

DECLARAÇÃO DE DESEMPENHO

DoP 0213

para sistema de injeção fischer FIS AB (ancoragem de injeção metálica para uso em alvenaria)

PT

- | | |
|---|--|
| 1. <u>Código de identificação único do produto-tipo:</u> | DoP 0213 |
| 2. <u>Utilização(ões) prevista(s):</u> | Fixação pós-instalada em alvenaria, ver anexoss, especialmente anexos B1 - B12. |
| 3. <u>Fabricante:</u> | fischerwerke GmbH & Co. KG, Otto-Hahn-Straße 15, 79211 Denzlingen, Alemanha |
| 4. <u>Representante autorizado:</u> | — |
| 5. <u>Sistema(s) de avaliação e verificação da regularidade do desempenho (AVCP):</u> | 1 |
| 6. <u>Documento de Avaliação Europeu:</u> | EAD 330076-00-0604, Edition 11/ 2017 |
| Avaliação Técnica Europeia: | ETA-17/0352; 2021-06-08 |
| Organismo de Avaliação Técnica: | DIBt- Deutsches Institut für Bautechnik |
| Organismo(s) notificado(s): | 2873 TU Darmstadt |

7. Desempenho(s) declarado(s):

Resistência mecânica e estabilidade (BWR 1)

Valores de Resistência característica:

Fator de redução; ver anexoss, especialmente anexo C27

Resistência característica de uma única ancoragem sob carga de tração: ver anexoss, especialmente anexos B3, C5, C7, C9, C11, C13, C15, C17, C19, C21, C23, C26

Resistência característica de um grupo de ancoragens sob carga de tração: ver anexoss, especialmente anexo B11

Resistência característica de uma única ancoragem sob carga de corte: ver anexoss, especialmente anexos B3, C2, C3, C5, C7, C9, C11, C13, C15, C17, C19, C21, C23, C26

Resistência característica de um grupo de ancoragens sob carga de corte sem e com influência do bordo: ver anexoss, especialmente anexo B11

distância ao bordo e espaçamento característico: ver anexoss, especialmente anexos B11, C4, C6, C8, C10, C12, C14, C16, C18, C20, C22, C24

Distância ao bordo e espaçamento mínimo ver anexoss, especialmente anexos B11, C4, C6, C8, C10, C12, C14, C16, C18, C20, C22, C24

Fator de grupo sob cargas de tração e corte: ver anexoss, especialmente anexos B11, C4, C6, C8, C10, C12, C14, C16, C18, C20, C22, C25

Espessura mínima do substrato: ver anexoss, especialmente anexo B2

Durabilidade: ver anexoss, especialmente anexos A5, B2, B3

Deslocamentos: ver anexoss, especialmente anexo C27

Segurança em caso de incêndio (BWR 2)

Reação ao fogo: Classe (A1)

Higiene, saúde e meio ambiente (BWR 3)

Conteúdo, emissão e / ou liberação de substâncias perigosas: NPD



8. Documentação Técnica Adequada e/ou
Documentação Técnica Específica:

O desempenho do produto identificado acima está em conformidade com o conjunto de desempenhos declarados. A presente declaração de desempenho é emitida, em conformidade com o Regulamento (UE) n.º 305/2011, sob a exclusiva responsabilidade do fabricante identificado acima.

Assinado por e em nome do fabricante por:



Dr. Oliver Geibig, Diretor Administrativo de Unidades de Negócios e Engenharia
Tumlingen, 2021-06-14



Jürgen Grün, Diretor Administrativo de Química e Qualidade

Este DoP foi preparado em diferentes línguas. Em caso de litígio sobre a interpretação, a versão em inglês prevalecerá sempre.

O Anexo inclui informações voluntárias e complementares em inglês que excedem os requisitos legais (linguisticamente especificados).

Specific Part

1 Technical description of the product

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

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

The product description is given in Annex A.

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

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

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

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

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic values for resistance	See Annexes C 1 to C 26
Displacements	See Annex C 27
Durability	See annex B 2

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1

3.3 Hygiene, health and the environment (BWR 3)

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

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

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

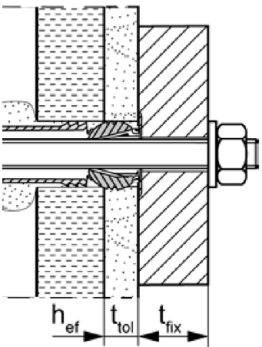
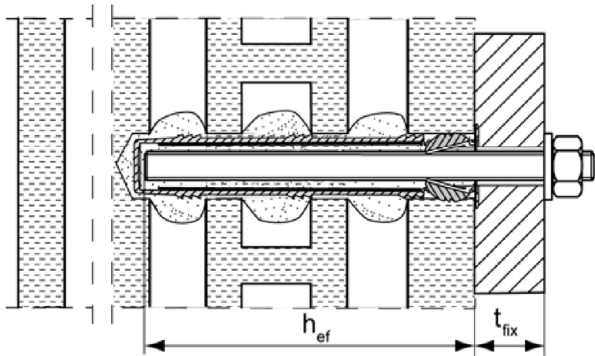
The system to be applied is: 1

Installation conditions part 1

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

Pre-positioned anchorage:

Installation with render bridge

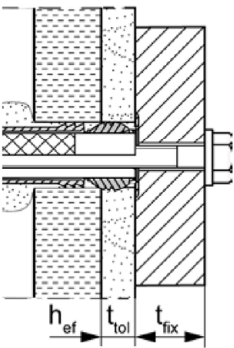
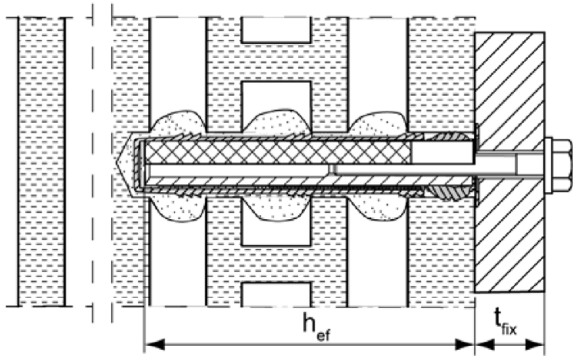


Size of the perforated sleeve:	FIS H 12x85 K	FIS H 16x130 K	FIS H 20x130 K
	FIS H 16x85 K	FIS H 20x85 K	FIS H 20x200 K

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

Pre-positioned anchorage:

Installation with render bridge



Figures not to scale

h_{ef} = effective anchorage depth

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

t_{fix} = thickness of fixture

fischer injection system FIS AB for masonry

Product description
Installation conditions part 1, Installation in perforated and solid brick masonry
Anchor rods and internal threaded anchor with perforated sleeve

Installation conditions part 2

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

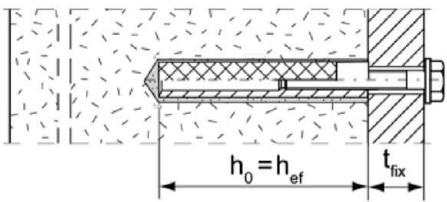
Pre-positioned anchorage: Push through anchorage: Annular gap filled with mortar



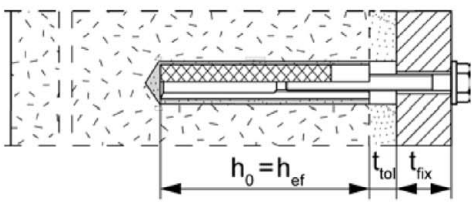
Installation with render bridge

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

Pre-positioned anchorage:



Installation with render bridge



Figures not to scale

h_0 = depth of drill hole	t_{tol} = thickness of unbearing layer (e.g. plaster)
h_{ef} = effective anchorage depth	t_{fix} = thickness of fixture

fischer injection system FIS AB for masonry

Product description
Installation conditions part 2, Installation in solid brick masonry and autoclaved aerated concrete. Anchor rods and internal threaded anchors without perforated sleeve

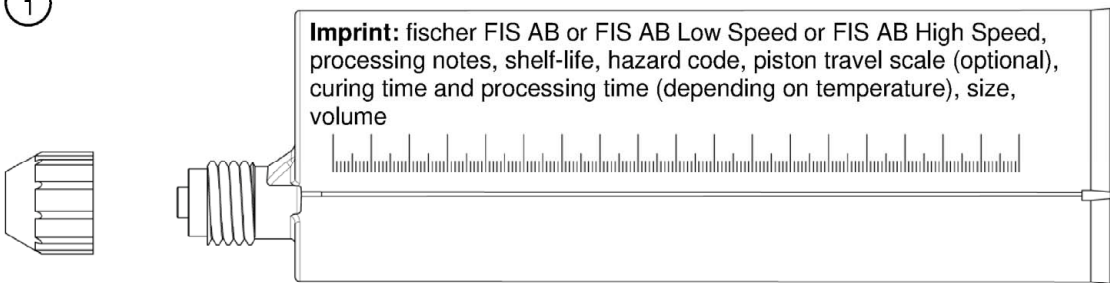
Overview system components part 1

Mortar cartridge (shuttle cartridge) with sealing cap

1

Size: 350 ml, 360 ml, 390 ml, 550 ml, 825 ml

Imprint: fischer FIS AB or FIS AB Low Speed or FIS AB High Speed, processing notes, shelf-life, hazard code, piston travel scale (optional), curing time and processing time (depending on temperature), size, volume

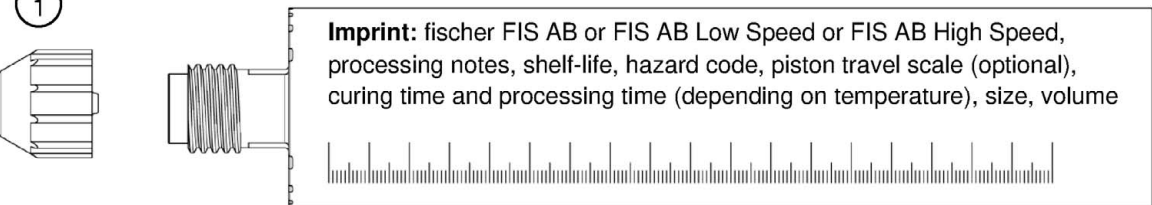


Mortar cartridge (coaxial cartridge) with sealing cap

1

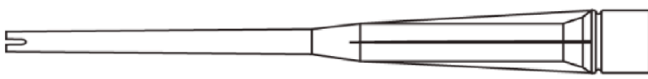
Size: 100 ml, 150 ml, 300 ml, 380 ml, 400 ml, 410 ml

Imprint: fischer FIS AB or FIS AB Low Speed or FIS AB High Speed, processing notes, shelf-life, hazard code, piston travel scale (optional), curing time and processing time (depending on temperature), size, volume

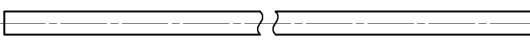


Static mixer MR Plus with extension tube

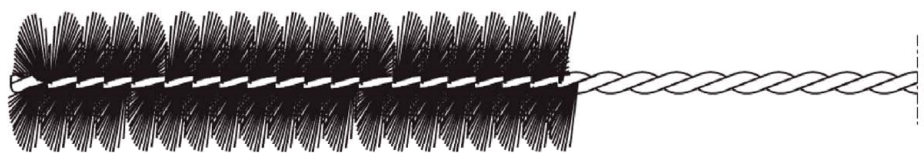
Static mixer



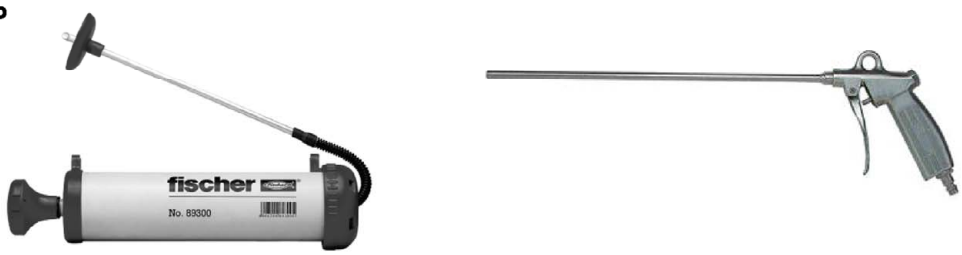
Extension tube



Cleaning brush BS



Blow-out pump ABG or ABP



fischer injection system FIS AB for masonry		Figures not to scale
System description Overview system components part 1: cartridge / static mixer / cleaning tools		

Overview system components part 2

fischer anchor rod

2



Size: M8, M10, M12

Internal threaded anchor FIS E

5



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

Perforated sleeve FIS H K

7



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

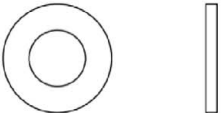
7



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

Washer

3



Hexagon nut

4



Figures not to scale

fischer injection system FIS AB for masonry

System description
Overview system components part 2: steel parts / perforated sleeve

Table A5.1: Materials

Part	Designation	Material		
1	Mortar cartridge	Mortar, hardener; filler		
		Steel	Stainless steel R	High corrosion-resistant steel HCR
		zinc plated	acc. to EN 10088-1:2014 Corrosion resistance class CRC III acc. to EN 1993-1-4:2015	acc. to EN 10088-1:2014 Corrosion resistance class CRC V acc. to EN 1993-1-4:2015
2	Anchor rod	Property class 4.8; 5.8 or 8.8; EN ISO 898-1: 2013 zinc plated $\geq 5\mu\text{m}$, EN ISO 4042:2018 Zn5/An(A2K) or hot-dip galvanised EN ISO 10684:2004 $f_{uk} \leq 1000 \text{ N/mm}^2$ $A_5 > 8\%$ fracture elongation	Property class 50, 70 or 80; EN ISO 3506-1:2009 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; 1.4062; 1.4662; 1.4462; EN 10088-1:2014 $f_{uk} \leq 1000 \text{ N/mm}^2$ $A_5 > 8\%$ fracture elongation	Property class 50 or 80; EN ISO 3506-1:2009 or property class 70 with $f_{yk} = 560 \text{ N/mm}^2$ 1.4565; 1.4529 EN 10088-1:2014 $f_{uk} \leq 1000 \text{ N/mm}^2$ $A_5 > 8\%$ fracture elongation
3	Washer ISO 7089:2000	zinc plated $\geq 5\mu\text{m}$, EN ISO 4042:2018 Zn5/An(A2K) or hot-dip galvanised EN ISO 10684:2004	1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; EN 10088-1:2014	1.4565; 1.4529 EN 10088-1:2014
4	Hexagon nut	Property class 5 or 8; EN ISO 898-2:2012 zinc plated $\geq 5\mu\text{m}$, EN ISO 4042:2018 Zn5/An(A2K) or hot-dip galvanised ISO 10684:2004	Property class 50, 70 or 80; EN ISO 3506-1:2020 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; EN 10088-1:2014	Property class 50, 70 or 80; EN ISO 3506-1:2009 1.4565; 1.4529 EN 10088-1:2014
5	Internal threaded anchor FIS E	Property class 5.8; EN 10277-1:2008-06 zinc plated $\geq 5\mu\text{m}$, EN ISO 4042:2018 Zn5/An(A2K)	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 3506-1:2009 1.4565; 1.4529 EN 10088-1:2014
6	Commercial standard screw or threaded rod for internal threaded anchor FIS E	Property class 5.8 or 8.8; EN ISO 898-1:2013 zinc plated $\geq 5\mu\text{m}$, EN ISO 4042:2018 Zn5/An(A2K)	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 3506-1:2009 1.4565; 1.4529 EN 10088-1:2014
7	Perforated sleeve	PP / PE		

fischer injection system FIS AB for masonry

Product description
 Materials
Annex A 5

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Specifications of intended use (part 1)			
Table B1.1: Overview use and performance categories			
		fischer injection system FIS AB for masonry	
Hole drilling with hammer drill mode 		all bricks	
Hole drilling with rotary drill mode 		all bricks	
Static and quasi static load, in masonry		all bricks	
Use category	dry or wet masonry	all bricks	
Installation	Pre-positioned anchorage	Anchor rod or internal threaded anchor (in solid brick masonry and autoclaved aerated concrete)	Perforated sleeve with anchor rod or internal threaded anchor (in perforated and solid brick masonry) Size: FIS H 12x85 K FIS H 16x85 K FIS H 16x130 K FIS H 20x85 K FIS H 20x130 K FIS H 20x200 K
	Push through anchorage	Anchor rod (in solid brick masonry and autoclaved aerated concrete)	---
Installation conditions	category d/d	all bricks	
	category w/d		
	category w/w		
Installation direction		D3 (downward and horizontal and upwards (e.g. overhead) installation)	
Installation temperature		T _{i,min} = 0 °C bis T _{i,max} = +40 °C	
In-service temperature	Temperature range Tb	-40 °C to +80 °C (max. short term temperature +80 °C max. long term temperature +50 °C)	
fischer injection system FIS AB for masonry			Annex B 1 Appendix 7 / 45
Intended Use Specifications (part 1)			

Specifications of intended use (part 2)

Anchorage subject to:

- Static and quasi-static loads

Base materials:

- Solid brick masonry (Use category b) and autoclaved aerated concrete (Use category d), acc. to Annex B 10
- Hollow brick masonry (use category c), according to Annex B 10
- For minimum thickness of masonry member is $h_{ef}+30\text{mm}$
- Mortar strength class of the masonry M2,5 at minimum according to EN 998-2:2010
- For other bricks in solid masonry, hollow or perforated masonry and autoclaved aerated concrete, the characteristic resistance of the anchor may be determined by job site tests according to EOTA Technical Report TR 053, Annex B under consideration of the β -factor according to Annex C 27, Table C27.

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)

Use conditions (Environmental conditions):

- **X1:** Structures subject to dry internal conditions exist
(zinc coated steel, stainless steel or high corrosion resistant steel)
- **X2:** Structures subject to external atmospheric exposure including industrial and marine environment or exposure to permanently damp internal condition, if no particular aggressive conditions exist
(stainless steel or high corrosion resistant steel)
- **X3:** Structures subject to external atmospheric exposure and to permanently damp internal condition, if other particular aggressive conditions exist (high corrosion resistant steel)

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

fischer injection system FIS AB for masonry

Intended Use
Specifications (part 2)

Annex B 2

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Specifications of intended use (part 2 continued)

Design:

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

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

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

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

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

$N_{Rk,s}$, $V_{Rk,s}$ and $M^0_{Rk,s}$ see annex C1-C3

Factors for job site tests and displacements see Annex C27

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

Installation:

- Category d/d: - Installation and use in dry structures
- Category w/w: - Installation and use in dry and wet structures
- Category w/d: - Installation in wet structures and use in dry structures
- Hole drilling see Annex C (drilling method)
- In case of aborted hole: The hole shall be filled with mortar
- Bridging of unbearing layer (e.g. plaster) 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 7, Table B7.2
- Commercial standard threaded rods, washers and hexagon nuts may also be used if the following requirements are fulfilled:

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

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

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

fischer injection system FIS AB for masonry

Intended Use
Specifications (part 2 continued)

Annex B 3

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

Anchor rod	Thread	M8	M10	M12
Nominal drill hole diameter	d_0 [mm]	10	12	14
Effective anchorage depth $h_{ef}^{1)}$ in AAC	$h_{0,min}=h_{ef,min}$ [mm] $h_{0,max}=h_{ef,max}$ [mm]	100 200		
Effective anchorage depth $h_{ef}^{1)}$ in solid brick (depth of drill hole $h_0 = h_{ef}$)	$h_{ef,min}$ [mm] $h_{ef,max}$ [mm]	50 $h-30, \leq 200$		
Diameter of clearance hole in the fixture	pre-position $d_r \leq$ [mm] push through $d_r \leq$ [mm]	9 11	12 14	14 16
Diameter of cleaning brush	$d_b \geq$ [mm]	see Table B7.1		
Maximum installation torque	T_{inst} [Nm]	see parameters of brick		

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

fischer anchor rods M8, M10, M12



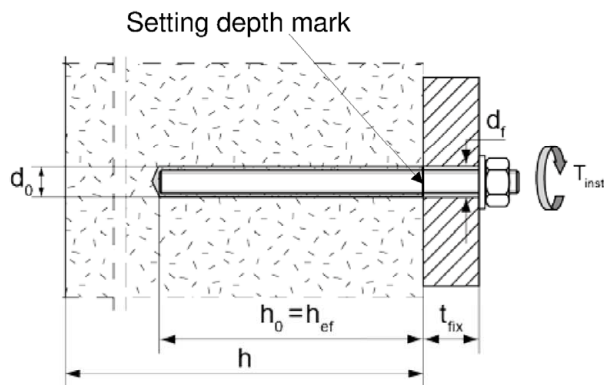
Marking (on random place) fischer anchor rod:

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

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

¹⁾ PC = property class

Installation condition:



Figures not to scale

fischer injection system FIS AB for masonry

Intended Use

Installation parameters for anchor rods without perforated sleeve

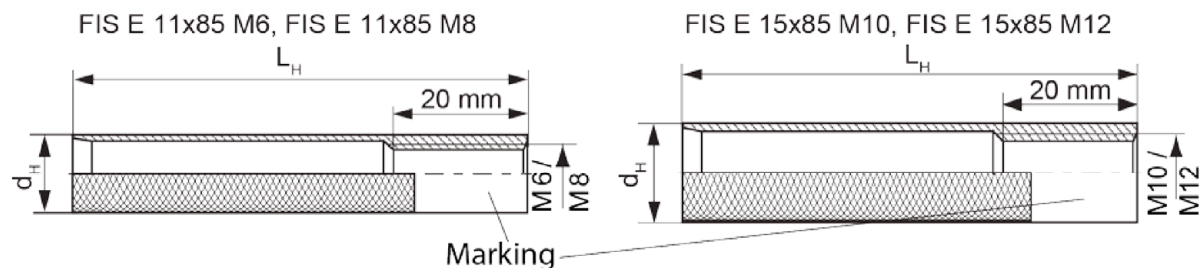
Annex B 4

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

Internal threaded anchor FIS E		11x85 M6	11x85 M8	15x85 M10	15x85 M12
Diameter of anchor	d _H [mm]	11		15	
Nominal drill hole diameter	d ₀ [mm]	14		18	
Length of anchor	L _H [mm]	85			
Effective anchorage depth	h ₀ = h _{ef} [mm]	85			
Diameter of cleaning brush	d _b ≥ [mm]	see Table B7.1			
Maximum installation torque	T _{inst} [Nm]	see parameters of brick			
Diameter of clearance hole in the fixture	d _f [mm]	7	9	12	14
Screw-in depth	l _{E,min} [mm]	6	8	10	12
	l _{E,max} [mm]	60			

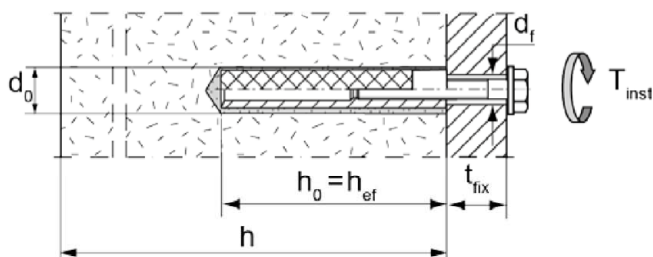
fischer internal threaded anchor FIS E



Marking:

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

Installation condition:



Figures not to scale

fischer injection system FIS AB for masonry

Intended Use

Installation parameters for internal threaded rods FIS E without perforated sleeve

Annex B 5

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

perforated sleeve FIS H K		12x85	16x85	16x130 ²⁾	20x85	20x130 ²⁾	20x200 ²⁾
Nominal drill hole diameter $d_0 = D_{\text{sleeve, nom}}$	d_0 [mm]	12	16		20		
Depth of drill hole	h_0 [mm]	90	90	135	90	135	205
Effective anchorage depth	$h_{\text{ef, min}}$ [mm]	65	85	110	85	110	180
	$h_{\text{ef, max}}$ [mm]	85	85	130	85	130	200
Size of threaded rod	[-]	M8	M8 and M10		M12		
Size of internal threaded anchor FIS E		---	11x85	---	15x85	---	---
Diameter of cleaning brush ¹⁾	$d_b \geq$ [mm]	see Table B7.1					
Maximum installation torque	T_{inst} [Nm]	see parameters of brick					

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

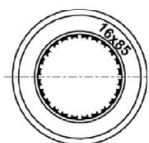
²⁾ Bridging of unbearing layer (e.g. plaster) is possible. When reducing the effective anchorage depth $h_{\text{ef, min}}$, the values of the next shorter perforated sleeve of the same diameter must be used. The smaller value of characteristic resistance must be taken.

Perforated sleeve

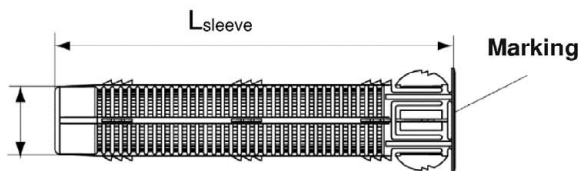
FIS H 12x85 K; FIS H 16x85 K; FIS H 16x130 K;
FIS H 20x85 K; FIS H 20x130 K; FIS H 20x200 K

Marking:

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



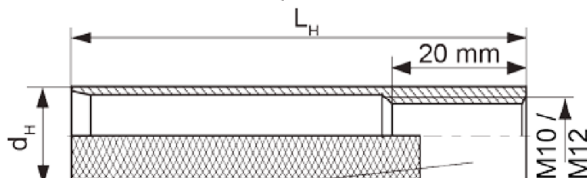
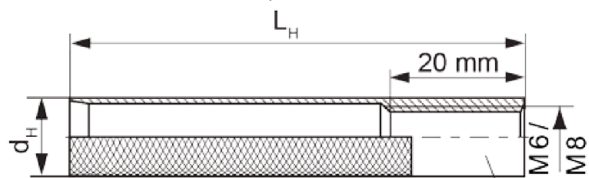
$D_{\text{sleeve, nom}}$



fischer internal threaded anchor FIS E

FIS E 11x85 M6, FIS E 11x85 M8

FIS E 15x85 M10, FIS E 15x85 M12

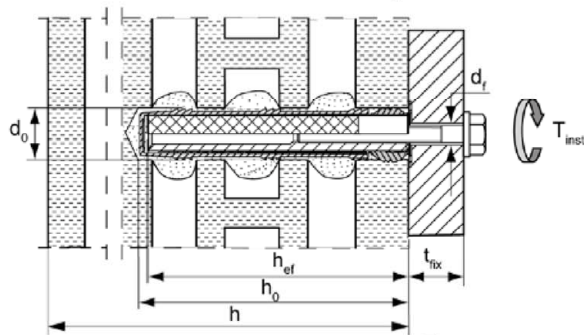
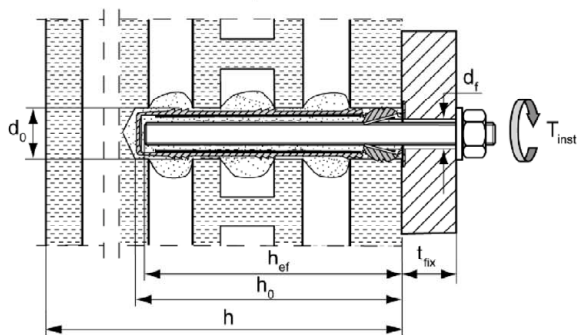


Marking

Installation conditions:

Anchor rod with perforated sleeve

Internal threaded anchor with perforated sleeve



Figures not to scale

fischer injection system FIS AB for masonry

Intended Use

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

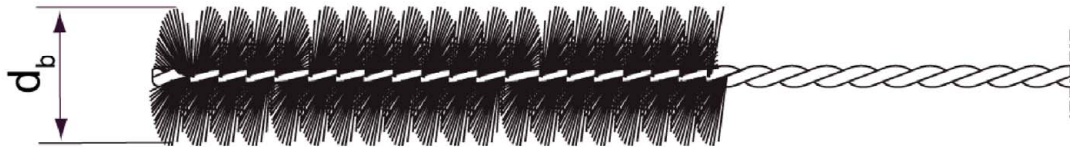
Annex B 6

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Table B7.1: Parameters of the cleaning brush BS (steel brush with steel bristles)

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

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



Only for solid bricks and autoclaved aerated concrete

Table B7.2: Maximum processing times and minimum curing times
(During the curing time of the mortar the masonry temperature may not fall below the listed minimum temperature)

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

¹⁾ For wet bricks the curing time must be doubled

²⁾ Minimum cartridge temperature +5°C

³⁾ Minimum cartridge temperature ±0°C

Figures not to scale

fischer injection system FIS AB for masonry

Intended use

Cleaning brush (steel brush)

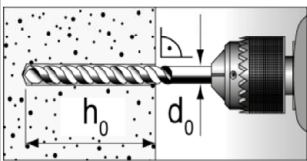
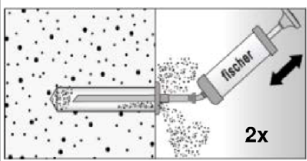
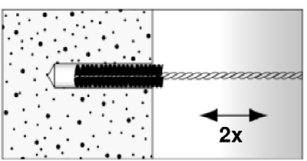
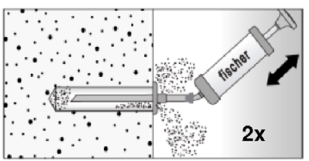
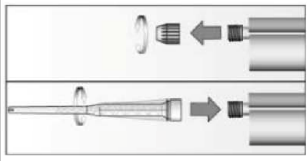
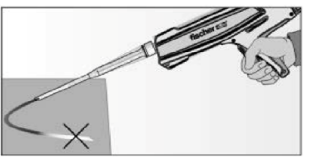
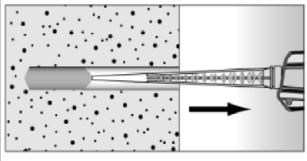
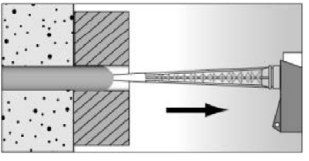
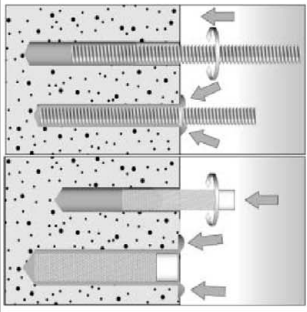
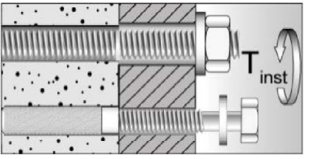
Maximum processing times and minimum curing times

Annex B 7

Appendix 13 / 45

Installation instruction part 1

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

1		Drill the hole (drilling method see Annex C of the respective brick) depth of drill hole h₀ and drill hole diameter d₀ see Table B4.1; B5.1		
2				Blow out the drill hole twice. Brush twice and blow out twice again.
3				
4		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.
5		Fill approximately 2/3 of the drill hole with mortar beginning from the bottom of the hole ¹⁾ . Avoid bubbles!		For push through anchorage (not FIS E) fill the annular clearance with mortar.
6				
7		Do not touch. Minimum curing time see Table B7.2		Mounting the fixture. T _{inst} see parameter of brick.

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

fischer injection system FIS AB for masonry

Intended use

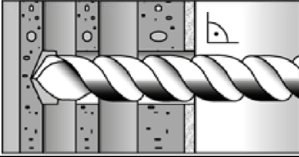
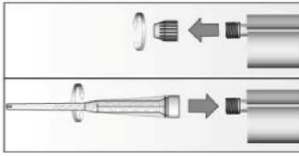
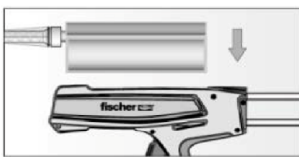
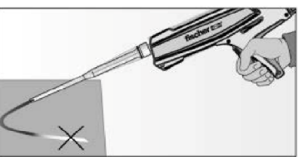
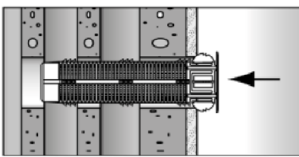
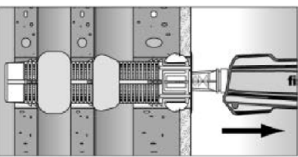
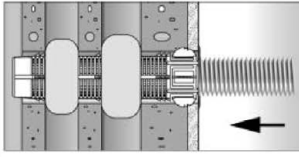
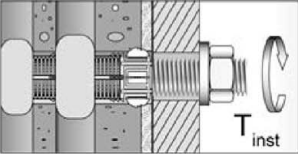
Installation instruction (without perforated sleeve) part 1

Annex B 8

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Installation instruction part 2

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

1		Drill the hole (drilling method see Annex C of the respective brick). depth of drill hole h_0 and drill hole diameter d_0 see Table B6.1	When install perforated sleeves in solid bricks or solid areas of hollow bricks, also clean the hole by blowing out and brushing.
2		Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible)	
3		Place the cartridge into a suitable dispenser.	 Press out approximately 10 cm of mortar until the resin is permanently grey in colour. Mortar which is not grey in colour will not cure and must be disposed of.
4		Insert the perforated sleeve flush with the surface of the masonry or plaster.	 Fill the perforated sleeve completely with mortar beginning from the bottom of the hole ¹⁾ .
5		Only use clean and oil-free metal parts. Mark the anchor rod for setting depth. Insert the anchor rod or the internal threaded anchor FIS E by hand using light turning motions until reaching the setting depth marking (anchor rod) or flush with the surface (internal threaded anchor).	
6		Do not touch. Minimum curing time see Table B7.2	 Mounting the fixture. T_{inst} see parameter of brick.

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

fischer injection system FIS AB for masonry

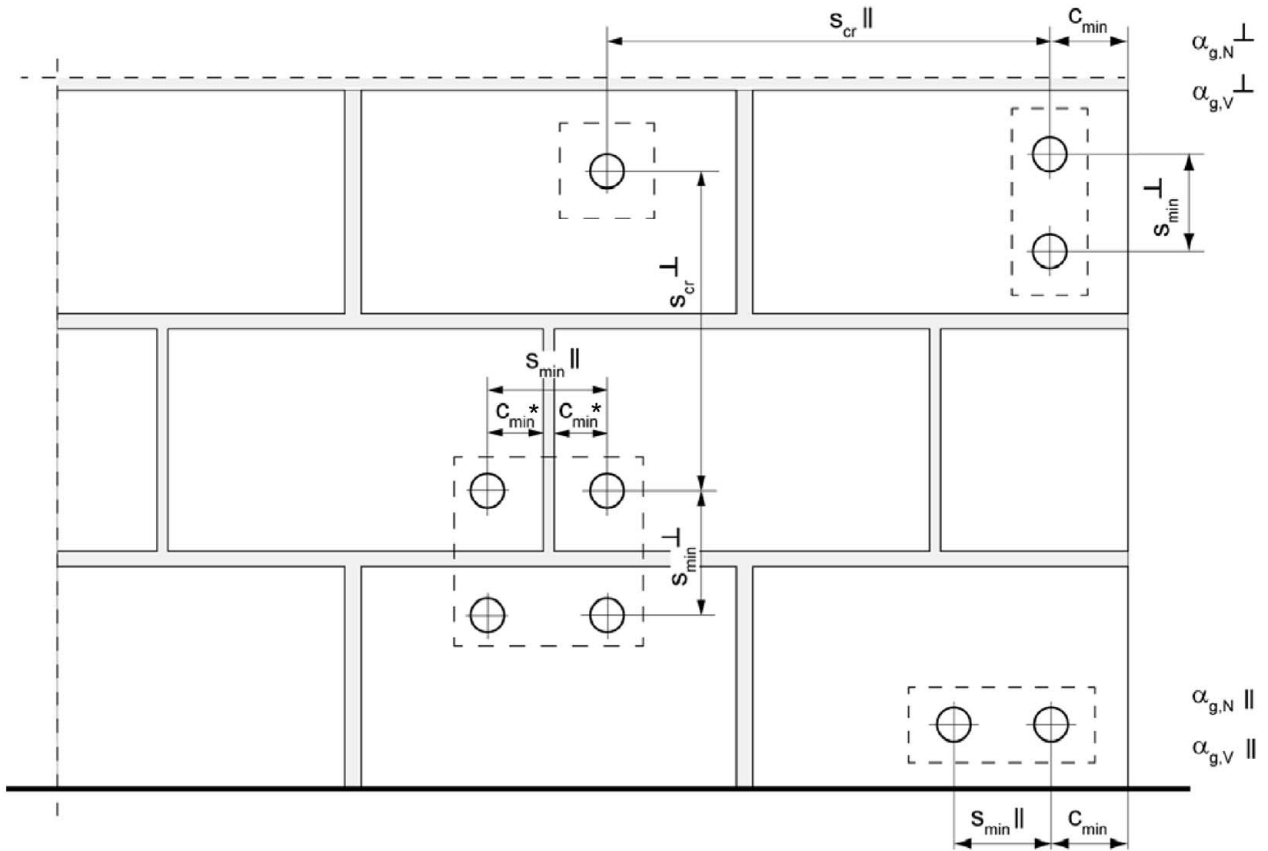
Intended use

Installation instruction (with perforated sleeve) part 2

Annex B 9

Appendix 15 / 45

Spacing and edge distance



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

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

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

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

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

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

fischer injection system FIS AB for masonry

Intended use
Spacing and edge distance

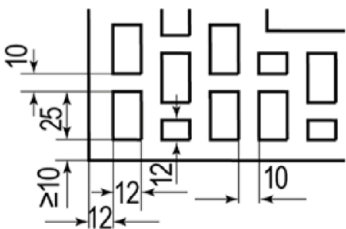
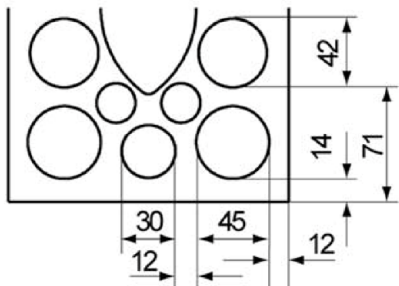
Annex B 11

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Table B12.1: Overview dimensions of perforated and hollow bricks

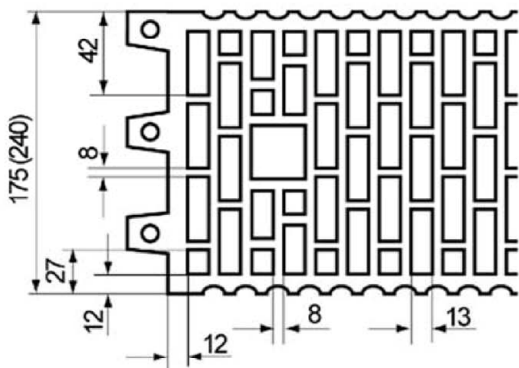
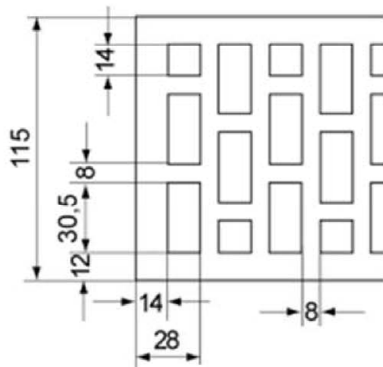
Perforated sand-lime brick KSL, 3DF, EN 771-2:2015;
e.g. KS Wemding according to Annex C 12

Vertical perforated brick HLz, EN 771-1:2015:
e.g. Wienerberger, according to Annex C 14

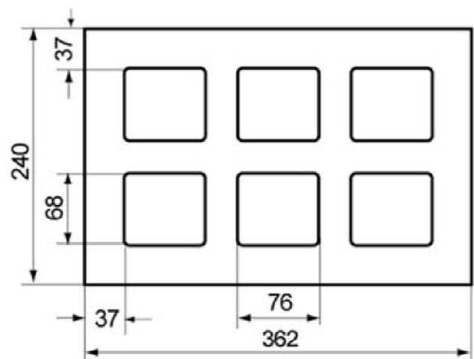


Vertical perforated brick HLz, 2DF, EN 771-1:2015:
e.g. Wienerberger, Poroton according to Annex C 16

Vertical perforated brick HLz, EN 771-1:2015
according to Annex C 18



Light-weight concrete hollow block Hbl, EN 771-3:2015
according to Annex C 22



Figures not to scale

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

Anchor rod				M8	M10	M12
Bearing capacity under tensile load, steel failure						
Characteristic resistance $N_{Rk,s}$	Steel zinc plated	4.8	[kN]	15(13)	23(21)	33
		5.8		19(17)	29(27)	43
		8.8		29(27)	47(43)	68
	Stainless steel R and High corrosion resistant steel HCR	50		19	29	43
		70		26	41	59
		80		30	47	68
Partial factors ¹⁾						
Partial factor $\gamma_{Ms,N}$	Steel zinc plated	4.8	[-]	1,50		
		5.8		1,50		
		8.8		1,50		
	Stainless steel R and High corrosion resistant steel HCR	50		2,86		
		70		1,50 ²⁾ / 1,87		
		80		1,60		

¹⁾ In absence of other national regulations

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

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

fischer injection system FIS AB for masonry

Performance

Characteristic steel bearing capacity of anchor rods under tensile load

Annex C 1

Appendix 19 / 45

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

Anchor rod			M8		M10		M12	
Bearing capacity under shear load, steel failure								
without lever arm								
Characteristic resistance $V_{Rk,s}$	Steel zinc plated	Property class	4.8	[kN]	9(8)	14(13)	20	
			5.8		11(10)	17(16)	25	
			8.8		15(13)	23(21)	34	
	50		9		15	21		
	70		13		20	30		
	80		15		23	34		
with lever arm								
Characteristic resistance $M^0_{Rk,s}$	Steel zinc plated	Property class	4.8	[Nm]	15(13)	30(27)	52	
			5.8		19(16)	37(33)	65	
			8.8		30(26)	60(53)	105	
	50		19		37	65		
	70		26		52	92		
	80		30		60	105		
Partial factors ¹⁾								
Partial factors $\gamma_{Ms,V}$	Steel zinc plated	Property class	4.8	[-]	1,25			
			5.8		1,25			
			8.8		1,25			
	50		2,38					
	70		1,25 ²⁾ / 1,56					
	80		1,33					

¹⁾ In absence of other national regulations

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

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

fischer injection system FIS AB for masonry

Performance

Characteristic steel bearing capacity of anchor rods under shear load

Annex C 2

Appendix 20 / 45

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

fischer internal threaded anchor FIS E				M6	M8	M10	M12	
Bearing capacity under tensile load, steel failure								
Characteristic resistance with screw	$N_{Rk,s}$	Property class	5.8	[kN]	10	18	29	42
		Property class 70	R		14	26	41	59
			HCR		14	26	41	59
Partial factors ¹⁾								
Partial factor	$\gamma_{Ms,N}$	Property class	5.8	[-]	1,50			
		Property class 70	R		1,87			
			HCR		1,87			
Bearing capacity under shear load, steel failure								
without lever arm								
Characteristic resistance with screw	$V_{Rk,s}$	Property class	5.8	[kN]	5	9	15	21
		Property class 70	R		7	13	20	30
			HCR		7	13	20	30
with lever arm								
Characteristic resistance	$M^0_{Rk,s}$	Property class	5.8	[Nm]	8	19	37	65
		Property class 70	R		11	26	52	92
			HCR		11	26	52	92
Partial factors ¹⁾								
Partial factor	$\gamma_{Ms,V}$	Property class	5.8	[-]	1,25			
		Property class 70	R		1,56			
			HCR		1,56			

¹⁾ In absence of other national regulations

fischer injection system FIS AB for masonry

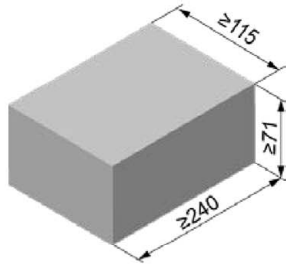
Performance

Characteristic steel bearing capacity of fischer internal threaded anchor FIS E

Annex C 3

Appendix 21 / 45

Solid brick Mz, NF, EN 771-1:2015



Solid brick Mz, NF, EN 771-1:2015			
Producer	e.g. Wienerberger		
Nominal dimensions [mm]	length L	width W	height H
	≥ 240	≥ 115	≥ 71
Density ρ [kg/dm ³]	≥ 1,8		
Compressive strength f_b [N/mm ²]	≥ 12 / ≥ 20		
Standard or annex	EN 771-1:2015		

Table C4.1: Installation parameters for edge distance $c=100\text{mm}$

Anchor rod		M8	M10	M12	-		
Internal threaded anchor FIS E		-	-	-	M6	M8	
					11x85		
Anchor rod and internal threaded anchor FIS E without perforated sleeve							
Effective anchorage depth h_{ef}	[mm]	50	50	50	85		
		80	80	80			
		200	200	200			
Max. installation torque T_{inst}	[Nm]	10			4	10	
General installation parameters							
Edge distance C_{min}	[mm]	100			100		
Edge distance $h_{ef}=200$ C_{min}		150			_1)		
Spacing		$s_{min II,N}$	60			60	
		$h_{ef}=200$ $s_{min II,N}$	240			_1)	
		$s_{min II,v}$	240			240	
		$s_{scr II}$	240			240	
		$s_{scr \perp} = s_{min \perp}$	75			75	
Drilling method							

Drilling method

Hammer drilling with hard metal hammer drill

¹⁾ No performance assessed

Table C4.2: Group factors

Anchor rods		M8	M10	M12	-	
Internal threaded anchor FIS E		-	-	-	M6	M8
					11x85	
Edge distance	Cmin	[mm]	100			
Group factor	$\alpha_{g,N} \parallel$	[-]	1,5			
	$\alpha_{g,V} \parallel$		2,0			
	$h_{ef}=200 \alpha_{g,N} \parallel$		1,5			
	$h_{ef}=200 \alpha_{g,V} \parallel$		2,0			
	$\alpha_{g,N} \perp$		2,0			
	$\alpha_{g,V} \perp$		2,0			
	$h_{ef}=200 \alpha_{g,N} \perp$		2,0			
	$h_{ef}=200 \alpha_{g,V} \perp$		2,0			

fischer injection system FIS AB for masonry	Annex C 4 Appendix 22 / 45
Performance Solid brick Mz, NF, dimensions, installation parameters $c=100\text{mm}$	

Solid brick Mz, NF, EN 771-1:2015

Table C5.1: Characteristic resistance under tensile load for edge distance $c=100\text{mm}$

Anchor rod			M8		M10			M12			-	
Internal threaded anchor FIS E			-		-			-			M6	M8
											11x85	
Tensile load N _{Rk} [kN] depending on the compressive strength f _b (temperature range 50/80°C)												
compressive strength f _b	use categorie		Effective anchorage depth h _{ef} [mm]									
			≥ 50	50	80	200	50	80	200	85		
≥ 12N/mm²	w/w	w/d	2,5	2,0	3,0	7,5	2,0	3,5	5,0	3,5		
	d/d		4,0	3,5	5,0	12,0	3,0	5,5	8,0	5,5		
≥ 20N/mm²	w/w	w/d	3,5	3,0	4,5	11,0	3,0	5,0	7,0	5,0		
	d/d		5,5	5,0	7,0	12,0	4,5	8,0	11,5	8,0		

Table C5.2: Characteristic resistance under shear load for edge distance $c=100\text{mm}$

Anchor rod			M8		M10		M12		-	
Internal threaded anchor FIS E			-		-		-		M6	M8
									11x85	
Shear load V _{Rk} [kN] depending on the compressive strength f _b (temperature range 50/80°C)										
compressive strength f _b	use categorie		Effective anchorage depth h _{ef} [mm]							
			≥ 50	≥ 50	200	≥ 50	200	85		
≥ 12N/mm²	w/w	w/d	2,5	4,0	8,5	4,0	11,5	2,5		
	d/d									
≥ 20N/mm²	w/w	w/d	4,0	6,0	12,0	5,5	12,0	4,0		
	d/d									

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

Performance

Solid brick Mz, NF, Characteristic resistance under tensile and shear load $c=100\text{mm}$

Annex C 5

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Solid brick Mz, NF, EN 771-1:2015

Table C6.1: Installation parameters for edge distance $c=60\text{mm}$

Anchor rod		M8	M10	M12	-	
Internal threaded anchor FIS E		-	-	-	M6	M8
					11x85	
Anchor rod and internal threaded anchor FIS E without perforated sleeve						
Effective anchorage depth h_{ef}	[mm]	50	50	50	85	
		100	100	100		
		200	200	200		
Max. installation torque T_{inst}	[Nm]	10			4	10
General installation parameters						
Edge distance c_{min}	[mm]	60				
Edge distance $h_{ef}=200$ c_{min}		60				
$s_{min \parallel, N}$		80				
$h_{ef}=200 \text{ } s_{min \parallel, N}$		80				
$s_{min \parallel, V}$		80				
$s_{cr \parallel}$		$3 \times h_{ef}$				
$s_{min \perp}$		80				
$s_{cr \perp}$		$3 \times h_{ef}$				
Drilling method						
Hammer drilling with hard metal hammer drill						

Table C6.2: Group factors

Anchor rods		M8	M10	M12	-	
Internal threaded anchor FIS E		-	-	-	M6	M8
					11x85	
Edge distance	Cmin	[mm]	60			
Group factor	$\alpha_{g,N} \parallel$	[-]	0,6			
	$\alpha_{g,V} \parallel$		1,3			
	$h_{ef}=200 \alpha_{g,N} \parallel$		1,4			
	$h_{ef}=200 \alpha_{g,V} \parallel$		1,5			
	$\alpha_{g,N} \perp$		0,3			
	$\alpha_{g,V} \perp$		1,3			
	$h_{ef}=200 \alpha_{g,N} \perp$		2,0			
	$h_{ef}=200 \alpha_{g,V} \perp$		1,1			

fischer injection system FIS AB for masonry

Performance

Solid brick Mz, NF, dimensions, installation parameters $c=60\text{mm}$

Annex C 6

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Solid brick Mz, NF, EN 771-1:2015**Table C7.1:** Characteristic resistance under tensile load for edge distance $c=60\text{mm}$

Anchor rod			M8		M10			M12			-	
Internal threaded anchor FIS E			-		-			-			M6	M8
											11x85	
Tensile load N _{Rk} [kN] depending on the compressive strength f _b (temperature range 50/80°C)												
compressive strength f _b	use category		Effective anchorage depth h _{ef} [mm]									
			50	100	50	100	200	50	100	200	85	
≥ 12N/mm²	w/w	w/d	2,0	2,0	2,0	2,5	- ¹⁾	2,0	2,5	- ¹⁾	- ¹⁾	
	d/d		3,0	4,0	3,0	4,0	9,5	3,0	4,0	9,5	- ¹⁾	
≥ 20N/mm²	w/w	w/d	2,5	3,0	2,5	3,5	- ¹⁾	3,0	3,5	- ¹⁾	- ¹⁾	
	d/d		4,5	5,5	4,5	5,5	12	4,5	5,5	12	- ¹⁾	

¹⁾ No performance assessed

Table C7.2: Characteristic resistance under shear load for edge distance $c=60\text{mm}$

Anchor rod			M8		M10			M12			-	
Internal threaded anchor FIS E			-		-			-			M6	M8
											11x85	
Shear load V _{RK} [kN] depending on the compressive strength f _b (temperature range 50/80°C)												
compressive strength f _b	use category		Effective anchorage depth h _{ef} [mm]									
			50	100	50	100	200	50	100	200	85	
≥ 12N/mm²	w/w	w/d	1,2	3,0	2,0	3,0	1,5	1,5	3,0	3,0	- ¹⁾	
	d/d											
≥ 20N/mm²	w/w	w/d	1,5	4,5	3,0	4,5	2,5	2,0	4,5	4,5	- ¹⁾	
	d/d											

¹⁾ No performance assessed

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

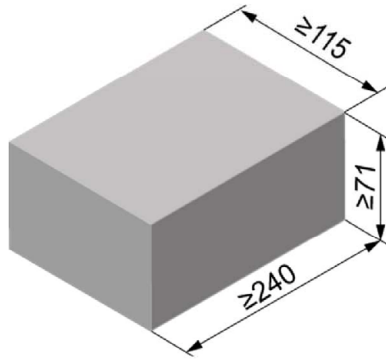
Performance

Solid brick Mz, NF, Characteristic resistance under tensile and shear load $c=60\text{mm}$

Annex C 7

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Solid sand-lime brick KS, NF, EN 771-2:2015



Solid sand-lime brick KS, NF, EN 771-2:2015			
Producer	-		
Nominal dimensions [mm]	length L	width W	height H
	≥ 240	≥ 115	≥ 71
Density ρ [kg/dm ³]	≥ 1,8		
Compressive strength f_b [N/mm ²]	≥ 12 / ≥ 20		
Standard or annex	EN 771-2:2015		

Table C8.1: Installation parameters

Anchor rod		M8	M10	M12	-		
Internal threaded anchor FIS E		-	-	-	M6	M8	
					11x85		
Anchor rod and internal threaded anchor FIS E without perforated sleeve							
Effective anchorage depth	h _{ef}	[mm]	50	50	50	85	
			100	100	100		
			1) ¹⁾	200	200		
Max. installation torque	T _{inst}	[Nm]	5	15	15	3	5
General installation parameters							
Edge distance	c _{min}	[mm]	60				
Spacing	s _{min}		80				
	s _{cr}		3x h _{ef}				
	s _{min} ⊥		80				
	s _{cr} ⊥		3x h _{ef}				
Drilling method							
Hammer drilling with hard metal hammer drill							

¹⁾ No performance assessed

Table C8.2: Group factors

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

fischer injection system FIS AB for masonry

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

Annex C 8

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Solid sand-lime brick KS, NF, EN 771-2:2015

Table C9.1: Characteristic resistance under tensile load

Anchor rod			M8		M10			M12			-	
Internal threaded anchor FIS E			-		-			-			M6	M8
											11x85	
Tensile load N _{Rk} [kN] depending on the compressive strength f _b (temperature range 50/80°C)												
compressive strength f _b	use category		Effective anchorage depth h _{ef} [mm]									
			50	100	50	100	200	50	100	200	85	
≥ 12N/mm²	w/w	w/d	2,5	4,5	2,5	3,5	7,0	2,5	3,0	6,5	2,5	
	d/d		4,0	8,0	4,0	5,5	12	4,0	4,5	12	4,0	
≥ 20N/mm²	w/w	w/d	3,5	6,5	3,5	4,5	10	3,5	4,0	9,5	3,5	
	d/d		6,0	11	6,0	8,0	12	6,0	6,5	12	6,0	

Table C9.2: Characteristic resistance under shear load

Anchor rod		M8		M10		M12		-	
Internal threaded anchor FIS E		-		-		-		M6	M8
								11x85	
Shear load V _{Rk} [kN] depending on the compressive strength f _b (temperature range 50/80°C)									
compressive strength f _b	use category		Effective anchorage depth h _{ef} [mm]						
	50	100	50	≥100	50	≥100	85		
≥ 12N/mm²	w/w	w/d	1,5	3,0	1,2	2,0	1,2	2,0	1,2
	d/d								
≥ 20N/mm²	w/w	w/d	2,5	4,0	1,5	3,0	1,5	3,0	1,5
	d/d								

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

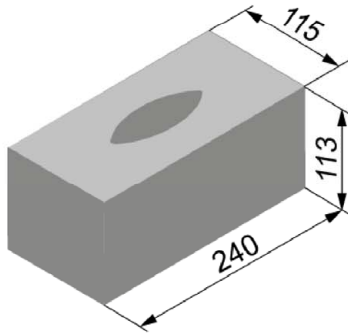
Performance

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

Annex C 9

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Solid sand-lime brick KS, EN 771-2:2015



Solid sand-lime brick KS, EN 771-2:2015			
Producer	-		
Nominal dimensions [mm]	length L	width W	height H
	240	115	113
Density ρ [kg/dm ³]	$\geq 1,8$		
Compressive strength f_b [N/mm ²]	$\geq 10 / \geq 20$		
Standard or annex	EN 771-2:2015		

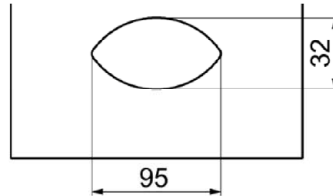


Table C10.1: Installation parameters

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

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

Max. installation torque	T_{inst} [Nm]	2
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General installation parameters

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

Drilling method

Hammer drilling with hard metal hammer drill

Table C10.2: Group factors

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

Group factor	$\alpha_{g,N \parallel} = \alpha_{g,V \parallel}$	[-]	2,0
	$\alpha_{g,N \perp} = \alpha_{g,V \perp}$		2,0

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fischer injection system FIS AB for masonry	Annex C 10 Appendix 28 / 45
Performance Perforated sand-lime brick KS, dimensions, installation parameters	

Solid sand-lime brick KS, EN 771-2:2015

Table C11.1: Characteristic resistance under tensile load

Anchor rod	M8		-		M8	M10	M8	M10	-		M12	M12
Internal threaded anchor FIS E	-		M6	M8	-		-		M10	M12	-	-
			11x85						15x85			
Perforated sleeve FIS H K	12x85		16x85				16x130		20x85			20x130
Tensile load N _{RK} [kN] depending on the compressive strength f _b (temperature range 50/80°C)												
compressive strength f _b	use category											
≥ 10N/mm²	w/w	w/d	3,5	2,0			2,0		6,5			4,5
	d/d		6,0	3,5			3,5		8,5			7,0
≥ 20N/mm²	w/w	w/d	5,0	3,0			3,0		8,5			6,0
	d/d		8,5	5,5			5,0		8,5			8,5

Table C11.2: Characteristic resistance under shear load

Anchor rod	M8		-		M8	M10	M8	M10	-		M12	M12
Internal threaded anchor FIS E	-	M6	M8	-		-		M10	M12	-	-	
		11x85						15x85				
Perforated sleeve FIS H K	12x85	16x85				16x130		20x85			20x130	
Shear load V _{Rk} [kN] depending on the compressive strength f _b (temperature range 50/80°C)												
compressive strength f _b	use category											
≥ 10N/mm²	w/w	w/d	3,0	3,5								
	d/d											
≥ 20N/mm²	w/w	w/d	4,5	5,5								
	d/d											

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

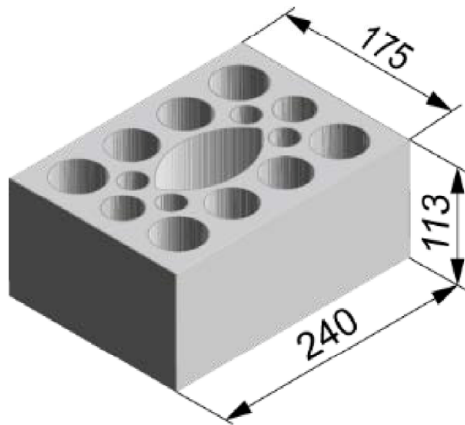
Performance

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

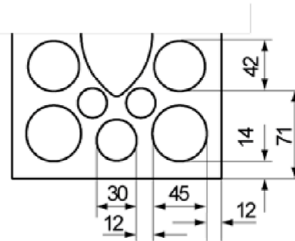
Annex C 11

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Perforated sand-lime brick KSL, 3DF, EN 771-2:2015



Perforated sand-lime brick KSL, 3DF, EN 771-2:2015			
Producer	e.g. KS Wemding		
Nominal dimensions [mm]	length L	width W	height H
	240	175	113
Density ρ [kg/dm ³]	$\geq 1,4$		
Compressive strength f_b [N/mm ²]	$\geq 12 / \geq 20$		
Standard or annex	EN 771-2:2015		



Dimension see also Annex B 12

Table C12.1: Installation parameters

Anchor rod		M8		-		M8	M10	M8	M10	-		M12	M12	
Internal threaded anchor FIS E		-		M6	M8	-		-		M10	M12	-	-	
				11x85						15x85				
Perforated sleeve FIS H K		12x85		16x85				16x130		20x85			20x130	
Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K														
Max. installation torque		T _{inst}	[Nm]	2										
General installation parameters														
Edge distance		C _{min}	[mm]	60		80								
Spacing		S _{min}		100										
		S _{scr}		240										
		S _{min} ⊥		115										
		S _{scr} ⊥		115										
Drilling method														
Hammer drilling with hard metal hammer drill														

Table C12.2: Group factors

Anchor rod			M8	-		M8	M10	M8	M10	-		M12	M12
Internal threaded anchor FIS E			-	M6	M8	-		-		M10	M12	-	-
				11x85						15x85			
Perforated sleeve FIS H K			12x85	16x85				16x130		20x85			20x130
Group factors	$\alpha_{g,N} \parallel = \alpha_{g,V} \parallel$	[-]	1,5										
	$\alpha_{g,N} \perp = \alpha_{g,V} \perp$		2,0										

fischer injection system FIS AB for masonry

Performance

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

Annex C 12

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Perforated sand-lime brick KSL, 3DF, EN 771-2:2015

Table C13.1: Characteristic resistance under tensile load

Anchor rod	M8		-		M8	M10	M8	M10	-		M12	M12
Internal threaded anchor FIS E	-		M6	M8	-		-		M10	M12	-	-
			11x85						15x85			
Perforated sleeve FIS H K	12x85		16x85				16x130		20x85			20x130
Tensile load N _{RK} [kN] depending on the compressive strength f _b (temperature range 50/80°C)												
compressive strength f _b	use category											
≥ 12N/mm²	w/w	w/d	2,5	2,5			3,0		3,0			3,0
	d/d		2,5	3,0			3,5		3,5			3,5
≥ 20N/mm²	w/w	w/d	4,0	4,5			5,5		5,5			5,5
	d/d		4,5	5,0			6,0		6,0			6,0

Table C13.2: Characteristic resistance under shear load

Anchor rod	M8	-		M8	M10	M8	M10	-		M12	M12
Internal threaded anchor FIS E	-	M6	M8	-		-		M10	M12	-	-
		11x85						15x85			
Perforated sleeve FIS H K	12x85	16x85				16x130		20x85			20x130
Shear load V _{Rk} [kN] depending on the compressive strength f _b (temperature range 50/80°C)											
compressive strength f _b	use category										
≥ 12N/mm²	w/w	w/d	2,5		4,5						
	d/d										
≥ 20N/mm²	w/w	w/d	4,5		4,0		7,5				
	d/d										

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

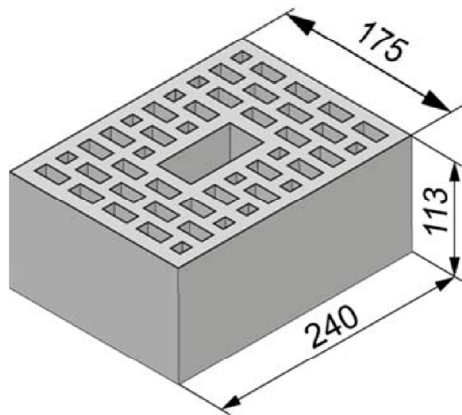
Performance

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

Annex C 13

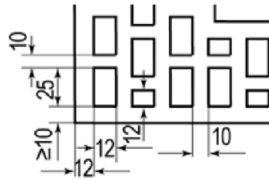
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Vertical perforated brick HLz, EN 771-1:2015



Vertical perforated brick HLz, EN 771-1:2015

Producer	e.g. Wienerberger		
Nominal dimensions [mm]	length L	width W	height H
	240	175	113
Density ρ [kg/dm ³]	$\geq 0,9$		
Compressive strength f_b [N/mm ²]	≥ 10		
Standard or annex	EN 771-1:2015		



Dimension see also Annex B 12

Table C14.1: Installation parameters

Anchor rod		M8		-		M8	M10	M8	M10	-		M12		M12	
Internal threaded anchor FIS E		-	M6	M8	-		-		M10		M12	-		-	
			11x85						15x85						
Perforated sleeve FIS H K		12x85		16x85				16x130		20x85				20x130	
Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K															
Max. installation torque	T _{inst}	[Nm]	2												
General installation parameters															
Edge distance	C _{min}	[mm]	100												
Spacing	S _{min}		240												
	S _{cr}		240												
	S _{min} ⊥		115												
	S _{cr} ⊥		115												
Drilling method															
Hammer drilling with hard metal hammer drill															

Table C14.2: Group factors

Anchor rod			M8	-		M8	M10	M8	M10	-	M12	M12	
Internal threaded anchor FIS E			-	M6	M8	-		-		M10	M12	-	-
				11x85						15x85			
Perforated sleeve FIS H K			12x85	16x85				16x130		20x85			20x130
Group factors	$\alpha_{g,N \parallel} = \alpha_{g,V \parallel}$	[-]	2,0										
	$\alpha_{g,N \perp} = \alpha_{g,V \perp}$		2,0										

fischer injection system FIS AB for masonry

Performance

Vertical perforated brick HLz, dimensions, installation parameters

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Vertical perforated brick HLz, EN 771-1:2015

Table C15.1: Characteristic resistance under tensile load

Anchor rod			M8		-		M8	M10	M8	M10	-		M12		M12	
Internal threaded anchor FIS E			-		M6	M8	-		-		M10	M12	-		-	
					11x85						15x85					
Perforated sleeve FIS H K			12x85		16x85				16x130		20x85				20x130	
Tensile load N _{Rk} [kN] depending on the compressive strength f _b (temperature range 50/80°C)																
compressive strength f _b		use category														
≥ 10N/mm²		w/w	w/d	3,5	3,5				4,5							
		d/d		4,0	3,5				5,0							

Table C15.2: Characteristic resistance under shear load

Anchor rod	M8		-		M8	M10	M8	M10	-		M12	M12
Internal threaded anchor FIS E	-	M6	M8	-		-		M10	M12	-	-	
		11x85						15x85				
Perforated sleeve FIS H K	12x85	16x85				16x130		20x85			20x130	
Shear load V _{Rk} [kN] depending on the compressive strength f _b (temperature range 50/80°C)												
compressive strength f _b	use category											
≥ 10N/mm²	w/w	w/d	4,0		5,5				6,0			
	d/d											

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

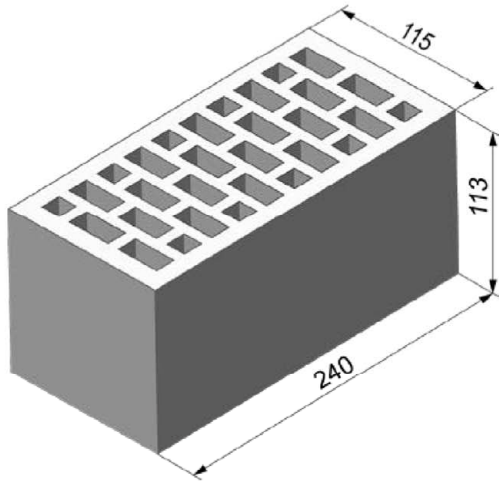
Performance

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

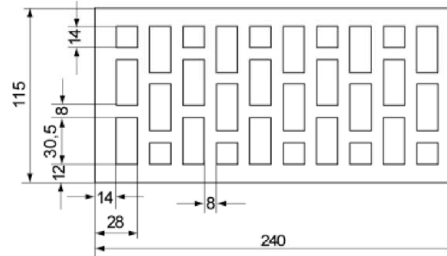
Annex C 15

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



Vertical perforated brick HLz, 2DF, EN 771-1:2015			
Producer	e.g. Wienerberger		
Nominal dimensions [mm]	length L	width W	height H
	240	115	113
Density ρ [kg/dm ³]	$\geq 1,4$		
Compressive strength f_b [N/mm ²]	≥ 20		
Standard or annex	EN 771-1:2015		



Dimension see also Annex B 12

Table C16.1: Installation parameters

Anchor rod	M8		-		M8	M10	-		M12
Internal threaded anchor FIS E	-		M6	M8	-		M10	M12	-
			11x85				15x85		
Perforated sleeve FIS H K	12x85		16x85				20x85		
Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K									
Max. installation torque	T _{inst}	[Nm]	2						
General installation parameters									
Edge distance	C _{min}	[mm]	80						
Spacing	S _{cr} = S _{min}		240						
	S _{cr} ⊥ = S _{min} ⊥		115						
Drilling method									
Hammer drilling with hard metal hammer drill									

Table C16.2: Group factors

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

fischer injection system FIS AB for masonry

Performance

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

Annex C 16

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

Table C17.1: Characteristic resistance under tensile load

Anchor rod	M8		-		M8	M10	-		M12
Internal threaded anchor FIS E	-		M6	M8	-		M10	M12	-
			11x85				15x85		
Perforated sleeve FIS H K	12x85		16x85				20x85		
Tensile load N _{Rk} [kN] depending on the compressive strength f _b (temperature range 50/80°C)									
compressive strength f _b	use category								
≥ 20N/mm²	w/w	w/d	3,5	2,5			3,0		
	d/d		4,0	2,5			3,0		

Table C17.2: Characteristic resistance under shear load

Anchor rod	M8		-		M8	M10	-		M12
Internal threaded anchor FIS E	-		M6	M8	-		M10	M12	-
			11x85				15x85		
Perforated sleeve FIS H K	12x85		16x85				20x85		
Shear load V _{Rk} [kN] depending on the compressive strength f _b (temperature range 50/80°C)									
compressive strength f _b	use category								
≥ 20N/mm²	w/w	w/d	7,5	4,0	4,5		8,5		
	d/d								

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

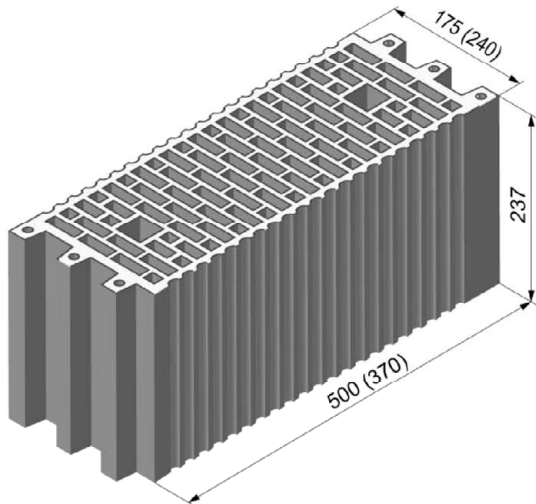
Performance

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

Annex C 17

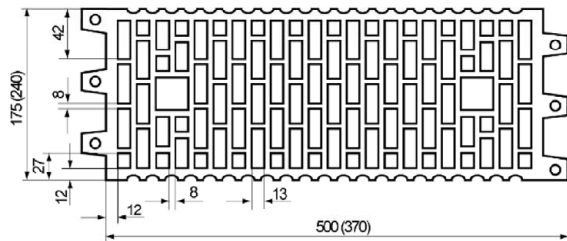
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Vertical perforated brick HLz, EN 771-1:2015



Vertical perforated brick HLz, EN 771-1:2015

Producer	e.g. Wienerberger, Poroton		
Nominal dimensions [mm]	length L	width W	height H
	500	175	237
	370	240	237
Density ρ [kg/dm ³]	$\geq 1,0$		
Compressive strength f_b [N/mm ²]	≥ 10		
Standard or annex	EN 771-1:2015		



Dimension
see also
Annex B 12

Table C18.1: Installation parameters

Anchor rod		M8		-		M8	M10	M8	M10	-		M12	M12
Internal threaded anchor FIS E		-		M6	M8	-		-		M10	M12	-	-
				11x85						15x85			
Perforated sleeve FIS H K		12x85		16x85				16x130		20x85			20x130
Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K													
Max. installation torque	T _{inst}	[Nm]	2										
General installation parameters													
Edge distance	c _{min}	[mm]	100										
Spacing	s _{min}		100										
	s _{scr}		500 (370)										
	s _{min} ⊥		100										
	s _{scr} ⊥		240										
Drilling method													
Hammer drilling with hard metal hammer drill													

Table C18.2: Group factors

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

fischer injection system FIS AB for masonry

Performance

Vertical perforated brick HLz, dimensions, installation parameters

Annex C 18

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Vertical perforated brick HLz, EN 771-1:2015

Table C19.1: Characteristic resistance under tensile load

Anchor rod			M8		-		M8	M10	M8	M10	-		M12		M12	
Internal threaded anchor FIS E			-		M6	M8	-		-		M10	M12	-		-	
					11x85						15x85					
Perforated sleeve FIS H K			12x85		16x85				16x130		20x85				20x130	
Tensile load N _{Rk} [kN] depending on the compressive strength f _b (temperature range 50/80°C)																
compressive strength f _b		use category														
≥ 10N/mm²		w/w	w/d	0,9		2,5									3,0	
		d/d		0,9		2,5									3,5	

Table C19.2: Characteristic resistance under shear load

Anchor rod	M8	-		M8	M10	M8	M10	-		M12	M12
Internal threaded anchor FIS E	-	M6	M8	-		-		M10	M12	-	-
		11x85						15x85			
Perforated sleeve FIS H K	12x85	16x85				16x130		20x85			20x130
Shear load V _{Rk} [kN] depending on the compressive strength f _b (temperature range 50/80°C)											
compressive strength f _b	use category										
≥ 10N/mm²	w/w	w/d	1,2				1,5	1,2			1,5
	d/d										

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

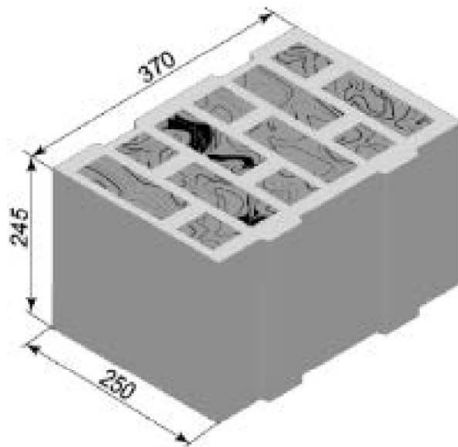
Performance

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

Annex C 19

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



Vertical perforated brick HLz, filled with mineral wool, EN 771-1:2015			
Producer	-		
Nominal dimensions [mm]	length L	width W	height H
	370	250	245
Density ρ [kg/dm ³]	$\geq 0,6$		
Compressive strength f_b [N/mm ²]	≥ 8		
Standard or annex	EN 771-1:2015		

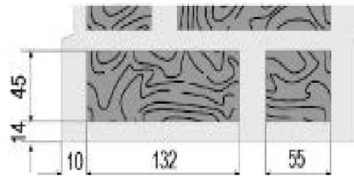


Table C20.1: Installation parameters

Anchor rod		M8		-		M8	M10	M8	M10	-		M12	M12	M12
Internal threaded anchor FIS E		-	M6	M8	-		-		M10		M12	-	-	-
			11x85								15x85			
Perforated sleeve FIS H K		12x85	16x85				16x130		20x85			20x130	20x200	
Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K														
Max. installation torque	T _{inst}	[Nm]	2											
General installation parameters														
Edge distance	c _{min}	[mm]	250											
Spacing	s _{min}		250											
	s _{scr}		250											
	s _{min} ⊥		245											
	s _{scr} ⊥		245											
Drilling method														
Hammer drilling with hard metal hammer drill														

Table C20.2: Group factors

Anchor rod			M8	-		M8	M10	M8	M10	-		M12	M12	M12
Internal threaded anchor FIS E			-	M6	M8	-		-		M10	M12	-	-	-
				11x85						15x85				
Perforated sleeve FIS H K			12x85	16x85				16x130		20x85			20x130	20x200
Group factors		$\alpha_{g,N} \parallel$	[-]	2,0										
		$\alpha_{g,V} \parallel$												
		$\alpha_{g,N} \perp$												
		$\alpha_{g,V} \perp$												

fischer injection system FIS AB for masonry

Performance

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

Annex C 20

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

Table C21.1: Characteristic resistance under tensile load

Anchor rod			M8	-		M8	M10	M8	M10	-		M12	M12	M12
Internal threaded anchor FIS E			-	M6	M8	-		-		M10	M12	-	-	-
				11x85						15x85				
Perforated sleeve FIS H K			12x85	16x85				16x130		20x85			20x130	20x200
Tensile load N _{Rk} [kN] depending on the compressive strength f _b (temperature range 50/80°C)														
compressive strength f _b		use category												
≥ 8N/mm ²		w/w	w/d	2,0	1,5			2,5		2,0			3,0	
		d/d		2,0	2,0			3,0		2,0			3,0	

Table C21.2: Characteristic resistance under shear load

Anchor rod	M8	-		M8	M10	M8	M10	-		M12	M12	M12
Internal threaded anchor FIS E	-	M6	M8	-		-		M10	M12	-	-	-
		11x85						15x85				
Perforated sleeve FIS H K	12x85	16x85			16x130		20x85			20x130	20x200	
Shear load V_{Rk} [kN] depending on the compressive strength f_b (temperature range 50/80°C)												
compressive strength f_b	use category											
$\geq 8\text{N/mm}^2$	w/w	w/d	2,5		3,0			1,5				
	d/d											

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

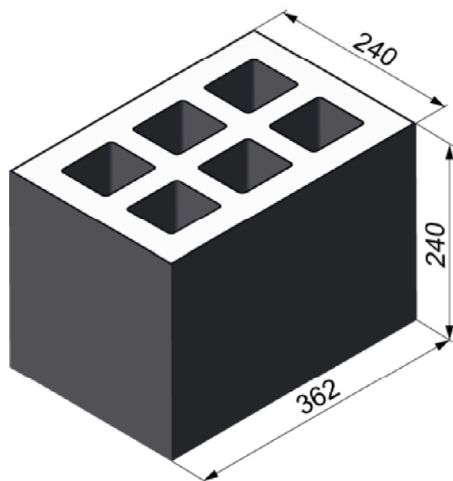
Performance

Vertical perforated brick HLz, filled with mineral wool;
Characteristic resistance under tensile and shear load

Annex C 21

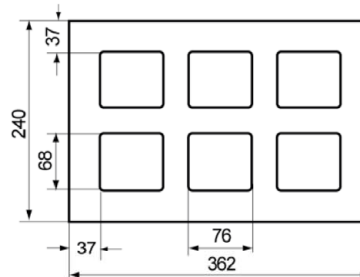
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Light-weight concrete hollow block Hbl, EN 771-3:2015



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

Producer	-		
Nominal dimensions [mm]	length L	width W	height H
	362	240	240
Density ρ [kg/dm ³]	$\geq 1,0$		
Compressive strength f_b [N/mm ²]	≥ 4		
Standard or annex	EN 771-3:2015		



Dimension see also Annex B 12

Table C22.1: Installation parameters

Anchor rod		M8		-		M8	M10	M8	M10	-		M12	M12
Internal threaded anchor FIS E		-		M6	M8	-		-		M10	M12	-	-
				11x85						15x85			
Perforated sleeve FIS H K		12x85		16x85				16x130		20x85			20x130
Anchor rod and internal threaded anchor FIS E with perforated sleeve FIS H K													
Max. installation torque	T _{inst}	[Nm]	2										
General installation parameters													
Edge distance	C _{min}	[mm]	60										
Spacing	S _{min}		100										
	S _{scr}		362										
	S _{min} ⊥ = S _{scr} ⊥		240										
Drilling method													
Hammer drilling with hard metal hammer drill													

Table C22.2: Group factors

Anchor rod		M8		-		M8	M10	M8	M10	-		M12	M12
Internal threaded anchor FIS E		-	M6	M8	-		-		M10	M12	-	-	
			11x85						15x85				
Perforated sleeve FIS H K		12x85	16x85				16x130		20x85			20x130	
Group factors	$\alpha_{g,N} \parallel$	[-]	1,2										
	$\alpha_{g,V} \parallel$		1,1										
	$\alpha_{g,N} \perp$		2,0										
	$\alpha_{g,V} \perp$												

fischer injection system FIS AB for masonry

Performance

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

Annex C 22

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

Table C23.1: Characteristic resistance under tensile load

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

Table C23.2: Characteristic resistance under shear load

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

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

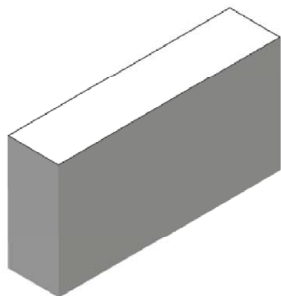
Performance

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

Annex C 23

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Autoclaved aerated concrete, EN 771-4:2015



Autoclaved aerated concrete, EN 771-4:2015				
Producer		e.g. Ytong		
Density ρ	[kg/dm ³]	≥ 0,35	≥ 0,5	≥ 0,65
Compressive strength f_b	[N/mm ²]	≥ 2	≥ 4	≥ 6
Standard or annex		EN 771-4		

Table C24.1: Installation parameters

Anchor rod	M8	M10	M12	-		-	
Internal threaded anchor FIS E	-	-	-	M6	M8	M10	M12
				11x85		15x85	

Anchor rod and internal threaded anchor FIS E without perforated sleeve

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

General installation parameters

Edge distance	c_{min}	[mm]	100
Spacing	$s_{cr \parallel} = s_{min \parallel}$		250
	$h_{ef}=200mm$		80
	$s_{min \parallel}$		$3 \times h_{ef}$
	$h_{ef}=200mm$		
	$s_{cr \perp} = s_{min \perp}$		250
	$h_{ef}=200mm$		80
	$s_{min \perp}$		
	$h_{ef}=200mm$		$3 \times h_{ef}$
	$s_{cr \perp}$		

Drilling method
1. Drilling method 2. Drilling method 3. Drilling method 4. Drilling method 5. Drilling method 6. Drilling method 7. Drilling method 8. Drilling method 9. Drilling method 10. Drilling method 11. Drilling method 12. Drilling method 13. Drilling method 14. Drilling method 15. Drilling method 16. Drilling method 17. Drilling method 18. Drilling method 19. Drilling method 20. Drilling method 21. Drilling method 22. Drilling method 23. Drilling method 24. Drilling method 25. Drilling method 26. Drilling method 27. Drilling method 28. Drilling method 29. Drilling method 30. Drilling method 31. Drilling method 32. Drilling method 33. Drilling method 34. Drilling method 35. Drilling method 36. Drilling method 37. Drilling method 38. Drilling method 39. Drilling method 40. Drilling method 41. Drilling method 42. Drilling method 43. Drilling method 44. Drilling method 45. Drilling method 46. Drilling method 47. Drilling method 48. Drilling method 49. Drilling method 50. Drilling method 51. Drilling method 52. Drilling method 53. Drilling method 54. Drilling method 55. Drilling method 56. Drilling method 57. Drilling method 58. Drilling method 59. Drilling method 60. Drilling method 61. Drilling method 62. Drilling method 63. Drilling method 64. Drilling method 65. Drilling method 66. Drilling method 67. Drilling method 68. Drilling method 69. Drilling method 70. Drilling method 71. Drilling method 72. Drilling method 73. Drilling method 74. Drilling method 75. Drilling method 76. Drilling method 77. Drilling method 78. Drilling method 79. Drilling method 80. Drilling method 81. Drilling method 82. Drilling method 83. Drilling method 84. Drilling method 85. Drilling method 86. Drilling method 87. Drilling method 88. Drilling method 89. Drilling method 90. Drilling method 91. Drilling method 92. Drilling method 93. Drilling method 94. Drilling method 95. Drilling method 96. Drilling method 97. Drilling method 98. Drilling method 99. Drilling method 100. Drilling method

Hammer drilling with hard metal hammer drill

fischer injection system FIS AB for masonry

Performance

Autoclaved aerated concrete, dimensions, installation parameters

Annex C 24

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Table C25.1: Group factors for autoclaved aerated concrete
(Compressive strength $f_b \geq 2 \text{ N/mm}^2$)

Anchor rod		M8	M10	M12	-		-	
Internal threaded anchor FIS E		-	-	-	M6	M8	M10	M12
					11x85		15x85	
Group factors	$h_{ef}=200 \alpha_{g,N} \parallel$	[-]	1,6			_1)		_1)
	$h_{ef}=200 \alpha_{g,V} \parallel$		1,1			_1)		_1)
	$\alpha_{g,N} \parallel, \alpha_{g,V} \parallel$		2					
	$h_{ef}=200 \alpha_{g,N} \perp$		1,6			_1)		_1)
	$h_{ef}=200 \alpha_{g,V} \perp$		0,8			_1)		_1)
	$\alpha_{g,N} \perp, \alpha_{g,V} \perp$		2					

¹⁾ No performance assessed

Table C25.2: Group factors for autoclaved aerated concrete
(Compressive strength $f_b \geq 4 \text{ N/mm}^2$)

Anchor rod		M8	M10	M12	-		-	
Internal threaded anchor FIS E		-	-	-	M6	M8	M10	M12
					11x85		15x85	
Group factors	$h_{ef}=200 \alpha_{g,N} \parallel$	[-]	0,7			_1)		_1)
	$h_{ef}=200 \alpha_{g,V} \parallel$		2,0			_1)		_1)
	$\alpha_{g,N} \parallel, \alpha_{g,V} \parallel$		2					
	$h_{ef}=200 \alpha_{g,N} \perp$		0,7			_1)		_1)
	$h_{ef}=200 \alpha_{g,V} \perp$		1,2			_1)		_1)
	$\alpha_{g,N} \perp, \alpha_{g,V} \perp$		2					

¹⁾ No performance assessed

Table C25.3: Group factors for autoclaved aerated concrete
(Compressive strength $f_b \geq 6 \text{ N/mm}^2$)

Anchor rod		M8	M10	M12	-		-	
Internal threaded anchor FIS E		-	-	-	M6	M8	M10	M12
					11x85		15x85	
Group factors	$h_{ef}=200 \alpha_{g,N} \parallel$	[-]	0,7			_1)		_1)
	$h_{ef}=200 \alpha_{g,V} \parallel$		2,0			_1)		_1)
	$\alpha_{g,N} \parallel, \alpha_{g,V} \parallel$		2					
	$h_{ef}=200 \alpha_{g,N} \perp$		0,7			_1)		_1)
	$h_{ef}=200 \alpha_{g,V} \perp$		1,2			_1)		_1)
	$\alpha_{g,N} \perp, \alpha_{g,V} \perp$		2					

¹⁾ No performance assessed

fischer injection system FIS AB for masonry

Performance
Autoclaved aerated concrete, Group factors

Annex C 25

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Autoclaved aerated concrete, EN 771-4:2015

Table C26.1: Characteristic resistance under tensile load

Anchor rod			M8		M10		M12		-		-	
Internal threaded anchor FIS E			-		-		-		M6	M8	M10	M12
									11x85		15x85	
Tensile load N _{Rk} [kN] depending on the compressive strength f _b (temperature range 50/80°C)												
compressive strength f _b	use category		Effective anchorage depth h _{ef} [mm]									
			100	200	100	200	100	200	85			
≥ 2 N/mm²	w/w	w/d	1,5	2,0	1,5	3,0	1,5	3,0	1,5	1,5		
	d/d		1,5	3,0	1,5	3,5	2,0	4,0	1,5	1,5		
≥ 4 N/mm²	w/w	w/d	2,0	1,5	2,5	3,5	2,5	3,5	2,0	1,5		
	d/d		2,0	3,0	3,0	5,0	2,5	5,0	2,0	1,5		
≥ 6 N/mm²	w/w	w/d	3,0	2,5	4,5	5,0	4,5	7,0	3,5	2,5		
	d/d		3,5	4,0	5,0	7,0	5,0	9,0	3,5	2,5		

Table C26.2: Characteristic resistance under shear load

Anchor rod		M8		M10		M12		-		-	
Internal threaded anchor FIS E		-		-		-		M6	M8	M10	M12
								11x85		15x85	
Shear load V _{RK} [kN] depending on the compressive strength f _b (temperature range 50/80°C)											
compressive strength f _b	use category		Effective anchorage depth h _{ef} [mm]								
	100	200	100	200	100	200	85				
≥ 2 N/mm²	w/w	w/d	1,2	1,2	1,2	1,2	1,5	1,2	1,2	1,5	
	d/d										
≥ 4 N/mm²	w/w	w/d	2,5	2,0	2,0	2,0	2,5	2,0	2,0	2,5	
	d/d										
≥ 6 N/mm²	w/w	w/d	3,0	2,5	3,0	3,0	3,5	4,0	2,5	3,5	
	d/d										

Factor for job site tests and displacements see annex C27

fischer injection system FIS AB for masonry

Performance

Autoclaved aerated concrete, Characteristic resistance under tensile and shear load

Annex C 26

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β-factors for job site tests; displacements

Table C27.1: β-factors for job site tests

use category		w/w and w/d	d/d
temperature range		50/80	50/80
Material	Size		
solid units	M8	0,57	0,96
	M10	0,59	
	M12	0,6	
	FIS E 11x85	0,62	
	FIS H 16x85 K	0,55	
hollow units	all sizes	0,86	0,96
Autoclaved aerated concrete (AAC)	all sizes	0,73	0,81

Table C27.2: Displacements

Material	N [kN]	δN ₀ [mm]	δN _∞ [mm]	V [kN]	δV ₀ [mm]	δV _∞ [mm]
solid units and autoclaved aerated concrete h _{ef} =100mm	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	0,03	0,06	$\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$	0,82	0,88
hollow units	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	0,48	0,06	$\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$	1,71	2,56
solid brick Mz NF annex C 4 - C 7	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	0,74	1,48	$\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$	1,23	1,85
solid brick KS NF annex C 8 / C 9	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	0,2	0,4	$\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$	0,91	1,37
Autoclaved aerated concrete (AAC) h _{ef} =200 mm annex C 24 - C 26	$\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$	1,03	2,06	$\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$	1,25	1,88

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

fischer injection system FIS AB for masonry

Performance

β-factors for job site tests; displacements

Annex C 27

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