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European Technical Assessment Body for construction products



European Technical Assessment

ETA-16/0757 of 20 December 2024

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

This version replaces

Deutsches Institut für Bautechnik

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry

Metal Injection anchors for use in masonry

Adolf Würth GmbH & Co. KG Reinhold-Würth-Straße 12-17 74653 Künzelsau DEUTSCHLAND

Werk 3

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

EAD 330076-01-0604, Edition 10/2022

ETA-16/0757 issued on 15 December 2016

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Specific Part

1 Technical description of the product

The "Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry" is a bonded anchor (injection type) consisting of a mortar cartridge with injection mortar WIT-VM 250 or WIT-NORDIC, 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

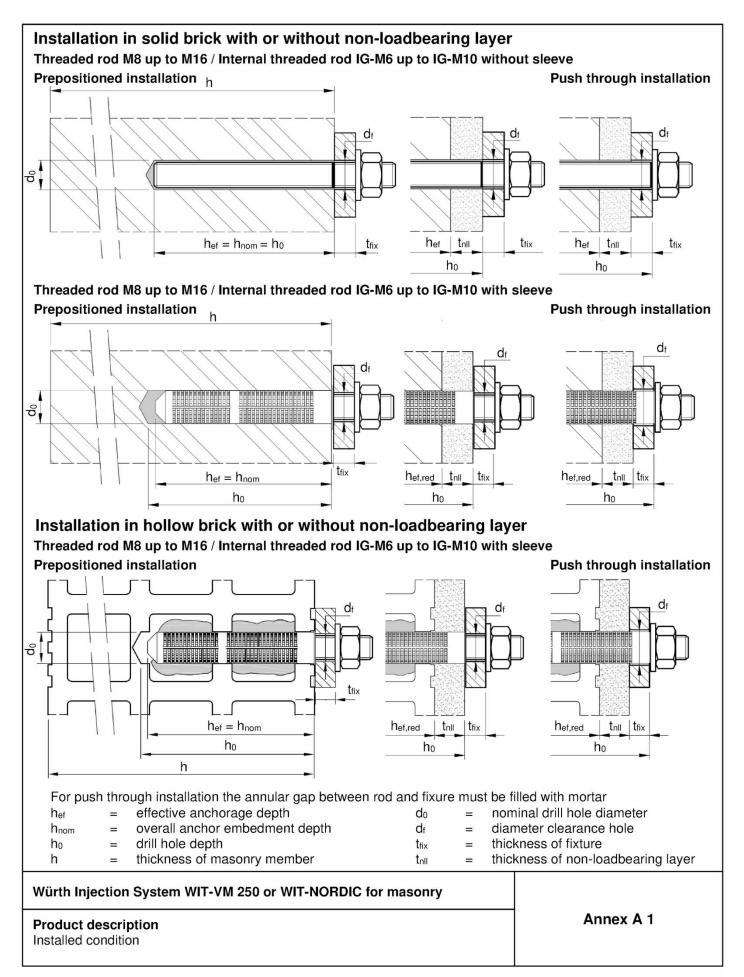
5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document

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 20 December 2024 by Deutsches Institut für Bautechnik

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

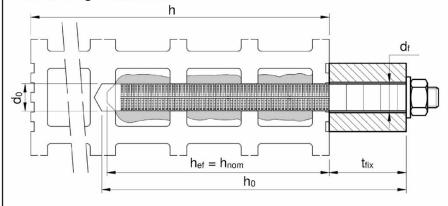


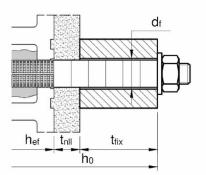




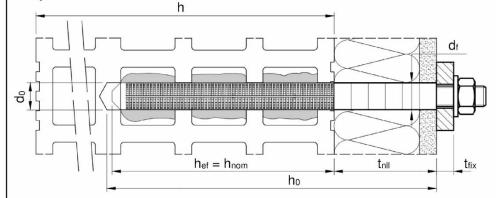
Installation in hollow brick with or without non-loadbearing layer and / or thermal isolation

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

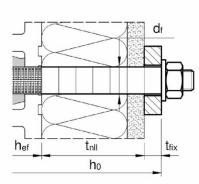




Prepositioned installation



Push through installation



hef = effective anchorage depth

h_{nom} = overall anchor embedment depth

 h_0 = drill hole depth

h = thickness of masonry member

d₀ = nominal drill hole diameter

d_f = diameter clearance hole

t_{fix} = thickness of fixture

t_{nll} = thickness of non-loadbearing layer

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry

Product description

Installed condition

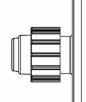
Annex A 2



Cartridge system

Coaxial Cartridge:

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



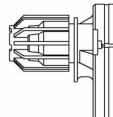
Imprint:

WIT-VM 250 or WIT-NORDIC

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



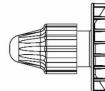
Imprint:

WIT-VM 250 or WIT-NORDIC

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

Foil Tube Cartridge:

165 ml and 300 ml

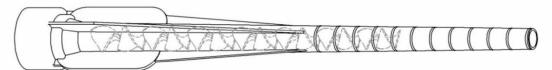


Imprint:

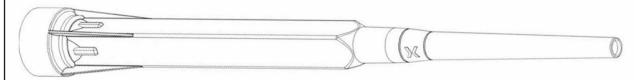
WIT-VM 250 or WIT-NORDIC

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

Static mixer WIT-M 14 W / Fill & Clean



Static mixer WIT-M19 W / WIT-MX



Mixer extension



Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry

Product description

Injection system

Annex A 3



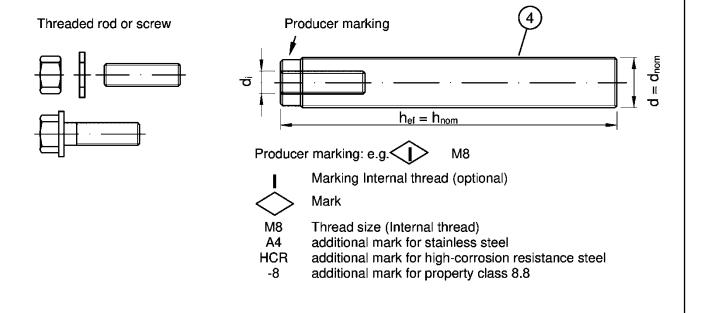
Threaded rod M8 up to M16 with washer and hexagon nut

Mark of the embedment depth Lges hef = hnom 1 3 2

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

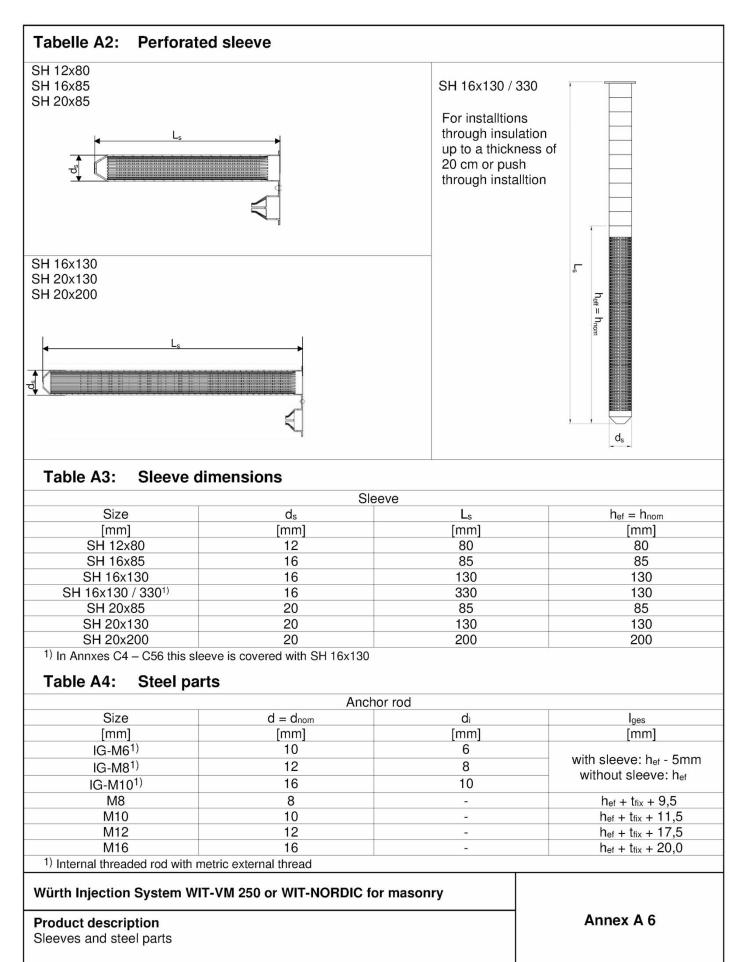


Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Product description Threaded rod and Internal threaded rod	Annex A 4



	ble A1: Materials					
	Designation	Material	1.400	00 0017)		
	el, zinc plated (Steel acc. to nc plated ≥ 5 μm	acc. to EN ISO 4042:202		63:2017)		
- he	ot-dip galvanised ≥ 40 µm	acc. to EN ISO 1461:202 acc. to EN ISO 17668:20	22 and	d EN ISO 10684:2004+AC	0:2009 or	
	·	Property class		Characteristic steel ultimate tensile strength	Characteristic steel yield strength	Elongation a
			4.6	f _{uk} = 400 N/mm ²	f _{Vk} = 240 N/mm ²	A ₅ > 8%
1 Threaded rod				f _{uk} = 400 N/mm ²	f _{VK} = 320 N/mm ²	A ₅ > 8%
	Threaded fou	acc. to		f _{uk} = 500 N/mm²	f _{VK} = 300 N/mm ²	A ₅ > 8%
		EN ISO 898-1:2013		f _{uk} = 500 N/mm ²	f _{VK} = 400 N/mm ²	A ₅ > 8%
				f _{uk} = 800 N/mm ²	f _{Vk} = 640 N/mm ²	A ₅ > 8%
			4	for anchor rod class 4.6	_ , · ·	
2	Hexagon nut	acc. to 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	∩ 7094·200£
			0, EN	Characteristic steel	Characteristic steel	
	Internal threaded	Property class		ultimate tensile strength		fracture
anchor rod ²⁾		acc. to	5.8	f _{uk} = 500 N/mm ²	$f_{yk} = 400 \text{ N/mm}^2$	A ₅ > 8%
		EN ISO 898-1:2013	8.8	f _{uk} = 800 N/mm ²	f _{yk} = 640 N/mm ²	A ₅ > 8%
	inless steel A4 (Material 1.4 h corrosion resistance ste				Characteristic steel	Elongation fracture
	T		50	f _{UK} = 500 N/mm ²	f _{VK} = 210 N/mm ²	A ₅ > 8%
1	Threaded rod ¹⁾	acc. to		f _{uk} = 700 N/mm ²	f _{VK} = 450 N/mm ²	A ₅ > 8%
		EN ISO 3506-1:2020		f _{UK} = 800 N/mm ²	f _{VK} = 600 N/mm ²	A ₅ > 8%
				for anchor rod class 50	yk	5
2	Hexagon nut ¹⁾	acc. to EN ISO 3506-1:2020		for anchor rod class 70		
				for anchor rod class 80		
3	Washer	Stainless steel A2, A4 (e.g.: EN ISO 887:200		CR I ISO 7089:2000, EN ISO		
		Property class		Characteristic steel	Characteristic steel	
4	Internal threaded		50	ultimate tensile strength f _{uk} = 500 N/mm ²	f _{vk} = 210 N/mm ²	fracture A ₅ > 8%
	anchor rod ²⁾	acc. to EN ISO 3506-1:2020		f _{UK} = 700 N/mm ²	$f_{VK} = 450 \text{ N/mm}^2$	$A_5 > 8\%$
ι a	I Property class 80 only for stain Ising internally threaded ancho Ind strength class of the intern Istic perforated sleeve	less steel A4 and HCR or rod screws and threaded	rods (, , , , , , , , , , , , , , , , , , , 	1 7	
	ve sleeve SH			Polypropylene (PP)		
— Wi	irth Injection System WIT		C for	masonrv		
	oduct description				Annex A	5







Specifications of inten	ded use							
Anchorages subject to:	Static and quasi-static loads, fire exposure under tens M8 up to M16, IG-M6 up to IG-M10 (with and without							
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 maso (incl. w/d installation in wet masonry a							

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+ A2:2020 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:
 - $N_{Rk} = N_{Rk,b} = N_{Rk,p} = N_{Rk,b,c} = N_{Rk,p,c}$
 - $V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V_{Rk,c,\perp}$
- For the calculation of pulling out a brick under tension loading N_{Rk,pb} or pushing out a brick under shear loading V_{Rk,pb} see EOTA Technical Report TR 054, Edition July 2022.
- N_{Rk,s}, V_{Rk,s} and M⁰_{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)
 - $V_{Rk,c,j} = 0.15 * V_{Rk,c}$ and $V_{Rk,b,j} = 0.15 * V_{Rk,b}$ ($V_{Rk,b}$ see Annex C 4 to C 56; and $V_{Rk,c}$ 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.

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Intended use Specifications	Annex B 1



	Overview brick elements (Anch			erties with corre	sponding 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		cc. to		Hollow light weigh EN 771-3:2011+A1		cc. to	
AAC ρ = 0,35 - 0,60 ≥ 499x240x249 Table C4 - C10	I	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 con	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	EFF	M8 - M16 IG-M6 - IG-M10	16x130 20x130
	Calcium si	lica bricks	acc. to E	N 771-2:2011+A1:2	015		
KS ρ ≥ 2,0 ≥ 240x115x71 Table C11 - C18		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200			M8 - M16 IG-M6 - IG-M10	16x85 16x130 20x85 20x130
KSL-8DF ρ≥ 1,4 248x240x238 Table C26 - C32	888	M8 - M16 IG-M6 - IG-M10	16x130 20x130 20x200	KSL-12DF ρ≥ 1,4 498x175x238 Table C33 - C40	3333	M8 - M16 IG-M6 - IG-M10	16x130 20x130
	Solid	l clay brick	s acc. to	EN 771-1:2011+A1	: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
Würth Injection S	system WIT-VM 25	0 or WIT-N	ORDIC fo	or masonry			
Intended use Brick types and pro	operties with corres	ponding fas	stening e	lements	An	nex B 2	



Naming Density [kg/dm³] Dimensions LxBxH [mm] Annex	Density [kg/dm³] Dimensions LxBxH [mm] Annex		Anchor rods Page Naming Density [kg/dm³] Dimensions LxBxH [mm] Annex				Perforated	
	Hollov	v clay brick	s 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 p ≥ 0,7 500x200x200 Table C92 - C98		M8 - M16 IG-M6 - IG-M10	12x8 16x8 16x13 20x8 20x13	
Calibric R+ ρ ≥ 0,6 500x200x314 Table C78 - C84		M8 - M16 16x8 IG-M6 - 16x13 IG-M10 20x8	IG-M6 - 16x130	M8 - M16 16x85 16x130 25 1G-M10 20x85 20x130	Blocchi Leggeri p ≥ 0,6 250x120x250 Table C99 - C105		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130
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 brick	s with ther	mal insu	lation acc. to EN 7	71-1:2011+A1:201	5		
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 16x13 20x8 20x13 20x20	
	System WIT-VM 25	0 W/IT N	ODDIC 4					



Table B1:	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	9 1	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				

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Intended use Brick types and properties with corresponding fastening elements	Annex B 4



Table B2:	(without sleeve) for prepositioned or push through installation									
Anchor size				M8	M10	IG-M6	M12	IG-M8	M16	IG-M10
Nominal drill hole	Nominal drill hole diameter		[mm]	10	1	2	1	4		18
Drill hole depth		h ₀	[mm]	h _{ef} + t _{fix} 1)						
Effective anchor	h _{ef}	[mm]	80	1			100	≥ 100		
Diameter of	Prepositioned installation	d _f ≤	[mm]	9	12	7	14	9	18	12
clearance hole in the fixture	Push through installation	d _f ≤	[mm]	12	14	14	16	16	20	20
Maximum install	ation torque	T _{inst}	[Nm]	See Annexes C 4 – C 56						
Minimum thickness of member h _{min} [mm]			[mm]	h _{ef} + 30						
Minimum spacing	Minimum spacing s					Caa An	nexes C	4 C E C		
Minimum edge di	stance	C _{min}	[mm]			See An	nexes C	4 – 0 56		

¹⁾ 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 / M10 / IG-M6			M12 / M16 / IG-M8 / IG-M10			
Perf	12x80	16x85	16x130	16x130/330	20x85	20x130	20x200			
Nominal drill hole diameter	d ₀	[mm]	12	16	16	16	20	20	20	
Drill hole depth	h ₀	[mm]	85	90	135	330	90	135	205	
Effective anchorage depth	h _{ef}	[mm]	80	85	130	130	85	130	200	
Diameter of clearance hole in the fixture	d _f ≤	[mm]	9		7 (IG-M6) VI8) / 12 (I		9 (IG-M8) / 12 (IG-M10) / 14 (M12) / 18 (M16)			
Maximum installation torque	T _{inst}	[Nm]	See Annexes C 4 – C 56							
Minimum thickness of member	h _{min}	[mm]	115	115	195	195	115	195	240	
Minimum spacing	s _{min}	[mm]	See Annexes C 4 – C 56							
Minimum edge distance	c _{min}	[mm]								

Würth Injection System WIT-VM 250 or WIT-NORDIC 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

Anchor size				M10 / M6	M12 / M16 / IG-M8 / IG-M10			
	ı	Perforated sle	16x130	16x130/330	20x130	20x200		
Nominal drill hol	e diameter	d ₀	[mm]	16	16	20	20	
Drill hole depth		h ₀	[mm]		h _{ef} + 5mm	+ t _{nll} + t _{fix} 1)		
Effective embedment	Prepositioned installation	h _{ef}	[mm]	130	130	130	200	
depth	Push through installation	h _{ef}	[mm]	85	130	85	85	
Maximum thickn loadbearing laye		max t _{nll}	[mm]	45 200		45	115	
Diameter of clearance hole	Prepositioned installation	d _f ≤	[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 ≤	[mm]	18		2	22	
Maximum install	T _{inst}	[Nm]		See Annexe	es C 4 – C 56			
Minimum thickne	h _{min}	[mm]	195 (115)	195	195 (115)	240 (115)		
Minimum spacin	S _{min}	[mm]		See Anneye	s C 4 – C 56			
Minimum edge o	distance	c _{min}	[mm]	See Annexes C 4 – C 56				

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

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Intended use Installation parameters	Annex B 6



Table B5: Parameter cleaning and installation tools arrerrer. d_0 d_b $d_{b,min}$ **Anchor rod** Perforated sleeve Drill bit - Ø Brush - Ø min. Brush - Ø HD, CA WIT-[mm] [mm] [mm] [mm] Autoaerted ACC and solid masonry (without sleeve) **M8** 12 10,5 RMB10 10 M10 12 RMB12 14 12,5 M12 14 RMB14 16 14,5 M16 18 RMB18 20 18,5 Solid and hollow masonry (with sleeve) **M8** SH 12x80 12 **RMB12** 14 12,5 SH 16x85 M8 / M10 / IG-M6 SH 16x130 16 **RMB16** 18 16,5 SH 16x130/330 SH 20x85

20

Cleaning and installation tools

SH 20x130

SH 20x200

Hand pump

(Volume ≥ 750 ml)

M12/M16/

IG-M8 / IG-M10



Brush WIT-RMB



Compressed air tool

RMB20

(min 6 bar)



22

20,5

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Intended use Cleaning and installation tools	Annex B 7



Table B6:	Working and	curing time -	- WIT-VM 250
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Temperature in base material			Maximum working time	Minimum curing time 1)		
	Т		t _{work}	t _{cure}		
- 10°C	to	- 6 °C	90 min ²⁾	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			

¹⁾ 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 - WIT-NORDIC

Temperature in base material			Maximum working time	Minimum curing time 1)		
	Т		t _{work}	t _{cure}		
- 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		
Cartridge temperature			-20°C to +10°C			

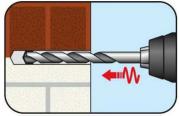
¹⁾ The minimum curing time is only valid for dry base material. In wet base material the curing time must be doubled.

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Intended use Working and curing time	Annex B 8

²⁾ Cartridge temperature must be at minimum +15°C

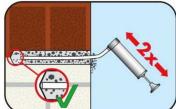


Installation instructions

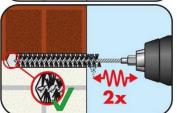


Drill a hole to the required embedment depth with drilling method according to Annex C 4 - C 56.

Drill bit diameter according to Table B5.

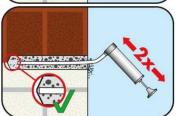


Blow the bore hole clean minimum 2x from the bottom or back by hand pump or compressed air tool (Annex B 7). For applications in solid masonry with a bore hole depth h₀ > 100mm cleaning with compressed air is required.

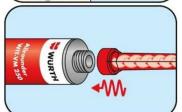


b. Attach brush WIT-RMB according to Table B5 to a drilling machine or a cordless screwdriver.

Brush the bore hole minimum 2x with brush over the entire embedment depth in a twisting motion (if necessary, use a brush extension).



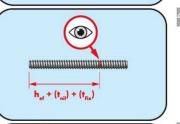
Finally blow the bore hole clean minimum 2x from the bottom or back by hand pump or compressed air tool (Annex B 7). For applications in solid masonry with a bore hole depth $h_0 > 100$ mm cleaning with compressed air is required.



Screw on static-mixing nozzle WIT-M 14 W / WIT-M19 W / WIT-MX, 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_{nll} and/or t_{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.



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).

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry

Intended use

Installation instructions

Annex B 9

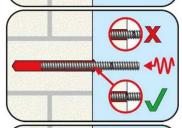


Installation instructions (continuation)

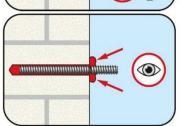
Installation without sleeve



Starting at bottom of the hole and fill the hole up to approximately two-thirds with adhesive. (If necessary, a mixer nozzle extension 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).



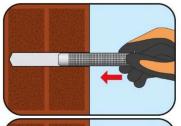
Insert the anchor rod while turning slightly up to the embedment mark.



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 $(h_{\rm ef})$.

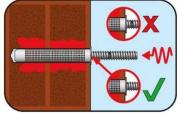
For installation with sleeve SH 16x130/330 through a non-load-bearing layer and/or fixture the clamping area may be reduced to the thickness of the non-load-bearing layer and/or attachment.



Starting from the bottom or back fill the sleeve with mortar. (If necessary, a mixer nozzle extension 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 t_{work} (Annex B 8).



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

Würth Injection System WIT-VM 250 o	or WIT-NORDIC for masonry
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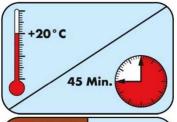
Intended use

Installation instructions (continuation)

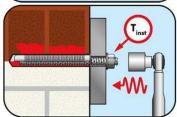
Annex B 10



Installation instructions (continuation)



Temperature related curing time t_{cure} (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).

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry

Intended use
Installation instructions (continuation)

Annex B 11



					Anchor	age	β-Factor						
Base material	anchor	size	Perforate sleeve S		depth		T _a : 40°C / 24°C		24°C	T _b : 80°C / 50°C		T _c : 120°C / 72°C	
			0.00100	. [h _{ef}		(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		all		0	,95	0,86	0,81	0,73	0,81	0,73
	d₀ ≤ 14	mm	with Cli	ı	all.		0	,93	0,80	0,87	0,74	0,65	0,56
0.1.	d₀≥16	mm	with SH		all		0	,93	0,93	0,87	0,87	0,65	0,65
Calcium silica bricks	d₀ ≤ 14	mm	islam.is C		- 100 m		0	,93	0,80	0,87	0,74	0,65	0,56
Diloks	d₀≥16	mm	without S	·	≤ 100 n	irri	0	,93	0,93	0,87	0,87	0,65	0,65
	all siz	es	without S	Н	> 100 n	nm	0	,93	0,56	0,87	0,52	0,65	0,40
			with SH		all		0	,86	0,86	0,86	0,86	0,73	0,73
Clay Bricks	all siz	es	without S	Н	≤ 100 n	nm	0	,93	0,80	0,87	0,74	0,65	0,56
			without S	Н	> 100 n	nm	0	,86	0,43	0,86	0,43	0,73	0,37
	d₀ ≤ 12	mm	with and	1			0	,93	0,80	0,87	0,74	0,65	0,56
Concrete bricks	d₀≥16	mm	without S		all			,93	0,93	0,87	0,87	0,65	0,65
Table C2: C	haracte	ristic	steel resi	stanc	ce								
Anchor size						M8	3	M10	M12	M16	IG-M6	IG-M8	IG-M10
Cross section area				As	[mm²]	36,	6	58	84,3	157	-	-	-
Characteristic tens	sion resis	stance	Steel failu	re ¹⁾					•				
		4.6 aı	nd 4.8 N _{Rk}		s [kN]	15 (1	3)	23 (21)	34	63	_3)	_3)	_3)
Steel, Property class		5.6 aı	nd 5.8	N _{Rk,s}	s [kN]	18 (1	7)	29 (27)	42	78	10	17	29
		8.8	N _{Rk,}			29 (2	27)	46 (43)	67	125	16	27	46
Stainless steel A2,	A4 and	50	N _{Rk}			18	:	29	42	79	_3)	_3)	_3)
HCR, class	AT alla	70		N _{Rk,s}		26	;	41	59	110	14	26	41
(A2 only class 50 a	nd 70)	80	N _{Rk}			29	,	46	67	126	_3)	_3)	_3)
Characteristic tens	sion resis	stance	Partial fac	tor ²⁾								•	
			nd 5.6	γ _{Ms,N}	v [-]			2	2,0			_3)	
Steel, Property clas	S	4.8, 5	5.8 and 8.8	γ _{Ms,N}						1,5			
Stainless steel A2,	A4 and	50		γ _{Ms,N}			2,86				_3)		
HCR, class	A4 and	70		γ _{Ms,N}						1,87			
(A2 only class 50 a	nd 70)	80		γ _{Ms,N}		1,6			· ·		_3)		
Characteristic she	ar resista	ance, S	teel failure	witho	out lever	arm ¹)						
			nd 4.8	V ⁰ Rk	s [kN]	7 (6		12 (10)	17	31	_3)	_3)	_3)
Steel, Property clas	s	5.6 aı	nd 5.8	V ⁰ Rk	.s [kN]	9 (8	3)	15 (13)	21	39	5	9	15
		8.8		V^0_{Rk}	s [kN]	15 (1	3)	23 (21)	34	63	8	14	23
Stainless steel A2,	A4 and	50		V^0_{Rk}	_{.s} [kN]	9		15	21	39	_3)	_3)	_3)
HCR, class		70		V_{Rk}	_{.,s} [kN]	13		20	30	55	7	13	20
(A2 only class 50 and 70)		80		V ⁰ Rk	,s [kN]	15	,	23	34	63	_3)	_3)	_3)
Würth Injection	System \	NIT-VI	M 250 or W	IT-NC	PRDIC fo	r mas	on	ry			_		
Performances β-factors for job s	ito toetin	r undo	r tension lo	he							Anne	x C 1	



Table C2: Characteristic steel resistance (continuation)										
Anchor size				M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Cross section area		As	[mm²]	36,6	58	84,3	157	-	-	-
Characteristic shear resista	nce, Steel failure	with lev	er arm	1)						
	4.6 and 4.8	M ⁰ Rk,s	[Nm]	15 (13)	30 (27)	52	133	_3)	_3)	_3)
Steel, Property class	5.6 and 5.8	М ⁰ Rk,s	[Nm]	19 (16)	37 (33)	65	166	8	19	37
	8.8	М ⁰ Rk,s	[Nm]	30 (26)	60 (53)	105	266	12	30	60
Stainless steel A2, A4 and	50	М ⁰ Rk,s	[Nm]	19	37	66	167	_3)	_3)	_3)
HCR, class	70	М ⁰ Rk,s	[Nm]	26	52	92	232	11	26	52
(A2 only class 50 and 70)	80	M ⁰ Rk,s	[Nm]	30	59	105	266	_3)	_3)	_3)
Characteristic shear resista	ınce, Partial facto	r ²⁾						•		
Stool Property class	4.6 and 5.6	γ _{Ms,V}	[-]		1,67					
Steel, Property class	4.8, 5.8 and 8.8	γ _{Ms,V}	[-]		1,25					
Stainless steel A2, A4 and	50	γMs,V	[-]	2,38					_3)	
HCR, class (A2 only class 50 and 70)	70	γ _{Ms,V}	[-]				1,56			
	80	γ _{Ms,V}	[-]	1,33				_3)		

¹⁾ Values are only valid for the given stress area A_s. Values in brackets are valid for undersized threaded rods with smaller stress area A_s for hot-dip galvanised threaded rods according to EN ISO 10684:2004+AC:2009.

- 2) in absence of national regulation
- 3) Fastener type not part of the ETA

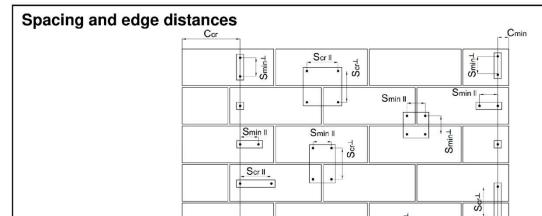
Table C3: Characteristic steel resistance under fire exposure 1)

Anchor size				М8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Characteristic tension resistance, S	teel failui	'e								
	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; Stainless steel A2, A4 and HCR,	R60	$N_{Rk,s,fi}$	[kN]	0,9	1,4	2,3	4,2	0,2	0,9	1,4
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; Stainless steel A2, A4 and HCR,	R60	$V_{Rk,s,fi}$	[kN]	0,9	1,4	2,3	4,2	0,2	0,9	1,4
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	$V_{Rk,s,fi}$	[kN]	0,5	0,8	1,2	2,2	0,1	0,5	0,8
Characteristic shear resistance, Ste	el failure	with lev	er arm	1						
	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 _{Rk,s,fi}	[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 _{Rk,s,fi}	[Nm]	0,7	1,3	2,5	6,3	0,1	0,7	1,3
	R120	M _{Rk,s,fi}	[Nm]	0,5	1,0	1,8	4,7	0,1	0,5	1,0

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

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances	Annex C 2
Characteristic steel resistance under tension and shear load – under fire exposure	





Char. Edge distance Ccr Minimum Edge distance Cmin

Characteristic (minimum) spacing for anchors placed parallel to horizontal joint Scr,II; (Smin,II) =

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

Scr II

Load direction Anchor position	Tensio	n load		arallel to free e V _{II}	Shear load perpendicular to free edge V ⊥		
Anchors parallel to horizontal joint scr,II; (smin,II)		α_g II,N	V	α _g ॥,٧ ॥	V	$\alpha_{g \text{ II,V} \perp}$	
Anchors vertical to horizontal joint $s_{cr,\perp}$; $(s_{min,\perp})$		$\alpha_{g \perp,N}$	V	$\alpha_{g\perp,V\parallel}$	V-•	$\alpha_{\text{g}\perp,\text{V}\perp}$	

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

= Reduction factor for shear loads perpendicular to the free edge for $c_{min} \le c < c_{cr}$ (single anchor) α_{edge,V} ⊥

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

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

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

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

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

= Group factor for anchors parallel to horizontal joint under shear load perpendicular to the free edge $\alpha_{\text{a II.V}}$

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

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

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

 $N^{g}_{Rk} = \alpha_{g,N} * N_{RK,b}$

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

 $V^{g}_{Rk,c II} = \alpha_{g,V II} * V_{Rk,b}$ resp. $V_{Rk,c\perp} = \alpha_{g,V\perp} * V_{Rk,b}$ (for $c \ge c_{min}$)

Group of 4 anchors: N^{g}_{Rk} $= \alpha_g \parallel_{N} * \alpha_g \perp_{N} * \mathbf{N}_{RK,b}$

Group of 2 anchors:

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

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

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.

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances	Annex C 3
Definition of the reduction- and group factors	



Brick type: Autoclaved aerated concrete - AAC

Table C4: Stone description

		9
Brick type		Autoclaved aerated concrete AAC
Density	ρ [kg/dm³]	0,35 – 0,6
Normalised mean compressive strenght	f _b [N/mm²]	≥ 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

Table Co. Instanta	o pu										
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	Tinst	[Nm]	≤ 5	≤ 5	≤ 10	≤ 10	≤ 5	≤ 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, ⊥	[mmm]				50					

Table C6: Reduction factors for single anchors at the edge

Ι ,	ension 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	0,85		50	0,12		50	0,70		
	30	0,83		125	0,50	Ţ	125	0,85		
. je se	150	1,00		210	1,00		150	1,00		

Table C7: Factors for anchor groups under tension load

And	chor position p	arallel to hor. jo	oint	Ancho	r position perp	endicular to ho	r. joint
1	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		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		with c ≥	with s ≥	α _g II,V ⊥	1	with c ≥	with s ≥	$\alpha_{g\perp,V\perp}$	
perpendicular		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	·!1	with c ≥	with s ≥	αg II,V II	+	with c ≥	with s ≥	α _{g ⊥,} 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	

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry

Performances Autoclaved Aerated Concrete - AAC

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

Annex C 4



Table C9: Cl	iai actei	istic vai	ues or ter		shear loa					
	e			Charac	cteristic Res		•	and s≥s _{cr}		
	ee	Effecitve Anchorage depth		Use condition						
	ated s			d/d		w/d w/w		d/d w/d w/w		
Anchor size	Perforated sleeve	Eff Ancl d	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 temperatur ranges	
	ds	h _{ef}	N	I I _{Rk,b} = N _{Rk,p}	1)		$N_{Rk,b} = N_{Rk,b}$	1)	V _{Rk,b} ¹⁾	
	[mm]	[mm]	I`	•нк,b — • •нк,р	<u> </u>	[kN]	**************************************			
Normalis			ssive stren	ght f _b ≥ 2	≥ 0,35 kg/d	lm³				
M8	-	80	1,2	0,9	0,9	0,9	0,9	0,9	1,5	
M10 / 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) $N_{Rk,b,c} = N_{Rk,p,c}$ ar	nd V _{Rk,c II} =	VRk,c⊥aco	cording to An	nex C 3						
				Charac	cteristic Res	istances w	ith c≥c	ands≥s		
) ve	Effecitve Anchorage depth		011414		Use condit		ATTO O O OCT		
	Perforated sleeve		d/d				w/d w/w		d/d w/d w/w	
Anchor size	Perfora	Eff Anc d	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 temperatur ranges	
	ds	h _{ef}		$I_{Rk,b} = N_{Rk,p}$	1)	1	N _{Rk,b} = N _{Rk,}	1)	V _{Rk,b} 1)	
	[mm]	[mm]				[kN]		•		
Normalis	ed mear	compre	ssive stren	ght f _b ≥ 4	N/mm²;		Density ρ	≥ 0,50 kg/d	lm³	
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) $N_{Rk,b,c} = N_{Rk,p,c}$ ar	nd V _{Rk,c II} =	= V _{Rk,c} ⊥aco	cording to An	nex C3						
Würth Injection S	ystem V	/IT-VM 25	0 or WIT-N	IORDIC fo	r masonry					
Performances autoclaved aerated concrete - AAC Characteristic Resistances and Displacements							Annex C 5			



Brick type: Au	toclave	d aerat	ed concr	ete – AA	C							
			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$									
	40			Use condition								
	d sleeve	Effecitve Anchorage depth		d/d			w/d w/w					
Ancnor size	Anchor size Perforated sleeve	erforated Eff 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 _{ef}	N	Jrk,b = Nrk,p	1)	1	$N_{Rk,b} = N_{Rk,b}$	1) p	$V_{Rk,b}^{1)}$			
		[mm]		,		[kN]						
Normalis	ed mear	compre	ssive stren	ight f _b ≥ 6	N/mm²;		Density ρ	≥ 0,60 kg/d	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			

¹⁾ $N_{Rk,b,c} = N_{Rk,p,c}$ and $V_{Rk,c \, II} = V_{Rk,c} \perp$ according to Annex C 3

Table C10: Displacements

Anoboroizo	hef	δ _N / N	δΝο	δN∞	δv / 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 _{Rk} / 2,8	2 *δN0	0,3	0,3*V _{Rk} /2,8	1,5*δ∨0
M16	all	,	0,1 14hk / 2,0	2710	0,1	0,1*V _{Rk} /2,8	1,5*δ∨ο

Würth Injection System WIT-VM 250 or WIT-NORDIC 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	v. v	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	ver	$(f_b / 28)^{0,5} \le 1,0$
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 _{inst}	[Nm]	m] ≤10 ≤10 ≤15 ≤15 ≤10 ≤10 ≤						≤ 10
Char. Edge distance (under fire conditions)	Cer; (Cer,fi)	[mm]	$150 (2 h_{ef})$ (for shear loads perpendicular to the free edge: $c_{cr} = 240$)						240)
Minimum Edge Distance	Cmin	[mm]	60						
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]	240 (4 h _{ef})						
(under fire conditions)	Scr, ⊥; (Scr,fi, ⊥)	[mm]	150 (4 h _{ef})						
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 ¹⁾	0,50		60	0,30		60	0,60	
•	100 ¹⁾	0,50		100	0,50	• [100	1,00	
	150 ¹⁾	1,00		240	1,00		150	1.00	
	180	1,00		240	1,00		130	1,00	

¹⁾ All applications, except for hef = 200mm and without sleeve

Table C14: 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	
60 ¹⁾ 75 150 ¹⁾ 75	0,70	60 ¹⁾	75	1,15				
	75	1,40		150 ¹⁾	75	2,00		
• •	1501)	240	2,00		150 ¹⁾	150	2,00	
	180 ²⁾	180 ²⁾ 75 1,00		180 ²⁾	75	1,15		
	180 ²⁾	240	1,70		180 ²⁾	150	2,00	
	240 ²⁾	240	2,00	1802)		150	2,00	

¹⁾ 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	11	with c ≥	with s ≥	α _g II,V ⊥	1	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	
		150	240	2,00		150	150	2,00	

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry

Performances solid calcium silica brick KS-NF

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

Annex C7

²⁾ Only for application with hef = 200mm 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 $s \ge s_{cr}$								
	l o	<u>. o</u>	Use condition								
	Perforated sleeve	Effecitve Anchorage depth		d/d			w/d		d/d		
	<u>s</u>	fec Short					w/w		w/w (w/d)		
Anchor size	jej	EF 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	temperature		
) j								ranges		
	<u>a</u>	h _{ef}	ľ	$N_{Rk,b} = N_{Rk,p}$	2) p	1	$V_{Rk,b} = N_{Rk,}$	2) p	V _{Rk,b} ²⁾		
		[mm]		[kN]							
		Normalis	ed mean c	ompressi	ve strength	f _b ≥ 28 N/	mm² 1)				
M8	-	80									
M10 / IG-M6	-	≥ 90	7,0	6,5	5,0	6,0	5,5	4,0			
M12 / IG-M8	_	≥ 100							l		
M16 / IG-M10	-	≥ 100	7,0	6,5	5,0	7,0	6,5	5,0			
M10 / M12 / M16 / IG-M6 / IG-M8 /		200	9,0	8,5	6,5	5,5	5,0	4,0	7,0		
IG-M10	_	200	9,0	0,3	6,5	3,5	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			

¹⁾ 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

Anohor sizo	hef	δη / Ν	δΝ0	δN∞	δv / V	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0.4	0,1*N _{Rk} / 3,5	0****	0,3	0,3*V _{Rk} /3,5	1,5*δ∨ο
M16	all	0,1		2*δΝο	0,1	0,1*V _{Rk} /3,5	1,5*δ∨ο

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

						*			
		Effective	Characteristic Resistances						
A mahay aima	Perforated	anchorage depth	$N_{Rk,b,fi} = N_{Rk,p,fi} = V_{Rk,b,fi}$						
Anchor size	sleeve	h _{ef}	R30	R60	R90	R120			
	1	[mm]	[kN]						
M8	-	80							
M10 / IG-M6	-	≥ 90	1 0.40	0,41	0,34	0,30			
M12 / IG-M8	-	≥ 100	0,48			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	0,20	- '/	- 17			

¹⁾ no performance assessed

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances solid calcium silica brick KS-NF Characteristic Resistances and Displacements	Annex C 8

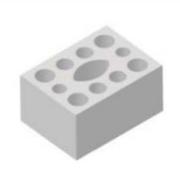
²⁾ $N_{Rk,b,c} = N_{Rk,p,c}$ and $V_{Rk,c \mid I} = V_{Rk,c} \perp$ according to Annex C 3



Brick type: Hollow 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 ²]	≥ 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



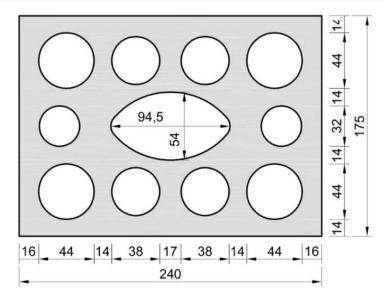


Table C20: Installation parameter

Table 620. Interanati	opu								
Anchor size		[-]	M8	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 _{cr} = 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 opaoing	Smin, ⊥	[]	120						

Table C21: 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		
•	60	1,00		60	0,30	<u> </u>	60	1,00		
	120	1,00		240	1,00		120	1,00		

Würth Injection System WIT-VM 250 or WIT-NORDIC 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

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	
	60	120	1,50		60	120	1,00	
	120	120	2,00		60	120	1,00	
of an annual desired	120	240	2,00		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 ≥	αg⊥, V⊥
perpendicular		60	120	0,30		60	120	0,30
to the free		120	120	1,00		00	120	0,30
edge		120	240	2,00		240	120	2,00
Shear load		with c ≥	with s ≥	αg II,V II	1	with c ≥	with s ≥	αg ⊥,V II
l	••	60	120	1,00	•	60	120	1,00
parallel to the free edge		120	120	1,60		00	120	1,00
nee eage	.;	120	240	2,00		120	120	2,00

Table C24: Characteristic values of tension and shear load resistances

		erforated sleeve Effecitve Anchorage depth		Charac	cteristic Res	sistances w	rith c≥c _{cr} a	and s ≥ s _{cr}					
				Use condition									
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 _{ef}	$N_{Rk,b} = N_{Rk,p}^{2)}$			1	$N_{Rk,b} = N_{Rk,b}$	2) p	V _{Rk,b} ²⁾				
		[mm]				[kN]							
		Normalis	ed mean c	ompressi	ve strength	f _b ≥ 14 N/	mm² 1)						
M8 / M10/	01116	≥ 85	2,5	2,5	1,5	2,5	2,5	1,5	6,0				
IG-M6	SH 16	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				

¹⁾ 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

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

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow calcium silica brick KSL-3DF Group factors, characteristic Resistances and Displacements	Annex C 10

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



Brick type: Hollow Calcium silica brick KSL-8DF

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 ²]	≥ 12
Conversion factor for low compressive strengths	wer	$(f_b / 12)^{0.75} \le 1.0$
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



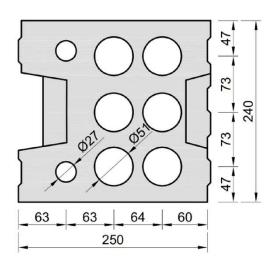


Table C27: Installation parameter

Anchor size		[-]	M8	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 _{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				
William Spacing	Smin, ⊥	[mini]		50						

Table C28: 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		
• 1	50	1,00	→	50	0,30	1	50	1,00		
	120	1,00		250	1,00		120	1,00		

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry

Performances hollow calcium silica brick KSL-8DF

Description of the stone, Installation parameters, Reductionfactors

Annex C 11



120

2,00

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 ≥ with c ≥ with s ≥ αg II, N $\alpha_{g\,\perp,\,N}$ 50 50 1,00 50 50 1,00 120 120

2,00

Table C30:	Factors for	anchor g	roups und	ler shear l	oad				
	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	•••	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 ≥	αg ⊥,V 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

250

	eve	Effecitve Anchorage depth		Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$									
				Use condition									
							w/d		d/d				
	sle	Effecitve Anchorage depth		d/d			w/w		w/d				
Anchor size	g	# 2 0					2000 (F. 1909)		w/w				
Afficitor Size	ate	Ā							All				
	Perforated sleeve	h _{ef}	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				
			N	$N_{Rk,b} = N_{Rk,p}^{(2)}$ $N_{Rk,b} = N_{Rk,p}^{(2)}$ $V_{Rk,b}$									
		[mm]		[kN]									
	,	Normalis	sed mean c	ompressi	ve strength	f _b ≥ 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				

¹⁾ 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 sizo	hef	δη / Ν	δΝο	δN∞	δv / V	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δΝο	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all	,		= 3110	0,31	0,31*V _{Rk} / 3,5	1,5*δ∨0

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow calcium silica brick KSL-8DF Group factors, characteristic Resistances and Displacements	Annex C 12

8.06.04-249/24 Z1000745.24

²⁾ $N_{Rk,b,c} = N_{Rk,p,c}$ 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_b [N/mm 2]	≥ 12
Conversion factor for low strengths	er compressive	$(f_b / 12)^{0.75} \le 1.0$
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



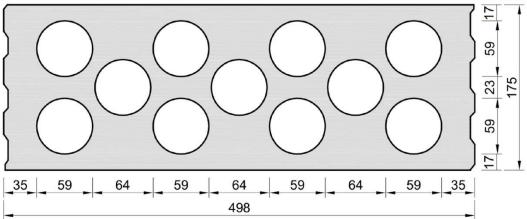


Table C34: Installation parameter

Anchor size			M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Installation torque	Tinst	[Nm]	≤ 4	≤ 4	≤ 5	≤ 5	≤ 4	≤ 5	≤ 5
Char. Edge distance (under fire conditions)	Cer; (Cer,fi)	[mm]	(for s	near load		120 (2 h _{ef} dicular to) the free e	edge: c _{cr} =	= 500)
Minimum Edge Distance	Cmin	[mm]	50						
Characteristic Spacing	Scr, II; (Scr,fi, II)	,fi, II) [mm] 500 (4 hef))		
(under fire conditions)	[mm]	120 (4 h _{ef})							
Minimum Spacing	[mm]	50							

Table C35: Reduction factors for single anchors at the edge

Tension load	k X				Shea	ır load			
			Perpendic	ular to the fr	ee edge	Paralle	Parallel to the free edge		
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II	
•	50	1,00		50	0,45	•	50	1,00	
	120	1,00		500	1,00		120	1,00	

Table C36: Factors for anchor groups under tension load

Anchor position	on parallel to he	or. joint		Anchor position	n perpendicula	ar 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

Würth Injection System	WIT-VM 250 or	r WIT-NORDIC for masonry	1
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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 ≥ α_g II,V \perp $\alpha_g \perp$, $v \perp$ 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 αg II,V II $\alpha_{g\perp,V\mid I}$ 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 $s \ge s_{cr}$							
	e e	a e	Use condition								
	Perforated sleeve	Effecitve Anchorage depth		d/d			w/d		d/d		
	S	e P		a, a			w/w		w/w (w/d)		
Anchor size	ted	Anc d							All		
	ora	1	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		
	Ţ								ranges		
	h _{ef}	N	$J_{Rk,b} = N_{Rk,p}$	2)	1	$V_{Rk,b}^{(2)}$					
		[mm]			[kN]						
		Normalis	ed mean c	ompressi	ve strength	f _b ≥ 12 N/	mm ^{2 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		

¹⁾ 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

Ī	Anchor size	h _{ef}	δ _N / N [mm/kN]	δN0 [mm]	δΝ∞ [mm]	δv / V	δv / V δv0 [mm/kN] [mm] 0,55 0,55*V _{Rk} / 3,5 0,31 0,31*V _{Rk} / 3,5	δ∨∞ [mm]
	M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δN0	•2.000000000000000000000000000000000000		1,5*δvo
	M16	all	1000 8 88 175	**************************************	_ 3110	0,31	0,31*V _{Rk} / 3,5	1,5*δνο

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

	S 0	Effective		Characteristic F	Resistances	30.00
Anahar aiza	Perforated	anchorage depth	$N_{Rk,b,fi} = N_{Rk,p,fi}$	$_{,fi} = V_{Rk,b,fi}$		
Anchor size	sleeve	h _{ef}	R30	R60	R90	R120
		[mm]	[kN]			
M8 / M10 /IG-M6	SH 16	130		2		_1)
M12 / IG-M8	SH 20	≥ 130	0,37	0,27	0,17	-17
M16 / IG-M10	SH 20	≥ 130				0,12

¹⁾ no performance assessed

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow calcium silica brick KSL-12DF Group factors, characteristic Resistances and Displacements	Annex C 14

²⁾ $N_{Rk,b,c} = N_{Rk,p,c}$ 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 _b [N/mm ²]	≥ 20
Conversion factor for low strengths	er compressive	$(f_b / 20)^{0.5} \le 1.0$
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

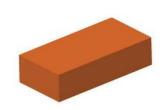


Table C42: Installation parameter

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 _{cr} = 240)						
Minimum Edge Distance	Cmin	[mm]	60						
	Scr, II	[mm]		240					
Characteristic Spacing	Scr, ⊥	[mm]				130			
Minimum Spacing	Smin, II;	[mm]				65			
William Opacing	Smin, ⊥	[]				00			

Table C43: Reduction factors for single anchors at the edge

Tension load			Shear load					
			Perpendicular to the free edge			Parallel to the free edge		
1	with c ≥	αedge, N		with c ≥	αedge, V⊥	1	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

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	
	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 parallel to hor. joint				Anchor position perpendicular to hor. joint			
Shear load	11	with c ≥	with s ≥	α _g II,V ⊥	-1	with c ≥	with s ≥	$\alpha_{g\perp}, v_{\perp}$
perpendicular	•••	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 ≥	αg II,V II		with c ≥	with s ≥	α _{g ⊥,} 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

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances solid clay brick 1DF Description of the stone, Installation parameters, Reduction- and Group factors	Annex C 15



Brick type: Sol	Brick type: Solid clay brick 1DF									
Table C46: Ch	naracte	ristic val	ues of ter	nsion and	shear loa	d resista	nces			
				Charac	cteristic Res	istances w	rith c≥c _{cr} :	and s ≥ s _{cr}		
		40				Use condit	ion			
	e ve	age h					w/d		d/d	
	S e	Effecitve Anchorage depth		d/d			w/u w/w			
Anchor size	Perforated sleeve	Effecitve Anchorage depth							W/W 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		
)er								ranges	
	_	h _{ef}	$N_{Rk,b} = N_{Rk,p}^{2)}$			1	$N_{Rk,b} = N_{Rk,b}$	2) p	V _{Rk,b} ²⁾	
		[mm]	[kN]							
		Normalis	ed mean c	ompressi	ve strength	f _b ≥ 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	

¹⁾ 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	δ _N / N	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 _{Rk} / 3,5	2*δN0	0,3	0,3*V _{Rk} / 3,5	1,5*δνο
M16	all			_ = 5110	0,1	0,1*V _{Rk} /3,5	1,5*δvo

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry

Performances solid clay brick 1DF
Characteristic Resistances and Displacements

Annex C 16

²⁾ $N_{Rk,b,c} = N_{Rk,p,c}$ 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	f _b [N/mm ²]	≥ 28	
Conversion factor for low 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	200	Hammer drilling	

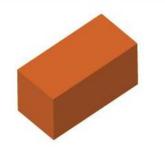


Table C49: Installation parameter

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 (under fire conditions)	Ccr; (Ccr,fi)	[mm]	mm] $150 (2 h_{ef})$ (for shear loads perpendicular to the free edge: $c_{cr} = 240$)				= 240)		
Minimum Edge Distance	Cmin	[mm]							
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]	240 (4 h _{ef})						
(under fire conditions)	Scr, ⊥; (Scr,fi, ⊥)	[mm]	m] 240 (4 h _{ef})						
Minimum Spacing	Smin, II; Smin, ⊥	[mm]	50						

Table C50: Reduction factors for single anchors at the edge

1	Tension load		Shear load pe	rpendicular t	o free edge	Shear load	d parallel to f	ree edge
1	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II
	50 ¹⁾	1,00		50	0,20		50	1.00
	150 ¹⁾	1,00		125	0,50	Ţ	50	1,00
_ 	180	1,00	4	240	1,00] 	150	1,00

¹⁾ All applications, except for hef = 200mm and without sleeve

Table C51: Factors for anchor groups under tension load

An	chor position p	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 ¹⁾	50	1,50		50 ¹⁾	50	0,80	
• •	150 ¹⁾	240	2,00		150 ¹⁾	240	2,00	
	1802)	60	1,00		180 ²⁾	60	1,00	
	180 ²⁾	240	1,55] 4	180 ²⁾	120	2,00	
	240 ²⁾	240	2,00		180-7	120	2,00	

¹⁾ All applications, except for hef = 200mm and without sleeve

Table C52: Factors for anchor groups under shear load

		Visit .						
	Anchor	position pa	rallel to hor.	. joint	Anchor position perpendicular to hor. joint			
Chaorland		with c ≥	with s ≥	α _g II,V ⊥		with c ≥	with s ≥	α _{g ⊥} , v ⊥
Shear load perpendicular		50	50	0,40		50	50	0,20
to the free	•••	240	50	1,20	-	240	50	0,60
edge		240	240	2,00		240	125	1,00
eage		240 22	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		•	240	2,00		50	125	1,00
		150	150 240 2	2,00		150	240	2,00

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry

Performances solid clay brick 2DF

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

Annex C 17

²⁾ 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

Table Cos. Ci	Table C55. Characteristic values of terision and shear load resistances										
				Charac	cteristic Res	istances w	rith c≥c _{cr} :	and s ≥ s _{cr}			
	d sleeve	Perforated sleeve Effecitve Anchorage depth		Use condition							
Auchor size sleeve				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		
		h _{ef}	$N_{Rk,b} = N_{Rk,p}^{(2)}$			1	$\mathbf{V}_{Rk,b} = \mathbf{N}_{Rk,}$	2) p	V _{Rk,b} ²⁾		
		[mm]				[kN]		•			
	Normalised mean compressive strength f _b ≥ 28 N/mm ^{2 1)}										
M8	-	80	0.0	0.0	7.5	0.0	0.0	7.5	0.5		
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 ³⁾		
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			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 ³⁾		

¹⁾ 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

Anchor size	hef	δn / N	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 _{Rk} / 3,5	2*δΝο	0,3	0,3*V _{Rk} / 3,5	1,5*δνο
M16	all	,		2 3110	0,1	0,1*V _{Rk} /3,5	1,5*δνο

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

						•			
		Effecitve							
A	Perforated	Anchorage depth		$N_{Rk,b,fi} = N_{Ri}$	$k_{i,p,fi} = V_{Rk,b,fi}$				
Anchor size	sleeve	h _{ef}	R30	R60	R90	R120			
		[mm]							
M8	-	80							
M10 / IG-M6	-	≥ 90	0.51	0,44	0.06	0.22			
M12 / IG-M8	-	≥ 100	0,51	0,44	0,36	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	30 16	130	0,92	0,74	0,57	0,49			
M12/M16/	SH 20	≥ 85	0,36	0,26	0,15	0,10			
IG-M8 /IG-M10	J 3FI ZU	≥ 130	0,92	0,74	0,57	0,49			

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances solid clay brick 2DF Characteristic Resistances and Displacements	Annex C 18

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

³⁾ Valid for all stone strengths with min. 10 N/mm²



Brick type: Hollow clay brick 10 DF

Table C56: Stone description

Brick type		Hollow clay brick HLZ-10DF	
Density	ρ [kg/dm³]	≥ 1,25	
Normalised mean compressive strenght	f _b [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]	300 x 240 x 249	
Drilling method		Rotary drilling	



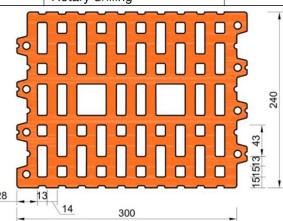


Table C57: Installation parameter

				12		8	S-	33	2/
Anchor size			M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Installation torque	T _{inst}	[Nm]	≤ 5	≤ 10	≤ 10	≤ 10	≤ 5	≤ 5	≤ 10
Char. Edge distance (under fire conditions)	Ccr; (Ccr,fi)	[mm]	(for s	hear load		120 (2 h _{ef} dicular to		dge: c _{cr} =	300)
Minimum Edge Distance	Cmin	[mm]	50						
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]	mm] 300 (4 h _{ef})						
(under fire conditions)	$Scr, \perp; (Scr,fi, \perp)$	[mm]	250 (4 hef)						
Minimum Spacing	Smin, II; Smin, ⊥	[mm]	, ,						

Table C58: Reduction factors for single anchors at the edge

Tension load			Shear load							
1	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		50	0,20	•	50	1,00		
	120	1,00		300	1,00		120	1,00		

Table C59: Factors for anchor groups under tension load

And	chor position pa	arallel to hor. jo	int	Anchor	position perp	endicular to ho	r. joint
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	α _{g ⊥, N}
• •	50	50	1,55		50	50	1,00
	120	300	2,00		120	250	2,00

Würth Injection System WIT-VM 250 or WIT-NORDIC 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 _g II,V ⊥	·	with c ≥	with s ≥	$\alpha_g \perp$, v \perp		
perpendicular		50	50	0,30		50	50	0,20		
to the free		300	50	1,40		300	50	1,00		
edge		300	300	2,00		300	250	2,00		
Shear load		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	α _{g ⊥,} 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

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$									
			Use condition									
	Perforated sleeve	Effective Anchorage depth					w/d		d/d			
d slee ffectiv chora depth			d/d			w/d						
Anchor size	g	# 5 8				2	w/w					
Andrior Size	ate	Ā							All			
	- fo		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			
)er								ranges			
		h _{ef}	$N_{Rk,b} = N_{Rk,p}^{2}$		1	$V_{Rk,b}^{(2)}$						
		[mm]					[kN]					
		Normalis	sed mean c	ompressi	ve strength	f _b ≥ 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			

¹⁾ 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 / V	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δΝο	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all			1110	0,31	0,31*V _{Rk} / 3,5	1,5*δνο

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

		Effecitve	Characteristic Resistances						
Anchor size Perforated		Anchorage depth	$N_{Rk,b,fi} = N_{Rk,p,fi} = V_{Rk,b,fi}$						
Andrior Size	sleeve	h _{ef}	R30	R60	R90	R120			
		[mm]	[kN]						
M8 / M10 /IG-M6	SH 16	130			200				
M12 / M16 / IG-M8 IG-M10	SH 20	≥ 130	0,57	0,39	0,21	0,12			

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow clay brick HLZ 10DF Group factors, characteristic Resistances and Displacements	Annex C 20

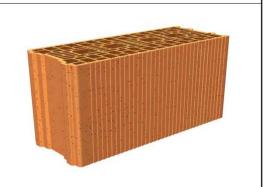
²⁾ $N_{Rk,b,c} = N_{Rk,p,c}$ and $V_{Rk,c | II} = V_{Rk,c} \perp$ according to Annex C 3



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 _b [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



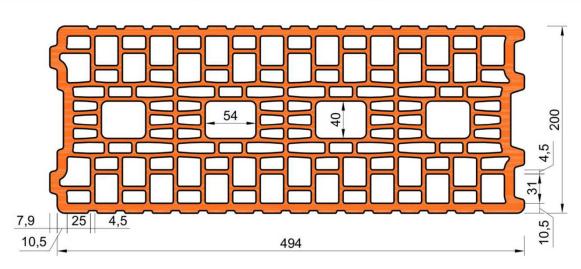


Table C65: Installation parameter

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

Table C66: Reduction factors for single anchors at the edge

Tension load			Shear load							
			Perpendic	ular to the fr	ee edge	Parallel to the free edge				
11	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	I I	120	0,60		
i je e e e e e e e e e e e e e e e e e e	120	1,00	of a second second	500	1,00		200	1,00		

	Würth Injection S	vstem WIT-VM	250 or WIT-NO	ORDIC for masonry
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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 Anchor position parallel to hor. joint Anchor position perpendicular to hor. joint with c ≥ with s ≥ with c ≥ with s ≥ αg II, N $\alpha_{g\perp,\,N}$ 120 100 1,00 120 100 1,00 200 100 2,00 200 100 1,20 120 500 120 300 2,00 2,00

Table C68:	Factors for anchor groups under shear load								
	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	
l cage		120	500	2,00		120	300	2,00	
Shear load		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	α _{g ⊥,} ν II	
parallel to the	•	120	100	1,00		120	100	1,00	
free edge		120	500	2,00		120	300	2,00	

Characteristic values of tension and shear load resistances Table C69: Characteristic Resistances with c ≥ c_{cr} and s ≥ s_{cr} Use condition Effective Anchorage Perforated sleeve d/d w/d d/d w/d w/w w/w Anchor size 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 $N_{Rk,b} = N_{Rk,p}^{(2)}$ $N_{\text{Rk,b}} = N_{\text{Rk,p}}^{2)}$ $V_{Rk,b}^{2)}$ hef [mm] [kN] Normalised mean compressive strength $f_b \ge 10 \text{ N/mm}^2$ **M8** SH 12 3,0 1,2 M8 / M10/ ≥ 85 1,2 3,0 SH 16 IG-M6 130 1,5 3,5 M12 / M16/ ≥ 85 1,2 4,0 SH 20 IG-M8 / IG-M10 ≥ 130 1,5 4,0

Table C70: Displacements

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / V	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δN0	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all		2 4 50 88850 6940		0,31	0,31*V _{Rk} / 3,5	1,5*δvo

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow clay brick Porotherm Homebric Group factors, characteristic Resistances and Displacements	Annex C 22

¹⁾ 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.

²⁾ NRk,b,c = NRk,p,c and VRk,c II = VRk,c \(^{+}\) 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/dm³] ≥ 0,60 Normalised mean f_b [N/mm²] ≥ 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

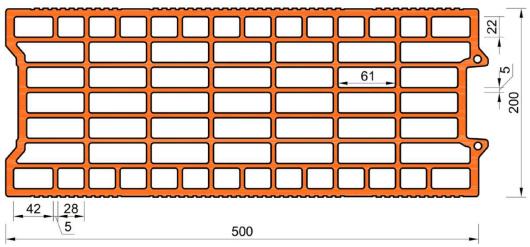


Table C72: Installation parameter									
Anchor size	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque T _{inst}		[Nm]	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: $c_{cr} = 500$)						
Minimum Edge Distance	Cmin	[mm]	120			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

Table C73: 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				
† <u>1</u>	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	Ţ	120	0,60		
	120	1,00	ojananajana dia amand	500	1,00	· į · · · · · · · · · · · · · · · · · ·	250	1,00		

Würth Injection System WIT-VM 250 or WIT-NORDIC 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

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	
	120	100	1,00		120	100	1,00	
	200	100	1,70		200	100	1,10	
of an annual and bearing and	120	500	2,00		120	315	2,00	

Table C75: Factors for anchor groups under shear load

3.5. J. C.								
	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 ≥	αg⊥, V⊥
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 ≥	αg II,V II		with c ≥	with s ≥	α _{g ⊥,} 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

OF STREET, STR		(post-size-size-size-size-size-size-size-size		recorded and the residence of the second	COLUMN TO SERVICE OF THE SERVICE OF THE COLUMN TO SERVICE OF THE COLUMN TO SERVICE OF THE S	Otto De State De Balance de Colonia				
			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$							
	=97	ffecitve ichorage depth	Use condition							
	Perforated sleeve Effecitve Anchorage		d/d				w/d w/w	d/d w/d w/w		
Anchor size		ΑĀ							All	
	for	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	
	e								ranges	
		h _{ef}	١	$N_{Rk,b} = N_{Rk,p}$	$N_{Rk,p}$ $N_{Rk,b} = N_{Rk,p}$			$V_{Rk,b}^{(2)}$		
		[mm]				[kN]				
		Normalis	sed mean d	ompressi	ve strength	f _b ≥ 10 N/	mm² ¹⁾			
M8	SH 12	80		30.	0,	9			3,5	
M8 / M10/	SH 16	≥ 85			0,	9	9			
IG-M6	SH 10	130	2	,0	1,5	2	,0	1,5	4,0	
M12 / M16	SH 20	≥ 85		0,9			-	4,0		
IG-M8 / IG-M10	SH 20	≥ 130	2	,0	1,5	2	,0	1,5	4,0	

¹⁾ 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

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / V	δνο	δ∨∞	
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]	
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δΝο	0,55	0,55*V _{Rk} / 3,5	1,5*δγο	
M16	all	2 100 AT	E YES PROGRESS SECRETARISM STREET STREET		0,31	0,31*V _{Rk} / 3,5	1,5*δvo	

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow clay brick BGV Thermo Group factors, characteristic Resistances and Displacements	Annex C 24

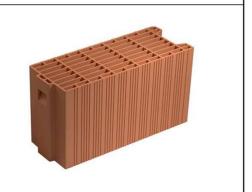
²⁾ $N_{Rk,b,c} = N_{Rk,p,c}$ and $V_{Rk,c \, II} = V_{Rk,c} \perp$ according to Annex C 3



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 _b [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. Leroux (FR)
Brick dimensions	[mm]	500 x 200 x 314
Drilling method		Rotary drilling



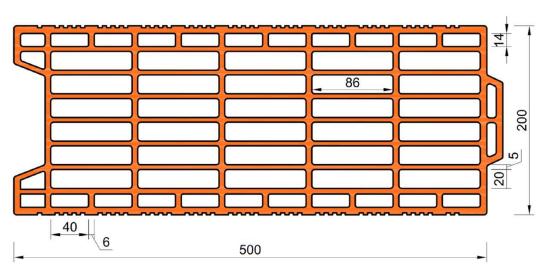


Table C79: Installation parameter

Table 9791 Installation parameter												
Anchor size	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10				
Installation torque	T _{inst}	[Nm]	≤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						
g	Smin, ⊥	[]				0						

Table C80: Reduction factors for single anchors at the edge

Description of the stone, Installation parameters, Reductionfactors

-	Tension load			Shear load							
Tension load			Perpendic	ular to the fr	ee edge	Parallel to the free edge					
11	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II			
	120	1,00		120	0,15		120	0,30			
	120	1,00		250	0,30	Ţ	120	0,50			
	120	1,00		500	1,00		250	1,00			

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow clay brick Calibric R+	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				
1	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	α _{g ⊥, N}	
••	120	100	1,00	•	120	100	1,00	
	175	100	1,70		175	100	1,10	
o francous and decreased	120	500	2,00	1	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		with c ≥	with s ≥	αg II,V ⊥		with c ≥	with s ≥	αg⊥, V⊥
perpendicular to the free	•••	120	100	1,00	•	120	100	1,00
edge		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 ≥	αg ⊥,V 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

		Effective Anchorage depth		Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$								
			Use condition									
Anchor size	Perforated sleeve			d/d			d/d w/d w/w					
	orate		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			
	Perf		10 0/21 0	00 0/00 0	120 0/12 0	10 0/21 0	00 0/00 0	120 0/12 0	ranges			
		h _{ef}	$N_{Rk,b} = N_{Rk,p}^{2)}$			1	V _{Rk,b} ²⁾					
		[mm]		*		[kN]	H					
		Normalis	sed mean o	compressi	ve strengt	h f _b ≥ 12 N	/mm² ¹⁾	-2				
M8	SH 12	80	1,2	1,2	0,9	1,2	1,2	0,9	4,0			
M8 / M10/	SH 16	≥ 85	1,2	1,2	0,9	1,2	1,2	0,9	5,5			
IG-M6	SH 10	130	1,5	1,5	1,2	1,5	1,5	1,2	5,5			
M12 / M16	SH 20	≥ 85	1,2	1,2	0,9	1,2	1,2	0,9	8,5			
IG-M8 /IG-M10	3H 2U	≥ 130	1,5	1,5	1,2	1,5	1,5	1,2	8,5			

¹⁾ 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 / V	δνο	δ∨∞
Alichor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δN0	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all				0,31	0,31*V _{Rk} / 3,5	1,5*δvo

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow Clay brick Calibric R+ Group factors, characteristic Resistances and Displacements	Annex C 26

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



Brick type: Hollow Clay brick Urbanbric Stone description Table C85: Hollow clay brick Brick type Urbanbric Density ≥ 0,70 ρ [kg/dm³] Normalised mean f_b [N/mm²] ≥ 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 9 63 40_ 9,5 560 Table C86: Installation parameter M12 Anchor size M10 IG-M6 IG-M8 IG-M10 [-] **M8** M₁₆ ≤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 ≥ αedge, V⊥ 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

Wurth Injection System WII-VM 250 or WII-NORDIC 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 Anchor position parallel to hor. joint Anchor position perpendicular to hor. joint with c ≥ with s ≥ with c ≥ with s ≥ α_g II, N $\alpha_{g\perp\!\!\!\!\!\perp,\;N}$ 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	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 to the free	•••	120	100	1,00	•	120	100	1,00					
edge		120	560	2,00		120	275	2,00					
Shear load		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	α _g ⊥,ν II					
parallel to the	•	120	100	1,00		120	100	1,00					
free edge		120	560	2,00		120	275	2,00					

Table C90: Characteristic values of tension and shear load resistances													
			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$										
	40	a .		Use condition									
	eve	Effective Anchorage depth					w/d		d/d				
	Se	Effective Inchorage depth		d/d			w/u w/w		w/d				
Anchor size	g	# 5 8							w/w				
Anchor size	Perforated sleeve	ы V	200						All				
			40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C 80°C/50°		120°C/72°C	temperature				
	el G								ranges				
	_		N	$J_{Rk,b} = N_{Rk,p}$	2)	1	$V_{Rk,b}^{(2)}$						
		[mm]				[kN]							
		Normalis	sed mean c	ompressiv	e strength	f _b ≥ 12 N/	mm² 1)						
M8	SH 12	80	1,2	1,2	0,9	1,2	1,2	0,9	4,5				
M8 / M10/	CU 16	CLIAC	SH 16			≥ 85	1,2	1,2	0,9	1,2	1,2	0,9	4,5
IG-M6	SH 10	130	3,0	3,0	2,5	3,0	3,0	2,5	4,5				
M12 / M16	SH 20	CH 20	SH 20	SH 20 ≥ 85	1,2	1,2	0,9	1,2	1,2	0,9	5,0		
IG-M8 / IG-M10		≥ 130	3,0	3,0	2,5	3,0	3,0	2,5	5,0				

¹⁾ 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

=======================================	h c	S / M	2112	e	21/11/	21.12	ç
Anchor size	hef	δN / N	δΝο	δN∞	δv / V	δνο	δ∨∞
	[mm]	[mm/kN]	[mm]	[mm] [mm/kN]		[mm]	[mm]
M8 – M12 /	all		0,13*N _{Rk} / 3,5	2*δΝο	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
IG-M6 – M10		0,13			0,00	O,OO TIKT O,O	1,5 000
M16	all	5		2,5,5,5	0,31	0,31*V _{Rk} / 3,5	1,5*δνο

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow clay brick Urbanbric Group factors, characteristic Resistances and Displacements	Annex C 28

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



Brick type: Hollow Clay brick 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 _b [N/mm²]	≥ 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. Terreal (FR)	
Brick dimensions	[mm]	500 x 200 x 200	
Drilling method		Rotary drilling	



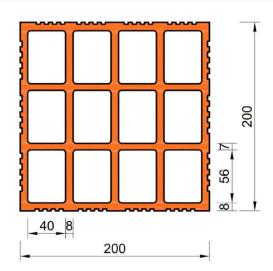


Table C93: Installation parameter

SE SEASON PROPERTY OF THE PROP												
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]	120 (for shear loads perpendicular to the free edge: $c_{cr} = 500$)									
Minimum Edge Distance	Cmin	[mm]	120									
	Scr, II	[mm]	500									
Characteristic Spacing	Scr, ⊥	[mm]		200								
Minimum Spacing	Smin, II;	[mm]	200									
	Smin, ⊥	լուսույ				200						

Table C94: Reduction factors for single anchors at the edge

T	ension load			Shear 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	0,83	1 <u>†</u>	120	1,00	
1		120	1,00		500	1,00		250	1,00	

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow clay brick Brique Creuse C40 Description of the stone, Installation parameters, Reductionfactors	Annex C 29



Anch	nor position				under te	113101			r position	n perpend	dicular to hor.	. joint
	with c ≥	with			Xg II, N				with o	<u> </u>	with s ≥	α _{g ⊥, N}
	120	50	0		2,00				120)	200	2,00
Table C96:	Factors f	or anch	or gr	oups	under sh	ear l	oad					
	Anch	nor positio	n pai	rallel to	hor. joint			And	chor pos	ition perp	endicular to I	nor. joint
Shear load		with	2 ≥	with s	s≥ α _g	II,V ⊥				with c ≥	with s ≥	$\alpha_{g}\bot,v\bot$
perpendicular to the free edge	-	120		500	2,	00				120	200	2,00
Shear load		with	2 ≥	with s	s ≥ α _g	II,V II	H		,	with c ≥	with s ≥	αg ⊥,V II
parallel to the free edge		120		500	500 2,0					120	200	2,00
Table C97:	Characte	ristic va	lues	of ten	sion and	d she	ar Id	oad r	resistar	nces		
		*			Chara	cteris	tic R	esista	ances w	ith c≥c _{cı}	and s ≥ s _{cr}	
	O)	d)						Use	e conditi	on		
Anchor size	d sleev	Effective Anchorage depth		d/d					w/d w/w		d/d w/d w/w	
	Perforated sleeve	An		C/24°C	80°C/50°C	120%	C/72°	°C 40	°C/24°C	80°C/50°0	120°C/72°C	All
	L L	h _{ef}		N	$J_{Rk,b} = N_{Rk}$	2) ,p			N	$J_{Rk,b} = N_R$	2) k,p	V _{Rk,b} ²⁾
		[mm]				1970		500 7 N	[kN]	2000		
NAO	SH 12		sed ı	mean c	ompress	ive st	reng	th f _b	≥ 12 N/ı	mm ^{2 1)}		
M8 / M10/		14450000	-									
IG-M6 M12 / M16 /	SH 16	SANCETTI	-	1,2	1,2		0,9		1,2 1		,2 0,9	1,5
IG-M8 / IG-M1	SH 201	≥ 85										
 For lower corwith higher st N_{Rk,b,c} = N_{Rk,p} Table C98: 	trengths, the	shown valu = V _{Rk,c} ⊥ac	ues ar	e valid v	without con			onver	rsion facto	or accordii	ng to Table C9	2. For stones
Ancho	r size	hef	5000	δη / Ν		N0	\perp	δN∞	200	/ V	δνο	δ∨∞
M8 – 1		[mm	<u> [r</u>	mm/kN]	[m	nm]	+	[mm]		n/kN]	[mm]	[mm]
IG-M6		all		0,13	0,13*N	N _{Rk} / 3	,5	2*δΝ	0,	55	0,55*V _{Rk} / 3,5	5 1,5*δvo
M1	6	all								31	0,31*V _{Rk} / 3,5	5 1,5*δvo
Würth Injectio	on System \	WIT-VM 2	50 oı	r WIT-N	IORDIC fo	or ma	sonr	·v				
		111 6	0			u		,		I		



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 _b [N/mm²]	≥ 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. Wienerberger (IT)	
Brick dimensions	[mm]	250 x 120 x 250	
Drilling method		Rotary drilling	



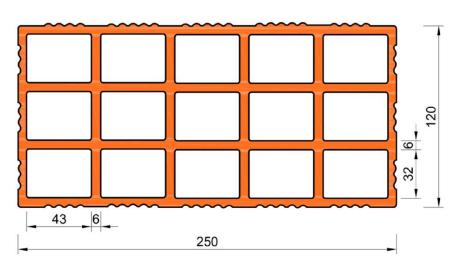


Table C100: Installation parameter

Table 6100. Installation parameter											
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	Tinst	[Nm]	≤2 ≤2 ≤2 ≤2 ≤2 ≤2								
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: $c_{cr} = 250$)								
Minimum Edge Distance	Cmin	[mm]	60								
Characteristic Spacing	Scr, II	[mm]	250								
Characteristic Spacing	Scr, ⊥	[mm]	250								
Minimum Spacing	Smin, II;	[mm]	100								
wiinimum Spacing	Smin, ⊥	[[[]]]	mm] 100								

Table C101: 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		
•	60	1,00		60	0,40	1	60	0,40		
	120	1,00		250	1,00		120	1,00		

Würth Injection System WIT-VM 250 or WIT-NORDIC 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 ≥ αg II, N $\alpha_{g\perp,\,N}$ 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 _g II,V ⊥		with c ≥	with s ≥	α _{g ⊥, V ⊥}	
	•••	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 ≥	αg II,V II		with c ≥	with s ≥	α _{g ⊥,V II}	
	••	60	100	0,40	•	60	100	0,40	
parallel to the 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 $s \ge s_{cr}$									
				Use condition								
Analassaira	Perforated sleeve	Effective Anchorage depth		d/d			d/d w/d w/w					
Anchor size		erforate E 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			
		h _{ef}	N	$J_{Rk,b} = N_{Rk,p}$	2)	1	$N_{Rk,b} = N_{Rk,p}^{2)}$					
		[mm]				[kN]						
		Normalis	sed mean o	ompressi	ve strength	f _b ≥ 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	****						**			

¹⁾ 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 / V	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δΝο	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all	36		21.13	0,31	0,31*V _{Rk} / 3,5	1,5*δνο

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow clay brick Blocchi Leggeri Group factors, characteristic Resistances and Displacements	Annex C 32

²⁾ $N_{Rk,b,c} = N_{Rk,p,c}$ 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 [kg/dm³]	≥ 0,90
Normalised mean compressive strenght	f_b [N/mm 2]	≥ 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



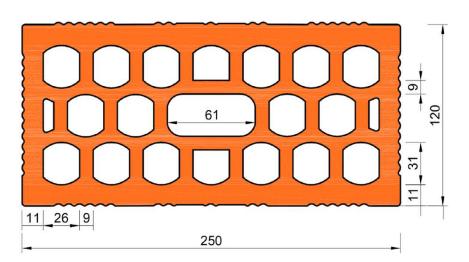


Table C107: Installation parameter

(i) MACHINE ARCHINICATOR (ii) 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1									
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]	120 (for shear loads perpendicular to the free edge: $c_{cr} = 250$)						
Minimum Edge Distance	Cmin	[mm]	100						
Characteristic Spacing	Scr, II	[mm]	250						
Characteristic Spacing	Scr, ⊥	[mm]	120						
Minimum Spacing	Smin, II; Smin, ⊥	[mm]	100						

Table C108: Reduction factors for single anchors at the edge

Tension load			Shear load							
	ension load		Perpendic	ular to the fr	ee edge	Paralle	el to the free	edge		
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II		
•	100	1,00	→→	100	0,50	<u> </u>	100	1,00		
	120	1,00		250	1,00		120	1,00		

Würth Injection System WIT-VM 250 or WIT-NORDIC 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

Anchor position parallel to hor. joint				Ancho	r position perp	endicular to ho	r. joint
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, 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 _g II,V ⊥		with c ≥	with s ≥	αg⊥, V⊥
perpendicular	•••	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 ≥	αg II,V II		with c ≥	with s ≥	αg ⊥,V II
parallel to the	• •	100	100	1,00		100	100	1,00
free edge		120	250	2,00		120	120	2,00

Table C111: Characteristic values of tension and shear load resistances

Tubic OTTIL OF	Tuble 0111. Characteristic values of terision and shear road resistances									
		Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$								
		Use condition								
	Perforated sleeve	Effective Anchorage depth		-17-1			w/d		d/d	
	S	ffectiv chora depth		d/d		w/w			w/d w/w	
Anchor size	l ed	E C							Sota	
	rat	< <							All .	
	<u>و</u>		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	
) el								ranges	
		h _{ef}	N	$J_{Rk,b} = N_{Rk,p}$	2)	1	$N_{Rk,b} = N_{Rk,p}$	2)	$V_{Rk,b}^{(2)}$	
		[mm]				[kN]				
		Normalis	sed mean c	ompressiv	e strength	f _b ≥ 28 N/	mm² ¹⁾			
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								

¹⁾ 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	δΝ0	δN∞	δv / V	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δN0	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all	4m & 2000		_ 5110	0,31	0,31*V _{Rk} / 3,5	1,5*δνο

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow clay brick Doppio Uni Group factors, characteristic Resistances and Displacements	Annex C 34

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



Brick type: Hollow clay brick 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 _b [N/mm²]	≥ 6
Conversion factor for lower strengths	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



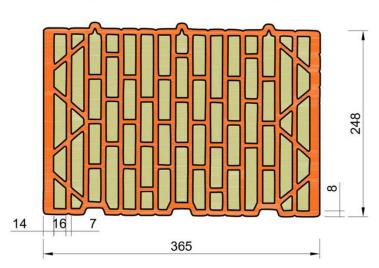


Table C114: Installation parameter

Table Cit ii iiiotanati	p											
Anchor size	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10				
nstallation torque T _{inst} [Nm			≤ 5	≤5 ≤5 ≤10 ≤10 ≤5 ≤5 ≤5								
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]	250									
Minimum Spacing	Smin, II;	[mm]	50									
l willing opacing	Smin, ⊥	firmil		50								

Table C115: 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		50	0,30	<u>†</u>	50	1,00		
	120	1,00		250	1,00		120	1,00		

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	

Performances hollow clay brick Coriso WS07 with insulationDescription 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 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	1,50		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 p	Anchor position perpendicular to hor. joint			
Shear load perpendicular to the free edge		with c ≥	with s ≥	α _g II,V ⊥	·	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 _g II,V II		with c ≥	with s ≥	α _{g ⊥,} ν II	
	•	50	50	1,65		50	50	1,00	
		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 $s \ge s_{cr}$								
		Effective Anchorage depth				Use conditi	on				
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 _{ef}	$N_{Bk,b} = N_{Bk,p}^{2}$			N	$J_{Rk,b} = N_{Rk,p}$	2)	$V_{Rk,b}^{(2)}$		
		[mm]				[kN]					
		Normali	sed mean o	compressi	ve strengtl	n f _b ≥ 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	20								

¹⁾ 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 / V	δνο	δ∨∞
Alichor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δN0	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all	See Specify	1000 P 10		0,31	0,31*V _{Rk} / 3,5	1,5*δνο

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow Clay brick Coriso WS07 with insulation Group factors, characteristic Resistances and Displacements	Annex C 36

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



Brick type: Hollow clay brick 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 _b [N/mm ²]	≥ 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. Wienerberger (DE)
Brick dimensions	[mm]	248 x 365 x 249
Drilling method	-	Rotary drilling



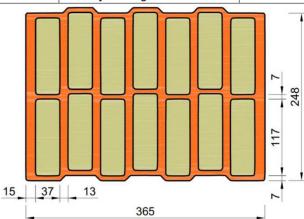


Table C121: Installation parameter

Anchor size	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	T _{inst}	[Nm]	≤ 5	≤ 5	≤ 10	≤ 10	≤ 5	≤ 5	≤ 5	
Char. Edge distance	0 (0 5)	[mm]				120 (2 h _{ef})			
(under fire conditions)	Ccr; (Ccr,fi)	firming	(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 _{ef})			
(under fire conditions)	Scr, ⊥; (Scr,fi, ⊥)	[mm] 250 (4 h _{ef})								
Minimum Spacing	[mm]	50								
10011: 7990	4 3.	7011110								

Table C122: 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		50	0,35	<u> </u>	50	1,00			
	120	1,00		250	1,00		120	1,00			

Table C123: 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	1,40		50	50	1,15	
	120	250	2,00		120	250	2,00	

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry

Performances hollow clay brick T7 MW with insulation

Description of the stone, Installation parameters, Reductionfactors

Annex C 37



Brick type: Hollow clay brick T7 MW with insulation										
Table C124: Factors for anchor groups under shear load										
	Anchor	Anchor position parallel to hor. joint Anchor position perpendicular to hor. joint								
Shear load	41	with c ≥	with s ≥	α _g II,V ⊥	·	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		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	α _{g ⊥,} ν II		
parallel to the	•	50	50	2,00		50	50	1,20		
free edge		120	250	2,00		120	250	2,00		

Table C125: Characteristic values of tension and shear load resistances

				Charac	teristic Res	istances w	ith c≥c _{cr} a	and s≥s _{cr}				
	Perfora	Ferforated sleeve Effective Anchorage		Use condition								
Anchor size			d/d				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			
			$N_{Rk,b} = N_{Rk,p}^{(2)}$			١	J _{Rk,b} = N _{Rk,p}	2)	V _{Rk,b} ²⁾			
		[mm]				[kN]						
	1220	Normali	sed mean d	compressi	ve strengtl	n f _b ≥8N/n	nm² 1)					
M8	SH 12	80										
M8 / M10/ IG-M6	SH 16	≥ 85		0.0			0.0		3,0			
M12 / IG-M8	SH 20	≥ 85	2,0	2,0	1,5	2,0	2,0	1,5	<i>9</i> 7			
M16 / IG-M10	SH 20	≥ 85							4,5			

¹⁾ 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 / V	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δΝο	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all	,		1110	0,31	0,31*V _{Rk} / 3,5	1,5*δνο

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

	ii).	Effecitve	Characteristic Resistances					
Anchor size	Perforated	Anchorage depth						
	sleeve	h _{ef}	R30	R60	R90	R120		
		[mm]	[kN]					
M8 / M10 /IG-M6	SH 16	130		200 1200	man, the gr	200.624		
M12 / M16 / IG-M8 IG-M10	SH 20	≥ 130	0,64	0,37	0,11	_1)		

¹⁾ no performance assessed

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow clay brick T7 MW with insulation Group factors, characteristic Resistances and Displacements	Annex C 38

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



Brick type: Hollow clay brick 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 _b [N/mm ²]	≥ 6
Conversion factor for lowe strengths	er compressive	$(f_b / 6)^{0,5} \le 1,0$
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



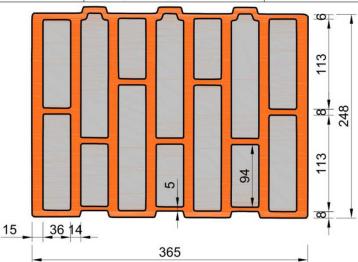


Table C129: Installation parameter

Table 0123. Ilistaliati	on pan	anicici								
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: $c_{cr} = 250$)							
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, ⊥	[min]				30				

Table C130: 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		50	0,25] <u>†</u>	50	1,00		
	120	1,00		250	1,00		120	1,00		

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
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 ≥	αg⊥, N	
• •	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	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint			
Shear load		with c ≥	with s ≥	α _g II,V ⊥	1	with c ≥	with s ≥	$\alpha_{g\perp,V\perp}$
perpendicular to the free edge	•••	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		with c ≥	with s ≥	α _g II,V II		with c ≥	with s ≥	α _g ⊥,ν II
parallel to the free edge	•	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

Table C133. C	iiai acte	istic vai	ues or ter	ision and	Silcai iua	u i coiota	IICES					
				Charac	teristic Res	istances w	rith c≥c _{cr} a	and s ≥ 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			
	L L	h _{ef}	$N_{Rk,b} = N_{Rk,p}^{2)}$			1	$N_{Rk,b} = N_{Rk,j}$	2)	V _{Rk,b} ²⁾			
		[mm]				[kN]						
	_	Normali	sed mean o	compressi	ve strengtl	n f _b ≥ 6 N/r	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	4,5			
M12 / IG-M8	SH 20	≥ 85				20		20				
M16 / IG-M10	SH 20	≥ 85	2,5	2,5	2,0	2,5	2,5	2,0	7,0			

¹⁾ 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

Committee of the contract of t									
Anchor size	hef	δη / Ν	δΝ0	δN∞	δv / V	δνο	δ∨∞		
Afficitor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]		
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δΝο	0,55	0,55*V _{Rk} / 3,5	1,5*δνο		
M16	all				0,31	0,31*V _{Rk} / 3,5	1,5*δνο		

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow clay brick T8 P with insulation Group factors, characteristic Resistances and Displacements	Annex C 40

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



Brick type: Hollow clay brick 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 _b [N/mm²]	≥ 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. Mein Ziegelhaus (DE)
Brick dimensions	[mm]	248 x 365 x 249
Drilling method		Rotary drilling



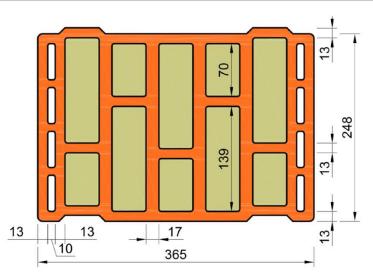


Table C136: Installation parameter

Table 6100. 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: $c_{cr} = 250$)							
Minimum Edge Distance	Cmin	[mm]	50							
Characteristic Spacing	Scr, II	[mm]		250						
Characteristic Spacing	Scr, ⊥	[mm]	mm] 250							
Minimum Spacing	Smin, II;	[mm]	50							
William Spacing	Smin, ⊥	[min]	50							

Table C137: Reduction factors for single anchors at the edge

Tension load				Shear load							
	ension load		Perpendicular to the free edge			Paralle	el to the free	edge			
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II			
• 1	50	1,00	→	50	0,25	1 • <u>•</u>	50	1,00			
	120	1,00		250	1,00		120	1,00			

Würth Injection System WIT-VM 250 or WIT-NORDIC 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 ≥	α _{g ⊥, 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	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint			
Shear load		with c ≥	with s ≥	α _g 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		250	250	2,00
Shear load		with c ≥	with s ≥	α _g II,V II		with c ≥	with s ≥	α _g ⊥,ν II
parallel to the	•	50	50	1,65		50	50	1,15
free edge		120	250	2,00		120	250	2,00

Table C140: Characteristic values of tension and shear load resistances

Tubic OTTO. O	ilaiacte	istic vai	ucs of ter	ision and	Silcui lou	a resista	1003		
				Charac	cteristic Res	istances w	rith c≥c _{cr} a	and s ≥ s _{cr}	
					J	Use condit	ion		
A mala ay aire	Perforated sleeve	Effective Anchorage depth	ffective chorage depth p/p			w/d w/w			d/d w/d w/w
Anchor size	erforate	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
	"	h _{ef}	N	$J_{Rk,b} = N_{Rk,p}$	2)	1	$N_{Rk,b} = N_{Rk,j}$	2)	$V_{Rk,b}^{(2)}$
		[mm]				[kN]			
	_	Normalis	sed mean c	ompressi	ve strength	f _b ≥ 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) 			*		25	
M16 / IG-M10	SH 20	≥ 85	3,5	3,5	3,0	3,5	3,5	3,0	7,5

¹⁾ 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 / V	δνο	δ∨∞
Afficior size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δη0	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all		,		0,31	0,31*V _{Rk} / 3,5	1,5*δνο

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow clay brick Thermoplan MZ90-G with insulation Group factors, characteristic Resistances and Displacements	Annex C 42

²⁾ $N_{Rk,b,c} = N_{Rk,p,c}$ 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 _b [N/mm ²]	≥ 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



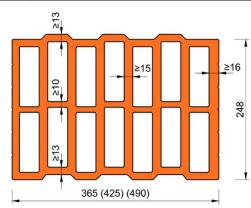


Table C143: Installation parameter

	The state of the s								= //
Anchor size	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque	T _{inst}	[Nm] ≤5 ≤5 ≤10 ≤10 ≤5 ≤5							≤ 5
Char. Edge distance (under fire conditions)	Ccr; (Ccr,fi)	[mm]	$[m]$ 120 (2 h_{ef}) (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 _{ef})		
(under fire conditions)	$S_{cr, \perp; (S_{cr,fi, \perp})}$	[mm]	250 (4 h _{ef})						
Minimum Spacing	Smin, II; Smin, ⊥	[mm]				50			

Table C144: 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	0,35	<u> </u>	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 ≥	αg⊥, N	
• •	50	50	1,40		50	50	1,15	
	120	250	2,00		120	250	2,00	

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry

Performances hollow clay brick Poroton FZ7,5 with insulation

Description of the stone, Installation parameters, Reductionfactors

Annex C 43



Brick type: Hollow clay brick Poroton FZ7,5 with insulation												
Table C146: Factors for anchor groups under shear load												
	Anchor	Anchor position parallel to hor. joint Anchor position perpendicular to hor. joint										
Shear load perpendicular		with c ≥	with s ≥	α _g 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 _{g ⊥,} ν II				
parallel to the	• •	50	50	2,00		50	50	1,20				
free edge		120	250	2,00		120	250	2,00				

Table C147: Characteristic values of tension and shear load resistances

				Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$								
						Use conditi	ion					
	eve	Effective Anchorage depth					w/d		d/d			
	sle	ffectiv ichora depth		d/d			w/w		w/d			
Anchor size	D D	# 5 B					•••		w/w			
Allohol Size	Perforated sleeve Effective Anchorage	ΑĀ							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 _{ef}		N	$J_{Rk,b} = N_{Rk,p}$	2)	1	$N_{Rk,b} = N_{Rk,p}$	2)	V _{Rk,b} ²⁾			
		[mm]				[kN]						
	1221	Normali	sed mean d	compressi	ve strengtl	n f _b ≥8N/n	nm² ¹⁾					
M8	SH 12	80			1000							
M8 / M10/ IG-M6	SH 16	≥ 85	2.0	2.0	1.5	2.0	2.0	1.5	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			

¹⁾ 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

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	0,13	0,13*N _{Rk} / 3,5	2*δN0	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all			7,10	0,31	0,31*V _{Rk} / 3,5	1,5*δνο

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

1			Effective Characteristic Resistances Anchorage depth $N_{Rk,b,fi} = N_{Rk,p,fi} = V_{Rk,b,fi}$						
	Anchor cizo	Perforated							
	Anchor size	sleeve	h _{ef}	R30	R60	R90	R120		
			[mm]	[kN]					
	M8 / M10 /IG-M6	SH 16	130			and the second	2000		
	M12 / M16 / IG-M8 IG-M10	SH 20	≥ 130	0,64	0,37	0,11	_1)		

¹⁾ no performance assessed

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow clay brick Poroton FZ7,5 with insulation Group factors, characteristic Resistances and Displacements	Annex C 44

²⁾ $N_{Rk,b,c} = N_{Rk,p,c}$ 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 _b [N/mm²]	≥ 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



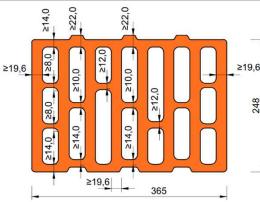


Table C151: Installation parameter

Anchor size	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10			
Installation torque	T _{inst}	[Nm]	≤ 5	≤ 5	≤ 10	≤ 10	≤ 5	≤ 5	≤ 5		
Char. Edge distance	C (C v)	[mm]				120 (2 h _{ef}	•				
(under fire conditions)	Ccr; (Ccr,fi)	[[[]]]	(for shear loads perpendicular to the free edge: $c_{cr} = 250$)								
Minimum Edge Distance	Cmin	[mm]	53		191	50		7282			
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]			2	250 (4 h _{ef})				
(under fire conditions)	$S_{cr, \perp;}(S_{cr,fi, \perp})$	[mm]	nm] 250 (4 h _{ef})								
Minimum Spacing	Smin, II; Smin, ⊥	[mm]				50					

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		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 pa	arallel to hor. jo	int	Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	α _{g ⊥, N}	
• •	50	50	1,40		50	50	1,15	
	120	250	2,00		120	250	2,00	

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry

Performances hollow clay brick Poroton FZ9 with insulationDescription 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	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint							
Shear load	11	with c ≥	with s ≥	α _g II,V ⊥		with c ≥	with s ≥	$\alpha_{g \perp, V \perp}$				
perpendicular to the free	•••	50	50	0,60		50	50	0,40				
		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 _{g ⊥,} ν II				
parallel to the		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								
	eve	Effective Anchorage depth						d/d				
Anchor size	Se	ffectiv ichora depth		d/d			w/d w/w		w/d			
	g	# 5 8					w/w					
Alichor Size	ate	ΑĀ	000-7000-2000-000-000-00-20		W0000000000 1150000000000000000000000000				All			
	ق		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			
d d) er								ranges			
	_	h _{ef}	N	$J_{Rk,b} = N_{Rk,p}$	2)	1	$N_{Rk,b} = N_{Rk,p}$	2)	V _{Rk,b} ²⁾			
		[mm]				[kN]						
	11211	Normalis	sed mean c	ompressiv	ve strength	f _b ≥ 10 N/	mm² 1)					
M8	SH 12	80										
M8 / M10/ IG-M6	SH 16	≥ 85	2.0	2.0	1.5	2.0	2.0	1.5	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			

¹⁾ 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

Anchor size	hef	δN / N	δΝο δΝ∞		δv / V	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δΝο	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all				0,31	0,31*V _{Rk} / 3,5	1,5*δνο

Table C157: 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 _{ef}	R30	R60	R90	R120				
		[mm]	[kN]		7					
M8 / M10 /IG-M6	SH 16	130	100 A 100 CONT	1000 100000	ST00 MJ NO	20/00/27				
M12 / M16 / IG-M8 IG-M10	SH 20	≥ 130	0,64	0,37	0,11	_1)				

¹⁾ no performance assessed

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow clay brick Poroton FZ9 with insulation Group factors, characteristic Resistances and Displacements	Annex C 46

²⁾ $N_{Rk,b,c} = N_{Rk,p,c}$ 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 _b [N/mm ²]	≥ 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



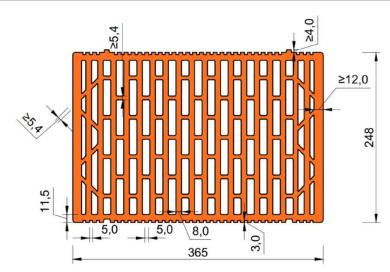


Table C159: Installation parameter

Table Cites interaction	Table 6 1001 motamation 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]	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, ⊥	[mm]	50									

Table C160: Reduction factors for single anchors at the edge

,	ension 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		50	0,30	1 <u>†</u>	50	1,00			
	120	1,00		250	1,00		120	1,00			

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonr	Würth Injection	System \	WIT-VM 250	or WIT-NORDIC	for masonry
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Performances hollow clay brick Poroton S9 with insulationDescription 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

And	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 ≥	α _{g ⊥, 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 _g II,V ⊥		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		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	α _{g ⊥,} ν II	
parallel to the free edge	•	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 $s \ge s_{cr}$										
				Use condition									
Anchor size	Perforated sleeve	Effective Anchorage depth					w/d		d/d				
	sle	Effective Anchorage depth		d/d			w/u w/w		w/d				
	D D	# 5 B					w/w						
	ate	ΑĀ							All				
	l 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				
) el								ranges				
	_	h _{ef}	$N_{Rk,b} = N_{Rk,p}^{2}$			N	$J_{Rk,b} = N_{Rk,p}$	2)	$V_{Rk,b}^{(2)}$				
		[mm]				[kN]							
		Normalis	sed mean c	ompressiv	e strength	f _b ≥ 12 N/ı	mm² 1)						
M8	SH 12	80		3799									
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						20					

¹⁾ 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

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	0,13			0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all	See Specify	1000 P 10		0,31	0,31*V _{Rk} / 3,5	1,5*δνο

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow clay brick Poroton S9 with insulation Group factors, characteristic Resistances and Displacements	Annex C 48

²⁾ $N_{Rk,b,c} = N_{Rk,p,c}$ 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

	175	
Brick type		Hollow clay brick Thermopor TV8+
Insulation material		Rock wool
Density	ρ [kg/dm³]	≥ 0,70
Normalised mean compressive strenght	f _b [N/mm²]	≥ 10
Conversion factor for lowe strengths	r compressive	$(f_b / 10)^{0,5} \le 1,0$
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



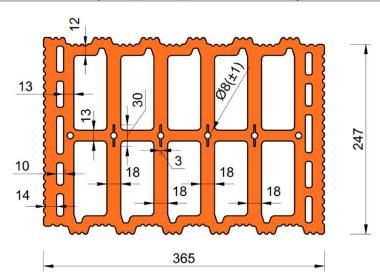


Table C166: Installation parameter

Table 6 1001 Installation parameter									
Anchor size		[-]	[-] M8 M10 M12 M16 IG-M6 IG-M8 IG					IG-M10	
Installation torque	Tinst	[Nm]	≤ 4	≤ 4	≤ 10	≤ 10	≤ 4	≤ 4	≤ 4
Char. Edge distance	Ccr	[mm]	120	(for shear	loads perp	endicular t	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	[mm]	50							
William Spacing	[mini				30				

Table C167: 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	→	50	0,25] <u>•</u> [50	1,00		
	120	1,00		250	1,00		120	1,00		

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow clay brick Thermopor TV8+ with insulation Description of the stone, Installation parameters, Reductionfactors	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	Ancho	r position perp	endicular to ho	r. 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 _g II,V ⊥		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		250	250	2,00
Shear load		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	αg ⊥,V II
parallel to the	• •	50	50	1,65]	50	50	1,15
free edge		120	250	2,00		120	250	2,00

Table C170: Characteristic values of tension and shear load resistances

or section to the section of the sec	1											
				Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$								
			Use condition									
	Perforated sleeve	Effective Anchorage depth					/مأ		d/d			
	<u> </u>	ffectivichora;		d/d			w/d w/w		w/d			
Anchor size	g	Effective Anchorage depth	9				VV/ VV		w/w			
Afficitor size	ate	ΑÆ							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			
	Per								ranges			
		h _{ef}	N	$J_{Rk,b} = N_{Rk,p}$	2)	$N_{Rk,b} = N_{Rk,p}^{2}$			$V_{Rk,b}^{(2)}$			
		[mm]				[kN]						
		Normalis	sed mean c	ompressiv	e strength	ı f _b ≥ 10 N/mm² 1)						
M8	SH 12	80		S 18								
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	20			10		25				
M16 / IG-M10	SH 20	≥ 85	3,5	3,5	3,0	3,5	3,5	3,0	7,0			

¹⁾ 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 / V	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δΝ0	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all	- 77700000		3110	0,31	0,31*V _{Rk} / 3,5	1,5*δνο

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow clay brick Thermopor TV8+ with insulation Group factors, characteristic Resistances and Displacements	Annex C 50

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



Brick type: Hollow light weight concrete brick HBL 16DF

Table C172: Stone description

Brick type		Hollow light weight concrete brick HBL 16DF
Density	ρ [kg/dm³]	≥ 1,0
Normalised mean compressive strenght	f _b [N/mm²]	≥ 3,1
Conversion factor for low strengths	er compressive	$(f_b/3,1)^{0.5} \le 1,0$
Code		EN 771-3:2011+A1:2015
Producer (Country)		e.g. KLB Klimaleichtblock (DE)
Brick dimensions	[mm]	500 x 250 x 240
Drilling method		Rotary drilling



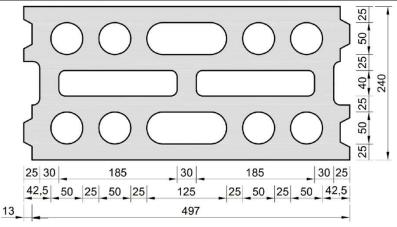


Table C173: Installation parameter

31. Section Production Control											
Anchor size			M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	T _{inst}	[Nm]	≤ 2	≤ 2	≤ 5	≤ 5	≤ 2	≤ 5	≤ 5		
Char. Edge distance (under fire conditions)	Cer; (Cer,fi)	[mm]	120 (2 h _{ef}) (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]	500 (4 h _{ef})								
(under fire conditions)	Scr, ⊥; (Scr,fi, ⊥)	[mm]	250 (4 h _{ef})								
Minimum Spacing	Smin, II; Smin, ⊥	[mm]	50								

Table C174: Reduction factors for single anchors at the edge

_	oneign load		Shear load								
Tension 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 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	2,00		50	50	1,55	
	120	500	2,00		120	250	2,00	

Würth Injection System WIT-VM 250 or WIT-NORDIC 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 ≥ αg II,V⊥ with c ≥ $\alpha_{\text{g}}\,\bot,\,\text{V}\,\bot$ 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

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$									
		ated sleeve Effective Anchorage		Use condition								
	eve					w/d		d/d				
	se Se	ffectiv ichora depth		d/d			w/w		w/d			
Anchor size		풀얼					w/w					
Allohol Size	Perforated sleeve	Ar	40°C/24°C			40°C/24°C			All			
				80°C/50°C	120°C/72°C		80°C/50°C	120°C/72°C	temperature			
									ranges			
		h _{ef}	$N_{Rk,b} = N_{Rk,p}^{2)}$			1	$V_{Rk,b}^{(2)}$					
		[mm]		[kN]								
		Normalis	ed mean c	ompressiv	e strength	f _b ≥ 3,1 N/	mm² 1)					
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	1,5 1,5	1.0	3,0			
M16 / IG-M10	SH 20	≥ 85	1,5	1,5	1,2	1,5		1,2	5,0			

¹⁾ 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 / V	δνο	δ∨∞
Afficitor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δΝο	0,55	0,55*V _{Rk} / 3,5	1,5*δγο
M16	all	000 8 40000	-,	_ = 0140	0,31	0,31*V _{Rk} / 3,5	1,5*δνο

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

	Perforated	Effecitve Anchorage depth	Characteristic Resistances $N_{Rk,b,fi} = N_{Rk,b,fi} = V_{Rk,b,fi}$						
Anchor size	sleeve	h _{ef}	R30	R60	R90	R120			
		[mm]	[kN]						
M8 / M10 / IG-M6	SH 16	130	0,29	0,21	-1)	₋ 1)			
M12 / IG-M8	SH 20	≥ 130	0,29	0,21	-1/	-17			
M16 / IG-M10	SH 20	≥ 130	0,29	0,21	0,12	_1)			

¹⁾ no performance assessed

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow light weight concrete brick HBL 16DF Group factors, characteristic Resistances and Displacements	Annex C 52

²⁾ $N_{Rk,b,c} = N_{Rk,p,c}$ 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_b [N/mm ²]	≥ 5,2	
Conversion factor for low strengths	$(f_b / 5,2)^{0,5} \le 1,0$		
Code		EN 772-1	
Producer (Country)		e.g. Leroux (FR)	
Brick dimensions	[mm]	500 x 200 x 200	
Drilling method		Rotary drilling	



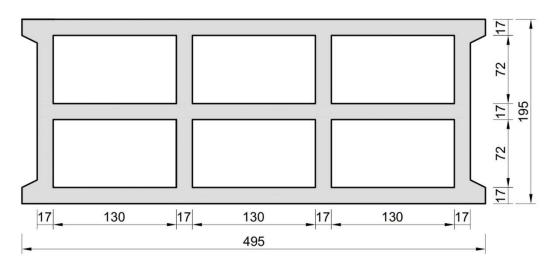


Table C181: Installation parameter

III. MAQAMA NAME - ART CALLATA - A. H. SANTA CALLATAN AND ART CALLA											
Anchor size				M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	Tinst	[Nm]	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4		
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: c _{cr} = 170)								
Minimum Edge Distance	Cmin	[mm]	50								
Observantariatia Consainar	Scr, II	[mm]	170								
Characteristic Spacing	Scr, ⊥	[mm]	200								
Minimum Spacing	Smin, II;	[mm]	50								
Williman Spacing	Smin, ⊥	լուուդ				30					

Table C182: Reduction factors for single anchors at the edge

Tension load			Shear load							
N•	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		50	0,35	<u> </u>	50	1,00		
	120	1,00		170	1,00		120	1,00		

Würth Injection System WIT-VM 250 or WIT-NORDIC 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	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	1,40	
	50	170	2,00		50	200	2,00	
· in a second second	120	170	2,00		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 to the free edge		with c ≥	with s ≥	αg II,V ⊥		with c ≥	with s ≥	αg⊥, V⊥	
		50	50	0,55		50	50	0,35	
		120	50	1,30		120	50	0,85	
		120	170	2,00		120	200	2,00	
		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	αg ⊥,V II	
Shear load	••	50	50	1,10	•	50	50	1,00	
parallel to the free edge		120 170	170	2,00	•	50	200	2,00	
			170	۷,00		120	200	2,00	

Table C185: Characteristic values of tension and shear load resistances

		ed High	Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$									
				Use condition								
Analasusias	Perfor ated sleeve		d/d				d/d w/d w/w					
Anchor size			A _D	Ā	Ar E	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 _{ef}	N	$I_{Rk,b} = N_{Rk,p}$	2)	N	$V_{Rk,b}^{(2)}$					
		[mm]				[kN]						
		Normalis	ed mean c	ompressiv	e strength	$f_b \geq 5,2 \text{ N/}$	mm ^{2 1)}					
M8 / M10/ IG-M6	SH 16	130	2,0	1.5	1.2	2,0	1,5	1.2	6,0			
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 130	2,0	1,5	1,2	2,0	1,5	1,2	0,0			

¹⁾ 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 / V	δνο	δ∨∞
Afficitor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δΝο	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all	,		= 3110	0,31	0,31*V _{Rk} / 3,5	1,5*δνο

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry	
Performances hollow concrete brick Bloc Creux B40 Group factors, characteristic Resistances and Displacements	Annex C 54

²⁾ $N_{Rk,b,c} = N_{Rk,p,c}$ 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 _b [N/mm²]	≥ 2	
Conversion factor for low strengths	$(f_b / 2)^{0.5} \le 1.0$		
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

Table C. Col Intelanati	on pan	41110101									
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 Spacing	Scr, II	[mm]		300							
Characteristic Spacing	Scr, ⊥	[mm]	300								
Minimum Spacing	Smin, II;	[mm]				120					
williman Spacing	Smin, ⊥	[mm]				120					

Table C189: 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		
•	60	1,00	→	60	0,25	1 <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 p	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
• •	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 _g II,V ⊥	·	with c ≥	with s ≥	α _{g ⊥, ∨ ⊥}	
		60	120	0,25		60	120	0,25	
		150	120	1,00		150	120	1,00	
		150	300	2,00		150	300	2,00	
		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	α _{g ⊥,} ν II	
Shear load		60	120	0,40	*	60	120	0,40	
parallel to the free edge		100	120	1,00		100	120	1,00	
	.,	150	300	2,00		150	300	2,00	

Würth Injection System WIT-VM 250 or WIT-NORDIC 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

ſ					Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$								
1		_		Use condition									
	Anchor size	d sleeve	Perforated sleeve Effective Anchorage depth		d/d		w/d w/w			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			
			h _{ef}	N	$J_{Rk,b} = N_{Rk,p}$	2)	1	$N_{Rk,b} = N_{Rk,b}$	2) p	V _{Rk,b} ²⁾			
			[mm]		[kN]								
			Normali	sed mean o	compressi	ive strengtl	h f _b ≥2N/r	nm² 1)					
	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										

¹⁾ 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

Anchor size	hef	δη / Ν	δΝ0	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 _{Rk} / 3,5	2*δN0	0,3	0,3*V _{Rk} /3,5	1,5*δ∨ο
M16	all	,	,		0,1	0,1*V _{Rk} /3,5	1,5*δ∨0

Würth Injection System WIT-VM 250 or WIT-NORDIC for masonry

Performances solid light weight concrete brick
Characteristic Resistances and Displacements

Annex C 56

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