean compressive Use strength / Min. comconpressive strength 50 100 50 100 50 100 50 100 50 100 85 ditions single brick 1) 4,0 7,0 5.0 6,0 6,0 5.5 7,5 5.5 w/w w/d 4,0 5,0 12,5 / 10 N/mm² 7,0 7,0 12,0 8.0 9.5 8.0 10.0 9.0 11,5 9.0 d/d w/w w/d 5.5 6.0 10.0 7.0 8.5 7.0 9.0 8.0 11.0 8.0 25 / 20 N/mm² 8,5 11,5 12,0 12,0 12,0 12,0 12,0 d/d 10,5 12,0 11,0 w/w w/d 4.5 12,0 11,5 12,0 12.0 12,0 12.0 12.0 12.0 8.0 45 / 36 N/mm² d/d 8.0 12.0 12,0 12,0 12.0 12.0 12,0 12,0 12,0 12.0 1) The compressive strength of the single brick must not be less than 80% of the mean compressive strength. 2) For temperature range 72/120°C: NRk (72/120°C) = 0,83 · NRk (50/80°C). Table C19.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading M6 **M8** M10 M12 M16 Anchor rod M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Shear resistance $V_{Rk} = V_{Rk,b} = V_{Rk,c,\parallel} = V_{Rk,c,\perp}$ [kN] depending on the mean compressive strength f_b; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive Effective anchorage depth her [mm] Use strength / Min. comconpressive strength 85 ≥ 50 ditions single brick ¹⁾ w/w w/d 12,5 / 10 N/mm² 3.0 5.0 5.5 4.0 4.0 3.0 5,0 5.5 4.0 d/d w/w w/d 25 / 20 N/mm² 4.5 7,0 7,5 6.0 7,0 7.5 6.0 6,0 4.5 d/d w/w w/d 45 / 36 N/mm² 11.0 12.0 4.5 9.0 11.0 12.0 12.0 4.5 9.0 d/d 1) The 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 C 123.

fischer injection system FIS V Plus for masonry

Performance

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

Annex C 19



115 +		Produ	ucer										-		
× /	95	Nomi	nal di	mensi	ons				[mn	n]	length		width W		ght H
113	2.	Mean	aros	e day o	density	10			[kg/d	m ³ 1	≥ 240		≥ 115 1,8	2	113
× I	>34	-	-		ve stre		/ Min.		1997	60.001				<u>e</u> 1939	ä
* 2.					ngth s)	[N/n	nm²]	1	2,5 /	10 or 2	5/20)
240		Stand	dard o	r anne	ex						EN 7	71-2	2:2011+	A1:2	015
Table C20.1:	Installation (Pre-positio				e with	per	forate	ed sle	eeve l	FIS	HK)				
Anchor rod		M6	M8		-	M8	M10	M8	M10		-	M12	M16	M12	M16
Internal threade	ed .		-	M6	M8		-		-) M12		-		-
anchor FIS E				11:	x85					15	x85	<u> </u>			
Perforated slee		-	x85	F10 F	16>				(130		20)	(85		20)	130
Anchor rod and Max. installation torque	max T _{inst} [Nm]		2		with	perio	rated	sieev	4						
General installa	tion parameter	s													
Edge distance	Cmin = Ccr							1	00				10		
Spacing		2	55		25	5		3	90		25	55		3	90
Drilling method Hammer drilling					nust no	ot be l	ess tha	an 80%	% of the	e mea	an com	press	sive stre	ngth.	_
¹⁾ The compr Table C20.2:	-	ors													
Table C20.2:	Group facto			N 8	M8	M	10	M8	M10) [M12	M16	5 M1	2	M16
ine comp	Group facto	M6	12x85	V18	M8 16	M [.] 5x85	10	M8 16×	M10 130) [V12 20x1	M16 85		2 20x13	M16 30
Table C20.2: Anchor rod Perforated slee Group $\alpha_{g,N}$ factors $\alpha_{g,N}$	Group facto	M6					10	16x) [



		k KS, EN 771-2:	2011+A1:2015		
Table C21.1:	Installation (Push throu	parameters Igh anchorage wit	th perforated sle	eve FIS H K)	
Anchor rod		M10	M12		M16
Perforated sleev	e FIS H K	000000000	0/200	2:	2x130/200
Anchor rod with	perforated sle	eve FIS H K			
Max. installation torque	max T _{inst} [Nm]			4	
General installat	ion parameter	S			
Edge distance	Cmin = Cor			100	
	Smin II			390	
Spacing	s _{cr} II [mm]			390	
	<u> </u>			390	
Drilling mothod	S _{cr} ⊥		•	390	
Drilling method Hammer drilling w	/ith hard metal	hammer drill			
Table C21.2:	Group facto		1440		B6 40
Anchor rod Perforated sleev		M10 18x13	M12	2.	M16 2x130/200
	N (Smin II)	IOAIJ	0/200	Z.	24130/200
$\begin{array}{c} \text{Group} & \underline{\alpha_g} \\ \text{factors} & \underline{\alpha_{g,}} \end{array}$, <u>∨ (Smin II)</u> , <u>∨ (Smin II)</u> ∧ (Smin ⊥) ∨ (Smin ⊥)			2	
fischer injectio	on system FIS	S V Plus for masc	onry		
Performance Solid calcium sili	cate brick KS, c	dimensions, installati	on parameters		Annex C 21



Anchor rod		M6 M8			M8	M10	M8 M10	-	M12 M16	M12 M16
Internal threaded anchor FIS E		-	M6	M8 x85	-		-	M10 M12 15x85	-	-
Perforated sleeve FI	ѕнк	12x85	+ •		x85		16x130		x85	20x130
Tension resistance N									mpressive	
strength f _b ; Installation	on and use	e condition	1 w/w,	, d/d; (temper	ature	e range 50/	80°C) ²⁾		
Mean compressive strength / Min. com-	Use									
pressive strength	con- ditions									
single brick ¹⁾	ultions									
12,5 / 10 N/mm ²	w/w	3,5		2,0	2,0)	2.0	6	.5	4,5
12,57 10 14/11/11	d/d	6,0		4,0	3,5	5	3,5	10),5	7,0
25 / 20 N/mm ²	w/w	5,0	;	3,0	3,0)	3,0	9	.5	6,0
23720 W/IIIII-	d/d	8,5		5,5	5,5	5	5,5	12	2, 0	10,0
sir		or under	tensi	•	ading	(Pus	h through			
Anchor rod		M ²				12			M16	
Perforated sleeve Fl				3x130/					x130/200	
Fension resistance N strength f₀; Installatio									mpressive	
Mean compressive					•		•			
strength / Min. com-	Use con-									
	0011									
pressive strength	ditions									
pressive strength										
pressive strength	w/w			2.0					4.5	
pressive strength single brick ¹⁾	w/w d/d			3,5					7,0	
pressive strength single brick ¹⁾	w/w d/d w/w			3,5 3,0					7,0 6.0	
pressive strength single brick ¹⁾ 12,5 / 10 N/mm ² 25 / 20 N/mm ²	w/w d/d w/w d/d		hrial	3,5 3,0 5,5					7,0 6.0 10,0	
pressive strength single brick ¹⁾ 12,5 / 10 N/mm ²	w/w d/d w/w d/d e strength o			3,5 3,0 5,5 must no			n 80% of the	e mean com	7,0 6.0 10,0	ngth.
pressive strength single brick ¹⁾ 12,5 / 10 N/mm ² 25 / 20 N/mm ² ¹⁾ The compressive ²⁾ For temperature	w/w d/d w/w d/d e strength o e range 72/	120°C no p	erfori	3,5 <u>3,0</u> 5,5 must no mance	assess	ed.	n 80% of the	e mean com	7,0 6.0 10,0	ngth.
pressive strength single brick ¹⁾ 12,5 / 10 N/mm ² 25 / 20 N/mm ² ¹⁾ The compressive	w/w d/d w/w d/d e strength o e range 72/	120°C no p	erfori	3,5 <u>3,0</u> 5,5 must no mance	assess	ed.	in 80% of the	e mean com	7,0 6.0 10,0	ngth.
pressive strength single brick ¹⁾ 12,5 / 10 N/mm ² 25 / 20 N/mm ² ¹⁾ The compressive ²⁾ For temperature	w/w d/d w/w d/d e strength o e range 72/	120°C no p	erfori	3,5 <u>3,0</u> 5,5 must no mance	assess	ed.	n 80% of the	e mean com	7,0 6.0 10,0	ngth.
pressive strength single brick ¹⁾ 12,5 / 10 N/mm ² 25 / 20 N/mm ² ¹⁾ The compressive ²⁾ For temperature	w/w d/d w/w d/d e strength o e range 72/	120°C no p	erfori	3,5 <u>3,0</u> 5,5 must no mance	assess	ed.	in 80% of the	e mean com	7,0 6.0 10,0	ngth.
pressive strength single brick ¹⁾ 12,5 / 10 N/mm ² 25 / 20 N/mm ² ¹⁾ The compressive ²⁾ For temperature	w/w d/d w/w d/d e strength o e range 72/	120°C no p	erfori	3,5 <u>3,0</u> 5,5 must no mance	assess	ed.	In 80% of the	e mean com	7,0 6.0 10,0	ngth.
pressive strength single brick ¹) 12,5 / 10 N/mm² 25 / 20 N/mm² ¹⁾ The compressive ²⁾ For temperature	w/w d/d w/w d/d e strength o e range 72/	120°C no p	erfori	3,5 <u>3,0</u> 5,5 must no mance	assess	ed.	n 80% of th	e mean com	7,0 6.0 10,0	ngth.
bressive strength single brick ¹⁾ 12,5 / 10 N/mm² 25 / 20 N/mm² ¹⁾ The compressive ²⁾ For temperature	w/w d/d w/w d/d e strength o e range 72/	120°C no p	erfori	3,5 <u>3,0</u> 5,5 must no mance	assess	ed.	in 80% of the	e mean com	7,0 6.0 10,0	ngth.
pressive strength single brick ¹) 12,5 / 10 N/mm² 25 / 20 N/mm² ¹⁾ The compressive ²⁾ For temperature	w/w d/d w/w d/d e strength o e range 72/	120°C no p	erfori	3,5 <u>3,0</u> 5,5 must no mance	assess	ed.	In 80% of the	e mean com	7,0 6.0 10,0	ngth.
pressive strength single brick ¹⁾ 12,5 / 10 N/mm ² 25 / 20 N/mm ² ¹⁾ The compressive ²⁾ For temperature	w/w d/d w/w d/d e strength o e range 72/	120°C no p	erfori	3,5 <u>3,0</u> 5,5 must no mance	assess	ed.	in 80% of the	e mean com	7,0 6.0 10,0	ngth.
pressive strength single brick ¹⁾ 12,5 / 10 N/mm ² 25 / 20 N/mm ² ¹⁾ The compressive ²⁾ For temperature Factor for job site te	w/w d/d w/w d/d e strength o e range 72/ ests and dis	120°C no p	s see	3,5 3.0 5,5 must no nance annex	assess C 123.	ed.	In 80% of the	e mean com	7,0 6.0 10,0	ngth.
pressive strength single brick ¹⁾ 12,5 / 10 N/mm ² 25 / 20 N/mm ² ¹⁾ The compressive ²⁾ For temperature	w/w d/d w/w d/d e strength o e range 72/ ests and dis	120°C no p	s see	3,5 3.0 5,5 must no nance annex	assess C 123.	ed.	In 80% of the	e mean com	7,0 6.0 10,0	



	aracteris chor und									~	ailure of a	single
Anchor rod		M6	M8	-		M8	M10	M8	M10	-	M12 M16	M12 M16
Internal threaded				M6	M8		-			M10 M12		
anchor FIS E		52	•i	11x	85				-	15x85	-	3.53
Perforated sleeve FIS	нк	12>	(85		16:	x85		16>	130	20	x85	20x130
Shear resistance V _{Rk} = Installation and use co										ompressiv	e strength f	b;
Mean compressive strength / Min. com- pressive strength single brick ¹⁾	Use con- ditions											
12,5 / 10 N/mm ²	w/w d/d	3,0							3,5			
25 / 20 N/mm ²	w/w d/d	4,0							5,5			
	range 72	/120°C tic re	c no p sista	erform nce to	ance D loc	asse: al bri	ssed. ck fai	ilure	or bri	ick edge f	pressive stre	
Anchor rod		8	M1	0	1	1	M12	-			M16	
Perforated sleeve FIS	нк			1007	130/2					22	x130/200	
Shear resistance VRk =		Rk,c,II =	VRk,c				g on t	he m	ean c			b;
Installation and use co Mean compressive strength / Min. com- pressive strength single brick ¹⁾	Use con- ditions	v/w, d	/d; (te	empera	ature	rang	e 50/8	<u>0°C)</u> 2				
12,5 / 10 N/mm ²	w/w d/d							3	,5			
25 / 20 N/mm²	w/w d/d							5	,5			
 The compressive For temperature Factor for job site tes 	range 72	/120°C) no p	erform	ance	asse	ssed.	ın 80%	% of th≀	e mean com	pressive stre	ngth.
fischer injection sy	stem FIS	SVP	lus f	or ma	sonr	.À						
Performance Solid calcium silicate I	orick KS, (Charao	cterist	ic resis	stance	e unde	er shea	ar loa	ding		Annex	C 23



Perforated cal	cium si	ilicat	e br	ick ł	<sl< th=""><th>, 3D</th><th>F, El</th><th>N 77</th><th>1-2:</th><th>2011</th><th>+A′</th><th>1:201</th><th>15</th><th></th><th></th><th></th><th></th></sl<>	, 3D	F, El	N 77	1-2:	2011	+A′	1:201	15				
/	\$						Proc	ducer	Į.								
	175	82											leng	th L	widt	h W	height I
		>	Nom	inal d	limen	isions	6			1	mm]		24	0	17	75	113
		-	Mea	n gros	ss dr	y den	sity p)		[kg/d	m ³]			≥ ′	1,4	
Y		× 113		n com press				•)	[N/	mm²]				/ 10 c or 25	or 15 / 1: 5 / 20
	240	*	-	dard				igio b	ion	0			1.000				1:2015
				C	30, 12,			1					Dime Anne			e also	i.
Table C24.1:	Installa (Pre-p					ge v	vith p	oerfo	rate	d sle	eve	FIS	HK)				
Anchor rod			M6	M8	M6	M8		-	M8	M10	M8	M10	-		M12	M16	M12 M ²
Internal threaded anchor FIS E	l			-		-	M6	M8 x85	-	-		-	M10 15x			-	-
Perforated sleeve	FISH	<	12	x50	12:	x85		16	x85		16>	130		20)	(85		20x13
Anchor rod and i	nternal t	thread	led a	ncho	r FIS	Ew	ith pe	erfora	ated	sleev	e FIS	внк					
Max. installation r	nax T _{inst}	[Nm]								2	2						
General installati	on para	meter	s														
Edge distance	Cmin = Ccr			6	0							8	0				
	s _{min} II									10	00						
Spacing	S _{cr} II	[mm]								24	10						
opaonig	S _{min} ⊥	-	<u> </u>							11							
	s _{cr} ⊥									11	15						
Drilling method																	
Hammer drilling w																	
¹⁾ The compres Table C24.2:	ssive stre Group	-		single	brick	c mus	t not i	be les	is tha	n 80%	6 of ti	ne me	an co	mpre	ssive	stren	gth.
Anchor rod			M6	M8	M6	M8		-	M8	M10	M8	M10	-		M12	M16	M12 M ²
Internal threaded FIS E	anchor			-		-	M6	M8 x85	-	-		-	M10 15x			-	-
Perforated sleeve	FIS H P	<	12	x50	12:	x85		16:	x85		16>	(130		20)	(85		20x13
	Smin II) = ,∨(Smin II)									1,	,5						
• •	S _{min} ⊥) = √ (S _{min} ⊥)	[-]								2,	,0						
fischer injectio	n syste	m FIS	SVI	Plus	for r	naso	onry										
Performance														1	An	nex (C 24



Perforated cal	cium silicat	e brick KSL, 3DI	F, EN 771-2:201	1+A1:2015	
Table C25.1:	Installation (Push throu	parameters gh anchorage wi	th perforated sle	eve FIS H K)	
Anchor rod		M10	M12		M16
Perforated sleev	e FIS H K	18x13	0/200	22	2x130/200
Anchor rod with	perforated sle	eve FIS H K			
Max. installation torque	max T _{inst} [Nm]			2	
General installat	ion parameter	5			
Edge distance	C _{min} = C _{cr}		(C)	80	
	s _{min} II			00	
Spacing	s _{cr} II [mm]		0.5	40	
	S _{min} ⊥			15	
	S _{cr} ⊥		1	15	
Drilling method	:41- 1				
Hammer drilling w	vith hard metal I	nammer drill			
Table C25.2:	Group facto				
Anchor rod		M10	M12		M16
Perforated sleev		18x13	0/200	22	2x130/200
Group 🔐	_{I,N} (Smin II) _{I,V} (Smin II) (-] [-]		1	1,5	
	<u>N (Smin ⊥)</u> ,∨ (Smin ⊥)		2	2,0	
fischer injectio	on system FIS	S V Plus for mase	onry		
Performance Perforated calciu	ım silicate brick	KSL, 3DF, dimensic	ns, installation para	meters	Annex C 25



sindle	anchor u	nder te	nsion la) adina	Pre-posi	tioned ar	nchorage	<u>,</u>)	
Anchor rod			M6 M8	-		M8 M10		M12 M16	M12 M1
Internal threaded anchor FIS E		-	-	M6 M8 11x85	-		M10 M12 15x85	· · · · · · · · · · · · · · · · · · ·	-
Perforated sleeve FIS H	к	12x50	12x85		x85	16x130	20)	x85	20x130
Tension resistance N _{Rk} = strength fь; Installation a	N _{Rk,p} = N _{Ri} nd use cor	,, b = N _{Rk,}	p,c = N Rk,b	,c [kN] d d/d; (ter	epending nperature	on the me	an comp /80°C) ²⁾	ressive	
Mean compressive stre- ngth / Min. compressive strength single brick ¹⁾	Use con- ditions								
10 / 8 N/mm²	w/w w/d d/d		,5 ,5		2.0 2,0	2,0 2,5	2.		2.0 2,5
12,5 / 10 N/mm²	w/w w/d	2	.,0 :,0	2	2.0 2,5	2,5 3,0	2.	,5	2.5 3,0
15 / 12 N/mm²	w/w w/d d/d	2	5	2	2,5	3,0	3,	.0	3,0
20 / 16 N/mm ²	w/w w/d	3	.,5 .,0	3	3,0 3,5	3,5 4,5	3.	.5	3,5 4.5
25 / 20 N/mm ²	d/d w/w w/d d/d	4	,5 .0 .5	4	4,0 4.5 5,0	4,5 5,5 6,0	4, 5, 6,	,5	4,5 5.5 6,0
	cteristic r	esistan	ce to pi	ull-out fa	ailure or l				
Table C26.2: Chara single Anchor rod	cteristic r anchor u	esistan	ce to pu nsion lo	ull-out fa bading (M	ailure or l		chorage) M	16	
Table C26.2: Chara single Anchor rod Perforated sleeve FIS H	cteristic r anchor u K	esistan nder te M1	ce to pu nsion lo 10 18x1	ull-out fa bading (<u>M</u> 30/200	ailure or Push thr 12	ough an	chorage) M 22x13	16 30/200	
Table C26.2: Chara single Anchor rod Perforated sleeve FIS H Fension resistance N _{Rk} =	cteristic r anchor u K N _{RK,P} = N _{RK}	esistan nder te M1	ce to pu nsion lo 10 18x1	ull-out fa bading (<u>M</u> 30/200	ailure or Push thr 12 epending	ough and on the me	chorage) M 22x13 an comp	16 30/200	
Table C26.2: Chara single Anchor rod Perforated sleeve FIS H Tension resistance N _{Rk} = strength f _b ; Installation at Mean compressive strength / Min. compressive	cteristic r anchor u K N _{RK,P} = N _{RK}	esistan nder te M1	ce to pu nsion lo 10 18x1	ull-out fa bading (<u>M</u> 30/200	ailure or Push thr 12 epending	ough and on the me	chorage) M 22x13 an comp	16 30/200	
Table C26.2: Chara single Anchor rod Perforated sleeve FIS H Tension resistance N _{Rk} = strength f _b ; Installation at Mean compressive strength / Min. compressive	Cteristic r anchor u K N _{Rk,p} = N _{Rk} nd use con Use con-	esistan nder te M1	ce to pu nsion lo 10 18x1	ull-out fa bading (<u>M</u> 30/200	ailure or Push thr 12 epending	ough and on the me	chorage) M 22x13 an comp	16 30/200	
Table C26.2: Charasingle Anchor rod Perforated sleeve FIS H Fension resistance NRk = strength fb; Installation at Mean compressive strength / Min. compressive strength single brick ¹)	Cteristic r anchor u K N _{Rk,p} = N _{Rk} nd use cor Use con- ditions w/w w/d	esistan nder te M1	ce to pu nsion lo 10 18x1	ull-out fa bading (<u>M</u> 30/200	ailure or Push thr 12 epending	ough and on the me range 50, 2,0 2,5 2,5	chorage) M 22x13 an comp	16 30/200	
Table C26.2: Chara single Anchor rod Perforated sleeve FIS H Fension resistance NRk = strength fb; Installation at Mean compressive strength / Min. compressive strength single brick ¹⁾ 10 / 8 N/mm ²	Cteristic r anchor u K NRk,p = NRH nd use cor ditions W/W W/d d/d W/W W/d d/d W/W W/d	esistan nder te M1	ce to pu nsion lo 10 18x1	ull-out fa bading (<u>M</u> 30/200	ailure or Push thr 12 epending	ough and on the me range 50, 2,5 2,5 3,0 3.0	chorage) M 22x13 an comp	16 30/200	
Table C26.2: Chara single Anchor rod Perforated sleeve FIS H Tension resistance NRk = strength fb; Installation at Mean compressive strength / Min. compressive strength single brick ¹⁾ 10 / 8 N/mm ² 12,5 / 10 N/mm ²	cteristic r anchor u K NRk,p = NRH nd use cor ditions W/W W/d d/d W/W W/d d/d w/w W/d d/d w/w W/d	esistan nder te M1	ce to pu nsion lo 10 18x1	ull-out fa bading (<u>M</u> 30/200	ailure or Push thr 12 epending	2.0 2.5 2.5 3.0 3.5 4.5	chorage) M 22x13 an comp	16 30/200	
Table C26.2: Chara single Anchor rod Perforated sleeve FIS H Perforated sleeve FIS H Fension resistance NRk = Strength fь; Installation a Mean compressive strength / Min. compressive strength / Min. compressive strength single brick ¹⁾ 10 / 8 N/mm ² 12,5 / 10 N/mm ² 15 / 12 N/mm ²	cteristic r anchor u K N _{Rk,p} = N _{Ri} nd use cor Use con- ditions W/W W/d d/d W/W W/d d/d W/W W/d d/d	esistan nder te M1	ce to pu nsion lo 10 18x1	ull-out fa bading (<u>M</u> 30/200	ailure or Push thr 12 epending	2.0 2.5 2.5 3.0 3.5 4.5 4.5 5.5	chorage) M 22x13 an comp	16 30/200	
Table C26.2: Charasingle Anchor rod Perforated sleeve FIS H Perforated sleeve FIS H Tension resistance NRk = Strength fb; Installation and Mean compressive strength / Min. compressive strength / Min. compressive strength single brick ¹⁾ 10 / 8 N/mm ² 12,5 / 10 N/mm ² 15 / 12 N/mm ² 20 / 16 N/mm ²	Cteristic r anchor u K NRk,p = NRind Use con- ditions W/w w/d d/d w/w w/d d/d w/w w/d d/d w/w w/d d/d w/w w/d d/d d/d w/w w/d d/d d/d w/w w/d d/d d/d	esistan nder te M1 .,b = NRk,j ndition v	ce to pu insion lo 10 18x1 p,c = NRk,b v/w, w/d,	all-out fa bading (<u>M</u> 30/200 .c [kN] d d/d; (ter	ailure or Push thr 12 epending nperature	ough and on the me range 50, 2,5 2,5 3,0 3,5 4,5 4,5 4,5 5,5 6,0	chorage) M 22x13 ean comp /80°C) ²⁾	16 30/200 ressive	gth.
Table C26.2: Charasingle Anchor rod Perforated sleeve FIS H Tension resistance NRk = strength fb; Installation and Mean compressive strength / Min. compressive strength single brick ¹⁾ 10 / 8 N/mm ² 10 / 8 N/mm ² 12,5 / 10 N/mm ² 20 / 16 N/mm ² 25 / 20 N/mm ² ¹⁾ The compressive stream ¹⁾ The compressive stream ²⁾ For temperature range	cteristic r anchor u K NRk,p = NRi duse cor ditions W/W W/d d/d W/W W/d d/d w/w W/d d/d w/w W/d d/d w/w W/d d/d w/w W/d d/d w/w W/d d/d w/w W/d d/d	esistan nder te M1 s,b = NRk, ndition v	ick must r	not be less 3 · NRk (50/k x C 123.	ailure or Push thr 12 epending nperature	ough and on the me range 50, 2,5 2,5 3,0 3,5 4,5 4,5 4,5 5,5 6,0	chorage) M 22x13 ean comp /80°C) ²⁾	16 30/200 ressive	



Perforated calciu	m sil	licat	e bri	ick k	SL,	3DI	F, EN	77	1-2:2011	+A1:20	15			
										or brick e nchorage	-	ure of a :	singl	e
Anchor rod			M6	M8	M6	M8	-		M8 M10	M8 M10	-	M12 M16	M12	M16
Internal threaded anchor FIS E			.	-		-	M6	M8 85	-	-	M10 M12 15x85	-		-
Perforated sleeve FI	ѕнк		12>	<50	12:	x85		16>	(85	16x130	20	x85	20x	130
Shear resistance V _{Rk} Installation and use o	= V _{Rk}	_b = V tion v	'Rk,c,ll [:] v/w, \	= V _{Rk} w/d, o	,⊥ [I d/d; ('	(N] d temp	epend eratur	ling re ra	on the m inge 50/80	ean comp)°C and 72	ressive st 2/120°C)	trength f₀	;	
Mean compressive strength / Min. com- pressive strength single brick ¹⁾	cc	se on- ons												
10 / 8 N/mm ²		w/d /d			1,5					3,0		2,5	3,0	2,5
12,5 / 10 N/mm²		w/d /d			2,0						3,5			
15 / 12 N/mm²		w/d /d			2,5					4,5		4,0	4,5	4,0
20 / 16 N/mm²			3,0	3,5	3,0	3,5	3,0			6,0		5,5	6,0	5,5
25 / 20 N/mm ²	$\frac{d/d}{d/d} = \frac{1}{4}, \frac{1}{$							6,5	7,5	6,5				
	arac	teris	tic re	esist near	ance	e to I	ocal b	oric	k failure ough an	or brick e chorage	edge failı)		-	e
Perforated sleeve FI	ѕнк				1	8x13	30/200				22x13	30/200		
Shear resistance V _{Rk} Installation and use o												trength fb	;	
Mean compressive strength / Min. com- pressive strength single brick ¹⁾	cc	se on- ons												
10 / 8 N/mm ²						3	.0				2	.5		
12,5 / 10 N/mm ²		/w				3	.5				3	.5		
15 / 12 N/mm ²		/d /d	<u> </u>				.5					.0		
20 / 16 N/mm² 25 / 20 N/mm² 7.5									. <u>5</u> .5					
¹⁾ The compressive Factor for job site te	23	vo voite				must	not be		s than 80%	of the mea			gth.	
fischer injection s Performance Perforated calcium si loading	-						-	resis	tance und	er shear		Annex	C 27	,



Vertical perfora	ated bi	rick H	ΗLΖ,	EN	771-	1:20)11+A1:	201	5						
	13	240)	1				Producer					e.g. V	Vie	nerberger,	Poroton
		\sim										length	L	width W	height H
		N	Nom	inal d	limen	sions	3			[mi	m]	500	-	175	237
		237		500 AMA 5090		177-34 7 -31-3	00-4-2-18 (File)			-		370	ši.	240	237
~~			in the second second				sity p			[kg/c	lm³]	2.01		≥ 1,0	
	500 (370)	\$					strength / I th single b		1)	[N/	mm²]			7,5 / 6 or <i>1</i> / 10 or 15	
			Stan	dard	or an	inex						ENT	771	-1:2011+A	1:2015
Table C28.1:	Installa	ation	para	mot											sion see nnex B 15
	mətana	ation											2		
Anchor rod			M6	M8	M6	M8	- M6 M8	- M8	M10	M8	M10	- M10 M	12	M12 M16	M12 M16
Internal threaded FIS E	anchor			-		-	11x85		-		-	15x8		-	-
Perforated sleeve	FISH M	۲	12	x50	12	x85	16:	x85		16x	130		20>	(85	20x130
Anchor rod and in	nternal f	thread	led a	ncho	r FIS	Ew	ith perfora	ated	sleev	e FIS	нк				
Max. installation n torque	nax T _{inst}	[Nm]							2	2					
General installation	on para	meter	s												
Edge distance	Cmin = Ccr		-						50000	00					
8	Smin II	[-						500 (00					
Spacing	- 13 W	[mm]	-							(370) 20					
-	S _{min} ⊥ S _{cr} ⊥								24						
Drilling method															
Hammer drilling wi	ith hard ı	metal l	hamr	ner dı	rill										
¹⁾ The compres	ssive stre	ngth o	f the	single	brick	k mus	t not be les	is tha	an 80%	6 of th	ie me	an com	pre	ssive stren	gth.
Table C28.2:	Group	facto	rs		-										
Anchor rod			M6	M8	M6	M8	-	M8	M10	M8	M10			M12 M16	M12 M16
Internal threaded FIS E	anchor			-		-	M6 M8 11x85		-		-	M10 M 15x8		-	-
Perforated sleeve	FISH	‹	12	x50	12	x85		x85		16x	130	-		(85	20x130
α _{g,N} (s	Smin II) =														
factors $\alpha_{g,N}$ (s	∨ (Smin II) Smin ⊥) = ⁄ (Smin ⊥)	[-]	-						1	1					
fischer injectior	n syste	m FIS	S V I	Plus	for r	naso	onry								
Performance Vertical perforated	d brick H	ILz, dii	mens	ions,	insta	Ilatio	n paramet	ers						Annex	C 28



Table C29.1: Chara	acteristic	resistan	ice to pi	ill-out f:	ailure or	brick hre	akout fai	ilure of a	1
	anchor		•				anour lu		L .
Anchor rod		M6 M8	M6 M8	-	M8 M10	M8 M10		M12 M16	M12 M1
Internal threaded anchor FIS E		-	-	M6 M8 11x85	-	-	M10 M12 15x85	-	-
Perforated sleeve FIS H	к	12x50	12x85	16	x85	16x130	20:	x85	20x130
Tension resistance N _{Rk} = atrength f _b ; Installation a								ressive	
Mean compressive stre-	Use	0							
ngth / Min. compressive	con-								
strength single brick ¹⁾	ditions			r					1
5 / 4 N/mm²	w/w w/d	-	30			0.90			1,20
	d/d		40			0,90			1,20
7,5 / 6 N/mm²	w/w w/d d/d		<u>50</u> 60			1,50			2,00
	w/w w/d	'	75			1,50			2,00
10 / 8 N/mm²	d/d		75 75			<u>2,00</u> 2,00			2,50
	w/w w/d	· · ·	90			2,00			3.00
12,5 / 10 N/mm ²	d/d	-	<u>90</u>			2,50			3,50
	w/w w/d		90			3,00			3,50
15 / 12 N/mm²	d/d		20			3,00			4,00
ancho	nge 72/120 acteristic or under	resistan shear lo	_{2/120°C)} = 0 ce to lo ading	,83 · N _{Rk}	(50/80°C). k failure	or brick e	edge fail		single
Table C29.2: Chara ancho Anchor rod Internal threaded	acteristic	resistan shear lo	_{2/120°C)} = 0 I <mark>ce to lo</mark>	,83 · N _{Rk} cal bric _ 	(50/80°C). k failure	or brick e	edge fail - M10 M12	ure of a : M12 M16	single
Table C29.2: Chara ancho Anchor rod Internal threaded anchor FIS E	acteristic or under	resistan shear loa M6 M8	2/120°C) = 0 Ice to log ading M6 M8	,83 · N _{Rk} cal bric - M6 M8 11x85	(50/80°C). k failure <u>M8 M10</u> -	or brick e <u>M8 M10</u> -	edge fail - M10 M12 15x85	ure of a : M12 M16	single
Table C29.2: Chara ancho Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H	k	resistan shear loa M6 M8 - 12x50	2/120°C) = 0 ice to loc ading M6 M8 - 12x85	,83 · N _{Rk} cal bric - M6 M8 11x85 16	(50/80°C). k failure <u>M8 M10</u> - ix85	or brick (<u>M8 M10</u> - 16x130	edge fail - M10 M12 15x85 20:	ure of a : M12 M16 - x85	single M12M1
Table C29.2: Chara anchor anchor Anchor rod Internal threaded Internal threaded anchor FIS E Perforated sleeve FIS H Shear resistance V _{Rk} = V Installation and use conditionant use condi	K Rk,b = VRk,c	resistan shear loa M6 M8 12x50	2/120°C) = 0 ice to lo ading <u>M6 M8</u> - 12x85 _ [kN] de	,83 · N _{Rk} cal bric - <u>M6 M8</u> 11x85 16 pending	(50/80°C). k failure <u>M8 M10</u> - ix85 on the me	or brick e M8 M10 - 16x130 ean comp	edge fail 	ure of a : M12 M16 - x85	single M12M1
Table C29.2: Chara anchor Anchor rod Internal threaded Internal threaded anchor FIS E Perforated sleeve FIS H Shear resistance V _{Rk} = V Shear resistance V _{Rk} = V nstallation and use cone Mean compressive stre- Mean compressive stre-	K K K Kk,b = VRk,c dition w/w	resistan shear loa M6 M8 12x50	2/120°C) = 0 ice to lo ading <u>M6 M8</u> - 12x85 _ [kN] de	,83 · N _{Rk} cal bric - <u>M6 M8</u> 11x85 16 pending	(50/80°C). k failure <u>M8 M10</u> - ix85 on the me	or brick e M8 M10 - 16x130 ean comp	edge fail 	ure of a : M12 M16 - x85	single M12M1
Table C29.2: Chara anchor anchor Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H Shear resistance V _{Rk} = V Shear resistance V _{Rk} = V Installation and use cond Mean compressive strength / Min. compressive Strength / Min.	K Rk,b = VRk,c	resistan shear loa M6 M8 12x50	2/120°C) = 0 ice to lo ading <u>M6 M8</u> - 12x85 _ [kN] de	,83 · N _{Rk} cal bric - <u>M6 M8</u> 11x85 16 pending	(50/80°C). k failure <u>M8 M10</u> - ix85 on the me	or brick e M8 M10 - 16x130 ean comp	edge fail 	ure of a : M12 M16 - x85	single M12M1 - 20x130
Table C29.2: Chara anchor anchor Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H Shear resistance V _{Rk} = V Shear resistance V _{Rk} = V Installation and use conditioned use	K K K K K K K K K K K K K K	resistan shear loa M6 M8 12x50	2/120°C) = 0 ice to loc ading M6 M8 - 12x85 [kN] dej ; (tempe	,83 · N _{Rk} cal bric - <u>M6 M8</u> 11x85 16 pending	(50/80°C). k failure <u>M8 M10</u> - ix85 on the me	or brick e M8 M10 - 16x130 ean comp	edge fail M10 M12 15x85 20: ressive st 2/120°C)	ure of a : M12 M16 - x85	single M12M1
Table C29.2: Chara anchor anchor Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H Shear resistance VRk = V Shear resistance VRk = V Installation and use come Mean compressive strength / Min. compressive strength single brick ¹⁾	K K K K K k,b = VRk,c dition w/w Use con- ditions	resistan shear loa M6 M8 12x50	2/120°C) = 0 ice to log ading M6 M8 - 12x85 [kN] de ; (tempe	,83 · N _{Rk} cal bric - M6 M8 11x85 16 pending rature ra	(50/80°C). k failure <u>M8 M10</u> - ix85 on the me	or brick e M8 M10 - 16x130 ean comp 0°C and 72	edge fail M10 M12 15x85 20: ressive st 2/120°C)	ure of a s M12 M16 - x85 trength f⊳	single M12 M1 - 20x130
Table C29.2: Chara anchor anchor Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H Shear resistance V _{Rk} = V Shear resistance V _{Rk} = V Installation and use come Mean compressive strength / Min. compressive strength single brick ¹⁾ 5 / 4 N/mm ²	K K K K K k,b = VRk,c dition w/w Use con- ditions w/w w/d	resistan shear loa M6 M8 12x50	2/120°C) = 0 ce to loc ading M6 M8 - 12x85 [kN] de ; (tempe 0, 0,	,83 · N _{Rk} cal bric - M6 M8 11x85 16 pending rature ra	(50/80°C). k failure <u>M8 M10</u> - ix85 on the me	or brick e M8 M10 - 16x130 ean comp 0°C and 72 0,60	edge fail M10 M12 15x85 20: ressive st 2/120°C) 0, 0,	ure of a : M12 M16 - x85 trength f⊾	single M12 M1 - 20x130 ; 0,60
Table C29.2: Chara anchor anchor Anchor rod Internal threaded Internal threaded anchor FIS E Perforated sleeve FIS H Shear resistance V _{Rk} = V Shear resistance V _{Rk} = V Nnstallation and use come Mean compressive strength / Min. compressive strength single brick ¹⁾ 5 / 4 N/mm² 5 / 4 N/mm² 7,5 / 6 N/mm²	K K K K K k,b = VRk,c dition w/w Use con- ditions w/w	resistan shear loa M6 M8 12x50	2/120°C) = 0 ce to loc ading M6 M8 - 12x85 [kN] de ; (tempe 0, 0, 0,	,83 · N _{Rk} cal bric M6 M8 11x85 16 pending rature ra	(50/80°C). k failure <u>M8 M10</u> - ix85 on the me	or brick e <u>M8 M10</u> - <u>16x130</u> ean comp 0°C and 72 0,60 0,90	edge fail - M10 M12 15x85 20: ressive st 2/120°C) 0, 0, 0,	ure of a s <u>M12 M16</u> - x85 trength f⊾ 50 75	single M12 M1 - 20x130 ; 0,60 0,90
Table C29.2:Chara anchoAnchor rodInternal threadedanchor FIS EPerforated sleeve FIS HShear resistance $V_{Rk} = V$ Installation and use condMean compressive strength / Min. compressiveStrength single brick 1)5 / 4 N/mm²7,5 / 6 N/mm²10 / 8 N/mm²	K K K K K k,b = VRk,c dition w/w Use con- ditions w/w w/d	resistan shear loa M6 M8 12x50	2/120°C) = 0 ce to loc ading M6 M8 - 12x85 [kN] de ; (tempe 0, 0, 0, 1,	,83 · N _{Rk} cal bric - M6 M8 11x85 16 pending rature ra 50 75 90	(50/80°C). k failure <u>M8 M10</u> - ix85 on the me	or brick e <u>M8 M10</u> - <u>16x130</u> ean comp 9°C and 72 0,60 0,90 1,20	edge fail - M10 M12 15x85 20: ressive st 2/120°C) 0, 0, 0, 1,	ure of a : M12 M16 - x85 trength f⊾ 50 75 90	single M12 M1 20x130 ; 0,60 0,90 1,20
Table C29.2:Chara anchoAnchor rodInternal threadedanchor FIS EPerforated sleeve FIS HShear resistance $V_{Rk} = V$ Installation and use condMean compressive strength / Min. compressivestrength single brick ¹⁾ 5 / 4 N/mm²7,5 / 6 N/mm²10 / 8 N/mm²12,5 / 10 N/mm²	K Rk,b = VRk,c dition w/w Use con- ditions w/w w/d d/d	resistan shear loa M6 M8 - 12x50 ,II = V _{Rk,c,1} , w/d, d/d	2/120°C) = 0 ce to loc ading M6 M8 - 12x85 [kN] de ; (tempe 0, 0, 0, 1, 1, fick must r	,83 · NRk cal bric - M6 M8 11x85 16 pending rature ra 50 75 90 20 50 not be les	(50/80°C). k failure <u>M8 M10</u> - ix85 on the mo inge 50/80	or brick e M8 M10 - 16x130 ean comp 0,60 0,90 1,20 1,50 2,00	edge faile - M10 M12 15x85 20: ressive st 2/120°C) 0, 0, 0, 1, 1, 1,	ure of a : M12 M16 - x85 trength f⊾ 50 75 90 20 50	single M12 M1 - 20x130 ; 0,60 0,90 1,20 1,50 2,00



Vertical perforated brick	HLz, 2	DF, E	EN 771	-1:20)11+A	1:201	5					
115	Produce	er							e.g.	Wiener	berge	r
	Nominal	dimer	nsions				[mm]	le	ngth L	width \		ight H
	Mean gr	oss dr	v densi	h o			[kg/dm ³		240	115 ≥ 1,4		113
	Mean co		-		1			7	5 / 6 or	12,5 / 1		0 / 16
	Min. con					rick 1)	[N/mm	-1	or 25	/ 20 or	35/2	8
240	Standar	d or an	inex	-					EN 771	-1:2011	+A1:2	2015
Table C30.1: Installatio	n paran	neters		- 14 - - 28 -		240					ensior Anne	n see x B 15
Anchor rod	M6	M8	M6	M8		-	M8	M10			M12	M16
Internal threaded anchor FIS E		-			M6	M8 <85	-		M10	M12		-
Perforated sleeve FIS H K	12)	<50	12>	(85			x85		15/	20x	85	
Anchor rod and internal thre					forated			ĸ				
Max. installation max T _{inst} [Nr torque	n]					:	2					
General installation paramet	ers											
Edge distance cmin = ccr							0					
Spacing <u>scr II = smin II</u> [mi	n]						40 15					
$s_{cr} \perp = s_{min} \perp$ Drilling method						1	15					
Hammer drilling with hard meta	al hamme	er drill										
¹⁾ The compressive strength Table C30.2: Group fac		ngle bri	ick must	t not be	e less th	an 80%	% of the m	iean	compre	ssive str	rength	
Anchor rod	M6	M8	M6	M8		_	M8	VI10	-		M12	M16
Internal threaded					M6	M8			M10	M12		
anchor FIS E		-		•	11:	(85	-		15>			-
Perforated sleeve FIS H K	12>	(50	12>	(85		16:	x85			20x	85	
$\begin{array}{c} \begin{array}{c} \alpha_{g,N} (s_{min} \ II) \\ \\ Group \\ factors \end{array} & \begin{array}{c} \alpha_{g,V} (s_{min} \ II) \\ \hline \alpha_{g,N} (s_{min} \ \bot) \\ \hline \alpha_{g,V} (s_{min} \ \bot) \end{array} \end{array} \left[-\frac{1}{2} \right]$:	2					
fischer injection system F	IS V PI	us for	masc	nry								
Performance Vertical perforated brick HLz,	2DF, dim	ensior	ns, insta	Illation	param	eters				Anne	x C 3	30



Table C31.1: Characte single at							ailure	e or l	orick	break	out fa	ilure o	fa	
Anchor rod			M6	M8	M6	M8		-	M8	M10		-	M12	M16
Internal threaded anchor FIS E			6		1	-11 	M6	M8 x85			M10	M12 x85		•
Perforated sleeve FIS H K			12>	<50	12	x85		10	6x85			20)	k85	
Γension resistance N _{Rk} = N _F strength f _b ; Installation and	Rk,p = NF	_{Rk,b} = M onditio	Rk,p,c	= NR# v, w/c	, _{b,c} [k l, d/d	N] de	epen npera	ding ature	on the range	e mean 50/80	comp °C) ²⁾	ressiv	e	
Mean compressive strength Min. compressive strength single brick ¹⁾	Us co ditic	n-												
7,5 / 6 N/mm²	w/w d/	w/d 'd	0,1 0,1		-	90 20).75),75				90 90	
12,5 / 10 N/mm ²	w/w	u w/d	0,1 1,2			20 50			,,,, <u>,</u> 1.20			,	50 50	
12,07 TO M/IIIIIT	d/	d	1,2	20	2,	00		-	,20			1,	50	
20 / 16 N/mm ²	d/d				-	50			2.00				00	
	20 / 16 N/mm ² d/d 25 / 20 N/mm ² w/w w				· ·	00			2,00				50	
25 / 20 N/mm ²	Jay /Jay					<u>50</u> 00			2 <u>.50</u> 2,50				00 00	
	u w/d	2,9 3,0		· · ·	00			3,50 8,50			,	00		
35 / 28 N/mm ²	w/w d/		3,9			50			3,50				50 50	
Table C31.2: Characte anchor u	eristic	resis	tance	e to I		· N _{Rk} bricl			o r b rie	ck edg	ge fail	ure of	a sing	gle
anchor u Anchor rod	eristic	resis	tance	e to I		bricl		ure (or brid M8	ck edg M10	ge fail M10	ure of - M12	a sing M12	-
anchor u Anchor rod Internal threaded	eristic	resis	tance load	e to I ling	ocal	bricl	k fail	ure (M10	-		-
anchor u Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H K	eristic under :	resis shear	tance load M6 12>	e to l ling M8	ocal M6	bric M8 - x85	k fail M6 11)	ure (M8 6x85	M10	M10 15	- M12 x85 20	M12	-
anchor u Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b}	eristic under : = V _{Rk,c}	resis shear	tance load M6 12)	e to l ling M8 (50 kN] d	ocal M6 12 epen	brick M8 - x85 ding	k fail M6 11) on th	ure (M8 6x85 ean co	M10	M10 15 sive s	- M12 x85 20	M12	-
anchor u Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} nstallation and use conditi Mean compressive strength	eristic under : = V _{Rk,c} on w/w	resis shear ,u = V _R ,w/d, se n-	tance load M6 12)	e to l ling M8 (50 kN] d	ocal M6 12 epen	brick M8 - x85 ding	k fail M6 11) on th	ure (M8 6x85 ean co	M10	M10 15 sive s	- M12 x85 20	M12	gle M10
anchor u Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} nstallation and use conditi Mean compressive strength	= V _{Rk,c} on w/w	resis shear ,u = V _R ,w/d, se n-	tance load M6 12)	e to l ling M8 (50 kN] d	ocal M6 12 epen	brick M8 - x85 ding ire ra	k fail M6 11) on th	ure (M8 6x85 ean co	M10	M10 15 sive s	- M12 x85 20; trengtl	M12	-
anchor u Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} nstallation and use conditi Mean compressive strength Min. compressive strength single brick ¹	= V _{Rk,c} on w/w	resis shear , u = V _R , w/d, se n- ons	tance load M6 12x tk.c [I d/d; (e to l ling M8 (50 kN] d temp	ocal M6 12 epen eratu	brick M8 - x85 ding ire ra	k fail M6 11) on th nge	ure (M8 6x85 ean co °C an	M10	M10 15 sive s	- M12 x85 20 trengtl	M12 x85 n f⊳;	-
Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} nstallation and use conditi Mean compressive strength Min. compressive strength single brick ¹⁾ 7,5 / 6 N/mm ²	= V _{Rk,c} on w/w Us co ditic	resis shear , u = V _R , w/d, se n- ons	tance load M6 12) kk,c,⊥ [l d/d; (e to l ling M8 <50 kN] d temp	ocal M6 12 epen eratu	brick M8 x85 ding ire ra 2,0 4,0	k fail M6 11) on th nge	ure (M8 6x85 ean co °C an 1,5	M10	M10 15 sive s	- x85 20; trengtl 22 4	M12 x85 n f⊳;	-
anchor u Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} nstallation and use conditi Mean compressive strength Min. compressive strength single brick ¹⁾ 7,5 / 6 N/mm ² 12,5 / 10 N/mm ² 20 / 16 N/mm ²	= V _{Rk,c} on w/w Us co ditic	resis shear , u = V _R , w/d, se n- ons	tance load M6 12x tk.c., [I d/d; (1,2 2,0	e to l ling M8 (50 kN] d temp 1,5 2,5	ocal M6 12 epen eratu 1,2 2,0	brick M8 x85 ding ire ra 2,0 4,0	k fail M6 11) on th nge 1 1,2 2,0	ure (M8 6x85 ean co °C an 1,5 2,5	M10	M10 15 sive s	- x85 20: trengtl 2 2 4 7	M12 x85 n fь; ,5 ,5	-
Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} nstallation and use conditi Mean compressive strength Min. compressive strength single brick ¹⁾ 7,5 / 6 N/mm ² 12,5 / 10 N/mm ² 20 / 16 N/mm ²	= V _{Rk,c} on w/w Us co ditic	resis shear , u = V _R , w/d, se n- ons	tance load M6 12) kk,c,⊥ [l d/d; (1,2 2,0 3,0	e to l ling M8 (50 kN] d temp 1,5 2,5 3,5	0cal M6 12: epen eratu 1,2 2,0 3,0	brick M8 x85 ding ire ra 2,0 4,0 6,0	k fail M6 11) on th nge 1,2 2,0 3,0	ure (M8 6x85 ean co °C an 1,5 2,5 3,5	M10	M10 15 sive s	- x85 20: trengtl 2 2 4 7 8	M12 x85 n fь; ,5 ,5 ,0	-
Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} Installation and use conditi Mean compressive strength Min. compressive strength single brick ¹⁾ 7,5 / 6 N/mm ² 12,5 / 10 N/mm ² 20 / 16 N/mm ²	= V _{Rk,c} on w/w Us co ditic w/ w/	resis shear shear , wid, se n- ons /w /d /d /d /d	tance load M6 12> kk.c.⊥ [I d/d; (1,2 2,0 3,0 4,0 5,0 e brick	e to l ling M8 (50 kN] d temp 1,5 2,5 3,5 4,5 6,5 (mus)	0cal M6 12 epen eratu 2,0 3,0 4,0 5,0 t not t	brick M8 - x85 ding ire ra 2,0 4,0 6,0 7,5 9,5 be les	k fail M6 11) on th nge 2,0 3,0 4,0 5,0	ure d M8 (85 1) ne me 50/80	M8 6x85 ean co °C an 1,5 2,5 3,5 4,5 6,5	M10	M10 15 sive s 20°C)	- x85 20: trengtl 22 4 7 8 12	M12 x85 n fb; ,5 ,5 ,5 ,0 ,5 2,0	- -
anchor uAnchor rodInternal threaded anchor FIS EPerforated sleeve FIS H KShear resistance V _{Rk} = V _{Rk,b} Installation and use conditiMean compressive strength single brick 1)7,5 / 6 N/mm²12,5 / 10 N/mm²20 / 16 N/mm²25 / 20 N/mm²35 / 28 N/mm²1)The compressive strength	= VRK,c on w/w Us co ditic w/ w/ d/ up th of the displac	resis shear , = VR , w/d, se n- ons /w /d /d /d /d /cemen	tance load M6 12) kk,c,⊥ [I d/d; (1,2 2,0 3,0 4,0 5,0 e brick ts see	e to I ling M8 (50 kN] d temp 1,5 2,5 3,5 4,5 6,5 (mus e anne	0cal M6 122 epen eratu 1,2 2,0 3,0 4,0 5,0 t not t ex C	brick M8 - x85 ding ire ra 2,0 4,0 6,0 7,5 9,5 be les	k fail M6 11) on th nge 2,0 3,0 4,0 5,0	ure d M8 (85 1) ne me 50/80	M8 6x85 ean co °C an 1,5 2,5 3,5 4,5 6,5	M10	M10 15 sive s 20°C)	- x85 20: trengtl 22 4 7 8 12	M12 x85 n fb; ,5 ,5 ,5 ,0 ,5 2,0	- -

Vertical perforated brick HLz, 2DF, Characteristic resistance under tension and shear loading



Vertical perforated brid	ck H	ILz,	U8	, EN	177	1-1:	201	1+A	1:2	015				
248	[1				F	Produ	ucer				e.g. \	Vienerbe	rger
o,	5	Nom	inal	dim	ensio	ons				ſr	nm]		width W	height H
College and												248	365	248
	2	Mean	-					h / M		[kg	/dm ³]		0,6	
		Mear comp								[N/mm ²]	5 / 4 or	7,5/6 or	10/8
		Stan	dard	dora	anne	x						EN 771-	1:2011+A	1:2015
365						8					~			
						10.0			S		<u> </u>		ension se	e also
						8,5	je	Š	Ž			Anne	ex B 15	
Table C32.1: Installat	ion	nara	mo	tors		t		3,5	4,9	35	7			
(Pre-pos						witl	h pe	erfora	ated	sleeve	FIS H	K)		
Anchor rod		M6	M8	M6	M8			M8	M10	M8 M10	5 .	M12 M16	M12 M16	M12 M16
Internal threaded						M6	M8				M10 M12	2		
anchor FIS E		1		2	105-	11)	k85	100		1000	15x85		10 7 0	
Perforated sleeve FIS H K		12x	_		x85			x85		16x130		x85	20x130	20x200
Anchor rod and internal th								rorat	ed s	leeve Fi		1417.C		
torque max Tinstallation max Tinst [[Nm]	3	5	3	5	3	5					5		
General installation param	neters	5												
Edge distance Cmin = Cor										60				
		,								80 250				
Spacing Smin L	uuu	-								80				
Sor ⊥	Ī	2								250				
Drilling method														
Rotary drilling with carbide d	Irill													
¹⁾ The compressive streng	gth of	f the s	singl	e bri	ick m	ust n	ot be	less	than	80% of t	he mean	compress	ive streng	ith.
Table C32.2: Group f	acto	rs												
Anchor rod		M6	M8	M6	M8		-	M8	M10	M8 M10	-	M12 M16	M12 M16	M12 M16
Internal threaded		_			-	M6	M8		_		M10 M12	2		_
anchor FIS E					-	11;	<u> </u>		-	-	15x85			-
Perforated sleeve FIS H K		12x	50	12	x85		16)	x85		16x130	20	x85	20x130	20x200
$\begin{array}{c c} \alpha_{g,N} (s_{min} l) \\ \hline \alpha_{g,V} (s_{min} l) \end{array}$	-									1,3 1,2				
Group $\alpha_{g,V}$ (smin II)factors $\alpha_{g,N}$ (smin \perp)	[-]									1,3				
$\frac{\alpha_{g,V}(Smin \perp)}{\alpha_{g,V}(Smin \perp)}$	ŀ									1,0				
fischer injection system	n FIS	S V F	Plus	s for	' ma	son	ry							
Performance												 /	Annex C	32
Vertical perforated brick HL	.z, U8	8, dim	ens	ions	, ins	tallati	ion p	aram	neter	s				
1466-23													0.00	04-134/23



_			-1:2011+A1:201	5										
Table C33.1:			ith perforated sle	eve FIS H K)										
Anchor rod		erforated sleeve FIS H K ax Tinst [Nm] 5 on parameters 60 Smin II 80 scr II 80 scr I 250 carbide drill 250												
Perforated sleev	ve FIS H K	18x1	30/200	22	2x130/200									
		leeve FIS H K												
Max. installation torque	max T _{inst} [Nm	1]		5										
General installa	tion parameter	ers												
Edge distance	Cmin = Ccr			1999 X850										
	in const		1											
Spacing —	100 C													
·														
				250										
Drilling method														
Rotary drilling wi	th carbide drill													
Table C33.2:	Group fac	tors												
Anchor rod														
Perforated sleev	ve FIS H K	18x1			2x130/200									
_α	_{.g,N} (s _{min} II)			1,3										
	$\frac{g,V(s_{min} I)}{(s_{min} I)}$ [-]			1,2										
factors α_{0}	<u>g,N (Smin ⊥)</u> ^{с ј}			1,3										
α	_{g,V} (S _{min} ⊥)			1,0										
fischer injecti	on system F	IS V Plus for mas	onry											
Performance	-	J8, dimensions, insta	-		Annex C 33									



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 anchorage)

-												
Anchor rod	-					-	M8M10	M8 M10	-	M12 M16	M12 M16	M12 M1
Internal threaded					-	M6 M8	-	-	M10M12		_	
anchor FIS E			_			11x85			15x85	_		
Perforated sleeve FIS H K			12x	50	12x85	16x	85	16x130	20>	(85	20x130	20x20
Tension resistance N _{Rk} = N _{Rk} , strength f _b ; Installation and u											sive	
Mean compressive strength /	U											
Min. compressive strength single brick ¹⁾	co ditio											
	w/w		1,	2					1,2			
5 / 4 N/mm²	w/w											
			1, 1,						1,5			
8 / 6 N/mm ²	d/d								1,5 1,5			
	d/d / 8 N/mm ² w/w w/											
10 / 8 N/mm ²	/d	1, 2,						2,0 2,0				
Table C34.2: Character single and					•						eora	
Anchor rod				Ν	/10							
Perforated sleeve FIS H K							M12			M1	6	
Tension resistance N _{Rk} = N _{Rk} , strength f _b ; Installation and u	orated sleeve FIS H K ion resistance N _{Rk} = N _{Rk,p} = N _{Rk,}					130/200				M1 22x13	-	
1102N NA NY 242N NA				NRk,b,c	[kN] de) pendin			22x13 compres)/200		
	se co	ondit se			NRk,b,c	[kN] de) pendin			22x13 compres)/200	
Min. compressive strength	Se co	ondit se			NRk,b,c	[kN] de) pendin			22x13 compres)/200	
Min. compressive strength single brick ¹⁾	Se co	ondit se in- ons			NRk,b,c	[kN] de) pendin	re range		22x13 compres)/200	
Min. compressive strength	Se co Us co ditio	ondit se on- ons w/d			NRk,b,c	[kN] de) pendin	re range		22x13 compres)/200	
Min. compressive strength single brick ¹⁾ 5 / 4 N/mm ²	se co Us co ditio w/w	ondit se on- ons w/d /d			NRk,b,c	[kN] de) pendin	1,2 1,5 1,5		22x13 compres)/200	
Min. compressive strength single brick ¹⁾	se co Co ditio w/w	ondit se on- ons w/d /d w/d			NRk,b,c	[kN] de) pendin	re range 1,2 1,5		22x13 compres)/200	
	se co Ut co ditio w/w d/ w/w	ondit se on- ons w/d /d w/d /d			NRk,b,c	[kN] de) pendin	1,2 1,5 1,5		22x13 compres)/200	

¹⁾ The compressive strength of the single brick must not be less than 80% of the mean compressive strength. ²⁾ For temperature range 72/120°C: $N_{Rk(72/120^{\circ}C)} = 0.83 \cdot N_{Rk(50/80^{\circ}C)}$.

2,0

Factor for job site tests and displacements see annex C 123.

d/d

fischer injection system FIS V Plus for masonry

Performance

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

Annex C 34



Vertical perforated brick	k HL:	z, U8	B, El	N 7	71-1	1:2	2011+	A1:20	15	;					
Table C35.1: Character anchor ur												~	e failur	e of a si	ingle
Anchor rod			M6	M8	M6 N	8N	-	M8 M10	М	B M10	-		M12 M16	M12 M16	M12 M16
Internal threaded anchor FIS E			-		-	ŀ	M6 M8 11x85	-	\vdash	-	M10 15x	_	-	-	-
Perforated sleeve FIS H K			12x	50	12x8	B5	16	x85	16	x130		20x	(85	20x130	20x200
Shear resistance V _{Rk} = V _{Rk,b} = Installation and use condition	₩ N W/W	.,⊪ = V /, w/d	/ _{Rk,c,} _ , d/d	∟ [k l; (t	N] de	epe era	ending ture ra	on the inge 50	e m 0/80	ean c)°C ai	omp nd 72	ress 2/12(ive stre)°C)	ength f _b ;	
Mean compressive strength / Min. compressive strength single brick ¹⁾	co diti	se on- ons													
5 / 4 N/mm²		w/d /d								1,2	2				
8 / 6 N/mm²	w/w di	w/d /d								1,5	;				
10 / 8 N/mm ²	w/w d/	w/d /d								1,5	;				
¹⁾ The compressive strength			ale br	rick	must	no	t be les	s than f	80%	6 of th	e me	an o	ompress	ive streng	ith.
Table C35.2: Character anchor ur												-	e failur	e of a si	ingle
Amahammad															
Anchor rod				N	A10			M12	2					16	
Perforated sleeve FIS H K	2010/00						(130/2))0					22x13	0/200	
				∟ [k	N] de	epe	ending)0 on the	m				22x13 sive stre	0/200	
Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} =		r, w/d se on-		∟ [k	N] de	epe	ending)0 on the	m				22x13 sive stre	0/200	
Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} = Installation and use condition Mean compressive strength / Min. compressive strength	n w/w Us co	v, w/d se on- ons w/d		∟ [k	N] de	epe	ending)0 on the	m		nd 72		22x13 sive stre	0/200	
Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} = Installation and use condition Mean compressive strength / Min. compressive strength single brick ¹⁾	n w/w Us co ditio w/w	v, w/d se on- ons w/d /d w/d		∟ [k	N] de	epe	ending)0 on the	m)°C aı	nd 72		22x13 sive stre	0/200	
Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} = Installation and use condition Mean compressive strength / Min. compressive strength single brick ¹⁾ 5 / 4 N/mm ²	n w/w Us co ditic w/w d/ w/w	r, w/d se on- ons w/d /d w/d /d w/d /d w/d		∟ [k	N] de	epe	ending)0 on the	m)°C a ı 1,2	nd 72		22x13 sive stre	0/200	
Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} = Installation and use condition Mean compressive strength / Min. compressive strength single brick ¹⁾ 5 / 4 N/mm ² 8 / 6 N/mm ²	w/w ditio ditio d/w/w d/ w/w d/ n of th	r, w/d se on- ons w/d (d w/d (d w/d (d w/d (d e sing	gle br	∟ [k i; (t	N] de empo	epeera	ending ture ra	on the inge 50	e m)/8()°C ai 1,2 1,5 1,5	nd 72	2/120	22x13 sive stre 0°C)	:0/200 ength f⊳;	oth.
Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} = Installation and use condition Mean compressive strength / Min. compressive strength single brick ¹⁾ 5 / 4 N/mm ² 8 / 6 N/mm ² 10 / 8 N/mm ²	n w/w Us co ditid w/w d/ w/w d/ d/ d/ n of th displa	v, w/d se on- ons w/d (d w/d (d w/d (d ce sing aceme	l, d/d	∟ [k l; (t	muste anne	e pe era	t be les C 123.	on the inge 50	e m)/8()°C ai 1,2 1,5 1,5	nd 72	2/120	22x13 sive stre 0°C)	:0/200 ength f⊳;	



Vertical perforated brick	(HL	_z, T	10	, T11,	EN 771	-1:2	2011	+A1	:20	15				
248	P	roduc	cer								e.g	. W	/ienerber	ger
- Ferrer		omin		dimensio					Ē.	nm]	length I	_ v	vidth W	height H
الى ^{ماري} ك		omin		annensi	5115				U	ang	248		365	249
24			-		l ensity ρ				[kg	/dm ³]			0,7	
	M				ve strengt ngth sing				[N/mm²]	10 /		or 12,5 / [.] 15 / 12	10 or
	S	tanda	ard	or anne	x						EN 77	1-1	:2011+A	1:2015
Table C36.1: Installatio (Pre-posit	•				3,5	43,5 erfor		d sle	eve	FIS H	Ar		nsion se x B 16	e also
Anchor rod	N	/6 M	18	M6 M8	-	M8	M10	M8	M10		M12 M	16	M12M16	M12 M16
Internal threaded anchor FIS E		-		-	M6 M8 11x85	-	-			M10 M1 15x85	2		-	-
Perforated sleeve FIS H K	1.	12x5	0	12x85		x85		16x	130)x85	+	20x130	20x200
Anchor rod and internal thre	ade	d and	cho	or FIS E	with per	fora	ted s	leev	e FIS	внк				
Max. installation max T _{inst} [Nr	m]			3			5	3			19	5		
General installation paramet	ers													
Edge distance cmin = ccr									0					
Smin II									0					
Spacing [mi	m]								50					
Smin⊥	+								0					
s _{cr} ⊥ Drilling method			_					2:	50			_		
Rotary drilling with carbide dril	1													
¹⁾ The compressive strength		he sir	nale	e brick m	ust not be		s than	80%	6 of t	he mear	compre	issi	ve strena	th
Table C36.2: Group fac			ngi	5 DITOR II		. 100	5 than	1007	0010		roompre	000	ve strong	u1.
Anchor rod	N	16 N	18	M6 M8	-	M8	M10	M8				16	M12 M16	M12 M16
Internal threaded anchor FIS E		-		-	M6 M8 11x85	-	-		-	M10 M1 15x85			-	-
Perforated sleeve FIS H K	1	12x5(0	12x85	16	x85		16x	130	2	0x85		20x130	20x200
α _{g,N} (smn II)								1	,7					
Group $\alpha_{g,V}(s_{\min} I)$	ιL							0	,5					
factors $\alpha_{g,N} (s_{\min} \perp)$	• _								,3					
$lpha_{ extsf{g}, extsf{V}}$ (Smin ot)								0	,5					
fischer injection system f Performance Vertical perforated brick HLz,					-	ation		amet	ere			A	nnex C	36
vention periorated block HEZ,	110	, i i i	, u		no, motali	4101	Parc							



Vertical perfo	rated brick H	U 7 T10 T11 E	N 771-1:2011+A	1.2015	
Table C37.1:	Installation p	parameters	ith perforated sle		
Anchor rod		M10	M12		M16
Perforated sleev	ve FIS H K	000000000	30/200	2:	2x130/200
Anchor rod with					
Max. installation torque				5	
General installa	tion parameters	3			
Edge distance	Cmin = Ccr			60	
	s _{min} II			80	
Spacing —	s _{cr} II [mm]			250	
Spacing	Smin ⊥			80	
	s _{cr} ⊥			250	
Drilling method					
Rotary drilling wit	th carbide drill				
Table C37.2:	Group facto	rs			
Anchor rod		M10	M12		M16
Perforated sleev	ve FISHK	18x1	30/200	22	2x130/200
α	_{g,N} (s _{min} II)			1,7	
	. _{g,V} (s _{min} II) [_1			0,5	
factors α_{ς}	_{g,N} (S _{min} ⊥) [-]			1,3	
α	g,∨ (\$ min ⊥)			0,5	
fischer injectio	on system FIS	S V Plus for mas	onry		
Performance			, installation param	eters	Annex C 37



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 anchorage)

Anchor rod			M6	M8	M6	M8	-		M8 M10	DM	8 M10	- 1	M12 M	116	M12 M16	M12 M1
Internal threaded anchor FIS E				-	-		M6 11x		-		-	M10M1 15x85			-	-
Perforated sleeve FIS H K			12	x50	12x	85		16>	. 85	10	6x130	2)x85		20x130	20x20
Tension resistance N _{Rk} = N _R strength f _b ; Installation and														res	sive	
Mean compressive strength / Min. compressive strength single brick ¹⁾	cc	se on- ons			010											
10 / 8 N/mm ²		w/d /d		,5 ,5								1,5 2,0				
12,5 / 10 N/mm²	w/w	w/d /d	1	,5 ,5 ,0								2,0 2,0 2,0				
15 / 12 N/mm ²	w/w	w/d /d	2	,0 ,0 ,0								2,0 2,0 2,5				
¹⁾ The compressive streng ²⁾ For temperature range Table C38.2: Characte single ar	ith of 72/ erist	the s 120°C ic re	ingle C: Nr	e bric Rk (72/ anc	120°C) e to	= 0, pu	,83 · Il-ou	Nr⊪ t fa	ailure	or	brick	e mean break	out fai	lur	-	th.
Anchor rod			M1(0	3x1:		M					M [*]				

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
12,5 / 10 N/mm ²	w/w w/	d 2,0	2,0
12,57 10 14/11111-	d/d	2,0	2,0
15 / 12 N/mm²	w/w w/	d 2,0	2,0
10/12/N/IIIII	d/d	2,5	2,5

¹⁾ The compressive strength of the single brick must not be less than 80% of the mean compressive strength. ²⁾ For temperature range 72/120°C: $N_{Rk(72/120^\circ C)} = 0.83 \cdot N_{Rk(50/80^\circ C)}$.

Factor for job site tests and displacements see annex C 123.

fischer injection system FIS V Plus for masonry

Performance

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

Annex C 38



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 anchorage)

Shear resistance V _{Rk} = V _{Rk,c,I} = V _{Rk,c,I} = V _{Rk,c,I} [kN] depending on the mean compressive strength f _b ; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength / Single brick ¹) Use con- ditions 10 / 8 N/mm ² w/w w/d d/d 0,9 12,5 / 10 N/mm ² w/w w/d d/d 0,9 15 / 12 N/mm ² w/w w/d d/d 0,9 15 / 12 N/mm ² w/w w/d d/d 1,2 10 Karacteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through anchorage) Anchor rod M10 M12 Anchor rod M10 M12 Perforated sleeve FIS H K 18x130/200 22x130/200 Shear resistance V _{Rk} = V _{Rk,c,I} = V _{Rk,c,I} [kN] depending on the mean compressive strength f _b ; mstallation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)	anchor FIS E 11x85 15x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 20x130 Shear resistance V _{Rk} = V _{Rk,c,II} = V	FIS E 11x85 15x85 - - ted sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 20x130 20x20 asistance V _{Rk} = V _{Rkc,I} = V _{Rkc,I} = V _{Rkc,I} [KN] depending on the mean compressive strength / con- ditions Use con- ditions 2,0 2,0 2,0 2,0 10 / 8 N/mm ² W/W W/d d/d 0,9 1,5 2,0 2,0 2,0 15 / 12 N/mm ² W/W W/d d/d 0,9 1,5 2,0 2,0 2,0 15 / 12 N/mm ² W/W W/d d/d 1,2 2,0 2,0 2,0 2,0 rod Mile 1,2 2,0 2,0 2,0 fixed w/d 1,2 2,0 2,0 2,0 fixed w/d 1,2 2,0 2,0 <td brick="" colspancis="" edg<="" failure="" local="" or="" resistance="" restrestrestic="" th="" to=""><th>Anchor rod</th><th></th><th>1016</th><th>NI8</th><th>M6 M</th><th></th><th></th><th>M8 M10</th><th></th><th></th><th>M12 M16</th><th>M12M1</th></td>	<th>Anchor rod</th> <th></th> <th>1016</th> <th>NI8</th> <th>M6 M</th> <th></th> <th></th> <th>M8 M10</th> <th></th> <th></th> <th>M12 M16</th> <th>M12M1</th>	Anchor rod		1016	NI8	M6 M			M8 M10			M12 M16	M12M1
Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 20x130 20x Shear resistance V _{Rk} = V _{Rk,c,II} = V _{R,I} 10 / 8 N/mm ² U/W U/d 1,5 2,0 2,0 2,0 2,0 2,0 2,0	Perforated sleeve FIS H K12x5012x8516x8516x13020x8520x130Shear resistance $V_{Rk} = V_{Rk,c,ll} = V$	ted sleeve FIS H K12x5012x8516x8516x13020x8520x13020x20pasistance V _{Rk} = V _{Rkc,II} = V _{Rkc,II} [kN] depending on the mean compressive strength fs; ton and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)ompressive strength / mpressive strength / d/dUse con- ditions10 / 8 N/mm2 W/W W/d d/d 0.91,52,015/ 12 N/mm2 W/W W/d d/d 0.91,52,016/ 10 N/mm2 W/W W/d d/d 1,22,02,015 / 12 N/mm2 W/W W/d d/d 1,22,02,0And M10M12M16Can- ditionsCon- ditions15 / 2,02,012,5 / 10 N/mm2 W/W W/d d/d M/W W/d d/d 1,22,02,0Con- ditionsTodM10M12M16Can- d/dM10M12M16Can- d/dCan- d/dCan- d/d1,52,0Can- d/dM/W W/d M12M16Can- d/dCan- d/dM10M12M16Can- can- <br< th=""><th></th><th></th><th> .</th><th>-</th><th>-</th><th></th><th></th><th>-</th><th></th><th>-</th><th>- </th><th>- </th></br<>			.	-	-			-		-	-	-	
Shear resistance $V_{Rk} = V_{Rk,c,ll} = V$	Shear resistance V _{Rk} = V _{Rk,c,II} = V _R = V _{Rk,C,II} = V _R =	assistance $V_{Rk} = V_{Rk,c,ll} = V_{Rk,c,ll} = V_{Rk,c,l}$ [kN] depending on the mean compressive strength fs; ion and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) pompressive strength / mpressive strength Use con- ditions 10 / 8 N/mm ² w/w w/d d/d 0,9 1,5 2,0 12,5 / 10 N/mm ² w/w w/d d/d 0,9 1,5 2,0 15 / 12 N/mm ² w/w w/d d/d 1,2 2,0 2,0 15 / 12 N/mm ² w/w w/d d/d 1,2 2,0 2,0 16 / 12 N/mm ² w/w w/d d/d 1,2 2,0 2,0 15 / 12 N/mm ² w/w w/d d/d 1,2 2,0 2,0 16 / 12 N/mm ² w/w w/d d/d 1,2 2,0 2,0 16 / 12 N/mm ² W/W w/d d/d 1,2 2,0 2,0 17 / 12 N/mm ² W/W w/d d/d 1,2 2,0 2,0 16 / 12 N/mm ² W/W w/d d/d 1,2 2,0 22x130/200 assistance V _{Rk} = V _{Rk,c,ll} = V _{Rk,c,ll} = V _{Rk,c,ll} [kN] depending on the mean compressive strength fs; ion and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) 2,0 pmpressive strength / mpressive strength / d/d <t< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>													
nstallation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength / single brick ¹⁾ Use con- ditions 10 / 8 N/mm ² w/w w/d d/d 0,9 1,5 2,0 12,5 / 10 N/mm ² w/w w/d d/d 0,9 1,5 2,0 15 / 12 N/mm ² w/w w/d d/d 0,9 1,5 2,0 15 / 12 N/mm ² w/w w/d d/d 1,2 2,0 2,0 '' The 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 anchorage) Anchor rod M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 Shear resistance V _{Rk} = V _{Rkb} = V _{Rkb,c,ll} = V _{Rkb,c,ll} = V _{Rk,c,ll} [KN] depending on the mean compressive strength f _b ; nstallation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength / single brick ¹ Use con- ditions 2,0 10 / 8 N/mm ² w/w w/d d/d 1,5 2,0 12,5 / 10 N/mm ² w/w w/d d/d 2,0 2,0	Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength / Min. compressive strength Use con- ditions 10 / 8 N/mm ² $w/w w/d $ d/d 0,9 1,5 2,0 12,5 / 10 N/mm ² $w/w w/d $ d/d 0,9 1,5 2,0 15 / 12 N/mm ² $w/w w/d $ d/d 0,9 1,5 2,0 15 / 12 N/mm ² $w/w w/d $ d/d 1,2 2,0 2,0 '' The compressive strength of the single brick must not be less than 80% of the mean compressive strength a sime anchor under shear loading (Push through anchorage) Anchor rod M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 Shear resistance V _{Rk} = V _{Rkc,II} = V _{Rkc,II} [KN] depending on the mean compressive strength fs; nstallation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength fs; nd/d 10 / 8 N/mm ² $w/w w/d / d / d / d / 1,5$ 2,0 12,5 / 10 N/mm ² $w/w w/d / d / d / d / d / d / d / d / d / d$	tion and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) compressive strength / more sive strength / ditions 10 / 8 N/mm ² W/w w/d d/d 0,9 1,5 2,0 12,5 / 10 N/mm ² W/w w/d d/d 0,9 1,5 2,0 15 / 12 N/mm ² W/w w/d d/d 0,9 1,5 2,0 15 / 12 N/mm ² W/w w/d d/d 1,2 2,0 2,0 15 / 12 N/mm ² W/w w/d d/d 1,2 2,0 2,0 15 / 12 N/mm ² W/w w/d d/d 1,2 2,0 2,0 15 / 12 N/mm ² W/w w/d d/d 1,2 2,0 2,0 16 compressive strength of the single brick must not be less than 80% of the mean compressive strength. C39.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through anchorage) 10 rod M10 M12 M16 ted sleeve FIS H K 18x130/200 22x130/200 esistance V _{Rk b} = V _{Rk c,II} = V _{Rk c,L} [kN] depending on the mean compressive strength f _b ; to an duse condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) 10 / 8 N/mm ² 10 / 8 N/mm ² W/w w/d d/d 1,5 2,0 </th <th>an ar healan Mean</th> <th>//2012/</th> <th></th> <th>10.5000</th> <th>SALESS ON</th> <th>,412-014</th> <th>1000</th> <th></th> <th></th> <th>2000 C. 1990</th> <th>Sector States</th> <th>20x20</th>	an ar healan Mean	//2012/		10.5000	SALESS ON	,412-014	1000			2000 C. 1990	Sector States	20x20	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	mpressive strength rick 1)con- ditions10 / 8 N/mm² $w/w w/d / d/d$ 0,91,52,012,5 / 10 N/mm² $w/w w/d / d/d$ 0,91,52,015 / 12 N/mm² $w/w w/d / d/d$ 1,22,02,015 / 12 N/mm² $w/w w/d / d/d$ 1,22,02,0he compressive strength of the single brick must not be less than 80% of the mean compressive strength.C39.2:Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through anchorage)*rodM10M12M16ted sleeve FIS H K18x130/20022x130/200sesistance $V_{Rk, cl, II} = V_{Rk, cl, II} [kN]$ depending on the mean compressive strength fb;tion and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)ompressive strength / rick 10Use con- ditions10 / 8 N/mm² $w/w w/d d/d1,52,012,5 / 10 N/mm²w/w w/d d/d1,52,015 / 12 N/mm²w/w w/d d/d2,02,0he compressive strength of the single brick must not be less than 80% of the mean compressive strength.$											ngth f _b ;		
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10 / 8 N/mm² d/d 0,91,52,012,5 / 10 N/mm² $W/W W/d$ 0,91,52,015 / 12 N/mm² $W/W W/d$ 1,22,02,0''The 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 anchorage)Anchor rodM10M12M16Perforated sleeve FIS H K18x130/20022x130/200Shear resistance V _{Rk} = V _{Rk,c,1} = V _{Rk,c,1} [kN] depending on the mean compressive strength fb; nstallation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)Mean compressive strength / min. compressive strength / d/dUse con- ditions10 / 8 N/mm² $W/w w/d$ d/d1,52,015 / 12 N/mm² $W/w w/d$ d/d2,02,0	10 / 8 N/mm² d/d 0,91,52,012,5 / 10 N/mm² w/w w/d0,91,52,015 / 12 N/mm² w/w w/d1,22,02,0''The compressive strength of the single brick must not be less than 80% of the mean compressive strengthTable C39.2:Characteristic resistance to local brick failure or brick edge failure of a sin anchor under shear loading (Push through anchorage)Anchor rodM10M12M16Perforated sleeve FIS H K18x130/20022x130/200Shear resistance V _{Rk} = V _{Rkc,l} = V _{Rkc,l} [kN] depending on the mean compressive strength fb; nstallation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)Mean compressive strength / min. compressive strength / d/dUse con- ditions10 / 8 N/mm² w/w w/d d/d1,52,015 / 12 N/mm² w/w w/d d/d2,02,0	10 / 8 N/mm² d/d 0,91,52,012,5 / 10 N/mm² w/w w/d0,91,52,015 / 12 N/mm² w/w w/d1,22,02,015 / 12 N/mm² w/w w/d1,22,02,0he compressive strength of the single brick must not be less than 80% of the mean compressive strength.C39.2:Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through anchorage)rodM10M12M16ted sleeve FIS H K18x130/20022x130/200esistance V _{Rk} = V _{Rkc,L} = V _{Rkc,L} [KN] depending on the mean compressive strength fb;10 / 8 N/mm²uon and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)00pressive strength / mpressive strength / d/dUse con- ditions10 / 8 N/mm² w/w w/d d/d1,52,012,5 / 10 N/mm² w/w w/d d/d2,02,015 / 12 N/mm² w/w w/d d/d2,02,0	Single brick												
12,5 / 10 N/mm² d/d 0,9 1,5 2,0 15 / 12 N/mm² w/w w/d d/d 1,2 2,0 2,0 '' The 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 anchorage) M16 Anchor rod M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 Shear resistance V _{Rk} = V _{Rk,c,l} = V _{Rk,c,l} = V _{Rk,c,l} [kN] depending on the mean compressive strength f _b ; installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength / didons 10 / 8 N/mm² w/w w/d d/d 1,5 2,0 12,5 / 10 N/mm² w/w w/d d/d 1,5 2,0 15 / 12 N/mm² w/w w/d d/d 2,0 2,0	12,5 / 10 N/mm² d/d 0,9 1,5 2,0 15 / 12 N/mm² w/w w/d 1,2 2,0 2,0 '' The compressive strength of the single brick must not be less than 80% of the mean compressive strength 2,0 Table C39.2: Characteristic resistance to local brick failure or brick edge failure of a sim anchor under shear loading (Push through anchorage) Anchor rod M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 Shear resistance V _{Rk} = V _{Rk,c,II} = V _{Rk,c,L} [kN] depending on the mean compressive strength fb; installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength / d/d Min. compressive strength Use conditions 2,0 2,0 10 / 8 N/mm² w/w w/d 1,5 2,0 12,5 / 10 N/mm² w/w w/d 1,5 2,0 15 / 12 N/mm² w/w w/d 2,0 2,0	12,5 / 10 N/mm² d/d 0,91,52,015 / 12 N/mm² $w/w w/d$ 1,22,02,015 / 12 N/mm² $w/w w/d$ 1,22,02,0he compressive strength of the single brick must not be less than 80% of the mean compressive strength.C39.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through anchorage)rodM10M12M16tted sleeve FIS H K18x130/20022x130/200esistance V _{Rk} = V _{Rk,c,II} = V _{Rk,c,L} [kN] depending on the mean compressive strength f _b ; con- ditions010 / 8 N/mm² $w/w w/d$ 1,52,012,5 / 10 N/mm² $w/w w/d$ 1,52,015 / 12 N/mm² $w/w w/d$ 2,02,0the compressive strength of the single brick must not be less than 80% of the mean compressive strength.	10 / 8 N/mm ²			0,9	9		1,5			2	.,0		
$\frac{d'd}{d/d} = \frac{d'd}{d/d} = $	Image: constraint of the single brick must not be less than 80% of the mean 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 sin anchor under shear loading (Push through anchorage) Anchor rod M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 Shear resistance V _{Rk} = V _{Rk,c,II} = V _{Rk,c,L} [kN] depending on the mean compressive strength fb; nstallation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength / Min. compressive strength / Single brick ¹⁰ Use condition w/w, w/d 1,5 2,0 10 / 8 N/mm ² W/w w/d 1,5 2,0 2,0 2,0 2,0 15 / 12 N/mm ² W/w w/d 1,2 2,0 2,0 2,0 2,0	d/dd/d1,22,02,015 / 12 N/mm² W/W W/d d/d 1,22,02,0he compressive strength of the single brick must not be less than 80% of the mean compressive strength.C39.2:Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through anchorage)rodM10M12M16ted sleeve FIS H K18x130/20022x130/200seistance V _{Rk} = V _{Rk,b} = V _{Rk,c,I} = V _{Rk,c,L} [kN] depending on the mean compressive strength fb; tion and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)ompressive strength / mpressive strengthUse con- ditions10 / 8 N/mm² W/W W/d d/d1,52,012,5 / 10 N/mm² W/W W/d d/d2,02,0the compressive strength of the single brick must not be less than 80% of the mean compressive strength.	12 5 / 10 N/mm²	w/w w/d		0.	0		1 6				0		
15 / 12 N/mm²1,22,02,01)The 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 anchorage)Anchor rodM10M12M16Perforated sleeve FIS H K18x130/200Shear resistance V _{Rk} = V _{Rk,b} = V _{Rk,c,II} = V _{Rk,c,L} [kN] depending on the mean compressive strength f _b ;Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)Mean compressive strength / single brick 10Use con- ditions10 / 8 N/mm² $\frac{w/w}{d/d}$ 10 / 8 N/mm² $\frac{w/w}{d/d}$ 15 / 12 N/mm² $\frac{w/w}{w/d}$ 2,02,02,02,0	15 / 12 N/mm²1,22,02,01)The compressive strength of the single brick must not be less than 80% of the mean compressive strengthTable C39.2:Characteristic resistance to local brick failure or brick edge failure of a sime anchor under shear loading (Push through anchorage)Anchor rodM10M12Perforated sleeve FIS H K18x130/200Shear resistance V _{Rk} = V _{Rk,c,II} = V _{Rk,c,L} [kN] depending on the mean compressive strength f _b ; nstallation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)Mean compressive strength / single brick ¹⁾ Use con- ditions10 / 8 N/mm² $\frac{w/w}{dd}$ 1,52,0 $\frac{w/w}{dd}$ 2,015 / 12 N/mm² $\frac{w/w}{w/d}$ 2,0	15 / 12 N/mm²1,22,02,0the compressive strength of the single brick must not be less than 80% of the mean compressive strength.C39.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through anchorage)rodM10M12M16ted sleeve FIS H K18x130/20022x130/200esistance V _{Rk} = V _{Rk,c,II} = V _{Rk,c,L} [kN] depending on the mean compressive strength fb;tion and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)ompressive strength / mpressive strengthUse con- ditions2,010 / 8 N/mm² $\frac{w/w}{w/d}$ 1,52,012,5 / 10 N/mm² $\frac{w/w}{w/d}$ 1,52,015 / 12 N/mm² $\frac{w/w}{w/d}$ 2,02,0the compressive strength of the single brick must not be less than 80% of the mean compressive strength.	12,37 TU W/IIIII1	d/d		υ,:	9		1,5			2	.,0		
1) The 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 anchorage) Anchor rod M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 Shear resistance V _{Rk} = V _{Rk,b} = V _{Rk,c,ll} = V _{Rk,c,l.} [kN] depending on the mean compressive strength fb; nstallation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength / Min. compressive strength / Use con- ditions 10 / 8 N/mm ² w/w w/d 1,5 2,0 12,5 / 10 N/mm ² w/w w/d 2,0 2,0 15 / 12 N/mm ² w/w w/d 2,0 2,0	$\frac{d/d}{d}$ ¹⁾ The 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 sin anchor under shear loading (Push through anchorage) Anchor rod M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 Shear resistance V _{Rk} = V _{Rk,c,II} = V _{Rk,c,L} [kN] depending on the mean compressive strength f _b ; nstallation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength / Use con- ditions 10 / 8 N/mm ² $\frac{w/w}{dd}$ 1,5 2,0 12,5 / 10 N/mm ² $\frac{w/w}{dd}$ 1,5 2,0 15 / 12 N/mm ² $\frac{w/w}{dd}$ 2,0 2,0	d/dd/dhe compressive strength of the single brick must not be less than 80% of the mean compressive strength.C39.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through anchorage)rodM10M12M16ted sleeve FIS H K18x130/20022x130/200esistance V _{Rk} = V _{Rk,c,II} = V _{Rk,c,LI} [kN] depending on the mean compressive strength f _b ; tion and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)ompressive strength / ditions10 / 8 N/mm² w/w w/d d/d10 / 8 N/mm² w/w w/d d/d1,52,0 d/d 2,015 / 12 N/mm² w/w w/d d/d2,02,02,02,0	dE / da N/mm²	w/w w/d		4	<u>^</u>		2.0			· ·	0		
Table C39.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through anchorage)Anchor rodM10M12M16Perforated sleeve FIS H K18x130/20022x130/200Shear resistance V _{Rk} = V _{Rk,c,II} = V _{Rk,c,L} [kN] depending on the mean compressive strength f _b ; nstallation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)Mean compressive strength / single brick ¹⁾ Use con- ditions10 / 8 N/mm² $\frac{W/W W/d}{d/d}$ 1,52,012,5 / 10 N/mm² $\frac{W/w W/d}{d/d}$ 2,02,045 / 12 N/mm² $\frac{W/w W/d}{d/d}$ 2,02,0	Table C39.2: Characteristic resistance to local brick failure or brick edge failure of a sin anchor under shear loading (Push through anchorage) Anchor rod M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 Shear resistance V _{Rk} = V _{Rk,b} = V _{Rk,c,⊥} = V _{Rk,c,⊥} [kN] depending on the mean compressive strength f _b ; nstallation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength / ditions Min. compressive strength / Min. compressive strength Use con-ditions 2,0 10 / 8 N/mm ² w/w w/d 1,5 2,0 12,5 / 10 N/mm ² w/w w/d 2,0 2,0 15 / 12 N/mm ² w/w w/d 2,0 2,0	C39.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through anchorage) rod M10 M12 M16 ted sleeve FIS H K 18x130/200 22x130/200 esistance V _{Rk} = V _{Rk,b} = V _{Rk,c,II} = V _{Rk,c,L} [kN] depending on the mean compressive strength f _b ; 0 cion and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) 0 ompressive strength / nick ¹ Use conditions 10 / 8 N/mm ² w/w w/d d/d 1,5 2,0 12,5 / 10 N/mm ² w/w w/d d/d 2,0 2,0 15 / 12 N/mm ² w/w w/d d/d 2,0 2,0 he compressive strength of the single brick must not be less than 80% of the mean compressive strength.	15712 N/mm-	d/d	1	١,	2		2,0			2	,0		
Perforated sleeve FIS H K18x130/20022x130/200Shear resistance V _{Rk} = V _{Rk,c,II} = V _{Rk,c,II} = V _{Rk,c,⊥} [kN] depending on the mean compressive strength f _b ; nstallation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)10 / 8 N/mm ² Mean compressive strength / Min. compressive strength / ditionsUse con- ditions2,010 / 8 N/mm ² $\frac{W/W}{M}$ d/d1,52,012,5 / 10 N/mm ² $\frac{W/W}{M/d}$ d/d1,52,015 / 12 N/mm ² $\frac{W/W}{M/d}$ d/d2,02,0	Perforated sleeve FIS H K18x130/20022x130/200Shear resistance V _{Rk} = V _{Rk,b} = V _{Rk,c,ll} = V _{Rk,c,⊥} [kN] depending on the mean compressive strength f _b ; nstallation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)200Mean compressive strength / Min. compressive strength isingle brick TUse con- ditions2,010 / 8 N/mm² w/w w/d d/d1,52,012,5 / 10 N/mm² w/w w/d d/d1,52,015 / 12 N/mm² w/w w/d d/d2,02,0	ted sleeve FIS H K18x130/20022x130/200esistance V_{Rk} = V_{Rk,c,II} = V_{Rk,c,L} [kN] depending on the mean compressive strength fb;condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)ompressive strength / mpressive strength / ditions10 / 8 N/mm² $\frac{W/w}{w/d}$ 1,52,012,5 / 10 N/mm² $\frac{W/w}{w/d}$ 1,52,015 / 12 N/mm² $\frac{W/w}{w/d}$ 2,02,0he compressive strength of the single brick must not be less than 80% of the mean compressive strength.	Table C39.2: Characte	ristic resi	star	nce	to loc	cal bric	k failure	e or bri	ck edge	•	-		
Perforated sleeve FIS H K18x130/20022x130/200Shear resistance V _{Rk} = V _{Rk,c,II} = V _{Rk,c,II} = V _{Rk,c,⊥} [kN] depending on the mean compressive strength f _b ; nstallation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)10 / 8 N/mm ² Mean compressive strength / Min. compressive strength / ditionsUse con- ditions2,010 / 8 N/mm ² $\frac{W/W}{M}$ d/d1,52,012,5 / 10 N/mm ² $\frac{W/W}{M/d}$ d/d1,52,015 / 12 N/mm ² $\frac{W/W}{M/d}$ d/d2,02,0	Perforated sleeve FIS H K18x130/20022x130/200Shear resistance V _{Rk} = V _{Rk,b} = V _{Rk,c,ll} = V _{Rk,c,⊥} [kN] depending on the mean compressive strength f _b ; nstallation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)200Mean compressive strength / Min. compressive strength isingle brick TUse con- ditions2,010 / 8 N/mm² w/w w/d d/d1,52,012,5 / 10 N/mm² w/w w/d d/d1,52,015 / 12 N/mm² w/w w/d d/d2,02,0	ted sleeve FIS H K18x130/20022x130/200esistance V_{Rk} = V_{Rk,c,II} = V_{Rk,c,L} [kN] depending on the mean compressive strength fb;condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C)ompressive strength / mpressive strength / ditions10 / 8 N/mm² $\frac{W/w}{w/d}$ 10 / 8 N/mm² $\frac{W/w}{w/d}$ 1,52,012,5 / 10 N/mm² $\frac{W/w}{w/d}$ 15 / 12 N/mm² $\frac{W/w}{w/d}$ 42,02,02,0	Anchor rod			N	110		M12			M1	6		
Shear resistance V _{Rk} = V _{Rk,c,ll} = V _{Rk,c,⊥} [kN] depending on the mean compressive strength f _b ; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength / Use con-ditions Min. compressive strength / W/w w/d 1,5 2,0 10 / 8 N/mm ² $\frac{W/w}{dd}$ 1,5 2,0 2,0 12,5 / 10 N/mm ² $\frac{W/w}{dd}$ 1,5 2,0 2,0 15 / 12 N/mm ² $\frac{W/w}{dd}$ 2,0 2,0 2,0	Shear resistance V _{Rk} = V _{Rk,c,II} = V _{Rk,c,L} [kN] depending on the mean compressive strength f _b ; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength / Use Min. compressive strength Use con- con- ditions 0/8 N/mm² 10 / 8 N/mm² w/w w/d 12,5 / 10 N/mm² w/w w/d 15 / 12 N/mm² w/w w/d w/w w/d 2,0 2,0 2,0	Pesistance V _{Rk} = V _{Rk,c,II} = V _{Rk,c,II} = V _{Rk,c,⊥} [kN] depending on the mean compressive strength f _b ; tion and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) ompressive strength / Use mpressive strength Use con- con- ditions 2,0 10 / 8 N/mm² w/w w/d w/w w/d 1,5 2,0 2,0 12,5 / 10 N/mm² w/w w/d w/w w/d 2,0 15 / 12 N/mm² w/w w/d w/w w/d 2,0 he compressive strength of the single brick must not be less than 80% of the mean compressive strength.						3x130/20							
$\frac{\text{single brick}^{(1)}}{10 / 8 \text{ N/mm}^2} \qquad \frac{\text{w/w} \text{ w/d}}{\text{d/d}} \qquad 1,5 \qquad 2,0$ $\frac{12,5 / 10 \text{ N/mm}^2}{\text{d/d}} \qquad \frac{\text{w/w} \text{ w/d}}{\text{d/d}} \qquad 1,5 \qquad 2,0$ $\frac{15 / 12 \text{ N/mm}^2}{\text{d/d}} \qquad \frac{\text{w/w} \text{ w/d}}{\text{d/d}} \qquad 2,0 \qquad 2,0$	$ \frac{\text{single brick}^{(1)}}{10 / 8 \text{ N/mm}^2} \frac{\frac{\text{w/w}}{\text{w/d}}}{\frac{\text{d/d}}{1,5}} 2,0 $ $ \frac{12,5 / 10 \text{ N/mm}^2}{\frac{\text{w/w}}{\text{w/d}}} \frac{\frac{\text{w/w}}{\text{w/d}}}{\frac{1,5}{2,0}} 2,0 $ $ \frac{15 / 12 \text{ N/mm}^2}{\frac{\text{w/w}}{\text{w/d}}} \frac{\frac{\text{w/w}}{\text{w/d}}}{\frac{1,5}{2,0}} 2,0 $	rick 1)ditions10 / 8 N/mm² $\frac{w/w}{d/d}$ 1,52,012,5 / 10 N/mm² $\frac{w/w}{d/d}$ 1,52,015 / 12 N/mm² $\frac{w/w}{d/d}$ 2,02,0the compressive strength of the single brick must not be less than 80% of the mean compressive strength.	nstallation and use conditio Mean compressive strength /	n w/w, w/d Use									ngth f _b ;		
	$ \begin{array}{c cccccccccccccccccccccccccccccccc$	NMAM/MM/M1,52,010 / 8 N/mm² $\frac{W/W}{d/d}$ 1,52,012,5 / 10 N/mm² $\frac{W/W}{d/d}$ 1,52,015 / 12 N/mm² $\frac{W/W}{d/d}$ 2,02,0he compressive strength of the single brick must not be less than 80% of the mean compressive strength.		2002/01/02/02											
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	10 / 8 N/mm²1,52,0 d/d 1,52,0 $12,5 / 10 N/mm²$ $w/w w/d$ d/d 1,52,0 $15 / 12 N/mm²$ $w/w w/d$ d/d 2,02,0he compressive strength of the single brick must not be less than 80% of the mean compressive strength.	-												
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	12,5 / 10 N/mm² w/w w/d d/d1,52,015 / 12 N/mm² w/w w/d d/d2,02,0the compressive strength of the single brick must not be less than 80% of the mean compressive strength.	10 / 8 N/mm ²					1,5				2,0)		
12,5 / 10 N/mm² 1,5 2,0 15 / 12 N/mm² $w/w w/d $ 2,0 2,0 15 / 12 N/mm² $w/w d/d $ 2,0 2,0	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	12,5 / 10 N/mm²1,52,015 / 12 N/mm² w/w w/d2,02,015 / 12 N/mm² d/d 2,02,0he compressive strength of the single brick must not be less than 80% of the mean compressive strength.													
15 / 12 N/mm² w/w w/d d/d 2,0 2,0	15 / 12 N/mm² w/w w/d 2,0 2,0	15 / 12 N/mm² w/w w/d $2,0$ $2,0$ he compressive strength of the single brick must not be less than 80% of the mean compressive strength.	12,5 / 10 N/mm ²					1,5				2,0)		
15 / 12 N/Mm ² 2,0 2,0	15/12 N/MM- 2,0 2,0	he compressive strength of the single brick must not be less than 80% of the mean compressive strength.													
		he compressive strength of the single brick must not be less than 80% of the mean compressive strength.	15 / 12 N/mm²					2,0				2,0)		
Factor for job site tests and displacements see annex C 123.	Factor for job site tests and displacements see annex C 123.		1) The compressive strengt		gle b	rick	must n	ot be les	s than 80	0% of the	e mean c	ompressiv	ve strengt	h.	
fischer injection system FIS V Plus for masonry	fischer injection system FIS V Plus for masonry														



Vertical perforated brick	HLz, T7	PF, fille	ed with	perl	lit, E	EN 771-	1:2011	+A1:20)15		
248	Produce	Producer						e.g.	e.g. Wienerberger		
	Nominal	dimensio	ns			[r	nm] -	length L	width W		
	Mean gro	oss dry de	ensity o			[ko	/dm ³]	248	365 0,5	249	
249			e strengt	h / Mi	n.				500 FED 07 30		
	compres	sive strer	ve strength single brick ¹⁾ [N/mm ²]						/ 4 or 8 /		
	Standard	or annex	5.44	0				EN 771	-1:2011+/	1:2015	
		arameters ed anchorage with perforated sleeve FIS H K)							e also		
Anchor rod	M6 M8	M6 M8	-			M8 M10			6M12M16	M12M16	
Internal threaded anchor FIS E	-	M6 M8 M8 M8 M10 M8 M10 - M12 M16 M12 M16 M12 M12						-			
Perforated sleeve FIS H K	12x50	12x85	16>	<85		16x130	20	x85	20x130	20x200	
Anchor rod and internal thre	aded anch	or FIS E	with per	forate	ed s	leeve FI	SHK				
Max. installation max T _{inst} [Nr	n]	2 5 2 5									
General installation paramet	ers										
Edge distance cmin = ccr						60					
Smin II						80					
SpacingScr II [mi	mJ					250 80					
Smin⊥Scr⊥_	- <u> </u>	250						1			
Drilling method											
Rotary drilling with carbide drill											
¹⁾ The compressive strength	n of the singl	e brick m	ust not be	less	than	80% of t	he mean	compres	sive strenç	gth.	
Table C40.2: Group fac	tors										
Anchor rod	M6 M8	M6 M8	-	M8	M10	M8 M10	-	M12 M10	6 M12 M16	M12 M16	
Internal threaded anchor FIS E	-	-	M6 M8	-		-	M10 M12 15x85	2 -	-	-	
Perforated sleeve FIS H K	12x50	12x85	16)	(85		16x130		x85	20x130	20x200	
α _{g,N} (s _{min} II)						1,1			1		
Group $\alpha_{g,V}$ (s _{min} II)						1,2					
$\frac{\alpha_{g,N} (\$_{min} \perp)}{1,1}$											
$\alpha_{g,V}$ (S _{min} \perp)	上) 1,2										
fischer injection system F	FIS V Plus	s for ma	sonry								
Performance Vertical perforated brick HLz, dimensions, installation paran		d with per	lite,						Annex (C 40	



Vertical perfor	ated brick H	ILz, T7 PF, filled	with perlite, E	N 771-1:2011+	A1:2015
Table C41.1:	Installation (Push throu	parameters gh anchorage wit	th perforated sle	eeve FIS H K)	
Anchor rod		M10	M12		M16
Perforated sleeve	e FIS H K	18x13	0/200	2:	2x130/200
Anchor rod with	perforated sle	eve FIS H K			
Max. installation r	max T _{inst} [Nm]			5	
General installati	ion parameter	S			
Edge distance	Cmin = Ccr			60	
	s _{min} II			80	
Spacing ——	s _{cr} II [mm]			250	
	Smin 上			80	
	s _{cr} ⊥			250	
Drilling method					
Rotary drilling with	n carbide drill				
Table C41.2:	Group facto				
Anchor rod		M10	M12		M16
Perforated sleeve	e FIS H K	18x13	0/200		2x130/200
αg,	N (Smin II)			1 ,1	
· ·	$\vee (\mathbf{s}_{\min} \mathbf{I})$ [-]			1,2	
factors $\alpha_{g,t}$	N (Smin⊥)			1,1	
α _{g,\}	∨ (\$min ⊥)			1,2	
fischer injectio	n system FIS	S V Plus for masc	onry		
Performance	d brick HLz, T7	PF, filled with perlite			Annex C 41



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 anchorage)

			,								_								<u> </u>
Anchor rod			M6	M8	M6	M8	•	•	M8	M10	M	8 M10	-		M12	M16	M12	M16	M12 M1
Internal threaded anchor FIS E					-		M6	M8 (85		-		-	M10 15x		-			-	-
Perforated sleeve FIS H K			12>	c50	12>	(85			x85		1	6x130		20>	85		20x	130	20x200
Tension resistance N _{Rk} = N _{Rk} , strength f _b ; Installation and u	_p = N se c	_{Rk,b} = ondit	N _R	k,p,c w/v	= N; v, w/	Rk,b,c / d, c	[kN I/d; (] de (terr	eper nper	ndin ratu	g (re	on the range	mea 50/8	n co 0°C	omp) ²⁾	ress	sive		
Mean compressive strength / Min. compressive strength single brick ¹⁾	co	se on- ons																	
5 / 4 N/mm ²	w/w	w/d				1	,2					1,2		1	,2		1	,2	2,0
5/4N/MM*	d	/d				1	, 5					1,5		1	,5		1	, 5	2,0
8 / 6 N/mm ²	w/w	w/d				1	,5					1,5		1	,5		1	,5	2,5
0/0N/MM-	d	/d				1	,5					2,0		1	,5		2	2,0	3,0

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

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

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

Anchor rod			M10	M12	M16
Perforated sleeve FIS H K			18x13	0/200	22x130/200
Γension resistance N _{Rk} = N _{Rk} strength fь; Installation and ւ					
Mean compressive strength / Min. compressive strength single brick ¹⁾	cc	se on- ons			
5 / 4 N/mm ²	w/w	w/d	1,	2	1,2
"mm/ki # \ C	d	/d	1,	5	1,5
8 / 6 N/mm²	w/w	w/d	1,;	5	1,5
0 / 0 N/IIII-	d	/d	2,	о — — — — — — — — — — — — — — — — — — —	2,0

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

2) 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 C 123.

fischer injection system FIS V Plus for masonry

Performance

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



Vertical perforated brick	HLz, T	7 PF, fi	illed w	ith p	ber	lite, E	N 771	1:2	011-	+A1:20	015	
Table C43.1:Characteranchor un									-	failure	e of a si	ngle
Anchor rod		M6 M8	M6 M8	-		M8 M10	M8 M10	-	-		6 M12 M16	M12 M16
Internal threaded anchor FIS E		-	-	M6 11x		-	-	<u> </u>	M12 x85	-		-
Perforated sleeve FIS H K		12x50	12x85		16x	85	16x130		20x	85	20x130	20x200
Shear resistance V _{Rk} = V _{Rk,b} = Installation and use condition	$V_{Rk,c,II} = V$ w/w, w/c	V _{Rk,c,⊥} [k d, d/d; (t	N] depe empera	endir ture	ng o rar	on the nge 50/	mean co 80°C an	ompi id 72	ressi /120	ve stre °C)	ngth f _b ;	
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 compressive strength	of the sin	gle brick	must no	t be l	ess	than 8	0% of the	e mea	an co	mpressi	ve streng	th.
Table C43.2: Character anchor un									· ·	failure	e of a si	ngle
Anchor rod		Ν	/ 10			M12				M1		
Perforated sleeve FIS H K		3	18x	130/	200)				22x13	0/200	
Shear resistance $V_{Rk} = V_{Rk,b} =$ Installation and use condition	w/w, w/o										ngth f _b ;	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions											
5 / 4 N/mm ²	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 compressive strength	of the sin	gle brick	must no	t be l	ess	than 8	0% of the	e mea	an co	mpressi	ive streng	th.
Factor for job site tests and c	lisplacem	ents see	annex	C 12	3.							
fischer injection system F	IS V Plu	us for m	hasonry	/								
Performance Vertical perforated brick HLz, Characteristic resistance unde			oerlite,							A	nnex C	: 43



Vertical perforated brick	HLz, T9	MW, fil	led with	n min	era	al wool	, EN 77	71-1:201	1+A1:2	2015
248	Produce	r						e.g. \	Vienerbe	rger
	Nominal	dimensio	ne			Ĩr	nm] -	length L	width W	height H
248		010 20						248	425	248
		oss dry de			5	[kg	/dm ³]		0,8	
		mpressiv sive strer				[N/	mm²]	5/40	r 8 / 6 or	10/8
	Standard	d or anne:	x					EN 771-	1:2011+A	1:2015
425						_] {				
		20.7] [- <u>15,</u> 2] ໄສ[ension se ex B 16	e also
		7	<u>; [` `</u>		100	3.01				
Table C44.1: Installation (Pre-positi	Array and a series of the seri			2,3		sleeve	FIS H	K)		
Anchor rod	M6 M8	M6 M8				M8 M10			M12 M16	M12 M16
Internal threaded	-	-	M6 M8			-	M10 M12	2 -	-	-
anchor FIS E Perforated sleeve FIS H K	12x50	12x85	11x85 16>	,0E	+	16x130	15x85	x85	20x130	20x200
Anchor rod and internal three					_			200	202130	202200
Max. installation torque		3	with peri	1.0	5	3		5		
General installation parameter	ers									
Edge distance cmin = Ccr						60				
S _{min} II						80				
Spacings_r II [mn	n]					250				
Smin ⊥	2					80				9
s _{cr} ⊥ Drilling method						250				
Rotary drilling with carbide drill										
¹⁾ The compressive strength	of the sina	le brick m	ust not be	less th	nan	80% of t	he mean	compress	ive strend	th.
Table C44.2: Group fac	-				0.770.00					
Anchor rod	M6 M8	M6 M8	-	M8 M	10	M8 M10	-	M12 M16	M12M16	M12 M16
Internal threaded			M6 M8	I			M10 M12	2		
anchor FIS E	-	-	11x85	-		-	15x85] -	-	-
Perforated sleeve FIS H K	12x50	12x85	16>	(85		16x130	20	x85	20x130	20x200
α _{g,N} (s _{min} II)						1,3				
$\begin{bmatrix} \text{Group} & \alpha_{g, \forall} (s_{\min} I) \\ \text{factors} & \alpha_{g, \forall} (s_{\min} I) \end{bmatrix} \begin{bmatrix} I \end{bmatrix}$						1,2				
						0,6 1,2				
α _{g,} ν (Smin ⊥)						∠, ו				
fischer injection system F	IS V Plus	s for ma	sonry							
Performance Vertical perforated brick HLz, ⁻ parameters	T9 MVV, fille	ed with m	ineral wo	ol, dim	iens	sions, ins	stallation		nnex C	: 44



Vertical perforated bri	ick HLz,	T9 MW, filled	d with mineral	l wool, EN 771-	1:2011+A1:2015
	tion para hrough a		h perforated sl	eeve FIS H K)	
Anchor rod		M10	M12		M16
Perforated sleeve FIS H K		18x13	0/200	22	2x130/200
Anchor rod with perforate	d sleeve F	IS H K			
Max. installation max T _{inst}	[Nm]			5	
General installation param	neters				
Edge distance c _{min} = c _{cr}				60	
S _{min} II				80	-
Spacing	[mm]			250	
S _{min} ⊥	-			80	
Scr⊥				250	
Drilling method	ما بيا ب ا				
Rotary drilling with carbide o	arill				
Table C45.2: Group f	factors				
Anchor rod		M10	M12		M16
Perforated sleeve FIS H K		18x13	0/200		2x130/200
α _{g,N} (s _{min} II)				1,3	
Group α _{g,V} (s _{min} II)	[-]			1,2	
factors $\alpha_{g,N}(s_{\min} \perp)$				0,6	
$\alpha_{g,V} (\mathbf{s}_{\min} \perp)$				1,2	
fischer injection system	n FIS V F	Plus for maso	nry		
Performance Vertical perforated brick HL dimensions, installation par		, filled with mine	ral wool,		Annex C 45



			-		ure or brick e-positione			e of a	
Anchor rod		M6 M8	M6 M8	- M	8 M10 M8 M10	- 10	M12 M16	M12 M16	M12 M1
Internal threaded anchor FIS E		-	-	M6 M8 11x85		M10M12 15x85	-	-	-
Perforated sleeve FIS H K		12x50	12x85	16x8	5 16x130	202	x85	20x130	20x20
「ension resistance N _{Rk} = N _{Rk,} strength fь; Installation and u	_p = N _{Rk,b} = se condi	= N _{Rk,p,c} : tion w/w	= N _{Rk,b,c} v, w/d, d	[kN] depe /d; (temp	ending on th erature rang	e mean o e 50/80°C	compres C) ²⁾	sive	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions		-du - Ste						
5 / 4 N/mm²	w/w w/d	1,	,5	2,0	3,0	2	,5	4,	0
• • • • • • • • • • • • • • • • • • • •	d/d	2,	,0	2,5	3,0	2	,5	4,	5
8 / 6 N/mm²	w/w w/d		,0	2,5	3,5	+	,0	5,	
	d/d	2,		3,0	4,0		,0	5,	
10 / 8 N/mm ²	w/w w/d		,5	3,0	4,0		,5	6,	
	d/d	2,	,5	3,0	4,5	3	,5	6,	5
Perforated sleeve FIS H K			10	600-026 (2010-0262) Core 21			The second se		
i choraced siceve i to ii h			188	130/200			22x130	0/200	
ension resistance N _{Rk} = N _{Rk} ,			= N _{Rk,b,c}	[kN] depe			compres		
Tension resistance N _{Rk} = N _{Rk} , strength f _b ; Installation and u Mean compressive strength / Min. compressive strength			= N _{Rk,b,c}	[kN] depe			compres		
Tension resistance N _{Rk} = N _{Rk} , strength f _b ; Installation and u Mean compressive strength / Min. compressive strength single brick ¹⁾	se condi Use con-		= N _{Rk,b,c}	[kN] depe			compres C) ²⁾		
Tension resistance N _{Rk} = N _{Rk} , strength f _b ; Installation and u Mean compressive strength / Min. compressive strength	se condi Use con- ditions		= N _{Rk,b,c}	[kN] depe /d; (tempo			compres C) ²⁾ 4	sive	
Tension resistance N _{Rk} = N _{Rk} , strength f _b ; Installation and u Mean compressive strength / Min. compressive strength single brick ¹⁾ 5 / 4 N/mm ²	se condi Use con- ditions w/w w/d		= N _{Rk,b,c}	[kN] depe /d; (tempo 3,0			compres C) ²⁾ 4 4	s ive	
Tension resistance N _{Rk} = N _{Rk} , strength f_b; Installation and u Mean compressive strength / Min. compressive strength single brick ¹⁾	se condi Use con- ditions w/w w/d d/d		= N _{Rk,b,c}	[kN] depe /d; (tempo 3,0 3,0			compres C) ²⁾ 4 4 5	,0 ,5	
Tension resistance N _{Rk} = N _{Rk} , strength f _b ; Installation and u Mean compressive strength / Min. compressive strength single brick ¹) 5 / 4 N/mm ² 8 / 6 N/mm ²	se condi Use con- ditions w/w w/d d/d w/w w/d d/d		= N _{Rk,b,c}	[kN] depe /d; (tempe 3,0 3,0 3,5 4,0 4,0			2) ²⁾ 4 4 5 5 6	9,0 9,5 9,5 9,5 9,5 9,5	
Tension resistance N _{Rk} = N _{Rk} , strength f _b ; Installation and u Mean compressive strength / Min. compressive strength Single brick ¹⁾ 5 / 4 N/mm ² 8 / 6 N/mm ² 10 / 8 N/mm ² ¹⁾ The compressive strength	se condi Use con- ditions w/w w/d d/d w/w w/d d/d d/d d/d	tion w/w	= N _{Rk,b,c}	[kN] depe /d; (tempo 3,0 3,0 3,5 4,0 4,0 4,5 ot be less th	nan 80% of th	e 50/80°C	2) ²⁾ 4 4 5 5 6 6	5,0 5,5 5,0 5,5 5,5 5,5	h.
Tension resistance N _{Rk} = N _{Rk} , strength f _b ; Installation and u Mean compressive strength / Min. compressive strength single brick ¹) 5 / 4 N/mm ² 8 / 6 N/mm ² 10 / 8 N/mm ²	se condi Use con- ditions w/w w/d d/d w/w w/d d/d d/d d/d d/d to of the sin 2/120°C: displacem	gle brick NRk (72/12 lents see	= N _{Rk,b,c} v, w/d, d	[kN] depe /d; (tempo 3,0 3,0 3,5 4,0 4,0 4,5 ot be less th 33 · N _{Rk (50/} C 123.	nan 80% of th	e 50/80°C	2) ²⁾ 4 4 5 5 6 6	5,0 5,5 5,0 5,5 5,5 5,5	h.



Vertical perforated brick	·	·				·				
Table C47.1: Character anchor ur							-	failure	of a sir	ngle
Anchor rod		M6 M8	M6 M8	-	M8 M10	M8 M10	-	M12 M16	M12 M16	M12 M16
Internal threaded anchor FIS E		-	-	M6 M8 11x85	-	-	M10M12 15x85	-	-	-
Perforated sleeve FIS H K		12x50	12x85	16>	85	16x130	20>	(85	20x130	20x200
Shear resistance V _{Rk} = V _{Rk,b} = Installation and use condition	V _{Rk,c,ll} = n w/w, w/	V _{Rk,c,⊥} [k d, d/d; (1	(N] depo tempera	ending ature rai	on the nge 50/	mean co 80°C an	ompressi d 72/120	ive strer °C)	ngth f⊳;	
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 compressive strength	of the sir	igle brick	must no	t be less	s than 8	D% of the	e mean co	mpressiv	re strengt	h.
Table C47.2: Character anchor ur							-	e failure	of a sir	ngle
Anchor rod		N	/ 10		M12			M10		
Perforated sleeve FIS H K			01100000	130/200				22x130		
Shear resistance $V_{Rk} = V_{Rk,b} =$ Installation and use condition									ngth f⊳;	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions									
5 / 4 N/mm²	w/w w/d d/d			2,5				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	Ì	
¹⁾ The compressive strength	h of the sir	ngle brick	must no	t be less	s than 8	D% of the	e mean co	mpressiv	/e strengt	th.
Factor for job site tests and		-						·	Ū	
								1		
fischer injection system F	TIS V PI	us for n	nasonr	у						



Vertical perforated br	ick H	ILz, FZ	7, filled	d with m	nine	ral	wool, E	EN 771	-1:2011	+A1:201	5
24	'o	Producer	ſ						e.g.	Wienerbe	rger
	×	Nominal	dimensic	ons			[mm]	length L	-	
		Mean gro	oss drv d	ensity o			٢ka	g/dm ³]	248	425 0,8	248
	248	100000 (Contraction of the contraction of the contr		e strength	n / M	in.		1	E / A a		10/0
	ļ			ngth single	e bri	ck 1)	e.	[N/mm ²]		or 7,5 / 6 or	
	$\langle $	Standard	l or anne.	х 'L				ń.	EN 771	I-1:2011+A	1:2015
425	×			•					Dir	nension se	
4				i i i						nex B 16	c also
		10	8	101							
		parame									
(Pre-po	ositio			with pe		_					
Anchor rod		M6 M8	M6 M8	- M6 M8	M8	M10	M8 M10	 M10M1	<u> </u>	6 M12 M16	M12 M16
Internal threaded anchor FIS E		-	-	11x85		-	-	15x85		-	-
Perforated sleeve FIS H K	(12x50	12x85	16>	(85		16x130		0x85	20x130	20x200
Anchor rod and internal t	hread	led anch	or FIS E	with perf	orat	ed s	leeve Fl	ѕнк			
Max. installation max T _{inst}	[Nm]		2			5	2		5	i	
General installation parar	meter	S			8						
Edge distance cmin = Ccr							60				
Smin II	[mm]						80 250				
Spacing s _{min} ⊥	[]						80				
Scr ⊥							250				
Drilling method											
Rotary drilling with carbide											
¹⁾ The compressive stre	-	•	e brick m	ust not be	less	than	80% of	the mear	o compres	ssive streng	jth.
Table C48.2: Group	facto	ors									
Anchor rod		M6 M8	M6 M8	-	M8	M10	M8 M10			16 M12 M16	M12 M16
Internal threaded anchor FIS E		-	-	M6 M8 11x85	-	-	-	M10 M1		-	-
Perforated sleeve FIS H K	(12x50	12x85	11205	(85		16x130) 0x85	20x130	20x200
α _{g,N} (s _{min} II)							1,9				
Group α _{g,V} (s _{min} Ⅱ)	r_1						0,9				
factors $\alpha_{g,N}$ (s _{min} \perp)	[-]	-					1,0				
$\alpha_{g,V} (\mathbf{s}_{\min} \perp)$							0,7				
fischer injection syste	m FIS	S V Plus	for ma	sonry							
Performance Vertical perforated brick H dimensions, installation pa			with mine	eral wool;						Annex (2 48



Anchor rod		M10	M12		M16
Perforated sleeve FI	ISHK	18x130/200	100030303000	22	x130/200
Anchor rod with per	rforated sleev				
Max. installation	T _{inst} [Nm]		5		
loique					
General installation	- r - r -				
	in = Ccr Smin II		60 80		
	s _{cr} II [mm]		250		
Spacing	Smin ⊥		80		
-	S _{cr} ⊥		250		
Drilling method			ಸಾಹತ್		
Rotary drilling with ca	arbide drill				
able C49.2: G	roup factors	s M10	M12		M16
Perforated sleeve FI	іян к	18x130/200		22	x130/200
α _{g,N} (s		100/200	, 1,9		X100/200
$\frac{\alpha_{g,N}}{\alpha_{g,V}}$			0,9		
factors $\alpha_{g,N}$ (s			1,0		
α _{g,V} (s			0,7		



Anchor rod		M6 M8	M6 M8	-	M8 M10	M8 M10	-	M12 M16	M12 M16	M12 M1
Internal threaded anchor FIS E		-	-	M6 M8	-	-	M10M12 15x85	-	•	-
Perforated sleeve FIS H K		12x50	12x85	16>	. 85	16x130	20>	k85	20x130	20x20
ົອກຣion resistance N _{Rk} = N _{Rk} strength fь; Installation and ເ									sive	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions		, w.u, u	ind, (ten	iperatu	re rang		, ·		
_	w/w w/d	0,60	0,75	1,5	50	2.00	1.:	20	2,00	2,00
5 / 4 N/mm²	d/d	0,60	0,90	1,		2,00	· · ·	 50	2,00	2,50
	w/w w/d	0,75	0,90	1,5		2,00	1,	50	2,50	2,50
7,5 / 6 N/mm²	d/d	0,90	0,90	2,0	00	2,50	2,	00	2,50	3,00
10 / 8 N/mm ²	w/w w/d	0,90	1,20	2,0	00	2,50	2,	00	2,50	3,00
	d/d	0,90	1,20	2,0	00	3,00	2,	00	3,00	3,50
single and		er tens	sion loa 110	I-out fa ading (I	Push t M12			age) M1	6	
single and Anchor rod Perforated sleeve FIS H K	chor und	er tens	ion loa //10 18x	I-out fa ading (I (130/200	illure c Push t M12	hrough	anchor	age) M1 22x13(6 D/200	
single and Anchor rod Perforated sleeve FIS H K Tension resistance N _{Rk} = N _{Rk}	chor und .p = N _{Rk,b} =	er tens M NRk,p,c	sion loa //10 18x = N _{Rk,b,c}	l-out fa ading (l 130/200 [kN] de	M12	hrough	anchor e mean c	age) M1 22x130 compres	6 D/200	_
single and Anchor rod Perforated sleeve FIS H K Tension resistance N _{Rk} = N _{Rk} strength f _b ; Installation and u	chor und .p = N _{Rk,b} =	er tens M NRk,p,c	sion loa //10 18x = N _{Rk,b,c}	l-out fa ading (l 130/200 [kN] de	M12	hrough	anchor e mean c	age) M1 22x130 compres	6 D/200	
Single and Anchor rod Perforated sleeve FIS H K Tension resistance N _{Rk} = N _{Rk} Strength f _b ; Installation and u Mean compressive strength / Min. compressive strength	p = N _{Rk,b} = ise condi Use con-	er tens M NRk,p,c	sion loa //10 18x = N _{Rk,b,c}	l-out fa ading (l 130/200 [kN] de	M12	hrough	anchor e mean c	age) M1 22x130 compres	6 D/200	
Single and Anchor rod Perforated sleeve FIS H K Tension resistance N _{Rk} = N _{Rk} Strength f _b ; Installation and u Mean compressive strength / Min. compressive strength	p = N _{Rk,b} = Ise condit Use con- ditions	er tens M NRk,p,c	sion loa //10 18x = N _{Rk,b,c}	l-out fa ading (l (130/200 [kN] de l/d; (tem	M12	hrough	anchor e mean c	rage) <u>M1</u> 22x13(compres C) ²⁾	6 0/200 ssive	
Single and Anchor rod Perforated sleeve FIS H K Tension resistance N _{Rk} = N _{Rk} Strength f _b ; Installation and u Mean compressive strength / Min. compressive strength	p = N _{Rk,b} = ise condit Use con- ditions w/w w/d	er tens M NRk,p,c	sion loa //10 18x = N _{Rk,b,c}	I-out fa ading (I 130/200 [kN] de I/d; (terr 2,0	M12	hrough	anchor e mean c	rage) <u>M1</u> 22x13(compres C) ²⁾ 2,0	6)/200 ssive	
Single and Anchor rod Perforated sleeve FIS H K Tension resistance N _{Rk} = N _{Rk} Strength f _b ; Installation and u Mean compressive strength / Min. compressive strength single brick ¹) 5 / 4 N/mm ²	p = N _{Rk,b} = Ise condit Use con- ditions W/W W/d d/d	er tens M NRk,p,c	sion loa //10 18x = N _{Rk,b,c}	I-out fa ading (I 130/200 [kN] de I/d; (tem 2,0 2,0	M12	hrough	anchor e mean c	rage) M1 22x13(compres c) ²⁾ 2,0 2,0	6 0/200 ssive	
Single and Anchor rod Perforated sleeve FIS H K Tension resistance N _{Rk} = N _{Rk} strength f _b ; Installation and u Mean compressive strength / Min. compressive strength single brick ¹)	p = N _{Rk,b} = ise conditions W/W w/d d/d w/w w/d	er tens M NRk,p,c	sion loa //10 18x = N _{Rk,b,c}	I-out fa ading (I 130/200 [kN] de I/d; (terr 2,0 2,0 2,0	M12	hrough	anchor e mean c	rage) M1 22x13(compres C) ²⁾ 2,(2,(2,(2,5)	6)/200 ssive	
single and Anchor rod Perforated sleeve FIS H K Tension resistance N _{Rk} = N _{Rk} strength f _b ; Installation and u Mean compressive strength / Min. compressive strength single brick ¹) 5 / 4 N/mm ² 7,5 / 6 N/mm ²	P = NRK,b = ISE conditions W/W W/d d/d W/W W/d d/d	er tens M NRk,p,c	sion loa //10 18x = N _{Rk,b,c}	I-out fa ading (I (130/200 [kN] de I/d; (tem 2,0 2,0 2,0 2,5	M12	hrough	anchor e mean c	rage) M1 22x13(compres C) ²⁾ 2,0 2,0 2,5 2,5 2,5 2,5 2,5 2,5 2,5 2,5	6 0/200 ssive	
Single and Anchor rod Perforated sleeve FIS H K Tension resistance N _{Rk} = N _{Rk} Strength f _b ; Installation and u Mean compressive strength / Min. compressive strength single brick ¹) 5 / 4 N/mm ²	chor und p = N _{Rk,b} = ise conditions W/w W/d d/d w/w W/d d/d w/w W/d d/d w/w W/d d/d w/w W/d d/d	er tens	M10 18x NRk,b,c V, W/d, d	I-out fa ading (I (130/200 [kN] de I/d; (tem 2,0 2,0 2,0 2,5 2,5 3,0 ot be less	M12 M12 pendin peratu	hrough ig on the re range	anchor e mean c e 50/80°C	rage) M1 22x13(compres C) ²⁾ 2,0 2,0 2,5 2,5 2,5 3,0	6 0/200 ssive	h.

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

Characteristic resistance under tension loading



K HLZ, H	Z 7, fill	led wit	h mine	eral w	ool, EN	771-1:	2011+/	A1:201	5
						-	e failure	of a sir	ngle
	M6 M8	M6 M8	-	M8 M10	M8 M10	-	M12 M16	M12 M16	M12 M16
	-	-	M6 M8 11x85	-	-	M10M12 15x85	-	-	-
	12x50	12x85	16>	(85	16x130	20	(85	20x130	20x200
= V _{Rk,c,ll} = on w/w, w	V _{Rk,c,⊥} [I /d, d/d; ((N] depo tempera	ending ature rai	on the nge 50/	mean co 80°C an	ompress d 72/120	ive strer °C)	ngth f⊳;	
con-	9								
w/w w/d d/d	1 1,2				1,5				1,5
w/w w/o d/d	i 1,5				2,0				1,5
w/w w/o d/d	1,5				2,5				2,0
ristic re	sistance	e to loc	al brick	failur	e or bri	ck edge	·	Ū	
						~ 3 ~/	8446		
		 8x130/2		2	-			200	
								ngth f _b ;	
con-		-							
w/w w/d d/d					1,5				
w/w w/d d/d					2,0				
w/w w/c d/d					2,5				
	-			s than 80	D% of the	e mean co	ompressiv	ve strengt	h.
	= VRK,c,II = on w/w, w, Use con- ditions w/w w/c d/d w/w w/c ditions w/w w/c d/d w/w w/c <t< th=""><th>Arristic resistance Inder shear load M6 M6 I2x50 VRK,c,II VRK,C,II</th><th>eristic resistance to locander shear loading (Pr</th><th>eristic resistance to local brick inder shear loading (Pre-position</th><th>eristic resistance to local brick failure inder shear loading (Pre-positioned M6 M8 M6 M8 - M8 M10 - M10 M8 W/W W/d 12 - M10 M12 - M10 M</th><th>eristic resistance to local brick failure or brinder shear loading (Pre-positioned anchor M6 M8 M6 M8 M10 M8 M10 - - M6 M8 -</th><th>eristic resistance to local brick failure or brick edge inder shear loading (Pre-positioned anchorage) M6 M8 M8 M8 M10 M8 M10 M10 - - - M6 M8 - M10 M12 - - - M10 M12 - - - M10 - - - M10 - - - M10 -</th><th>eristic resistance to local brick failure or brick edge failure inder shear loading (Pre-positioned anchorage) M6 M8 M6 M8 - M10 M12 M14 M12 M14 M12 M14 M15 M14 M14 M14 M15 M14 M14 M15 M14 M14 M15 M15 M14</th><th>M6 M8 M6 M8 M8 M10 M12 M12 M12 1</th></t<>	Arristic resistance Inder shear load M6 M6 I2x50 VRK,c,II VRK,C,II	eristic resistance to locander shear loading (Pr	eristic resistance to local brick inder shear loading (Pre-position	eristic resistance to local brick failure inder shear loading (Pre-positioned M6 M8 M6 M8 - M8 M10 - M10 M8 W/W W/d 12 - M10 M12 - M10 M	eristic resistance to local brick failure or brinder shear loading (Pre-positioned anchor M6 M8 M6 M8 M10 M8 M10 - - M6 M8 -	eristic resistance to local brick failure or brick edge inder shear loading (Pre-positioned anchorage) M6 M8 M8 M8 M10 M8 M10 M10 - - - M6 M8 - M10 M12 - - - M10 M12 - - - M10 - - - M10 - - - M10 -	eristic resistance to local brick failure or brick edge failure inder shear loading (Pre-positioned anchorage) M6 M8 M6 M8 - M10 M12 M14 M12 M14 M12 M14 M15 M14 M14 M14 M15 M14 M14 M15 M14 M14 M15 M15 M14	M6 M8 M6 M8 M8 M10 M12 M12 M12 1



	and and	Proc	lucer									e.a.	Bouyer Le	roux
						-					, †	length L	width W	
	\sim	Nom	ninal c	limen	sions	5				[mm		500	200	315
\wedge		Mea	n gro	ss dry	/ den	sity p	(- 1	[kg/dn	1 ³]		≥ 0,6	
× See			n con press)	[N/mr	n²]	5/4 0	r 7,5 / 6 or	10/8
		Stan	dard	or an	nex							EN 771	-1:2011+A	1:2015
Table C52.7	1: Installation	n para	amet	ers		30 30 30 7,7]]] 50) [] [] []] [] [] []] [] [] []] [] [] [] [] 0				imension s nnex B 16	see also
	(Pre-positi	oned	anc	hora		vith p	perfo							
Anchor rod		M6	M8	M6	M8		-	M8	M10	M8	M10		M12 M16	5 M12 M [·]
Internal threa anchor FIS E			-		-	M6 11;	M8 x85		-	-		M10 M12 15x85	-	-
Perforated sl	eeve FIS H K	12	x50	12:	(85		16)	(85		16x1	30	20	x85	20x13
Anchor rod a	ind internal threa	ded a	ncho	r FIS	Ew	ith pe	erfora	ted	sleev	e FIS	нк			
Max. installation		-							2	2				
	allation paramete	ers												
Edge distance	1.000								12	CALMEN				
	S _{min} II [mm	ŋ							12					
Spacing _	Scr II								50	6680				
	$s_{\min} \perp = s_{cr} \perp$								31	5				
Drilling meth	od ng with hard meta													
		i nann	ner di	rill										
¹⁾ The con Table C52.2	npressive strength	of the tors	single	e brick		t not t	oe les							
¹⁾ The con Table C52.2 Anchor rod	npressive strength 2: Group fact	of the			mus M8		-		in 80% M10				M12 M16	
¹⁾ The con Table C52.2	npressive strength 2: Group fact	of the tors	single	e brick		M6	- M8					- M10 M12	M12 M16	
¹⁾ The con Table C52.2 Anchor rod Internal threa	npressive strength 2: Group fact aded anchor	of the tors M6	single	brick		M6	- M8 x85				V 10	- M10 M12 15x85	M12 M16	
¹⁾ The con Table C52.2 Anchor rod Internal threa FIS E	npressive strength 2: Group fact aded anchor eeve FIS H K	of the tors M6	single M8	brick	M8	M6	- M8 x85	M8	M10 -	M8 - 16x1	V 10	- M10 M12 15x85	M12 M16	5 M12 M
¹⁾ The con Table C52.2 Anchor rod Internal threa FIS E Perforated sl Group	npressive strength 2: Group fact aded anchor eeve FIS H K $\alpha_{g,N}$ (Smin II) $\alpha_{g,N}$ (Smin II)	of the tors M6	single M8	brick	M8	M6	- M8 x85	M8	M10 -	M8 - 16x1 3	V 10	- M10 M12 15x85	M12 M16	5 M12 M
¹⁾ The con Table C52.2 Anchor rod Internal threa FIS E Perforated sl	npressive strength 2: Group fact aded anchor eeve FIS H K $\alpha_{g,N}$ (Smin II) $\alpha_{g,V}$ (Smin II) [-]	of the tors M6	single M8	brick	M8	M6	- M8 x85	M8	M10 - 1,	M8 - 16x1 3 7	V 10	- M10 M12 15x85	M12 M16	5 M12 M
¹⁾ The con Table C52.2 Anchor rod Internal threa FIS E Perforated sl Group	npressive strength 2: Group fact aded anchor eeve FIS H K $\alpha_{g,N}$ (Smin II) $\alpha_{g,N}$ (Smin II) $\alpha_{g,N}$ (Smin \perp) [-]	of the tors M6	single M8	brick	M8	M6	- M8 x85	M8	M10 -	M8 - 16x1 3 7	V 10	- M10 M12 15x85	M12 M16	5 M12 M
¹⁾ The con Table C52.2 Anchor rod Internal threa FIS E Perforated sl Group	npressive strength 2: Group fact aded anchor eeve FIS H K $\alpha_{g,N}$ (Smin II) $\alpha_{g,V}$ (Smin II) [-]	of the tors M6	single M8	brick	M8	M6	- M8 x85	M8	M10 - 1,	M8 - 16x1 3 7	V 10	- M10 M12 15x85	M12 M16	5 M12 M
The con Table C52.2 Anchor rod Internal threa FIS E Perforated sl Group factors	pressive strength 2: Group fact aded anchor eeve FIS H K $\frac{\alpha_{g,N} (Smin II)}{\alpha_{g,V} (Smin \bot)}$ $\frac{\alpha_{g,N} (Smin \bot)}{\alpha_{g,V} (Smin \bot)}$ [-] ction system F	of the tors M6 12	single M8 - x50	 brick M6 122 	M8	M6 11	- M8 x85	M8	M10 - 1,	M8 - 16x1 3 7	V 10	- M10 M12 15x85	M12 M16	M12M



Table C53.1: Installation parameters (Push through anchorage with perforated sleeve FIS H K) Anchor rod M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 Anchor rod with perforated sleeve FIS H K 18x130/200 22x130/200 Machor rod with perforated sleeve FIS H K 18x130/200 22x130/200 General installation parameters 2 General installation parameters Edge distance 120 120 Spacing Smill 120 120 Smach B en ul 1315 100 100 Drilling method Harmer drill 1315 100 Table C53.2: Group factors Anchor rod M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 22x130/200 Group Group (Gen II) (Group (Gen II)) (acy (Gen II)) (acy (Gen II)) 1,7 2,0 2,0 fischer injection system FIS V Plus for masonry Performance Annex C 53 Annex C 53	Vertical perforated brick	HI 7 EN 771-1-20)11+ ∆ 1·2015		
(Push through anchorage with perforated sleeve FIS H K) Anchor od With perforated sleeve FIS H K 18x130/20 22x130/200 Anchor od With perforated sleeve FIS H K 18x130/20 22x130/200 Max, installation max Tme INm 2 General installation parameters 120 315 Edge distance Sem II 100 M10 M10 2 Spacing Sem II Sem II Sem II Sem II Sem II Sem III Sem IIII Sem IIII Sem IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	-				
Anchor rod M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 Anchor rod with perforated sleeve FIS H K 18x130/200 22x130/200 Max. Installation max Tme [Nm] 2 General installation parmeters Edge distance 120 Spacing Sent II 500 500 Smin II 500 315 500 Drilling method Hammer drill 120 22x130/200 Hammer drilling with hard metal hammer drill 700 22x130/200 22x130/200 Group Gapit (Sem II) 1.3 2 1.3 Group Gapit (Sem II) 1.7 1.7 factors Gapit (Sem II) 1.7 2.0			th perforated sle	eeve FIS H K)	
Perforated sleeve FIS H K 18x130/200 22x130/200 Anchor rod with perforated sleeve FIS H K Max. installation max Tmm [Nm] 2 General installation max Tmm [Nm] 2 2 General installation max Tmm [Nm] 120 2 Spacing	·		•		M16
Anchor rod with perforated sleeve FIS H K Max. Installation max T_me [Nm] 2 General installation parameters 120 Edge distance 0mn 120 Spacing smin II sem 1 = ser I 120 Drilling method 120 135 Drilling with hard metal hammer drill Table C53.2: Group factors M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 22x130/200 1.3 Group agv (Smin II) agv (Smin II) factors [1] 1.7 2.0 1.3 Group factors 1.3 2.0 2.0 2.0 2.0 2.0 fischer injection system FIS V Plus for masonry 2.0 Annex C 53 Annex C 53		000000.VCV	036275295565	22	23236.2322-0.
Max. installation torque max Tmst Bdige distance IMm 2 Edge distance Ceneral installation parameters 120 Spacing Semin II Semin II Semin II Semin II Semin II Semin II 120 Jammer drilling with hard metal hammer drill 5000 315 Drilling method M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 Group factors Group (Semin II) Group (Seg (Semin II) factors 1.3 2.0 Group factors I 1.7 2.0 2.0					
Concertal installation parameters 120 Spacing Smn II Smn I = Sor I 120 Spacing Smn II Smn I = Sor I 120 Spacing Sor II 120 Spacing Sor II 120 Smn I = Sor I 315 0 Drilling method Hammer drilling with hard metal hammer drill M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 Group Group (Smn II) (Gay (Smn II)) (Gay (Sm	Max installation			2	
Edge distance Cmm = Cm 120 Spacing Smm II Smm II 120 Spacing Smm II Smm II Smm II Smm II Spacing Smm II Smm II Smm II Smm II Smm II Spacing Smm II	toldne			2	
Spacing Serie II Serie I Imm 120 Spacing Serie II Serie I Serie II 500 Drilling method 315 315 Hammer drilling with hard metal hammer drill Table C53.2: Group factors M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 22x130/200 1.3<		rs		400	
Spacing set II Imm 500 Drilling method 315 315 Hammer drilling with hard metal hammer drill Table C53.2: Group factors M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 1.3 <td< th=""><th></th><th>13</th><th></th><th>10.003</th><th></th></td<>		13		10.003	
315 Drilling method Hammer drill Table C53.2: Group factors Anchor rod M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 Group agv (Smin II) a	[mm]			Philipping	
Drilling method Harmmer drill Table C53.2: Group factors Anchor rod M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 Group factors Cask (Smin II) Group factors 1.3 1.7 Group factors [-] 2.0 2.0 Start (Smin II) Group factors [-] 2.0 Group factors [-] 2.0 2.0 fischer injection system FIS V Plus for masonry Fischer injection system FIS V Plus for masonry Performance				40.00% \$4.000	
Hammer drilling with hard metal hammer drill Table C53.2: Group factors Anchor rod M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 factors ag,v (Smin II) ag,v	100% 00000 0000 0000 0000 0000 0000	<u>.</u>			
Anchor rod M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 Group factors Group agv (smn II) agv (smn II) agv (smn II) I 1.3 Image: Company (smn II) agv (smn II) Image: Company (smn III) agv (smn II) Image: Company (smn II		hammer drill			
Anchor rod M10 M12 M16 Perforated sleeve FIS H K 18x130/200 22x130/200 Group factors Group agv (smn II) agv (smn II) agv (smn II) I 1.3 Image: Company (smn II) agv (smn II) Image: Company (smn III) agv (smn II) Image: Company (smn II					
Perforated sleeve FIS H K 18x130/200 22x130/200 Group factors	Table C53.2: Group factor	ors			
Group factors $ \frac{\alpha_{g,V}(s_{min} II)}{\alpha_{g,V}(s_{min} II)}} $	Anchor rod	M10	M12		M16
Group factors <i>a</i> _g v (\$min II) <i>a</i> _g v (\$min II] <i>a</i> _g v (\$min II]	Perforated sleeve FIS H K	18x1	30/200	22	2x130/200
factors Image: Grand Lip of Grand Lip	α _{g,N} (s _{min} II)			1,3	
Ideal S Cig N (Smin L) Cig V (Smin L) 2,0 Ideal S Cig N (Smin L) 2,0 <t< th=""><th></th><th></th><th></th><th>1,7</th><th></th></t<>				1,7	
fischer injection system FIS V Plus for masonry Performance Annex C 53	factors $\alpha_{g,N} (s_{min} \perp)$			20	
Performance Annex C 53	α _{g.V} (s _{min} ⊥)			2,0	
Performance Annex C 53					
Performance Annex C 53					
Performance Annex C 53					
Performance Annex C 53					
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Performance Annex C 53					
Performance Annex C 53					
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Performance Annex C 53					
Performance Annex C 53					
Performance Annex C 53					
Performance Annex C 53					
Performance Annex C 53					
	fischer injection system FI	S V Plus for mase	onry		
		imensions, installatio	n parameters		Annex C 53



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

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

Ŭ						•					~	<i>'</i>		
Anchor rod		M6	M8	M6	M8	-	M8	M10	M8 M1	0	-	M12	M16	M12 M1
Internal threaded			_		-	M6 M8		_		M10	M12		_	
anchor FIS E			·			11x85		-	-	152	x85		·	-
Perforated sleeve FIS H K		12)	x50	12	x85	16	6x85		16x13)	20 2	x85		20x130
Tension resistance N _{Rk} = N _R strength f _b ; Installation and												ressi	ive	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions													
5 / 4 N/mm²	w/w w/d	0,	50			1,50			0,75		1,	50		1,50
5/4 N/MIN*	d/d	0,	60			1,50			0,90		1,	50		2,00
7,5 / 6 N/mm²	w/w w/d	0,	75			2,00			1,20		2,	00		2,50
7,576 W/IIIII-	d/d	0,9	90			2,50			1,20		2,	50		2,50
10 / 8 N/mm ²	w/w w/d	0,5	90			3,00			1,50		3,	00		3,50
	d/d	1,:	20			3,00			2,00		3,	00		3,50
²⁾ For temperature range Table C54.2: Characte single ar	eristic re	sista	ance	e to	pul	l-out fa	ilure	orb					of a	
Anchor rod			M	10		- 10	M12				ľ	M16		
Perforated sleeve FIS H K					18x1	30/200			6		22x'	130/2	:00	
Tension resistance N _{Rk} = N _R strength f _b ; Installation and												ressi	ive	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions													
5 / 4 N/mm ²	w/w w/d				C),75						1,50		
3/4 N/IIIII-	d/d				C),90					2	2,00		

0,90 2,00 w/w w/d 1,20 2,50 7,5 / 6 N/mm² d/d 1,20 2,50 w/w w/d 1,50 3,50 10 / 8 N/mm² d/d 2,00 3,50

¹⁾ The compressive strength of the single brick must not be less than 80% of the mean compressive strength. ²⁾ For temperature range 72/120°C: $N_{Rk(72/120^{\circ}C)} = 0.83 \cdot N_{Rk(50/80^{\circ}C)}$.

Factor for job site tests and displacements see annex C 123.

fischer injection system FIS V Plus for masonry

Performance

Vertical perforated brick HLz, Characteristic resistance under tension loading



Vertical perforated brid	k HLz, I	EN 771-	1:2011	+A1:2	015					
Table C55.1: Characte anchor u								-	ure of a s	single
Anchor rod		M6 M8	M6 M8	-	M8	M10	M8 M10	-	M12 M16	M12 M16
Internal threaded anchor FIS E		-	-	M6 M8 11x85		-	-	M10 M12 15x85	2 -	-
Perforated sleeve FIS H K		12x50	12x85	16	5x85		16x130	20	x85	20x130
Shear resistance V _{Rk} = V _{Rk,b} Installation and use condition									trength f _b ;	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions									
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/mm ²	w/w w/d d/d		3	,5			2,0	3,5	4,5	2,0
anchor u Anchor rod	inder sh	ear load M10	ling (Pu	ish thro M1	-	n and	horage)		116	
Perforated sleeve FIS H K			18x130/2						30/200	
Shear resistance V _{Rk} = V _{Rk,b} Installation and use condition									trength f _b ;	
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 compressive streng Factor for job site tests and		-			than	80%	of the me	an compre	essive stren	gth.
fischer injection system	FIS V P	lus for r	nasonr	y					Annex	



Vertical perforated brick	HLz,	EN	771-	1:20)11+A1:2	2015				
an an	Prod	lucer						e.g	. Wienerbe	erger
	Nom	inal c	limon	eione			[mm]	length L	width W	height H
				01			-	500	200	300
	-				sity p	140100	[kg/dm ³]		≥ 0,7	
					strength / I th single bi		[N/mm ²	2] 5/40	or 7,5 / 6 o 12,5 / 10	
	Stan	dard	or an	nex				EN 77	1-1:2011+	A1:2015
Table C56.1: Installation (Pre-positi		amet		. ⁵⁰ .	vith perfo	rated sle	eve FIS	H K)	Dimensio also Ann	
Anchor rod	M6	M8	M6	M8	_	M8 M10	M8 M10	_	M12 M16	M12 M16
Internal threaded					M6 M8			M10 M12		
anchor FIS E		-		-	11x85	-	-	15x85	-	-
Perforated sleeve FIS H K	-	x50		x85		(85	16x130	203	(85	20x130
Anchor rod and internal threa	ded a	ncho	r FIS	Ewi	ith perfora	ted sleev	e FIS H K			
Max. installation torque max T _{inst} [Nm	-					2	2			
General installation parameter	rs				-			•		
Edge distance cmin = Ccr				5	0	10	8	0	50	80
Spacing Scr II	ı]—					50	2000			
$s_{min} \perp = s_{cr} \perp$	1					30	1981.			
Drilling method										
Hammer drilling with hard meta	l hamr	ner d	rill							
1) The compressive strength	of the	single	brick	mus	t not be les	s than 80%	of the mea	an compre	ssive stren	gth.
Table C56.2: Group fact	ors									
Anchor rod	M6	M8	M6	M8	-	M8 M10	M8 M10	-	M12 M16	M12 M16
Internal threaded		1			M6 M8			M10 M12		
anchor FIS E		-		-	11x85	-		15x85	-	-
Perforated sleeve FIS H K	12:	x50	12:	x85	16:	(85	16x130	202	(85	20x130
α _{g,N} (s min II)						1,	4			
Group $\alpha_{g,V}$ (s _{min} II)										
factors $\alpha_{g,N} (s_{min} \perp)$						2	2			
$lpha_{ extsf{g}, extsf{V}}(extsf{s}_{ extsf{min}}\perp)$										
fischer injection system F	IS V I	Plus	for r	nasc	onry					
Performance Vertical perforated brick HLz, o	limens	sions,	insta	llatio	n paramete	ers			Annex	C 56



Vertical perforated brick	HLz, EN 771-1:20)11+A1:2015		
	n parameters bugh anchorage wi	th perforated sle	eeve FIS H K)	
Anchor rod	M10	M12		M16
Perforated sleeve FIS H K	18x13	30/200	22	2x130/200
Anchor rod with perforated s	leeve FIS H K			
Max. installation torque max T _{inst} [Nn	n]		2	
General installation paramet	ers			
Edge distance cmin = ccr			80	
s _{min} II	n]		100	
Spacing s _{cr} II			500	
$S_{\min} \perp = S_{cr} \perp$			300	
Drilling method Hammer drilling with hard meta	l hommor drill			
Table C57.2: Group fac	tors M10	M12		M16
Perforated sleeve FIS H K		0/200	23	2x130/200
α _{g,N} (S _{min} II)			1,4	
Group ((av (Smin II))			.,,	
factors $\frac{\alpha_{g,N}(s_{min} \perp)}{\alpha_{g,N}(s_{min} \perp)}$ [-]			2	
$\frac{\alpha_{g,V}(\text{smin} \perp)}{\alpha_{g,V}(\text{smin} \perp)}$				
fischer injection system F	IS V Plus for mase	onry		
Performance Vertical perforated brick HLz,	dimensions, installatio	n parameters		Annex C 57



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

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

Anchor rod Internal threaded anchor FIS E		-	M6 M8	M6 M8 11x85		-	M8 M10 -	M10 M12 15x85	-	-
Perforated sleeve FIS H K Tension resistance N _{Rk} = N				[kN] de				ean comp	x85 ressive	20x130
strength f _b ; Installation and Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions	dition w/	w, w/d, d	1/d; (tem	pera	ture	range 50	/80°C) ²⁾		
5 / 4 N/mm²	w/w w/d d/d		50 60),60),75		1,20 1,20		75 90	1,50 1,50
7,5 / 6 N/mm²	w/w w/d d/d		75 90		,90 ,20		1,50 2,00		20 20	2,00 2,50
10 / 8 N/mm²	w/w w/d d/d	0	90 20	1	,20 ,50		2,00 2,50	1,	50 50	2,50 3,00
12,5 / 10 N/mm²	w/w w/d d/d	1	20 50	1	,50 ,50 2,00		2,50 3,00	2,	00	3,50 4,00
single a	nchor u		ision loa	<u> </u>		thro	ough an			
Anchor rod		M10		M1	2			М	16	
Perforated sleeve FIS H K			18x130/						30/200	
Tension resistance N _{Rk} = N _F strength f _b ; Installation and									ressive	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions									
5 / 4 N/mm ²	w/w w/d		10	,2					,5	
	d/d			,2					,5	
7,5 / 6 N/mm ²	w/w w/d			,5					<u>,0</u>	
	d/d w/w w/d			,0					,5 	
10 / 8 N/mm ²	d/d			,0 ,5					,5 ,0	
	w/w w/d			,5 ,5					, 5	
12,5 / 10 N/mm ²	d/d			, <u>0</u> ,0					, <u>.</u> ,0	
 The compressive streng For temperature range Factor for job site tests and 	72/120°	C: NRk (72/	_{120°C)} = 0,	83 · N _{Rk (}			of the me	an compre	ssive strer	igth.
fischer injection system	FIS V I	Plus for	masoni	ſy					Annex	C 59

Vertical perforated brick HLz, Characteristic resistance under tension loading



Vertical perforated brick HLz, EN 771-1:2011+A1:2015 Table C59.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned anchorage) 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 16x130 12x50 12x85 16x85 20x85 20x130 Shear resistance V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V_{Rk,c,⊥} [kN] depending on the mean compressive strength f_b; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength / Use Min. compressive strength conditions single brick 1) w/w w/d 0.9 5 / 4 N/mm² 0.9 1.2 1.2 0.6 2.0 0.6 d/d w/w w/d 7.5 / 6 N/mm² 1.2 1.5 1.2 1.5 0.9 3.0 0.9 d/d w/w w/d 10 / 8 N/mm² 1,5 2,0 1,5 2,0 1,2 4,0 1,2 d/d w/w|w/d 12,5 / 10 N/mm² 2.0 3,0 2.0 3,0 1,5 5,0 1.5 d/d 1) The 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 anchorage)

Anchor rod	0	M10	M12	M16
Perforated sleeve FIS H K	26	18x13	0/200	22x130/200
Shear resistance V _{Rk} = V _{Rk,b} nstallation and use conditi	$= V_{Rk,c,II} = V_F$ on w/w, w/d,	^{Rk,c,⊥} [kN] deper d/d; (temperat	nding on the mean c ure range 50/80°C ar	ompressive strength f₅ nd 72/120°C)
Mean compressive strength Min. compressive strength single brick ¹⁾	Use con- ditions			
5 / 4 N/mm ²	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	

Factor for job site tests and displacements see annex C 123.

fischer injection system FIS V Plus for masonry

Performance

Vertical perforated brick HLz, Characteristic resistance under shear loading



Vertical perforated	brick I	HLz,	EN	771-	1:20	11+	A1:2	2015	5					
	300	Prod	ucer									e.g. T	errea	al
	SX.	Nom	inal d	limen	sions					[mm]	length			height H
					y den					[kg/dm ³]	500	20	200	315
	315	-					, gth / I	Min.		112020101	2	5/20		4 or
\sim	5						igle b)	[N/mm		,5/6 c		
		Stan	dard	or an	nex						EN 77	1-1:20	11+/	1:2015
	allation -positic	para	met	ers	ge w	500	perfo	orate	d sle	eve FIS	Ā	imensio nnex B		e also
Anchor rod		M6	M8	M6	M8		-	M8	M10	M8 M10	-	M12	M16	M12 M16
Internal threaded anchor FIS E			-		-	M6	M8 x85	-	-	-	M10 M12 15x85	-		-
Perforated sleeve FIS	нк	12>	(5 0	12:	x85		16:	x85		16x130	20	x85		20x130
Anchor rod and intern	al thread	led a	ncho	r FIS	E wi	th po	erfora	ated	sleev	e FIS H K			-	
Max. installation torque max T	nst [Nm]								2	2				
General installation pa	rameter	S											T	
Edge distance cmin =					5	0				80		50		80
Smi	<u>, </u> , [mm]									00 00				
Spacing <u>so</u>										00				
										15				
Drilling method														
Hammer drilling with ha	d metal	hamn	ner di	rill										
¹⁾ The compressive s	trength c	of the s	single	brick	mus	t not	be les	s tha	in 80%	of the me	an compr	essive s	strenç	gth.
Table C60.2: Grou	up facto	ors												
Anchor rod		M6	M8	M6	M8		-	M8	M10	M8 M10	-	M12	M16	M12 M16
Internal threaded			-		-	M6	1		-	-	M10 M12	2 -		-
anchor FIS E Perforated sleeve FIS	L K	12>	/E^	40-	x85	11	x85	x85		16x130	15x85	x85		20x130
		12)	(50	12)	CON		102	K00	1.		20	202		202130
<u>αg,</u> N (Smin Group αg,∨ (Smin										,1				
Group $\alpha_{g,V}$ (Sminfactors $\alpha_{g,N}$ (Smin										, <u>2</u> ,1				
αg,∀ (Smin										,2				
fischer injection sys	tem FI	SVF	Plus	for r	nasc	nry								
Performance Vertical perforated brick						-		ers				Ann	ex (C 60



Vertical per	forated brick H	ILz, EN 771-1:20)11+A1:2015		
Table C61.1		parameters gh anchorage wi	th perforated slee	eve FIS H K)	
Anchor rod		M10	M12		M16
Perforated sle	eeve FIS H K	18x13	30/200	22	x130/200
	ith perforated sle	eve FIS H K		•	
Max. installation torque	on max T _{inst} [Nm]			2	
2 	llation parameter	s			
Edge distance				30	
	Smin II		1973	00	
Spacing	s _{cr} II [mm]		825	00	
	Smin ⊥			00	
Drilling moth	S _{cr} ⊥		3	15	
Drilling metho	ig with hard metal I	hammer drill			
	iy with hard metall				
Table C61.2	: Group facto	ors			
Anchor rod		M10	M12		M16
Perforated sle	eeve FIS H K	18x13	30/200		x130/200
	$lpha_{ extsf{g}, extsf{N}}$ (s _{min} II)			,1	
Group _	$\alpha_{g,V}(\mathbf{s}_{\min} \mathbf{I})$ [-]			,2	
factors	α _{g,N} (Smin⊥)			,1	
	α _{g,} ∨ (\$min ⊥)		1	,2	
fischer inier	ction system EI	S V Plus for mase	onry		
Performance)	mensions, installatio	-		Annex C 61



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

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

Anchor rod			M6	M8	M6	M8		-	M8	M10	M8	M10		-	M12	M16	M12	M16
Internal threaded anchor FIS E				-		-		M8 x85		-		-		M12 x85		-		-
Perforated sleeve FIS H K			12	x50	12	c85			ix85		16)	(130	15.		x85		20x	130
Tension resistance N _{Rk} = N _R strength f _b ; Installation and (ressi	ve		
Mean compressive strength / Min. compressive strength single brick ¹⁾	co	se n- ons																
2,5 / 2 N/mm ²	w/w d/	w/d /d				0,	5				0.5	6		0	,5		0,	6
E (4 M/m m ²	w/w					•,	<u> </u>				0.9	<u> </u>			,•		•,	,•
5 / 4 N/mm²	d/	/d	0	,9								1,2						
7,5 / 6 N/mm²	w/w	w/d									1,5							
1,578 N/IIII	d/	/d									1,5							
10 / 8 N/mm ²	w/w	w/d									2.0							
	d/	/d									2,0							

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

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

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

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x13	0/200	22x130/200
Tension resistance N _{Rk} = N _R strength f _b ; Installation and				
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- dition			
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
7,5 / 6 N/mm²	w/w w d/d	/d		<u>1.5</u> 1,5
10 / 8 N/mm²	w/w w d/d	/d		2.0 2,0

Factor for job site tests and displacements see annex C 123.

fischer injection system FIS V Plus for masonry

Performance

Vertical perforated brick HLz, Characteristic resistance under tension loading



anchor u					k failure o tioned an		•	ure of a s	single
Anchor rod		M6 M8	M6 M8	-	M8 M10	M8 M10	-	M12 M16	M12 M16
Internal threaded anchor FIS E		-	-	M6 M8		-	M10 M12 15x85	-	-
Perforated sleeve FIS H K		12x50	12x85	1	6x85	16x130	20)	k85	20x130
Shear resistance V _{Rk} = V _{Rk,b} nstallation and use conditi	$= V_{Rk,c,ll}$	= V _{Rk,c,⊥} [v/d_d/d: (kN] dep	ending	on the me	an comp	ressive st	rength f _b ;	;
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions								
2,5 / 2 N/m m ²	w/w w/d d/d	0,30	0,60	0,3	0,60	0,60	0,5	90	0,75
5 / 4 N/mm²	w/w w/d d/d	0,75	1,20	0,7	1,20	1,20	2,0	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	4,0	00	3,00
		I M	10		M12		-	V16	
		M	10 18x′	130/200	M12			V16 130/200	
Anchor rod Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} Installation and use conditi	o = V _{Rk,c,ll} :	= V _{Rk,c,⊥} [18x′ kN] dep	ending	on the me	an comp	22x1 ressive st	130/200	•
Perforated sleeve FIS H K	o = V _{Rk,c,II} on w/w, v Use con- ditions	= V _{Rk,c,⊥} [18x′ kN] dep	ending	on the me	an comp °C and 72	22x1 ressive st	130/200	;
Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} nstallation and use conditi Mean compressive strength / Min. compressive strength	on w/w, v Use con-	= V _{Rk,c,⊥} [v/d, d/d; (18x ⁴ kN] dep tempera	ending	on the me	an comp °C and 72	22x1 ressive st 2/120°C)	130/200	•
Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} Installation and use conditi Mean compressive strength / Min. compressive strength single brick ¹)	on w/w, v Use con- ditions w/w w/d	= V _{Rk,c,⊥} [v/d, d/d; (18x ² kN] dep tempera	ending ature ra	on the me	an comp °C and 72	22x1 ressive st 2/120°C)	I30/200 trength f⊳;	
Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} Installation and use conditi Mean compressive strength / Min. compressive strength single brick ¹⁾ 2,5 / 2 N/mm ²	on w/w, v Use con- ditions w/w w/d d/d w/w w/d	= V _{Rk,c,⊥} [v/d, d/d; (18x ² kN] dep tempera	ending ature ra	on the me	an comp °C and 72	22x1 ressive st 2/120°C) (130/200 arength f⊳; 0,75	;
Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} nstallation and use conditi Mean compressive strength / Min. compressive strength single brick ¹⁾ 2,5 / 2 N/mm ² 5 / 4 N/mm ²	on w/w, v Use con- ditions w/w w/d d/d w/w w/d d/d w/w w/d	= V _{Rk,c,⊥} [v/d, d/d; (18x' kN] dep tempera	ending ature ra 0,60	on the me	an comp °C and 72	22x1 ressive st 2/120°C) (1 30/200 arength fь; 0,75	;
Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk,b} Installation and use conditi Mean compressive strength / Min. compressive strength single brick ¹⁾ 2,5 / 2 N/mm ² 5 / 4 N/mm ² 7,5 / 6 N/mm ²	on w/w, v Use con- ditions w/w w/d d/d w/w w/d d/d w/w w/d d/d w/w w/d d/d w/w w/d d/d	= V _{Rk,c,⊥} [v/d, d/d; (18x ² kN] dep tempera (ending ature ra 0,60 1,20 1,50 2,00 ot be les	on the me nge 50/80'	°C and 72	22x1 ressive st 2/120°C) ((1 30/200 srength f₅; 0,75 1,50 2,00 3,00	

Vertical perforated brick HLz, Characteristic resistance under shear loading



Vertical perforated brick I	HLz, EN 771-1:20)11+A1:2015								
110. 20	Producer				e.g. Imery	/				
	Nominal dimensions		[mm]	length L	width W	height H				
				560	200	275				
	Mean gross dry den		[kg/dm ³]		≥ 0,7					
	Mean compressive scompressive strengt		[N/mm ²]	5007404 C.HO 243	or 8/6 or	0.0231617000				
50	Standard or annex		(3	EN 771	-1:2011+/	A1:2015				
Table C64.1: Installation	parameters				see	ension also ex B 17				
Anchor rod	M8 M10	M10 M12	M12	M16	M	16				
Perforated sleeve FIS H K	16x130	18x130/200	20x13	30	22x13	0/200				
Anchor rod with perforated sle	eve FIS H K									
Max. installation max T _{inst} [Nm]			2							
General installation parameter	'S									
Edge distance cmin = Ccr	-		30							
Spacing $\frac{s_{\min} \parallel = s_{cr} \parallel}{s_{\min} \perp = s_{cr} \perp}$ [mm]			60 75							
Drilling method		2	15							
Hammer drilling with hard metal	hammer drill									
¹⁾ The compressive strength of Table C64.2: Group factor	-	t not be less than 80%	% of the mear	n compres	ssive stren	gth.				
Anchor rod	M8 M10	M10 M12	M12	M16	M	16				
Perforated sleeve FIS H K	16x130	18x130/200	20x13	30	22x13	0/200				
$\begin{array}{c} \begin{array}{c} \alpha_{g,N} \left(S_{min} \ II \right) \\ \\ \text{Group} \\ \text{factors} \end{array} \begin{array}{c} \alpha_{g,V} \left(S_{min} \ II \right) \\ \hline \alpha_{g,V} \left(S_{min} \ \bot \right) \end{array} \left[- \right] \end{array}$			2							
fischer injection system FI	S V Plus for mase	onry								
Performance		V Plus for masonry								



Vertical perforated brick HLz, EN 771-1:2011+A1:2015 Table C65.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading **M8** M10 M10 M12 M12 Anchor rod M16 M16 Perforated sleeve FIS H K 16x130 18x130/200 20x130 22x130/200 Tension resistance $N_{Rk} = N_{Rk,p} = N_{Rk,p,c} = N_{Rk,p,c}$ [kN] depending on the mean compressive strength f_b; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C) ²⁾ Mean compressive strength / Use Min. compressive strength consingle brick 1) ditions w/w w/d 0.9 1,2 5 / 4 N/mm² d/d 1.2 1.5 w/w|w/d 1,5 2,0 8 / 6 N/mm² 1.5 2.0 d/d 2.0 2,5 w/w|w/d 10 / 8 N/mm² d/d 2,5 3.0 1) The 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)}. Table C65.2: 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 Perforated sleeve FIS H K 16x130 18x130/200 20x130 22x130/200 Shear resistance V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V_{Rk,c,⊥} [kN] depending on the mean compressive strength f_b; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength / Use Min. compressive strength consingle brick 1) ditions w/w w/d 5 / 4 N/mm² 0,9 d/d w/w w/d 8 / 6 N/mm² 1,5 d/d w/w w/d 10 / 8 N/mm² 2.0 d/d 1) The 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 C 123.

fischer injection system FIS V Plus for masonry

Performance

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



Vertical perforated brick	HLz, E	N 77'	1-1:20	11+A	1:201	5						
120	Produce	r							e	.g. Wiene	erberge	r
	Nominal	dimer	nsions				[mm	י ני	length 255			eight H 118
	Mean gr	oss dr	y densit	y ρ			[kg/dr	n ³]		≥ 1,	0	10.0/2510
118	Mean co compres					N.	[N/mr	n²]		/ 2 or 5 / 4 or 12,5 / 1		
	Standar	d or an	nnex						EN 1	771-1:201	1+A1:2	2015
255 Table C66.1: Installation	-	$\mathbb{R} \xrightarrow{\mathbb{R}} \frac{12}{12} \xrightarrow{\mathbb{R}} \frac{12}{255}$							Dimension see also Annex B 18			
Anchor rod	M6	M8	M6	M8			M8	M1	0	-	M12	M16
Internal threaded anchor FIS E		<u>M6 M8</u> - <u>N</u> 11x85										-
Perforated sleeve FIS H K	12>	12x50 12x85 16x85									x85	
Anchor rod and internal threa	aded and	anchor FIS E with perforated sleeve FIS H K										
Max. installation max T _{inst} [Nn torque	ו]					2	2					
General installation parameter	ers											
Edge distance cmin = ccr							0					
Spacing $\frac{s_{cr} II = s_{min} II}{s_{cr} \bot = s_{min} \bot}$ [mn	nj					226223	55 20					
Drilling method	36											
Hammer drilling with hard meta												
¹⁾ The compressive strength Table C66.2: Group fac		igle bri	ick must	not be	less th	an 80%	6 of th∈	e mea	n com	pressive s	trength	
Anchor rod	M6	M8	M6	M8	-		M8	M1	_	-	M12	M16
Internal threaded			-		M6	M8		-	M		4	-
anchor FIS E Perforated sleeve FIS H K	12>	·50	12×	25	1 1 ×		<85			15x85 20	×85	
αg,N (Smin II)	127		127	05		107	100			20	X00	
$\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \underline{\alpha_{g,V} (smin \ I)} \\ factors \end{array} & \begin{array}{c} \underline{\alpha_{g,V} (smin \ I)} \\ \hline \alpha_{g,N} (smin \ \bot) \end{array} \end{array} \left[- \right] \end{array}$						2	2					
fischer injection system F	fischer injection system FIS V Plus for masonry											
Performance Vertical perforated brick HLz, •	dimensio	ns, ins	atallation	n parar	neters					Ann	ex C (66



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

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		-	M8	M10	-	M12	M10
Internal threaded anchor FIS E				-		-	M6	M8 x85	-	-	 M12 x85	-	-
Perforated sleeve FIS H K			12:	k50	12x85				x85			x85	
Tension resistance N _{Rk} = N _{Rl} strength f _b ; Installation and (essive		
Mean compressive strength / Min. compressive strength single brick ²⁾	co	se in- ons											
2,5 / 2 N/mm²	w/w d,	w/d (d	,	40 50			0,: 0,:					3) 3)	
5 / 4 N/mm²	w/w d,	w/d ⁄d	,	90 90			0,9 1,2					50 50	
8 / 6 N/mm ²	w/w d/	w/d /d	1,	20 50			1,! 1,!	50				75 75	
10 / 8 N/mm ²		w/d	1,	50 00			2,0	00			0,	90 90	
12,5 / 10 N/mm²	w/w	w/d /d	2,	00 50			2,5	50			1,	20	
15 / 12 N/mm ²	w/w	w/d (d	2,	50 00			3,0 3,8	00			1,	50 50	

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

2) The compressive strength of the single brick must not be less than 80% of the mean compressive strength. 3) No performance assessed

Factor for job site tests and displacements see annex C 123.

fischer injection system FIS V Plus for masonry

Performance

Vertical perforated brick HLz, Characteristic resistance under tension loading



Vertical perforated brick HLz, EN 771-1:2011+A1:2015 Table C68.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading M6 M8 **M**8 M10 M12 Anchor rod M6 M8 M16 M6 M8 M10 | M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 20x85 Shear resistance V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V_{Rk,c,⊥} [kN] depending on the mean compressive strength f_b; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength / Use Min. compressive strength condition single brick 1) w/w|w/d 2,5 / 2 N/mm² 0,60 0,75 0,60 0,75 0,90 d/d w/w|w/d 5 / 4 N/mm² 1,20 1,50 1,50 1,20 2,00 d/d w/w|w/d 8 / 6 N/mm² 2,00 2,00 2,00 2,00 2,50 d/d w/w|w/d 10 / 8 N/mm² 2,50 3,00 3,50 2,50 3,00 d/d w/w|w/d 3,00 12,5 / 10 N/mm² 3,50 3,00 3,50 4,50 d/d w/w w/d 15 / 12 N/mm² 4,00 4,50 4,00 4,50 5,50 d/d

¹⁾ The 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 C 123.

fischer injection system FIS V Plus for masonry

Performance

Vertical perforated brick HLz, Characteristic resistance under shear loading



Vertical perforated brick	HLz, EN 77	'1-1:2011+A	1:2015						
130	Producer				e.g. Cer	manica Fa	rreny S.A.		
	Nominal dime	nsions		[mm]	length L	width W	height H		
					275	130	94		
	Mean gross d			[kg/dm ³]		≥ 0,8			
	Mean compre compressive s			[N/mm ²]	1.1.5.1	or 10 / 8 or / 16 or 25	15 / 12 or / 20		
215	Standard or a	<u> </u>				1-1:2011+			
		•	00000						
		0							
		130			Dimension see also				
		, ∺	μυυμι	10000	<u> </u>				
		₽		0 275					
	n parameter	S H	· · · · · ·	-	•				
Anchor rod	M6 M8	M6 M8		M8 M1	_		M12 M16		
Internal threaded anchor FIS E	-	-	M6 M8 11x85		M10		-		
Perforated sleeve FIS H K	12x50	12x85	15x85 20x85						
Anchor rod and internal three					-				
Max. installation max T _{inst} [Nn		•		2					
General installation parameter	ers						Ĩ		
Edge distance c _{min} = c _{cr}		1	00			120			
Spacing <u>s_{cr} II = s_{min} II</u> [mr	n]		0	75					
$s_{cr} \perp = s_{min} \perp$			ç	95			7		
Drilling method Hammer drilling with hard meta	l hommor drill								
¹⁾ The compressive strength		rick must not be	e less than 80%	6 of the me	an compr	essive stre	nath		
	-			o or the me	an oompi		iigui.		
Table C69.2: Group fac	tors								
Anchor rod	M6 M8	M6 M8	-	M8 M*			M12 M16		
Internal threaded anchor FIS E	-	-	M6 M8		M10		-		
Perforated sleeve FIS H K	12x50	12x85	11x85	x85	18	5x85 20x8	<u> </u>		
α _{g,N} (s _{min} II)	12,50	12205	10.	X05		2080	5		
$\begin{bmatrix} \text{Group} & \underline{\alpha_{g,V}} \text{ (Smin (A)} \\ \text{factors} & \underline{\alpha_{g,N}} \text{ (Smin (L)} \end{bmatrix} \begin{bmatrix} - \end{bmatrix}$				2					
α _{g,V} (s _{min} ⊥)									
fischer injection system F	IS V Plus fo	r masonry							
Performance						Annex	C 69		
Vertical perforated brick HLz,	ertical perforated brick HLz, dimensions, installation parameters								



Table C70.1:Charactersingle ar							ilure	or bri	ck br	eakou	ıt failı	ire of	a	
Anchor rod			M6	M8	M6	M8		-	M8	M10		-	M12	M16
Internal threaded anchor FIS E								M10			-			
anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 20x85										x85				
Tension resistance N _{Rk} = N _R strength f _b ; Installation and Mean compressive strength / Min. compressive strength	Use U													
single brick 1)	1.00000	ons			1									
7,5 / 6 N/mm²		w/d /d		40 40						,90 ,90				
10 / 8 N/mm ²	w/w	w/d	0,	50					1,	20				
	d,	/d	0,	60					1,	,20				
15 / 12 N/mm ²	w/w	w/d	0.	75					1	50				
	d,	/d	0,	90					2	,00				
20 / 16 N/mm ²		w/d /d		90 20						,00 ,50				
		uda	1	20					3	00				
25 / 20 N/mm²	w/w	w/u	<u> </u>	20					~					

¹⁾ The 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)}.

fischer injection system FIS V Plus for masonry

Performance

Vertical perforated brick HLz, Characteristic resistance under tension loading



Anchor rod		M6	M8	M6	M8		-	M8	M10	-	M12 M16
Internal threaded anchor FI	SE		-	-		M6	M8		-	M10 M12	-
Perforated sleeve FIS H K		12	x50	12x	,0E	11	x85	c85		15x85	x85
Shear resistance V _{Rk} = V _{Rk,b}	= Vpk o ll =					on the			nraeei		
nstallation and use condition	on w/w, w	/d, d/d	; (tem	perati	ure rai	nge 5	0/80°C	and 7	2/120	°C)	15,
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/mm ²	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/mm ²	w/w w/d d/d	4	,0					4	,0		

fischer injection system FIS V Plus for masonry

Performance

Vertical perforated brick HLz, Characteristic resistance under tension loading



Vertical perforated brick	HLz,	EN	771-	1:20)11+	A1:2	2015	;					
190	Produ	cer									e	.g. Percera	ım
	Nomin	al dir	nensi	ons					ſm	ım]	length L	width W	height H
\times		LIGT STORE			• •					-	220	190	290
	Mean Mean					h / M	n		[kg/	dm ³]		≥ 0,7	
	compr								[N/	mm²]	7,5/60	or 10 / 8 or	12,5 / 10
	Standa	ard or	anne	ex		0					EN 77	1-1:2011+/	1:2015
Table C72.1: Installation	10000 000 000 000 000 000 000 000 000 0									A	mension s nnex B 18	ee also	
23-05 107 (FC207) - CONTRACT					nu k	Jeno			a ve and the				
Anchor rod	M6	M8	M6	M8	MG	- M2	M8	M10	M8	M10	- M10 M12	- I	M12 M16
Internal threaded anchor FIS E		<u>M6 M8 </u> <u>N</u>								15x85		-	
Perforated sleeve FIS H K	12	12x50 12x85 16x85 16x130								20	20x130		
Anchor rod and internal threa	ded a	ncho	r FIS	E wi	th pe	erfora	ated	sleev	e FIS	нк			
Max. installation max T _{inst} [Nm]							2	2				
General installation paramete	rs												
Edge distance c _{min} = c _{cr} s _{min} II = s _{cr} II [mm	, <u> </u>							11 22					
Spacing $\frac{s_{min} + s_{cr}}{s_{min} \perp s_{cr} \perp}$								29	1031				
Drilling method	1												
Hammer drilling with hard metal	hamn	ner di	rill										
¹⁾ The compressive strength Table C72.2: Group fact		single	brick	mus	t not l	be les	s tha	n 80%	5 of th	ne me	an compre	essive strer	igth.
Anchor rod	M6	M8	M6	M8		-	M8	M10	M8	M10	-	M12 M16	M12 M16
Internal threaded		-	-	-	M6			-		-	M10 M12	<u> </u>	_
anchor FIS E Perforated sleeve FIS H K	4.2	x50	40.	.05	11:	x85	<85		46.	130	15x85	×95	20x130
	12)	K90	12)	(85		103	(00		10X	130	20	x85	202130
$\begin{array}{c} \begin{array}{c} \begin{array}{c} \hline \alpha_{g,V} (Smin \ I) \\ \hline \alpha_{g,N} (Smin \ \bot) \\ \hline \alpha_{g,V} (Smin \ \bot) \\ \hline \end{array} \begin{bmatrix} - \end{bmatrix} \end{array} $	2												
fischer injection system F	em FIS V Plus for masonry												
Performance Vertical perforated brick HLz, c					-	amete	ers					Annex	C 72
1/66 23													04-134/23



Vertical perforated brick	HLz, EN 771-1:20)11+A1:2015		
	n parameters ough anchorage wi	th perforated sle	eve FIS H K)	
Anchor rod	M10	M12		M16
Perforated sleeve FIS H K	18x13	30/200	22	2x130/200
Anchor rod with perforated s	sleeve FIS H K			
Max. installation max T _{inst} [Nr torque	n]		2	
General installation paramet	ers			
Edge distance c _{min} = c _{cr}			110	
Spacing smin II = scr II [mi	n]		220	
$s_{min} \perp = s_{cr} \perp$			290	
Drilling method	al la autor au defil			
Hammer drilling with hard meta	al nammer drill			
Table C73.2: Group fac			1	
Anchor rod	M10	M12		M16
Perforated sleeve FIS H K	18x13	30/200	22	2x130/200
$\begin{array}{c} \begin{array}{c} \alpha_{g,N} \left(s_{\min} \ II \right) \\ \\ \text{Group} \\ \text{factors} \\ \hline \begin{array}{c} \alpha_{g,V} \left(s_{\min} \ II \right) \\ \hline \alpha_{g,N} \left(s_{\min} \ \bot \right) \\ \hline \end{array} \end{array} \left[-1 \right] \end{array}$]		2	
fischer injection system F	FIS V Plus for mase	onry		
Performance Vertical perforated brick HLz,	dimensions, installatio	n parameters		Annex C 73



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

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

		M6 M8	_	M6 M8		0 M8 M10	M10 M12		116 M12 N
Internal threaded anchor FIS E		-	-	11x85	-	-	15x85	-	-
Perforated sleeve FIS H K		12x50	12x85	<u> </u>	x85	16x130		x85	20x13
Tension resistance N _{Rk} = N _R									
strength f _b ; Installation and	use cond	dition w/	w, w/d, d	l/d; (temp	peratur	e range 50	/80°C) ²⁾	1633176	
Mean compressive strength /	Use		- û û						
Min. compressive strength	con-								
single brick 1)	ditions		T				i		
7,5 / 6 N/mm ²	w/w w/d	0,3	1,2	1	,2	1,5	1	,2	1,5
	d/d	0,4	1,5	1	,5	1,5	1	,5	1,5
10 / 8 N/mm ²	w/w w/d	0,5	1,5	1	,5	2,0	1	,5	2,0
	d/d	0,5	2,0	2	,0	2,5	2	,0	2,5
	w/w w/d	0,6	2,0	2	,0	2,5	2	,0	2,5
$42 E / 40 M/mm^2$					E	3,0	2	,5	3,0
 12,5 / 10 N/mm² ¹⁾ The compressive streng ²⁾ For temperature range Table C74.2: Character single and 	72/120°0 eristic re	C: NRk (72/1	_(20°C) = 0,; e to pul	83 · NRk (5 I-out fa il	than 80° ₀/ଃ⁰°୯). lure or	6 of the me	an compre akout fai	ilure of	rength.
 ¹⁾ The compressive streng ²⁾ For temperature range Table C74.2: Character single and 	th of the s 72/120°C	ingle brick C: NRk (72/1 sistance ider ten:	k must no _(20°C) = 0, e to pul sion loa	ot be less t 83 · NRk (5 I-out fail ading (P	than 80° o/80°C). lure or ush th	6 of the me	an compre akout fai chorage)	ilure of	rength.
 The compressive streng For temperature range Table C74.2: Charactersingle an Anchor rod 	th of the s 72/120°C	ingle brick C: NRk (72/1 sistance ider ten:	k must no $_{120^{\circ}C} = 0,$ e to pul sion loa	bt be less t 83 · NRk (5 I-out fail ading (P	than 80° ₀/ଃ⁰°୯). lure or	6 of the me	an compre akout fai chorage)	ilure of M16	f a
 ¹⁾ The compressive streng ²⁾ For temperature range Table C74.2: Character single an Anchor rod Perforated sleeve FIS H K 	th of the s 72/120°C eristic re ichor un	ingle brick C: NRk (72) sistance Ider ten: N	k must no $(20^{\circ}C) = 0,$ to pul sion loa 110 18x ¹	ading (P	than 80 [°] ^{0/50°C).} lure or ush th M12	6 of the me brick bre rough an	an compre akout fai chorage) 1 22x ⁻	ilure of M16	f a
 ¹⁾ The compressive streng ²⁾ For temperature range Table C74.2: Character single an Anchor rod Perforated sleeve FIS H K Tension resistance N_{Rk} = N_R 	th of the s 72/120°C eristic re ichor un	ingle brick C: NRk (72) sistance ider ten: N b = NRk,p,c	k must no (20°C) = 0, e to pul sion loa 110 18x ¹ = N _{Rk,b,c}	bt be less 1 83 · NRk (5 I-out fail ading (P 130/200 [kN] dep	than 80° o/so°c). lure or ush th M12 pending	6 of the me brick bre rough an	an compre akout fai chorage) 1 22x ² ean comp	ilure of M16	f a
¹⁾ The compressive streng ²⁾ For temperature range Table C74.2: Characte	th of the s 72/120°C eristic re ichor un	ingle brick C: NRk (72) sistance ider ten: N b = NRk,p,c	k must no (20°C) = 0, e to pul sion loa 110 18x ¹ = N _{Rk,b,c}	bt be less 1 83 · NRk (5 I-out fail ading (P 130/200 [kN] dep	than 80° o/so°c). lure or ush th M12 pending	6 of the me brick bre rough an	an compre akout fai chorage) 1 22x ² ean comp	ilure of M16	f a
 ¹⁾ The compressive streng ²⁾ For temperature range Table C74.2: Character single an Anchor rod Perforated sleeve FIS H K Tension resistance N_{Rk} = N_R strength f_b; Installation and Mean compressive strength / Min. compressive strength 	th of the s 72/120°C eristic re ichor un k,p = N _{Rk,b} use conc Use con-	ingle brick C: NRk (72) sistance ider ten: N b = NRk,p,c	k must no (20°C) = 0, e to pul sion loa 110 18x ¹ = N _{Rk,b,c}	bt be less 1 83 · NRk (5 I-out fail ading (P 130/200 [kN] dep	than 80° o/so°c). lure or ush th M12 pending	6 of the me brick bre rough an	an compre akout fai chorage) 1 22x ² ean comp	ilure of M16	f a
 ¹⁾ The compressive streng ²⁾ For temperature range Table C74.2: Character single an Anchor rod Perforated sleeve FIS H K Fension resistance N_{Rk} = N_R strength f_b; Installation and Mean compressive strength / Min. compressive strength 	th of the s 72/120°C eristic re achor un k,p = N _{Rk,b} use conc Use con- ditions	ingle brick C: NRk (72) sistance ider ten: N b = NRk,p,c	k must no (20°C) = 0, e to pul sion loa 110 18x ¹ = N _{Rk,b,c}	bt be less 1 83 · NRk (5 I-out fail ading (P 130/200 [kN] dep	than 80° o/so°c). lure or ush th M12 pending	6 of the me brick bre rough an on the me range 50	an compre akout fai chorage) 1 22x ² ean comp	ilure of M16	f a
 ¹⁾ The compressive streng ²⁾ For temperature range Table C74.2: Character single an Anchor rod Perforated sleeve FIS H K Fension resistance N_{Rk} = N_R strength f_b; Installation and Mean compressive strength / Min. compressive strength 	th of the s 72/120°C eristic re ichor un k,p = NRk,t use conc Use con- ditions w/w w/d	ingle brick C: NRk (72) sistance ider ten: N b = NRk,p,c	k must no (20°C) = 0, e to pul sion loa 110 18x ¹ = N _{Rk,b,c}	bt be less 1 83 · NRk (5 I-out fail ading (P 130/200 [kN] dep	than 80° o/so°c). lure or ush th M12 pending	6 of the me brick bre rough an on the me range 50	an compre akout fai chorage) 1 22x ² ean comp	ilure of M16	f a
 ¹⁾ The compressive streng ²⁾ For temperature range Table C74.2: Character single an Anchor rod Perforated sleeve FIS H K Tension resistance N_{Rk} = N_R strength f_b; Installation and Mean compressive strength / Min. compressive strength single brick ¹) 	th of the s 72/120°C eristic re achor un k,p = N _{Rk,b} use conc Use con- ditions w/w w/d d/d	ingle brick C: NRk (72) sistance ider ten: N b = NRk,p,c	k must no (20°C) = 0, e to pul sion loa 110 18x ¹ = N _{Rk,b,c}	bt be less 1 83 · NRk (5 I-out fail ading (P 130/200 [kN] dep	than 80° o/so°c). lure or ush th M12 pending	6 of the me brick bre rough an on the me range 50	an compre akout fai chorage) 1 22x ² ean comp	ilure of M16	f a
 ¹⁾ The compressive streng ²⁾ For temperature range Table C74.2: Character single an Anchor rod Perforated sleeve FIS H K Tension resistance N_{Rk} = N_R Strength f_b; Installation and Mean compressive strength / Min. compressive strength single brick ¹) 	th of the s 72/120°C eristic re ichor un k,p = NRk,t use conc Use con- ditions w/w w/d d/d	ingle brick C: NRk (72) sistance ider ten: N b = NRk,p,c	k must no (20°C) = 0, e to pul sion loa 110 18x ¹ = N _{Rk,b,c}	bt be less 1 83 · NRk (5 I-out fail ading (P 130/200 [kN] dep	than 80° o/so°c). lure or ush th M12 pending	6 of the me brick bre rough an on the me range 50	an compre akout fai chorage) 1 22x ² ean comp	ilure of M16	f a
 ¹⁾ The compressive streng ²⁾ For temperature range Table C74.2: Character single an Anchor rod Perforated sleeve FIS H K Tension resistance N_{Rk} = N_R strength f_b; Installation and Mean compressive strength / Min. compressive strength single brick ¹) 7,5 / 6 N/mm² 	th of the s 72/120°C eristic re achor un k,p = N _{Rk,b} use conc Use con- ditions W/w w/d d/d w/w w/d	ingle brick C: NRk (72) oder ten: b = NRk,p,c dition w/n	k must no (20°C) = 0, e to pul sion loa 110 18x ¹ = N _{Rk,b,c}	bt be less 1 83 · NRk (5 I-out fail ading (P 130/200 [kN] dep	than 80° o/so°c). lure or ush th M12 pending	6 of the me brick bre rough an on the me range 50	an compre akout fai chorage) 1 22x ² ean comp	ilure of M16	f a
 ¹⁾ The compressive streng ²⁾ For temperature range Table C74.2: Character single an Anchor rod Perforated sleeve FIS H K Tension resistance N_{Rk} = N_R strength f_b; Installation and Mean compressive strength / Min. compressive strength single brick ¹⁾ 7,5 / 6 N/mm² 	th of the s 72/120°C eristic re ichor un k,p = NRk,t use conc Use con- ditions w/w w/d d/d	ingle brick C: NRk (72) oder ten: b = NRk,p,c dition w/n	k must no (20°C) = 0, e to pul sion loa 110 18x ¹ = N _{Rk,b,c}	bt be less 1 83 · NRk (5 I-out fail ading (P 130/200 [kN] dep	than 80° o/so°c). lure or ush th M12 pending	6 of the me brick bre rough an on the me range 50	an compre akout fai chorage) 1 22x ² ean comp	ilure of M16	f a

Factor for job site tests and displacements see annex C 123.

fischer injection system FIS V Plus for masonry

Performance

Vertical perforated brick HLz, Characteristic resistance under tension loading



Vertical perforated brick HLz, EN 771-1:2011+A1:2015 Table C75.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned anchorage) M6 M8 M6 M8 M8 M10 M8 M10 M12 M16 M12 M16 Anchor rod M10 M12 M6 M8 Internal threaded anchor FIS E 15x85 11x85 Perforated sleeve FIS H K 20x85 12x50 12x85 16x85 16x130 20x130 Shear resistance V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V_{Rk,c,⊥} [kN] depending on the mean compressive strength f_b; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength Use / Min. compressive strength conditions single brick 1) w/w w/d 7,5 / 6 N/mm² 1.5 1.5 1.5 2.5 1.5 2.0 d/d w/w w/d 10 / 8 N/mm² 2.0 2.0 2.0 3.5 2.0 3.0 d/d w/w w/d 12,5 / 10 N/mm² 2,5 3.0 3.0 4,5 3,0 3,5 d/d The 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 anchorage) M12 M16 Anchor rod M10 Perforated sleeve FIS H K 18x130/200 22x130/200 Shear resistance V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V_{Rk,c,⊥} [kN] depending on the mean compressive strength f_b; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength Use / Min. compressive strength consingle brick ¹⁾ ditions w/w w/d 7,5 / 6 N/mm² 2,0 d/d w/w w/d 10 / 8 N/mm² 3.0 d/d w/w w/d 12.5 / 10 N/mm² 3.5 d/d The 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 Annex C 75 Performance Vertical perforated brick HLz, Characteristic resistance under shear loading



					Producer					e.a 7i	egelwerk I	Brenna
300										length L	width W	Self to self
AMA AMA	Nomi	nal di	mens	sions				[m	nm]	253	300	240
	Mean	n gros	s dry	dens	sity p			[kg/	dm ³]		≥ 0,8	
	1.1.0.0.1.0.1.1.1		A		trength / I h single b		5	[N/r	nm²]	2,5 / :	2 or 5 / 4 o	r 8 / 6
240	Stand	dard c	or ann	nex						EN 771	I-1:2011+A	1:2015
Table C76.1: Installation	n para	imete	ers		Annex B 1			01/0	EIS		0, 48 25	1.275
(Pre-positi						-				1	P	
Anchor rod	M6	M8	M6	M8	- M6 M8	- M8	M10	M8	M10	- M10 M12	M12 M16	M12 M1
Internal threaded anchor FIS E		-		-	11x85	-	-		-	15x85	-	-
Perforated sleeve FIS H K	12	x50	12:	x85		x85		16x	130		x85	20x130
Anchor rod and internal threa							sleev					
Max. installation max T _{inst} [Nm							2					
General installation paramete	rs											
Edge distance c _{min} = c _{cr}	-						6	0				
Spacing s _{min} II = s _{cr} II [mm	ני						25	533.0				
$s_{\min} \perp = s_{cr} \perp$							24	10				
Drilling method Hammer drilling with hard metal												
¹⁾ The compressive strength Table C76.2: Group fact		single	brick	(mus	t not be le	ss tha	ın 80%				essive stren	gth.
		single M8	brick M6	I	t not be le	ss tha			ne me M10	-	M12 M16	-
Fable C76.2: Group fact Anchor rod Internal threaded	ors	Ĩ		I	- M6 M8					- M10 M12	M12 M16	-
Fable C76.2: Group fact Anchor rod Internal threaded anchor FIS E	ors M6	- -	M6	M8	- M6 M8 11x85	M8		M8	M10 -	- M10 M12 15x85	M12 M16	M12 M1 -
Fable C76.2: Group fact Anchor rod Internal threaded	ors M6	Ĩ	M6	I	- M6 M8 11x85			M8		- M10 M12 15x85	M12 M16	-
Table C76.2: Group fact Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H K	ors M6	- -	M6	M8	- M6 M8 11x85	M8		M8 16x	M10 -	- M10 M12 15x85	M12 M16	M12 M1 -
Table C76.2: Group fact Anchor rod Internal threaded Internal threaded anchor FIS E Perforated sleeve FIS H K $\alpha_{g,N} (s_{min} l)$ Group $\alpha_{g,N} (s_{min} l)$ factors $\alpha_{g,N} (s_{min} \perp)$ $\alpha_{g,V} (s_{min} \perp)$ [-]	Ors M6	M8 - x50	M6 12)	M8 - x85	- M6 M8 11x85 16	M8	M10 -	M8 16x	M10 -	- M10 M12 15x85	M12 M16	M12 M1 -
Cable C76.2: Group fact Anchor rod Internal threaded Internal threaded Anchor FIS E Perforated sleeve FIS H K $\alpha_{g,N} (s_{min} II)$ Group $\alpha_{g,N} (s_{min} II)$ Gactors $\alpha_{g,N} (s_{min} I)$ [-]	Ors M6	M8 - x50	M6 12)	M8 - x85	- M6 M8 11x85 16	M8	M10 -	M8 16x	M10 -	- M10 M12 15x85	M12 M16	M12 M1 -



Vertical perforated bri	ick HLz, EN	771-1:20	11+A1:2015	5	
	tion paramet hrough anch		h perforated	sleeve FIS H K)	
Anchor rod	M	110	M12		M16
Perforated sleeve FIS H K		18x13	0/200	2	2x130/200
Anchor rod with perforate	d sleeve FIS H	ιĸ			
Max. installation T _{inst}	[Nm]			2	
General installation param	neters				
Edge distance c _{min} = c _{cr}				60	
Spacingsmin II = scr II	[mm]			255	
$s_{\min} \perp = s_{cr} \perp$				240	
Drilling method					
Hammer drilling with hard m	netal nammer d	Irill			
Table C77.2: Group f					
Anchor rod		10	M12		M16
Perforated sleeve FIS H K		18x13	0/200	2:	2x130/200
$\begin{array}{c} \alpha_{g,N} (s_{min} \ II) \\ \alpha_{g,V} (s_{min} \ II) \\ factors \\ \alpha_{g,N} (s_{min} \ L) \\ \alpha_{g,V} (s_{min} \ L) \end{array}$	[-]			2	
fischer injection system	n FIS V Plus	for masc	onry		
Performance Vertical perforated brick HL	Lz, dimensions	, installatior	n parameters		Annex C 77



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

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

Anchor rod		M6	M8	M6	M8	-	M8	M10	M8	M10	-	M12	M16	M12	M16
Internal threaded			-			M6 M8		-		-	M10 M1	12	-		-
anchor FIS E						11x85					15x85	;	_		
Perforated sleeve FIS H K		12	x50	12)	c85	16	5x85		16	x130	2	20x85		20x	130
Tension resistance N _{Rk} = N _R strength f _b ; Installation and													ive		
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions														
0 E / 0 N/mm2	w/w w/d	-	3)	0,9	50	0.	,50		0,	40		0,50		0,4	40
2,5 / 2 N/mm ²	d/d	0,	30	0,9	50	0.	,50		0,	50		0,50		0,9	50
E / A N/mm2	w/w w/d	0,	50	0,9	90	0.	,90		0,	90		0,90		0,9	90
5 / 4 N/mm²	d/d	0,	60	0,9	90	0.	,90		0,	90		0,90		0,9	90
		0	75	1,5	50	1	50		1	20		1,50		1:	20
8 / 6 N/mm²	w/w w/d	ιυ,	10		~~	•		I	••	20		1,00		,	

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

³⁾ No performance assessed.

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

Anchor rod		M10	M12	M16
Perforated sleeve FIS H K		18x	130/200	22x130/200
Fension resistance N _{Rk} = N _R strength f₀; Installation and	_{k,p} = N _{Rk,b} use cond	= N _{Rk,p,c} = N _{Rk,t} ition w/w, w/d,	c [kN] depending d/d; (temperature	on the mean compressive e 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
2,572 N/MMF	d/d			0,5
5 / 4 N/mm ²	w/w w/d			0,9
5/4N/MM-	d/d			0,9
8 / 6 N/mm²	w/w w/d			1,2
0/0N/MM-	d/d			1,5

¹⁾ The 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).

Factor for job site tests and displacements see annex C 123.

fischer injection system FIS V Plus for masonry

Performance

Vertical perforated brick HLz, Characteristic resistance under tension loading



Vertical perforated brick HLz, EN 771-1:2011+A1:2015 Table C79.1: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned anchorage) M6 M8 M8 M10 M8 M10 M12 M16 M12 M16 Anchor rod M6 **M**8 M10 M12 M6 M8 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x50 12x85 16x85 16x130 20x85 20x130 Shear resistance V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V_{Rk,c,⊥} [kN] depending on the mean compressive strength f_b; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength / Use Min. compressive strength conditions single brick 1) w/w w/d 2,5 / 2 N/mm² 0.5 0.6 d/d w/w w/d 5 / 4 N/mm² 0.9 1.2 d/d w/w w/d 8 / 6 N/mm² 1,5 1,5 d/d The 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 anchorage) Anchor rod M10 M12 M16 22x130/200 Perforated sleeve FIS H K 18x130/200 Shear resistance $V_{Rk} = V_{Rk,b} = V_{Rk,c,\parallel} = V_{Rk,c,\perp}$ [kN] depending on the mean compressive strength fb; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Mean compressive strength / Use Min. compressive strength consingle brick 1) ditions w/w w/d 2,5 / 2 N/mm² 0,5 0,6 d/d w/w w/d 5 / 4 N/mm² 0,9 1,2 d/d w/w w/d 8 / 6 N/mm² 1,5 1,5 d/d The 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 C 123. fischer injection system FIS V Plus for masonry Annex C 79 Performance Vertical perforated brick HLz, Characteristic resistance under shear loading



Vertical perforated brick I	ILZ PO	rothern	n W 44	filled	w	ith min	eral w	ool		
EN 771-1:2011+A1:2015	, , 0		,	mou				,		
250	127		Produ	lcer				e.q.	Wienerbe	rger
	Nominal	dimensio	ns			Б	nm]	ength L	width W	
								250	440	250
250	Mean gro		1.0014 D.60740000			[kg	ı/dm³]		0,7	
			e strengtl ngth singl			[N	/mm²]	8 / 6 or	10 / 8 or 1	2,5 / 10
	Standard	l or anne	ĸ					EN 771	-1:2011 + A	1:2015
Table C80.1: Installation	parame	ters			7! 15	17.5 42 18.5			iension se iex B 18	e also
(Pre-positio	•		with pe	rforat	ed	sleeve	FIS H	K)		
Anchor rod	M6 M8	M6 M8	-	M8 M	10	M8 M10	-	M12 M1	6 M12 M16	M12 M16
Internal threaded anchor FIS E	3 8 8	8 15	M6 M8 11x85				M10 M12 15x85	2	0.0	-
Perforated sleeve FIS H K	12x50	12x85		k85	_	16x130		x85	20x130	20x200
Anchor rod and internal thread	led anch	or FIS E	with per	forated	s	eeve FIS	внк			
Max. installation torque max T _{inst} [Nm]		2		5	5	2 !	5		6	_
General installation parameter	s									
Edge distance c _{min} = c _{or}						60				
Smin II						80				
Spacing s _{cr} II [mm]						250 80				
Scr⊥						250				
Drilling method						C. C. C. C.				
Rotary drilling with carbide drill										
Table C80.2: Group facto	ors									
Anchor rod	M6 M8	M6 M8	-	M8 M	10	M8 M10	-	M12 M1	6M12M16	M12 M16
Internal threaded	_		M6 M8	-		-	M10 M12	2		_
anchor FIS E			11x85		_	-	15x85			
Perforated sleeve FIS H K	12x50	12x85	16)	(85		16x130	20	x85	20x130	20x200
$\frac{\alpha_{g,N} (s_{min} l)}{\alpha_{g,N} (s_{min} l)}$						1,3				
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$						1,3 0,8				
$\frac{\alpha_{g,N}(Smin \perp)}{\alpha_{g,V}(Smin \perp)}$						1,3				
						.,-				
fischer injection system FIS	S V Plus	s for ma	sonry							
Performance Vertical perforated brick HLz, Pe dimensions, installation parame		W 44, fille	ed with m	ineral v	NO	ol;			Annex (C 80



Vertical perforated br EN 771-1:2011+A1:20		Lz, Porotherm \	N 44, filled with	mineral woo	l,
		parameters gh anchorage wit	h perforated sle	eve FIS H K)	
Anchor rod		M10	M12		M16
Perforated sleeve FIS H M	(18x13	80/200	2	2x130/200
Anchor rod with perforate	ed slee	eve FIS H K			
$\begin{array}{l} \text{Max. installation} \\ \text{torque} \end{array} \text{ max } T_{\text{inst}} \end{array}$	-	5		6	
General installation parar	neters	1			
Edge distance c _{min} = c _{cr}			6-9	60	
S _{min} II				30	
Spacings_r II	[mm]			50	
S _{min} ⊥				30	
Scr ⊥			2	50	
Drilling method					
Rotary drilling with carbide	drill				
Table C81.2: Group	factor				
Anchor rod		M10	M12		M16
Perforated sleeve FIS H K	(18x13			2x130/200
α _{g,N} (s _{min} II)				,3	
Groupα _{g,V} (s _{min} II)	[-]			,3	
factors $\alpha_{g,N}(s_{min} \perp)$	· · ·),8	
$\alpha_{g,V}$ (Smin \perp)			1	,3	
fischer injection system	m FIS	V Plus for masc	nry		
Performance Vertical perforated brick H dimensions, installation pa			with mineral wool;		Annex C 81



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 anchorage)

Anchor rod		M6 M8	M6 M8	-	M8 M10	M8 M10	-	M12 M16	M12 M16	M12 M1 [.]
Internal threaded			-	M6 M8		-	M10 M12	-		_
anchor FIS E		-		11x85	-		15x85		-	-
Perforated sleeve FIS H K		12x50	12x85	16:	c 85	16x130	20:	x85	20x130	20x20
Tension resistance N _{Rk} = N _{Rk,} strength f _b ; Installation and u	p = N _{Rk} se con	,b = N _{Rk,p,c} dition w/v	= N _{Rk,b,c} w, w/d, c	[kN] de l/d; (ten	ependir nperatu	ng on th ire rang	e mean (e 50/80°(compres C) ²⁾	sive	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- dition	-0								
8 / 6 N/mm²	w/w w	/d 0,75	1,50	1,	20		1,	50		2,50
0 / 0 IN//////	d/d	0,90	1,50	1,:	20		1,	,50		2,50
10 / 8 N/mm ²	w/w w	//d 0,90	1,50	1,:	20		1,	50		2,50
TUTO N/MITT	d/d	0,90	2,00	1,	50		2,	,00		3,00
12,5 / 10 N/mm ²	w/w w	//d 0,90	2,00	1,	50		2,	,00		3,00
12,57 TO N/IIIII-	d/d	1,20	2,00	1,	50		2,	00		3,50
²⁾ For temperature range 7 Table C82.2: Character single and	ristic r	esistanc	e to pul	ll-out fa	ailure c	or brick			e of a	
Anchor rod			M10		M12			M1	6	
Perforated sleeve FIS H K			18>	(130/20	0			22x130)/200	
Tension resistance N _{Rk} = N _{Rk,} strength f _b ; Installation and u									sive	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- dition									
8 / 6 N/mm ²	w/w w d/d	//d				1,5 1,5				
	w/w w	//d				1,5				
10 / 8 N/mm ²						2.0				

 d/d
 2,0

 12,5 / 10 N/mm²
 w/w w/d
 2,0

 d/d
 2,0
 2,0

¹⁾ The compressive strength of the single brick must not be less than 80% of the mean compressive strength. ²⁾ For temperature range 72/120°C: $N_{Rk (72/120^{\circ}C)} = 0.83 \cdot N_{Rk (50/80^{\circ}C)}$.

Factor for job site tests and displacements see annex C 123.

fischer injection system FIS V Plus for masonry

Performance

Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool, Characteristic resistance under tension loading



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 anchorage)

							•				<u> </u>			
Anchor rod		M6	M8	M6	M8	-	N	/18 M	110	M8 M10	-	M12 M16	M12M16	M12 M1
Internal threaded anchor FIS E		-		-		M6 N	_	-		-	M10 M1: 15x85		-	-
Perforated sleeve FIS	нк	12x	50	12x8	85	1	6x8	5		16x130	20	x85	20x130	20x20
Shear resistance V _{Rk} = nstallation and use co													ength f⊳;	
Mean compressive strength / Min. com- pressive 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/mm²	w/w w/d d/d				0,	9				1,5	(0,9	1,5	1,2
12,5 / 10 N/mm ²	w/w w/d d/d				1,	2				1,5		1,2	1,5	1,5
anch			ieai	r load			sh tl	hrou		ure or b ancho		-	e of a si	ngle
Anchor rod Perforated sleeve FIS I			N	/110		130/20	5,6	W12				M10 22x130		
Shear resistance V _{Rk} = nstallation and use co Mean compressive strength / Min. com- pressive strength single brick ¹⁾													ength ib;	
8 / 6 N/mm ²	w/w w/d d/d	•				1,2						1,2		
10 / 8 N/mm ²	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 compressive s Factor for job site test			19475											1
Performance	on system FIS V Plus for masonry ed brick HLz, Porotherm W 44, filled with mineral wool; esistance under shear loading												Annex C	; 83



	108	Prod	ucer							e.g.	Wienerb	erger	
		Nami	مما مانمم	onoion				[length L	width W	/ heig	ght
		Nom	nal dim	ension	S			[mi	mj -	230	108	Ę	55
	55	Mear	gross	dry der	nsity ρ			[kg/d	lm ³]		≥ 1,4		
						th / Min Ile brick		[N/m	m²]	2,5/2	or 5 / 4 or 10 / 8		6
	230	Stand	dard or	annex						EN 771	-1:2011+	A1:2	015
Table C84.1:	Installatio	n parar	neters	108	18 26 -	25		00	V 0		iension s iex B 18	ee al	so
Anchor rod		M6	M8	M6	M8			M8	M10	+		12	M1
Internal threaded anchor FIS E	ł		-		-	M6 11x	M8 (85		-	M10	M12 85	-	
Perforated sleev	e FIS H K	12	x50	12	(85		16)	(85			20x88	;	
Anchor rod and	internal thre	aded an	chor F	IS E wi	th per	forated	sleev	e FIS I	нк				
Max. installation torque	max T _{inst} [Nr	n]					2	2					
General installat	ion paramet	ers											
Edge distance	Cmin = Ccr						6						
	Smin II						8						
Spacing	s _{cr} II [mr	nj					23 6						
	S _{cr} ⊥						6	-					
Drilling method	Scr ⊥							<u> </u>					
Hammer drilling w	vith hard meta	al hamm	er drill										_
¹⁾ The compre Table C84.2: Anchor rod	ssive strength Group fac		ingle bri	ck mus M6	t not be M8	e less th		of the	mean	-		-	M1
Internal threaded	1					M6	M8		1		M12	·· 1	
anchor FIS E	-		-		-	11)	(85		-	15x		-	
Perforated sleev	e FIS H K	12	x50	12>	(85		16>	(85			20x85	;	
	_{,N} (S _{min} II)							,					
$\begin{array}{c} \text{Group} & \alpha_{g} \\ \text{factors} & \alpha_{g}, \end{array}$,∨ (Smin II) <u>N (Smin ⊥)</u> ∨ (Smin ⊥)						2	<u>-</u>					



Table C85.1:Charactersingle al				•			or bri	ck br	eakou	ıt failu	ire of	a	
Anchor rod		M6	M8	M6	M8		-	M8	M10			M12	M16
Internal threaded anchor FIS E			-		-	M6	M8 x85		-	M10 15	M12 (85	-	-
Perforated sleeve FIS H K		12	x50	12	x85		16:	(85			20	x85	
Tension resistance N _{Rk} = N _F strength f _b ; Installation and											essive		
Mean compressive strength / Min. compressive strength single brick ²⁾	Use con- ditions												
2,5 / 2 N/mm ²	w/w w/d d/d		30 30		90 90		0,					50 60	
5 / 4 N/mm ²	w/w w/d	0.	60	1.	50		1.	50			0.	90	
8 / 6 N/mm ²	w/w w/d	0.	75 90	2.	00 50		2.				1,	20 50	
	d/d		90		00		<u>2,</u> 3,				50		
40.79M/mm^2	w/w w/d	1.	20	3,	50			JU			Ζ.	00	
	d/d area, for gth of the s 72/120°(eristic re	1, w/w, th single b C: NRk (esistal	50 he cha prick mu 72/120°C) n ce tc	4, racteri ust not = 0,83 o local	00 stic va be les: 3 · N _{Rk}	s than (50/80°C)	3, all be r 80% of	50 educe the m	ean co	mpress	2, ctor 0,0 sive str	50 64. rength.	
 If the fixing is in a solid The compressive streng For temperature range Table C85.2: Character anchor u 	d/d area, for gth of the s 72/120°(eristic re	1, w/w, tł single b C: NRk (esistar iear lo	50 ne cha prick mi 72/120°C) nce to pading	4, racteri ust not = 0,83 b local	00 stic va be les: 3 · NRk I bricł	s than (50/80°C) c failu	3, all be r 80% of i re or	50 educe the m brick	ean co edge	mpress	2, ctor 0,0 sive str	50 64. rength. a sing	jle
 If the fixing is in a solid The compressive streng For temperature range Table C85.2: Character anchor u 	d/d area, for gth of the s 72/120°(eristic re	1, w/w, th single b C: NRk (esistal	50 he cha prick mu 72/120°C) n ce tc	4, racteri ust not = 0,83 o local	00 stic va be les: 3 · N _{Rk}	s than (50/80°C) c failu	3, all be r 80% of	50 educe the m	ean co	mpress failur	2, ctor 0, sive str re of a	50 64. rength.	jle
 If the fixing is in a solid The compressive streng For temperature range Table C85.2: Characte anchor u Anchor rod Internal threaded 	d/d area, for gth of the s 72/120°(eristic re	1, w/w, tł single b C: NRk (esistai iear lo	50 ne cha prick mi 72/120°C) nce to pading	4, racteri ust not = 0,83 b local	00 stic va be les: 3 · NRk I bricł	s than (50/80°C) c failu M6	3, all be r 80% of ire or - M8	50 educe the m brick	ean co edge	failur failur M10	2, ctor 0, sive str re of a - M12	50 64. rength. a sing	jle
 If the fixing is in a solid The compressive streng For temperature range Table C85.2: Characte anchor u Anchor rod Internal threaded anchor FIS E 	d/d area, for gth of the s 72/120°(eristic re	1, w/w, tł single b C: NRk (esistal ear lo M6	50 ne cha prick mi 72/120°C) nce to pading	4, racteri ust not = 0,83 b loca b loca M6	00 stic va be les: 3 · NRk I bricł	s than (50/80°C) c failu M6	3, all be r 80% of	50 educe the m brick	ean co edge	failur failur M10	2, ctor 0, sive str re of a - M12 (85	50 64. rength. a sing	jle
 If the fixing is in a solid The compressive streng For temperature range Table C85.2: Character Table C85.2: Character Character Character	d/d area, for of the s 72/120°(eristic re under sh	1, w/w, th single b C: NRk (esistal ear lo M6 12: = VRk,c,	50 ne cha rick mi 72/120°C) nce to pading M8 - x50 ⊥ [kN]	4, racteri ust not = 0,83 b loca M6 12; deper	00 stic va be less 3 · NRk I brick M8 - x85 nding	s than (50/80°C) (50/80°C) (failu M6 11) on the	3, all be r 80% of ire or - M8 x85 16; 2 mear	50 educe the m brick M8 (85 (85)	ean co edge M10 - pressi	failur failur M10 15x	2, ctor 0, sive str re of a M12 (85 20)	50 64. rength. a sing M12	jle
 If the fixing is in a solid The compressive streng For temperature range Table C85.2: Character Table C85.2: Character Character Character	d/d area, for of the s 72/120°(eristic re under sh = V _{Rk,c,II} on w/w, v	1, w/w, tł single b C: NRK (esistar ear lo M6 12: VRk,c, v/d, d/	50 ne cha rick mi 72/120°C) nce to pading M8 - x50 ⊥ [kN]	4, racteri ust not = 0,83 b loca M6 12; deper	00 stic va be less 3 · NRk I brick M8 - x85 nding	s than (50/80°C) c failu M6 11: on the nge 50	3, all be r 80% of ire or - M8 x85 16; 2 mear	50 educe the m brick M8 (85 (85)	ean co edge M10 - pressi	failur failur M10 15x	2, ctor 0, sive str re of a M12 (85 20)	50 64. rength. a sing M12 x85 f _b ;	jle
 If the fixing is in a solid The compressive streng For temperature range Table C85.2: Character anchor to Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H K Shear resistance V_{Rk} = V_{Rk,b} nstallation and use condition Mean compressive strength / Min. compressive strength single brick ¹) 	d/d area, for th of the s 72/120°(eristic re under sh under sh = V _{Rk,c,ll} on w/w, v Use con- ditions w/w w/d	1, w/w, tł single b C: NRk (esistal ear lo M6 12: V/d, d/u	50 ne cha rick mi 72/120°C) nce to pading M8 - x50 ⊥ [kN]	4, racteri ust not = 0,83 b loca M6 12; deper	00 stic va be less 3 · NRk I brick M8 - x85 nding ure ra	s than (50/80°C) (failu M6 11) on the nge 50	3, all be r 80% of ire or - M8 x85 16; 2 mear	50 educe the m brick M8 (85 (85)	ean co edge M10 - pressi	failur failur M10 15x	2, ctor 0, sive str re of a M12 (85 20) ength	50 64. rength. a sing M12 x85 f _b ;	jle
 If the fixing is in a solid The compressive streng For temperature range Table C85.2: Character anchor u Anchor rod Internal threaded anchor FIS E Perforated sleeve FIS H K Shear resistance V_{Rk} = V_{Rk,b} nstallation and use condition Mean compressive strength / Min. compressive strength single brick ¹) 2,5 / 2 N/mm² 	d/d area, for of the s 72/120°(eristic re under sh = V _{Rk,c,II} on w/w, v Use con- ditions w/w w/d d/d w/w w/d	1, w/w, th single b C: NRk (esistan ear lo M6 12: V/d, d/u	50 ne cha rick mi 72/120°C) nce to pading M8 - x50 ⊥ [kN]	4, racteri ust not = 0,83 b loca M6 12; deper	00 stic va be les: 3 · NRk I brick M8 - x85 nding ure ra 0,6	s than (50/80°C) (50/80°C) (failu M6 11) on the nge 50	3, all be r 80% of ire or - M8 x85 16; 2 mear	50 educe the m brick M8 (85 (85)	ean co edge M10 - pressi	failur failur M10 15x	2, ctor 0, sive str re of a M12 c85 20; ength 0,4	50 64. rength. a sing M12 x85 fb; 4	jle

fischer injection system FIS V Plus for masonry

Performance

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



Vertical perfo	rated b	rick f	illed	with	n min	neral v	wool	, EN '	771-	1:201	1+A′	1:20	15			
	21	ſ	Produ	cer									e.g.	Wiene	rberg	er
265	-		Nomir	nal dir	mensi	ons				٢r	nm]	leng				eight H
200	Nord N	10										≥ 3	65	≥ 24	3	≥ 245
	C. Mee.			-		density		Min		[kg	/dm ³]			0,6		
245	~		comp	ressiv	e stre	ve stre ength s)	[N	/mm²]			10/3	3	
			Stand	ard o	r anne	ex				C		EN	771	-1:201	1+A1	2015
Table C86.1:	Installa	ation	para	nete	ers	- 1 7,5	28	97 - 97 - 8,0		<u>16</u> 40 18,6	imens	ion se	ee al	lso Anr	lex B	19
	(Pre-p					e with	n perf	orate	d sle	eeve f	FIS H	K)				
Anchor rod			M6	M 8		-	M8	M10	M8	M10	-		M1	2 M16	M12	2 M16
Internal threade	d				M6	M8		-		-	M10			-	-	-
anchor FIS E Perforated sleev		<i>c</i>	12)	85	11	x85	x85		16.	(130	15x	020260	x85		20	x130
Anchor rod and			0.002		FISE	1712		rated			нк	20	x05			×130
Max.	max T _{inst}		2							4						
General installat	tion para	meter	s													-
Edge distance	Cmin = Ccr								1	00						
	S _{min} II								2	50						
Spacing	201	[mm]	25						576	20803						
140 B2004	Smin⊥ Scr⊥								2	45						
Drilling method	3 0 ±															
Hammer drilling v	with hard i	m et al I	hamm	er dri	ill ill											
¹⁾ The compre	essive stre	ngth o	f the s	ingle	brick ı	must no	ot be le	ess tha	ın 80%	% of the	e mear	ı com	pres	sive str	ength	
Table C86.2:	Group	facto	ors													
Anchor rod			M6		M8	M8	M1	0	M8	M10	M	12	M1	6 M	12	M16
Perforated sleev	/e FIS H H	(1	2x85	6	10	6x85		16>	(130		20x	85		20x1	30
$\begin{array}{c} \text{Group} & \underline{\alpha} \\ \text{factors} & \underline{\alpha}_{g,N} \end{array}$	(s _{min} II) = g.∨ (s _{min} II) (s _{min} ⊥) = g.∨ (s _{min} ⊥)								ġ	2						
fischer injection Performance Vertical perforate	-						-	install	ation	param	eters			Anne	x C a	86



Vertical perfor	ated brick f	illed with minera	al wool, EN 771-	1:2011+A1:20)15
Table C87.1:		parameters igh anchorage wi	th perforated slee	eve FIS H K)	
Anchor rod		M10	M12		M16
Perforated sleev	e FIS H K	18x13	30/200	22	2x130/200
Anchor rod with	perforated sle	eve FIS H K			
Max. installation torque	max T _{inst} [Nm]		2	4	
General installat	ion parameter	S			
Edge distance	C _{min} = C _{cr}		1	00	
	Smin II		2	50	
Spacing	s₀r II [mm]				
	Smin⊥ Scr⊥		2	45	
Drilling method					
Hammer drilling w	ith hard metal	hammer drill			
Table C87.2:	Group facto				
Anchor rod		M10	M12		M16
Perforated sleeve		18x13	30/200	22	2x130/200
$\begin{array}{c} \text{Group} & \underline{\alpha_{g,}} \\ \text{factors} & \underline{\alpha_{g,}} \end{array}$	<u>N (Smin II)</u> <u>V (Smin II)</u> N (Smin ⊥) V (Smin ⊥)			2	
fischer injectio Performance	n system FIS	S V Plus for mase	onry		Annex C 87
	ed brick filled w	ith mineral wool, dim	ensions, installation	parameters	



Vertical perforated brick													
Table C88.1: Characte single an				•									
Anchor rod		M6	M8	-		M8 M10	M8 N	/10	· · · · ·	<u> </u>	M12 M16	M12	M16
Internal threaded anchor FIS E		-			V18	-	-		M10 M12	-	-		.
Perforated sleeve FIS H	IK	12x8	85	11x8	16x	85	16x1	30	15x85 20x	85	20x130	20x	200
Tension resistance N _{Rk} = N _{Rk} strength f _b ; Installation and u	.,p = NRk,b	= NR	k,p,c	= N _{Rk,b}	,c [k	N] depe	nding	on	the mean		042362	201	200
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions		VV / V1	, u/u,	(ren	nperatu	re ranç	Je :	50/80 0 0				
10 / 8 N/mm ²	w/w	2		1,5		2	:,5		2,0)	2,0	3	,0
	d/d	2		2,0		3	,0		2,0)	2,0	3	,0
 The compressive strengt For temperature range Table C88.2: Characte single an 	72/120°C ristic re	sista	erfoi nce	rmance e to pu	e as: ull-c	sessed. out failu	ire or	bri	ck break	out failu		ju I.	
Anchor rod			M.	10		N	12	20			16		
Perforated sleeve FIS H K						0/200					30/200		
Tension resistance N _{Rk} = N _{Rk} strength f _b ; Installation and u										compre	essive		
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions												
10 / 8 N/mm ²	w/w				1.5	5				2	.0		
	d/d				2,0	כ				2	,0		
 The compressive strengt For temperature range Factor for job site tests and 	72/120°C	; no pe	erfoi	rmance	e as	sessed.	an 809	6 DT	the mean	compres	sive stren(jtn.	
fischer injection system	FIS V P	lus fo	or n	nason	ıry								
Performance Vertical perforated brick filled loading	with min	ieral w	vool,	, Chara	acte	ristic res	istance	e ur	nder tensio		Annex (88	



Table C89.1:	Characte anchor u							brick edg horage)	je failu	re of a s	ingle	9
Anch	nor rod		M6	M8	-	M8 M10	M8 M10	-	M12 M16	M12 M16	M12	M1
	threaded or FIS E		-		M6 M8 11x85	-	-	M10 M12 15x85	-	-		
Perforated s	leeve FIS I	нк	12x	85	16x	(85	16x130	20x8	35	20x130	20x	200
Shear resistance nstallation and u								n compres	sive str	ength f _b ;		
Mean compressive / Min. compressive single brick ¹⁾		Use con- ditions										
10 / 8 N/m	m^2	w/w	2,5	3,0	3,	0	3,0	1,5		1,5	1,5	1,5
		d/d	2,5	3,0	3,	0	3,0	1,5		1,5	1,5	1,5
Anchor rod	anchor u				ling (Pus		gh anch	brick edg orage)	·	16		
Anchor rod				M	10	M	12		М	16		
Perforated sleeve	e FIS H K				18x13	0/200			22x13	30/200		
 single brick ¹⁾ 10 / 8 N/m ¹⁾ The comprend ²⁾ For tempera Factor for job si 	ssive streng ature range	72/120°C	C no p	erfo	rmance as	0 be less th ssessed.	an 80% of	f the mean	1	<u>,5</u> ,5 sive stren(gth.	



Vertical perforated brick	k HLz,	EN 7	71-1:	2011	+A1:2	01	5							
	Produce	r								1	e.g.	Wiener	berg	er
175 0000	Nominal	dime	nsions					ſ	mm]	leng	A CONTRACTOR OF	A DATE OF STREET		eight H
										≥2	40	≥ 175		≥ 113
· · · · · · · · · · · · · · · · · · ·	Mean gr Mean co				th / Min			[kg	J/dm ³]			0,9		
	compres					1)		[N	/mm²]	Address 2010al Distances				
340	Standard	d or a	nnex							EN 771-1:2011+A1:2015				
Table C90.1: Installation parameters (Pre-positioned anchorage with perforated sleeve FIS H K) Dimension see also Annex B 19												19		
Anchor rod	M6	M8		-	M8 M	10	M8	M10	-		M12	2 M16	M1 :	2 M16
Internal threaded		-	M6	M8	-			-	M10			-		-
anchor FIS E			11>				40	400	15x					
Perforated sleeve FIS H K Anchor rod and internal three		x85	EIS E	111121	x85	bot		(130	цк	20	20x85 20x13			x130
Max.	eaueu ai	ICHO	FISE	WILII	perioral	leu	Sieev	le FIS	пк					
installation max T _{inst} [Ni torque	m] 2	2						4	ł					
General installation parame	ters						74.5							
Edge distance Cmin = Ccr							1	00						
Spacing[m	m]						2	40						
spacing							1	15						
Drilling method														
Hammer drilling with hard met	tal hamm	ier dri	II											
¹⁾ The compressive strengt	h of the s	single	brick m	nust no	ot be less	s tha	an 80%	% of th	e mear	n com	pres	sive stre	ength	1.
Table C90.2: Group far	ctors													
Anchor rod	M6		M8	M8	M10		M8	M10) M	12	M1 ⁻			M16
Perforated sleeve FIS H K		12x85		16	6x85		16>	c130		20x	85		20x'	130
$\begin{array}{c} \alpha_{g,N} (s_{min} \ II) = \\ \hline Group \\ factors \\ \alpha_{g,N} (s_{min} \ \bot) = \\ \alpha_{g,V} (s_{min} \ \bot) \end{array} \begin{bmatrix} \alpha_{g,N} (s_{min} \ \bot) \\ \alpha_{g,V} (s_{min} \ \bot) \end{bmatrix}$	-]							2						
fischer injection system	FIS V F	Plus f	or ma	asonr	у								_	
Performance Vertical perforated brick HLz,	, dimensi	ons, i	nstalla	ition p	aramete	rs						Anne>	(C	90



Vertical perforated brick	HLz, EN 771-1:20)11+A1:2015							
	n parameters bugh anchorage wi	th perforated sle	eve FIS H K)						
Anchor rod	M10	M12		M16					
Perforated sleeve FIS H K	18x13	30/200	22	2x130/200					
Anchor rod with perforated s	leeve FIS H K								
Max. installation max T _{inst} [Nr	n]		4						
General installation paramet	ers								
Edge distance c _{min} = c _{or}		1	00						
Spacing $\frac{\frac{S_{min} I }{S_{cr} I }}{\frac{S_{min} \perp}{2}}$	n]	240							
Scr ⊥									
Drilling method Hammer drilling with hard meta	al hammer drill								
Table C91.2: Group factors									
Anchor rod	M10	M12		M16					
Perforated sleeve FIS H K	18x13	30/200	22	2x130/200					
$\begin{array}{ c c c c c } & & & \frac{\alpha_{g,N} (s_{min} I)}{\alpha_{g,V} (s_{min} I)} \\ \hline factors & & & \frac{\alpha_{g,N} (s_{min} I)}{\alpha_{g,V} (s_{min} L)} \end{array} \begin{bmatrix} -1 \\ -1 \\ -1 \\ -1 \\ -1 \\ -1 \\ -1 \\ -1$			2						
fischer injection system F Performance Vertical perforated brick HLz,		-		Annex C 91					



Vertical perforated brick HLz, EN 771-1:2011+A1:2015 Table C92.1: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned anchorage) M6 | M8 M10 M8 M12 M16 Anchor rod M8 M10 M12 M16 M6 M8 M10 M12 Internal threaded anchor FIS E 11x85 15x85 Perforated sleeve FIS H K 12x85 16x85 16x130 20x85 20x130 Tension resistance N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c} [kN] depending on the mean compressive strength f_b; Installation and use condition w/w, d/d; (temperature range 50/80°C)²⁾ Mean compressive Use strength / Min. concompressive strength ditions single brick ¹⁾ w/w 3,5 4,0 4,5 4,5 4,0 12,5 / 10 N/mm² d/d 4 4.5 5,0 5.0 4.0 1) The 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. Table C92.2: Characteristic resistance to pull-out failure or brick breakout failure of a

single anchor under tension loading (Push through anchorage)

5			5.	5 5 /
nchor rod		M10	M12	M16
Perforated sleeve FIS H	к	18x1	30/200	22x130/200
ension resistance N _{Rk} = trength f _b ; Installation a				g on the mean compressive nge 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
12,57 10 10/11/11	d/d		4,0	
fischer injection syst	em FIS V P	Plus for masor	nry	
Performance Vertical perforated brick	HLz, Charact	teristic resistanc	e under tension loa	ading Annex C 9



Vertical perforated b	rick HL:	z, EM	N 77 [.]	1-1:2	2011	+A1	:201	5							
	cteristic r under										~	ailure	e of a	sing	le
Anchor rod		M6	M 8		-	M8	M10	M8	M10		-	M12	M16	M12	M16
Internal threaded				M6	M8		-		_	M10	M12	2			
anchor FIS E				11:	x85				-	15)	c 85		-		
Perforated sleeve FIS H	-	12)		Chickle Chick		x85			130			x85			130
Shear resistance V _{Rk} = V _R Installation and use cond										ompre	essiv	e stre	ngth f	ь;	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions														
12 5 / 10 N/mm²	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
12,5 / 10 N/mm²	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
 The compressive strength of the single brick must not be less than 80% of the mean compressive strength. For temperature range 72/120°C no performance assessed. Table C93.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through anchorage) 															
Anchor rod			M10)		J	V 12					M16			
Perforated sleeve FIS H	ĸ	18x130/200 2				22	2x130/200								
Shear resistance V _{Rk} = V _R Installation and use cond										ompre	essiv	e stre	ngth f	b;	
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					
12,57 10 14/11/11	d/d		7,0				6,0					8,0			
 The compressive stre For temperature ran Factor for job site tests a 	ige 72/12	0°C n	o per	form	ance	asses	sed.					pressi		argun.	
fischer injection syste	m FIS \	/ Plu	s for	' ma	sonr	у									
Performance Vertical perforated brick F	ILz, Char	acteri	stic n	esista	ance	under	shea	r Ioad	ing			Annex C 93			



Producer					
Nominal dimensions	[mm]	length L	width W	•	
Mean gross dry density ρ	[kg/dm ³]	250 78 ≥ 0,7		248	
Mean compressive strength / Min. compressive strength single brick ¹⁾	[N/mm ²]	2,5 / 2 or 5 / 4 or 8 / 6			
Standard or annex		EN 771-1:2011+A1:2015			
			nension se nex B 19	e also	

Table C94.1: Installation parameters

Anchor rod			M6	M8
Perforated sle	eve FIS H 🖡	(12	×50
Anchor rod wi	th perforat	ed sleeve FIS I	нк	
Max. installatio torque	n max T _{inst}	[Nm]		2
General instal	lation para	meters		
Edge distance	Cmin = Ccr		1	00
	s _{min} II	[]	23	75
Spacing	s _{cr} II	[mm]	2	50
S _{min} ⊥ =	$min \perp = s_{cr} \perp$		2	50
Drilling metho	d			

Hammer drilling with hard metal hammer drill

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

Table C94.2: Group factors

Anchor ro	bd	M6	M8
Perforated	d sleeve FIS H K	12	x50
	α _{g,N} (s _{min} II)	1	,6
Group factors		1	,1
factors		2	,0
	$lpha_{ extsf{g}, extsf{V}}$ (s _{min} ot)	2	، ت

fischer injection system FIS V Plus for masonry

Performance

Horizontal perforated brick LLz, dimensions, installation parameters



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	2		12x50
		= N _{Rk,p,c} = N _{Rk,b,c} [kN] depending ition w/w, w/d, d/d; (temperature	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions		
2,5 / 2 N/mm ²	w/w w/d		0,5
2,372 10/11111-	d/d		0,6
5 / 4 N/mm ²	w/w w/d		0,9
574 N/IIII-	d/d		1,2
Q / C M/mana2	w/w w/d		1,5
8 / 6 N/mm ²	d/d		1,5

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

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

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

Anchor rod	,	M6	M8
Perforated sleeve FIS H K		12x5	0
Shear resistance V _{Rk} = V _{Rk} , Installation and use conditi	o = V _{Rk,c,II} = on w/w, w	V _{Rk,c,⊥} [kN] depending on the mean o /d, d/d; (temperature range 50/80°C a	compressive strength f _b ; nd 72/120°C)
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	
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 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 C 123.

fischer injection system FIS V Plus for masonry

Performance

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



	ଟ୍ୟ		Producer	e.a. Cerr	nanica Far	renv S A			
	~			length L	width W	height H			
$\langle 2 \rangle$	\sim		Nominal dimensions [mm]	275	88	128			
\sim	A		Mean gross dry density ρ [kg/dm ³]	2020.00	≥ 0,8				
			Mean compressive strength / Min. compressive strength single brick ¹⁾ [N/mm ²		2,5/2				
	275		Standard or annex	EN 771-1:2011+A1:2015					
12 Table C96.1:	8	tion	Dimension Annex B 19 parameters						
Anchor rod		923954000	M6	N	18				
Perforated sleev	e FIS H K	[12x50						
Anchor rod with									
Max. installation torque	-	[Nm]	2						
General installat	ion parar	neter	5						
Edge distance	Cmin = Ccr		60						
	s _{min} II		75						
Spacings _{cr} II [I	[mm]								
	S _{min} ⊥_		75						
Deilling mothod	s _{cr} ⊥		130						
Drilling method Hammer drilling v	vith hard r	notal	nammer drill						
Table C96.2:	essive strei	_		-		gth.			
Anchor rod			M6	N	18				
Perforated sleev		`	12x50						
αg	g _i N (Smin II) (s. i II)		1,3						
-	g,∨ (Smin II)	[-]							
· · ·			1,3						
factors α _g	I,N (S min ⊥)		15						
factors α _g	<u>,,N (Smin ⊥)</u> ,,∨ (Smin ⊥)		1,5						
factors αg αg	,,∨ (S min ⊥)	n FI	1,5 S V Plus for masonry						



Horizontal perforated brick LLz, EN 771-1:2011+A1:2015								
		sistance to pull-out failure or brid der tension loading	ck breakout	failure of a				
Anchor rod		M6		M8				
Perforated sleeve FIS H K		12x	:50					
		= N _{Rk,p,c} = N _{Rk,b,c} [kN] depending on ition w/w, w/d, d/d; (temperature rar						
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions							
2,5 / 2 N/mm²	w/w w/d d/d	1,	1,5					
²⁾ For temperature range 7	72/120°C	ngle brick must not be less than 80% of : N _{Rk (72/120°C)} = 0,83 · N _{Rk (50/80°C)} .						
		sistance to local brick failure or t ear loading	orick edge f	failure of a single				
Anchor rod		M6		M8				
Perforated sleeve FIS H K		12x	S-51258-111					
		$V_{Rk,c,\perp}$ [kN] depending on the mean /d, d/d; (temperature range 50/80°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					
2.5 / 2 N/mm² w/w w/d 1.2								
fischer injection system I	FIS V P	lus for masonry						
Performance Horizontal perforated brick LL loading	.z, Chara	cteristic resistance under tension and	shear	Annex C 97				



Light-weight concrete ho	llow blo	ck Hbl,	EN 77'	1-3:201	1+A1:2	015			
240	Produce	r							
	Nominal	dimensic	ne		[m	m] len	gth L	width W	height H
		121 - 01				3	62	240	240
		oss dry d	ensity ρ e strengtl	h / Min	[kg/d	im ³]		≥ 1,0	
240			ngth singl		[N/n	וm²]	2	,5 / 2 or 5 /	4
	Standard	d or anne	×			E	EN 771	1-3:2011+A	1:2015
Table C98.1: Installation (Pre-position			FISH	Dimension see also Annex B 19					
Anchor rod	M6 M8	M6 M8	_		M8 M10	CAR CALMENTALIS		/16 M12 M1	6 M12 M16
Internal threaded	1410 1410		- M6 M8			- M10 M12			
anchor FIS E	-	-	11x85	-	-	15x85	- 1	-	-
Perforated sleeve FIS H K	12x50	12x85	162	c85	16x130	20	x85	20x13	0 20x200
Anchor rod and internal threa	ded anch	or FIS E	with per	forated s	leeve FIS	внк			
Max. installation max T _{inst} [Nm	I				2				
General installation paramete	rs								
Edge distance Cmin = Ccr					60 100				
Spacing s _{cr} II [mm]				362				
$s_{min} \perp = s_{cr} \perp$	<u>.</u>				240				
Drilling method									
Hammer drilling with hard metal	hammer	drill							
¹⁾ The compressive strength Table C98.2: Group fact	-	le brick m	ust not be	less than	n 80% of ti	he mean	compr	essive strer	igth.
Anchor rod	M6 M8	M6 M8	-	M8 M10	M8 M10	-	M12	/16 M12 M1	6 M12 M16
Internal threaded	_	_	M6 M8	-	_	M10 M12	2		
anchor FIS E Perforated sleeve FIS H K	40.50	40.05	11x85	25	40.400	15x85	0.5	00.40	
	12x50	12x85	163	(85	16x130	20	x85	20x13	0 20x200
$\begin{array}{c c} \alpha_{g,N} (s_{min} l) \\ \hline \\ Group & \alpha_{g,V} (s_{min} l) \\ \end{array}$					1,2 1,1				
$\begin{bmatrix} \text{Group} & \frac{\alpha_{g,V}(s_{\min} \parallel)}{\alpha_{g,N}(s_{\min} \perp)} \end{bmatrix} [-]$									
$\alpha_{g,\vee}(\operatorname{Smin} \bot)$					2,0				
	1								
fischer injection system F Performance Light-weight concrete hollow bl			-	ition para	meters			Annex	C 98
1/66 23									04-134/23



Light-weight concrete hol	low block Hbl, E	EN 771-3:2011+A	1:2015	
	parameters igh anchorage wi	th perforated slee	eve FIS H K)	
Anchor rod	M10	M12		M16
Perforated sleeve FIS H K	18x13	30/200	22	2x130/200
Anchor rod with perforated sle	eve FIS H K			
Max. installation max T _{inst} [Nm]		;	2	
General installation parameter	S			
Edge distance Cmin = Ccr		6	0	
s _{min} II		1	00	
SpacingScr II		30	52	
s _{min} ⊥ = s _{cr} ⊥		24	40	
Drilling method				
Hammer drilling with hard metal	hammer drill			
Table C99.2: Group facto				
Anchor rod	M10	M12		M16
Perforated sleeve FIS H K	18X1.	30/200		2x130/200
$\alpha_{g,N}$ (smin II)			,2	
$\begin{bmatrix} \text{Group} & \alpha_{g,V} (\text{Smin} I) \\ \text{factors} & \alpha_{g,V} (\text{Smin} I) \end{bmatrix} [-]$		1	,1	
$\alpha_{g,N} (S_{min} \perp)$		2	,0	
$\alpha_{g, \forall} (S_{\min} \perp)$				
fischer injection system FIS	S V Plus for mase	onry		
Performance Light-weight concrete hollow blo		-	ers	Annex C 99



Light-weight concrete hollow block Hbl, EN 771-3:2011+A1:2015

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

Anchor rod			M6	M8	M6	M8		•	M8	M10	M8	M10		-	M12	M16	M12	M16	M12	2M16
Internal threaded anchor FIS E				•		-	<u> </u>	M8 (85		-		-	<u> </u>	M12 x85	2	-		•		-
Perforated sleeve FIS H K			12>	c50	12	x85		16>	(85		16	c130		20	x85		20x	130	20×	<200
Tension resistance N _{Rk} = N _{Rk} strength f _b ; Installation and u																pres	sive			
Mean compressive strength / Min. compressive strength single brick ¹⁾	cc	se on- ons																		
2,5 / 2 N/mm ²	w/w	w/d	1,	2								1,5							2	2,5
2,572 1/1111 -	d	/d	1,	2								1,5							2	2,5
5 / 4 N/mm ²	w/w	w/d	2,	0								3,0							5	5,0
574 N/MIII-	d	/d	2,	5								3,0							5	5,5

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

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

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

Anchor rod			M10	M12	M16
Perforated sleeve FIS H K			18x13	30/200	22x130/200
Tension resistance N _{Rk} = N _{Rk} strength f _b ; Installation and u					
Mean compressive strength / Min. compressive strength single brick ¹⁾	cc	se on- ons			
2,5 / 2 N/mm ²	w/w	w/d		1	,5
2,072 N/IIIII-	d	/d		1	,5
5 / 4 N/mm ²	w/w	w/d			9, 0
⇒7 4 N/IIIII=	d	/d		3	5, 0

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

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

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



Light-weight concrete he	ollow bl	lock H	bl, EN	771-3:	2011+	-A1:20	15			
Table C101.1:Characteranchor un							-	e failure	of a sir	ngle
Anchor rod		M6 M8	M6 M8	-	M8 M10	M8 M10	-	M12 M16	M12 M16	M12 M16
Internal threaded anchor FIS E		-	-	M6 M8 11x85	-	-	M10M12 15x85	-	-	-
Perforated sleeve FIS H K		12x50	12x85	16)	85	16x130	20>	(85	20x130	20x200
Shear resistance V _{Rk} = V _{Rk,b} = Installation and use condition	V _{Rk,c,ll} = '	V _{Rk,c,⊥} [I d, d/d; (1	(N] dep tempera	ending ature ra	on the nge 50/	mean co /80°C an	ompress d 72/120	ive strer I°C)	ngth f⊳;	
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 compressive strength	of the sin	igle brick	must no	t be less	s than 8	0% of the	e mean co	ompressiv	ve strengt	h.
Table C101.2: Character anchor un							-	e failure	of a sir	ngle
Anchor rod		Ν	/110		M12			M1	6	
Perforated sleeve FIS H K			18x	130/200)			22x130	/200	
Shear resistance $V_{Rk} = V_{Rk,b} =$ Installation and use condition									ngth f⊳;	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions									
2,5 / 2 N/mm ²	w/w w/d d/d	40				0,9				
5 / 4 N/mm²	w/w w/d d/d					2,0				
1) The compressive strength	of the sin	igle brick	must no	t be less	s than 8	0% of the	e mean co	ompressiv	/e strengt	h.
Factor for job site tests and o	lisplacem	ients see	e annex	C 123.						
fischer injection system F	IS V Pli	us for n	nasonr	у						
Performance Light-weight concrete hollow b	lock Hbl,	Charact	teristic r	esistanc	e undei	r shear lo	oading	Ar	nnex C	101



Light-weight concrete he	ollow blo	ck Hbl,	EN 771-	3:2011+	A1:2015	12 10		
300	Producer						e.g. Sepa	
	Nominal d	imensions	ñ		[mm]	length L	width W	height H
						500	200	200
	Mean gros	-			[kg/dm ³]		≥ 1,0	
	Mean com compress				[N/mm ²]	2,5 /	2 or 5 / 4 o	r 8 / 6
500	Standard	or annex				EN 77	1-1:2011+A	1:2015
Table C102.1: Installation	n parame	ters					imension s nnex B 19	ee also
Anchor rod	M6 M8	M6 M8	-	M8 M10	M8 M10	M10 M12		M12 M16
Internal threaded anchor FIS E	-	-	M6 M8 11x85	-	-	-	M10 M12 15x85	-
Perforated sleeve FIS H K	12x50	12x85	162	k85	16x130	18x130/20	0 20	x85
Anchor rod and internal three	aded anch	or FIS E v	vith perfo	rated slee	ve FIS H	к		
Max. installation max T _{inst} [Nn	[ר	1				2		
General installation parameter	ers							
Edge distance c _{min} = c _{cr}					100			
Spacing smin II = scr II [mr	n]				500			
$S_{\min} \perp = S_{cr} \perp$					200			
Drilling method Hammer drilling with hard meta	hammer	hrill						
1) The compressive strength			st not be le	ess than 8()% of the m	nean compr	essive stret	nath
Table C102.2: Group fac	-					•		
Anchor rod	M6 M8	M6 M8	-	M8 M10	M8 M10	M10 M12	2 -	M12 M16
Internal threaded			M6 M8		I	I	M10 M12	!
anchor FIS E	-	-	11x85	-	-	-	15x85	-
Perforated sleeve FIS H K	12x50	12x85	162	(85	16x130	18x130/20	0 20	x85
$ \begin{array}{ c c c c c } & & & & & & & \\ \hline Group \\ factors & & & & & \\ \hline \alpha_{g,V} (s_{min} \ II) \\ \hline \alpha_{g,N} (s_{min} \ \bot) \\ \hline \alpha_{g,V} (s_{min} \ \bot) \\ \hline \end{array} \left[- \right] \end{array} $					2			
fischer injection system F	IS V Plus	for mas	onry					
Performance Light-weight concrete hollow k	olock Hbl, d	imensions	, installati	on parame	eters		Annex	C 102



Anchor rod		M6 M8	M6 M8	-	M8 M10	M8 M10	M10	M12	-	M12 M1
Internal threaded		_	-	M6 M8	_		_		M10 M12	_
anchor FIS E				11x85					15x85	
Perforated sleeve FIS H K		12x50	12x85	16)	(85	16x130	18x13	0/200	20:	x85
Tension resistance N _{Rk} = strength f _b ; Installation a									essive	
Mean compressive stren- gth / Min. compressive strength single brick ¹⁾	use con- ditions									
2,5 / 2 N/mm ²	w/w w/d d/d					0,4 0,5				
5 / 4 N/mm ²	w/w w/d					0.9				
<i>↓ / ♥</i> (₩/11/11)	d/d					0,9				
8 / 6 N/mm ²	w/w w/d d/d					<u>1.2</u> 1,5				
		shear I								
Anchor rod		M6 M8		_	M8 M10	M8 M10	M10	M12		M12M
Anchor rod Internal threaded		M6 M8	M6 M8	M6 M8		- M8 M10	M10	M12	M10M12	
Internal threaded anchor FIS E		-	-	M6 M8 11x85	-	-	-		M10M12 15x85	-
Internal threaded anchor FIS E Perforated sleeve FIS H Shear resistance V _{Rk} = V _F		- 12x50	- 12x85 ∝,⊥ [kN] (M6 M8 11x85 16 dependin	x85 g on the	- 16x130 mean con	- 18x13 npressi	0/200 ive sti	M10 M12 15x85 20	- x85
Internal threaded anchor FIS E Perforated sleeve FIS H Shear resistance V _{Rk} = V _F nstallation and use cond	Rk,b = VRk lition w/v	- 12x50	- 12x85 ∝,⊥ [kN] (M6 M8 11x85 16 dependin	x85 g on the	- 16x130 mean con	- 18x13 npressi	0/200 ive sti	M10 M12 15x85 20	- x85
Internal threaded anchor FIS E Perforated sleeve FIS H Shear resistance V _{Rk} = V _R nstallation and use cond Mean compressive stren-	Rk,b = VRk lition w/v Use	- 12x50	- 12x85 ∝,⊥ [kN] (M6 M8 11x85 16 dependin	x85 g on the	- 16x130 mean con	- 18x13 npressi	0/200 ive sti	M10 M12 15x85 20	- x85
Internal threaded anchor FIS E Perforated sleeve FIS H Shear resistance V _{Rk} = V _F nstallation and use cond	Rk,b = VRk lition w/v Use con- ditions	- 12x50 .c.,ii = V _{Rk} , w, w/d, d	- 12x85 ∝,⊥ [kN] (M6 M8 11x85 16 dependin	x85 g on the	- 16x130 mean con	- 18x13 npressi	0/200 ive sti	M10 M12 15x85 20	- x85
Internal threaded anchor FIS E Perforated sleeve FIS H I Shear resistance V _{Rk} = V _R nstallation and use cond Mean compressive stren- gth / Min. compressive	Rk,b = VRk lition w/v Use con- ditions w/w w/d	- 12x50 .c.,ii = V _{Rk} , w, w/d, d	- 12x85 ∝,⊥ [kN] (M6 M8 11x85 16 dependin	x85 g on the	- 16x130 mean con	- 18x13 npressi	0/200 ive sti	M10 M12 15x85 20	- x85
Internal threaded anchor FIS E Perforated sleeve FIS H I Shear resistance $V_{Rk} = V_R$ installation and use cond Mean compressive stren- gth / Min. compressive strength single brick ¹⁾ 2,5 / 2 N/mm ²	Rk,b = VRk lition w/v Use con- ditions	- 12x50 .c.,II = V _{Rk} , w, w/d, d	- 12x85 ∝,⊥ [kN] (M6 M8 11x85 16 dependin	x85 g on the	- 16x130 mean con 80°C and 0,9	- 18x13 npressi	0/200 ive sti	M10 M12 15x85 20	- x85
Internal threaded anchor FIS E Perforated sleeve FIS H I Shear resistance $V_{Rk} = V_{R}$ nstallation and use cond Mean compressive stren- gth / Min. compressive strength single brick ¹⁾	Rk,b = VRk lition w/v Use con- ditions w/w w/d d/d w/w w/d d/d	- 12x50 ,II = V _{Rk} , w, w/d, d	- 12x85 ∝,⊥ [kN] (M6 M8 11x85 16 dependin	x85 g on the	- 16x130 mean con 80°C and	- 18x13 npressi	0/200 ive sti	M10 M12 15x85 20	- x85
Internal threaded anchor FIS E Perforated sleeve FIS H I Shear resistance $V_{Rk} = V_R$ installation and use cond Mean compressive stren- gth / Min. compressive strength single brick ¹⁾ 2,5 / 2 N/mm ²	Rk,b = VRk lition w/v Use con- ditions w/w w/d d/d w/w w/d	- 12x50 ,II = V _{Rk} , w, w/d, d	- 12x85 ∝,⊥ [kN] (M6 M8 11x85 16 dependin	x85 g on the	- 16x130 mean con 80°C and 0,9	- 18x13 npressi	0/200 ive sti	M10 M12 15x85 20	- x85
Internal threaded anchor FIS E Perforated sleeve FIS H I Shear resistance V _{Rk} = V _R nstallation and use cond Mean compressive stren- gth / Min. compressive strength single brick ¹⁾ 2,5 / 2 N/mm ² 5 / 4 N/mm ²	Rk,b = VRk lition w/v Use con- ditions w/w w/d d/d w/w w/d d/d w/w w/d d/d ength of t	- 12x50 .c.,II = VRk, w, w/d, d	- 12x85 ₀,⊥ [kN] (/d; (tem	M6 M8 11x85 16 dependin perature	x85 g on the range 50/	- 16x130 mean con 80°C and 0,9 1,5 2,5	- 18x13 npressi 72/120	ive sti °C)	M10 M12 15x85 20 rength f⊳;	×85



Light-weight concret	e hol	low blo	ck Hbl,	EN 771-3	3:2011+A	1:2015			
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	15	Producer					e.g.	Roadstone	wood
		Nominal d	limension	-		[mm]	length L	width W	height H
		Nominal u	Innension	5			440	215	215
	40	Mean gro				[kg/dm ³ ]		≥ 1,2	
				stren-gth / gth single b		[N/mm	2] 5/4	or 8 / 6 or or 12,5 / 1	
	×[	Standard	or annex				EN 77	1-3:2011+	A1:2015
Table C104.1: Installa		0.0			160	eeve FIS	Ar	mension s inex B 20	ee also
Anchor rod		M6 M8		5.75%		M8 M10	-	M12 M16	M12 M16
Internal threaded		-	-	M6 M8		<u> </u>	M10 M12		-
anchor FIS E Perforated sleeve FIS H F		12x50	12x85	11x85	x85	16x130	15x85	x85	20x130
Anchor rod and internal	-						20	105	202130
Max. installation torque max T _{inst}				in portor		2			
General installation para	meter	s							
Edge distance c _{min} = c _{er}						10			
s _{min} II	4					00			
Spacing sor II	[[mm]					40			
Smin ⊥						00			
s _{cr} ⊥ Drilling method	·]				2	15			
Hammer drilling with hard i	metal	hammer d	rill						
¹⁾ The compressive strer <b>Table C104.2:</b> Group	•		brick mus	st not be les	s than 80%	of the mea	n compres	ssive streng	jth.
Anchor rod		M6 M8	M6 M8		M8 M10		-	M12 M16	M12 M16
Internal threaded anchor FIS E		-	-	M6 M8 11x85		-	M10 M12 15x85	-	-
Perforated sleeve FIS H	<	12x50	12x85	16	x85	16x130	202	x85	20x130
α _{g,N} (s _{min} Ⅱ)	-				1	,4			
Groupα _{g,V} (s _{min} Ⅱ)	[-]				2	,0			
factors $\alpha_{g,N}$ (Smin $\perp$ )						,4			
$\alpha_{g, \vee} (\mathbf{s}_{min} \perp)$					1	,2			
fischer injection syste Performance Light-weight concrete holl				-	n paramete	ers		Annex (	C 104
							l		



Light-weight concrete ho	bliow block Hbl, E	EN 771-3:2011+.	A1:2015	
Table C105.1: Installation (Push thro	n parameters ugh anchorage wi	th perforated sle	eve FIS H K)	
Anchor rod	M10	M12		M16
Perforated sleeve FIS H K	18x13	30/200	2:	2x130/200
Anchor rod with perforated s	leeve FIS H K			
Max. installation max T _{inst} [Nm	]		2	
General installation parameter	ers			
Edge distance c _{min} = c _{cr}			110	
Smin II			100	
Spacings_r II [mm	ו]		440	
Smin ⊥			100	
s _{cr} ⊥			215	
Drilling method				
Hammer drilling with hard meta	I hammer drill			
Table C105.2: Group fact	tors			
Anchor rod	M10	M12		M16
Perforated sleeve FIS H K	18x13	30/200		2x130/200
α _{g,N} (s _{min} II)			1,4	
Group $\alpha_{g,V}(s_{\min} I )$			2,0	
factors $\alpha_{g,N}(s_{min} \perp)$			1,4	
α _{g,V} (\$min ⊥)			1,2	
fischer injection system F	IS V Plus for mase	onry		
Performance Light-weight concrete hollow b		-	eters	Annex C 105



Anchor rod		M6 N	18 M6 M8	-	M8 M10	M8 M10	M10	M12	-	M12 M10
Internal threaded anchor FIS E		-	-	M6 M8		-		-	M10 M12 15x85	-
Perforated sleeve FIS H K		12x5	0 12x85	1	6x85	16x130	18x13	30/200	20	x85
rension resistance Nռե = strength fb; Installation a									essive	
Mean compressive stren-	Use									
gth / Min. compressive strength single brick ¹⁾	con- ditions									
5 / 4 N/mm ²	w/w w/d		0,9		1,2				2.0	
	d/d		1,2		1,5				2,0	
8 / 6 N/mm ²	w/w w/d		1.5		2,0				3.0	
	d/d		1,5		2,0				3,0	
10 / 8 N/mm ²	w/w w/d d/d		2.0 2,0		<u>2,5</u> 3,0				<u>3.5</u> 4,0	
	w/w w/d		2,5		3,0				4,5	
12,5 / 10 N/mm ²	d/d		3,0						5,0	
single	nge 72/12 acteristic	:0°C: Ň c resis	le brick mu Irk (72/120°C) stance to er tensior	= 0,83 · I pull-ou	NRk(50/80°C). It failure c g (Push t	or brick b	reako	ut fail rage)	ssive stren	gth.
²⁾ For temperature rar Table C106.2: Chara	nge 72/12 acteristic anchor	:0°C: Ň c resis	le brick mu IRk(72/120°C) stance to er tension M10	= 0,83 · I pull-ou n loadin	less than 8 NRk (50/80°C). It failure c g (Push t M12	or brick b	reako	ut fail rage) M	ssive stren	gth.
<ul> <li>²⁾ For temperature rar</li> <li>Table C106.2: Chara single</li> <li>Anchor rod</li> <li>Perforated sleeve FIS H</li> <li>Fension resistance N_{Rk} =</li> </ul>	nge 72/12 acteristic anchor K : N _{Rk,p} = N	resia unde	le brick mu IRk (72/120°C) stance to er tension M10 18 NRk,p,c = N	= 0,83 ·   o pull-ou n loadin 3x130/20 Rk,b,c [kN	less than 8 N _{Rk (50/80°C)} . It failure c g (Push t M12 0 ] dependir	or brick b hrough a	reako incho mean (	ut fail rage) M 22x13	ssive stren lure of a 16 30/200	gth.
²⁾ For temperature rar Table C106.2: Chara single Anchor rod Perforated sleeve FIS H	nge 72/12 acteristic anchor K NRk,p = N	resia unde	le brick mu IRk (72/120°C) stance to er tension M10 18 NRk,p,c = N	= 0,83 ·   o pull-ou n loadin 3x130/20 Rk,b,c [kN	less than 8 N _{Rk (50/80°C)} . It failure c g (Push t M12 0 ] dependir	or brick b hrough a	reako incho mean (	ut fail rage) M 22x13	ssive stren lure of a 16 30/200	gth.
²⁾ For temperature rar Table C106.2: Chara single Anchor rod Perforated sleeve FIS H Tension resistance N _{Rk} = strength f _b ; Installation a Mean compressive stren- gth / Min. compressive	nge 72/12 acteristic anchor K NRk,p = N	resia unde	le brick mu IRk (72/120°C) stance to er tension M10 18 NRk,p,c = N	= 0,83 ·   o pull-ou n loadin 3x130/20 Rk,b,c [kN	less than 8 N _{Rk (50/80°C)} . It failure c g (Push t M12 0 ] dependir	or brick b hrough a	reako incho mean (	ut fail rage) M 22x13	ssive stren lure of a 16 30/200	gth.
<ul> <li>²⁾ For temperature rar Table C106.2: Chara single</li> <li>Anchor rod</li> <li>Perforated sleeve FIS H</li> <li>Tension resistance N_{Rk} = strength f_b; Installation a</li> <li>Mean compressive stren- gth / Min. compressive strength single brick ¹⁾</li> </ul>	K NRK,p = N NRK,p = N Use con- ditions	0°C: N c resis unde IRK,b = onditi	le brick mu IRk (72/120°C) stance to er tension M10 18 NRk,p,c = N	= 0,83 - 1 o pull-ou n loadin 3x130/20 Rk,b,c [kN //d, d/d; (	less than 8 N _{Rk (50/80°C)} . It failure c g (Push t M12 0 ] dependir	or brick b hrough a	reako incho mean (	ut fail rage) <u>M</u> 22x13 compr C) ²⁾ 2,	ure of a 16 30/200 ressive	gth.
²⁾ For temperature rar Table C106.2: Chara single Anchor rod Perforated sleeve FIS H Tension resistance N _{Rk} = strength f _b ; Installation a Mean compressive stren- gth / Min. compressive	K NRK,p = N NRK,p = N Use con- ditions W/W W/d d/d	IRK,b =	le brick mu IRk (72/120°C) stance to er tension M10 18 NRk,p,c = N	= 0,83 - 1 p pull-ou n loadin 3x130/20 Rk,b,c [kN //d, d/d; ( 1.2 1,5	less than 8 N _{Rk (50/80°C)} . It failure c g (Push t M12 0 ] dependir	or brick b hrough a	reako incho mean (	ut fail rage) <u>M</u> 22x13 compr C) ²⁾ <u>2.</u> 2,	ure of a 16 30/200 ressive	gth.
<ul> <li>²⁾ For temperature rar Table C106.2: Chara single</li> <li>Anchor rod</li> <li>Perforated sleeve FIS H</li> <li>Tension resistance N_{Rk} = strength f_b; Installation a</li> <li>Mean compressive stren- gth / Min. compressive strength single brick ¹⁾</li> </ul>	K NRk,p = N NRk,p = N ditions W/W W/d d/d W/W W/d	IRK,b =	le brick mu IRk (72/120°C) stance to er tension M10 18 NRk,p,c = N	= 0,83 - 1 o pull-ou n loadin Bx130/20 Rk,b,c [kN //d, d/d; ( 1,2 1,5 2,0	less than 8 N _{Rk (50/80°C)} . It failure c g (Push t M12 0 ] dependir	or brick b hrough a	reako incho mean (	ut fail rage) <u>M</u> 22x13 compr C) ²⁾ <u>2.</u> 2.	ssive stren ure of a 16 30/200 ressive	gth.
²⁾ For temperature rar Table C106.2: Chara single Anchor rod Perforated sleeve FIS H Tension resistance N _{Rk} = strength f _b ; Installation a Mean compressive stren- gth / Min. compressive strength single brick ¹⁾ 5 / 4 N/mm ²	NRK,p = N           NRK,p = N           Use           con-           ditions           W/W W/d           d/d	IRK,b =	le brick mu IRk (72/120°C) stance to er tension M10 18 NRk,p,c = N	= 0,83 - 1 p pull-ou h loadin 3x130/20 Rk,b,c [kN //d, d/d; ( 1,2 1,5 2,0 2,0	less than 8 N _{Rk (50/80°C)} . It failure c g (Push t M12 0 ] dependir	or brick b hrough a	reako incho mean (	ut fail rage) <u>M</u> 22x13 compr C) ²⁾ 2, 2, 3, 3,	ssive stren lure of a 16 30/200 ressive 0 0 0 0	gth.
²⁾ For temperature rar Table C106.2: Chara single Anchor rod Perforated sleeve FIS H Tension resistance N _{Rk} = strength f _b ; Installation a Mean compressive stren- gth / Min. compressive strength single brick ¹⁾ 5 / 4 N/mm ²	Reference of the second	IRK,b =	le brick mu IRk (72/120°C) stance to er tension M10 18 NRk,p,c = N	= 0,83 - 1 p pull-ou h loadin <b>3x130/20</b> <b>R</b> k,b,c [kN //d, d/d; ( 1.2 1.5 2.0 2,0 2.5	less than 8 N _{Rk (50/80°C)} . It failure c g (Push t M12 0 ] dependir	or brick b hrough a	reako incho mean (	ut fail rage) <u>M</u> 22x13 compr C) ²⁾ <u>2.</u> 2. 3. 3. 3.	ssive stren lure of a 16 30/200 ressive 0 0 0 0 5	gth.
²⁾ For temperature rar Table C106.2: Chara single Anchor rod Perforated sleeve FIS H Tension resistance N _{Rk} = strength f _b ; Installation a Mean compressive stren- gth / Min.	nge 72/12 acteristic anchor K NRk,p = N nd use c Use con- ditions W/w w/d d/d w/w w/d d/d w/w w/d d/d	IRK,b =	le brick mu IRk (72/120°C) stance to er tension M10 18 NRk,p,c = N	= 0,83 - 1 p pull-ou h loadin <b>3x130/20</b> <b>Rk,b,c [kN</b> //d, d/d; ( 1.2 1,5 2.0 2,0 2.5 3,0	less than 8 N _{Rk (50/80°C)} . It failure c g (Push t M12 0 ] dependir	or brick b hrough a	reako incho mean (	ut fail rage) <u>M</u> 22x13 compr C) ²⁾ <u>2,</u> 2, 3, 3, 3, 3, 4,	ssive stren ure of a 16 30/200 ressive 0 0 0 5 0	gth.
<ul> <li>²⁾ For temperature rar Fable C106.2: Chara single</li> <li>Anchor rod</li> <li>Perforated sleeve FIS H</li> <li>Tension resistance N_{Rk} = strength f_b; Installation a</li> <li>Mean compressive stren- gth / Min. compressive strength single brick ¹⁾</li> <li>5 / 4 N/mm²</li> <li>8 / 6 N/mm²</li> </ul>	Reference of the second	IRK,b =	le brick mu IRk (72/120°C) stance to er tension M10 18 NRk,p,c = N	= 0,83 - 1 p pull-ou h loadin <b>3x130/20</b> <b>R</b> k,b,c [kN //d, d/d; ( 1.2 1.5 2.0 2,0 2.5	less than 8 N _{Rk (50/80°C)} . It failure c g (Push t M12 0 ] dependir	or brick b hrough a	reako incho mean (	ut fail rage) <u>M</u> 22x13 compr C) ²⁾ <u>2.</u> 2. 3. 3. 3.	ssive stren ure of a 16 30/200 ressive 0 0 0 5 0 5	gth.
²⁾ For temperature rar Table C106.2: Chara single Anchor rod Perforated sleeve FIS H Tension resistance N _{Rk} = strength f _b ; Installation a Mean compressive stren- gth / Min.	nge 72/12 acteristic anchor K NRk,p = N Ind use c Use con- ditions W/w w/d d/d w/w w/d d/d w/w w/d d/d w/w w/d d/d ength of th nge 72/12	0°C: N c resis r unde IRk,b = onditi	le brick mu IRk (72/120°C) stance to er tension M10 18 NRk,p,c = N on w/w, w	= 0,83 - 1 p pull-ou h loadin <b>3x130/20</b> <b>Rk,b,c [kN</b> <b>//d, d/d; (</b> 1.2 1,5 2.0 2,0 2.5 3,0 3.0 3.5 ust not be = 0,83 - 1	less than 8 NRk (50/80°C). It failure c g (Push t M12 0 ] dependir temperatu	or brick b hrough a ng on the ire range	reako incho mean 50/80°	ut fail rage) M 22x13 compr C) ²⁾ 2, 2, 3, 3, 3, 3, 4, 4, 5,	ssive stren lure of a 16 30/200 ressive 0 0 0 0 5 0 5 0 0	
<ul> <li>²⁾ For temperature rar Table C106.2: Chara single</li> <li>Anchor rod</li> <li>Perforated sleeve FIS H</li> <li>Tension resistance N_{Rk} = strength f_b; Installation a</li> <li>Mean compressive stren- gth / Min. compressive strength single brick ¹⁾</li> <li>5 / 4 N/mm²</li> <li>8 / 6 N/mm²</li> <li>10 / 8 N/mm²</li> <li>10 / 8 N/mm²</li> <li>10 / 8 N/mm²</li> <li>The compressive stren- gth / 10 response strence</li> </ul>	nge 72/12 acteristic anchor K NRk,p = N Ind use c Use con- ditions W/w w/d d/d w/w w/d d/d w/w w/d d/d w/w w/d d/d ength of th nge 72/12	0°C: N c resis r unde IRk,b = onditi	le brick mu IRk (72/120°C) stance to er tension M10 18 NRk,p,c = N on w/w, w	= 0,83 - 1 p pull-ou h loadin <b>3x130/20</b> <b>Rk,b,c [kN</b> <b>//d, d/d; (</b> 1.2 1,5 2.0 2,0 2.5 3,0 3.0 3.5 ust not be = 0,83 - 1	less than 8 NRk (50/80°C). It failure c g (Push t M12 0 ] dependir temperatu	or brick b hrough a ng on the ire range	reako incho mean 50/80°	ut fail rage) M 22x13 compr C) ²⁾ 2, 2, 3, 3, 3, 3, 4, 4, 5,	ssive stren lure of a 16 30/200 ressive 0 0 0 0 5 0 5 0 0	



Light-weight cond	rete	ho	llow	blo	ck H	bl, E	EN 77	′1-3:	:201	11 <b>+A</b>	1:20	)15				
Table C107.1: Ch and							local   (Pre-						-	e fail	ure of a s	single
Anchor rod			M6	M8	M6	M8	-		M8	M10	M8	M10		-	M12 M16	M12 M16
Internal threaded anchor FIS E				•		-	M6 11x8	M8 85		-		-		M12 x85	-	-
Perforated sleeve FIS	внк		12>	<b>(50</b>	12:	x85		16x	85		16x	130		20:	x85	20x130
Shear resistance V _{Rk} Installation and use c	= V _{Rk} ondit	b = ∖ ion y	/ _{Rk,c,ll} w/w,	= V _R w/d,	k.c,⊥ [ d/d; (	kN] c (temp	lepend peratu	ding re ra	on t nge	he m 50/80	ean o )°C a	comp nd 7	oress 2/120	ive s )°C)	trength f _b ;	
Mean compressive strength / Min. compressive strength single brick ¹⁾	Us cor ditio	n-														
5 / 4 N/mm²	w/w d/e		0,75	1,20	0,75	1,20	0,75						1,20	)		
8 / 6 N/mm²	w/w d/e		1,20	2,00	1,20	2,00	1,20						2,00	)		
10 / 8 N/mm²	w/w d/e		1,50	2,50	1,50	2,50	1,50						2,50	)		
12,5 / 10 N/mm ²	w/w d/e		2,00	3,00	2,00	3,00	2,00						3,00	)		
¹⁾ The compressive Table C107.2: Ch and	arac	teris	stic n	esist	ance	e to		bricl	k fai	lure	or b	rick	edge	•		•
Anchor rod				M1	0			M12	2					M	16	
Perforated sleeve FIS	нк				1	8x13	0/200						2	2x13	0/200	
Shear resistance Installation	V _{Rk} =	= V _{Rk} use	_{c,b} = V cond	Rk,c,ll	= V _R w/w,	_{k,c,⊥} [ , w/d,	kN] de , d/d; (	epen temj	ding perat	on th ture r	ne m ange	ean ( 50/8	omp 0°C	oress and 7	ive streng /2/120°C)	th fь;
Mean compressive strength / Min. compressive strength single brick ¹⁾	Us co ditio	n-														
5 / 4 N/mm²	w/w d/		-							1	,2					1
8 / 6 N/mm²	w/w d/		-							2,	,0					
10 / 8 N/mm²	w/w d/									2	,5					
12,5 / 10 N/mm ²	w/w d/		_							3,	,0					
¹⁾ The compressive Factor for job site te									s tha	n 80%	6 of tl	ie me	ean ci	ompre	essive stren	igth.
fischer injection sy Performance Light-weight concrete							-	stand	ce un	nder s	hear	loadi	ng		Annex (	C 107



Light-weight concrete s	olid block Vbl,	EN 771-3:20	11+A1:2015		
A A A	Producer			e.	g. Sepa
4300	Nominal dimen	aiana	[mn	length L w	vidth W height H
11/1/11	Nominal dimens	SIONS		≥ 372	≥ 300 ≥ 254
	Mean gross dry		[kg/di	m ³ ]	≥ 0,6
2254		sive strength / Mi rength single bric		m²]	2,5 / 2
	Standard or an	nex		EN 771-3	:2011+A1:2015
Table C108.1: Installatio	on parameters			Dimension Annex B 20	
Anchor rod	M8 M10	M10 M12	M12 M16	M16	M12 M16
Perforated sleeve FIS H K	16x130	18x130/200	20x130	22x130/200	20x200
Anchor rod with perforated	sleeve FIS H K				
Max. installation max T _{inst} [Ni	m]		4		
General installation paramet	ters				
Edge distance c _{min} = c _{cr}	-		130		
Spacings _{min} II = s _{cr} II [m	m]		370		
S _{min} ⊥ = S _{cr} ⊥			250		
Drilling method					
Hammer drilling with hard met		must not be less	then 80% of the m		io otronath
Table C108.2:         Group fac	Ū.	indat not be less			ve strengtr.
Anchor rod	M8 M10	M10 M12	M12 M16	M16	M12 M16
Perforated sleeve FIS H K	16x130	18x130/200	20x130	22x130/200	20x200
$ \begin{array}{ c c c c c } & & & & & & \\ \hline Group & & & & & \\ factors & & & & & \\ \hline \alpha_{g,V} (s_{min} \perp) & & \\ \hline \alpha_{g,V} (s_{min} \perp) & & \\ \hline \end{array} \left( \begin{array}{c} & & \\ \hline \end{array} \right) \end{array} \left( \begin{array}{c} \\ \hline \end{array} \right) $	]		2		
fischer injection system f Performance Light-weight concrete solid bl		-	rameters	Ar	nnex C 108



Anabarrad			0.02802	loadin	-					1997-914 Hora	
Anchor rod		10002	VI10	M10	M12	M12	M16	M16		M12	M16
Perforated sleeve FIS H K	040	16x13			0/200	20x		22x130/2		20x2	200
ension resistance N _{Rk} = I strength f _b ; Installation an									essiv	ve	
Mean compressive stren- gth / Min. compressive strength single brick ¹⁾	Use con- ditions	5						-224			
2,5 / 2 N/mm ²	w/w w/d		2,0				2			3,	
1) The compressive stree	d/d		2,0				3			4,	
		shear loa	ding	(				-	ire o		_
Anchor rod	,	23273 0.9	VI10	M10	M12	M12	M16	M16		M12	M16
Perforated sleeve FIS H K Shear resistance V _{Rk} = V _{Rk}	-	16x13		1. CAMP 0280.1-590	0/200	1.000.000	130	22x130/2	1000	20x2	200
nstallation and use condi									rengi	un 16,	
Mean compressive stren- gth / Min. compressive strength single brick ¹⁾	Use con- ditions										
2,5 / 2 N/mm ²	w/w w/d d/d			4,5	i				6,	5	
		<b>3</b>	in march	t not be	less tha	n 80% o	f the me	an compres	ssive	strength	
Factor for job site tests a	nd displa					n 80% o	f the me	an compres	ssive	strength	



Light-weight concrete so	lid bloc	k Vb	I, E	N 771-:	3:20	11+	A1:201	5				
2240	roducer										KLB	
	Nominal d	imen	sion	e			٢r	nm]	leng	gth L	width W	height H
	61-C								≥2	250	≥ 240	≥ 239
	Mean gros					22	[kg	/dm ³ ]			≥ 1,6	
	Mean com compressi						[	N/mm²]	:	5/40	r 8 / 6 or	10/8
	Standard	or ann	nex						EN	1771-	3:2011+A	1:2015
Table C110.1: Installation					a.	250					ension se ex B 20	e also
(Pre-positio				e with pe					_		I	
Anchor rod	M6 M8	M6	M8	-	M8	M10	M8 M10		_	2 M16	M12M16	M12 M16
Internal threaded anchor FIS E	-	-		M6 M8		-	-	M10 M1 15x85	_	-	-	-
Perforated sleeve FIS H K	12x50	12x	85		x85		16x130		)x85	i	20x130	20x200
Anchor rod and internal threa	ded anch	or FI	SE	with per	forat	ed s	leeve FIS	внк			1	1
Max. installation max T _{inst} [Nm]	Í						4					
General installation paramete	rs											
Edge distance Cmin = Ccr							130					
Spacing smin II = scr II [mm	]						250					9
$S_{\min} \perp = S_{cr} \perp$							250					-
Drilling method Hammer drilling with hard metal	hammer	drill										
¹⁾ The compressive strength			k m	ust not be	less	than	80% of t	he mean	o con	noress	ive strend	ıth.
Table C110.2: Group fact	-											,
Anchor rod	M6 M8	M6	M8	-	M8	M10	M8 M10	-	M1	2 M16	M12M16	M12 M16
Internal threaded				M6 M8				M10 M1	_			
anchor FIS E	-	-		11x85		-	-	15x85		-	-	-
Perforated sleeve FIS H K	12x50	12x	85	162	x85		16x130	20	)x85	i	20x130	20x200
$\begin{array}{ c c c c c } & & & \frac{\alpha_{g,N} (s_{min} \ II)}{\alpha_{g,V} (s_{min} \ II)} \\ factors & & & \frac{\alpha_{g,N} (s_{min} \ II)}{\alpha_{g,N} (s_{min} \ \bot)} \end{array} [-] \end{array}$							2,0					
fischer injection system FI	S V Plus	s for	ma	sonry								
Performance Light-weight concrete solid bloc	k Vbl, din	nensi	ons,	, installati	on pa	aram	eters			A	nnex C	110



Light-weight concrete		771-3:2011+A1	1:2015	
Table C111.1: Installati (Push th	ion parameters hrough anchorage wit	th perforated sle	eve FIS H K)	
Anchor rod	M10	M12		M16
Perforated sleeve FIS H K	18x13	0/200	22	2x130/200
Anchor rod with perforated	d sleeve FIS H K			
Max. installation max T _{inst} [I	Nm]		2,0	
General installation param	eters			
Edge distance c _{min} = c _{cr}			130	
Spacingsmin II = scr II [r	mm]		250	
$s_{min} \perp = s_{cr} \perp$			250	
Drilling method				
Hammer drilling with hard me	etal hammer drill			
Table C111.2: Group fa				
Anchor rod	M10	M12		M16
Perforated sleeve FIS H K	18x13	0/200	22	2x130/200
$ \begin{array}{c} \begin{array}{c} \alpha_{g,N} \left( s_{\min}  II \right) \\ \\ \textbf{Group} \\ \textbf{factors} \\ \end{array} \\ \begin{array}{c} \alpha_{g,V} \left( s_{\min}  II \right) \\ \hline \alpha_{g,N} \left( s_{\min}  \bot \right) \\ \hline \alpha_{g,V} \left( s_{\min}  \bot \right) \end{array} \end{array} $	[-]	:	2,0	
fischer injection system	I FIS V Plus for masc	onry		
Performance Light-weight concrete solid I	block Vbl, dimensions, in	stallation paramete	:rs	Annex C 111



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

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

anchor FIS E		-	-	11x85	-		15x85	-	· ·	-
Perforated sleeve FIS H	٢	12x50	12x85	16>	<b>k85</b>	16x130		x85	20x130	20x20
Tension resistance N _{Rk} = strength f₀; Installation ar	N _{Rk,p} = N _R nd use co	_{k,b} = N _F ndition	_{k,p,c} = N w/w, v	R _{k,b,c} [kN v/d, d/d; (	] depend (tempera	ding on t ature ran	he mean ge 50/80°	compres °C) ²⁾	ssive	
Mean compressive stren- gth / Min. compressive strength single brick ¹⁾	Use con- ditions									
5 / 4 N/mm ²	w/w w/d	1,2	2,0		2,5			3	,0	
01 4 10/10/10	d/d	2,0	3,5		4,0			5	,0	
8 / 6 N/mm²	w/w w/d	1,5	3,0		4,0			5	,0	
0101010	d/d	3,0	5,0		6,5			7	,5	
10 / 8 N/mm ²	w/w w/d	2,0	4,0		5,0			6	,5	
	d/d	4,0	7,0		8,5			9	,0	
single	cteristic anchor ເ	under	tensio		ig (Pusł				re of a	
single Anchor rod	anchor ι	under	tensio 110	n loadin	ig (Pusł M12			orage) M16	i	
Anchor rod Perforated sleeve FIS H I	anchor ι «	under f	tensio /110 18	n loadin   	ig (Pusł M12 0	n throug	h anchc	orage) M16 22x130/	200	
single Anchor rod Perforated sleeve FIS H I Fension resistance N _{Rk} =	anchor ( K N _{RK,p} = N _R	under f N KK, b = N F	tensio /10 18 Rk,p,c = N	n loadin Bx130/200 I _{Rk,b,c} [kN	ig (Push M12 0 ] depend	h throug	h ancho he mean	M16 22x130/ compres	200	_
single Anchor rod	anchor ( K N _{RK,p} = N _R	under f N KK, b = N F	tensio /10 18 Rk,p,c = N	n loadin Bx130/200 I _{Rk,b,c} [kN	ig (Push M12 0 ] depend	h throug	h ancho he mean	M16 22x130/ compres	200	_
Single Anchor rod Perforated sleeve FIS H I Tension resistance N _{Rk} = strength f _b ; Installation ar Mean compressive stren- gth / Min. compressive strength single brick ¹⁾	anchor u K NRK,p = NR Id use co Use con-	under f N KK, b = N F	tensio /10 18 Rk,p,c = N	n loadin Bx130/200 I _{Rk,b,c} [kN	ig (Push M12 0 ] depend	h throug	h ancho he mean	M16 22x130/ compres	200	
Single Anchor rod Perforated sleeve FIS H I Fension resistance N _{Rk} = strength f _b ; Installation ar Mean compressive stren- gth / Min. compressive	Anchor u K N _{Rk,p} = N _R nd use co Use con- ditions	under f N KK, b = N F	tensio /10 18 Rk,p,c = N	n loadin 3x130/200 I _{Rk,b,c} [kN v/d, d/d; (	ig (Push M12 0 ] depend	h throug	h ancho he mean	orage) M16 22x130/ compre: ℃) ²⁾	200	
single Anchor rod Perforated sleeve FIS H I Tension resistance N _{Rk} = strength f _b ; Installation ar Mean compressive stren- gth / Min. compressive strength single brick ¹⁾ 5 / 4 N/mm ²	anchor u K NRK,p = NR d use co Use con- ditions W/w w/d	under f N KK, b = N F	tensio /10 18 Rk,p,c = N	n loadin 3x130/200 I _{Rk,b,c} [kN v/d, d/d; ( 2,5	ig (Push M12 0 ] depend	h throug	h ancho he mean	orage) <u>M16</u> 22x130/ compres °C) ²⁾ 3,0	200	
Single Anchor rod Perforated sleeve FIS H I Tension resistance N _{Rk} = strength f _b ; Installation ar Mean compressive stren- gth / Min. compressive strength single brick ¹⁾	Anchor u K N _{Rk,p} = N _R d use co Use con- ditions W/W W/d d/d	under f N KK, b = N F	tensio /10 18 Rk,p,c = N	n loadin 3x130/200 JRk,b,c [kN v/d, d/d; 0 2,5 4,0	ig (Push M12 0 ] depend	h throug	h ancho he mean	orage) M16 22x130/ compre: °C) ²⁾ 3,0 5,0	200	
single Anchor rod Perforated sleeve FIS H I Tension resistance N _{Rk} = strength f _b ; Installation ar Mean compressive stren- gth / Min. compressive strength single brick ¹⁾ 5 / 4 N/mm ² 8 / 6 N/mm ²	Anchor u K NRK,p = NR d use co Use con- ditions W/W W/d d/d W/W W/d	under f N KK, b = N F	tensio /10 18 Rk,p,c = N	2,5 4,0 4,0	ig (Push M12 0 ] depend	h throug	h ancho he mean	<b>M16</b> 22x130/ <b>compres</b> °C) ²⁾ 3,0 5,0 5,0	200	
single Anchor rod Perforated sleeve FIS H I Tension resistance N _{Rk} = strength f _b ; Installation ar Mean compressive stren- gth / Min. compressive strength single brick ¹⁾ 5 / 4 N/mm ²	anchor u ( N _{Rk,p} = N _R d use co ditions w/w w/d d/d w/w w/d d/d w/w w/d d/d	Inder 1	tensio 110 18 Rk,p,c = N W/w, v	2,5 4,0 4,0 6,5 5,0 8,5	ig (Push M12 0 I] depend (tempera	ding on t ature ran	h ancho he mean ge 50/80°	<b>M16</b> <b>22x130/</b> <b>compre</b> <b>°C)</b> ²⁾ 3,0 5,0 5,0 7,5 6,5 9,0	200 ssive	

fischer injection system FIS V Plus for masonry

Performance

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



Light-weight concre	ete soli	d bl	lock	k Vb	ol, E	N 7	71-3	:2011+	A1:201	5			
Table C113.1: Char anch									ure or b ed anch	-	ge failur	e of a si	ngle
Anchor rod		M6	M8	M6	M8		-	M8 M10	M8 M10	-	M12 M16	M12 M16	M12 M16
Internal threaded anchor FIS E			-		-	M6 11>			-	M10 M12 15x85	-	-	-
Perforated sleeve FIS H	IK	12	x50	12	x85		16x	85	16x130	20:	x85	20x130	20x200
Shear resistance V _{Rk} = V Installation and use con	/ _{Rk,b} = V _R dition w	αk,c,ll ∕ <b>w, v</b>	= V _R w/d,	^{k,c,⊥} d/d;	[kN] (ten	dep nper	endi ature	ng on th e range t	ie mean ( 50/80°C a	compres and 72/12	sive stre 20°C)	ength f₀;	
Mean compressive strength / Min. com- pressive strength single brick ¹⁾	Use con- ditions												
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 compressive st <b>Table C113.2:</b> Char anch	acterist	ic re	esist	tand	ce to	o loc	al b	rick fail		rick edg	-	_	
Anchor rod			Ν	Л10				M12			M16	i	
Perforated sleeve FIS H	IK				18>	(130	/200				22x130	200	
Shear resistance V _{Rk} = V Installation and use con												ength f⊳;	
Mean compressive strength / Min. com- pressive strength single brick ¹⁾	Use con- ditions												
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 compressive st Factor for job site tests	and disp	blace	emer	nts s	ee a	nnex	C 12		180% of t	he mean (	compress	ive streng	th.
fischer injection syst Performance Light-weight concrete so							-				┥ ѧ	nnex C	113



Producer Nominal of Mean gro Mean cor pressive s Standard	dimensions ss dry d npressivestrength	lensity ρ ve streng single b			[mm] [kg/dm ³ ] [N/mm ² ]	length ≥ 440	≥ 1	h W 00 2,0 6 or 1	height H ≥ 215
Mean gro Mean cor pressive s	ss dry d npressiv strength	lensity ρ ve streng single b			[kg/dm ³ ]	≥ 440	≥ 1 ≥ 2 4 or 8 /	00 2,0 6 or 1	≥ 215
Mean cor pressive	npressiv	ve streng single b				5 /	4 or 8 /	6 or 1	
pressive	strength	single b		com-	[N/mm ² ]	5 /			0/8
								5/10	
						EN 7	71-3:20	A REAL PROPERTY AND A REAL	1:2015
n parame	eters								
M	6	M	8	M	10	M1	2	1	M16
d sleeve									
n] 50	70	50	70	50	70	50	70	50	70
·	<b>ļ</b>				10	)			
ers									
-									
l hammer	drill								
ors	-	1							-
M	6		8		-	M1	2		M16
				١,	5				
	M d sleeve o] 50 or rs of the sing cors	M6         d sleeve         d sleeve         i]       50         i]       4         ii]       4         ii]       1         ii]       1         iii]       1         iii]       1         iiii]       1         iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	M6     M       d sleeve     1       1     50     70     50       1     4     1       1     4     1       1     4     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1       1     1     1	M6       M8         d sleeve	M6         M8         Mr           d sleeve	M6         M8         M10           d sleeve	M6         M8         M10         M1           d sleeve         1         50         70         50         70         50           1         50         70         50         70         50         70         50           1         4         10         10         10         10         10           Image: state s	M6         M8         M10         M12           d sleeve         d         10         70         50         70         50         70           1         4         10         10         10         10         10         10           Intersection of the single brick must not be less than 80% of the mean compressive cors           I hammer drill           of the single brick must not be less than 80% of the mean compressive cors           M6         M8         M10         M12           1,6           1,3           1,4	M6       M8       M10       M12       I         d sleeve       10       50       70       50       70       50       70       50         i       50       70       50       70       50       70       50       70       50         i       4       10       10       10       10       10       10         i       100       75       3x her       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10



#### 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 M6 **M8** M10 M12 M16 Anchor rod Tension resistance NRk = NRk,p = NRk,b = NRk,p,c = NRk,b,c [kN] depending on the mean compressive strength f_b; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C) ²⁾ Effective anchorage depth hef [mm] Mean compressive stren-Use gth / Min. compressive con-≥ 50 ditions strength single brick¹⁾ w/w w/d 1,2 1,2 5 / 4 N/mm² d/d 2,0 2,0 w/w w/d 1.5 2.0 8 / 6 N/mm² d/d 3,0 3,5 w/w w/d 2.0 2,5 10 / 8 N/mm² d/d 4,0 4,5 3,5 w/w w/d 3,0 12,5 / 10 N/mm² 5.0 5,5 d/d

¹⁾ The compressive strength of the single brick must not be less than 80% of the mean compressive strength. ²⁾ For temperature range 72/120°C:  $N_{Rk (72/120^{\circ}C)} = 0.83 \cdot N_{Rk (50/80^{\circ}C)}$ .

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
Shear resistance V _{Rk} = V _R Installation and use cond						th f₀;
Mean compressive stren- gth / 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/mm ²	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 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 C 123.

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#### Performance

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



Light-wei	ght concrete	sol	id bloc	k Vbl,	EN 77	1-3:20	11+A1:	2015				
	295	Pro	ducer					<u>.</u>	ĺ	Trar	mac	
	$\langle \rangle$				1990 1990				length l	widt	hW	height H
/		NO	minal dir	mensior	IS			[mm]	≥ 440	≥ 9	95	≥ 215
	215	Me	an gross	s dry de	nsity ρ			[kg/dm ³ ]		≥2	2,0	
	~1				strength			[N/mm ² ]	7,5/6			12,5 / 10
					gth single	e brick 1)	Ì	[(s/nin ]		or 15		
	2440	Sta	indard o	r annex					EN 7	71-3:20	11+A	1:2015
Table C11	16.1: Installat	ion	parame	eters								
Anchor rod	1		M	6	N	18	М	10	M1	2		M16
	without perfor	ated								-		
Effective anchorage of	b.( [	mm]	50	70	50	70	50	70	50	70	50	70
Max. installa torque	max Tinst	-	4	ţ				10	0			
	stallation param	eter	5					_				
Edge distan								0				
	Smin II							5				
Spacing	S[	mmj						h _{ef}				
	\$min⊥							5				
Drilling me	s _{cr} ⊥						38	h _{ef}				
	illing with hard m	etal I	nammer	drill								
	ompressive stren				must not	be less	than 80%	6 of the m	ean com	pressive	e strer	ngth.
	16.2: Group f	-										-
Anchor rod	1		M	6	l N	18	M	10	M1:	2		M16
	α _{g,N} (Smin II)						1	,9				
Group	α _{g.V} (s _{min} II)	[-]					1	,4				
factors	$\alpha_{g,N}$ (S _{min} $\perp$ )	.,						,9				
	$lpha_{g,V}$ (Smin $\perp$ )						1	,4				
fischer in	jection systen	n FIS	S V Plu	s for m	nasonry	1						
Performan Light-weigh	<b>ice</b> ht concrete solid	blocl	∢Vbl, dir	mensior	ns, install	ation pa	rameters	5		Anı	nex (	C 116



## 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		Ν	<i>1</i> 6	N	18	M	10	M	12	M	16
Tension resistance N _{Rk} = N _R strength f _b ; Installation and										ve	
Mean compressive strength	Use	° .		Ef	fective	anchora	age dep	th h _{ef} [m	m]		
/ Min. compressive strength single brick ¹⁾	con- ditions	50	70	50	70	50	70	50	70	50	70
7.5 / C. N(	w/w w/c	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
40.10 M/mm ²	w/w w/c	1 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 / 40 MJ 2	w/w w/c	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
dE ( d0 Nimme ²	w/w w/c	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/d	5,0	7,0	5,0	7,0	5,0	7,5	5,0	7,5	5,0	7,5

¹⁾ The 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).

## Table C117.2: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

Anchor rod		M6	M8	M10	M12	M16
Shear resistance V _{Rk} = V _{Rk,b} Installation and use condition						th fь;
Mean compressive strength / Min. compressive strength single brick ¹⁾	Use con- ditions		Effective a	anchorage dept ≥ 50	h 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 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 C 123.

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### Performance

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



	$\sim$	Pro	oduce	r									e.g. Ytor	ng
/		Me	an gr	oss dr	y dens	sity p				[kg/d	m ³ ]	0,35		0,65
		- 1-0-075		10		strengt h sing				[N/r	nm²]	2,5/2	2 5/4	8/6
		Sta	andard	d or ar	nnex							EN 7	71-4:2011	+A1:2015
Table C ^r	118.1: Installa	tion p	barar	neter	s									
Anchor ro	bd		N	16	M	18	M	10	M	12	М	16	-	-
Internal ti FIS E	hreaded anchor		3	-8					8	-c	,	-	M6 M8 11x85	M10 M12
Anchor ro	od and internal t	thread	led ar	nchor	FIS E	with	out pe	rforat	ted sl	eeve				
Effective anchorage	e depth ^{h_{ef}}	[mm]	100	200	100	200	100	200	100	200	100	200	٤	5
Max. insta torque	max I inst			4	1	8	2	12	2	16	2	20	1	2
	nstallation para	meter	S											
Edge dista										00				
	s _{cr} II = s _{min} II h _{er} =200mm	4 1							25	50				
	Smin II								8	0				
	h _{ef} =200mm								3х	h _{ef}				
Spacing									25					
	$\frac{s_{cr} \perp = s_{min} \perp}{h_{ef} = 200 mm}$								8					
	S _{min} ⊥ h _{ef} =200mm s _{cr} ⊥								3x	h _{ef}				
Drilling m														
_	frilling with hard i	metal I	hamm	er dril	1									
¹⁾ The	compressive stre	ngth o	t the s	ingle t	orick m	nust no	ot be le	ess tha	in 80%	6 of the	e mea	n comp	pressive stre	ength.
ficebori	njection syste	m Els		Plus fa	or ma	asonr	v							



Anchor rod	M6	M8	M10	M12	M16	-		-	
Internal threaded anchor FIS E	-	_	_	_	_		<b>M</b> 8	M10	
						11x8	5	15x	
$h_{ef}=200 \alpha_{g,N} (s_{min} II)$			1,6			_1)		_1	
h _{ef} =200 $\alpha_{g,V}$ (s _{min} II)			1,1			_1)		_1	
Group $\alpha_{g,N}   , \alpha_{g,V} (s_{\min}   )$				2					
$\frac{h_{ef}=200 \alpha_{g,N} (S_{min} \perp)}{1000}$			1,6			_1)		_1	
$h_{ef}=200 \alpha_{g,V}(s_{min} \perp)$			0,8			_1)		_1	
$\frac{\alpha_{g,N} \perp, \alpha_{g,V} (\mathbf{s}_{\min} \perp)}{^{1)}}$ No performance assessed				2					
Fable C119.2:         Group factor           (Compress)				ncrete				1	
Anchor rod	M6	M8	M10	M12	M16	-		-	
Internal threaded anchor FIS E	-	-	-	-	-		M8	M10	
( <u>222</u> ( <u>11</u> )			0.7			11x8:	5	<b>15x</b>	
$\frac{h_{ef}=200 \alpha_{g,N} (s_{min} II)}{h_{ef}=200 \alpha_{g,N} (s_{min} II)}$			0,7						
$\begin{array}{c} \begin{array}{c} \begin{array}{c} h_{ef}=200 \ \alpha_{gV} \left( \mathbf{s}_{min} \ \mathbf{II} \right) \\ \hline \alpha_{g,N} \ \mathbf{II}, \ \alpha_{gV} \left( \mathbf{s}_{min} \ \mathbf{II} \right) \end{array}$			2,0	2				_	
				<u> </u>					
/ · · ·			0.7			_1)		_1	I
factors $h_{ef}=200 \alpha_{g,N} (s_{min} \perp)$			0,7			_1)		_1	
/ · · · · · · · · · · · · · · · · · · ·			0,7	2					
factors $h_{ef}=200 \alpha_{g,N} (s_{min} \perp)$ $h_{ef}=200 \alpha_{g,V} (s_{min} \perp)$ $\alpha_{g,N} \perp, \alpha_{gV} (s_{min} \perp)$ ¹⁾ No performance assesses <b>Table C119.3:</b> Group factor (Compress	ors for auto	th f⊳=6 N/	1,2 erated cor /mm ² )	2 ncrete					
factors $h_{ef}=200 \alpha_{g,N} (s_{min} \perp)$ $h_{ef}=200 \alpha_{g,V} (s_{min} \perp)$ $\alpha_{g,N} \perp, \alpha_{gV} (s_{min} \perp)$ ¹⁾ No performance assesses <b>Table C119.3:</b> Group factor (Compress	nd. Prs for aut		1,2 erated cor	2	M16	_1)		1	
factors $h_{ef}=200 \alpha_{g,N} (s_{min} \perp)$ $h_{ef}=200 \alpha_{g,V} (s_{min} \perp)$ $\alpha_{g,N} \perp, \alpha_{gV} (s_{min} \perp)$ ¹⁾ No performance assesses <b>Table C119.3:</b> Group factor (Compress Anchor rod	ors for auto ve streng	th f⊳=6 N/	1,2 erated cor /mm ² )	2 ncrete	M16	_1) 1) 	V18	_1 	M12
factors $h_{ef}=200 \alpha_{g,N} (s_{min} \perp)$ $h_{ef}=200 \alpha_{g,V} (s_{min} \perp)$ $\alpha_{g,N} \perp, \alpha_{gV} (s_{min} \perp)$ ¹⁾ No performance assesses <b>Table C119.3:</b> Group factor (Compress Anchor rod Internal threaded anchor FIS E	ors for auto ve streng	th f⊳=6 N/	1,2 erated cor /mm ² ) M10	2 ncrete	M16 -	_1) 		_1 M10 15x	M12 85
factors $h_{ef}=200 \alpha_{g,N} (s_{min} \perp)$ $h_{ef}=200 \alpha_{g,V} (s_{min} \perp)$ $\alpha_{g,N} \perp, \alpha_{gV} (s_{min} \perp)$ ¹⁾ No performance assesses <b>Table C119.3:</b> Group factor (Compress Anchor rod Internal threaded anchor FIS E $h_{ef}=200 \alpha_{g,N} (s_{min} II)$	ors for auto ve streng	th f⊳=6 N/	1,2 erated cor (mm ² ) M10 - 0,7	2 ncrete	M16 -	1) 		_1 M10 15x _1	M12 85
factors $ \begin{array}{c} \begin{array}{c} \begin{array}{c} h_{ef}=200 \ \alpha_{g,N} \ (\textbf{S}_{min} \ \bot) \\ \hline h_{ef}=200 \ \alpha_{g,V} \ (\textbf{S}_{min} \ \bot) \\ \hline \end{array} \end{array} \right) \\ \hline \end{array} \\ \begin{array}{c} \begin{array}{c} \begin{array}{c} \\ \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ \begin{array}{c} \\ \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ \begin{array}{c} \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ $	ors for auto ve streng	th f⊳=6 N/	1,2 erated cor /mm ² ) M10	2 ncrete <u>M12</u> -	M16 -	_1) 		_1 M10 15x	M12 85
factors $ \begin{array}{c} \begin{array}{c} \begin{array}{c} h_{ef}=200 \ \alpha_{g,N} \ (S_{min} \ \bot) \\ \hline h_{ef}=200 \ \alpha_{g,V} \ (S_{min} \ \bot) \\ \hline \end{array} \end{array} \\ \begin{array}{c} \begin{array}{c} h_{ef}=200 \ \alpha_{g,V} \ (S_{min} \ \bot) \\ \hline \end{array} \end{array} \\ \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} $	ors for autove streng	th f⊳=6 N/	1,2 erated cor (mm ² ) M10 - 0,7 2,0	2 ncrete	M16 _	1) 		_1 M10 15x _1	M12 85
factors $\begin{array}{c} \begin{array}{c} \begin{array}{c} h_{ef}=200 \ \alpha_{g,N} \ (\textbf{S}_{min} \ \bot) \\ \hline h_{ef}=200 \ \alpha_{g,V} \ (\textbf{S}_{min} \ \bot) \\ \hline \end{array} \\ \hline \end{array} \\ \begin{array}{c} \begin{array}{c} h_{ef}=200 \ \alpha_{g,V} \ (\textbf{S}_{min} \ \bot) \\ \hline \end{array} \\ \hline \end{array} \\ \begin{array}{c} \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \hline \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} $	ors for autove streng	th f⊳=6 N/	1,2 erated cor (mm ² ) M10 - 0,7 2,0 0,7	2 ncrete <u>M12</u> -	M16 -	1) 		_1 M10 15x _1	M12 85
factors $ \begin{array}{c} \begin{array}{c} \begin{array}{c} h_{ef}=200 \ \alpha_{g,N} \ (S_{min} \ \bot) \\ \hline h_{ef}=200 \ \alpha_{g,V} \ (S_{min} \ \bot) \\ \hline \end{array} \end{array} \\ \begin{array}{c} \begin{array}{c} h_{ef}=200 \ \alpha_{g,V} \ (S_{min} \ \bot) \\ \hline \end{array} \end{array} \\ \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} $	ors for autove streng	th f⊳=6 N/	1,2 erated cor (mm ² ) M10 - 0,7 2,0	2 ncrete <u>M12</u> -	M16 _	1) 		_1 M10 15x _1 _1	M12 85
factors $h_{ef}=200 \alpha_{g,N} (s_{min} \perp)$ $l_{ef}=200 \alpha_{g,V} (s_{min} \perp)$ $h_{ef}=200 \alpha_{g,V} (s_{min} \perp)$ $\alpha_{g,N} \perp, \alpha_{gV} (s_{min} \perp)$ 1)       No performance assessed         Table C119.3: Group factor (Compress)         Anchor rod         Internal threaded anchor FIS E $h_{ef}=200 \alpha_{g,N} (s_{min} II)$ $h_{ef}=200 \alpha_{g,V} (s_{min} II)$ $h_{ef}=200 \alpha_{g,V} (s_{min} II)$ $h_{ef}=200 \alpha_{g,N} (s_{min} II)$ $h_{ef}=200 \alpha_{g,N} (s_{min} II)$ $h_{ef}=200 \alpha_{g,N} (s_{min} II)$	ors for autove streng	th f⊳=6 N/	1,2 erated cor (mm ² ) M10 - 0,7 2,0 0,7	2 ncrete <u>M12</u> -	M16 _	1) 		_1 M10 15x _1 _1	N 8
factors $ \begin{array}{c} \begin{array}{c} \begin{array}{c} h_{ef}=200 \ \alpha_{g,N} \ (Smin \ \bot) \\ \hline h_{ef}=200 \ \alpha_{g,V} \ (Smin \ \bot) \\ \hline \\ \hline \\ \hline \\ \end{array} \\ \begin{array}{c} h_{ef}=200 \ \alpha_{g,V} \ (Smin \ \bot) \\ \hline \\ \hline \\ \end{array} \\ \begin{array}{c} \alpha_{g,N} \ \bot, \ \alpha_{gV} \ (Smin \ \bot) \\ \hline \\ \hline \\ \hline \\ \end{array} \\ \begin{array}{c} \alpha_{g,N} \ \bot, \ \alpha_{gV} \ (Smin \ \bot) \\ \hline \\ \hline \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} $	ors for auto ve streng M6	th f⊳=6 N/	1,2 erated cor (mm ² ) M10 - 0,7 2,0 0,7	2 ncrete <u>M12</u> - 2	M16	1) 		_1 M10 15x _1 _1	M1 85



Anchor rod		N	16		<b>M</b> 8	M	10	N	112	M	16	-		-
Internal threaded anchor FIS E			-		-		-		-		-	M6 M	-+	M10 M1
Fension resistance N _{Rk} =	N _{Rk n} = N		NRk	nc = N	Rkhc [	kN1 de	epend	lina (	on the	mea	n com	11x85 pressive	_	15x85
strength fc,m; Installation a					w/d, d	/d; (te	mpe	ratur	e rang	je <b>50</b> /	80°C)	3)		
Mean compressive stren-	Use					Effecti	ive an	hora	age de	epth h	_{ef} [mm]	]		
gth / Min. compressive strength single brick ²⁾	con- ditions			100				100 :		100	200		8	
2,5 / 2 N/mm ²	w/w w/d	1,2	1,2				-		-	2,0	3,0	1,5		1,5
2,07210/1111	d/d	1,5	3,0	1,5	3,0 ·	1,5 3	3,5 2	2,0	4,0	2,0	4,0	1,5		1,5
5 / 4 N/mm ²	w/w w/d	1,2	_1)	2,0	1,5	2,5 3	3,5 2	2,5	3,5	2,0	3,5	2,0		1,5
574 N/IIIII	d/d	1,5	-1)	2,0	3,0 3	3,0 5	5,0 2	2,5	5,0	2,0	5,0	2,0		1,5
8 / 6 N/mm²	w/w w/d	1,5	_1)	3,0	2,5 4	4,5 5	5,0	4,5	7,0	3,0	8,5	3,5		2,5
876 N/mm-	d/d	1,5	_1)	3,5	4,0 (	5,0 7	7,0 3	5,0	9,0	3,0	11,5	3,5		2,5
A				-	40		4.0		4.0		40			
		N	16	1	8N	M	10	N	112	M	16	-		-
Internal threaded		<b>ا</b> ۷	16 -	1	- -	M'	10 -	N	112 -	M	16 -	M6 M	-	M10 M1 15x85
Anchor rod Internal threaded anchor FIS E Shear resistance V _{Rk} = V _R nstallation and use condi		,ıı = V	Rk,c,	[kN]	- deper	Iding	on th	e me	- an co	mpre	- ssive	11x85 strength		15x85
Internal threaded anchor FIS E Shear resistance V _{Rk} = V _R nstallation and use condi	ition w/w	,ıı = V	Rk,c,	[kN]	- deper	nding ure ra	on th nge 5	e me 50/80	- °C and	mpre d 72/1	- ssive	11x85 strength		15x85
Internal threaded anchor FIS E Shear resistance V _{Rk} = V _R		,ıı = V	Rk,c,	[kN] ; (terr	- deper perat	nding ure ra	on th nge 5	e me 50/80	- °C and age de	mpre d 72/1	- ssive 20°C)	11x85 strength		15x85 ^m ;
Internal threaded anchor FIS E Shear resistance V _{Rk} = V _R nstallation and use condi Mean compressive stren- gth / Min. compressive	ition w/w Use con-	,⊪ = V , w/d	- / _{Rk,c,⊥} , d/d	[kN]; (tem	- deper perational 200	iding ure ra Effecti	on th nge 5 ve an	e me 50/80 nchora	- °C and age de	mpre d 72/1 epth h	- ssive 20°C) _{ef} [mm]	11x85 strength	1 fc,	15x85 ^m ;
Internal threaded anchor FIS E Shear resistance V _{Rk} = V _R nstallation and use condi Mean compressive stren- gth / Min. compressive strength single brick ²⁾ 2,5 / 2 N/mm ²	ition w/w Use con- ditions w/w w/d	,ıı = V , w/d 100	- <mark>′_{Rk,c,⊥} , d/d</mark> 200	[kN] ; (terr 100 1,2	- deper perational 200	nding ure ra Effecti 100	on th nge 5 ve an 200	e me 50/80 100	- °C and age de 200	mpre d 72/1 apth h	- 20°C) er [mm] 200	11x85 strength	85 2	15x85
Internal threaded anchor FIS E Shear resistance V _{Rk} = V _R nstallation and use condi Mean compressive stren- gth / Min. compressive strength single brick ²⁾ 2,5 / 2 N/mm ²	ition w/w Use con- ditions w/w w/d d/d w/w w/d d/d w/w w/d d/d ssessed.	, w/d 100 1,2 2,0 2,5	- //Rk,c,_ , d/d 2000 1,2 _1) _1)	(kN); (tem) (tem) 100 1,2 2,5 3,0	- deper perati 200 1,2 2,0 2,5	100 1,2 2,0 3,0	- on th nge 5 ve an 200 1,2 2,0 3,0	e me 50/80 100 1,5 2,5 3,5	- *C and age de 200 1,2 2,0 4,0	mpre d 72/1 apth h 100 1,2 2,0 4,5	- <b>ssive</b> <b>20°C)</b> 200 1,2 2,0 4,5	11x85 strength 1,: 2, 2,	85 2 0 5	15x85



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Autoclaved aerated co		ete (coni	cal drill h	ole with s	special dril	l bit PB	в),						
EN 771-4:2011+A1:201	15												
$\land$	P	roducer			e.g. Ytong								
	M	lean gross	dry density p	,	[kg/dm ³ ]	0,35	0,5	0,65					
	M	lean compre	essive stren	gth / Min.		0.5.40	514	_					
			strength sir		[N/mm ² ]	2,5/2	5/4	4 8/6					
	S	tandard or a	annex			EN 7	771-4:2011+A1:2015						
	201												
-													
Table C121.1: Installat	tion	paramete	rs										
Anchor rod		M	18	M	10	N		-					
Internal threaded								M6	M8				
anchor FIS E		-	-	-	-	-	-	11	x85				
Anchor rod and internal th	nread	ed anchor	FIS E with	out perfora	ted sleeve								
Effective hef [	[mm]	75	95	75	95	75	95	8	5				
anchorage depth	1	10		10		10			<u> </u>				
Max. installation torque max T _{inst} [	[Nm]												
General installation param	neter	•											
Edge distance $c_{min} = c_{cr}$		120	150	120	150	120	150	1!	50				
scr II = smin II [	[mm]	240	300	240	300	240	300		00				
Spacing $\frac{s_{cr} \perp = s_{min} \perp}{s_{cr} \perp = s_{min} \perp}$		240	250	240	250	240	250	250					
Drilling method													
Hammer drilling with hard m	netal ł	nammer dril	1										
¹⁾ The compressive stren				ot be less tha	an 80% of the	mean com	pressive stre	enath.					
	-	-											
Table C121.2: Group f	facto	rs											
Anchor rod		M	18	M	10	M12		-					
Internal threaded								M6	M8				
anchor FIS E		-	-	-	-	-	-	11)	<b>&lt;85</b>				
α _{g,N} (s _{min} II)													
Group α _{g,V} (s _{min} II)					<u> </u>								
factors $\alpha_{g,N}$ (smin $\perp$ )	[-]	2											
α _{g,} ∨ ( <b>s</b> _{min} ⊥)													
finction system			or maaaan										
fischer injection systen			or masonr	У									
Performance	Annex C 121												
Autoclaved aerated concre dimensions, installation par			ole with spe	cial drill bit l	-BB),								
amensions, installation par	anel	000											



#### 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 **M**8 M10 M12 Anchor rod M8 M6 Internal threaded anchor FIS E 11x85 Tension resistance NRk = NRk,p = NRk,b = NRk,p,c = NRk,b,c [kN] depending on the mean compressive strength f_{c.m}; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C)²⁾ Effective anchorage depth hef [mm] Mean compressive strength / Use Min. compressive strength con-75 95 75 95 75 95 85 single brick 1) ditions w/wlw/d 2.0 2.5 2.0 2.5 2.0 2.5 2.0 2,5 / 2 N/mm² d/d 2,0 2,5 2,0 2,5 2,0 2,5 2,0 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 w/w|w/d 3,5 4,0 3,5 4,0 3,5 4,0 3,5 8 / 6 N/mm² d/d 4.0 4.5 4.0 4.5 4.0 4.5 4.0 1) The compressive strength of the single brick must not be less than 80% of the mean compressive strength. For temperature range 72/120°C: NRk (72/120°C) = 0,83 · NRk (50/80°C). 2) Table C122.2: Characteristic resistance under shear loading Anchor rod **M**8 **M**10 M12 M6 **M8** Internal threaded anchor FIS E 11x85 Shear resistance $V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V_{Rk,c,\perp}$ [kN] depending on the mean compressive strength $f_{c,m}$ ; Installation and use condition w/w, w/d, d/d; (temperature range 50/80°C and 72/120°C) Effective anchorage depth hef [mm] Mean compressive strength / Use Min. compressive strength con-75 95 75 95 75 95 85 single brick 1) ditions w/w w/d 2,5 2,5 / 2 N/mm² d/d w/w|w/d 5 / 4 N/mm² 4,5 d/d w/w w/d 8 / 6 N/mm² 6.0 d/d The 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 C 123. fischer injection system FIS V Plus for masonry Annex C 122 Performance Autoclaved aerated concrete (conical drill hole with special drill bit PBB), Characteristic resistance under tension and shear loading



β-factors for job site tests; displacements

 Table C123.1:
 β-factors for job site tests

use conditions		w/w ai	nd w/d	d/d			
temperature range [°C]		50/80	72/120	50/80	72/120		
Material	Size						
	M6	0,55	0,46				
	M8	0,57 0,51					
	M10	0,59	0,52		0,80		
solid units	M12 FIS E 11x85	0,60	0,54	0,96			
	M16 FIS E 15x85	0,62	0,52				
	FIS H 16x85 K	0,55	0,46				
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 [k <b>N</b> ]	δ <b>Ν₀</b> [mm]	δΝ∞ [mm]	V [kN]	δV₀ [mm]	δV∞ [mm]
solid units and autoclaved aerated concrete h _{ef} =100mm	Ν _{Rk} 1,4 * γ _{Mm}	0,03	0,06	 1,4 * γ _{Mm}	0,82	0,88
hollow units	NRκ 1,4 * γ _{Mm}	0,48	0,06	 1,4 * γ _{Mm}	1,71	2,56
solid brick Mz NF annex C 4 - C 7	Ν _{Rk} 1,4 * γ _{Mm}	0,74	1,48	 1,4 * γ _{Mm}	1,23	1,85
solid brick KS NF annex C 14 / C 15	<u>Ν_{Rk}</u> 1,4 * γ _{Mm}	0,20	0,40	VRk 1,4 * γ _{Mm}	0,91	1,37
AAC h _{ef} =200 mm annex C 118 - C 120	NRk 1,4 * <b>y</b> Mm	1,03	2,06	 1,4 * γ _{Mm}	1,25	1,88
brick Annex C 101 / C 102	Ν _{Rk} 1,4 * γ _{Mm}	0,03	0,06	 1,4 * γ _{Mm}	6,44	9,66

For anchorage in autoclaved aerated concrete, the partial factor YMAAC shall be used instead of YMm.

fischer injection system FIS V Plus for masonry

Performance

β-factors for job site tests; displacements



Table (	2124.	<b>1:</b> Fi	re resista		1			n and	shear	loading						
Brick		Solid brick Mz,NF, acc. to Annex C 4		Solid calcium silicate brick KS, NF,acc. to Annex C 14		Perforated calcium silicate brick KSL, acc to Annex C 24			Vertical perforated brick HLz, acc to Annex C 30			Vertical perforated brick HLz, acc to Annex C 28				
Mean compressive strength / Min. compressive strength single brick ³⁾		≥ 15 / 2	≥ 12	≥ 15 / ≥ 12		≥ 10 / ≥ 8			≥ 7,5 / ≥ 6			≥5/≥4				
Size M8 M10 M12		2 M8 M10 M12		M8 M10		M12	M8 M10		M12	M8 M10		M12				
Perforate	Perforated Sleeve -		-		16x130		20x130	16x85		20x 85	16x130		20x130			
Perforated Sleeve for bridging of unbearing layer		-						20x 200	16x130		20x 130			20x200		
h _{ef}		[mm]	] ≥ 80		≥ 50		≥ 130		≥ 130	≥ 85		≥ 85	≥ 130		≥ 130	
Charact	eristic	resist	ance to fa	ailure	unde	r ten	sion	loading	g							
	R30	0,82			0,32		1,07	1,09	1,10	0,28	0,30	0,35	35 0,31			
NRK,s, fi = 008 008 008 008 008 008 008 00	0	0,73	0,73 0,31			0,66	0,61	0,56	0,19	0,22	0,22	2 0,22		2		
	R90	90 [kN]	0,64	1	0,29			0,25	0,13	_ 1)	0,10	0,10	0,10	0,13		3
	R120		0,59		0,28		_ 1)	_ 1)	_ 1)	_ 1)	_ 1)	_ 1)	_ 1)			
			Char	acter	istic r	esis	tance	to fail	ure uno	der shea	r load	ing ²⁾		2		
without	lever a	arm														
	R30		0,82		0,32			1,07	1,09	1,10	0,28	0,30	0,35	0,31		
V _{Rk,s,fi}	⁵ : R60 삼	0,73	0,31		0,66	0,61	0,56	0,19	0,22	0,22	0,22					
< R	R90	[KIN]	0,64		0,29			0,25	0,13	_ 1)	0,10	0,10	0,10	0,13		
	R120		0,59		0,28		_ 1)	_1) _1) _1)		_ 1) _ 1) _ 1)		_ 1)	_ 1)			
with leve	er arm															
	R30		0,83 1,05						1,40	1,71	0,29	0,39				
щ "	R60	[Nm]	0,74 0,93					0,67	0,78	0,86	0,19			0,22	0,28	0,34
M ⁰ Rk,s,fi	R90	[,,,,,]	0,65 0,82	-				0,26	0,17	_ 1)	0,10	0,12		0,13	0,16	0,20
	R120		0,60 0,76	-	0,28	0,35	0,43	_ 1)	_ 1)	_ 1)	_ 1)	_ 1)	_ 1)	_ 1)	- 1)	_ 1)
General	instal	ation	Paramete	rs	r									F		
14402400000000	C _{cr,fi}	[mm]	100	100		60		80			80				100	
Edge distance	27	320 200			520			340			520					
	Scr,fi		020													

fischer injection system FIS V Plus for masonry

### Performance

Fire resistance to failure under tension and shear loading; Fire resistance to pull-out failure or brick breakout failure of a single anchor under tension loading