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**European Technical Assessment Body** for construction products



## **European Technical Assessment**

## ETA-25/0280 of 22 August 2025

English translation prepared by DIBt - Original version in German language

#### **General Part**

Technical Assessment Body issuing the European Technical Assessment:

Trade name of the construction product

Product family to which the construction product belongs

Manufacturer

Manufacturing plant

This European Technical Assessment contains

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

Deutsches Institut für Bautechnik

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

Metal Injection anchors for use in masonry

Ferrometal Oy Karhutie 9 FI-01900 NURMIJÄRVI **FINNLAND** 

Plant 1, Finland

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

EAD 330076-01-0604, Edition 10/2022

## **European Technical Assessment ETA-25/0280**

English translation prepared by DIBt



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#### **Specific Part**

#### 1 Technical description of the product

The "Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry" is a bonded anchor (injection type) consisting of a mortar cartridge with injection mortar Injektionsmörtel Fix Master FIT-Ve 200 or Fix Master FIT-Wi 200, a perforated 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 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 5, B 6 C 1 to C 56
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 Annexes C2, C7, C8, C13, C14, C17, C18, C19, C20, C37, C38, C43, C44, C45, C46, C51 and C52

#### 3.3 Hygiene, health and the environment (BWR 3)

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

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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

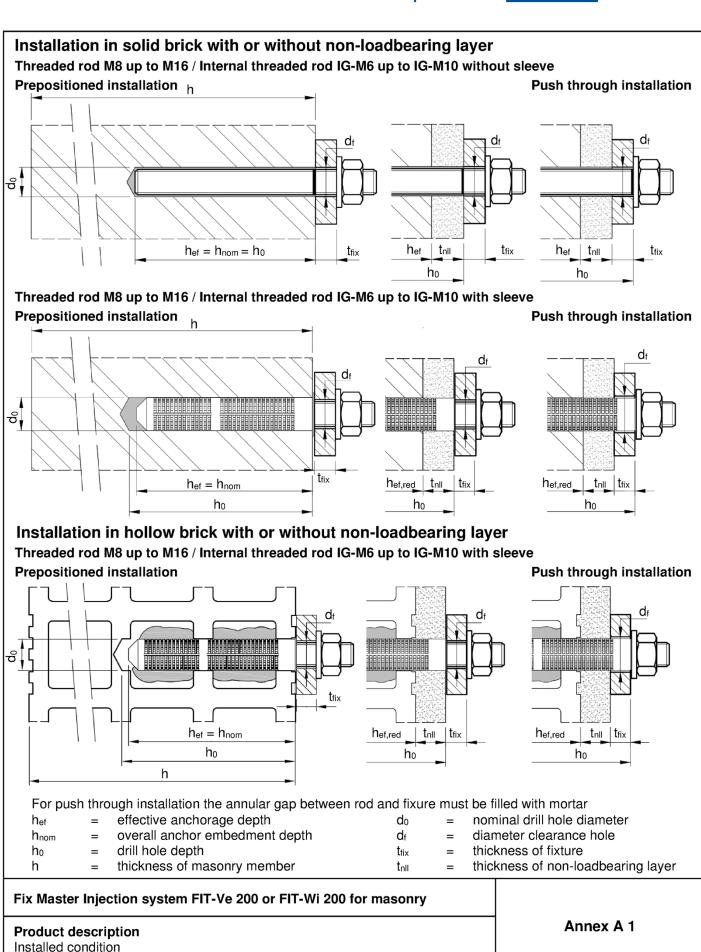
5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document

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 22 August 2025 by Deutsches Institut für Bautechnik

Dipl.-Ing. Beatrix Wittstock Head of Section beglaubigt: Baderschneider

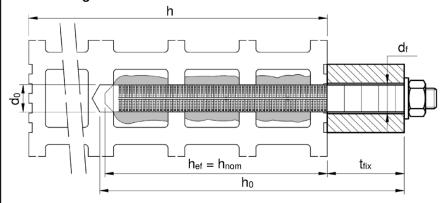


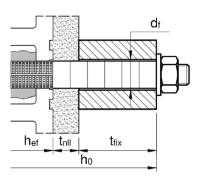




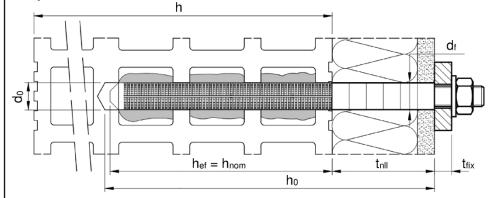
# Installation in hollow brick with or without non-loadbearing layer and / or thermal isolation

Threaded rod M8 and M10 / Internal threaded rod IG-M6 with sleeve SH 16x130/330 Push through installation

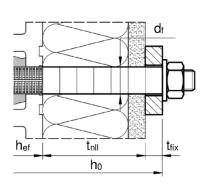




#### **Prepositioned installation**



#### Push through installation



hef = effective anchorage depth

h<sub>nom</sub> = overall anchor embedment depth

 $h_0$  = drill hole depth

h = thickness of masonry member

d<sub>0</sub> = nominal drill hole diameter

d<sub>f</sub> = diameter clearance hole

t<sub>fix</sub> = thickness of fixture

t<sub>nll</sub> = thickness of non-loadbearing layer

#### Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

#### **Product description**

Installed condition

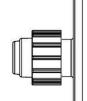
Annex A 2



## Cartridge system

### **Coaxial Cartridge:**

150 ml, 160ml, 280 ml, 300 ml up to 333 ml and 380 ml up to 420 ml



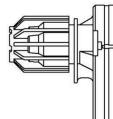
#### Imprint:

#### Fix Master FIT-Ve 200 or Fix Master FIT-Wi 200

Processing and safety instructions, shelf life, charge number, manufacturer's information, quantity information

## Side-by-Side Cartridge:

235 ml, 345 ml up to 360 ml and 825 ml



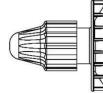
#### Imprint:

#### Fix Master FIT-Ve 200 or Fix Master FIT-Wi 200

Processing and safety instructions, shelf life, charge number, manufacturer's information, quantity information

## Foil Tube Cartridge:

165 ml and 300 ml



#### **Imprint:**

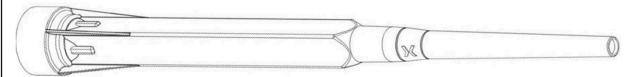
#### Fix Master FIT-Ve 200 or Fix Master FIT-Wi 200

Processing and safety instructions, shelf life, charge number, manufacturer's information, quantity information

#### Static mixer SM-14W



## Static mixer PM-19E



#### Mixer extension VL



#### Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

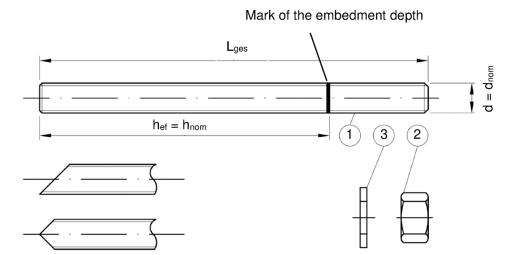
#### **Product description**

Injection system

Annex A 3



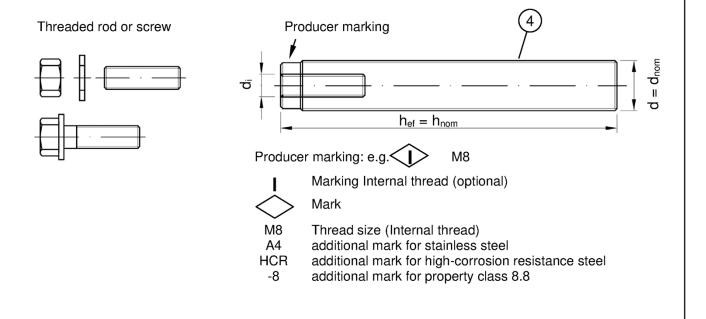
## Threaded rod M8 up to M16 with washer and hexagon nut



#### Commercial standard rod with:

- Materials, dimensions and mechanical properties acc. to Table A1
- Inspection certificate 3.1 acc. to EN 10204:2004. The document shall be stored
- Marking of embedment depth

#### Internal threaded rod IG-M6 to IG-M10

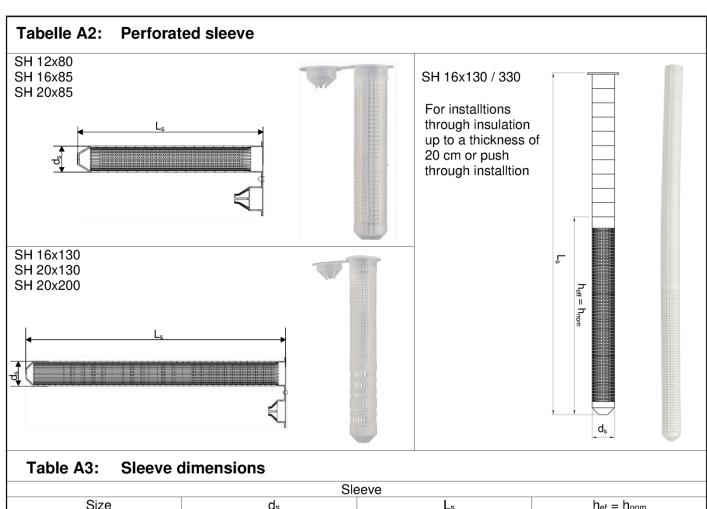


Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Product description Threaded rod and Internal threaded rod	Annex A 4



Pari	Designation	Material				
	el, zinc plated (Steel acc. to E		J 102	63·2017)		
		icc. to EN ISO 4042:202		00.2017)		
h	ot-dip galvanised ≥ 40 µm a	cc. to EN ISO 1461:202	22 and	d EN ISO 10684:2004+AC	C:2009 or	
s	nerardized ≥ 45 µm a	cc. to EN ISO 17668:20	16	I a		
		Property class		Characteristic steel ultimate tensile strength	Characteristic steel	Elongation a fracture
			16	$f_{UK} = 400 \text{ N/mm}^2$	f <sub>VK</sub> = 240 N/mm <sup>2</sup>	A <sub>5</sub> > 8%
	Threaded rod			f <sub>uk</sub> = 400 N/mm <sup>2</sup>	f <sub>VK</sub> = 320 N/mm <sup>2</sup>	$A_5 > 8\%$
1		acc. to			,	
		EN ISO 898-1:2013		f <sub>uk</sub> = 500 N/mm <sup>2</sup>	f <sub>yk</sub> = 300 N/mm <sup>2</sup>	A <sub>5</sub> > 8%
				f <sub>uk</sub> = 500 N/mm <sup>2</sup>	$f_{yk} = 400 \text{ N/mm}^2$	A <sub>5</sub> > 8%
				f <sub>uk</sub> = 800 N/mm <sup>2</sup>	$f_{yk} = 640 \text{ N/mm}^2$	$A_5 > 8\%$
		acc. to	4	for anchor rod class 4.6		
2	P Hexagon nut	EN ISO 898-2:2022	5	for anchor rod class 5.6	or 5.8	
			8	for anchor rod class 8.8		
3	Washer			alvanised or sherardized I ISO 7089:2000, EN ISO	7093-2000 or EN IS	∩ 7004·200¢
			o, ⊏iV	Characteristic steel	Characteristic steel	
	Internal threaded	Property class		ultimate tensile strength		fracture
4	anchor rod <sup>2)</sup>	acc. to	5.8	f <sub>uk</sub> = 500 N/mm <sup>2</sup>	f <sub>Vk</sub> = 400 N/mm <sup>2</sup>	A <sub>5</sub> > 8%
		EN ISO 898-1:2013		•	f <sub>Vk</sub> = 640 N/mm <sup>2</sup>	A <sub>5</sub> > 8%
Sta	inless steel A2 (Material 1.430				,	
	inless steel A4 (Material 1.440					
	h corrosion resistance steel				,	
		Property class		Characteristic steel	Characteristic steel	Elongation
		Froperty class		ultimate tensile strength	yield strength	fracture
1	Threaded rod <sup>1)</sup>		50	$f_{uk} = 500 \text{ N/mm}^2$	$f_{yk} = 210 \text{ N/mm}^2$	$A_5 > 8\%$
		acc. to EN ISO 3506-1:2020	70	f <sub>uk</sub> = 700 N/mm <sup>2</sup>	$f_{yk} = 450 \text{ N/mm}^2$	$A_5 > 8\%$
			80	f <sub>uk</sub> = 800 N/mm <sup>2</sup>	f <sub>VK</sub> = 600 N/mm <sup>2</sup>	A <sub>5</sub> > 8%
				for anchor rod class 50	,	
2	Hexagon nut1)	acc. to EN ISO 3506-1:2020	70	for anchor rod class 70		
			80	for anchor rod class 80		
3	Washer	Stainless steel A2, A4			7000 0000 FN IO	
_		(e.g.: EN ISO 887:200	16, EN	NISO 7089:2000, EN ISO		
		Property class		Characteristic steel ultimate tensile strength	Characteristic steel	fracture
4	Internal threaded anchor rod <sup>2)</sup>	1-	50	$f_{UK} = 500 \text{ N/mm}^2$	f <sub>vk</sub> = 210 N/mm <sup>2</sup>	A <sub>5</sub> > 8%
	anchorrod-	acc. to EN ISO 3506-1:2020	70	f <sub>UK</sub> = 700 N/mm <sup>2</sup>	f <sub>VK</sub> = 450 N/mm <sup>2</sup>	A <sub>5</sub> > 8%
· -			70	1uk = 700 14/11111	1yk = 430 14/11111	75 > 0 /8
	Property class 80 only for stainles		d. /	inal mutandunahan muta	at lagat aggregated to	
	Ising internally threaded anchor r nd strength class of the internally			ino. nut and washer) must	at least correspond to	o ine matemat
	stic perforated sleeve					
	ve sleeve SH			Polypropylene (PP)		
				<u> </u>		
				Γ		
				r masonry		
Fix	Master Injection system Fl	T-Ve 200 or FIT-Wi 20	JU TOI	i iliasoili y		
	• •	T-Ve 200 or FIT-Wi 20	JU TOI	- masoni y	Annos A	. =
Pr	Master Injection system Flooduct description	T-Ve 200 or FIT-Wi 20	JU TOI	- masoniy	Annex A	5





	Sle	eeve	
Size	ds	Ls	$h_{ef} = h_{nom}$
[mm]	[mm]	[mm]	[mm]
SH 12x80	12	80	80
SH 16x85	16	85	85
SH 16x130	16	130	130
SH 16x130 / 330 <sup>1)</sup>	16	330	130
SH 20x85	20	85	85
SH 20x130	20	130	130
SH 20x200	20	200	200

<sup>1)</sup> In Annxes C4 – C56 this sleeve is covered with SH 16x130

## Table A4: Steel parts

Anchor rod						
Size	$d = d_{nom}$	di	I <sub>ges</sub>			
[mm]	[mm]	[mm]	[mm]			
IG-M6 <sup>1)</sup>	10	6	with all and by English			
IG-M8 <sup>1)</sup>	12	8	$[mm]$ with sleeve: $h_{ef}$ - 5mm without sleeve: $h_{ef}$ $h_{ef} + t_{fix} + 9,5$ $h_{ef} + t_{fix} + 11,5$			
IG-M10 <sup>1)</sup>	16	10	without sieeve. Her			
M8	8	-	$h_{ef} + t_{fix} + 9,5$			
M10	10	-	$h_{ef} + t_{fix} + 11,5$			
M12	12	-	$h_{ef} + t_{fix} + 17,5$			
M16	16	-	$h_{ef} + t_{fix} + 20,0$			

<sup>1)</sup> Internal threaded rod with metric external thread

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Product description Sleeves and steel parts	Annex A 6



Specifications of inten	ded use					
Anchorages subject to:	Static and quasi-static loads, fire exposure under tension and shear loads M8 up to M16, IG-M6 up to IG-M10 (with and without sleeve)					
Base material	Masonry group b: Solid brick masonry Masonry group c: Hollow brick masonry Masonry group d: Autoclaved Aerated Concrete	Annex B 2 Annex B 2 to B 4 Annex B 2				
	Mortar strength class of the masonry M2,5 at minimum according to EN 998-2:2016. For other bricks in solid masonry and in hollow masonry or in autoclaved aerated concrete, the characteristic resistance of the anchor may be determined by job site tests according to EOTA TR 053, Edition July 2022 under consideration of the β-factor according to Annex C 1, Table C1.					
Hole drilling	See Annex C 4 – C 56					
Use category	Condition d/d: Installation and use in dry masonry Condition w/w: Installation and use in dry or wet masonry (incl. w/d installation in wet masonry and use in dry masonry)					
Temperature Range	T <sub>a</sub> : - 40°C to +40°C (max. short term temperature +40°C and max. long term temperature +24°C) T <sub>b</sub> : - 40°C to +80°C (max. short term temperature +80°C and max. long term temperature +50°C) T <sub>a</sub> : - 40°C to +120°C (max. short term temperature +120°C and max. long term temperature +72°C)					

Note: The characteristic resistance for solid bricks and autoclaved aerated concrete are also valid for larger brick sizes and larger compressive strength of the masonry unit.

#### Use conditions (Environmental conditions):

- Structures subject to dry internal conditions (all materials).
- For all other conditions according to EN 1993-1-4:2006 + A1:2015 corresponding to corrosion resistance classes to Table A1 (stainless steel and high corrosion resistant steel).

#### Design:

- Verifiable calculation notes and drawings are 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.
- The anchorages are designed in accordance with the EOTA TR 054, Edition July 2022, 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<sub>Rk,pb</sub> or pushing out a brick under shear loading V<sub>Rk,pb</sub> see EOTA Technical Report TR 054, Edition July 2022.
- $N_{\text{Rk,s}},\,V_{\text{Rk,s}}$  and  $M^0_{\text{Rk,s}}$  see Annexes C 1 C 2
- For application with sleeve with drill bit size ≤ 15mm installed in joints not filled with mortar:
  - $N_{Rk,p,j} = 0.18 * N_{Rk,p}$  and  $N_{Rk,b,j} = 0.18 * N_{Rk,b}$  ( $N_{Rk,p} = N_{Rk,b}$  see Annex C 4 to C 56)
  - $\bullet \quad V_{Rk,c,j} = 0,15 \ ^*V_{Rk,c} \ \text{and} \ V_{Rk,b,j} = 0,15 \ ^*V_{Rk,b} \qquad \qquad (V_{Rk,b} \ \text{see Annex C 4 to C 56; and } V_{Rk,c} \ \text{see Annex C 3})$
- Application without sleeve installed in joints not filled with mortar is not allowed.

#### Installation:

- Anchor Installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Intended use Specifications	Annex B 1



	Overview brick elements (Anch			erties with corre	esponding fast	ening	
Naming Density [kg/dm³] Dimensions LxBxH [mm] Annex	Picture	Anchor rods	Perforated sleeve	Naming Density [kg/dm³] Dimensions LxBxH [mm] Annex	Picture	Anchor rods	Perforated sleeve
Hollow light weigh	nt concrete brick a	cc. to		Hollow light weigh EN 771-3:2011+A1		cc. to	
AAC ρ = 0,35 - 0,60 ≥ 499x240x249 Table C4 - C10	1	M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200	VBL ρ≥ 0,6 ≥ 240x300x113 Table C187 - C193		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200
	Hollow light v	veight cond	crete bri	ck acc. to EN 771-3	:2011+A1:2015		
HBL 16DF ρ ≥ 1,0 500x250x240 Table C172 - C179		M8 - M16 IG-M6 - IG-M10	16x85 16x130 20x85 20x130 20x200	Bloc creux B40 ρ ≥ 0,8 495x195x190 Table C180 - C186	EEE	M8 - M16 IG-M6 - IG-M10	16x130 20x130
	Calcium si	lica bricks	acc. to E	N 771-2:2011+A1:2	2015	1	
KS ρ ≥ 2,0 ≥ 240x115x71 Table C11 - C18		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200	KSL-3DF ρ≥ 1,4 240x175x113 Table C19 - C25		M8 - M16 IG-M6 - IG-M10	16x85 16x130 20x85 20x130
KSL-8DF ρ ≥ 1,4 248x240x238 Table C26 - C32	883	M8 - M16 IG-M6 - IG-M10	16x130 20x130 20x200	KSL-12DF ρ≥ 1,4 498x175x238 Table C33 - C40	23331	M8 - M16 IG-M6 - IG-M10	16x130 20x130
	Solid	l clay brick	s acc. to	EN 771-1:2011+A1	1:2015		
Mz-1DF ρ ≥ 2,0 ≥ 240x115x55 Table C41 - C47		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200	Mz - 2 DF ρ ≥ 2,0 ≥ 240x115x113 Table C48 - C55		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200
	1	1	1			1	1
Fix Master Inject	ion system FIT-Ve	200 or FIT-	-Wi 200 f	or masonry			
Intended use Brick types and pr	roperties with corres	ponding fas	stening e	lements	An	nex B 2	



Naming Density [kg/dm³] Dimensions LxBxH [mm] Annex	Picture	Anchor rods	Perforated sleeve	Naming Density [kg/dm³] Dimensions LxBxH [mm] Annex	Picture	Anchor rods	Perforated
	Hollo	w clay brick	ks acc. to	EN 771-1:2011+A	1:2015		
Hlz-10DF ρ≥ 1,25 300x240x249 Table C56 - C63		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200	Porotherm Homebric ρ≥0,7 500x200x299 Table C64 - C70		M8 - M16 IG-M6 - IG-M10	12x8 16x8 16x1 20x8 20x1
BGV Thermo ρ ≥ 0,6 500x200x314 Table C71 - C77		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130	Brique creuse C40 ρ ≥ 0,7 500x200x200 Table C92 - C98		M8 - M16 IG-M6 - IG-M10	12x8 16x8 16x1 20x8 20x1
Calibric R+ ρ ≥ 0,6 500x200x314 Table C78 - C84		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130	Blocchi Leggeri p ≥ 0,6 250x120x250 Table C99 - C105		M8 - M16 IG-M6 - IG-M10	12x8 16x8 16x1 20x8 20x1
Urbanbric ρ ≥ 0,7 560x200x274 Table C85 - C91		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130	Doppio Uni ρ ≥ 0,9 250x120x120 Table C106 - C112		M8 - M16 IG-M6 - IG-M10	12x8 16x8 16x1 20x8 20x1
	Hollow clay bricl	s with ther	mal insu	lation acc. to EN 77	71-1:2011+A1:20	15	
Coriso WS07 ρ≥ 0,55 248x365x249 Mineral wool Table C113 - C119		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200	T8P  ρ ≥ 0,56 248x365x249  Perlite  Table C128 - C134		M8 - M16 IG-M6 - IG-M10	12x8 16x8 16x1 20x8 20x1 20x2
T7MW ρ≥ 0,59 248x365x249 Mineral wool  Table C120 - C127		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200	MZ90-G ρ ≥ 0,68 248x365x249 Mineral wool Table C135 - C141		M8 - M16 IG-M6 - IG-M10	12x8 16x8 16x1 20x8 20x1 20x2



Table B1: Overview brick types and properties with corresponding fastening elements (Anchor and Sleeves) (Continued)							
Naming Density [kg/dm³] Dimensions LxBxH [mm] Annex	Picture	Anchor rods	Perforated sleeve	Naming Density [kg/dm³] Dimensions LxBxH [mm] Annex	Picture	Anchor rods	Perforated sleeve
	Hollow clay brick	s with ther	mal insu	lation acc. to EN 7	71-1:2011+A1:201	5	
Poroton FZ7,5 ρ ≥ 0,90 248x365x249 Mineral wool Table C142 - C149		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200	Poroton FZ9 ρ ≥ 0,90 248x365x249 Mineral wool Table C150 - C157		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200
Poroton S9 ρ ≥ 0,85 248x365x249 Perlite Table C158 - C164		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200	Thermopor TV8+ ρ ≥ 0,70 248x365x249 Mineral wool Table C165 - C171		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Intended use Brick types and properties with corresponding fastening elements	Annex B 4



Table B2:	Installation parameters in autoaerted AAC and solid masonry (without sleeve) for prepositioned or push through installation									
Anchor size				M8	M10	IG-M6	M12	IG-M8	M16	IG-M10
Nominal drill hole diameter d <sub>0</sub> [mm]			[mm]	10	1	2	1	4		18
Drill hole depth h <sub>0</sub>			[mm]	h <sub>ef</sub> + t <sub>fix</sub> 1)						
Effective anchorage depth		h <sub>ef</sub>	[mm]	80	0 ≥ 90		≥ 100		≥ 100	
Diameter of	Prepositioned installation	d <sub>f</sub> ≤	[mm]	9	12	7	14	9	18	12
clearance hole in the fixture	Push through installation	d <sub>f</sub> ≤	[mm]	12	14	14	16	16	20	20
Maximum installation torque T <sub>inst</sub> [Nm]			[Nm]	See Annexes C 4 – C 56						
Minimum thickness of member		h <sub>min</sub>	[mm]	h <sub>ef</sub> + 30						
Minimum spacing		S <sub>min</sub>	[mm]	See Annexes C 4 – C 56						
Minimum edge di	stance	c <sub>min</sub>	[mm]			See An	nexes C	4 – 0 56		

<sup>1)</sup> Consider  $t_{fix}$  in case of push through installation.

Table B3: Installation parameters in solid and hollow brick (with perforated sleeve) for prepositioned installation

Anchor size			M8	M8 / M10 / IG-M6		M12 / M16 / IG-M8 / IG-M10			
Perforated sleeve SH			12x80	16x85	16x130	16x130/330	20x85	20x130	20x200
Nominal drill hole diameter	d <sub>0</sub>	[mm]	12	16	16	16	20	20	20
Drill hole depth	h <sub>0</sub>	[mm]	85	90	135	330	90	135	205
Effective anchorage depth	h <sub>ef</sub>	[mm]	80	85	130	130	85	130	200
Diameter of clearance hole in the fixture d <sub>f</sub> ≤ [mm]		9		7 (IG-M6) / 9 (IG-M8) / 12 (IG- 9 (M8) / 12 (M10) 14 (M12) / 18 (M					
Maximum installation torque	T <sub>inst</sub>	[Nm]	See Annexes C 4 – C 56						
Minimum thickness of member	h <sub>min</sub>	[mm]	115	115	195	195	115	195	240
Minimum spacing S <sub>min</sub> [mm]		Oct. America O. A. O. 50							
Minimum edge distance	c <sub>min</sub>	[mm]	See Annexes C 4 – C 56						

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Intended use Installation parameters	Annex B 5



Table B4: Installation parameters in solid and hollow bricks (with perforated sleeve) for prepositioned installation through non-load-bearing layers and/or push-through installation

	<b>.</b>						
Anchor size		M8 / M10 / IG-M6		M12 / M16 / IG-M8 / IG-M10			
Perforated sleeve SH				16x130	16x130/330	20x130	20x200
Nominal drill hol	e diameter	d <sub>0</sub>	[mm]	16	16	20	20
Drill hole depth		h <sub>0</sub>	[mm]	$h_{ef}$ + 5mm + $t_{nll}$ + $t_{fix}$ 1)			
Effective	Prepositioned installation	h <sub>ef</sub>	[mm]	130	130	130	200
embedment depth	Push through installation	h <sub>ef</sub>	[mm]	85	130	85	85
Maximum thickn loadbearing laye	mum thickness of non- pearing layer max t <sub>nll</sub> [mm] 45 200 45				115		
Diameter of	Prepositioned installation	d <sub>f</sub> ≤	[mm]	7 (IG-M6) / 9 (M8) / 12 (M10)		9 (IG-M8) / 12 (IG-M10) / 14 (M12) / 18 (M16)	
in the fixture	Push through installation $d_f \le [mm]$		1	8	2	2	
Maximum installation torque		T <sub>inst</sub>	[Nm]		See Annexes C 4 – C 56		
Minimum thickness of member		h <sub>min</sub>	[mm]	195 (115)	195	195 (115)	240 (115)
Minimum spacing		s <sub>min</sub>	[mm]				
Minimum edge o	distance	C <sub>min</sub>	[mm]	See Annexes C 4 – C 56			

<sup>1)</sup> Consider  $t_{\mbox{nll}}$  and/or  $t_{\mbox{fix}}$  in case of non-loadbearing layers and/or push through installation.

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Intended use Installation parameters	Annex B 6



#### Table B5: Parameter cleaning and installation tools $d_0$ $d_{b}$ $d_{b,min}$ **Anchor rod** Perforated sleeve Drill bit - Ø Brush - Ø min. Brush - Ø HD, CA [mm] [mm] [mm] [mm] Autoaerted ACC and solid masonry (without sleeve) M8 RBT10 10,5 10 M10 12 RBT12 14 12,5 M12 14 RBT14 16 14,5 M16 18 RBT18 20 18,5 Solid and hollow masonry (with sleeve) M8 SH 12x80 12 RBT12 14 12,5 SH 16x85 M8 / M10 / IG-M6 SH 16x130 16 RBT16 18 16,5 SH 16x130/330 SH 20x85 M12 / M16 / SH 20x130 20 RBT20 22 20,5 IG-M8 / IG-M10 SH 20x200

## Cleaning and installation tools

Hand pump

(Volume  $\geq 750 \text{ mI}$ )



Compressed air tool

(min 6 bar)



**Brush RBT** 



**Brush extension RBL** 



Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Intended use Cleaning and installation tools	Annex B 7



Temperature in base material			Maximum working time	Minimum curing time 1)	
	Т		t <sub>work</sub>	t <sub>cure</sub>	
- 10°C	to	- 6°C	90 min <sup>2)</sup>	24 h	
- 5°C	to	- 1 °C	90 min	14 h	
0°C	to	+ 4 °C	45 min	7 h	
+ 5°C	to	+ 9°C	25 min	2 h	
+ 10°C	to	+ 19°C	15 min	80 min	
+ 20 °C	to	+ 24 °C	6 min	45 min	
+ 25 °C	to	+ 29 °C	4 min	25 min	
+ 30 °C	to	+ 39°C	2 min	20 min	
	+ 40 °C		1,5 min	15 min	
Cartridge temperature			+5°C to +40°C		

<sup>1)</sup> The minimum curing time is only valid for dry base material. In wet base material the curing time must be doubled.

Table B7: Working and curing time - Fix Master FIT-Wi 200

Tempera	ture in bas	e material	Maximum working time	Minimum curing time 1)	
	Т		t <sub>work</sub>	t <sub>cure</sub>	
- 20 °C	to	- 16 °C	75 min	24 h	
- 15°C	to	- 11 °C	55 min	16 h	
- 10°C	to	- 6°C	35 min	10 h	
- 5°C	to	- 1 °C	20 min	5 h	
0°C	to	+ 4 °C	10 min	2,5 h	
+ 5 °C	to	+ 9 °C	6 min	80 min	
	+ 10 °C		6 min	60 min	
Cart	ridge tempe	rature	-20°C to +10°C		

<sup>1)</sup> The minimum curing time is only valid for dry base material. In wet base material the curing time must be doubled.

Fix Master Injection system FIT-Ve	200 or FIT-Wi 200 for masonry	
Intended use Working and curing time		Annex B 8

<sup>2)</sup> Cartridge temperature must be at minimum +15°C

Intended use

Installation instructions



# Installation instructions Drill a hole to the required embedment depth with drilling method according to Annex C 4 - C 56. Drill bit diameter according to Table B5. Blow the bore hole clean minimum 2x from the bottom or back by hand pump or compressed air tool (Annex B 7). For applications in solid masonry with a bore hole depth $h_0 > 100$ mm cleaning with compressed air is required. Attach brush RBT according to Table B5 to a drilling machine or a cordless screwdriver. Brush the bore hole minimum 2x with brush over the entire embedment depth in a twisting motion (if necessary, use a brush extension RBL). Finally blow the bore hole clean minimum 2x from the bottom or back by hand pump or compressed air tool (Annex B 7). For applications in solid masonry with a bore hole depth $h_0 > 100$ mm cleaning with compressed air is required. Screw on static-mixing nozzle SM-14W / PM-19E, and load the cartridge into an appropriate dispensing tool. If necessary, cut off the foil tube clip before use. For every working interruption longer than the maximum working time twork (Annex B 8) as well as for new cartridges, a new static-mixer shall be used. Mark setting position on the anchor rod. Consider $t_{\text{nll}}$ and/or $t_{\text{fix}}$ in case of installation through non-loadbearing layers and/or push through installation. The anchor rod shall be free of dirt, grease, oil or other foreign material. $h_{ef} + (t_{nll}) + (t_{fix})$ Not proper mixed mortar is not sufficient for fastening. Dispense and discard mortar until an uniform grey colour is shown (at least 3 full strokes; for foil tube cartridges at least 6 full strokes). Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

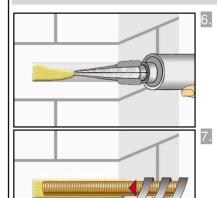
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Annex B 9



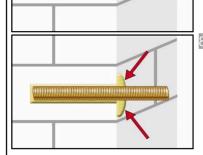
#### Installation instructions (continuation)

#### Installation without sleeve



Starting at bottom of the hole and fill the hole up to approximately two-thirds with adhesive. (If necessary, a mixer nozzle extension VL shall be used.) Slowly withdraw of the static mixing nozzle avoid creating air pockets Observe the temperature related working time  $t_{work}$  (Annex B 8).

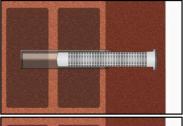
Insert the anchor rod while turning slightly up to the embedment mark.



Annular gap between anchor rod and base material must be completely filled with mortar. For push through installation the annular gap between anchor rod and fixture must be filled with mortar.

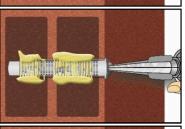
Otherwise, the installation must be repeated starting from step 6 before the maximum working time  $\rm t_{\rm work}$  has expired.

#### Installation with sleeve



Insert the perforated sleeve into the hole flush with the surface of the masonry. Never modify the sleeve in anchoring area  $(h_{\rm ef})$ .

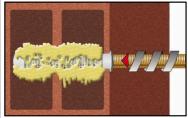
For installation with sleeve SH 16x130/330 through a non-load-bearing layer and/or fixture the clamping area may be reduced to the thickness of the non-load-bearing layer and/or attachment.



Starting from the bottom or back fill the sleeve with mortar. (If necessary, a mixer nozzle extension VL shall be used.)

Refer to the cartridge label or the technical data sheet for the exact amount of mortar. For push-through installation through the fixture the sleeve must also be completely filled with mortar up to the fixture.

Observe the temperature related working time twork (Annex B 8).



Insert the anchor rod with a slight twist up to the mark

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
	П

#### Intended use

Installation instructions (continuation)

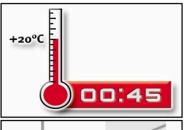
Annex B 10

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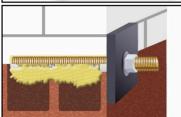
English translation prepared by DIBt



#### **Installation instructions (continuation)**



Temperature related curing time t<sub>cure</sub> (Annex B 8) must be observed. Do not move or load the fastener during curing time.



Install the fixture by using a calibrated torque wrench. Observe maximum installation torque (Annex C 4 to C 56).

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

Intended use
Installation instructions (continuation)

Annex B 11



					Anchor	age				β-Fa	ctor		
Base material	anchor	size	Perforate		dept		Та	: 40°C	24°C	Т <sub>ь</sub> : 80°С	C / 50°C	T <sub>c</sub> : 120°C / 72°C	
			sleeve SH _		h <sub>ef</sub>		(	d/d	w/d w/w	d/d	w/d w/w	d/d	w/d w/w
Autoclaved aerated concrete	all siz	es	with and without S	- 1	all		0	),95	0,86	0,81	0,73	0,81	0,73
	$d_0 \le 14 \text{ mm}$ $d_0 \ge 16 \text{ mm}$ $d_0 \le 14 \text{ mm}$				all		0	,93	0,80	0,87	0,74	0,65	0,56
0-1-1			m with SH		all		0	),93	0,93	0,87	0,87	0,65	0,65
Calcium silica bricks			without S	н	≤ 100 ı	mm	0	),93	0,80	0,87	0,74	0,65	0,56
	d <sub>0</sub> ≥16	mm	Without O	''	_ 1001		0	),93	0,93	0,87	0,87	0,65	0,65
	all siz	es	without S		> 100 ı	mm	_	),93	0,56	0,87	0,52	0,65	0,40
			with SH		all		_	),86	0,86	0,86	0,86	0,73	0,73
Clay Bricks	all sizes		without SH		≤ 100 ı		_	),93	0,80	0,87	0,74	0,65	0,56
				Н	> 100 ı	mm	_	),86	0,43	0,86	0,43	0,73	0,37
Concrete bricks	d <sub>0</sub> ≤ 12		with and		all		$\vdash$	),93	0,80	0,87	0,74	0,65	0,56
	d <sub>0</sub> ≥16	mm	without SH				0	),93	0,93	0,87	0,87	0,65	0,65
Table C2:	haracte	ristic	steel resi	stand	се			<b>.</b>				1	
Anchor size						M		M10	M12	M16	IG-M6	IG-M8	IG-M1
Cross section area		_		A <sub>s</sub>	[mm²	] 36,	6	58	84,3	157	-	-	-
Characteristic ten	sion resis			re ')	FL-N II	145 /	10)	00 (01)	0.4	1 00	_3)	_3)	_3)
			nd 4.8 N <sub>Rk</sub>		s [kN]	15 (1		23 (21)	+	63			
Steel, Property clas	SS		nd 5.8	N <sub>Rk,</sub>		18 (1		29 (27)		78	10	17	29
		8.8	N <sub>Rk,</sub>			29 (2		46 (43)		125	16 _3)	_3)	46 _3)
Stainless steel A2,	A4 and	50				18		29	42	79			
HCR, class (A2 only class 50 a	nd 70)	70		N <sub>Rk,</sub>		26		41	59	110	_3)	_3)	_3)
` ,		80	Doutiel fee	N <sub>Rk,</sub>	s [kN]	29	)	46	67	126			
Characteristic ten	sion resis		nd 5.6		. [-1	Τ					Τ	_3)	
Steel, Property clas	ss	-	.8 and 8.8	γMs,N		+	2,0		.,0				
-		50	.o and 0.0	γ <sub>Ms,N</sub>			0.00			1,5			
Stainless steel A2, HCR, class	A4 and	70		γMs,N			2,86			1,87			
(A2 only class 50 a	nd 70)	80		γ <sub>Ms,l</sub>		+	1,6			1,07	Τ	_3)	
Characteristic she	ar reciets		Stool failure	γ <sub>Ms,l</sub>		arm 1	)	<u>'</u>	,0				
Characteristic she	ai 1651516		nd 4.8	V <sup>0</sup> Rk	(s [kN]	7 (6		12 (10)	17	31	_3)	_3)	_3)
Steel, Property clas	ss		nd 5.8	V Rk	(,s [kN]	9 (8		15 (13)	+	39	5	9	15
		8.8		V <sup>0</sup> Rk	(,s   [kN]	15 (	_	23 (21)	34	63	8	14	23
Stainless steel A2,	A4 and	50		$V^0_{Rk}$	<sub>k,s</sub> [kN]	9		15	21	39	_3)	_3)	_3)
HCR, class		70		$ V^0_{Rk}$	$_{K,S}$ [kN]	13	}	20	30	55	7	13	20
(A2 only class 50 a	nd 70)	80		V <sup>0</sup> Rk	k,s [kN]	15	5	23	34	63	_3)	_3)	_3)
Fiv Magter Inter-	Nam		. Vo 000										
Fix Master Injec Performances	uon syst	em FM	-ve Zuu or	F11-\	VVI ZUU T	or ma	SOF	ir y			Anne	x C 1	



Table C2: Characteristic steel resistance (continuation)												
Anchor size				М8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Cross section area	A <sub>s</sub>	[mm²]	36,6	58	84,3	157	-	-	-			
Characteristic shear resistance, Steel failure with lever arm <sup>1)</sup>												
	4.6 and 4.8	М <sup>0</sup> <sub>Rk,s</sub>	[Nm]	15 (13)	30 (27)	52	133	_3)	_3)	_3)		
Steel, Property class	5.6 and 5.8	М <sup>0</sup> <sub>Rk,s</sub>	[Nm]	19 (16)	37 (33)	65	166	8	19	37		
	8.8	М <sup>0</sup> <sub>Rk,s</sub>	[Nm]	30 (26)	60 (53)	105	266	12	30	60		
Stainless steel A2, A4 and	50	М <sup>0</sup> <sub>Rk,s</sub>	[Nm]	19	37	66	167	_3)	_3)	_3)		
HCR, class	70	М <sup>0</sup> Rk,s	[Nm]	26	52	92	232	11	26	52		
(A2 only class 50 and 70)	80	М <sup>0</sup> <sub>Rk,s</sub>	[Nm]	30	59	105	266	_3)	_3)	_3)		
Characteristic shear resista	nce, Partial facto	r <sup>2)</sup>										
Stool Property class	4.6 and 5.6	γ <sub>Ms,V</sub>	[-]		1,6	<b>6</b> 7			_3)			
Steel, Property class	4.8, 5.8 and 8.8	γ <sub>Ms,V</sub>	[-]				1,25					
Stainless steel A2, A4 and	50	γ <sub>Ms,V</sub>	[-]		2,3	88			_3)			
HCR, class	70	γ <sub>Ms,V</sub>	[-]				1,56					
(A2 only class 50 and 70)	80	γ <sub>Ms,V</sub>	[-]		1,3	33	·		_3)			

Values are only valid for the given stress area A<sub>s</sub>. Values in brackets are valid for undersized threaded rods with smaller stress area A<sub>s</sub> for hot-dip galvanised threaded rods according to EN ISO 10684:2004+AC:2009.

Table C3: Characteristic steel resistance under fire exposure 1)

Anchor size	nchor size						M16	IG-M6	IG-M8	IG-M10
Characteristic tension resistance, S	teel failur	е								
	R30	$N_{Rk,s,fi}$	[kN]	1,1	1,7	3,0	5,7	0,3	1,1	1,7
Steel, Property class 5.8, and higher;	R60	$N_{Rk,s,fi}$	[kN]	0,9	1,4	2,3	4,2	0,2	0,9	1,4
Stainless steel A2, A4 and HCR, class 50 and higher	R90	$N_{Rk,s,fi}$	[kN]	0,7	1,0	1,6	3,0	0,2	0,7	1,0
3	R120	$N_{Rk,s,fi}$	[kN]	0,5	0,8	1,2	2,2	0,1	0,5	0,8
Characteristic shear resistance, Ste	el failure	without	lever a	arm						
	R30	$V_{Rk,s,fi}$	[kN]	1,1	1,7	3,0	5,7	0,3	1,1	1,7
Steel, Property class 5.8, and higher;	R60	$V_{Rk,s,fi}$	[kN]	0,9	1,4	2,3	4,2	0,2	0,9	1,4
Stainless steel A2, A4 and HCR, class 50 and higher	R90	$V_{Rk,s,fi}$	[kN]	0,7	1,0	1,6	3,0	0,2	0,7	1,0
3	R120	$V_{Rk,s,fi}$		0,5	0,8	1,2	2,2	0,1	0,5	0,8
Characteristic shear resistance, Ste	el failure	with lev	er arm							
	R30	$M_{Rk,s,fi}$	[Nm]	1,1	2,2	4,7	12,0	0,2	1,1	2,2
Steel, Property class 5.8, and higher;	R60	M <sub>Rk,s,fi</sub>	[Nm]	0,9	1,8	3,5	9,0	0,2	0,9	1,8
Stainless steel A2, A4 and HCR, class 50 and higher	R90	M <sub>Rk,s,fi</sub>	[Nm]	0,7	1,3	2,5	6,3	0,1	0,7	1,3
•	R120	M <sub>Rk,s,fi</sub>	[Nm]	0,5	1,0	1,8	4,7	0,1	0,5	1,0

<sup>1)</sup> partial factor in case of fire is 1,0 for all steel types and load directions.

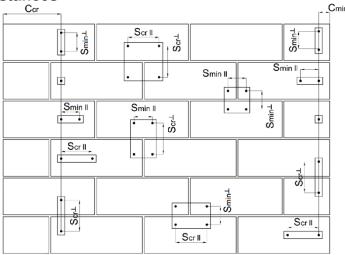
Performances	Annex C 2
Characteristic steel resistance under tension and shear load – under fire exposure	

<sup>2)</sup> in absence of national regulation

<sup>3)</sup> Fastener type not part of the ETA







 $C_{cr}$  = Char. Edge distance  $C_{min}$  = Minimum Edge distance

 $S_{cr,II}$ ;  $(S_{min,II})$  = Characteristic (minimum) spacing for anchors placed parallel to horizontal joint

 $S_{cr,\perp}$ ;  $(S_{min,\perp})$  = Characteristic (minimum) spacing for anchors placed perpendicular to horizontal joint

Load direction Anchor	Tensio	n load		arallel to free	Shear load perpendicular to free edge V ⊥		
position			cag				
Anchors parallel to horizontal joint scr,II; (smin,II)		$\alpha_g$ II,N	V	α <sub>g</sub>   ,۷	V	$\alpha_{g\text{II,V}\perp}$	
Anchors vertical to horizontal joint $s_{cr,\perp}$ ; $(s_{min,\perp})$		$\alpha_{\text{g}} \bot_{,\text{N}}$	V	α <sub>g ⊥,V II</sub>	V	α <sub>д ⊥,</sub> ν ⊥	

 $\alpha_{\text{edge},N}$  = Reduction factor for tension loads at the free edge for  $c_{\text{min}} \le c < c_{\text{cr}}$  (single anchor)

 $\alpha_{\text{edge,V} \perp}$  = Reduction factor for shear loads perpendicular to the free edge for  $c_{\text{min}} \leq c < c_{\text{cr}}$  (single anchor)

 $\alpha_{\text{edge,V II}}$  = Reduction factor for shear loads parallel to the free edge for  $c_{\text{min}} \le c < c_{\text{cr}}$  (single anchor)

 $\alpha_{g \parallel,N}$  = Group factor for anchors parallel to horizontal joint under tension load

 $\alpha_{g,L,N}$  = Group factor for anchors perpendicular to horizontal joint under tension load

 $\alpha_{g \parallel,V \parallel}$  = Group factor for anchors parallel to horizontal joint under shear load parallel to the free edge

 $\alpha_{g\perp,V\parallel}$  = Group factor for anchors perpendicular to horizontal joint under shear load parallel to the free edge

 $\alpha_{g \parallel,V \perp}$  = Group factor for anchors parallel to horizontal joint under shear load perpendicular to the free edge

 $\alpha_{g\perp,V\perp}$  = Group factor for anchors perpendicular to hor. joint under shear load perpendicular to the free edge

Single anchor at the edge:  $N_{RK,b,c} = \alpha_{edge,N} * N_{RK,b}$  resp.  $N_{RK,p,c} = \alpha_{edge,N} * N_{RK,p}$ 

 $V_{Rk,c | I} = \alpha_{edge,V | I} * V_{Rk,b}$ 

 $V_{Rk,c\perp} = \alpha_{edge,V\perp} * V_{Rk,b}$ 

Group of 2 anchors:  $N^{g}_{Rk} = \alpha_{g,N} * N_{RK,b}$ 

 $V^{g}_{\mathsf{Rk} \, \mathsf{II}} \quad = \alpha_{\mathsf{g},\mathsf{V} \, \mathsf{II}} \,^{\star} \, V_{\mathsf{Rk},\mathsf{b}} \qquad \qquad \mathsf{resp.} \ \ V^{g}_{\mathsf{Rk} \, \bot} \quad = \alpha_{\mathsf{g},\mathsf{V} \, \bot} \,^{\star} \, V_{\mathsf{Rk},\mathsf{b}} \qquad \qquad (\mathsf{for} \, \, \mathsf{c} \geq \mathsf{c}_{\mathsf{cr}})$ 

 $V^{g}_{Rk,c \mid I} = \alpha_{g,V \mid I} * V_{Rk,b} \qquad \qquad \text{resp. } V^{g}_{Rk,c \perp} = \alpha_{g,V \perp} * V_{Rk,b} \qquad \qquad (\text{for } c \geq c_{min})$ 

Group of 4 anchors:  $N^{g}_{Rk} = \alpha_{g \; II,N} * \alpha_{g \; \bot,N} * N_{RK,b}$ 

 $V^{g}_{Rk \, II} \quad = \alpha_{g \, II,V \, II} \, {}^{*} \, \alpha_{g \, \bot,V \, II} \, {}^{*} \, V_{Rk,b} \quad resp. \ V^{g}_{Rk \, \bot} \quad = \alpha_{g \, II,V \, \bot} \, {}^{*} \, \alpha_{g \, \bot,V \, \bot} \, {}^{*} \, V_{Rk,b} \ \ (for \, c \geq c_{cr})$ 

 $V^{g}_{\mathsf{Rk},c \, \mathsf{II}} \ = \alpha_{g \, \mathsf{II},\mathsf{V} \, \mathsf{II}} \,^{\star} \, \alpha_{g \, \bot,\mathsf{V} \, \mathsf{II}} \,^{\star} \, V_{\mathsf{Rk},b} \ \text{resp.} \ V^{g}_{\mathsf{Rk},c \, \bot} \ = \alpha_{g \, \mathsf{II},\mathsf{V} \, \bot} \,^{\star} \, \alpha_{g \, \bot,\mathsf{V} \, \bot} \,^{\star} \, V_{\mathsf{Rk},b} \ \text{(for } c \geq c_{\mathsf{min}})$ 

Equations depend on anchor position and load direction (see table above). Reduction factor, group factor and resistances see annex C 4 - C 56. Reduction for installation in joints see annex B 1.

## Performances Definition of the reduction and group feature

Definition of the reduction- and group factors

Annex C 3



## Brick type: Autoclaved aerated concrete - AAC

## Table C4: Stone description

Brick type		Autoclaved aerated concrete AAC
Density	ρ [kg/dm³]	0,35 – 0,6
Normalised mean compressive strenght	$f_b$ [N/mm <sup>2</sup> ]	≥ 2, ≥ 4 or ≥ 6
Code		EN 771-4:2011+A1:2015
Producer (Country)		e.g. Porit (DE)
Brick dimensions	[mm]	≥ 499 x 240 x 249
Drilling method		Rotary drilling



Table C5: Installation parameter

1													
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10				
Installation torque	Tinst	[Nm]	] \( \leq 5 \) \( \leq 5 \) \( \leq 10 \) \( \leq 5 \) \( \leq 5 \) \( \leq 5 \) \( \leq 5 \)					≤ 10					
Char. Edge distance	Ccr	[mm]	150 (for shear loads perpendicular to the free edge: $c_{cr} = 210$ )										
Minimum Edge Distance	Cmin	[mm]	50										
Characteristic Spacing	Scr, II	[mm]		300									
Characteristic Spacing	Scr, ⊥	[mm]		250									
Minimum Spacing	Smin, II;	[mm]	50										
William Spacing	Smin, ⊥	[111111]		50									

Table C6: Reduction factors for single anchors at the edge

	Tension load			Shear load							
'	ension load		Perpendic	ular to the fre	ee edge	Parallel to the free edge					
+	with c ≥	αedge, N	11	with c ≥	αedge, V⊥		with c ≥	αedge, V II			
	50	0,85	-	50	0,12		50	0,70			
	30	0,03		125	0,50	Ţ	125	0,85			
	150	1,00		210	1,00		150	1,00			

## Table C7: Factors for anchor groups under tension load

An An	chor position p	arallel to hor. jo	oint	Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg ⊥, N	
	50	50	1,10	•	50	50	0,75	
	150	50	1,25		150	50	0,90	
	150	300	2,00	1	150	250	2,00	

## Table C8: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	. joint	Anchor position perpendicular to hor. joint									
Shear load perpendicular		with c ≥	with s ≥	α <sub>g</sub> II,V ⊥	1	with c ≥	with s ≥	$\alpha_{g \perp,  V  \perp}$						
		50	50	0,20		50	50	0,25						
to the free		210	50	1,60		210	50	1,80						
edge		210	300	2,00		210	250	2,00						
Shear load		with c ≥	with s ≥	α <sub>g</sub> II,V II		with c ≥	with s ≥	α <sub>g ⊥,</sub> ν II						
parallel to the	••	50	50	1,15	•	50	50	0,80						
free edge		150	50	1,60	•	150	50	1,10						
		150	300	2,00		150	250	2,00						

#### Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

#### **Performances Autoclaved Aerated Concrete - AAC**

Description of the stone, Installation parameters, Reduction- and Group factors

Annex C 4



Brick type: Aut	oclave	d aerat	ed concr	ete – AA	C					
1					shear loa	d resista	nces			
					cteristic Res			and s ≥ s <sub>cr</sub>		
	Perforated sleeve			Use condition						
	Se	Effecitve Anchorage depth					w/d	d/d		
	ited			d/d					w/d w/w	
Anchor size	fora	Anc d							All	
	Per							120°C/72°C	temperature ranges	
	d₅	h <sub>ef</sub>	N	$J_{Rk,b} = N_{Rk,p}$	1)	1	$N_{Rk,b} = N_{Rk,b}$	$V_{Rk,b}^{1)}$		
	[mm]	[mm]				[kN]				
	ed mear		ssive stren				≥ 0,35 kg/d			
M8 M10 /	-	80	1,2	0,9	0,9	0,9	0,9	0,9	1,5	
IG-M6	-	90	1,2	0,9	0,9	0,9	0,9	0,9	2,5	
M12 / M16 / IG-M8 / IG-M10	-	100	2,0	1,5	1,5	1,5	1,5	1,5	2,5	
M8	SH 12	80	1,2	0,9	0,9	0,9	0,9	0,9	1,5	
M8 / M10/ IG-M6	SH 16	≥ 85	1,2	0,9	0,9	0,9	0,9	0,9	2,5	
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85	2,0	1,5	1,5	1,5	1,5	1,5	2,5	
1) $N_{Rk,b,c} = N_{Rk,p,c}$ and	d V <sub>Rk,c</sub> II =	= V <sub>Rk,c</sub> ⊥ac	cording to An	nex C 3						
				Charac	cteristic Res	istances w	rith c≥c <sub>cr</sub>	and s≥s <sub>cr</sub>		
	eve	Effecitve Anchorage depth				Use condit				
	Perforated sleeve		4/4				w/d	d/d		
			d/d				w/w		w/d w/w	
Anchor size	fora	Anc d							All	
	Per		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature ranges	
	d₅	h <sub>ef</sub>	N	$J_{Rk,b} = N_{Rk,p}$	1)	1	$N_{Rk,b} = N_{Rk,b}$	1) .p	$V_{Rk,b}^{1)}$	
	[mm]	[mm]				[kN]				
	ed mear		ssive stren	T				≥ 0,50 kg/d		
M8	-	80	3,0	2,5	2,0	2,5	2,0	2,0	4,5	
M10 / IG-M6	-	90	3,0	2,5	2,0	2,5	2,0	2,0	7,5	
M12 / M16 / IG-M8 / IG-M10	-	100	5,0	4,5	4,0	4,5	4,0	4,0	7,5	
M8	SH 12	80	3,0	2,5	2,0	2,5	2,0	2,0	4,5	
M8 / M10/ IG-M6	SH 16	≥ 85	3,0	2,5	2,0	2,5	2,0	2,0	7,5	
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85	5,0	4,5	4,0	4,5	4,0	4,0	7,5	
1) $N_{Rk,b,c} = N_{Rk,p,c}$ and	d V <sub>Rk,c II</sub> =	= V <sub>Rk,c</sub> ⊥ace	cording to An	nex C 3						
Fix Master Injection	on syste	em FIT-Ve	200 or FIT	-Wi 200 fo	or masonry					
Performances aut Characteristic Resi				AAC				Annex C	5	
		1-								



Brick type: Aut	toclave	d aerat	ed concr	ete – AA	C						
			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$								
			Use condition								
	d sleeve	Effecitve Anchorage depth		d/d			d/d w/d w/w				
Anchor size	Perforated sleeve	And	40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges		
	L L	h <sub>ef</sub>	N	$N_{Rk,b} = N_{Rk,p}^{(1)}$ $N_{Rk,b} = N_{Rk,p}^{(1)}$				V <sub>Rk,b</sub> <sup>1)</sup>			
		[mm]				[kN]					
Normalis	ed mear	compre	ssive strer	ight f <sub>b</sub> ≥ 6	N/mm²;		Density ρ	≥ 0,60 kg/c	lm³		
M8	-	80	4,0	3,5	3,0	3,5	3,0	3,0	6,0		
M10 / IG-M6	-	90	4,0	3,5	3,0	3,5	3,0	3,0	10,0		
M12 / M16 / IG-M8 / IG-M10	-	100	7,0	6,0	5,5	6,5	5,5	5,5	10,0		
M8	SH 12	80	4,0	3,5	3,0	3,5	3,0	3,0	6,0		
M8 / M10/ IG-M6	SH 16	≥ 85	4,0	3,5	3,0	3,5	3,0	3,0	10,0		
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85	7,0	6,0	5,5	6,5	5,5	5,5	10,0		

<sup>1)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c \parallel} = V_{Rk,c} \perp$  according to Annex C 3

## Table C10: Displacements

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / V	δνο	δ∨∞
Alichor Size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,1	0,1*N <sub>Rk</sub> / 2,8	2*δΝο	0,3	0,3*V <sub>Rk</sub> / 2,8	1,5*δνο
M16	all	,	, , , , , ,		0,1	0,1*V <sub>Rk</sub> /2,8	1,5*δvo

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances autoclaved aerated concrete – AAC Characteristic Resistances and Displacements	Annex C 6



## Brick type: Solid calcium silica brick KS-NF

Table C11: Stone description

Brick type	•	Solid calcium silica brick KS-NF
Density	ρ [kg/dm³]	≥ 2,0
Normalised mean compressive strenght	$f_b$ [N/mm $^2$ ]	≥ 28
Conversion factor for low compressive strengths	/er	$(f_b / 28)^{0.5} \le 1.0$
Code		EN 771-2:2011+A1:2015
Producer (Country)		e.g. Wemding (DE)
Brick dimensions	[mm]	≥ 240 x 115 x 71
Drilling method		Hammer drilling



## Table C12: Installation parameter

Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Installation torque	T <sub>inst</sub>	[Nm]	] ≤10 ≤10 ≤15 ≤15 ≤10 ≤10 ≤1						
Char. Edge distance (under fire conditions)	Ccr; (Ccr,fi)	[mm]	150 (2 $h_{ef}$ ) (for shear loads perpendicular to the free edge: $c_{cr} = 240$ )						
Minimum Edge Distance	Cmin	[mm]	60						
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]				240 (4 h <sub>ef</sub> )	)		
(under fire conditions)	Scr, ⊥; (Scr,fi, ⊥)	[mm]	150 (4 h <sub>ef</sub> )						
Minimum Spacing	Smin, II; Smin, ⊥	[mm]	75						

## Table C13: Reduction factors for single anchors at the edge

-	Tension load		Shear load pe	rpendicular t	o free edge	Shear load parallel to free edge		
	with c ≥	αedge, N		with c ≥	αedge, V ⊥		with c ≥	αedge, V II
	60 <sup>1)</sup>	0,50		60	0,30		60	0,60
•	100 <sup>1)</sup>	0,50		100	0,50	•	100	1,00
	150 <sup>1)</sup>	1,00		240	1.00		150	1.00
	180	1,00		240	1,00		130	1,00

<sup>1)</sup> All applications, except for hef = 200mm and without sleeve

## Table C14: Factors for anchor groups under tension load

Ar	nchor position p	arallel to hor. joi	int	Anchor position perpendicular to hor. joint					
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	α <sub>g ⊥, N</sub>		
	60 <sup>1)</sup>	75	0,70		60 <sup>1)</sup>	75	1,15		
	150 <sup>1)</sup>	75	1,40		150 <sup>1)</sup>	75	2,00		
• •	150 <sup>1)</sup> 2	240	2,00		150 <sup>1)</sup>	150	2,00		
	180 <sup>2)</sup>	75	1,00		180 <sup>2)</sup>	75	1,15		
	180 <sup>2)</sup>	240	1,70		180 <sup>2)</sup>	150	2,00		
	240 <sup>2)</sup>	240	2,00		100-/	150	2,00		

<sup>1)</sup> All applications, except for hef = 200mm and without sleeve

## Table C15: Factors for anchor groups under shear load

	Ancho	r position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint				
Shear load		with c ≥	with s ≥	αg II,V ⊥		with c ≥	with s ≥	$\alpha_{g\perp,V\perp}$	
perpendicular	• • •	60	75	0,75		60	75	0,90	
to the free		150	75	2,00		150	75	2,00	
edge		150	240	2,00		150	150	2,00	
Shear load		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	αg ⊥,V II	
parallel to the	• •	60	75	2,00	•	60	75	2,00	
free edge		150	75	2,00		150	75	2,00	
l		150	240	2,00		150	150	2,00	

## Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

#### Performances solid calcium silica brick KS-NF

Description of the stone, Installation parameters, Reduction- and Group factors

Annex C7

<sup>2)</sup> Only for application with  $h_{ef} = 200$ mm and without sleeve



## Brick type: Solid calcium silica brick KS-NF

## Table C16: Characteristic values of tension and shear load resistances

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$									
	g e	Effecitve Anchorage depth		Use condition								
	Perforated sleeve			d/d			d/d					
	8	fec Shc		u/ u			w/w		w/w (w/d)			
Anchor size	ltec	And And							All			
	ora		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C				
	erf								ranges			
	۵.	h <sub>ef</sub>	1	$N_{Rk,b} = N_{Rk,j}$	2) p	1	$N_{Rk,b} = N_{Rk,b}$	2) p	$V_{Rk,b}^{(2)}$			
		[mm]		[kN]								
	Normalised mean compressive strength f <sub>b</sub> ≥ 28 N/mm <sup>2 1)</sup>											
M8	-	80										
M10 / IG-M6	-	≥ 90	7,0	6,5	5,0	6,0	5,5	4,0				
M12 / IG-M8	-	≥ 100										
M16 / IG-M10	-	≥ 100	7,0	6,5	5,0	7,0	6,5	5,0				
M10 / M12 / M16 / IG-M6 / IG-M8 / IG-M10	-	200	9,0	8,5	6,5	5,5	5,0	4,0	7,0			
M8	SH 12	80	7,0	6,5	5,0	6,0	5,5	4,0				
M8 / M10/ IG-M6	SH 16	≥ 85										
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85	7,0	6,5	5,0	7,0	6,5	5,0				

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C11. For stones with higher strengths, the shown values are valid without conversion.

## Table C17: Displacements

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Anchor Size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0.1	0.1*N / 2.5	0*8	0,3	0,3*V <sub>Rk</sub> / 3,5	1,5*δvo
M16	all	0,1	0,1*N <sub>Rk</sub> / 3,5	2*δΝο	0,1	0,1*V <sub>Rk</sub> /3,5	1,5*δνο

## Table C18: Characteristic values of tension and shear load resistances under fire exposure

						<u> </u>				
		Effective		Characteristic	Resistances					
Ancheroize	Perforated	anchorage depth	$N_{Rk,b,fi} = N_{Rk,p,fi} = V_{Rk,b,fi}$							
Anchor size	sleeve	h <sub>ef</sub>	R30	R60	R90	R120				
		[mm]	[kN]							
M8	-	80								
M10 / IG-M6	-	≥ 90	0,48	0.41	0,34	0,30				
M12 / IG-M8	-	≥ 100	0,46	0,41	0,34	0,30				
M16 / IG-M10	-	≥ 100								
M8	SH 12	80								
M8 / M10 /IG-M6	SH 16	≥ 85	0.47	0.26	_ 1)	_ 1)				
M12 / M16 / IG-M8 /IG-M10	SH 20	≥ 85	0,47	0,26	- 1)	- '/				

<sup>1)</sup> no performance assessed

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances solid calcium silica brick KS-NF Characteristic Resistances and Displacements	Annex C 8

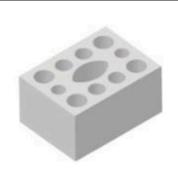
<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c | II} = V_{Rk,c} \perp$  according to Annex C 3

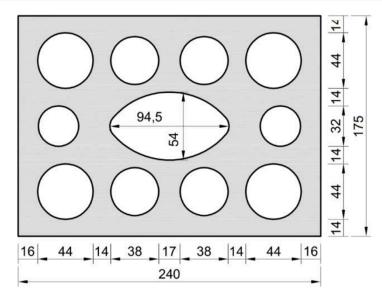


## Brick type: Hollow Calcium silica brick KSL-3DF

## Table C19: Stone description

Brick type		Hollow calcium silica brick KSL-3DF
Density	ρ [kg/dm³]	≥ 1,4
Normalised mean compressive strenght	$f_b$ [N/mm <sup>2</sup> ]	≥ 14
Conversion factor for low compressive strengths	ver	$(f_b / 14)^{0.75} \le 1.0$
Code		EN 771-2:2011+A1:2015
Producer (Country)		e.g. KS-Wemding (DE)
Brick dimensions	[mm]	≥ 240 x 175 x 113
Drilling method		Rotary drilling





#### Table C20: Installation parameter

Table 9201 Inclandion parameter									
Anchor size	Anchor size [-]			M10	M12	M16	IG-M6	IG-M8	IG-M10
Installation torque	Tinst	[Nm]	≤ 5	≤ 5	≤ 8	≤ 8	≤ 5	≤ 8	≤ 8
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: c <sub>cr</sub> = 240)						
Minimum Edge Distance	Cmin	[mm]	60						
Characteristic Spacing	Scr, II	[mm]	240						
Characteristic Spacing	Scr, ⊥	[mm]	120						
Minimum Spacing	Smin, II;	[mm]				120			
William Spacing	Smin, ⊥	[]		120					

## Table C21: Reduction factors for single anchors at the edge

Tension load			Shear load						
Tension load			Perpendicular to the free edge			Parallel to the free edge			
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II	
•	60	1,00	<b>→</b>	60	0,30	]     <u>•</u>	60	1,00	
	120	1,00		240	1,00		120	1,00	

### Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

#### Performances hollow calcium silica brick KSL-3DF

Description of the stone, Installation parameters, Reductionfactors

Annex C 9



# Brick type: Hollow Calcium silica brick KSL-3DF

Table C22:	Factors for anchor groups under tension load	d

Anchor position parallel to hor. joint				Anchor position perpendicular to hor. joint				
-	with c ≥	with s ≥	αg II, N	· · · · · · · · · · · · · · · · · · ·	with c ≥	with s ≥	$\alpha_{g\perp\!\!\!\!\perp,N}$	
• •	60	120	1,50	•	60	120	1,00	
	120	120	2,00			00	120	1,00
	120	240	2,00	· i	120	120	2,00	

## Table C23: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint			
Shear load		with c ≥	with s ≥	αg II,V ⊥	†	with c ≥	with s ≥	$\alpha_{g\perp,V\perp}$
perpendicular	•••	60	120	0,30		60	120	0,30
to the free	120	120	120	1,00		00	120	0,30
edge	•	120	240	240 2,00	240	120	2,00	
Shear load		with c ≥	with s ≥	αg II,V II	†	with c ≥	with s ≥	αg ⊥,V II
parallel to the	••	60	120	1,00	•	60	120	1,00
free edge		120 120 1,60	•	00	120	1,00		
l lice eage		120	240	2,00	- in-	120	120	2,00

#### Table C24: Characteristic values of tension and shear load resistances

					Charac	cteristic Res	istances w	rith c≥c <sub>cr</sub> a	and s ≥ s <sub>cr</sub>						
				Use condition											
Perforated sleeve	d sleeve	Effecitve Anchorage depth	d/d				d/d w/d w/w								
	erforate	40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges							
		L L	_ <b>L</b>	ш	ш	ш	ш	h <sub>ef</sub>	$N_{Rk,b} = N_{Rk,p}^{2}$			1	$N_{Rk,b} = N_{Rk,b}$	2) p	$V_{Rk,b}^{(2)}$
		[mm]				[kN]									
		Normalis	ed mean c	ompressi	ve strength	f <sub>b</sub> ≥ 14 N/	mm² 1)								
M8 / M10/	SH 16	≥ 85	2,5	2,5	1,5	2,5	2,5	1,5	6,0						
IG-M6	130	2,5	2,5	2,0	2,5	2,5	2,0	6,0							
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85	6,5	6,0	4,5	6,5	6,0	4,5	6,0						

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C19. For stones with higher strengths, the shown values are valid without conversion.

## Table C25: Displacements

Anghar siza	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δΝο	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	2 0110	0,31	0,31*V <sub>Rk</sub> / 3,5	<b>1,5</b> *δvo

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow calcium silica brick KSL-3DF Group factors, characteristic Resistances and Displacements	Annex C 10

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c \parallel} = V_{Rk,c} \perp$  according to Annex C 3

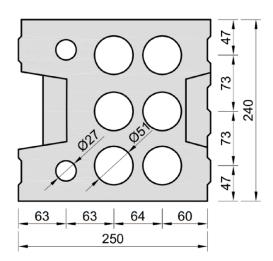


Brick type: Hollow	Calcium silica	brick KSL-8DF
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## Table C26: Stone description

Brick type		Hollow Calcium silica brick KSL-8DF
Density	ρ [kg/dm³]	≥ 1,4
Normalised mean compressive strenght	$f_b$ [N/mm <sup>2</sup> ]	≥ 12
Conversion factor for low compressive strengths	ver	$(f_b / 12)^{0.75} \le 1.0$
Code		EN 771-2:2011+A1:2015
Producer (Country)		e.g. KS-Wemding (DE)
Brick dimensions	[mm]	≥ 248 x 240 x 238
Drilling method		Rotary drilling





#### Table C27: Installation parameter

Anchor size		[-]	M8	M8 M10 M12 M16 IG-M6 IG-M8									
Installation torque	Tinst	[Nm]	≤ 5 ≤ 5 ≤ 8 ≤ 8				≤ 5	≤ 8	≤ 8				
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: $c_{cr} = 250$ )										
Minimum Edge Distance	Cmin	[mm]	50										
Characteristic Spacing	Scr, II	[mm]		250									
Characteristic Spacing	Scr, ⊥	[mm]		120									
Minimum Spacing	Smin, II;	[mm]	50										
I willing	Smin, ⊥	[]	50										

## Table C28: Reduction factors for single anchors at the edge

Tension load			Shear load							
'	ension load		Perpendic	ular to the fro	ee edge	Parallel to the free edge				
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II		
•	50	1,00	<b>→</b>	50	0,30	1     •	50	1,00		
	120	1,00		250	1,00		120	1,00		

### Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

#### Performances hollow calcium silica brick KSL-8DF

Description of the stone, Installation parameters, Reductionfactors

Annex C 11



## Brick type: Hollow Calcium silica brick KSL-8DF

## Table C29: Factors for anchor groups under tension load

Anchor position parallel to hor. joint				Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, N	
• •	50	50	1,00		50	50	1,00	
	120	250	2,00		120	120	2,00	

## Table C30: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint				
Shear load	-	with c ≥	with s ≥	αg II,V ⊥	1	with c ≥	with s ≥	$\alpha_g \perp$ , $\vee \perp$	
perpendicular	•••	50	50	0,45		50	50	0,45	
to the free		250	50	1,15		250	50	1,20	
edge	· · · · · · · · · · · · · · · · · · ·	250	250	2,00		250	250	2,00	
Shear load		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	α <sub>g</sub> ⊥,ν II	
parallel to the	•	50	50	1,30		50	50	1,00	
free edge		120	250	2,00		120	250	2,00	

#### Table C31: Characteristic values of tension and shear load resistances

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$									
				Use condition								
Anchor size	eve	Effecitve Anchorage depth					w/d		d/d			
	sle	Effecitve Anchorage depth		d/d			w/d					
	g	± 2 ⊅							w/w			
	Perforated sleeve	Ar				40°C/24°C			All			
			40°C/24°C	80°C/50°C	120°C/72°C		80°C/50°C	120°C/72°C	Temperature			
									ranges			
		h <sub>ef</sub>	N	$J_{Rk,b} = N_{Rk,p}$	2)	1	V <sub>Rk,b</sub> <sup>2)</sup>					
		[mm]		[kN]								
		Normalis	sed mean d	ompressi	ve strength	f <sub>b</sub> ≥ 12 N/	mm² 1)					
M8 / M10/ IG-M6	SH 16	130	5,0	4,5	3,5	5,0	4,5	3,5	3,5			
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 130	5,0	4,5	3,5	5,0	4,5	3,5	6,0			

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C26. For stones with higher strengths, the shown values are valid without conversion.

## Table C32: Displacements

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Alichor Size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δΝο	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	,	,		0,31	0,31*V <sub>Rk</sub> / 3,5	1,5*δ∨0

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow calcium silica brick KSL-8DF Group factors, characteristic Resistances and Displacements	Annex C 12

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c | II} = V_{Rk,c} \perp$  according to Annex C 3

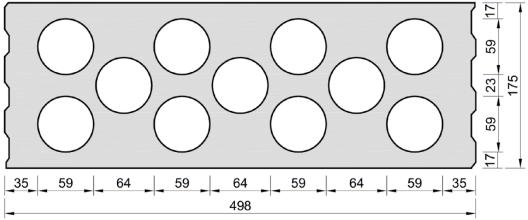


## Brick type: Hollow Calcium silica brick KSL-12DF

## Table C33: Stone description

Brick type		Hollow Calcium silica brick KSL-12DF		
Density	ρ [kg/dm³]	≥ 1,4		
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 12		
Conversion factor for low strengths	$(f_b / 12)^{0.75} \le 1.0$			
Code		EN 771-2:2011+A1:2015		
Producer (Country)		e.g. KS-Wemding (DE)		
Brick dimensions	[mm]	≥ 498 x 175 x 238		
Drilling method		Rotary drilling		





## Table C34: Installation parameter

Anchor size	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque	T <sub>inst</sub>	[Nm]	≤ 4	≤ 4	≤ 5	≤ 5	≤ 4	≤ 5	≤ 5
Char. Edge distance (under fire conditions)	Ccr; (Ccr,fi)	[mm]	120 (2 $h_{ef}$ ) (for shear loads perpendicular to the free edge: $c_{cr} = 500$ )						= 500)
Minimum Edge Distance	Cmin	[mm]	50						
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]	500 (4 h <sub>ef</sub> )						
(under fire conditions)	Scr, ⊥; (Scr,fi, ⊥)	[mm]	120 (4 h <sub>ef</sub> )						
Minimum Spacing	Smin, II; Smin, ⊥	[mm]	50						

## Table C35: Reduction factors for single anchors at the edge

Tension load			Shear load							
			Perpendic	ular to the fr	ee edge	Parallel to the free edge				
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II		
•	50	1,00		50	0,45	<b>•</b>	50	1,00		
	120	1,00		500	1,00		120	1,00		

## Table C36: Factors for anchor groups under tension load

Anchor position parallel to hor. joint				Anchor position perpendicular to hor. joint			
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	$\alpha_{g\perp}$ , N
• •	50	50	1,50		50	50	1,00
	120	500	2,00		120	240	2,00

#### Performances hollow calcium silica brick KSL-12DF

Description of the stone, Installation parameters, Reductionfactors

Annex C 13

free edge



120

250

2,00

#### Brick type: Hollow Calcium silica brick KSL-12DF Table C37: Factors for anchor groups under shear load Anchor position parallel to hor. joint Anchor position perpendicular to hor. joint Shear load with c ≥ with s ≥ with c ≥ with s ≥ $\alpha_{\text{g II,V}\,\perp}$ $\alpha_{\text{g}}\, \bot,\, \text{V}\, \bot$ perpendicular 0,55 0,50 50 50 50 50 to the free 500 50 1,00 500 50 1,00 edae 500 500 2,00 500 250 2,00 with c ≥ with s ≥ with c ≥ with s ≥ Shear load $\alpha_g$ II,V II $\alpha_{g\perp,V\;II}$ parallel to the 50 50 2,00 50 50 1,30

2,00

#### Table C38: Characteristic values of tension and shear load resistances

500

120

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$										
	g e	Φ Φ		Use condition									
	lee/	ffecitve ichorag depth		d/d			w/d		d/d				
	<u>S</u>			a, a			w/w		w/w (w/d)				
Anchor size	Perforated sleeve	Effecitve Anchorage depth							All				
			40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature				
									ranges				
		h <sub>ef</sub>	$N_{Rk,b} = N_{Rk,p}^{2}$			1	$V_{Rk,b}^{(2)}$						
		[mm]				[kN]							
		Normalis	sed mean d	ompressi	ve strength	f <sub>b</sub> ≥ 12 N/	mm² 1)						
M8 / M10/ IG-M6	SH 16	130	3,5	3,5	2,5	3,5	3,5	2,5	3,5				
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 130	3,5	3,5	2,5	3,5	3,5	2,5	7,0				

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C33. For stones with higher strengths, the shown values are valid without conversion.

## Table C39: Displacements

Anghar aiza	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	<b>2</b> *δ <sub>N0</sub>	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	,	,		0,31	0,31*V <sub>Rk</sub> / 3,5	1,5*δ∨0

## Table C40: Characteristic values of tension and shear load resistances under fire exposure

						•			
		Effective							
Anchor size	Perforated	anchorage depth	$N_{Rk,b,fi} = N_{Rk,p,fi} = V_{Rk,b,fi}$						
	sleeve	h <sub>ef</sub>	R30	R60	R90	R120			
		[mm]	[kN]						
M8 / M10 /IG-M6	SH 16	130				_1)			
M12 / IG-M8	SH 20	≥ 130	0,37	0,27	0,17	- 17			
M16 / IG-M10	SH 20	≥ 130				0,12			

<sup>1)</sup> no performance assessed

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow calcium silica brick KSL-12DF Group factors, characteristic Resistances and Displacements	Annex C 14

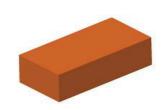
<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c | II} = V_{Rk,c} \perp$  according to Annex C 3



## Brick type: Solid clay brick 1DF

## Table C41: Stone description

Brick type		Solid clay brick Mz-1DF	
Density	ρ [kg/dm³]	≥ 2,0	
Normalised mean compressive strenght	f <sub>b</sub> [N/mm²]	≥ 20	
Conversion factor for low strengths	$(f_b / 20)^{0.5} \le 1.0$		
Code		EN 771-1:2011+A1:2015	
Producer (Country)		e.g. Wienerberger (DE)	
Brick dimensions	[mm]	≥ 240 x 115 x 55	
Drilling method		Hammer drilling	



## Table C42: Installation parameter

Anchor size	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	Tinst	[Nm]	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	
Char. Edge distance	Ccr	[mm]	150 (for shear loads perpendicular to the free edge: c <sub>cr</sub> = 240)					240)		
Minimum Edge Distance	Cmin	[mm]	60							
Characteristic Spacing	Scr, II	[mm]	240							
	Scr, ⊥	[mm]	130							
Minimum Spacing	Smin, II;	[mm]	65							
	Smin, ⊥	[]								

## Table C43: Reduction factors for single anchors at the edge

Tension load			Shear load						
'	ension load		Perpendicular to the free edge			Parallel to the free edge			
	with c ≥	αedge, N	1	with c ≥	αedge, V⊥	-	with c ≥	αedge, V II	
	60	0,75		60	0,10		60	0,30	
	150	1,00		100	0,50	Ţ	100	0,65	
	180	1,00		240	1,00		150	1,00	

## Table C44: Factors for anchor groups under tension load

An	chor position p	arallel to hor. jo	oint	Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N	1	with c ≥	with s ≥	αg⊥, N	
	60	65	0,85	•	60	65	1,00	
• •	150	65	1,15		150	65	1,20	
	150	240	2,00		150	130	2,00	

## Table C45: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	. joint	Anchor position perpendicular to hor. joint			
Shear load		with c ≥	with s ≥	α <sub>g</sub> II,V ⊥	1	with c ≥	with s ≥	$\alpha_{g\perp}, v_{\perp}$
perpendicular	ular	60	65	0,40		60	65	0,30
to the free		240	65	2,00		240	65	2,00
edge		240	240	2,00		240	130	2,00
Shear load parallel to the free edge		with c ≥	with s ≥	α <sub>g</sub> II,V II	•	with c ≥	with s ≥	α <sub>g ⊥,</sub> ν II
		60	65	1,75		60	65	1,10
		150	65	2,00	•	150	65	2,00
		150	240	2,00		150	130	2,00

## Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

#### Performances solid clay brick 1DF

Description of the stone, Installation parameters, Reduction- and Group factors

Annex C 15



Brick type: Solid clay brick 1DF											
Table C46: Characteristic values of tension and shear load resistances											
		Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$									
	0	40				Use condit	ion				
	eve.	tve age h					w/d		d/d		
	sle	Effecitve Anchorage depth		d/d			w/w		w/d w/w		
Anchor size	Ited	Anc							All		
	Perforated sleeve		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C			
) er	Per								ranges		
	_	h <sub>ef</sub>	N	$N_{Rk,b} = N_{Rk,p}^{2}$			$N_{Rk,b} = N_{Rk,b}$	2) p	$V_{Rk,b}^{(2)}$		
		[mm]					[kN]				
		Normalis	sed mean c	ompressi	ve strength	f <sub>b</sub> ≥ 20 N/	mm² 1)				
M8	-	80									
M10 / IG-M6	-	≥ 90	7,0	6,0	6,0	7,0	6,0	6,0	8,0		
M12 / IG-M8	-	≥ 100									
M16 / IG-M10	-	≥ 100	8,0	6,5	6,5	8,0	6,5	6,5	12,0		
M8	SH 12	80									
M8 / M10/ IG-M6	SH 16	> 05	7,0	6,0	6,0	7,0	6,0	6,0	8,0		
M12 / IG-M8	SH 20	≥ 85									
M16 / IG-M10	SH 20	≥ 85	8,0	6,5	6,5	8,0	6,5	6,5	12,0		

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C41. For stones with higher strengths, the shown values are valid without conversion.

#### **Table C47: Displacements**

Anchor size	hef	δη / Ν	δΝο	δN∞	$\delta v$ / $V$	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,1	0,1*N <sub>Rk</sub> / 3,5	2*δΝ0	0,3	0,3*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	,	, , ,	5.10	0,1	0,1*V <sub>Rk</sub> /3,5	1,5*δ∨0

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances solid clay brick 1DF Characteristic Resistances and Displacements	Annex C 16

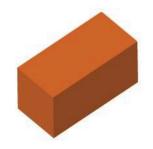
<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c \, II} = V_{Rk,c} \perp$  according to Annex C 3



## Brick type: Solid clay brick 2DF

#### Table C48: Stone description

Brick type		Solid clay brick Mz- 2DF	
Density	ρ [kg/dm³]	≥ 2,0	
Normalised mean compressive strenght	ompressive strenght Tb [IN/mm²]		
Conversion factor for lower strengths	$(f_b / 28)^{0.5} \le 1.0$		
Code		EN 771-1:2011+A1:2015	
Producer (Country)		e.g. Wienerberger (DE)	
Brick dimensions	[mm]	≥ 240 x 115 x 113	
Drilling method		Hammer drilling	



## Table C49: Installation parameter

Anchor size	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10			
Installation torque	Tinst	[Nm]	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10		
Char. Edge distance	0 (0 %)	[mm]				150 (2 h <sub>ef</sub>	)				
(under fire conditions)	C <sub>cr;</sub> (C <sub>cr,fi</sub> )	[[[]]]	(for shear loads perpendicular to the free edge: c <sub>cr</sub> = 240)								
Minimum Edge Distance	Cmin	[mm]	50								
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]	240 (4 h <sub>ef</sub> )								
(under fire conditions)	Scr, ⊥; (Scr,fi, ⊥)	[mm]	240 (4 h <sub>ef</sub> )								
Minimum Spacing	Smin, II; Smin, ⊥	[mm]	50								

### Table C50: Reduction factors for single anchors at the edge

7	Tension load		Shear load perpendicular to free edge			Shear load parallel to free edge			
+	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II	
	50 <sup>1)</sup>	1,00		50	0,20		50	1.00	
	150 <sup>1)</sup>	1,00		125	0,50	Ţ	50	1,00	
+	180	1,00		240	1,00	- <del> </del>	150	1,00	

<sup>1)</sup> All applications, except for hef = 200mm and without sleeve

#### Table C51: Factors for anchor groups under tension load

Anchor position parallel to hor. joint			Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg ⊥, N
	50 <sup>1)</sup>	50	1,50	·	50 <sup>1)</sup>	50	0,80
	150 <sup>1)</sup>	240	2,00	•	150 <sup>1)</sup>	240	2,00
	180 <sup>2)</sup>	60	1,00		180 <sup>2)</sup>	60	1,00
	180 <sup>2)</sup>	240	1,55		180 <sup>2)</sup>	120	2,00
	240 <sup>2)</sup>	240	2,00		180-7	120	2,00

<sup>1)</sup> All applications, except for hef = 200mm and without sleeve

#### Table C52: Factors for anchor groups under shear load

	•									
	Anchor	position pa	rallel to hor.	. joint	Anchor position perpendicular to hor. joint					
Choor load		with c ≥	with s ≥	α <sub>g</sub> II,V ⊥		with c ≥	with s ≥	$\alpha_{g\perp}, v_{\perp}$		
Shear load perpendicular to the free	•••	50	50	0,40	•	50	50	0,20		
		240	50	1,20		240	50	0,60		
edge		240	240	2,00		240	125	1,00		
Leage		240 240	240	2,00		240	240	2,00		
Shear load		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	αg ⊥,V II		
parallel to the	• •	50	50	1,20	•	50	50	1,00		
free edge		150	240	2.00	•	50	125	1,00		
		150	240	240 2,00	ļ	150	240	2,00		

#### Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

#### Performances solid clay brick 2DF

Description of the stone, Installation parameters, Reduction- and Group factors

Annex C 17

<sup>2)</sup> Only for application with hef = 200mm and without sleeve



## Brick type: Solid clay brick 2DF

### Table C53: Characteristic values of tension and shear load resistances

				Charac	cteristic Res	sistances w	ith c≥c <sub>cr</sub>	and s ≥ s <sub>cr</sub>			
	d sleeve	Perforated sleeve Effective Anchorage depth	Use condition								
Anchor size sleeve				d/d			w/d w/w				
	Perforate		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges		
	h <sub>ef</sub>		$N_{Rk,b} = N_{Rk,p}^{2}$				$N_{Rk,b} = N_{Rk,b}$	2) p	$V_{Rk,b}^{(2)}$		
		[mm]		[kN]							
Normalised mean compressive strength f <sub>b</sub> ≥ 28 N/mm <sup>2 1)</sup>											
M8	-	80	9,0	9,0	7,5	9,0	9,0	7,5	9,5		
M10 / IG-M6	-	≥ 90	9,0	9,0	7,5	9,0	9,0	7,5	9,5		
M12 / IG-M8	-	≥ 100	9,0	9,0	7,5	9,0	9,0	7,5	12		
M16 / IG-M10	-	≥ 100	9,0	9,0	7,5	9,0	9,0	7,5	12 <sup>3)</sup>		
M10 / M12 / IG-M6 / IG-M8	-	200	11,5	11,5	10,0	6,0	6,0	5,0	8,0		
M16 / IG-M10	-	200	11,5	11,5	10,0	6,0	6,0	5,0	12,0		
M8	SH 12	80	0.0	0.0	7.5	0.0	0.0	7.5	0.5		
M8 / M10/ IG-M6	SH 16	≥ 85	9,0	9,0	7,5	9,0	9,0	7,5	9,5		
M12 / IG-M8	SH 20	≥ 85	9,0	9,0	7,5	9,0	9,0	7,5	12,0		
M16 / IG-M10	SH 20	≥ 85	9,0	9,0	7,5	9,0	9,0	7,5	12,0 <sup>3)</sup>		

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C48. For stones with higher strengths, the shown values are valid without conversion.

#### Table C54: Displacements

Anghar aiza	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,1	0,1*N <sub>Rk</sub> / 3,5	2*δN0	0,3	0,3*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	,	,		0,1	0,1*V <sub>Rk</sub> /3,5	<b>1,5</b> *δvo

## Table C55: Characteristic values of tension and shear load resistances under fire exposure

						•		
			Characteristic Resistances					
Anchor size	Perforated	Anchorage depth		$N_{Rk,b,fi} = N_R$	$_{k,p,fi}=V_{Rk,b,fi}$	$i = V_{Rk,b,fi}$		
Andrior size	sleeve	$h_{ef}$	R30	R60	R90	R120		
		[mm]	[kN]					
M8	-	80						
M10 / IG-M6	-	≥ 90	0.51	0,44	0,36	0,33		
M12 / IG-M8	-	≥ 100	0,51	0,44	0,30	0,33		
M16 / IG-M10	-	≥ 100						
M8	SH 12	80	0,36	0,26	0,15	0,10		
M8 / M10 /IG-	SH 16	≥ 85	0,36	0,26	0,15	0,10		
M6	SH 16	130	0,92	0,74	0,57	0,49		
M12 / M16 /	CH 20	≥ 85	0,36	0,26	0,15	0,10		
IG-M8 /IG-M10	SH 20	≥ 130	0,92	0,74	0,57	0,49		

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances solid clay brick 2DF Characteristic Resistances and Displacements	Annex C 18

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c \mid I} = V_{Rk,c} \perp$  according to Annex C 3

<sup>3)</sup> Valid for all stone strengths with min. 10 N/mm<sup>2</sup>

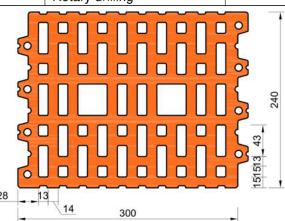


## Brick type: Hollow clay brick 10 DF

#### Table C56: Stone description

	Hollow clay brick HLZ-10DF				
ρ [kg/dm³]	≥ 1,25				
f <sub>b</sub> [N/mm²]	≥ 20				
Conversion factor for lower compressive strengths					
	EN 771-1:2011+A1:2015				
	e.g. Wienerberger (DE)				
[mm]	300 x 240 x 249				
	Rotary drilling				
	f <sub>b</sub> [N/mm <sup>2</sup> ] ver compressive				





#### Table C57: Installation parameter

	•								
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Installation torque	T <sub>inst</sub>	[Nm]	≤ 5	≤ 10	≤ 10	≤ 10	≤ 5	≤ 5	≤ 10
Char. Edge distance (under fire conditions)	Cer; (Cer,fi)	[mm]	m] $120 (2 h_{ef})$ (for shear loads perpendicular to the free edge: $c_{cr} = 300$ )						
Minimum Edge Distance	Cmin	[mm]	50						
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]	300 (4 h <sub>ef</sub> )						
(under fire conditions)	Scr, ⊥; (Scr,fi, ⊥)	[mm]				250 (4 h <sub>ef</sub>	)		
Minimum Spacing	Smin, II; Smin, ⊥	[mm]	50						

### Table C58: Reduction factors for single anchors at the edge

,	Tension load			Shear load							
Tension load			Perpendic	ular to the fro	ee edge	Parallel to the free edge					
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II			
•	50	1,00		50	0,20	<b> </b>	50	1,00			
	120	1,00		300	1,00	<b>-</b>	120	1,00			

#### Table C59: Factors for anchor groups under tension load

An	chor position p	arallel to hor. jo	oint	Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	$lpha_{g\perp}$ , N	
• •	50	50	1,55		50	50	1,00	
	120	300	2,00		120	250	2,00	

#### Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

#### Performances hollow clay brick HLZ 10DF

Description of the stone, Installation parameters, Reductionfactors

Annex C 19



Brick type: Hollow clay brick 10 DF										
Table C60: Factors for anchor groups under shear load										
	Anchor	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint					
Shear load		with c ≥	with s ≥	α <sub>g</sub> II,V ⊥	-t	with c ≥	with s ≥	$\alpha_{g\perp,V\perp}$		
perpendicular to the free	•••	50	50	0,30		50	50	0,20		
		300	50	1,40		300	50	1,00		
edge		300	300	2,00		300	250	2,00		
Shear load		with c ≥	with s ≥	α <sub>g</sub> II,V II		with c ≥	with s ≥	α <sub>g ⊥,</sub> ν II		
parallel to the	••	50	50	1,85		50	50	1,00		
free edge		120	300	2,00		120	250	2,00		

#### Table C61: Characteristic values of tension and shear load resistances

	tted sleeve Effective Anchorage		Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$									
		ve age		Use condition								
							w/d		d/d			
	<u>e</u>	ffectiv ichora depth		d/d			w/w		w/d			
Anchor size	000	Effective inchoragi depth					VV/ VV		w/w			
Andrior Size	Perforated sleeve	Ā							All			
		Perfor	40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature			
									ranges			
		h <sub>ef</sub>	N	$N_{Bk,b} = N_{Bk,p}^{2}$			$N_{Rk,b} = N_{Rk,p}^{2}$					
		[mm]				[kN]						
		Normalis	sed mean c	ompressi	ve strength	f <sub>b</sub> ≥ 20 N/	mm² 1)					
M8	SH 12	80	0.5	0.5	0.0	0.5	0.5	0.0	0.0			
M8 / M10/ IG-M6	SH 16	≥ 85	2,5	2,5	2,0	2,5	2,5	2,0	8,0			
M12 / IG-M8	SH 20	≥ 85	5,0	5,0	4,5	5,0	5,0	4,5	8,0			
M16 / IG-M10	SH 20	≥ 85	5,0	5,0	4,5	5,0	5,0	4,5	11,5			

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C56. For stones with higher strengths, the shown values are valid without conversion.

## **Table C62: Displacements**

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δN0	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	0,10			0,31	0,31*V <sub>Rk</sub> / 3,5	1,5*δ∨0

#### Table C63: Characteristic values of tension and shear load resistances under fire exposure

		Effecitve	Characteristic Resistances					
Anchor size	Perforated	Anchorage depth	$N_{Rk,b,fi} = N_{Rk,p,fi} = V_{Rk,b,fi}$					
Anchor size	sleeve	h <sub>ef</sub>	R30	R60	R90	R120		
		[mm]	[kN]					
M8 / M10 /IG-M6	SH 16	130						
M12 / M16 / IG-M8 IG-M10	SH 20	≥ 130	0,57	0,39	0,21	0,12		

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick HLZ 10DF Group factors, characteristic Resistances and Displacements	Annex C 20

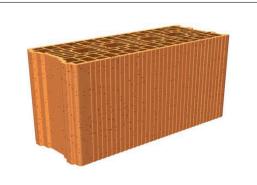
<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c | II} = V_{Rk,c} \perp$  according to Annex C 3

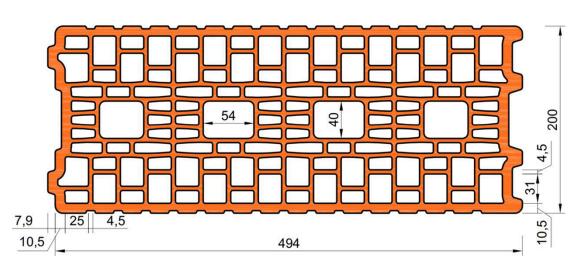


## **Brick type: Hollow Clay brick Porotherm Homebric**

## Table C64: Stone description

Brick type		Hollow clay brick Porotherm Homebric	
Density	ρ [kg/dm³]	≥ 0,70	
Normalised mean compressive strenght	f <sub>b</sub> [N/mm²]	≥ 10	
Conversion factor for low strengths	$(f_b / 10)^{0.5} \le 1.0$		
Code		EN 771-1:2011+A1:2015	
Producer (Country)		e.g. Wienerberger (FR)	
Brick dimensions	[mm]	500 x 200 x 300	
Drilling method		Rotary drilling	





## Table C65: Installation parameter

Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	T <sub>inst</sub>	[Nm]	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2		
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: $c_{cr} = 500$ )								
Minimum Edge Distance	Cmin	[mm]	120								
0	Scr, II	[mm]	500								
Characteristic Spacing	Scr, ⊥	[mm]		300							
Minimum Spacing	Smin, II;	[mm]	120								
Timming Spasing	Smin, ⊥	[]				0					

## Table C66: Reduction factors for single anchors at the edge

Tension load			Shear load						
rension load			Perpendic	ular to the fro	ee edge	Parallel to the free edge			
+	with c ≥	αedge, N	-	with c ≥	αedge, V⊥		with c ≥	αedge, V II	
•	120	1,00	-	120	0,30		120	0,60	
	120	1,00		250	0,60	Ţ	120	0,00	
· i · · · · · · · · · · · · · · · · · ·	120	1,00	· ;	500	1,00		200	1,00	

## Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

#### Performances hollow clay brick Porotherm Homebric

Description of the stone, Installation parameters, Reductionfactors

Annex C 21



## **Brick type: Hollow Clay brick Porotherm Homebric**

## Table C67: Factors for anchor groups under tension load

An	chor position p	arallel to hor. jo	oint	Anchor position perpendicular to hor. joint					
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, N		
	120	100	1,00	•	120	100	1,00		
	200	100	2,00		200	100	1,20		
	120	500	2,00		120	300	2,00		

#### Table C68: Factors for anchor groups under shear load

3 - 1											
	Anchor	position pa	rallel to hor.	. joint	Anchor position perpendicular to hor. joint						
		with c ≥	with s ≥	αg II,V ⊥		with c ≥	with s ≥	αg⊥, V⊥			
Shear load		120	100	0,30		120	100	0,30			
perpendicular to the free		250	100	0,60		250	100	0,60			
edge		500	100	1,00		120	300	2,00			
		120	500	2,00		120	300	2,00			
Shear load		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	α <sub>g ⊥,</sub> ν II			
parallel to the free edge	• •	120	100	1,00	*	120	100	1,00			
		120	500	2,00		120	300	2,00			

#### Table C69: Characteristic values of tension and shear load resistances

				Charac	cteristic Res	istances w	rith c≥c <sub>cr</sub> a	and s ≥ s <sub>cr</sub>			
		Effective Anchorage depth		Use condition							
	eve						w/d		d/d		
	) Se	Effective Anchorage depth		d/d			w/u w/w		w/d		
Anchor size	g	iffe de						w/w			
Auchor size sleeve	ate	Ā							All		
	for		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature		
	)ei								ranges		
	_	h <sub>ef</sub>	$N_{Rk,b} = N_{Rk,p}^{2}$			1	$N_{Rk,b} = N_{Rk,j}$	2) p	$V_{Rk,b}^{(2)}$		
		[mm]				[kN]					
		Normalis	ed mean c	ed mean compressive strength f <sub>b</sub> ≥ 10 N/mm <sup>2 1)</sup>							
M8	SH 12	80			1,	2			3,0		
M8 / M10/	SH 16	≥ 85		1,2					3,0		
IG-M6	SH 16	130	1,5				3,5				
M12 / M16/	SH 20	≥ 85		1,2							
IG-M8 / IG-M10	SH 20	≥ 130			1,	5			4,0		

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C64. For stones with higher strengths, the shown values are valid without conversion.

#### Table C70: Displacements

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δN0	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	,	,	_ = 1.10	0,31	0,31*V <sub>Rk</sub> / 3,5	1,5*δvo

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick Porotherm Homebric Group factors, characteristic Resistances and Displacements	Annex C 22

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c \, II} = V_{Rk,c} \perp$  according to Annex C 3



#### Brick type: Hollow Clay brick BGV Thermo Table C71: **Stone description** Hollow clay brick Brick type **BGV Thermo** Density ρ [kg/dm<sup>3</sup>] ≥ 0,60 Normalised mean f<sub>b</sub> [N/mm<sup>2</sup>] ≥ 10 compressive strenght Conversion factor for lower compressive $(f_b / 10)^{0.5} \le 1.0$ strengths EN 771-1:2011+A1:2015 Code Producer (Country) e.g. Leroux (FR) [mm] Brick dimensions 500 x 200 x 314 Drilling method Rotary drilling

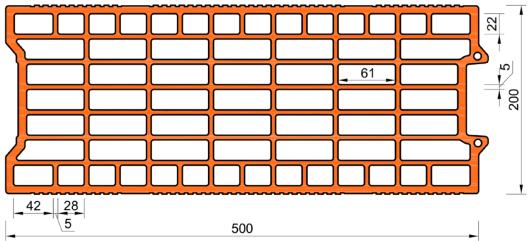


Table C72: Installation parameter												
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10			
Installation torque	T <sub>inst</sub>	[Nm]	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2			
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: $c_{cr} = 500$ )									
Minimum Edge Distance	Cmin	[mm]	120									
Characteristic Spacing	Scr, II	[mm]	500									
Characteristic Spacing	Scr, ⊥	[mm]				315						
Minimum Spacing Smin, II;		[mm]				120						

Table C/3:	neducti	on factors	ior single an	chors at th	ie eage					
_	ension load		Shear load							
'	ension load		Perpendic	ular to the fr	ee edge	Parallel to the free edge				
+	with c ≥	αedge, N	1	with c ≥	αedge, V⊥	-	with c ≥	αedge, V II		
	120	1,00	-	120	0,30		120	0,60		
	120	1,00		250	0,60	Į Į	120	0,00		
	120	1,00		500	1,00	· · · · · · · · · · · · · · · · · · ·	250	1,00		

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick BGV Thermo Description of the stone, Installation parameters, Reductionfactors	Annex C 23



## Brick type: Hollow Clay brick BGV Thermo

### Table C74: Factors for anchor groups under tension load

An	chor position pa	arallel to hor. jo	oint	Anchor position perpendicular to hor. joint					
1	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, N		
	120	100	1,00	•	120	100	1,00		
	200	100	1,70		200	100	1,10		
	120	500	2,00		120	315	2,00		

#### Table C75: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	. joint	Anchor position perpendicular to hor. joint							
Shear load		with c ≥	with s ≥	α <sub>g</sub> II,V ⊥		with c ≥	with s ≥	$\alpha_g \perp$ , $\vee \perp$				
perpendicular to the free	•••	120	100	1,00	-	120	100	1,00				
edge		120	500	2,00		120	315	2,00				
Shear load		with c ≥	with s ≥	α <sub>g</sub> II,V II		with c ≥	with s ≥	α <sub>g ⊥,</sub> ν II				
parallel to the	• •	120	100	1,00		120	100	1,00				
free edge		120	500	2,00		120	315	2,00				

#### Table C76: Characteristic values of tension and shear load resistances

		/e (ge	Characteristic Resistances with c ≥ c <sub>cr</sub> and s ≥ s <sub>cr</sub>									
				Use condition								
	sleeve						w/d		d/d			
	l se	Effecitve Anchorage depth		d/d			w/u w/w		w/d			
A a la a la	9	ff G G							w/w			
Anchor size	Perforated	A A							All			
		9010	40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature			
									ranges			
		h <sub>ef</sub>	$N_{Rk,b} = N_{Rk,p}^{2)}$			1	$N_{Rk,b} = N_{Rk,b}$	2) p	$V_{Rk,b}^{(2)}$			
		[mm]				[kN]						
		Normalis	sed mean compressive strength f <sub>b</sub> ≥ 10 N/mm <sup>2 1)</sup>									
M8	SH 12	80			0,	9			3,5			
M8 / M10/	SH 16	≥ 85		0,9					3,5			
IG-M6	SH 10	130	2	,0	1,5	2	,0	1,5	4,0			
M12 / M16	SH 20	≥ 85			0,	0,9			4,0			
IG-M8 / IG-M10	31120	≥ 130	2	,0	1,5	2	,0	1,5	4,0			

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C71. For stones with higher strengths, the shown values are valid without conversion.

#### **Table C77: Displacements**

	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δΝο	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	-,	,		0,31	0,31*V <sub>Rk</sub> / 3,5	1,5*δ∨0

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick BGV Thermo Group factors, characteristic Resistances and Displacements	Annex C 24

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c \, II} = V_{Rk,c} \perp according to Annex C 3$ 

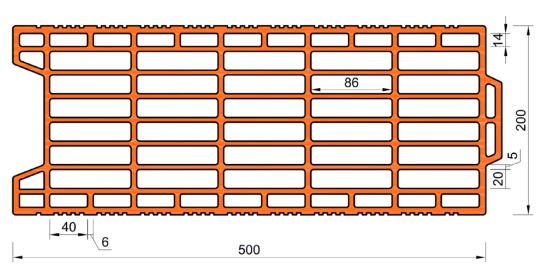


## Brick type: Hollow Clay brick Calibric R+

## Table C78: Stone description

Brick type		Hollow clay brick Calibric R+	
Density	ρ [kg/dm³]	≥ 0,60	
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 12	
Conversion factor for low strengths	$(f_b / 12)^{0.5} \le 1.0$		
Code		EN 771-1:2011+A1:2015	
Producer (Country)		e.g. Leroux (FR)	
Brick dimensions	[mm]	500 x 200 x 314	
Drilling method		Rotary drilling	





#### Table C79: Installation parameter

The state of the s												
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10			
Installation torque	T <sub>inst</sub>	[Nm]	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2			
Char. Edge distance	Ccr	[mm]	120	120 (for shear loads perpendicular to the free edge: c <sub>cr</sub> = 500)								
Minimum Edge Distance	Cmin	[mm]		120								
Characteristic Spacing	Scr, II	[mm]				500						
Characteristic Spacing	Scr, ⊥	[mm]		315								
Minimum Spacing	Smin, II;	[mm]	120									
Timming opasing	Smin, ⊥	[]				0						

## Table C80: Reduction factors for single anchors at the edge

Tension load		Shear load						
Tension load			Perpendic	ular to the fr	ee edge	Parallel to the free edge		
1	with c ≥	αedge, N	1	with c ≥	αedge, V⊥		with c ≥	αedge, V II
	• 120 1,00	1,00		120	0,15	I	120	0,30
120	1,00		250	0,30	Ţ	120	0,30	
ļ	120	1,00		500	1,00		250	1,00

#### Performances hollow clay brick Calibric R+

Description of the stone, Installation parameters, Reductionfactors

Annex C 25



## Brick type: Hollow Clay brick Calibric R+

## Table C81: Factors for anchor groups under tension load

An	chor position p	arallel to hor. jo	oint	Anchor position perpendicular to hor. joint			
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, N
• •	120	100	1,00		120	100	1,00
	175	100	1,70		175	100	1,10
	120	500	2,00		120	315	2,00

## Table C82: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	. joint	Anchor position perpendicular to hor. joint					
Shear load perpendicular to the free edge		with c ≥	with s ≥	αg II,V ⊥		with c ≥	with s ≥	$\alpha_g \perp$ , $\vee \perp$		
	•••	120	100	1,00	-	120	100	1,00		
		120	500	2,00		120	315	2,00		
Shear load parallel to the free edge		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	α <sub>g ⊥,</sub> ν II		
		120	100	1,00		120	100	1,00		
		120	500	2,00		120	315	2,00		

#### Table C83: Characteristic values of tension and shear load resistances

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$								
			Use condition								
	Perforated sleeve	Effective Anchorage depth	ffective chorage depth pp/p				d/d w/d w/w				
Anchor size	rate	Ar A							All		
	Perfo	5	40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature		
									ranges		
		"	h <sub>ef</sub>	1	$N_{Rk,b} = N_{Rk,p}$	2)	1	$N_{Rk,b} = N_{Rk,i}$	2) p	$V_{Rk,b}^{2)}$	
		[mm]				[kN]					
		Normalis	sed mean	compressi	ve strengt	h f <sub>b</sub> ≥ 12 N	/mm² 1)	_			
M8	SH 12	80	1,2	1,2	0,9	1,2	1,2	0,9	4,0		
M8 / M10/	01146	≥ 85	1,2	1,2	0,9	1,2	1,2	0,9	5,5		
IG-M6	IG-M6 SH 16	130	1,5	1,5	1,2	1,5	1,5	1,2	5,5		
M12 / M16	CH 20	≥ 85	1,2	1,2	0,9	1,2	1,2	0,9	8,5		
IG-M8 /IG-M10 SH 20	≥ 130	1,5	1,5	1,2	1,5	1,5	1,2	8,5			

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C78. For stones with higher strengths, the shown values are valid without conversion.

#### Table C84: Displacements

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	<b>2</b> *δN0	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	,	3,.3	2 0110	0,31	0,31*V <sub>Rk</sub> / 3,5	1,5*δνο

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow Clay brick Calibric R+ Group factors, characteristic Resistances and Displacements	Annex C 26

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c \mid I} = V_{Rk,c} \perp$  according to Annex C 3



#### Brick type: Hollow Clay brick Urbanbric Stone description Table C85: Hollow clay brick Brick type Urbanbric Density ≥ 0,70 ρ [kg/dm<sup>3</sup>] Normalised mean $f_b [N/mm^2]$ ≥ 12 compressive strenght Conversion factor for lower compressive $(f_b / 12)^{0.5} \le 1.0$ strengths EN 771-1:2011+A1:2015 Code Producer (Country) e.g. Imerys (FR) **Brick dimensions** [mm] 560 x 200 x 274 Drilling method Rotary drilling 5,5 040 5 63 Ó, 40\_ 9,5 560 Table C86: Installation parameter M12 Anchor size M10 IG-M6 IG-M8 IG-M10 [-] M8 M<sub>16</sub> ≤ 2 ≤ 2 ≤ 2 ≤ 2 ≤ 2 ≤ 2 ≤ 2 Installation torque Tinst [Nm] Char. Edge distance 120 (for shear loads perpendicular to the free edge: $c_{cr} = 500$ ) Ccr [mm] Minimum Edge Distance 120 [mm] Cmin [mm] 560 Scr, II Characteristic Spacing 275 [mm] Scr, ⊥ Smin, II; Minimum Spacing [mm] 100 Smin, ⊥ Table C87: Reduction factors for single anchors at the edge Shear load Tension load Perpendicular to the free edge Parallel to the free edge with c ≥ with c ≥ with c ≥ $\alpha$ edge, V $\perp$ αedge, V II αedge, N 120 0,25 120 1,00 120 0,50 250 0,50 500 250 120 1.00 1,00 1.00

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick Urbanbric Description of the stone, Installation parameters, Reductionfactors	Annex C 27



## Brick type: Hollow Clay brick Urbanbric

#### Table C88: Factors for anchor groups under tension load

An	chor position p	arallel to hor. jo	oint	Anchor position perpendicular to hor. joint			
1	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	$\alpha_g \perp$ , N
	120	100	1,00		120	100	1,00
	185	100	1,90		185	100	1,10
	120	560	2,00		120	275	2,00

## Table C89: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	. joint	Anchor position perpendicular to hor. joint									
Shear load perpendicular to the free edge		with c ≥	with s ≥	α <sub>g</sub> II,V ⊥		with c ≥	with s ≥	$\alpha_g \perp$ , $\vee \perp$						
	•••	120	100	1,00		120	100	1,00						
		120	560	2,00		120	275	2,00						
Shear load parallel to the free edge		with c ≥	with s ≥	αg II,V II	•	with c ≥	with s ≥	α <sub>g ⊥,</sub> ν II						
		120	100	1,00		120	100	1,00						
		120	560	2,00		120	275	2,00						

#### Table C90: Characteristic values of tension and shear load resistances

Table 650. Onaracteristic values of terision and shear four resistances													
				Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$									
			Use condition										
	eve	Effective Anchorage depth					w/d		d/d				
Anchor size	<u>e</u>	b cti.		d/d					w/d				
	ρ	ffectiv ichora depth					w/w		w/w				
	ate	A A							All				
	Perforated sleeve		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature				
									ranges				
		h <sub>ef</sub>		I NI	2)		. NI	2)	V <sub>Rk,b</sub> <sup>2)</sup>				
	1	1161	''	$I_{Rk,b} = N_{Rk,p}$		l l	$N_{Rk,b} = N_{Rk,j}$	p	<b>V</b> Rk,b				
		[mm]		IRk,b = INRk,p		[kN]	$N_{Rk,b} = IN_{Rk,j}$	р	V Rk,b				
		[mm]	sed mean c	, ,		[kN]		p	V Rk,b				
M8	SH 12	[mm]		, ,		[kN]		0,9	V <sub>Rk,b</sub>				
M8 M8 / M10/		[mm] Normalis	sed mean c	ompressiv	ve strength	[kN] f <sub>b</sub> ≥ 12 N/	mm² 1)						
	SH 12 SH 16	[mm] Normalis	sed mean c	ompressiv	ve strength	[kN] f <sub>b</sub> ≥ <b>12 N/</b> 1,2	mm <sup>2 1)</sup>	0,9	4,5				
M8 / M10/		[mm] <b>Normalis</b> 80 ≥ 85	sed mean c 1,2 1,2	ompressiv	/e strength	[kN] f <sub>b</sub> ≥ 12 N/ 1,2 1,2	mm <sup>2 1)</sup> 1,2 1,2	0,9	4,5 4,5				

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C85. For stones with higher strengths, the shown values are valid without conversion.

#### **Table C91: Displacements**

Anchor size	hef	δN / <b>N</b>	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	<b>2</b> *δN0	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	-,	,,	_ = 0.10	0,31	0,31*V <sub>Rk</sub> / 3,5	<b>1,5</b> *δvo

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick Urbanbric Group factors, characteristic Resistances and Displacements	Annex C 28

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c | II} = V_{Rk,c} \perp$  according to Annex C 3

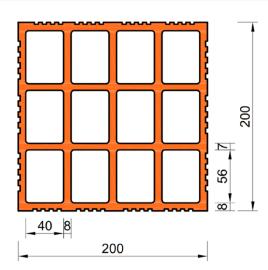


## Brick type: Hollow Clay brick Brique creuse C40

## Table C92: Stone description

Brick type		Hollow clay brick Brique creuse C40
Density	ρ [kg/dm³]	≥ 0,70
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 12
Conversion factor for lowe strengths	er compressive	$(f_b / 12)^{0.5} \le 1.0$
Code		EN 771-1:2011+A1:2015
Producer (Country)		e.g. Terreal (FR)
Brick dimensions	[mm]	500 x 200 x 200
Drilling method		Rotary drilling





### Table C93: Installation parameter

Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	T <sub>inst</sub>	[Nm]	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2		
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: c <sub>cr</sub> = 500)								
Minimum Edge Distance	Cmin	[mm]	120								
Characteristic Spacing	Scr, II	[mm]	500								
Characteristic Spacing	Scr, ⊥	[mm]	200								
Minimum Spacing	Smin, II;	[mm]	200								
Willimani Spacing	Smin, ⊥	[[[]]]	200								

## Table C94: Reduction factors for single anchors at the edge

Tension load			Shear load						
			Perpendicular to the free edge Parallel to the free edge						
	with c ≥	αedge, N		with c ≥	αedge, V ⊥		with c ≥	αedge, V II	
•	120	1,00	<b>→</b>	120	0,83	<u>†</u>	120	1,00	
	120	1,00		500	1,00		250	1,00	

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick Brique Creuse C40 Description of the stone, Installation parameters, Reductionfactors	Annex C 29



Brick type:	Hollo	ow Cla	av brick	Brid	aue d	creuse	e C4	10							
Table C95:			r ancho		-				load	ł					
			arallel to		•						r posit	ion perpe	endic	cular to hor	. joint
	with	C ≥	with s	5 ≥	(	χg II, N					wit	hc≥	٧	/ith s ≥	αg⊥, N
	12	20	500	)		2,00				120 200				200	2,00
Table C96:	Fact	tors fo	r ancho	r aro	uns i	under	she	ar lo	nad						
Tuble 656.			or position		•					And	chor p	osition pe	rpei	ndicular to	nor. joint
Shear load	1		with c				α <sub>g</sub> II,V ⊥		1			with c	· · · · · · · · · · · · · · · · · · ·		α <sub>g ⊥, ∨ ⊥</sub>
perpendicular to the free edge		•••	120		500		2,00				120			200	2,00
Shear load	h		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					/ II	he			with c	≥	with s ≥	αg ⊥,V II
parallel to the free edge			120 500 2,00							120		200	2,00		
Table C97:	Table C97: Characteristic values of tension and shear load resistances														
						Cha	aract	terist	ic Re	sist	ances	with c≥	c <sub>cr</sub> a	ınd s≥s <sub>cr</sub>	
		Φ	(I)							Us	e con	dition			
		sleev	Effective Anchorage depth						w/o		d/d w/d w/w				
Anchor size		Perforated sleeve	And	40°C	/24°C	80°C/50			C/72°C	°C 40°C/24°C 80°C/		C 80°C/50	0°C	120°C/72°C	All
			h <sub>ef</sub>		Ν	$J_{Rk,b} = N$	<b>J</b> Rk,p 27	)				$N_{Rk,b} = I$	$V_{Rk,p}$	2)	$V_{Rk,b}^{(2)}$
			[mm]								[kN]				
NAO.				ed m	ean c	ompre	ssiv	e str	engt	h f <sub>b</sub>	, ≥ 12 ∣	N/mm <sup>2 1)</sup>		I	
M8 / M10/ IG-M6		SH 12 SH 16	80 ≥ 85	1,21,2		1.2		0	),9		1,2	1,2	)	0,9	1,5
M12 / M16 / IG-M8 / IG-M1		SH 20	≥ 85			,2 0,9			1,2   1,2			3,3	1,5		
For lower corwith higher st     N <sub>Rk,b,c</sub> = N <sub>Rk,p</sub>	trength	is, the sl	hown valu	es are	valid v	without o	conve	d by t ersion	he co	nvei	rsion fa	ector accor	ding	to Table C9	2. For stones
Table C98:	Disp	olacem	nents												
Ancho	r 0170		hef	δι	N / N		δΝα	)		δN∞	,	δv / <b>V</b>		δνο	δ∨∞
Ancho			[mm]	[m	m/kN]		[mr	1]	]	mm	ı] [r	nm/kN]		[mm]	[mm]
M8 – I IG-M6		1	all	,	112	0.13	D*NI	. / 3	_	**		0,55	0,	55*V <sub>Rk</sub> / 3,5	5 1,5*δνο
M1		,	all	┤ ′	0,13	0,13	) INRI	<sub>k</sub> / 3,	5   2	!*δΝ	10	0,31	0,	31*V <sub>Rk</sub> / 3,5	5 1,5*δνο
				•		,			,		,		•		,
Fix Master Inje  Performances Group factors, cl	hollo	w clay	brick B	rique	Creus	se C40		r mas	sonry	/				Annex C	30

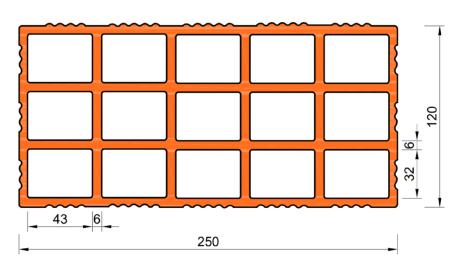


## Brick type: Hollow Clay brick Blocchi Leggeri

## Table C99: Stone description

Brick type		Hollow clay brick Blocchi Leggeri
Density	ρ [kg/dm³]	≥ 0,60
Normalised mean compressive strenght	f <sub>b</sub> [N/mm²]	≥ 12
Conversion factor for low strengths	er compressive	$(f_b / 12)^{0.5} \le 1.0$
Code		EN 771-1:2011+A1:2015
Producer (Country)		e.g. Wienerberger (IT)
Brick dimensions	[mm]	250 x 120 x 250
Drilling method		Rotary drilling





## Table C100: Installation parameter

Table Cites Intelanati	on pan	aiiioto.								
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque	Tinst	$[Nm]$ $\leq 2$ $\leq 2$ $\leq 2$ $\leq 2$ $\leq 2$								
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: c <sub>cr</sub> = 250)							
Minimum Edge Distance	Cmin	[mm]	60							
Characteristic Specing	Scr, II	[mm]	250							
Characteristic Spacing $s_{cr, \perp}$ [mm] 250										
Minimum Spacing	Smin, II;	[mm]	100							
	Smin, ⊥	' '								

## Table C101: Reduction factors for single anchors at the edge

-	Tension load		Shear load								
'	rension load		Perpendic	ular to the fr	ee edge	Parallel to the free edge					
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II			
•	60	1,00		60	0,40	1   <b>!</b>	60	0,40			
	120	1,00		250	1,00		120	1,00			

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick Blocchi Leggeri Description of the stone, Installation parameters, Reductionfactors	Annex C 31



#### Brick type: Hollow Clay brick Blocchi Leggeri Table C102: Factors for anchor groups under tension load Anchor position parallel to hor. joint Anchor position perpendicular to hor. joint with c ≥ with s ≥ with c ≥ with s ≥ $\alpha_g$ II, N $\alpha_{g\perp\!\!\!\!\!\!\perp,\;N}$ 60 100 1,00 60 100 2,00 120 250 2,00 120 250 2,00

## Table C103: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint			
Shear load perpendicular to the free edge		with c ≥	with s ≥	α <sub>g</sub> II,V ⊥	1	with c ≥	with s ≥	$\alpha_{g\perp,V\perp}$
	•••	60	100	0,40		60	100	0,40
		250	100	1,00		250	100	1,00
		250	250	2,00		250	250	2,00
Shear load		with c ≥	with s ≥	α <sub>g</sub> II,V II	+	with c ≥	with s ≥	α <sub>g ⊥,</sub> ν II
parallel to the		60	100	0,40		60	100	0,40
free edge		120	100	1,00		120	100	1,00
		120	250	2,00		120	250	2,00

#### Table C104: Characteristic values of tension and shear load resistances

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$						
		Effective Anchorage depth				Use condit	ion		
Anchor size	Perforated sleeve		d/d			w/d w/w			d/d w/d w/w
			40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges
		h <sub>ef</sub>	$N_{Rk,b} = N_{Rk,p}^{2)}$			1	$N_{Rk,b} = N_{Rk,b}$	2)	$V_{Rk,b}^{(2)}$
		[mm]				[kN]			
		Normalis	ed mean d	ompressi	ve strength	f <sub>b</sub> ≥ 12 N/	mm² 1)		
M8	SH 12	80							
M8 / M10/ IG-M6	SH 16	≥ 85	0,6	0,6	0,6	0,6	0,6	0,6	3,5
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85	-,-	,					

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C99. For stones with higher strengths, the shown values are valid without conversion.

#### Table C105: Displacements

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δΝ0	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	·	,		0,31	0,31*V <sub>Rk</sub> / 3,5	1,5*δ∨0

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick Blocchi Leggeri Group factors, characteristic Resistances and Displacements	Annex C 32

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c \, II} = V_{Rk,c} \bot according to Annex C 3$ 

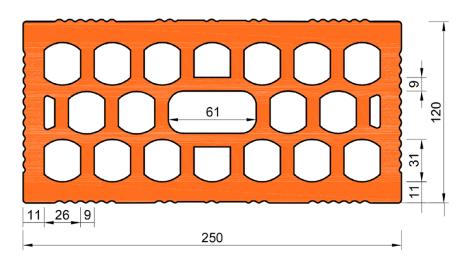


## Brick type: Hollow Clay brick Doppio Uni

## Table C106: Stone description

Brick type		Hollow clay brick Doppio Uni
Density	ρ [ <b>kg/dm³</b> ]	≥ 0,90
Normalised mean compressive strenght	f <sub>b</sub> [N/mm²]	≥ 28
Conversion factor for low strengths	er compressive	$(f_b / 28)^{0.5} \le 1.0$
Code		EN 771-1:2011+A1:2015
Producer (Country)		e.g. Wienerberger (IT)
Brick dimensions	[mm]	250 x 120 x 120
Drilling method		Rotary drilling





## Table C107: Installation parameter

Anchor size						M16	IG-M6	IG-M8	IG-M10	
Installation torque	T <sub>inst</sub>	[Nm]	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: c <sub>cr</sub> = 250)							
Minimum Edge Distance	Cmin	[mm]	100							
Characteristic Spacing	Scr, II	[mm]	250							
Characteristic Spacing	Scr, ⊥	[mm]		120						
Minimum Spacing	Smin, II;	[mm]			100					
Willimum Spacing	Smin, ⊥	[[[]]]	100							

## Table C108: Reduction factors for single anchors at the edge

Tension load			Shear load						
'	ension load		Perpendicular to the free edge			Parallel to the free edge			
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II	
•	100	1,00	<b>→</b>	100	0,50	<u>†</u>	100	1,00	
	120	1,00		250	1,00		120	1,00	

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick Doppio Uni Description of the stone, Installation parameters, Reductionfactors	Annex C 33



## Brick type: Hollow Clay brick Doppio Uni

## Table C109: Factors for anchor groups under tension load

An	chor position pa	arallel to hor. jo	oint	Ancho	or position perp	endicular to ho	r. joint
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	$lpha_{g\perp,N}$
• •	100	100	1,00		100	120	2,00
	120	250	2,00		120	120	2,00

#### Table C110: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint			
Shear load		with c ≥	with s ≥	α <sub>g</sub> II,V ⊥		with c ≥	with s ≥	$\alpha_{g\perp,V\perp}$
	perpendicular to the free edge	100	100	1,00	•	100	100	1,00
to the free edge		250	250	2,00		250	120	2,00
Shear load		with c ≥	with s ≥	α <sub>g</sub> II,V II		with c ≥	with s ≥	$\alpha_{g\perp,V}$ II
parallel to the free edge	• •	100	100	1,00		100	100	1,00
		120	250	2,00		120	120	2,00

### Table C111: Characteristic values of tension and shear load resistances

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$							
		Effective Anchorage depth				Use conditi	on			
Anchor size	Perforated sleeve			d/d		w/d w/w			d/d w/d w/w	
					120°C/72°C				All	
			40°C/24°C	80°C/50°C		40°C/24°C	80°C/50°C	120°C/72°C		
					0)			0)	ranges V <sub>Rk,b</sub> <sup>2)</sup>	
		$h_{ef}$	١	$N_{Rk,b} = N_{Rk,p}^{(2)}$			$N_{Rk,b} = N_{Rk,p}^{2}$			
		[mm]				[kN]				
		Normalis	ed mean c	ompressiv	ve strength	f <sub>b</sub> ≥ 28 N/	mm² <sup>1)</sup>			
M8	SH 12	80								
M8 / M10/ IG-M6	SH 16	≥ 85	1,2	1,2	0,9	1,2	1,2	0,9	2,5	
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85		•						

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C106. For stones with higher strengths, the shown values are valid without conversion.

#### **Table C112: Displacements**

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Alichor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δN0	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	,	,		0,31	0,31*V <sub>Rk</sub> / 3,5	1,5*δνο

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick Doppio Uni Group factors, characteristic Resistances and Displacements	Annex C 34

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c \, II} = V_{Rk,c} \bot according to Annex C 3$ 

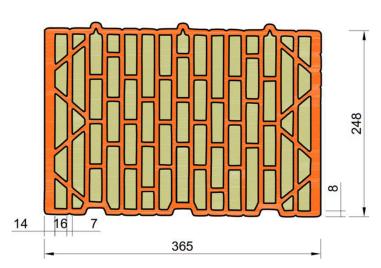


## Brick type: Hollow clay brick Coriso WS07 with insulation

## Table C113: Stone description

Brick type		Hollow clay brick Coriso WS07
Insulationmaterial		Rock wool
Density	ρ [kg/dm³]	≥ 0,55
Normalised mean compressive strenght	f <sub>b</sub> [N/mm²]	≥ 6
Conversion factor for lower strengths	r compressive	$(f_b / 6)^{0,5} \le 1,0$
Code		EN 771-1:2011+A1:2015
Producer (Country)		e.g. Unipor (DE)
Brick dimensions	[mm]	248 x 365 x 249
Drilling method		Rotary drilling





#### Table C114: Installation parameter

Anchor size			M8	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque	Tinst	[Nm]	≤ 5	≤ 5	≤ 10	≤ 10	≤ 5	≤ 5	≤ 5	
Char. Edge distance	Ccr	[mm]	nm] 120 (for shear loads perpendicular to the free edge: c <sub>cr</sub> = 250)				250)			
Minimum Edge Distance	Cmin	[mm]	50							
Characteristic Spacing	Scr, II	[mm]	250							
Characteristic Spacing	Scr, ⊥	[mm]	250							
Minimum Spacing	Smin, II;	[mm]	50							
Willimani Spacing	Smin, ⊥	[111111]	30							

#### Table C115: Reduction factors for single anchors at the edge

Tension load				Shear load						
Tension load			Perpendicular to the free edge			Parallel to the free edge				
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II		
•	50	1,00	<b>→</b>	50	0,30	1   <b>!</b>	50	1,00		
	120	1,00		250	1,00		120	1,00		

# **Performances hollow clay brick Coriso WS07 with insulation**Description of the stone, Installation parameters, Reduction factors

Annex C 35



## Brick type: Hollow clay brick Coriso WS07 with insulation

#### Table C116: Factors for anchor groups under tension load

An	chor position pa	arallel to hor. jo	oint	Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, N	
• •	50	50	1,50		50	50	1,00	
	120	250	2,00		120	250	2,00	

#### Table C117: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint			
Shear load	-	with c ≥	with s ≥	α <sub>g</sub> II,V ⊥	1	with c ≥	with s ≥	$\alpha_{g\perp,V\perp}$
perpendicular	•••	50	50	0,40		50	50	0,40
to the free		250	50	1,00		250	50	1,20
edge		250	250	2,00	1	250	250	2,00
Shear load		with c ≥	with s ≥	α <sub>g</sub> II,V II		with c ≥	with s ≥	α <sub>g ⊥,</sub> ν II
parallel to the	•	50	50	1,65		50	50	1,00
free edge		120	250	2,00		120	250	2,00

#### Table C118: Characteristic values of tension and shear load resistances

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$									
				Use condition								
	d sleeve	Perforated sleeve  Effective Anchorage	. d/d			w/d w/w			d/d w/d w/w			
Anchor size	Anchor size are		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges			
	"	h <sub>ef</sub>	N	$I_{Rk,b} = N_{Rk,p}$	2)	$N_{Rk,b} = N_{Rk,p}^{(2)}$			$V_{Rk,b}^{(2)}$			
		[mm]		[kN]								
		Normali	sed mean d	compressi	ve strengtl	h f <sub>b</sub> ≥6 N/n	nm² 1)					
M8	SH 12	80										
M8 / M10/ IG-M6	SH 16	≥ 85	1,5	1,5	1,5	1,5	1,5	1,5	5,0			
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85		. ,-								

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C113. For stones with higher strengths, the shown values are valid without conversion.

#### **Table C119: Displacements**

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Alichor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δN0	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δvo
M16	all	,	5,10 141R 7 5,5		0,31	0,31*V <sub>Rk</sub> / 3,5	<b>1,5</b> *δvo

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow Clay brick Coriso WS07 with insulation Group factors, characteristic Resistances and Displacements	Annex C 36

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c \, II} = V_{Rk,c} \bot according to Annex C 3$ 

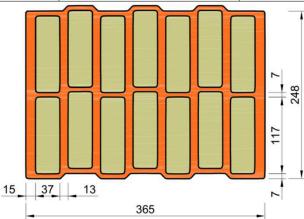


## Brick type: Hollow clay brick T7 MW with insulation

## Table C120: Stone description

Brick type		Hollow clay brick T7 MW
Insulation material		Rock wool
Density	ρ [kg/dm³]	≥ 0,59
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 8
Conversion factor for lowe strengths	$(f_b / 8)^{0.5} \le 1.0$	
Code		EN 771-1:2011+A1:2015
Producer (Country)		e.g. Wienerberger (DE)
Brick dimensions	[mm]	248 x 365 x 249
Drilling method		Rotary drilling





#### Table C121: Installation parameter

	<u> </u>									
Anchor size			M8	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque	T <sub>inst</sub>	[Nm]	≤ 5	≤ 5	≤ 10	≤ 10	≤ 5	≤ 5	≤ 5	
Char. Edge distance	C <sub>cr;</sub> (C <sub>cr,fi</sub> )	[mm]	120 (2 h <sub>ef</sub> )							
(under fire conditions)	Ccr; (Ccr,īi)	[[,,,,,,,]	(for shear loads perpendicular to the free edge: $c_{cr} = 250$ )							
Minimum Edge Distance	Cmin	[mm]	50							
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]			:	250 (4 h <sub>ef</sub>	)			
(under fire conditions)	Scr, ⊥; (Scr,fi, ⊥)	[mm]	m] 250 (4 h <sub>ef</sub> )							
Minimum Spacing	n Spacing s <sub>min, II;</sub> s <sub>min, ⊥</sub> [mm] 50									

#### Table C122: Reduction factors for single anchors at the edge

Tension load			Shear load							
'	ension load		Perpendic	ular to the fr	Paralle	llel to the free edge				
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II		
•	50	1,00	<b></b>	50	0,35	•	50	1,00		
	120	1,00		250	1,00		120	1,00		

## Table C123: Factors for anchor groups under tension load

Anchor position parallel to hor. joint				Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	$\alpha_{g\perp}$ , N	
• •	50	50	1,40	•	50	50	1,15	
	120	250	2,00		120	250	2,00	

## Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

#### Performances hollow clay brick T7 MW with insulation

Description of the stone, Installation parameters, Reductionfactors

Annex C 37

free edge



120

250

2,00

#### Brick type: Hollow clay brick T7 MW with insulation Table C124: Factors for anchor groups under shear load Anchor position parallel to hor. joint Anchor position perpendicular to hor. joint with c ≥ with s ≥ with c ≥ with s ≥ lphag II,V $oldsymbol{\perp}$ $\alpha_{\text{g}}\, \bot,\, \text{V}\, \bot$ Shear load 50 50 0,60 50 50 0,40 perpendicular to the free 250 50 1,55 250 50 1,00 edge 250 250 2,00 250 250 2,00 with c ≥ with s ≥ with c ≥ with s ≥ αg II,V II αg ⊥,V II Shear load parallel to the 50 50 2,00 50 50 1,20

2,00

#### Table C125: Characteristic values of tension and shear load resistances

250

120

				Charac	teristic Res	istances w	ith c≥c <sub>cr</sub> a	and s ≥ s <sub>cr</sub>					
				Use condition									
	eve	Effective Anchorage depth						d/d					
	l se	ffectiv ichora depth		d/d			w/d w/w		w/d				
Anchor size		Effective inchoragi depth		,			VV/ VV						
Andrior size	Perforated sleeve	An							All				
			40°C/24°C	80°C/50°C 1	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature				
									ranges				
		h <sub>ef</sub>	$N_{Rk,b} = N_{Rk,p}^{2)}$			1	$V_{Rk,b}^{(2)}$						
		[mm]				[kN]							
		Normali	sed mean o	compressi	ve strengtl	n f <sub>b</sub> ≥8 N/n	nm² <sup>1)</sup>						
M8	SH 12	80											
M8 / M10/ IG-M6	SH 16	≥ 85	0.0	0.0	4.5		0.0		3,0				
M12 / IG-M8	SH 20	≥ 85	2,0	2,0	1,5	2,0	2,0	1,5					
M16 / IG-M10	SH 20	≥ 85							4,5				

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C120. For stones with higher strengths, the shown values are valid without conversion.

#### Table C126: Displacements

	Anchor size	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
		[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
	M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δ <sub>N0</sub>	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
	M16	all	5,.0	,,-		0,31	0,31*V <sub>Rk</sub> / 3,5	1,5*δ∨0

#### Table C127: Characteristic values of tension and shear load resistances under fire exposure

		Effecitve	Characteristic Resistances  N <sub>Rk,b,fi</sub> = N <sub>Rk,p,fi</sub> = V <sub>Rk,b,fi</sub>					
Anchor size	Perforated	Anchorage depth						
	sleeve	h <sub>ef</sub>	R30	R60	R90	R120		
		[mm]	[kN]					
M8 / M10 /IG-M6	SH 16	130						
M12 / M16 / IG-M8 IG-M10	SH 20	≥ 130	0,64	0,37	0,11	_1)		

<sup>1)</sup> no performance assessed

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick T7 MW with insulation Group factors, characteristic Resistances and Displacements	Annex C 38

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c|I} = V_{Rk,c} \perp according to Annex C 3$ 

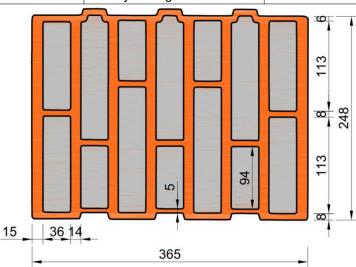


## Brick type: Hollow clay brick T8 P with insulation

## Table C128: Stone description

Brick type		Hollow clay brick T8 P	
Insulation material		Perlite	
Density	ρ [kg/dm³]	≥ 0,56	
Normalised mean compressive strenght	f <sub>b</sub> [N/mm²]	≥ 6	
Conversion factor for lowe strengths	$(f_b / 6)^{0,5} \le 1,0$		
Code		EN 771-1:2011+A1:2015	
Producer (Country)		e.g. Wienerberger (DE)	
Brick dimensions	[mm]	248 x 365 x 249	
Drilling method		Rotary drilling	





#### Table C129: Installation parameter

Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	Tinst	[Nm]	≤ 4	≤ 4	≤ 10	≤ 10	≤ 4	≤ 4	≤ 4		
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: c <sub>cr</sub> = 250)								
Minimum Edge Distance	Cmin	[mm]	50								
	Scr, II	[mm]	250								
Characteristic Spacing	Scr, ⊥	[mm]	250								
Minimum Spacing	[mm]	50									

## Table C130: Reduction factors for single anchors at the edge

Tension load			Shear load							
'	ension load		Perpendic	ular to the fro	ee edge	Parallel to the free edge				
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II		
•	50	1,00	<b>→</b>	50	0,25	1     •	50	1,00		
	120	1,00		250	1,00		120	1,00		

#### Performances hollow clay brick T8 P with insulation

Description of the stone, Installation parameters, Reductionfactors

Annex C 39



## Brick type: Hollow clay brick T8 P with insulation

#### Table C131: Factors for anchor groups under tension load

Anchor position parallel to hor. joint				Anchor position perpendicular to hor. joint			
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	α <sub>g ⊥, N</sub>
• •	50	50	1,30		50	50	1,10
	120	250	2,00		120	250	2,00

#### Table C132: Factors for anchor groups under shear load

	Anchor	Anchor position parallel to hor. joint				Anchor position perpendicular to hor. joint			
Shear load perpendicular to the free edge	+	with c ≥	with s ≥	α <sub>g</sub> II,V ⊥	1	with c ≥	with s ≥	$\alpha_{g\perp,V\perp}$	
	•••	50	50	0,40		50	50	0,30	
		250	50	1,35		250	50	1,20	
		250	250	2,00		250	250	2,00	
Shear load parallel to the free edge		with c ≥	with s ≥	α <sub>g</sub> II,V II		with c ≥	with s ≥	α <sub>g</sub> ⊥,ν II	
	•	50	50	1,70		50	50	1,00	
		120	250	2,00		120	250	2,00	

#### Table C133: Characteristic values of tension and shear load resistances

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$								
			Use condition								
	eve	Effective Anchorage depth					w/d		d/d		
Anchor size	sle	Effective inchoragi depth		d/d			w/w		w/d		
	eq	Eff Inc							w/w		
	orat	•	40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature		
	erfc		40 0/24 0	00 0/30 0	120 0/12 0	40 0/24 0	00 0/30 0	120 0/12 0	ranges		
		h <sub>ef</sub>	$N_{Rk,b} = N_{Rk,p}^{2)}$			1	$N_{Rk,b} = N_{Rk,j}$	2) p	V <sub>Rk,b</sub> <sup>2)</sup>		
		[mm]					[kN]				
		Normali	sed mean o	compressi	ve strengtl	n f <sub>b</sub> ≥ 6 N/r	nm² <sup>1)</sup>				
M8	SH 12	80									
M8 / M10/ IG-M6	SH 16	≥ 85	1,5	1,5	1,5	1,5	1,5	1,5	4,5		
M12 / IG-M8	SH 20	≥ 85									
M16 / IG-M10	SH 20	≥ 85	2,5	2,5	2,0	2,5	2,5	2,0	7,0		

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C128. For stones with higher strengths, the shown values are valid without conversion.

#### **Table C134: Displacements**

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δΝ0	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	,	,		0,31	0,31*V <sub>Rk</sub> / 3,5	1,5*δ∨0

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick T8 P with insulation Group factors, characteristic Resistances and Displacements	Annex C 40

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c \mid I} = V_{Rk,c} \perp$  according to Annex C 3

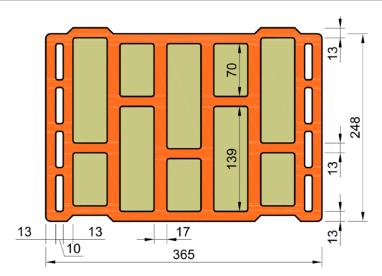


## Brick type: Hollow clay brick Thermoplan MZ90-G with insulation

## Table C135: Stone description

Brick type		Hollow clay brick Thermoplan MZ90-G	
Insulation material		Rock wool	
Density	ρ [kg/dm³]	≥ 0,68	
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 12	
Conversion factor for lowe strengths	$(f_b / 12)^{0.5} \le 1.0$		
Code		EN 771-1:2011+A1:2015	
Producer (Country)		e.g. Mein Ziegelhaus (DE)	
Brick dimensions	[mm]	248 x 365 x 249	
Drilling method		Rotary drilling	





#### Table C136: Installation parameter

1	o pa									
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque	T <sub>inst</sub>	[Nm]	≤ 4	≤ 4	≤ 10	≤ 10	≤ 4	≤ 4	≤ 4	
Char. Edge distance	Ccr	[mm]	120	120 (for shear loads perpendicular to the free edge: $c_{cr} = 250$ )						
Minimum Edge Distance	Cmin	[mm]	50							
Characteristic Spacing	Scr, II	[mm]	250							
Characteristic Spacing	Scr, ⊥	[mm]	250							
Minimum Spacing	Smin, II;	[mm]				50				
William Spacing	Smin, ⊥	[[[]]]				30				

## Table C137: Reduction factors for single anchors at the edge

Tension load			Shear load							
'	ension load		Perpendic	ular to the fr	ee edge	Parallel to the free edge				
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II		
•	50	1,00	<b>→</b>	50	0,25	1     •	50	1,00		
	120	1,00		250	1,00		120	1,00		

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick Thermoplan MZ90-G with insulation Description of the stone, Installation parameters, Reductionfactors	Annex C 41



## Brick type: Hollow clay brick Thermoplan MZ90-G with insulation

#### Table C138: Factors for anchor groups under tension load

Anchor position parallel to hor. joint				Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	$\alpha_{g\perp,N}$	
• •	50	50	1,00		50	50	1,00	
	120	250	2,00		120	250	2,00	

#### Table C139: Factors for anchor groups under shear load

	Anchor	Anchor position parallel to hor. joint				Anchor position perpendicular to hor. joint			
Shear load perpendicular to the free edge	+	with c ≥	with s ≥	α <sub>g</sub> II,V ⊥	1	with c ≥	with s ≥	$\alpha_{g\perp,V\perp}$	
	•••	50	50	0,75		50	50	0,50	
		250	50	2,00		250	50	1,70	
		250	250	2,00		250	250	2,00	
Shear load		with c ≥	with s ≥	α <sub>g</sub> II,V II		with c ≥	with s ≥	α <sub>g</sub> ⊥,ν II	
parallel to the free edge	•	50	50	1,65		50	50	1,15	
		120	250	2,00		120	250	2,00	

#### Table C140: Characteristic values of tension and shear load resistances

1 abic 0140. 0	i iui ucto	istic vai	ucs or ter	ision and	Silcui lou	a i coiota	1003					
				Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$								
		Effective Anchorage depth		Use condition								
Anchor size	d sleeve			d/d			d/d w/d w/w					
	Perforated sleeve		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges			
	"	h <sub>ef</sub>	N	$J_{Rk,b} = N_{Rk,p}$	2)	1	$N_{Rk,b} = N_{Rk,i}$	2) p	V <sub>Rk,b</sub> <sup>2)</sup>			
		[mm]					[kN]					
		Normalis	sed mean c	ompressi	ve strength	f <sub>b</sub> ≥ 12 N/	mm² 1)					
M8	SH 12	80										
M8 / M10/ IG-M6	SH 16	≥ 85	3,0	3,0	2,5	3,0	3,0	2,5	4,0			
M12 / IG-M8	SH 20	≥ 85										
M16 / IG-M10	SH 20	≥ 85	3,5	3,5	3,0	3,5	3,5	3,0	7,5			

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C135. For stones with higher strengths, the shown values are valid without conversion.

#### **Table C141: Displacements**

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δΝο	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	,	,		0,31	0,31*V <sub>Rk</sub> / 3,5	<b>1,5</b> *δvo

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick Thermoplan MZ90-G with insulation Group factors, characteristic Resistances and Displacements	Annex C 42

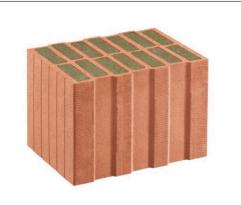
<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c \, II} = V_{Rk,c} \bot according to Annex C 3$ 

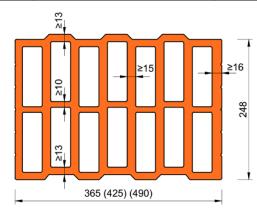


## Brick type: Hollow clay brick Poroton FZ7,5 with insulation

## Table C142: Stone description

Brick type		Hollow clay brick Poroton FZ7,5
Insulation material		Rock wool
Density	ρ [kg/dm³]	≥ 0,70
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 8
Conversion factor for lowe strengths	er compressive	$(f_b / 8)^{0,5} \le 1,0$
Code		EN 771-1:2011+A1:2015
Producer (Country)		e.g. Schlagmann (DE)
Brick dimensions	[mm]	248 x 365 x 249
Drilling method		Rotary drilling





#### Table C143: Installation parameter

	•								
Anchor size	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque	T <sub>inst</sub>	[Nm]	≤ 5	≤ 5	≤ 10	≤ 10	≤ 5	≤ 5	≤ 5
Char. Edge distance (under fire conditions)	Ccr; (Ccr,fi)	[mm]	120 (2 $h_{ef}$ ) (for shear loads perpendicular to the free edge: $c_{cr} = 250$ )						= 250)
Minimum Edge Distance	Cmin	[mm]	50					,	
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]				250 (4 h <sub>ef</sub>	)		
(under fire conditions)	Scr, ⊥; (Scr,fi, ⊥)	[mm]	[mm] 250 (4 h <sub>ef</sub> )						
Minimum Spacing	S <sub>min, II</sub> ; S <sub>min, ⊥</sub> [mm] 50								

#### Table C144: Reduction factors for single anchors at the edge

Tension load			Shear load							
rension load			Perpendic	ular to the fr	ee edge	Parallel to the free edge				
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II		
•	50	1,00	<b></b>	50	0,35	1	50	1,00		
	120	1,00		250	1,00		120	1,00		

## Table C145: Factors for anchor groups under tension load

Anchor position parallel to hor. joint			Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	$lpha_{g\perp}$ , N
• •	50	50	1,40		50	50	1,15
	120	250	2,00		120	250	2,00

#### Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

# **Performances hollow clay brick Poroton FZ7,5 with insulation** Description of the stone, Installation parameters, Reduction factors

Annex C 43

free edge



120

250

2,00

Brick type: Hollow clay brick Poroton FZ7,5 with insulation								
Table C146: Factors for anchor groups under shear load								
Anchor position parallel to hor. joint Anchor position perpendicular to hor. joint								
Shear load perpendicular		with c ≥	with s ≥	α <sub>g</sub> II,V ⊥		with c ≥	with s ≥	$\alpha_{g \perp,  V  \perp}$
	•••	50	50	0,60		50	50	0,40
to the free		250	50	1,55		250	50	1,00
edge	•	250	250	2,00		250	250	2,00
Shear load		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	α <sub>g</sub> ⊥,ν II
parallel to the	•	50	50	2,00		50	50	1,20

2,00

#### Table C147: Characteristic values of tension and shear load resistances

250

120

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$									
				Use condition								
	eve	Effective Anchorage depth					w/d		d/d			
	<u> </u>	ffectiv ichora depth		d/d			w/w		w/d			
A	ğ	ch de de					w/w					
Anchor size	ate	A P							All			
	Perforated sleeve		40°C/24°C	C/24°C   80°C/50°C   1	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature			
									ranges			
	"	h <sub>ef</sub>	$N_{Rk,b} = N_{Rk,p}^{2}$			1	$V_{Rk,b}^{(2)}$					
		[mm]				[kN]						
		Normali	sed mean o	compressi	ve strengtl	h f <sub>b</sub> ≥8 N/n	nm² <sup>1)</sup>					
M8	SH 12	80										
M8 / M10/ IG-M6	SH 16	≥ 85	2.0	2.0	1.5	2.0	0.0	1,5	3,0			
M12 / IG-M8	SH 20	≥ 85	2,0	2,0	1,5	2,0	2,0					
M16 / IG-M10	SH 20	≥ 85							4,5			

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C142. For stones with higher strengths, the shown values are valid without conversion.

#### **Table C148: Displacements**

Anghor size	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δΝ0	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δvo
M16	all	,	,		0,31	0,31*V <sub>Rk</sub> / 3,5	1,5*δ∨0

#### Table C149: Characteristic values of tension and shear load resistances under fire exposure

		Effecitve	Characteristic Resistances					
Anchor size Perforated		Anchorage depth	$N_{Rk,b,fi} = N_{Rk,p,fi} = V_{Rk,b,fi}$					
Anchor size	sleeve	h <sub>ef</sub>	R30	R60	R90	R120		
		[mm]		[kN]				
M8 / M10 /IG-M6	SH 16	130						
M12 / M16 / IG-M8 IG-M10	SH 20	≥ 130	0,64	0,37	0,11	_1)		

<sup>1)</sup> no performance assessed

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick Poroton FZ7,5 with insulation Group factors, characteristic Resistances and Displacements	Annex C 44

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c | II} = V_{Rk,c} \perp$  according to Annex C 3

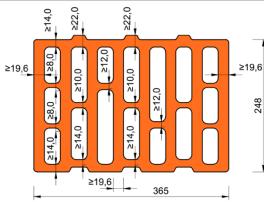


## Brick type: Hollow clay brick Poroton FZ9 with insulation

## Table C150: Stone description

Brick type		Hollow clay brick Poroton FZ9
Insulation material		Rock wool
Density	ρ [kg/dm³]	≥ 0,90
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 10
Conversion factor for lowe strengths	er compressive	$(f_b / 10)^{0.5} \le 1.0$
Code		EN 771-1:2011+A1:2015
Producer (Country)		e.g. Schlagmann (DE)
Brick dimensions	[mm]	248 x 365 x 249
Drilling method		Rotary drilling





#### Table C151: Installation parameter

Anchor size	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	T <sub>inst</sub>	[Nm]	≤ 5	≤ 5	≤ 10	≤ 10	≤ 5	≤ 5	≤ 5	
Char. Edge distance	Ccr; (Ccr,fi)	[mm]				120 (2 h <sub>ef</sub>	,			
(under fire conditions)	Ger; (Ger, 11)	[[,,,,,,,]	(for shear loads perpendicular to the free edge: $c_{cr} = 250$ )							
Minimum Edge Distance	Cmin	[mm]	50							
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]			2	250 (4 h <sub>ef</sub>	•)			
(under fire conditions)	$S_{cr, \perp;}(S_{cr,fi, \perp})$	[mm]	m] 250 (4 h <sub>ef</sub> )							
Minimum Spacing	Smin, II; Smin, ⊥	5.0								

#### Table C152: Reduction factors for single anchors at the edge

Tension load			Shear load							
'	ension load		Perpendic	ular to the fr	ee edge	Parallel to the free edge				
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II		
•	50	1,00	<b>→</b>	50	0,35	]     •   [	50	1,00		
	120	1,00		250	1,00		120	1,00		

#### Table C153: Factors for anchor groups under tension load

An	chor position p	arallel to hor. jo	oint	Anchor position perpendicular to hor. joint			
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	$lpha_{g\perp}$ , N
• •	50	50	1,40		50	50	1,15
	120	250	2,00		120	250	2,00

#### Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

# **Performances hollow clay brick Poroton FZ9 with insulation**Description of the stone, Installation parameters, Reduction factors

Annex C 45



Brick type:	Brick type: Hollow clay brick Poroton FZ9 with insulation											
Table C154: Factors for anchor groups under shear load												
	Anchor	Anchor position parallel to hor. joint Anchor position perpendicular to hor. joint										
Shear load	1	with c ≥	with s ≥	α <sub>g</sub> II,V ⊥	1	with c ≥	with s ≥	$\alpha_{g \perp,  V  \perp}$				
perpendicular	•••	50	50	0,60		50	50	0,40				
to the free		250	50	1,55		250	50	1,00				
edge		250	250	2,00		250	250	2,00				
Shear load parallel to the		with c ≥	with s ≥	αg II,V II	*	with c ≥	with s ≥	αg ⊥,V II				
		50	50	2,00		50	50	1,20				
free edge		120	250	2,00		120	250	2,00				

#### Table C155: Characteristic values of tension and shear load resistances

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$										
				Use condition									
	Perforated sleeve	Effective Anchorage depth					w/d		d/d				
Anchor size	sle	Effective Anchorage depth		d/d			w/u w/w		w/d				
	g	# 5 B					w/w						
	ate	ΑĀ							All				
	ĝ		40°C/24°C	80°C/50°C 1	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature				
	)er								ranges				
	-	h <sub>ef</sub>	N	$J_{Rk,b} = N_{Rk,p}$	2)	1	$N_{Rk,b} = N_{Rk,p}$	2) p	$V_{Rk,b}^{(2)}$				
		[mm]				[kN]							
		Normalis	sed mean c	ompressiv	ve strength	f <sub>b</sub> ≥ 10 N/	mm² 1)						
M8	SH 12	80											
M8 / M10/ IG-M6	SH 16	≥ 85	2.0	2.0	1.5		0.0	4.5	3,0				
M12 / IG-M8	SH 20	≥ 85	2,0	2,0	1,5	2,0	2,0	1,5					
M16 / IG-M10	SH 20	≥ 85							4,5				

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C150. For stones with higher strengths, the shown values are valid without conversion.

#### **Table C156: Displacements**

Anghor size	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δN0	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δvo
M16	all		,		0,31	0,31*V <sub>Rk</sub> / 3,5	1,5*δ∨0

### Table C157: Characteristic values of tension and shear load resistances under fire exposure

		Effecitve	Characteristic Resistances					
Anahar ai-a	Perforated	Anchorage depth	$_{\rm fi}=V_{\rm Rk,b,fi}$					
Anchor size	sleeve	h <sub>ef</sub>	R30	R60	R90	R120		
		[mm]	[kN]					
M8 / M10 /IG-M6	SH 16	130						
M12 / M16 / IG-M8 IG-M10	SH 20	≥ 130	0,64	0,37	0,11	_1)		

<sup>1)</sup> no performance assessed

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick Poroton FZ9 with insulation Group factors, characteristic Resistances and Displacements	Annex C 46

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c | II} = V_{Rk,c} \perp$  according to Annex C 3

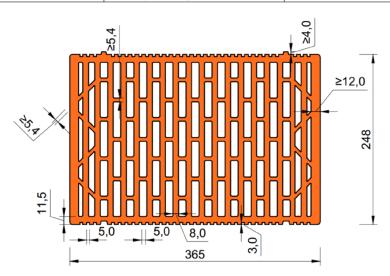


## Brick type: Hollow clay brick Poroton S9 with insulation

## Table C158: Stone description

Brick type		Hollow clay brick Poroton S9
Insulationmaterial		Perlite
Density	ρ [kg/dm³]	≥ 0,85
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 12
Conversion factor for lowe strengths	er compressive	$(f_b / 12)^{0.5} \le 1.0$
Code		EN 771-1:2011+A1:2015
Producer (Country)		e.g. Schlagmann (DE)
Brick dimensions	[mm]	248 x 365 x 249
Drilling method		Rotary drilling





#### Table C159: Installation parameter

1	P									
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque	T <sub>inst</sub>	[Nm]	≤ 5	≤ 5	≤ 10	≤ 10	≤ 5	≤ 5	≤ 5	
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: c <sub>cr</sub> = 250)							
Minimum Edge Distance	Cmin	[mm]	50							
Characteristic Spacing	Scr, II	[mm]	250							
Characteristic Spacing	Scr, ⊥	[mm]	250							
Minimum Spacing	Smin, II;	[mm]	50							
William Spacing	Smin, ⊥	[[[]]]				30				

## Table C160: Reduction factors for single anchors at the edge

Tension load			Shear load							
'	ension load		Perpendic	ular to the fro	ee edge	Parallel to the free edge				
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II		
•	50	1,00	<b>→</b>	50	0,30	1     •	50	1,00		
	120	1,00		250	1,00		120	1,00		

#### Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

# **Performances hollow clay brick Poroton S9 with insulation**Description of the stone, Installation parameters, Reduction factors

Annex C 47



## Brick type: Hollow clay brick Poroton S9 with insulation

### Table C161: Factors for anchor groups under tension load

An	chor position pa	arallel to hor. jo	oint	Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	$\alpha_{g\perp,N}$	
• •	50	50	1,50		50	50	1,00	
	120	250	2,00		120	250	2,00	

#### Table C162: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint			
Shear load perpendicular to the free edge		with c ≥	with s ≥	α <sub>g</sub> II,V ⊥	1	with c ≥	with s ≥	$\alpha_{g\perp,V\perp}$
		50	50	0,40		50	50	0,40
		250	50	1,00		250	50	1,20
		250	250	2,00	.,	250	250	2,00
Shear load parallel to the free edge		with c ≥	with s ≥	α <sub>g</sub> II,V II	•	with c ≥	with s ≥	α <sub>g</sub> ⊥,ν II
	•	50	50	1,65		50	50	1,00
		120	250	2,00		120	250	2,00

#### Table C163: Characteristic values of tension and shear load resistances

				Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$							
		Effective Anchorage depth	Use condition								
	d sleeve		d/d				w/d w/w		d/d w/d w/w		
Anchor size	Perforated sleeve	Ar	40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges		
	L L	h <sub>ef</sub>	N	$J_{Rk,b} = N_{Rk,p}$	2)	1	$N_{Rk,b} = N_{Rk,p}$	2)	<b>V</b> <sub>Rk,b</sub> <sup>2)</sup>		
		[mm]				[kN]					
		Normalis	ed mean c	ompressiv	e strength	f <sub>b</sub> ≥ 12 N/	mm² 1)				
M8	SH 12	80									
M8 / M10/ IG-M6	SH 16	≥ 85	1,5	1,5	1,5	1,5	1,5	1,5	5,0		
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85									

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C158. For stones with higher strengths, the shown values are valid without conversion.

#### **Table C164: Displacements**

Anghar siza	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δN0	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	,	,		0,31	0,31*V <sub>Rk</sub> / 3,5	1,5*δ∨0

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick Poroton S9 with insulation Group factors, characteristic Resistances and Displacements	Annex C 48

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c | II} = V_{Rk,c} \perp$  according to Annex C 3

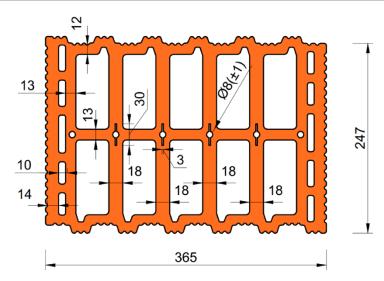


## Brick type: Hollow clay brick Thermopor TV8+ with insulation

## Table C165: Stone description

Brick type		Hollow clay brick Thermopor TV8+	
Insulation material		Rock wool	
Density	ρ [kg/dm³]	≥ 0,70	
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 10	
Conversion factor for lowe strengths	$(f_b / 10)^{0.5} \le 1.0$		
Code		EN 771-1:2011+A1:2015	
Producer (Country)		e.g. THERMOPOR GmbH (DE)	
Brick dimensions	[mm]	248 x 365 x 249	
Drilling method		Rotary drilling	





#### Table C166: Installation parameter

Table 6 1001 metamation parameter										
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque	Tinst	[Nm]	≤ 4	≤ 4	≤ 10	≤ 10	≤ 4	≤ 4	≤ 4	
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: c <sub>cr</sub> = 250)							
Minimum Edge Distance	Cmin	[mm]	50							
Characteristic Spacing	Scr, II	[mm]				250				
Characteristic Spacing	Scr, ⊥	[mm]	250							
Minimum Spacing	Smin, II;	[mm]	50							
William Spacing	Smin, ⊥	[[[]]]				30				

## Table C167: Reduction factors for single anchors at the edge

Description of the stone, Installation parameters, Reductionfactors

Tension load				Shear load							
'	ension load		Perpendic	ular to the fro	ee edge	Parallel to the free edge					
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II			
•	50	1,00	<b>→</b>	50	0,25	1     •	50	1,00			
	120	1,00		250	1,00		120	1,00			

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick Thermopor TV8+ with insulation	Annex C 49



## Brick type: Hollow clay brick Thermopor TV8+ with insulation

## Table C168: Factors for anchor groups under tension load

An	chor position pa	arallel to hor. jo	oint	Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, N	
• •	50	50	1,00		50	50	1,00	
	120	250	2,00		120	250	2,00	

### Table C169: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint			
Shear load	-	with c ≥	with s ≥	α <sub>g</sub> II,V ⊥	1	with c ≥	with s ≥	$\alpha_{g\perp,V\perp}$
perpendicular	•••	50	50	0,75		50	50	0,50
to the free		250	50	2,00		250	50	1,70
edge		250	250	2,00	1	250	250	2,00
Shear load		with c ≥	with s ≥	α <sub>g</sub> II,V II		with c ≥	with s ≥	α <sub>g ⊥,</sub> ν II
parallel to the	•	50	50	1,65		50	50	1,15
free edge		120	250	2,00		120	250	2,00

#### Table C170: Characteristic values of tension and shear load resistances

				Charac	teristic Res	istances w	ith c≥c <sub>cr</sub> a	and s ≥ s <sub>cr</sub>			
	0	Effective Anchorage depth	Use condition								
	d sleeve		d/d				w/d w/w	d/d w/d w/w			
Anchor size	Perforated sleeve	An	40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges		
	L L	h <sub>ef</sub>	$N_{Bk,b} = N_{Bk,p}^{2}$			1	V <sub>Rk,b</sub> <sup>2)</sup>				
		[mm]				[kN]					
		Normalis	ed mean c	ompressiv	e strength	f <sub>b</sub> ≥ 10 N/	mm² 1)				
M8	SH 12	80									
M8 / M10/ IG-M6	SH 16	≥ 85	3,0	3,0	2,5	3,0	3,0	2,5	3,5		
M12 / IG-M8	SH 20	≥ 85									
M16 / IG-M10	SH 20	≥ 85	3,5	3,5	3,0	3,5	3,5	3,0	7,0		

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C165. For stones with higher strengths, the shown values are valid without conversion.

#### **Table C171: Displacements**

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δΝο	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	,	,		0,31	0,31*V <sub>Rk</sub> / 3,5	<b>1,5</b> *δvo

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow clay brick Thermopor TV8+ with insulation Group factors, characteristic Resistances and Displacements	Annex C 50

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c \, II} = V_{Rk,c} \bot according to Annex C 3$ 

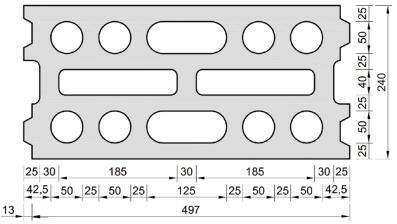


## Brick type: Hollow light weight concrete brick HBL 16DF

#### Table C172: Stone description

Hollow light weight concrete brick HBL 16DF
≥ 1,0
≥ 3,1
$(f_b/3,1)^{0,5} \le 1,0$
EN 771-3:2011+A1:2015
e.g. KLB Klimaleichtblock (DE)
500 x 250 x 240
Rotary drilling





#### Table C173: Installation parameter

Anchor size	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque	T <sub>inst</sub>	[Nm]	≤ 2	≤ 2	≤ 5	≤ 5	≤ 2	≤ 5	≤ 5
Char. Edge distance	C (C 5)	[mm]				120 (2 h <sub>ef</sub>	,		
(under fire conditions)	$c_{cr;}(c_{cr,fi})$ [mm] (for shear loads perpendicular to the free edge: $c_{cr} = 250$ )							= 250)	
Minimum Edge Distance	Cmin	[mm]				50			
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]	500 (4 h <sub>ef</sub> )						
(under fire conditions)	$S_{cr, \perp; (S_{cr,fi, \perp})}$	[mm]	250 (4 h <sub>ef</sub> )						
Minimum Spacing	Smin, II; Smin, ⊥	[mm]	50						

#### Table C174: Reduction factors for single anchors at the edge

٠,	Tension load			Shear load							
'	rension load		Perpendic	ular to the fr	ee edge	Parallel to the free edge					
	with c ≥	αedge, N		with c ≥	αedge, V ⊥		with c ≥	αedge, V II			
•	50	1,00		50	0,30	•	50	1,00			
	120	1,00		250	1,00		120	1,00			

#### Table C175: Factors for anchor groups under tension load

An	chor position pa	arallel to hor. jo	oint	Ancho	r position perp	endicular to ho	r. joint
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, N
• •	50	50	2,00		50	50	1,55
	120	500	2,00		120	250	2,00

#### Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

#### Performances hollow light weight concrete brick HBL 16DF Description of the stone, Installation parameters, Reductionfactors

Annex C 51

free edge



120

250

2,00

#### Brick type: Hollow light weight concrete brick HBL 16DF Table C176: Factors for anchor groups under shear load Anchor position parallel to hor. joint Anchor position perpendicular to hor. joint with c ≥ with s ≥ with s ≥ with c ≥ αg II,V ⊥ $\alpha_{\text{g}}\, \bot,\, \text{V}\, \bot$ Shear load 50 50 0,60 50 50 0,35 perpendicular to the free 120 50 2,00 120 50 1,15 edge 120 500 2,00 120 250 2,00 with c ≥ with s ≥ with c ≥ with s ≥ αg II,V II αg ⊥,V II Shear load 50 50 1,30 parallel to the 50 50 1,00 120 250

2,00

2,00

Table C177: Characteristic values of tension and shear load resistances

500

120

				Charac	cteristic Res	istances w	ith c≥c <sub>cr</sub> a	and s ≥ s <sub>cr</sub>			
	40		Use condition								
	eve	Effective Anchorage depth					w/d		d/d		
	se l	Effective inchorag depth		d/d			w/w		w/d		
Anchor size	g	و خ نظ					•••		w/w		
Perforated sleeve	ate	Ar	A F							All	
	erfor		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature		
									ranges		
		h <sub>ef</sub>	١	$J_{Rk,b} = N_{Rk,p}$	2)	1	$V_{Rk,b}^{(2)}$				
		[mm]				[kN]					
		Normalis	ed mean c	ompressiv	e strength	f <sub>b</sub> ≥ 3,1 N/	mm <sup>2 1)</sup>				
M8 / M10/ IG-M6	SH 16	≥ 85	1,2	1,2	0,9	1,2	1,2	0,9	2,0		
M12 / IG-M8	SH 20	≥ 85	1 5	1.5	1.0	1.5	1 - 1 -	1.0	3,0		
M16 / IG-M10	SH 20	≥ 85	1,5	1,5	1,2	1,5	1,5	1,2	5,0		

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C172. For stones with higher strengths, the shown values are valid without conversion.

#### Table C178: Displacements

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δN0	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	,	, , , , ,		0,31	0,31*V <sub>Rk</sub> / 3,5	1,5*δ∨0

### Table C179: Characteristic values of tension and shear load resistances under fire exposure

		Effecitve		Characteristic F	Resistances		
Anchor size	Perforated	Anchorage depth		$_{\rm fi}=V_{\rm Rk,b,fi}$			
Anchor Size	sleeve		R30	R60	R90	R120	
		[mm]	[kN]				
M8 / M10 / IG-M6	SH 16	130	0,29	0.21	_1)	<b>-1</b> )	
M12 / IG-M8	SH 20	≥ 130	0,29	0,21	-1)	-1)	
M16 / IG-M10	SH 20	≥ 130	0,29	0,21	0,12	<sub>-</sub> 1)	

<sup>1)</sup> no performance assessed

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow light weight concrete brick HBL 16DF Group factors, characteristic Resistances and Displacements	Annex C 52

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c|II} = V_{Rk,c} \perp$  according to Annex C 3

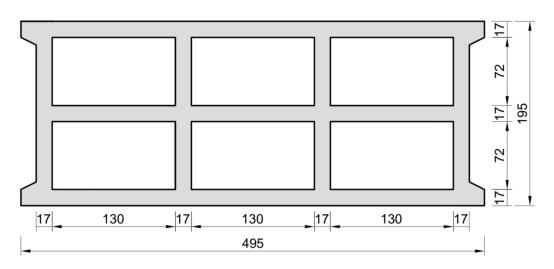


## Brick type: Hollow concrete brick Bloc Creux B40

## Table C180: Stone description

Brick type		Hollow concrete brick Bloc Creux B40
Density	ρ [kg/dm³]	≥ 0,8
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 5,2
Conversion factor for low strengths	er compressive	$(f_b / 5,2)^{0,5} \le 1,0$
Code		EN 772-1
Producer (Country)		e.g. Leroux (FR)
Brick dimensions	[mm]	500 x 200 x 200
Drilling method		Rotary drilling





## Table C181: Installation parameter

	•								
Anchor size		[-]							IG-M10
Installation torque	T <sub>inst</sub>	[Nm]	≤4 ≤4 ≤4 ≤4 ≤4 ≤4						≤ 4
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: ccr = 170)					170)	
Minimum Edge Distance	Cmin	[mm]	50						
Characteristic Spacing	Scr, II	[mm]		170					
Characteristic Spacing	200								
Minimum Spacing		[mm]	50						
Willimum Spacing	Smin, ⊥	[[[]]	50						

## Table C182: Reduction factors for single anchors at the edge

т	ension load		Shear load						
'	ension load		Perpendic	ular to the fro	ee edge	Parallel to the free edge			
	with c ≥	αedge, N		with c ≥	αedge, V ⊥		with c ≥	αedge, V II	
•	50	1,00		50	0,35	<u> </u>   [	50	1,00	
	120	1,00		170	1,00		120	1,00	

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow concrete brick Bloc Creux B40 Description of the stone, Installation parameters, Reductionfactors	Annex C 53



## Brick type: Hollow concrete brick Bloc Creux B40

## Table C183: Factors for anchor groups under tension load

An	chor position pa	arallel to hor. jo	pint	Anchor position perpendicular to hor. joint				
1	with c ≥	with s ≥	αg II, N	ļ	with c ≥	with s ≥	$\alpha_g \perp$ , N	
• •	50	50	1,50		50	50	1,40	
	50	170	2,00		50	200	2,00	
	120	170	2,00	1	120	200	2,00	

## Table C184: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint				
Shear load perpendicular		with c ≥	with s ≥	αg II,V ⊥		with c ≥	with s ≥	$\alpha_g \perp$ , $v \perp$	
	•••	50	50	0,55	•	50	50	0,35	
to the free		120	50	1,30		120	50	0,85	
edge	•	120	170	2,00		120	200	2,00	
Shear load parallel to the free edge		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	αg ⊥,V II	
		50	50	1,10	•	50	50	1,00	
	120	170	2,00	•	50	200	2,00		
lico cago		120	170	2,00		120	200	2,00	

#### Table C185: Characteristic values of tension and shear load resistances

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$										
		Effective Anchorage depth		Use condition									
Anchor size ated	Perfor			d/d			w/d w/w						
	ated	Anc							W/W All				
	sleeve	leeve h <sub>ef</sub>	40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C					
									ranges				
			N	$J_{Rk,b} = N_{Rk,p}$	2)	N	2) p	$V_{Rk,b}^{(2)}$					
		[mm]	[kN]										
		Normalis	ed mean c	ompressiv	e strength	f <sub>b</sub> ≥ 5,2 N/	mm <sup>2 1)</sup>						
M8 / M10/ IG-M6	SH 16	130	2,0	1.5	1.2	2.0	1.5	1.0	60				
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 130	2,0	1,5	1,2	2,0	1,5	1,2	6,0				

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C180. For stones with higher strengths, the shown values are valid without conversion.

#### Table C186: Displacements

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δΝο	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	,	,		0,31	0,31*V <sub>Rk</sub> / 3,5	1,5*δ∨0

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry	
Performances hollow concrete brick Bloc Creux B40 Group factors, characteristic Resistances and Displacements	Annex C 54

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c | II} = V_{Rk,c} \perp$  according to Annex C 3



## Brick type: Solid light weight concrete brick

## Table C187: Stone description

Brick type		Solid light weight concrete brick
Density	ρ [kg/dm³]	≥ 0,6
Normalised mean compressive strenght	f <sub>b</sub> [N/mm²]	≥ 2
Conversion factor for low strengths	er compressive	$(f_b / 2)^{0.5} \le 1.0$
Code		EN 771-3:2011+A1:2015
Producer (Country)		e.g. Bisotherm (DE)
Brick dimensions	[mm]	≥ 240 x 300 x 113
Drilling method		Rotary drilling



## Table C188: Installation parameter

	pa										
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	Tinst	[Nm]	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2		
Char. Edge distance	Ccr	[mm]	150								
Minimum Edge Distance	Cmin	[mm]	60								
Characteristic Specing	Scr, II	[mm]				300					
Characteristic Spacing Scr, 1		[mm]	300								
Minimum Spacing	Smin, II;	[mm]				120					
William Spacing	Smin, ⊥	[[,,,,,,,]	120								

#### Table C189: Reduction factors for single anchors at the edge

,	Tension load		Shear load								
'	i ension ioau		Perpendic	ular to the fr	ee edge	Parallel to the free edge					
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II			
•	60	1,00		60	0,25	<u> </u>	60	0,40			
	150	1,00		150	1,00		100	1,00			

#### Table C190: Factors for anchor groups under tension load

An	chor position pa	arallel to hor. jo	oint	Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	α <sub>g ⊥, N</sub>	
• •	60	120	1,00		60	120	1,00	
	150	300	2,00		150	300	2,00	

#### Table C191: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	. joint	Anchor position perpendicular to hor. joint				
Shear load perpendicular to the free edge		with c ≥	with s ≥	α <sub>g</sub> II,V ⊥		with c ≥	with s ≥	$\alpha_g \perp$ , v $\perp$	
		60	120	0,25		60	120	0,25	
	150	120	1,00		150	120	1,00		
	4	150	300	2,00	· i · · · · · · · · · · · · · · · · · ·	150	300	2,00	
Shear load parallel to the free edge	1	with c ≥	with s ≥	α <sub>g</sub> II,V II		with c ≥	with s ≥	α <sub>g ⊥,</sub> ν II	
		60	120	0,40	\$	60	120	0,40	
		100	120	1,00		100	120	1,00	
		150	300	2,00		150	300	2,00	

## Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

#### Performances solid light weight concrete brick

Description of the stone, Installation parameters, Reduction- and Group factors

Annex C 55



## Brick type: Solid light weight concrete brick

#### Table C192: Characteristic values of tension and shear load resistances

				Chara	starietic Pas	ietancee w	vith c > c	and e > e				
				Characteristic Resistances with c ≥ c <sub>cr</sub> and s ≥ s <sub>cr</sub>								
	i sleeve	Effective Anchorage depth		Use condition								
				d/d			d/d w/d w/w					
Anchor size	Perforated sleeve		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges			
	"	h <sub>ef</sub>		$J_{Rk,b} = N_{Rk,p}$	2)	1	$N_{Rk,b} = N_{Rk,b}$	2) p	V <sub>Rk,b</sub> <sup>2)</sup>			
		[mm]				[kN]	,		,			
	Normalised mean compressive strength f <sub>b</sub> ≥ 2 N/mm <sup>2 1)</sup>											
M8	-	80		•								
M10 / IG-M6	-	90	3,0	2,5	2,0	2,5	2,0	1,5				
M12 / M16 / IG-M8 / IG-M10	-	100							2.0			
M8	SH 12	80							3,0			
M8 / M10/ IG-M6	SH 16	≥ 85	2,5	2,5	2,0	2,5	2,0	1,5				
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85										

<sup>1)</sup> For lower compressive strengths resistances must be multiplied by the conversion factor according to Table C187. For stones with higher strengths, the shown values are valid without conversion.

#### **Table C193: Displacements**

Anghar siza	hef	δη / Ν	δΝο	δN∞	δv / <b>V</b>	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,1	0,1*N <sub>Rk</sub> / 3,5	2*δΝ0	0,3	0,3*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all	-,	, , ,		0,1	0,1*V <sub>Rk</sub> /3,5	1,5*δvo

Fix Master Injection system FIT-Ve 200 or FIT-Wi 200 for masonry

Performances solid light weight concrete brick
Characteristic Resistances and Displacements

Annex C 56

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c|II} = V_{Rk,c} \perp$  according to Annex C 3