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**European Technical Assessment Body** for construction products



# **European Technical Assessment**

# ETA-13/0265 of 20 November 2025

English translation prepared by DIBt - Original version in German language

#### **General Part**

Technical Assessment Body issuing the European Technical Assessment:

Trade name of the construction product

Product family to which the construction product belongs

Manufacturer

Manufacturing plant

This European Technical Assessment contains

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

This version replaces

Deutsches Institut für Bautechnik

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

Metal Injection anchors for use in masonry

Sympafix BV Fluorietweg 25E 1812RR ALKMAAR **NIEDERLANDE** 

SYMPAFIX, Plant 2

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

EAD 330076-01-0604, Edition 10/2022

ETA-13/0265 issued on 9 August 2017

Z205554.25

# **European Technical Assessment ETA-13/0265**

English translation prepared by DIBt



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#### **Specific Part**

#### 1 Technical description of the product

The "Sympafix Injection system C100-PLUS und C100-PLUS NORDIC for masonry" is a bonded anchor (injection type) consisting of a mortar cartridge with injection mortar C100-PLUS and C100-PLUS 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

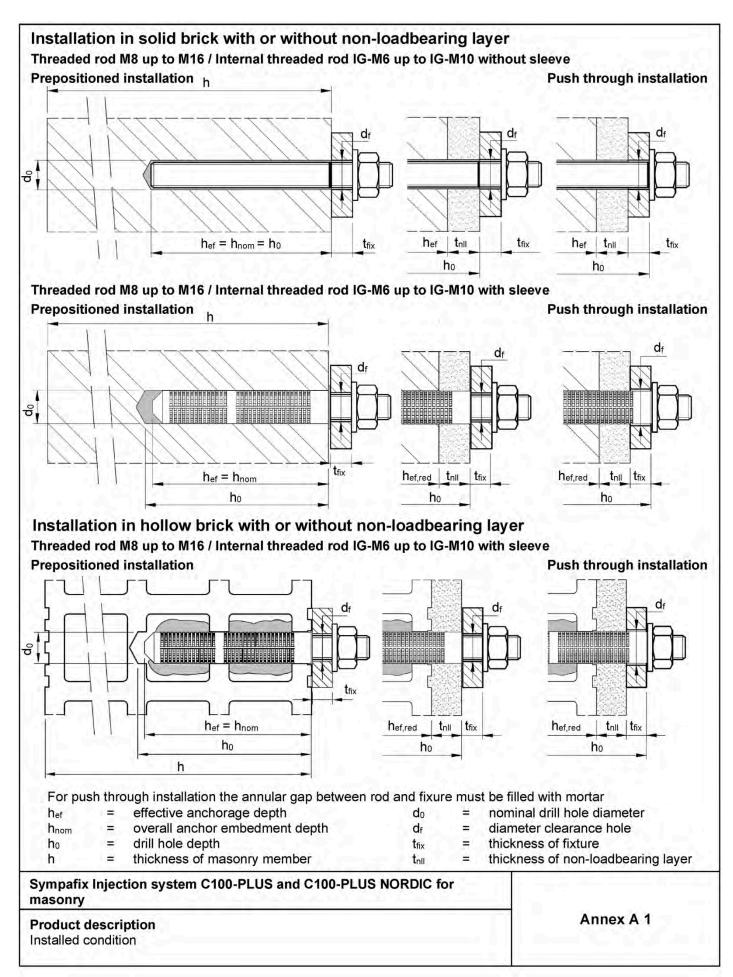
5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document

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 20 November 2025 by Deutsches Institut für Bautechnik

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

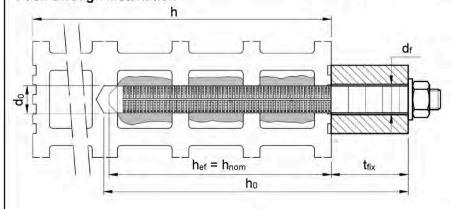


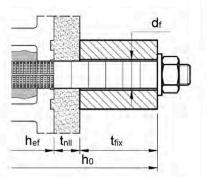




# Installation in hollow brick with or without non-loadbearing layer and / or thermal isolation

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

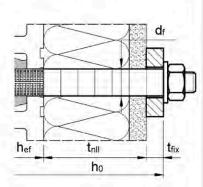




## Prepositioned installation

# $h_{ef} = h_{nom}$ $h_{0}$ $t_{nll}$

# Push through installation



hef = effective anchorage depth

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

h<sub>0</sub> = drill hole depth

h = thickness of masonry member

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

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

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

tnll = thickness of non-loadbearing layer

# Sympafix Injection system C100-PLUS and C100-PLUS 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

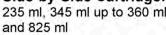


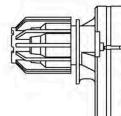
#### Imprint:

#### C100-PLUS or C100-PLUS 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





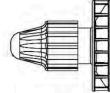
#### Imprint:

## C100-PLUS or C100-PLUS NORDIC

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

# Foil Tube Cartridge:

165 ml and 300 ml

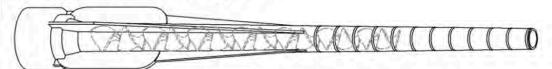


## Imprint:

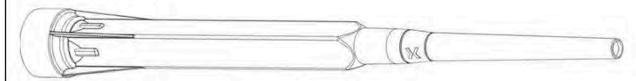
# C100-PLUS or C100-PLUS NORDIC

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

## Static mixer NOZZLE-BLACK-14



#### Static mixer PM-19E



#### Mixer extension EX



## Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

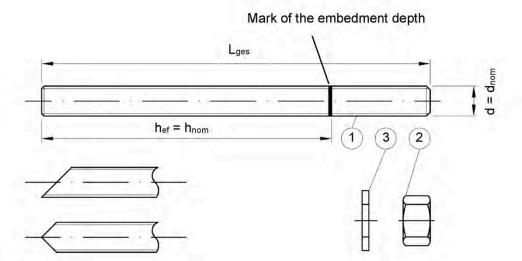
**Product description** 

Injection system

Annex A 3



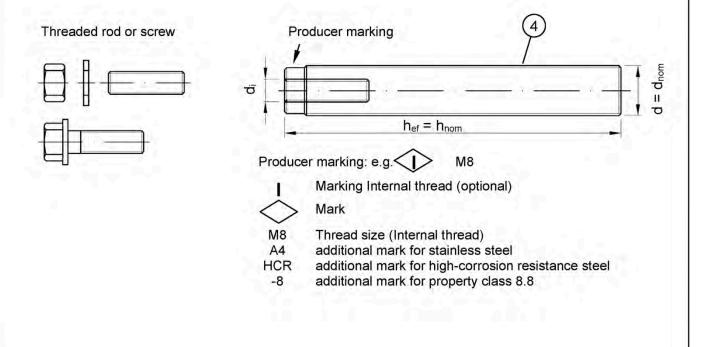
# Threaded rod M8 up to M16 with washer and hexagon nut



#### Commercial standard rod with:

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

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



# Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

#### Product description

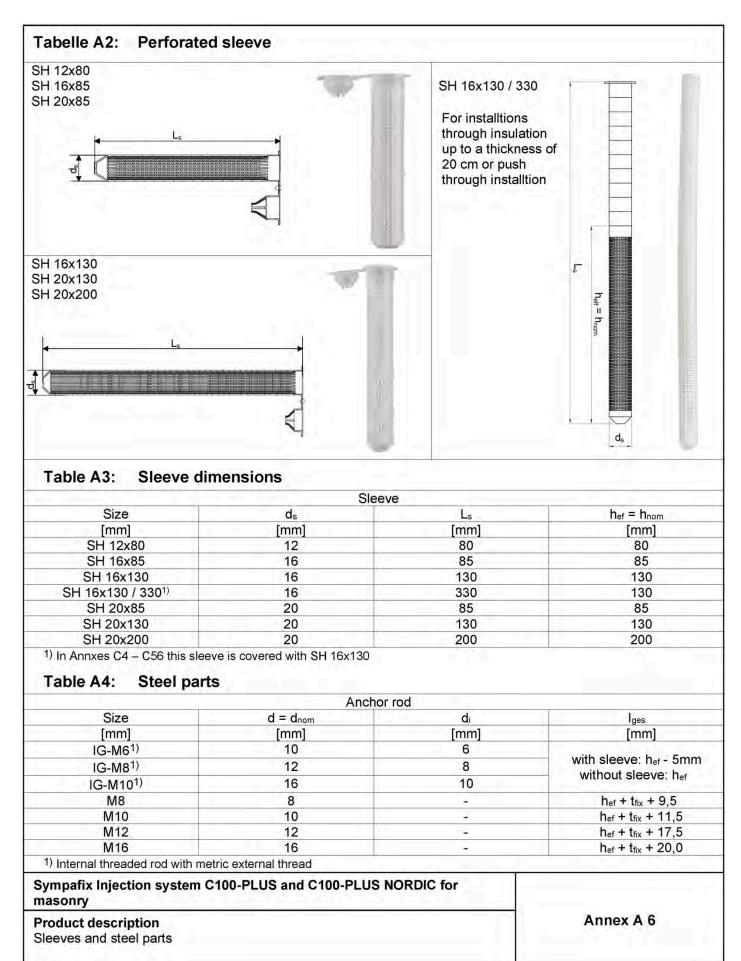
Threaded rod and Internal threaded rod

Annex A 4



_	ble A1: Materials							
	Designation	Material	1.400	00:0047)				
	el, zinc plated (Steel acc. to E nc plated ≥ 5 μm a	N ISO 683-4:2018 of EN ICC. to EN ISO 4042:202		63:2017)				
- ho	ot-dip galvanised   ≥ 40 µm  a		22 and	d EN ISO 10684:2004+AC	C:2009 or			
		Property class		Characteristic steel ultimate tensile strength	Characteristic steel yield strength	Elongation a fracture		
			4.6	f <sub>uk</sub> = 400 N/mm <sup>2</sup>	f <sub>vk</sub> = 240 N/mm <sup>2</sup>	A <sub>5</sub> > 8%		
1	Threaded rod		4.8	f <sub>uk</sub> = 400 N/mm <sup>2</sup>	f <sub>Vk</sub> = 320 N/mm <sup>2</sup>	A <sub>5</sub> > 8%		
'	Tilleaded fod	acc. to		f <sub>uk</sub> = 500 N/mm²	f <sub>VK</sub> = 300 N/mm <sup>2</sup>	A <sub>5</sub> > 8%		
		EN ISO 898-1:2013		f <sub>uk</sub> = 500 N/mm <sup>2</sup>	f <sub>VK</sub> = 400 N/mm <sup>2</sup>	A <sub>5</sub> > 8%		
				f <sub>Uk</sub> = 800 N/mm <sup>2</sup>	f <sub>Vk</sub> = 640 N/mm <sup>2</sup>	A <sub>5</sub> > 8%		
			4	for anchor rod class 4.6	J · ·	5		
2	Hexagon nut	acc. to	5	for anchor rod class 5.6				
		EN ISO 898-2:2022	8	for anchor rod class 8.8				
3	Washer			alvanised or sherardized				
<del>-</del>	7 7401101	(e.g.: EN ISO 887:200	6, EN	I ISO 7089:2000, EN ISO				
		Property class		Characteristic steel ultimate tensile strength	Characteristic steel	Elongation a fracture		
4	Internal threaded anchor rod <sup>2)</sup>	acc. to	5.8		f <sub>vk</sub> = 400 N/mm <sup>2</sup>	A <sub>5</sub> > 8%		
	anchor rod	EN ISO 898-1:2013		f <sub>uk</sub> = 800 N/mm <sup>2</sup>	f <sub>Vk</sub> = 640 N/mm <sup>2</sup>	A <sub>5</sub> > 8%		
Sta	linless steel A2 (Material 1.430				,	7.5		
	inless steel A4 (Material 1.440 h corrosion resistance steel			cc. to EN 10088-1: 2023)	,			
		Property class		Characteristic steel ultimate tensile strength		Elongation a fracture		
1	Threaded rod <sup>1)</sup>			f <sub>uk</sub> = 500 N/mm <sup>2</sup>	f <sub>yk</sub> = 210 N/mm <sup>2</sup>	A <sub>5</sub> > 8%		
		acc. to EN ISO 3506-1:2020	70	f <sub>uk</sub> = 700 N/mm <sup>2</sup>	f <sub>yk</sub> = 450 N/mm <sup>2</sup>	A <sub>5</sub> > 8%		
		211100 0000 1:2020	80	f <sub>uk</sub> = 800 N/mm <sup>2</sup>	f <sub>yk</sub> = 600 N/mm <sup>2</sup>	A <sub>5</sub> > 8%		
		acc. to	50					
2	Hexagon nut <sup>1)</sup>	EN ISO 3506-1:2020	70	for anchor rod class 70				
			80	for anchor rod class 80				
3	Washer	Stainless steel A2, A4		CR NISO 7089:2000, EN ISO	7093:2000 or FN IS	O 7094:200		
			-,	Characteristic steel	Characteristic steel			
	Internal threaded	Property class		ultimate tensile strength	yield strength	fracture		
4	anchor rod <sup>2)</sup>	acc. to	50	f <sub>uk</sub> = 500 N/mm <sup>2</sup>	f <sub>yk</sub> = 210 N/mm <sup>2</sup>	A <sub>5</sub> > 8%		
		EN ISO 3506-1:2020	70	f <sub>uk</sub> = 700 N/mm <sup>2</sup>	f <sub>yk</sub> = 450 N/mm <sup>2</sup>	A <sub>5</sub> > 8%		
2) L a	roperty class 80 only for stainles Ising internally threaded anchor r nd strength class of the internally	od screws and threaded		incl. nut and washer) must	at least correspond to	the material		
	stic perforated sleeve ve sleeve SH			Polypropylene (PP)				
שוכ	VE 3155VE 3□			i olypropyletie (PP)				
		00-PLUS and C100-P	2111	NORDIC for				
-	mpafix Injection system C1 asonry	00-1 L00 and 0 100-1 1	_00					







Specifications of intended use							
Anchorages subject to:	Static and quasi-static loads, fire exposure under tension and shear loads M8 up to M16, IG-M6 up to IG-M10 (with and without sleeve)						
Base material	Masonry group b: Solid brick masonry Masonry group c: Hollow brick masonry Masonry group d: Annex B 2						
	EN 998-2:2016. For other bricks in solid masonry and in hollow masonry concrete, the characteristic resistance of the anchor m	r strength class of the masonry M2,5 at minimum according to 98-2:2016. Ther bricks in solid masonry and in hollow masonry or in autoclaved aerated ete, the characteristic resistance of the anchor may be determined by job ests according to EOTA TR 053, Edition July 2022 under consideration of					
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 and						
Temperature Range	T <sub>a</sub> : - 40°C to +40°C (max. short term temperature +40°C and max. long ter T <sub>b</sub> : - 40°C to +80°C (max. short term temperature +80°C and max. long ter T <sub>a</sub> : - 40°C to +120°C (max. short term temperature +120°C and max. long ter	m temperature +50°C)					

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

## Use conditions (Environmental conditions):

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

#### Design:

- Verifiable calculation notes and drawings are prepared taking account the relevant masonry in the region of the anchorage, the loads to be transmitted and their transmission to the supports of the structure. The position of the anchor is indicated on the design drawings.
- The anchorages are designed in accordance with the EOTA TR 054, Edition July 2022, under the responsibility of an engineer experienced in anchorages and masonry work.
- Applies to all bricks if no other values are specified:
  - $N_{Rk} = N_{Rk,b} = N_{Rk,p} = N_{Rk,b,c} = N_{Rk,p,c}$
  - $V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$
- For the calculation of pulling out a brick under tension loading N<sub>Rk,pb</sub> or pushing out a brick under shear loading V<sub>Rk,pb</sub> see EOTA Technical Report TR 054, Edition July 2022.
- N<sub>Rk,s</sub>, V<sub>Rk,s</sub> and M<sup>0</sup><sub>Rk,s</sub> see Annexes C 1 C 2
- For application with sleeve with drill bit size ≤ 15mm installed in joints not filled with mortar:
  - N<sub>Rk,p,j</sub> = 0,18 \* N<sub>Rk,p</sub> and N<sub>Rk,b,j</sub> = 0,18 \* N<sub>Rk,b</sub> (N<sub>Rk,p</sub> = N<sub>Rk,b</sub> 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.

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry	
Intended use Specifications	Annex B 1



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
lollow light weight N 771-4:2011+A1:		acc. to		Hollow light weight EN 771-3:2011+A1:2		acc. to	
AAC ρ = 0,35 - 0,60 ≥ 499x240x249 Table C4 - C10		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200	Table		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200
	Hollow light	t weight con	crete bri	ck acc. to EN 771-3:2	2011+A1:2015		
HBL 16DF ρ≥ 1,0 500x250x240 Table C172 - C179		M8 - M16 IG-M6 - IG-M10	16x85 16x130 20x85 20x130 20x200	49501950190	EFF	M8 - M16 IG-M6 - IG-M10	16x130 20x130
	Calcium	silica bricks	acc. to E	N 771-2:2011+A1:20	15		IV -7 - Y -
KS ρ≥ 2,0 ≥ 240x115x71 Table C11 - C18		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200		SEE.	M8 - M16 IG-M6 - IG-M10	16x85 16x130 20x85 20x130
KSL-8DF ρ≥ 1,4 248x240x238 Table C26 - C32		M8 - M16 IG-M6 - IG-M10	16x130 20x130 20x200	498X175X238		M8 - M16 IG-M6 - IG-M10	16x130 20x130
	So	lid 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	Table		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200



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
1	Holl	ow clay bricl	ks acc. t	o EN 771-1:2011+A1:	2015		1 1 1
Hlz-10DF ρ≥ 1,25 300x240x249 Table C56 - C63		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200	Porotherm Homebric		M8 - M16 IG-M6 - IG-M10	12x8 16x8 16x13 20x8 20x13
BGV Thermo ρ≥ 0,6 500x200x314 Table C71 - C77		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130	Brique creuse C40 ρ ≥ 0,7 500x200x200 Table C92 - C98		M8 - M16 IG-M6 - IG-M10	12x86 16x86 16x13 20x86 20x13
Calibric R+ ρ ≥ 0,6 500x200x314 Table C78 - C84		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130	Blocchi Leggeri ρ ≥ 0,6 250x120x250 Table C99 - C105		M8 - M16 IG-M6 - IG-M10	12x8 16x8 16x13 20x8 20x13
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 16x13 20x8 20x13
Ho	llow clay brid	cks with ther	mal insu	lation acc. to EN 771	-1:2011+A1:20	015	
Coriso WS07 ρ ≥ 0,55 248x365x249 Mineral wool Table C113 - C119		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200	I I anie		M8 - M16 IG-M6 - IG-M10	12x8 16x8 16x13 20x8 20x13 20x20
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	12x80 16x89 16x13 20x89 20x13 20x20



	Overview brick elements (Anc			erties with corres (Continued)	ponding fas	tening	
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 bric	ks with ther	mal insu	lation acc. to EN 771	-1:2011+A1:20	15	
Poroton FZ7,5		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

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry	
Intended use	Annex B 4
Brick types and properties with corresponding fastening elements	



Table B2:	able B2: Installation parameters in autoaerted AAC and solid masonry (without sleeve) for prepositioned or push through installation									
Anchor size				М8	M10	IG-M6	M12	IG-M8	M16	IG-M10
Nominal drill hol	e diameter	d <sub>0</sub>	[mm]	10	1	12	1	4		18
Drill hole depth		h <sub>o</sub>	[mm]	h <sub>ef</sub> + t <sub>fix</sub> <sup>1)</sup>						
Effective anchor	age depth	h <sub>ef</sub>	[mm]	1] 80 ≥ 90 ≥ 100 ≥ 1			≥ 100			
Diameter of	Prepositioned installation	d <sub>f</sub> ≤	[mm]	9	12	7	14	9	18	12
clearance hole in the fixture	Push through installation	d <sub>f</sub> ≤	[mm]	12	14	14	16	16	20	20
Maximum install	ation torque	T <sub>inst</sub>	[Nm]			See An	nexes C	4 – C 56		
Minimum thickness of member h <sub>min</sub> [mm]		[mm]	h <sub>ef</sub> + 30							
Minimum spacing	]	s <sub>min</sub>	[mm]			Caa An	navaa C	4 C EC		
Minimum edge di	stance	c <sub>min</sub>	[mm]	See Annexes C 4 – C 56						

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

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

Anchor size	nchor size				M8 / M10 IG-M6	1		M12 / M16 -M8 / IG-N	
Perf	12x80	16x85	16×130	16x130/330	20x85	20×130	20×200		
Nominal drill hole diameter	d <sub>0</sub>	[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 <sub>ef</sub>	[mm]	80	85	130	130	85	130	200
Diameter of clearance hole in the fixture	d <sub>f</sub> ≤	[mm]	9 7 (IG-M6) / 9 (IG-M8) / 12 (IG-M10 9 (M8) / 12 (M10) 14 (M12) / 18 (M16)						
Maximum installation torque	$T_{inst}$	[Nm]	See Annexes C 4 – C 56						
Minimum thickness of member	h <sub>min</sub>	[mm]	115	115	195	195	115	195	240
Minimum spacing	s <sub>min</sub>	[mm]			Soc Ar	nexes C	4 C 56		
Minimum edge distance	c <sub>min</sub>	[mm]			See Ai	illexes C	4 - 0 56		

Sympafix Injection system C100-PLUS and C100-PLUS 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					
	I	Perforated sle	eeve SH	16x130	16x130/330	20x130	20×200			
Nominal drill hol	e diameter	d <sub>0</sub>	[mm]	16	16	20 20				
Drill hole depth		h <sub>0</sub>	[mm]		h <sub>ef</sub> + 5mm	5mm + t <sub>nll</sub> + t <sub>fix</sub> 1)				
Effective	Prepositioned installation	h <sub>ef</sub>	[mm]	130	130	130	200			
embedment depth	Push through installation	h <sub>ef</sub>	[mm]	85	130	85	85			
Maximum thickn loadbearing layer		max t <sub>nll</sub>	[mm]	45	200	45	115			
Diameter of clearance hole	Prepositioned installation	d <sub>f</sub> ≤	[mm]	,	-M6) / 12 (M10)	9 (IG-M8) / 12 (IG-M10) / 14 (M12) / 18 (M16)				
in the fixture	Push through installation	d <sub>f</sub> ≤	[mm]	1	8	2	2			
Maximum install	ation torque	T <sub>inst</sub>	[Nm]		See Annexe	s C 4 – C 56				
Minimum thickne	ess of member	h <sub>min</sub>	[mm]	195 (115)	195	195 (115)	240 (115)			
Minimum spacin	g	s <sub>min</sub>	[mm]	See Annexes C 4 – C 56						
Minimum edge of	listance	c <sub>min</sub>	[mm]							

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

Sympafix Injection system C100- masonry	PLUS and C100-PLUS NORDIC for	
Intended use Installation parameters		Annex B 6



Anchor rod	Perforated sleeve	d <sub>0</sub> Drill bit - Ø HD, CA	Bru	d <sub>b</sub> ısh - Ø	d <sub>b,min</sub> min. Brush - Ø	
[mm]		[mm]		[mm]	[mm]	
	Autoaerted ACC	and solid maso	nry (without			
M8		10	BRS10	12	10,5	
M10	1,5	12	BRS12	14	12,5	
M12	0	14	BRS14	16	14,5	
M16		18	BRS18	20	18,5	
	Solid and	hollow masonry				
M8	SH 12x80	12	BRS12	14	12,5	
	SH 16x85					
M8 / M10 / IG-M6	SH 16x130	16	BRS16	18	16,5	
	SH 16x130/330		70535			
2010/10/2017	SH 20x85		المناحا	- A-		
M12 / M16 /	SH 20x130	20	BRS20	22	20,5	
IG-M8 / IG-M10	SH 20x200			2.2	7-7-	
Volume ≥ 750 ml)			in 6 bar)			
Brush BRS	LEGIOLOGICE CO					
Brush BRS	***************************************					
Brush BRS						
Brush BRS						
Brush extension EXT						
Brush extension EXT		mmm	amma	mm		
Brush extension EXT		mmm	mm	umm		
Brush extension EXT		mmm	umm	mm		
Brush extension EXT		mmm	umm	mm		
Brush extension EXT		uuuuu	mm	umm		
Brush extension EXT		mmm	num	nnnn		
Brush extension EXT		mmm	umm	mm		



Table B6: V	<b>Norking and</b>	curing time -	- C100-PLUS
-------------	--------------------	---------------	-------------

Tempera	ture in bas	se material	Maximum working time	Minimum curing time 1)
	Т		t <sub>work</sub>	t <sub>cure</sub>
- 10°C	to	- 6°C	90 min <sup>2)</sup>	24 h
- 5°C	to	- 1°C	90 min	14 h
0°C	to	+ 4 °C	45 min	7 h
+ 5°C	to	+ 9°C	25 min	2 h
+ 10°C	to	+ 19°C	15 min	80 min
+ 20 °C	to	+ 24 °C	6 min	45 min
+ 25 °C	to	+ 29 °C	4 min	25 min
+ 30 °C	to	+ 39°C	2 min	20 min
	+ 40 °C		1,5 min	15 min
Carti	ridge tempe	erature	+5°C to	+40°C

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

Table B7: Working and curing time - C100-PLUS NORDIC

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

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

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

Intended use
Working and curing time

Annex B 8

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



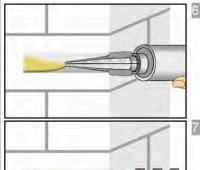
# Installation instructions Drill a hole to the required embedment depth with drilling method according to Annex C 4 - C 56. Drill bit diameter according to Table B5. Blow the bore hole clean minimum 2x from the bottom or back by hand pump or compressed air tool (Annex B 7). For applications in solid masonry with a bore hole depth h<sub>0</sub> > 100mm cleaning with compressed air is required. Attach brush BRS 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 EXT). 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<sub>0</sub> > 100mm cleaning with compressed air is required. Screw on static-mixing nozzle NOZZLE-BLACK-14 / PM-19E, and load the cartridge into an appropriate dispensing tool. If necessary, cut off the foil tube clip before use. For every working interruption longer than the maximum working time twork (Annex B 8) as well as for new cartridges, a new static-mixer shall be used. Mark setting position on the anchor rod. Consider $t_{\rm nll}$ and/or $t_{\rm fix}$ 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. $hef + (t_{nll}) + (t_{fix})$ Not proper mixed mortar is not sufficient for fastening. Dispense and discard mortar until an uniform grey colour is shown (at least 3 full strokes; for foil tube cartridges at least 6 full strokes).

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry	
Intended use Installation instructions	Annex B 9



#### Installation instructions (continuation)

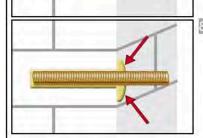
#### Installation without sleeve



Starting at bottom of the hole and fill the hole up to approximately two-thirds with adhesive. (If necessary, a mixer nozzle extension EX shall be used.) Slowly withdraw of the static mixing nozzle avoid creating air pockets Observe the temperature related working time twork (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.

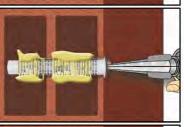
Otherwise, the installation must be repeated starting from step 6 before the maximum working time t<sub>work</sub> has expired.

#### Installation with sleeve



Insert the perforated sleeve into the hole flush with the surface of the masonry. Never modify the sleeve in anchoring area (hef).

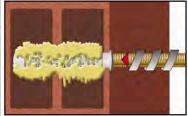
For installation with sleeve SH 16x130/330 through a non-load-bearing layer and/or fixture the clamping area may be reduced to the thickness of the nonload-bearing layer and/or attachment.



Starting from the bottom or back fill the sleeve with mortar. (If necessary, a mixer nozzle extension EX 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<sub>work</sub> (Annex B 8).



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

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for	r
masonry	

#### Intended use

Installation instructions (continuation)

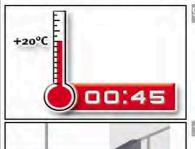
Annex B 10

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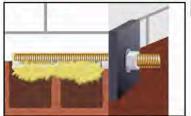
English translation prepared by DIBt



## Installation instructions (continuation)



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



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

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

Intended use

Installation instructions (continuation)

Annex B 11



					Anc	hora	ige	β-Factor					
Base material	anchor	size	Perforate sleeve S			lepth	_	a: 40°C	/ 24°C	Ть: 80°0	C / 50°C	T <sub>c</sub> : 120°	°C / 72°C
Autoclaved		Sieeve				h <sub>ef</sub>		d/d	w/d w/w	d/d	w/d w/w	d/d	w/d w/w
Autoclaved aerated concrete	all siz	es	with and without S			all		0,95	0,86	0,81	0,73	0,81	0,73
	d₀ ≤ 14	mm				-11		0,93	0,80	0,87	0,74	0,65	0,56
	d₀≥ 16	mm	with SH			all		0,93	0,93	0,87	0,87	0,65	0,65
Calcium silica	d₀ ≤ 14	mm				00		0,93	0,80	0,87	0,74	0,65	0,56
bricks	d₀≥ 16	mm	without S	SH	≤ 1	00 m	m 🖂	0,93	0,93	0,87	0,87	0,65	0,65
	all siz	es	without S	Н	> 1	00 m		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	_	≤ 1	00 m		0,93	0,80	0,87	0,74	0,65	0,56
oray Brione	un oiz		without S			00 m		0,86	0,43	0,86	0,43	0,73	0,37
	d <sub>0</sub> ≤ 12	mm	with and		- 1	JU 111		0,93	0,40	0,87	0,74	0,75	0,56
Concrete bricks	d <sub>0</sub> ≥ 16		without S			all	<u> </u>	0,93	0,93	0,87	0,87	0,65	0,65
	u₀≥ 10	111111	Without O	.				0,93	0,93	0,67	0,67	0,05	0,05
Table C2: C	haraata	rictic	steel resi	oton									
	Haracte	HSUC	Steer resi	Starre	ce		MO	N440	NA4	N46	10.840	10.840	10 8846
Anchor size				Ι,	- I-		M8	M10			IG-M6	IG-M8	IG-M10
Cross section area				As	[[n	nm²]	36,6	58	84,3	3   157	-	-	_
Characteristic tens	sion resis										1 2)	2)	T 2)
Steel, Property class		4.6 aı	nd 4.8	N <sub>Rk,</sub>		(N]	15 (13)	23 (21	-	63	_3)	_3)	_3)
		5.6 aı	nd 5.8 N <sub>F</sub>		s [k	κN]	18 (17)	29 (27	7) 42	78	10	17	29
		8.8	N <sub>F</sub>		s [k	κN]	29 (27)	46 (43	3) 67	125	16	27	46
Stainless steel A2,	A4 and	50	N <sub>R</sub>			(N)	18	29	42	79	_3)	_3)	_3)
HCR, class		70	N <sub>F</sub>			(N]	26	41	59	110	14	26	41
(A2 only class 50 ar	nd 70)	80		N <sub>Rk</sub> ,		(N]	29	46	67	126	_3)	_3)	_3)
Characteristic tens	sion resis	tance.	Partial fac		-  -			1					
			nd 5.6	γ <sub>Ms,1</sub>	-] <sub>V</sub>	1			2,0			_3)	
Steel, Property clas	S	H	.8 and 8.8	γ <sub>Ms,1</sub>				_,-	1,5				
0		50	10 4114 010	γ <sub>Ms,l</sub>			2,86			_3)			
Stainless steel A2, AHCR, class	44 and	70		<del>                                     </del>				<u>'</u>	_,00	1,87	1		
(A2 only class 50 ar	nd 70)	80		γMs,I					1,6	1,07		_3)	
Characteristic she			tool foilure	γMs,I			nrm 1)		1,0			/	
Characteristic she	ai iesistä	T	nd 4.8	1/0	rı.			12 (10	0) 17	31	_3)	_3)	_3)
Otaal Daggersters	_			V <sup>0</sup> Rk	(,s   [K	(N]	7 (6)	12 (10	<u> </u>	_			
Steel, Property clas	S		nd 5.8	V <sup>0</sup> Rk	<sub>(,s</sub>  [k	(N]	9 (8)	15 (13	<del>-</del>	39	5	9	15
		8.8		$ V^0_{Rk} $	<sub>(,s</sub>  [k	(N]	15 (13)	23 (21	1) 34	63	8	14	23
Stainless steel A2,	A4 and	50		$ V^0_{Rk} $	<sub>(,s</sub>  [k	(N]	9	15	21	39	_3)	_3)	_3)
HCR, class	ad 70\	70		V <sup>0</sup> Rk	<sub>c,s</sub> [[k	(N]	13	20	30	55	7	13	20
(A2 only class 50 ar	10 70)	80		V <sup>0</sup> Rk	<sub>(,s</sub>  [k	κN]	15	23	34	63	_3)	_3)	_3)
Sympafix Injection	on syste	m C10	0-PLUS an			LUS	NORDI	C for					
Performances β-factors for job s Characteristic ste	-		r tension lo	ad							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	[mm²]	36,6	58	84,3	157	-	-	-					
Characteristic shear resista	nce, Steel failure	with lev	er arm	1)									
	4.6 and 4.8	M <sup>0</sup> <sub>Rk,s</sub>	[Nm]	15 (13)	30 (27)	52	133	_3)	_3)	_3)			
Steel, Property class	5.6 and 5.8	М <sup>0</sup> <sub>Rk,s</sub>	[Nm]	19 (16)	37 (33)	65	166	8	19	37			
	8.8	M <sup>0</sup> Rk,s	[Nm]	30 (26)	60 (53)	105	266	12	30	60			
Stainless steel A2, A4 and	50	M <sup>0</sup> <sub>Rk,s</sub>	[Nm]	19	37	66	167	_3)	_3)	_3)			
HCR, class	70	M <sup>0</sup> <sub>Rk,s</sub>	[Nm]	26	52	92	232	11	26	52			
(A2 only class 50 and 70)	80	M <sup>0</sup> <sub>Rk,s</sub>		30	59	105	266	_3)	_3)	_3)			
Characteristic shear resista	ınce, Partial facto	r <sup>2)</sup>											
Steel, Property class	4.6 and 5.6	γ <sub>Ms,V</sub>	[-]		1,6	<b>5</b> 7			_3)				
Steel, Floperty Gass	4.8, 5.8 and 8.8	$\gamma_{Ms,V}$	[-]				1,25						
Stainless steel A2, A4 and	50	$\gamma_{Ms,V}$	[-]		2,3	88			_3)				
HCR, class	70	$\gamma_{Ms,V}$	[-]				1,56						
(A2 only class 50 and 70)	80	$\gamma_{Ms,V}$	[-]		1,3	33			_3)				

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

Table C3: Characteristic steel resistance under fire exposure 1)

Anchor size		M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Characteristic tension resistance, S										
	R30	$N_{Rk,s,fi}$	[kN]	1,1	1,7	3,0	5,7	0,3	1,1	1,7
Steel, Property class 5.8, and higher;	R60	$N_{Rk,s,fi}$	[kN]	0,9	1,4	2,3	4,2	0,2	0,9	1,4
Stainless steel A2, A4 and HCR, class 50 and higher	R90	$N_{Rk,s,fi}$	[kN]	0,7	1,0	1,6	3,0	0,2	0,7	1,0
5.255 55 2.12g51	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	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	$V_{Rk,s,fi}$		0,5	0,8	1,2	2,2	0,1	0,5	0,8
Characteristic shear resistance, Ste	el failure	with lev	er arm							
	R30	$M_{Rk,s,fi}$	[Nm]	1,1	2,2	4,7	12,0	0,2	1,1	2,2
Steel, Property class 5.8, and higher;	R60	$M_{Rk,s,fi}$	[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
3	$\overline{}$	$M_{Rk,s,fi}$		0,5	1,0	1,8	4,7	0,1	0,5	1,0

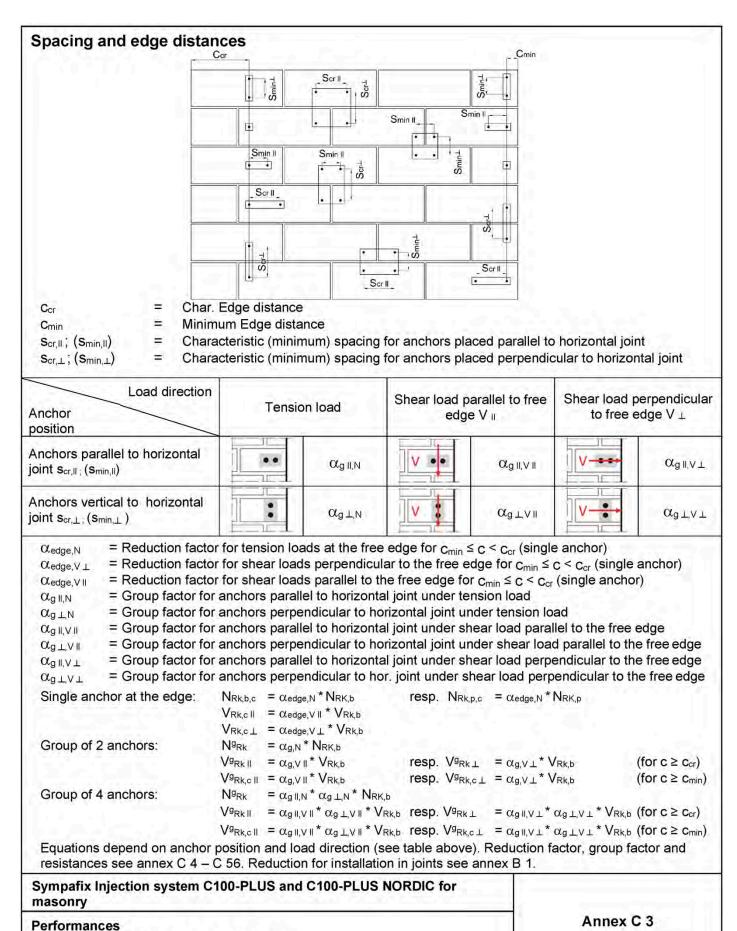
<sup>1)</sup> partial factor in case of fire is 1,0 for all steel types and load directions.

L		
	Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry	
ſ	Performances	Annex C 2
	Characteristic steel resistance under tension and shear load – under fire exposure	

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

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





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Definition of the reduction- and group factors



# Brick type: Autoclaved aerated concrete - AAC

# Table C4: Stone description

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



Table C5: Installation parameter Anchor size M10 M16 IG-M6 IG-M8 IG-M10 **M8** M12 [-] ≤ 5 ≤ 10 ≤ 10 Installation torque ≤ 5 ≤ 10 ≤ 5 ≤ 5 Tinst [Nm] Char. Edge distance 150 (for shear loads perpendicular to the free edge: cer = 210) Ccr [mm] Minimum Edge Distance [mm] Cmin 300 [mm] Scr, II Characteristic Spacing 250 [mm] Scr, 1

Minimum Spacing  $\begin{vmatrix} s_{min, | l|;} \\ s_{min, | \perp} \end{vmatrix}$  [mm] 50

# Table C6: Reduction factors for single anchors at the edge

7	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⊥	010000000000000000000000000000000000000	with c ≥	αedge, VII			
	50	0,85		50	0,12		50	0,70			
	50	0,65		125	0,50	I I I	125	0,85			
1,4	150	1,00	(farestual/seess)	210	1,00		150	1,00			

# Table C7: Factors for anchor groups under tension load

An	chor position p	arallel to hor. jo	int	Anchor position perpendicular to hor, joint					
	with c ≥	with s ≥	αg II, N	4	with c≥	with s ≥	αg⊥, N		
	50	50	1,10		50	50	0,75		
	150	50	1,25		150	50	0,90		
i	150	300	2,00	siamentano)	150	250	2,00		

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

	Anchor	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint				
Shear load perpendicular to the free edge	(secretaries)	with c ≥	with s ≥	αg II,V⊥	specialization and	with c ≥	with s ≥	αg⊥, V⊥	
	0-0-	50	50	0,20		50	50	0,25	
		210	50	1,60		210	50	1,80	
		210	300	2,00	() (Times in a sell for some of	210	250	2,00	
Cheer lead	(10000000000000000000000000000000000000	with c≥	with s ≥	αg II,V II	**************************************	with c ≥	with s ≥	α <sub>g ⊥,</sub> v II	
Shear load parallel to the		50	50	1,15		50	50	0,80	
free edge		150	50	1,60		150	50	1,10	
nee eage	[arrena   Davered	150	300	2,00	demonstrated.	150	250	2,00	

# Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

#### Performances Autoclaved Aerated Concrete - AAC

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



Brick type: Aut	oclave	d aerat	ed concr	ete – AA	С				
					shear loa	d resista	nces		
1000000		10000 100			cteristic Res			and s ≥ s <sub>cr</sub>	
	eve					Use condit		G	
	s S	Effecitve Anchorage depth					w/d		d/d
	ted			d/d				w/w	
Anchor size	ora	and the second						w/w All	
	Perforated sleeve	∢	40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	
	ds	h <sub>ef</sub>	N	$J_{Rk,b} = N_{Rk,p}$	1)	1	$N_{Rk,b} = N_{Rk,b}$	1) p	V <sub>Rk,b</sub> <sup>1)</sup>
	[mm]	[mm]				[kN]			
	ed mear		ssive stren			I		≥ 0,35 kg/d	
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) $N_{Rk,b,c} = N_{Rk,p,c}$ an	d V <sub>Rk,c II</sub> =	= V <sub>Rk,c</sub> ⊥ac	cording to Ar	inex C 3					
	40			Charac	cteristic Res	sistances w	rith c≥c <sub>cr</sub>	and s ≥ s <sub>cr</sub>	
	eve	Effecitve Anchorage depth				Use condit	ion		
	Perforated sleeve		d/d				w/d w/w		d/d w/d w/w
Anchor size			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
	ds	h <sub>ef</sub>	N	$J_{Rk,b} = N_{Rk,p}$	1)	1	$N_{Rk,b} = N_{Rk,b}$	1) p	$V_{Rk,b}^{1)}$
	[mm]	[mm]				[kN]			
	ed mear		ssive stren	1		T		≥ 0,50 kg/d	
M8	-	80	3,0	2,5	2,0	2,5	2,0	2,0	4,5
M10 / IG-M6	-	90	3,0	2,5	2,0	2,5	2,0	2,0	7,5
M12 / M16 / IG-M8 / IG-M10	-	100	5,0	4,5	4,0	4,5	4,0	4,0	7,5
M8	SH 12	80	3,0	2,5	2,0	2,5	2,0	2,0	4,5
M8 / M10/ IG-M6	SH 16	≥ 85	3,0	2,5	2,0	2,5	2,0	2,0	7,5
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85	5,0	4,5	4,0	4,5	4,0	4,0	7,5
1) $N_{Rk,b,c} = N_{Rk,p,c}$ an		-							
Sympafix Injection masonry	n syster	n C100-P	LUS and C	100-PLUS	NORDIC fo	or			
Performances aut Characteristic Resi				AAC				Annex C	5 5
		ı- ·							



Brick type: Aut	toclave	d aerat	ed concr	ete – AA	С						
			Characteristic Resistances with c ≥ c <sub>cr</sub> and s ≥ s <sub>cr</sub>								
			Use condition								
	d sleeve	Effecitve Anchorage depth	d/d				w/d w/w		d/d w/d w/w		
Anchor size	Perforated sleeve	Anc	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		
	<b>"</b>	h <sub>ef</sub>	$N_{Rk,b} = N_{Rk,p}^{1)}$			١	V <sub>Rk,b</sub> <sup>1)</sup>				
			$N_{Rk,b} = N_{Rk,p}^{1}$ $N_{Rk,b} = N_{Rk,p}^{1}$ $V_{Rk,b}$								
Normalis	ed mear	compre	ssive strenght $f_b \ge 6 \text{ N/mm}^2$ ; Density $\rho \ge 0,60 \text{ kg/dm}^3$								
M8	-	80	4,0	3,5	3,0	3,5	3,0	3,0	6,0		
M10 / IG-M6	-	90	4,0	3,5	3,0	3,5	3,0	3,0	10,0		
M12 / M16 / IG-M8 / IG-M10	-	100	7,0	6,0	5,5	6,5	5,5	5,5	10,0		
M8	SH 12	80	4,0	3,5	3,0	3,5	3,0	3,0	6,0		
M8 / M10/ IG-M6	SH 16	≥ 85	4,0	3,5	3,0	3,5	3,0	3,0	10,0		
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85	7,0	6,0	5,5	6,5	5,5	5,5	10,0		

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

# Table C10: Displacements

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

Sympafix Injection system C100-PLUS and C100-PLUS 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		Solid calcium silica brick KS-NF
Density	ρ [kg/dm³]	≥ 2,0
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 28
Conversion factor for lov 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	Tinst	[Nm]	≤ 10	≤ 10	≤ 15	≤ 15	≤ 10	≤ 10	≤ 10
Char. Edge distance (under fire conditions)	Ccr; (Ccr,fi)	[mm]	$150 (2 h_{ef})$ (for shear loads perpendicular to the free edge: $c_{cr} = 240$ )						
Minimum Edge Distance	Cmin	[mm]	60						
Characteristic Spacing	Scr. II; (Scr.fi, II)	[mm]	240 (4 h <sub>ef</sub> )						
(under fire conditions)	Scr, ±; (Scr,fi, ±)	[mm]	150 (4 h <sub>ef</sub> )						
Minimum Spacing	Smin, II; Smin, ⊥	[mm]	75						

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

Tension load			Shear load pe	erpendicular t	to free edge	Shear load parallel to free edge		
11 200	with c ≥	αedge, N		with c≥	αedge, V⊥	-	with c≥	αedge, VII
	60 <sup>1)</sup>	0,50		60	0,30	•	60	0,60
•	100 <sup>1)</sup>	0,50	· ·	100	0,50		100	1,00
-	150 <sup>1)</sup>	1,00		240	1,00	7	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

Ar	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 <sup>1)</sup>	75	0,70		60 <sup>1)</sup>	75	1,15		
	150 <sup>1)</sup>	75	1,40		150 <sup>1)</sup>	75	2,00		
• •	150 <sup>1)</sup>	240	2,00		150 <sup>1)</sup>	150	2,00		
	180 <sup>2)</sup>	75	1,00		180 <sup>2)</sup>	75	1,15		
	180 <sup>2)</sup>	240	1,70		180 <sup>2)</sup>	150	2.00		
	2402)	240	2,00		18047	150	2,00		

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

# Table C15: Factors for anchor groups under shear load

	Ancho	r position pa	rallel to hor.	joint	Anchor position perpendicular to hor, joint				
Shear load		with c ≥	with s ≥	αg II,V ⊥	1	with c ≥	with s ≥	αg⊥, V⊥	
perpendicular		60	75	0,75		60	75	0,90	
to the free		150	75	2,00		150	75	2,00	
edge	presentation and	150	240	2,00	()consultation	150	150	2,00	
Cheerland		with c≥	with s ≥	αg II,V II	190000000000000000000000000000000000000	with c ≥	with s ≥	αg⊥,VII	
Shear load parallel to the		60	75	2,00		60	75	2,00	
free edge		150	75	2,00		150	75	2,00	
nee eage	\$1000000000000000000000000000000000000	150	240	2,00	forman de la constant	150	150	2,00	

# Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

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

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

Annex C7

<sup>2)</sup> Only for application with 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 $s \ge s_{cr}$									
	g e	, <u>o</u>				Use condi	tion					
	Perforated sleeve	slee)	slee	lee	Effecitve Anchorage depth		d/d			w/d		d/d
		g cy g		1			w/w	T	w/w (w/d)			
Anchor size	Ě	⊞ ફ ઁ							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			
	) ji								ranges			
	ا م	h <sub>ef</sub>	1	$N_{Rk,b} = N_{Rk,i}$	2)	1	$V_{Rk,b}^{(2)}$					
		[mm]				$N_{Rk,b} = N_{Rk,p}^{(2)}$ $V_{Rk,b}^{(2)}$ [kN]						
	Normalised mean compressive strength f <sub>b</sub> ≥ 28 N/mm <sup>2</sup> 1)											
M8	-	80			_							
M10 / IG-M6	-	≥ 90	7,0	6,5	5,0	6,0	5,5	4,0				
M12 / IG-M8	-	≥ 100										
M16 / IG-M10	-	≥ 100	7,0	6,5	5,0	7,0	6,5	5,0				
M10 / M12 / M16 / IG-M6 / IG-M8 / IG-M10	-	200	9,0	8,5	6,5	5,5	5,0	4,0	7,0			
M8	SH 12	80	7,0	6,5	5,0	6,0	5,5	4,0				
M8 / M10/ IG-M6	SH 16	≥ 85										
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85	7,0	6,5	5,0	7,0	6,5	5,0				

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

# Table C17: Displacements

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

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

			Characteristic Resistances						
A sala sa si-sa Perfora		anchorage depth		$N_{Rk,b,fi} = N_R$	$_{k,p,fi} = V_{Rk,b,fi}$				
Anchor size	sleeve	sleeve	sleeve	sleeve	h <sub>ef</sub>	R30	R60	R90	R120
		[mm]	[kN]						
M8	-	80							
M10 / IG-M6	-	≥ 90	0,48	0,41	0,34	0,30			
M12 / IG-M8	-	≥ 100			0,54	0,30			
M16 / IG-M10	-	≥ 100							
M8	SH 12	80							
M8 / M10 /IG-M6	SH 16	≥ 85	0.47	0.26	_ 1)	_ 1)			
M12 / M16 / IG-M8 /IG-M10	SH 20	≥ 85	0,47	0,26	- '/	- '/			

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

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry	
Performances solid calcium silica brick KS-NF Characteristic Resistances and Displacements	Annex C 8

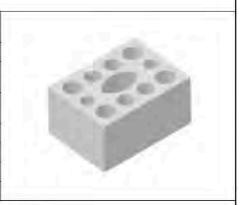
<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c|I} = V_{Rk,c} \perp$  according to Annex C 3

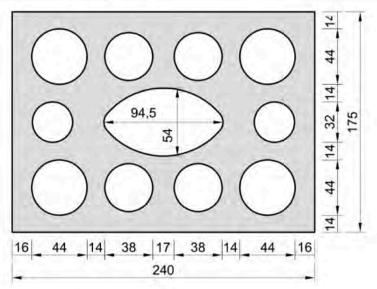


# Brick type: Hollow Calcium silica brick KSL-3DF

# Table C19: Stone description

Brick type		Hollow calcium silica brick KSL-3DF
Density p [kg/dm³]		≥ 1,4
Normalised mean compressive strenght f <sub>b</sub> [N/mm <sup>2</sup> ]		≥ 14
Conversion factor for locompressive strengths	wer	$(f_b / 14)^{0.75} \le 1.0$
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

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

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

	Fanaian land		Shear load							
	Tension load		Perpendic	ular to the fr	ee edge	Parallel to the free edge				
· ·	with c ≥	αedge, N	100000000000000000000000000000000000000	with c ≥	αedge, V⊥	(Filmston)	with c ≥	αedge, VII		
	60	1,00		60	0,30	•	60	1,00		
a Carriero Territoria	120	1,00		240	1,00	( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	120	1,00		

# Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

## Performances hollow calcium silica brick KSL-3DF

Description of the stone, Installation parameters, Reductionfactors



#### Brick type: Hollow Calcium silica brick KSL-3DF Table C22: 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 1,50 60 60 120 1,00 120 120 2,00 120 120 2.00 120 240 2.00

Table C23: Factors for anchor groups under shear load Anchor position parallel to hor. joint Anchor position perpendicular to hor. joint with c ≥ with s ≥ with c ≥ with s ≥ Shear load αg II,V⊥  $\alpha_{\text{g}\,\perp,\,\text{V}\,\perp}$ perpendicular 60 120 0,30 60 120 0,30 to the free 120 120 1,00 edge 120 120 240 2,00 240 2.00 with c≥ with s ≥ with c ≥ with s ≥ αg II,V II αg⊥,VII Shear load 60 120 1,00 parallel to the 60 120 1,00 120 120 1,60 free edge 120 240 120 120 2,00

2,00

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

				Charac	cteristic Res	sistances w	ith c≥c <sub>cr</sub> :	and s ≥ s <sub>cr</sub>	
		54.5	2			Use condit	ion		
A make a state	Perforated sleeve	Effecitve Anchorage depth	d/d				d/d w/d w/w		
Anchor size	a erforate	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 <sub>ef</sub>	$N_{Rk,b} = N_{Rk,p}^{2}$			V <sub>Rk,b</sub> <sup>2)</sup>			
	148 87	[mm]				[kN]			
		Normalis	sed mean c	ompressi	ve strength	f <sub>b</sub> ≥ 14 N/	mm² 1)		
M8 / M10/	01146	≥ 85	2,5	2,5	1,5	2,5	2,5	1,5	6,0
IG-M6	SHID	130	2,5	2,5	2,0	2,5	2,5	2,0	6,0
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85	6,5	6,0	4,5	6,5	6,0	4,5	6,0

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

#### Table C25: **Displacements**

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

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for
masonry

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

Group factors, characteristic Resistances and Displacements

Annex C 10

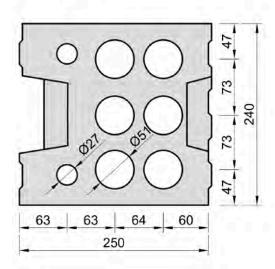
<sup>2)</sup> NRk,b,c = NRk,p,c and VRk,c II = VRk,c + according to Annex C 3



# 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 <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 12
Conversion factor for lov compressive strengths	ver	$(f_b / 12)^{0.75} \le 1.0$
Code		EN 771-2:2011+A1:2015
Producer (Country)		e.g. KS-Wemding (DE)
Brick dimensions	[mm]	≥ 248 x 240 x 238
Drilling method		Rotary drilling





## Table C27: Installation parameter

Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Installation torque	Tinst	[Nm]	≤ 5	≤ 5	≤ 8	≤ 8	≤ 5	≤ 8	≤ 8
Char. Edge distance	Ccr							edge: c <sub>cr</sub> =	250)
Minimum Edge Distance	Cmin	[mm]	50						
	Scr, II	[mm]	250						
Characteristic Spacing	Scr, ⊥	[mm]	v 6			120			
Minimum Spacing	ım Spacing S <sub>min, II;</sub> [mm] 50						3		

Table C28: Reduction factors for single anchors at the edge

	Tension load			Shear load								
1.0	ension load		Perpendic	ular to the fr	ee edge	Parallel to the free edge						
	with c ≥	αedge, N		with c ≥	αedge, V⊥	Character souls exerted	with c ≥	αedge, VII				
•	50	1,00		50	0,30	•	50	1,00				
	120	1,00		250	1,00	. Lasaran Danier	120	1,00				

# Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

## Performances hollow calcium silica brick KSL-8DF

Description of the stone, Installation parameters, Reductionfactors



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

Table C29: Factors for anchor groups under tension load

And	chor position p	arallel to hor. jo	int	Anchor position perpendicular to hor. joint					
100011001 100001	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	$\alpha_{g\perp,N}$		
988	50	50	1,00		50	50	1,00		
	120	250	2,00		120	120	2,00		

Table C30: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	joint	Anchor p	osition perpe	endicular to he	or. joint
Shear load		with c≥	with s ≥	αg II,V ⊥	f	with c ≥	with s ≥	αg⊥, V⊥
perpendicular		50	50	0,45		50	50	0,45
to the free		250	50	1,15		250	50	1,20
edge	ourousilistanis 4	250	250	2,00	Assessment of the second	250	250	2,00
Shear load	er coles exploration is	with c≥	with s ≥	αg II,V II	( Personned to took	with c ≥	with s ≥	αg⊥,VII
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

				Charac	cteristic Res	sistances w	rith c≥c <sub>cr</sub> a	and s ≥ s <sub>cr</sub>					
	N.S.			Use condition									
4.4.	Perforated sleeve  Effective Anchorage	ffecitve ichorage depth	d/d				d/d w/d w/w						
Anchor size		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 Te		All Temperature ranges					
		h <sub>ef</sub>	N	$N_{Rk,b} = N_{Rk,p}^{(2)}$			$N_{Rk,b} = N_{Rk,p}^{2}$						
		[mm]		[kN]									
		Normalis	sed mean o	ompressi	ve strength	f <sub>b</sub> ≥ 12 N/	mm <sup>2 1)</sup>						
M8 / M10/ IG-M6	SH 16	130	5,0	4,5	3,5	5,0	4,5	3,5	3,5				
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 130	5,0	4,5	3,5	5,0	4,5	3,5	6,0				

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

# Table C32: Displacements

Anaharaina	hef	δn / N	δΝΟ	δN∞	δv / V	δνο	δV∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δΝο	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δνο
M16	all			- 0110	0,31	0,31*V <sub>Rk</sub> /3,5	1,5*δνο

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

Performances hollow calcium silica brick KSL-8DF

Group factors, characteristic Resistances and Displacements

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

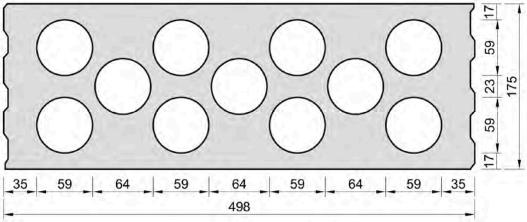


# Brick type: Hollow Calcium silica brick KSL-12DF

# Table C33: Stone description

Brick type		Hollow Calcium silica brick KSL-12DF
Density	ρ [kg/dm³]	≥ 1,4
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 12
Conversion factor for low strengths	ver 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)	Ccr; (Ccr,fi)	[mm]	[mm] 120 (2 h <sub>ef</sub> ) (for shear loads perpendicular to the free edg								
Minimum Edge Distance	Cmin	[mm]				50					
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]				500 (4 he	f)				
(under fire conditions)	[mm]	120 (4 h <sub>ef</sub> )									
Minimum Spacing	[mm]	50									

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

Tension load			Shear load							
			Perpendic	ular to the fr	ee edge	Parallel to the free edge				
	with c ≥	αedge, N	1 - V - V - V - V - V - V - V - V - V -	with c ≥	αedge, V⊥		with c ≥	αedge, VII		
	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	n parallel to h	or. joint		Anchor position perpendicular to hor. joint					
1	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, N		
	50	50	1,50		50	50	1,00		
	120	500	2,00		120	240	2,00		

# Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

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

Description of the stone, Installation parameters, Reductionfactors

parallel to the

free edge



50

120

50

250

1,30

2,00

Brick type:	Hollow Cal	cium silic	a brick K	SL-12DF				
Table C37:	Factors for	anchor g	roups und	er shear	load			
	Anchor posit	ion parallel	to hor. joint		Anchor positi	ion perpendic	cular to hor. jo	oint
Shear load	·	with c ≥	with s ≥	αg II,V⊥	4	with c ≥	with s ≥	αg⊥, V⊥
perpendicular		50	50	0,55		50	50	0,50
to the free	Check!	500	50	1,00		500	50	1,00
edge	-(neconecides	500	500	2,00	31	500	250	2,00
Shear load		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	αg ⊥,V II

2,00

2,00

Table C38: Characteristic values of tension and shear load resistances

50

120

50

500

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$ Use condition													
	Q.	Perforated sleeve  Effective Anchorage depth														
Anchor size	sleev		ecitve horag epth	ecitve horag epth	ecitve horag epth	ecitve horag epth	ecitve horag epth	ecitve horag epth	ecitve horag epth		d/d			w/d w/w		
	irforated		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							
	A.			$N_{Rk,b} = N_{Rk,p}^{(2)}$			$N_{Rk,b} = N_{Rk,p}^{(2)}$									
		[mm]	[kN]													
		Normalis	sed mean c	ompressi	ve strength	f <sub>b</sub> ≥ 12 N/	mm <sup>2 1)</sup>									
M8 / M10/ IG-M6	SH 16	130	3,5	3,5	2,5	3,5	3,5	2,5	3,5							
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 130	3,5	3,5	2,5	3,5	3,5	2,5	7,0							

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

## Table C39: Displacements

Anchor size	hef	δn / N	δΝΟ	δN∞	δv / V	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δΝο	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δ∨ο
M16	all		-1	2 5110	0,31	0,31*V <sub>Rk</sub> /3,5	1,5*δ∨ο

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

Anchor size	Perforated	Effective anchorage depth	Characteristic Resistances  N <sub>Rk,b,fi</sub> = N <sub>Rk,p,fi</sub> = V <sub>Rk,b,fi</sub>					
	sleeve	hef	R30	R60	R90	R120		
		[mm]	[kN]					
M8 / M10 /IG-M6	SH 16	130				-11		
M12 / IG-M8	SH 20	≥ 130	0,37	0,27	0,17	-17		
M16 / IG-M10	SH 20	≥ 130		A ASC 0		0,12		

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

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry	
Performances hollow calcium silica brick KSL-12DF Group factors, characteristic Resistances and Displacements	Annex C 14

<sup>2)</sup> N<sub>Rk,b,c</sub> = N<sub>Rk,p,c</sub> and V<sub>Rk,c II</sub> = V<sub>Rk,c</sub> ⊥ according to Annex C 3



Brick type: Solid clay brick 1D
---------------------------------

# Table C41: Stone description

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



# Table C42: Installation parameter

Anchor size			M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Installation torque	Tinst	[Nm]	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10
Char. Edge distance	Ccr	[mm]	150 (for shear loads perpendicular to the free edge: ccr = 240)						
Minimum Edge Distance	Cmin	[mm]	60						
Characteristic Spacing	Scr, II	[mm]	240						
	Scr, 1	[mm]	130						
Minimum Spacing	Smin, II; Smin, ⊥	[mm]	65						

Table C43: Reduction factors for single anchors at the edge

1 4 5	Tanalan land			Shear load							
Tension load			Perpendic	ular to the fr	ee edge	Parallel to the free edge					
4	with c ≥	αedge, N		with c≥	αedge, V⊥	(Anterior engine money	with c ≥	αedge, VII			
	60	0,75		60	0,10		60	0,30			
	150	1,00		100	0,50	1	100	0,65			
-(	180	1,00	insersides rest	240	1,00		150	1,00			

# Table C44: Factors for anchor groups under tension load

An	chor position p	arallel to hor. jo	int	Anchor position perpendicular to hor. joint				
-terresolement	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	
-i	150	240	2,00	ا السيداليسسية	150	130	2,00	

# Table C45: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint				
Shear load		with c ≥	with s ≥	αg II,V⊥	James and a second	with c ≥	with s ≥	αg⊥, V⊥	
perpendicular		60	65	0,40		60	65	0,30	
to the free		240	65	2,00		240	65	2,00	
edge	i	240	240	2,00	-j	240	130	2,00	
Chaorland	present personal	with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	αg⊥,VII	
Shear load parallel to the free edge		60	65	1,75		60	65	1,10	
		150	65	2,00	•	150	65	2,00	
	Terresolation of	150	240	2,00	January Marcal	150	130	2,00	

Sympafix Injection system C100-PLUS and C100-PLUS NOR	DIC for
masonry	

### Performances solid clay brick 1DF

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



Brick type: Sol	Brick type: Solid clay brick 1DF									
Table C46: Ch	Table C46: Characteristic values of tension and shear load resistances									
			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$							
						Use conditi	on			
	Perforated sleeve	Effecitve Anchorage depth		d/d			w/d w/w		d/d w/d	
Anchor size		A Total		Ι				Ι	w/w	
		erforat	◀	40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges
		h <sub>ef</sub>	$N_{Rk,b} = N_{Rk,p}^{2}$			١	$N_{Rk,b} = N_{Rk,b}$	2) p	V <sub>Rk,b</sub> <sup>2)</sup>	
		[mm]				[kN]				
		Normalis	sed mean c	ompressi	ve strength	f <sub>b</sub> ≥ 20 N/	mm² 1)			
M8	-	80								
M10 / IG-M6	-	≥ 90	7,0	6,0	6,0	7,0	6,0	6,0	8,0	
M12 / IG-M8	-	≥ 100								
M16 / IG-M10	-	≥ 100	8,0	6,5	6,5	8,0	6,5	6,5	12,0	
M8	SH 12	80								
M8 / M10/ IG-M6	SH 16	> 0F	7,0	6,0	6,0	7,0	6,0	6,0	8,0	
M12 / IG-M8	SH 20	≥ 85								

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

6,5

8,0

6,5

6,5

12,0

6,5

≥ 85

8,0

SH 20

### Table C47: Displacements

M16 / IG-M10

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

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

Performances solid clay brick 1DF
Characteristic Resistances and Displacements

Annex C 16

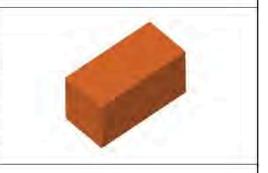
<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c | II} = V_{Rk,c} \perp$  according to Annex C 3



### Brick type: Solid clay brick 2DF

### Table C48: Stone description

Brick type		Solid clay brick Mz- 2DF
Density	ρ [kg/dm³]	≥ 2,0
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 28
Conversion factor for lov strengths	ver compressive	$(f_b / 28)^{0.5} \le 1.0$
Code		EN 771-1:2011+A1:2015
Producer (Country)		e.g. Wienerberger (DE)
Brick dimensions	[mm]	≥ 240 x 115 x 113
Drilling method		Hammer drilling
Drining metrod		Training anning



### 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)	C <sub>CF</sub> , (C <sub>CF</sub> ,fi)	[mm] $150 (2 h_{ef})$ (for shear loads perpendicular to the free edge: $c_{cr} = 240$ )				= 240)			
Minimum Edge Distance	Cmin	[mm]	50				- 1-4		
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]				240 (4 h <sub>e</sub>	f)		
(under fire conditions) $s_{cr, \perp; (S_{cr,fi, \perp})}$		[mm]	240 (4 h <sub>ef</sub> )						
Minimum Spacing	Smin, II; Smin, 1	[mm]	mm] 50						

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

	ension load		Shear load perpendicular to free edge			Shear load parallel to free edge		
1	with c ≥	αedge, N	1	with c ≥	αedge, V⊥	4	with c ≥	αedge, VII
	50 <sup>1)</sup>	1,00		50	0,20	1	50	1.00
	150 <sup>1)</sup>	1,00		125	0,50	Į.	50	1,00
deministration of	180	1,00		240	1,00	James land	150	1,00

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

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

And	chor position p	arallel to hor. jo	int	Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, N	
***************************************	50 <sup>1)</sup>	50	1,50	-1	50 <sup>1</sup> )	50	0,80	
	150 <sup>1)</sup>	240	2,00		150 <sup>1)</sup>	240	2,00	
	180 <sup>2)</sup>	60	1,00		180 <sup>2)</sup>	60	1,00	
	180 <sup>2)</sup>	240	1,55	dimensional lateral	1002)	400	2.00	
	240 <sup>2)</sup>	240	2,00	11 04	180 <sup>2)</sup> 120 2,		2,00	

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

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

	Anchor position parallel to hor. joint					Anchor position perpendicular to hor, joint				
Chasalasa		with c≥	with s ≥	αg II,V⊥	American Conc	with c ≥	with s ≥	$\alpha_{g\perp, V\perp}$		
Shear load		50	50	0,40		50	50	0,20		
perpendicular to the free		240	50	1,20	• • • • • • • • • • • • • • • • • • •	240	50	0,60		
		240	240	2.00	\$1	240	125	1,00		
edge		240	240	2,00		240	240	2,00		
Shear load	(entre to the trop of the total of	with c ≥	with s ≥	αg 11,V 11	[	with c≥	with s ≥	αg ⊥,V II		
parallel to the	B 20	50	50	1,20	•	50	50	1,00		
free edge		150 240	240	2.00	•	50	125	1,00		
nee euge	(managarithmanag		2,00	f	150	240	2.00			

# Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

### Performances solid clay brick 2DF

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

Annex C 17

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



### Brick type: Solid clay brick 2DF

Table C53: Characteristic values of tension and shear load resistances

Table Coo. Ci	iaiactei	istic vai	ues or ter	ision and	Sileai ioa	u resista	11062				
				Charac	cteristic Res	istances w	rith c≥c <sub>cr</sub>	and s ≥ s <sub>cr</sub>			
			Use condition								
	d sleeve	Effecitve Anchorage depth	d/d				d/d w/d w/w				
Anchor size	Perforated sleeve		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges		
	L L	h <sub>ef</sub>	N	$N_{Rk,b} = N_{Rk,p}$	2)	1	$N_{Rk,b} = N_{Rk,b}$	2) p	V <sub>Rk,b</sub> <sup>2)</sup>		
		[mm]				[kN]					
	Normalised mean compressive strength f <sub>b</sub> ≥ 28 N/mm <sup>2</sup> 1)										
M8	-	80						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 <sup>3)</sup>		
M10 / M12 / IG-M6 / IG-M8	-	200	11,5	11,5	10,0	6,0	6,0	5,0	8,0		
M16 / IG-M10	-	200	11,5	11,5	10,0	6,0	6,0	5,0	12,0		
M8	SH 12	80	0.0	0.0	7.5	0.0	0.0	7.5	0.5		
M8 / M10/ IG-M6	SH 16	≥ 85	9,0	9,0	7,5	9,0	9,0	7,5	9,5		
M12 / IG-M8	SH 20	≥ 85	9,0	9,0	7,5	9,0	9,0	7,5	12,0		
M16 / IG-M10	SH 20	≥ 85	9,0	9,0	7,5	9,0	9,0	7,5	12,0 <sup>3)</sup>		

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

### Table C54: Displacements

Angher 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	0,1	0,1*N <sub>Rk</sub> / 3,5	2*δηο	0,3	0,3*V <sub>Rk</sub> /3,5	1,5*δ∨0
M16	all	,	,		0,1	0,1*V <sub>Rk</sub> /3,5	1,5*δ∨0

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

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

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry	
Performances solid clay brick 2DF Characteristic Resistances and Displacements	Annex C 18

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

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

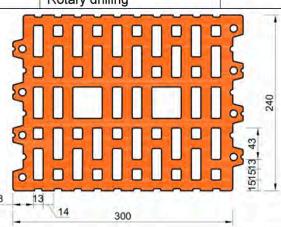


### Brick type: Hollow clay brick 10 DF

### Table C56: Stone description

	Hollow clay brick HLZ-10DF
ρ [kg/dm³]	≥ 1,25
f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 20
ver compressive	$(f_b / 20)^{0.5} \le 1.0$
	EN 771-1:2011+A1:2015
	e.g. Wienerberger (DE)
[mm]	300 x 240 x 249
	Rotary drilling
	f <sub>b</sub> [N/mm²] ver compressive





### Table C57: Installation parameter

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

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

7	oneion lood		Shear load						
1	ension load		Perpendic	ular to the fr	ee edge	Parallel to the free edge			
1	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, VII	
•	50	1,00		50	0,20	•	50	1,00	
demonstrates	120	1,00	. (	300	1,00		120	1,00	

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

And	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	1,55		50	50	1,00		
	120	300	2,00		120	250	2,00		

# Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

### Performances hollow clay brick HLZ 10DF

Description of the stone, Installation parameters, Reductionfactors



Brick type: Table C60:	Hollow clay Factors for			er shear l	oad			
	Anchor	position pa	rallel to hor.	joint	Anchor p	osition perpe	endicular to h	or. joint
Shear load	(processing present in	with c ≥	with s ≥	αg II,V⊥	42000-00-4	with c ≥	with s ≥	αg⊥, V⊥
perpendicular to the free		50	50	0,30		50	50	0,20
		300	50	1,40		300	50	1,00
edge	-(risemeser)esement	300	300	2,00	governdered,	300	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	1,85	1	50	50	1,00
free edge		120	300	2,00		120	250	2,00

Table C61:	Characteristic value	ues of tension	and shear loa	ad resistances
Table C61:	Characteristic vali	ues of tension	and shear loa	ad resista

				Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$									
	Perfors			Use condition									
Anchor size		Effective Anchorage depth	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				
		hef	1	$N_{Rk,b} = N_{Rk,p}^{(2)}$			$N_{Rk,b} = N_{Rk,p}^{2}$						
		[mm]				[kN]							
		Normalis	sed mean o	ompressi	ve strength	f <sub>b</sub> ≥ 20 N/	mm <sup>2 1)</sup>						
M8	SH 12	80	0.5	0.5	0.0	0.5	0.5	0.0	0.0				
M8 / M10/ IG-M6	SH 16	≥ 85	2,5	2,5	2,0	2,5	2,5	2,0	8,0				
M12 / IG-M8	SH 20	≥ 85	5,0	5,0	4,5	5,0	5,0	4,5	8,0				
M16 / IG-M10	SH 20	≥ 85	5,0	5,0	4,5	5,0	5,0	4,5	11,5				

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

### Table C62: Displacements

Anchor size	hef	δn/N	δΝο	δN∞	δv / V	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]		[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δηο	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δ∨ο
M16	all	0,13	3,12,11111.	2 0110	0,31	0,31*V <sub>Rk</sub> /3,5	1,5*δ∨ο

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

Ancher eize	Perforated	Effecitve Anchorage depth	Characteristic Resistances $N_{Rk,b,fi} = N_{Rk,p,fi} = V_{Rk,b,fi}$						
Anchor size	sleeve	hef	R30	R60	R90	R120			
		[mm]	[kN]						
M8 / M10 /IG-M6	SH 16	130	- 5002	-27-3					
M12 / M16 / IG-M8 IG-M10	SH 20	≥ 130	0,57	0,39	0,21	0,12			

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry	
Performances hollow clay brick HLZ 10DF Group factors, characteristic Resistances and Displacements	Annex C 20
Group factors, characteristic Nesistances and Displacements	

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

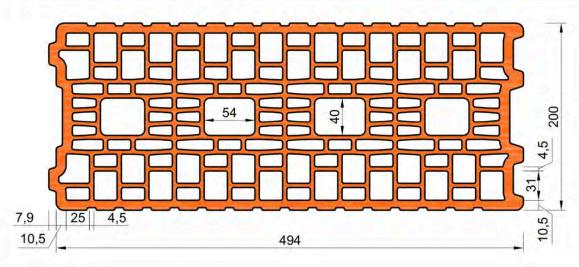


### Brick type: Hollow Clay brick Porotherm Homebric

### Table C64: Stone description

	Hollow clay brick Porotherm Homebric
ρ [kg/dm³]	≥ 0,70
f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 10
er compressive	$(f_b / 10)^{0.5} \le 1.0$
2	EN 771-1:2011+A1:2015
	e.g. Wienerberger (FR)
[mm]	500 x 200 x 300
	Rotary drilling
	f <sub>b</sub> [N/mm²] ver compressive





### Table C65: Installation parameter

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 <sub>cr</sub> = 500)						500)
Minimum Edge Distance	Cmin	[mm]	120						
0	Scr, II	[mm]	500						
Characteristic Spacing	Scr, ⊥	[mm]	300						
Minimum Spacing	Smin, II; Smin, ⊥	[mm]	11 6 -			120			

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

	Tension load		Shear load						
rension load			Perpendicular to the free edge			Parallel to the free edge			
	with c ≥	αedge, N	( Year and a representation	with c ≥	αedge, V⊥	(Encourage and and	with c ≥	αedge, VII	
	100	1.00		120	0,30		100	0.60	
	120	1,00		250	0,60	T I	120	0,60	
of more reported as a second	120	1,00	( the second sec	500	1,00	1 spanning barried	200	1,00	

# Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

### Performances hollow clay brick Porotherm Homebric

Description of the stone, Installation parameters, Reductionfactors



#### 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 g	roups und	er 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 ≥	$\alpha_{g\perp,V\perp}$	
		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	200	2.00	
cugo	3.0	120	500	2,00	F 1	120	300	2,00	
Shear load	(construction of the contract	with c≥	with s ≥	αg II,V II		with c ≥	with s ≥	αg ⊥,V II	
parallel to the		120	100	1,00		120	100	1,00	
free edge		120	500	2,00		120	300	2,00	

#### Table C69: Characteristic values of tension and shear load resistances Characteristic Resistances with c ≥ c<sub>cr</sub> and s ≥ s<sub>cr</sub> Use condition Effective Anchorage depth 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 $N_{Rk,b} = N_{Rk,p}^{2}$ $N_{Rk,b} = N_{Rk,p}^{2}$ V<sub>Rk,b</sub><sup>2)</sup> hef [mm] [kN] Normalised mean compressive strength f<sub>b</sub> ≥ 10 N/mm<sup>2</sup> 1) **M8** SH 12 3,0

M8 / M10/	SH 16	≥ 85	1,2	3,0
IG-M6	SH 16	130	1,5	3,5
M12 / M16/	SH 20	≥ 85	1,2	4,0
IG-M8 / IG-M10	SH 20	≥ 130	1,5	4,0
		ngths resistances mus hown values are valid	st be multiplied by the conversion factor accordi without conversion.	ng to Table C64. For stones

2) N<sub>Rk,b,c</sub> = N<sub>Rk,p,c</sub> and V<sub>Rk,c II</sub> = V<sub>Rk,c +</sub> according to Annex C 3

#### Table C70: **Displacements**

A nahay aina	hef	δN/N	δΝΟ	δN∞	δv / V	δνο	δV∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0.13	0,13*N <sub>Rk</sub> / 3,5	2*δΝο	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δ∨0
M16	all	Park of		- 5110	0,31	0,31*V <sub>Rk</sub> /3,5	1,5*δνο

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry	
Performances hollow clay brick Porotherm Homebric Group factors, characteristic Resistances and Displacements	Annex C 22



Brick type					clay brick					
		Floatial	31	BGV Th	nermo					
Density Normalised m	nean	ρ [kg/dr		≥ 0,60						
compressive	strenght	f₀ [N/mi		≥ 10					47	
Conversion fa strengths	actor for lowe	er compre	essive	(f <sub>b</sub> / 10) <sup>0</sup>				-		
Code		6			-1:2011+A1:	2015			1	
Producer (Co				1	oux (FR)					
Brick dimensi	THE BOX DE	[mm]			00 x 314			-		
Drilling metho	od			Rotary	drilling					
									22	
	1								ام	
		-	4			6	1	-	100	
			7	1			_		22	
								79	7	
	42 28				500					
Table C72	5		amete	ar .	500					
TELEBRICA TO SERVE	1				-,= 444-	M12	M16	IG-M6	IG-M8	IG-M10
Anchor size	Installat	ion par	[-]	M8	M10	M12 ≤ 2	M16 ≤ 2	IG-M6 ≤ 2	IG-M8 ≤ 2	I I Water Lande
Anchor size Installation to	Installat	ion para	[-] [Nm]	M8 ] ≤2	M10 ≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2
Anchor size Installation to Char. Edge di	Installat rque istance	ion par	[-] [Nm]	M8 ] ≤ 2 ] 1:	M10	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2
Anchor size Installation to Char. Edge di Minimum Edg	Installat rque istance ge Distance	Tinst	[-] [Nm]	M8 ] ≤ 2 ] 1:	M10 ≤ 2	≤ 2	≤ 2 endicular	≤ 2	≤ 2	≤ 2
Table C72: Anchor size Installation to Char. Edge di Minimum Edg Characteristic	Installat rque istance ge Distance	Tinst Ccr Cmin	[-] [Nm] [mm]	M8 ] ≤ 2 ] 1: ]	M10 ≤ 2	≤ 2	≤ 2 endicular 120	≤ 2	≤ 2	≤ 2
Anchor size Installation to Char. Edge di Minimum Edg	Installat rque istance ge Distance c Spacing	Tinst Ccr Cmin Scr, II	[-] [Nm] [mm] [mm]	M8 ] ≤ 2 ] 1: ] ]	M10 ≤ 2	≤ 2	≤ 2 endicular 120 500	≤ 2	≤ 2	
Anchor size Installation to Char. Edge di Minimum Edg Characteristic	Installate rque istance ge Distance consciung	Tinst Ccr Cmin Scr, II Scr, ⊥ Smin, II;	[-] [Nm] [mm] [mm] [mm]	M8 ] ≤ 2 ] 1: ] ] ]	M10 ≤ 2	≤ 2 loads perpe	≤ 2 endicular 120 500 315 120	≤ 2	≤ 2	≤ 2
Anchor size Installation to Char. Edge di Minimum Edg Characteristic Minimum Spa Table C73:	Installaterque istance ge Distance se Spacing Reducti	Tinst Ccr Cmin Scr, II Scr, ⊥ Smin, II;	[-] [Nm] [mm] [mm] [mm]	M8 ] ≤ 2 ] 1: ] ] ]	M10 ≤ 2 20 (for shear	≤ 2 loads perpe	≤ 2 endicular 120 500 315	≤ 2	≤ 2	≤ 2
Anchor size Installation to Char. Edge di Minimum Edg Characteristic Minimum Spa Table C73:	Installaterque istance ge Distance se Spacing Reduction load	Tinst Ccr Cmin Scr, II Scr, ⊥ Smin, II;	[-] [Nm] [mm] [mm] [mm]	M8 ] ≤ 2 ] 13 ] ] r single a	M10 ≤ 2 20 (for shear	≤ 2 loads perpe	≤ 2 endicular 120 500 315 120	≤ 2 to the free	≤ 2 edge: c <sub>cr</sub> =	≤ 2 500)
Anchor size Installation to Char. Edge di Minimum Edg Characteristic Minimum Spa Table C73:	Installaterque istance ge Distance se Spacing Reducti	Tinst Ccr Cmin Scr, II Scr, ⊥ Smin, II;	[-] [Nm] [mm] [mm] [mm] [mm]	M8 ] ≤ 2 ] 13 ] ] r single a	M10 ≤ 2 20 (for shear  anchors at  dicular to the with c ≥	≤ 2 the edge She free edge αedge, ∨ ⊥	≤ 2 endicular 120 500 315 120 ear load	≤ 2 to the free	≤ 2 edge: c <sub>cr</sub> =	≤ 2 500)
Anchor size Installation to Char. Edge di Minimum Edg Characteristic Minimum Spa Table C73:	Installate rque istance ge Distance c Spacing  Reducti ension load with c ≥ 120	Tinst Cor Cmin Sor, II Sor, ⊥ Smin, II; Smin, ⊥	[-] [Nm] [mm] [mm] [mm] [mm]	M8 ] ≤ 2 ] 13 ] ] r single a	M10 ≤ 2 20 (for shear	≤ 2 loads perpe	≤ 2 endicular 120 500 315 120 ear load	≤ 2 to the free	≤ 2 edge: c <sub>cr</sub> =	≤ 2 500)
Anchor size Installation to Char. Edge di Minimum Edg Characteristic Minimum Spa Table C73:	Installate rque istance ge Distance compacing Reduction load with c ≥	Tinst Cor Cmin Scr, II Smin, II; Smin, Δ	[-] [Nm] [mm] [mm] [mm] [mm]	M8 ] ≤ 2 ] 13 ] ] r single a	M10 ≤ 2 20 (for shear  anchors at  dicular to the with c ≥ 120	≤ 2 loads perpe	≤ 2 endicular 120 500 315 120 ear load	≤ 2 to the free	$\leq 2$ edge: $c_{cr} =$ o the free e with $c \geq$	≤ 2 500) dge αedge, ∨ II



#### 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 ≥ with c ≥ with s ≥ αg II, N $\alpha_{g\perp,N}$ 120 100 1,00 120 100 1,00 200 100 1,70 200 100 1,10 120 500 2,00 120 315 2,00

Table C75:	Factors for	anchor g	roups und	er 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⊥	derror de maria	with c ≥	with s ≥	αg⊥, V⊥	
perpendicular to the free		120	100	1,00		120	100	1,00	
edge	- II	120	500	2,00	ļ.	120	315	2,00	
Shear load		with c≥	with s ≥	αg II,V II		with c ≥	with s ≥	αg ⊥,V II	
parallel to the		120	100	1,00		120	100	1,00	
free edge	in a second transfer	120	500	2,00	-	120	315	2,00	

				Chara	cteristic Res	sistances w	ith c ≥ c <sub>cr</sub> :	and s ≥ s <sub>cr</sub>				
	1											
	d sleeve	Effecitve Anchorage depth	d/d			w/d w/w			d/d w/d w/w			
Anchor size	Perforated sleeve	An	40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	80°C/50°C 120°C/72°C				
	а.	h <sub>ef</sub>	1	$N_{Rk,b} = N_{Rk,p}^{2}$			NRK,b = NRK,	2) p	V <sub>Rk,b</sub> <sup>2)</sup>			
	1 11 3	[mm]										
		Normalis	sed mean d	ompressi	ve strength	f <sub>b</sub> ≥ 10 N/	mm² 1)					
M8	SH 12	80		2.0	0,	9			3,5			
M8 / M10/	SH 16	≥ 85	7	•	0,	9			3,5			
IG-M6	2110	130	2	,0	1,5	2	,0	1,5	4,0			
M12 / M16	SH 20	≥ 85			0,	9			4,0			
141.12 / 141.10												

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

1,5

2,0

2,0

≥ 130

SH 20

### Table C77: Displacements

IG-M8 / IG-M10

Ancheroise	hef	δn / N	δΝΟ	δN∞	δv / V	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δηο	0,55	0,55*V <sub>Rk</sub> /3,5	1,5*δ∨0
M16	all			2 3110	0,31	0,31*V <sub>Rk</sub> /3,5	1,5*δ∨ο

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry	
Performances hollow clay brick BGV Thermo Group factors, characteristic Resistances and Displacements	Annex C 24

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



Table C78:	Hollow C			IIIDIIC KT						
Brick type		7.		Hollow cla						
Density		ρ [kg/dr	n <sup>3</sup> ]	≥ 0,60						
Normalised me	ean	f <sub>b</sub> [N/mr		≥ 12						
compressive st		7		2 12			1			
Conversion fac strengths	tor for lowe	er compre	essive	(f <sub>b</sub> / 12) <sup>0,5</sup>	≤ 1,0					W
Code				EN 771-1	:2011+A1:2	015				
Producer (Cou	ntry)	- 4	_ 2	e.g. Leroi	ux (FR)				LE COLLEGE	
Brick dimensio	ns	[mm]		500 x 200	0 x 314					
Drilling method	N°			Rotary dr	illing					
						86			200	
	40	6			500				200	
Table C79:	_40_			r C	500				20	
Anchor size	Installat	ion para	[-]	r M8	M10	M12	M16	IG-M6	IG-M8	IG-M1
Anchor size Installation tord	Installat	ion para	[-] [Nm]	r   M8   ≤ 2	M10 ≤ 2	≤ 2	≤ 2	IG-M6 ≤ 2	IG-M8   ≤ 2	≤ 2
Anchor size Installation tord Char. Edge dis	Installat que stance	Tinst Cor	[-] [Nm] [mm]	r   M8   ≤ 2   120	M10	≤ 2	≤ 2 endicular t	IG-M6 ≤ 2	IG-M8   ≤ 2	≤ 2
Anchor size Installation tord Char. Edge dis	Installat que stance	Tinst Ccr Cmin	[-] [Nm] [mm] [mm]	r   M8   ≤ 2   120	M10 ≤ 2	≤ 2	≤ 2 endicular t 120	IG-M6 ≤ 2	IG-M8   ≤ 2	≤ 2
	Installat que stance e Distance	Tinst Ccr Cmin Scr, II	[-] [Nm] [mm] [mm]	r   M8   ≤ 2   120	M10 ≤ 2	≤ 2	≤ 2 endicular t 120 500	IG-M6 ≤ 2	IG-M8   ≤ 2	≤ 2
Anchor size Installation tord Char. Edge dis Minimum Edge Characteristic	Installat que stance e Distance Spacing	Tinst Ccr Cmin Scr, II Scr, ⊥ Smin, II;	[-] [Nm] [mm] [mm]	r   M8   ≤ 2   120	M10 ≤ 2	≤ 2	≤ 2 endicular t 120	IG-M6 ≤ 2	IG-M8   ≤ 2	≤ 2
Anchor size Installation tord Char. Edge dis Minimum Edge Characteristic	Installat que stance Distance Spacing	Tinst Ccr Cmin Scr, II Scr, ⊥ Smin, II;	[-] [Nm] [mm] [mm] [mm] [mm]	r   M8   ≤ 2   120	M10 ≤ 2	≤ 2 loads perpe	≤ 2 Indicular to 120 500 315 120	IG-M6 ≤ 2	IG-M8   ≤ 2	≤ 2
Anchor size Installation toro Char. Edge dis Minimum Edge Characteristic s Minimum Space Table C80:	Installat que stance Distance Spacing	Tinst Ccr Cmin Scr, II Scr, ⊥ Smin, II;	[-] [Nm] [mm] [mm] [mm] [mm]	r M8 ≤ 2 120 r single an	M10 ≤ 2 O (for shear	≤ 2 loads perpe	≤ 2 endicular t 120 500 315	IG-M6 ≤ 2 to the free	IG-M8 ≤2 edge: c <sub>cr</sub> =	≤ 2 500)
Anchor size Installation toro Char. Edge dis Minimum Edge Characteristic s Minimum Space Table C80:	Installat que stance e Distance Spacing sing Reductionsion load	Tinst Ccr Cmin Scr, II Scr, ⊥ Smin, II; Smin, ⊥	[-] [Nm] [mm] [mm] [mm] [mm]	r M8 ≤ 2 120 r single an	M10 ≤ 2 0 (for shear lackers at the colors at the color	≤ 2 loads perpe  he edge  Sheree edge	≤ 2 Indicular to 120 500 315 120  ear load	IG-M6 ≤ 2 to the free	IG-M8 ≤ 2 edge: c <sub>cr</sub> =	≤ 2 500)
Anchor size Installation toro Char. Edge dis Minimum Edge Characteristic s Minimum Space Table C80:	Installated and the stance and the s	Tinst Ccr Cmin Scr, II Scr, ⊥ Smin, II;	[-] [Nm] [mm] [mm] [mm] [mm]	r M8 ≤ 2 120 r single an	M10 ≤ 2 0 (for shear)  schors at to the followith c ≥	≤ 2 loads perpe  he edge Sheree edge αedge, ∨⊥	≤ 2 Indicular to 120 500 315 120  ear load	IG-M6 ≤ 2 to the free	IG-M8 ≤2 edge: c <sub>cr</sub> =	≤ 2 500)
Anchor size Installation toro Char. Edge dis Minimum Edge Characteristic s Minimum Space Table C80:	Installat que stance e Distance Spacing sing Reductionsion load	Tinst Ccr Cmin Scr, II Scr, ⊥ Smin, II; Smin, ⊥	[-] [Nm] [mm] [mm] [mm] [mm]	r M8 ≤ 2 120 r single an	M10 ≤ 2 0 (for shear lackers at the colors at the color	≤ 2 loads perpe  he edge  Sheree edge	≤ 2 Indicular to 120 500 315 120  ear load	IG-M6 ≤ 2 to the free	IG-M8 ≤ 2 edge: c <sub>cr</sub> =	≤ 2 500)

Performances hollow clay brick Calibric R+

Description of the stone, Installation parameters, Reductionfactors

Annex C 25

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for

masonry



# Brick type: Hollow Clay brick Calibric R+ Table C81: Factors for anchor groups under tension load

And	hor position p	arallel to hor. jo	int	Anchor	position perp	endicular to hor	. joint
-1	with c ≥	with s ≥	αg II, N	4	with c ≥	with s ≥	αg⊥, N
	120	100	1,00		120	100	1,00
Jesses ,	175	100	1,70		175	100	1,10
1	120	500	2,00	of sevies and eliminated.	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⊥	ļ	with c ≥	with s ≥	αg⊥, V⊥
perpendicular		120	100	1,00		120	100	1,00
to the free edge	[	120	500	2,00		120	315	2,00
Shear load		with c ≥	with s ≥	αg II,V II	4	with c ≥	with s ≥	αg ⊥,V II
parallel to the		120	100	1,00		120	100	1,00
free edge	Serveredenses	120	500	2,00		120	315	2,00

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

				Chara	cteristic Re	sistances v	with c≥c <sub>cr</sub>	and s ≥ s <sub>cr</sub>					
		Effective Anchorage depth		Use condition									
d sleeve	Perforated sleeve		d/d				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				
	100	h <sub>ef</sub>		$N_{Rk,b} = N_{Rk,p}$	2)	= 1	V <sub>Rk,b</sub> = N <sub>Rk,</sub>	2) p	V <sub>Rk,b</sub> <sup>2)</sup>				
		[mm]	1			[kN]							
AL THE		Normalis	sed mean	compressi	ive strengt	h f <sub>b</sub> ≥ 12 N	/mm <sup>2 1)</sup>						
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	CH 20	≥ 85	1,2	1,2	0,9	1,2	1,2	0,9	8,5				
IG-M8 /IG-M10	SH 20	≥ 130	1,5	1,5	1,2	1,5	1,5	1,2	8,5				

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

### Table C84: Displacements

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

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for	
masonry	į

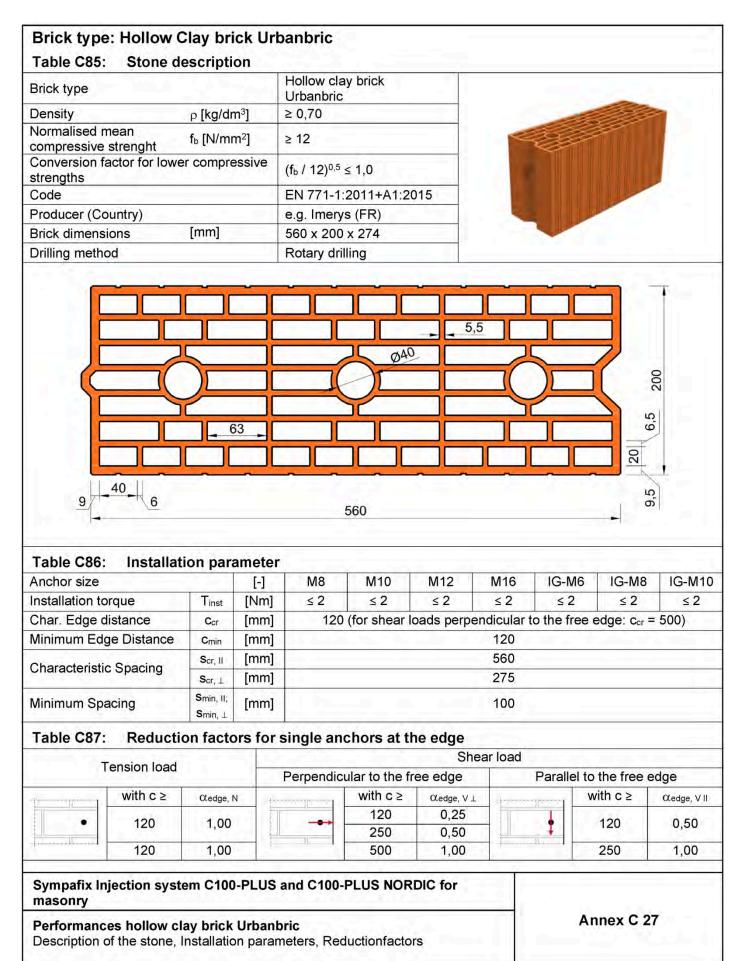
### Performances hollow Clay brick Calibric R+

Group factors, characteristic Resistances and Displacements

Annex C 26

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







#### 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 ≥ αg II, N $\alpha_{g\perp,N}$ 120 100 1,00 120 100 1,00 185 100 1,90 185 100 1,10 120 560 2,00 120 275 2,00

Table C89:	Factors for	anchor g	roups und	er 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 ≥	αg⊥, V⊥		
perpendicular to the free		120	100	1,00		120	100	1,00		
edge		120	560	2,00	- Consessed to the control of the co	120	275	2,00		
Shear load		with c≥	with s ≥	αg II,V II	F	with c ≥	with s ≥	αg⊥,VII		
parallel to the		120	100	1,00		120	100	1,00		
free edge	(conservations)	120	560	2,00		120	275	2,00		

				Charac	cteristic Res	sistances w	rith c≥c <sub>cr</sub> a	and s ≥ s <sub>cr</sub>				
		Perforated sleeve		Use condition								
			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			
			1	$N_{Rk,b} = N_{Rk,p}^{2}$			N <sub>RK,b</sub> = N <sub>RK,</sub>	2)	V <sub>Rk,b</sub> <sup>2)</sup>			
Y		[mm]		[kN]								
		Normalis	sed mean o	ompressi	ve strength	f <sub>b</sub> ≥ 12 N/	mm <sup>2 1)</sup>					
M8	SH 12	80	1,2	1,2	0,9	1,2	1,2	0,9	4,5			
M8 / M10/	CH 16	≥ 85	1,2	1,2	0,9	1,2	1,2	0,9	4,5			
IG-M6	SH 16	130	3,0	3,0	2,5	3,0	3,0	2,5	4,5			
M12 / M16	SH 20	≥ 85	1,2	1,2	0,9	1,2	1,2	0,9	5,0			
IG-M8 / IG-M10	3H 2U	≥ 130	3,0	3,0	2,5	3,0	3,0	2,5	5,0			

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

### Table C91: Displacements

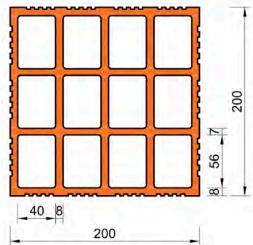
Ancheroise	hef	δN / N	δΝο	δN∞	δv / V	δνο	δV∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δΝο	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δ∨ο
M16	all		3,000	2 0110	0,31	0,31*V <sub>Rk</sub> /3,5	1,5*δνο

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry	
Performances hollow clay brick Urbanbric	Annex C 28
Group factors, characteristic Resistances and Displacements	

<sup>2)</sup> N<sub>Rk,b,c</sub> = N<sub>Rk,p,c</sub> and V<sub>Rk,c II</sub> = V<sub>Rk,c</sub> ⊥ according to Annex C 3



#### Brick type: Hollow Clay brick Brique creuse C40 Table C92: Stone description Hollow clay brick Brick type Brique creuse C40 Density $\rho$ [kg/dm<sup>3</sup>] ≥ 0,70 Normalised mean f<sub>b</sub> [N/mm<sup>2</sup>] ≥ 12 compressive strenght Conversion factor for lower compressive $(f_b / 12)^{0,5} \le 1,0$ strengths EN 771-1:2011+A1:2015 Code e.g. Terreal (FR) Producer (Country) [mm] 500 x 200 x 200 **Brick dimensions** Drilling method Rotary drilling



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 <sub>cr</sub> = 500)							
Minimum Edge Distance	Cmin	[mm]	120							
Characteristic Specing	Scr, II	[mm]	500							
Characteristic Spacing	Scr, ⊥	[mm]	200							
Minimum Spacing	Smin, II;	[mm]	200							

### Table C94: 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 ≥	Cledge, N	(10000000000000000000000000000000000000	with c ≥	αedge, V⊥	1	with c ≥	αedge, VII			
	120	1,00		120	0,83		120	1,00			
ļalt	120	1,00	- I	500	1,00		250	1,00			

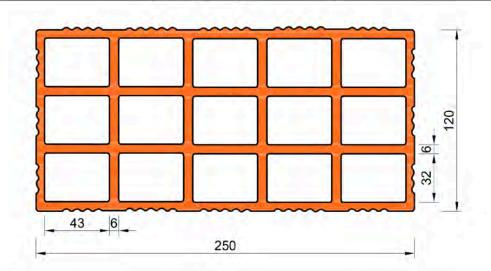
Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry	
Performances hollow clay brick Brique Creuse C40 Description of the stone, Installation parameters, Reductionfactors	Annex C 29



Anc		parallel to	A	under ter			ositio	n nernendi	cular to hor.	ioint
1 1	with c ≥	with		αg II, N	1	1	with	The second second second	with s ≥	αg⊥, N
• •	120	500		2,00			120		200	2,00
Table C96:	Factors	for ancho	r aroups	under sh	ear load					
	The second second	chor position	M. W. C. S. W. L. Phys. Y. L. P.	at the terms of the second		Ancho	or pos	ition perpe	endicular to h	nor, joint
Shear load	}	with c	The state of the state of the state of	STOREST AND ACTOR	,V.1	- renigration	ALCOHOL:	with c ≥	with s ≥	α <sub>g⊥,V⊥</sub>
perpendicular to the free edge		120	500	0 2,0	00	.,		120	200	2,00
Shear load	decement per	with c	≥ with	s≥ αg∥	,VII			with c ≥	with s ≥	αg⊥,V∥
parallel to the free edge		120	500	2,0	00			120	200	2,00
Table C97:	Charact	eristic val	ues of ter	nsion and	shear lo	ad res	sista	nces		
	I AA					-100			and s ≥ s <sub>cr</sub>	
							conditi		G.	
45.6	d sleeve	Effective Anchorage depth	d/d					w/d w/w		d/d w/d w/w
Anchor size	Perforated sleeve	An	40°C/24°C	80°C/50°C	120°C/72°	C 40°C	/24°C	80°C/50°C	120°C/72°C	All temperatur ranges
	п.	h <sub>ef</sub>		$N_{Rk,b} = N_{Rk,p}$	2)		1	$N_{Rk,b} = N_{Rk,b}$	2) p	V <sub>Rk,b</sub> <sup>2)</sup>
		[mm]					kN]			
			ed mean o	compressi	ve streng	th f <sub>b</sub> ≥	12 N/	mm <sup>2 1)</sup>	7	
M8	SH 1:	2 80								
M8 / M10/ IG-M6	SH 1	6 ≥ 85	1,2	1,2	0,9	1	1,2 1,2		0,9	1,5
M12 / M16 / IG-M8 / IG-M	10 SH 2		18.				on factor according to Table C			1.5
with higher s  N <sub>Rk,b,c</sub> = N <sub>Rk,l</sub> Table C98:	trengths, the	e shown valu ıı = V <sub>Rk,c</sub> ⊥acı	es are valid	without conv		onversio	on fact	or according	g to Table C9.	2. For stones
Ancho	r size	hef	δη/Ν	31		δN∞		//V	δνο	δV∞
M8 –	M12 /	[mm]	[mm/kN	] [m	mJ	[mm]		n/kN]	[mm]	[mm]
1G-M6		all	0,13	0,13*N	Rk / 3,5	2*δΝο	0	,55 0	,55*V <sub>Rk</sub> / 3,5	1,5*δ∨0
M	16	all		later a	77.		0	,31 0	,31*V <sub>Rk</sub> / 3,5	1,5*δνο
Sumnafile Int-	otion cust	om C400 D	1116 2-4 0	2400 DI UC	NORDIC	for				
Sympafix Inje masonry	cuon syst	em C100-P	LUS and C	100-PLUS	NORDIC	IOF				



#### Brick type: Hollow Clay brick Blocchi Leggeri Table C99: Stone description Hollow clay brick Brick type Blocchi Leggeri Density ≥ 0,60 $\rho$ [kg/dm<sup>3</sup>] Normalised mean f<sub>b</sub> [N/mm<sup>2</sup>] ≥ 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. Wienerberger (IT) [mm] **Brick dimensions** 250 x 120 x 250 Drilling method Rotary drilling



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 <sub>cr</sub> = 250)							
Minimum Edge Distance	Cmin	[mm]	60							
Characteristic Chasins	Scr, II	[mm]				250				
Characteristic Spacing	Scr, ⊥	[mm]	250							
Minimum Spacing	Smin, II;	[mm]		100						

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

7	ension load				Shea	r load		
	ension load		Perpendic	ular to the fr	ee edge	Paralle	l to the free	edge
	with c ≥	αedge, N	( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	with c ≥	αedge, V⊥		with c ≥	αedge, VII
1	60	1,00		60	0,40	•	60	0,40
	120	1,00		250	1,00	((2))	120	1,00

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry	
Performances hollow clay brick Blocchi Leggeri Description of the stone, Installation parameters, Reductionfactors	Annex C 31



100

250

with s≥

100

100

250

1,00

2,00

αg⊥,VII

0,40

1,00

2,00

#### 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⊥, N αg II, 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 parallel to hor, joint Anchor position perpendicular to hor, joint with s ≥ $\alpha_{g\perp}, v_{\perp}$ 100 0,40

					The second of th		
Shear load		with c ≥	with s ≥	αg II,V⊥	J	with c ≥	11-2
perpendicular	1000	60	100	0,40		60	
to the free	- Image	250	100	1,00		250	
edge		250	250	2,00	4	250	
Chandand	-tearresnethnerest	with c≥	with s ≥	αg II,V II	·	with c ≥	10
Shear load parallel to the		60	100	0,40		60	
free edge		120	100	1,00		120	
nee eage	e proposition of the state of the	120	250	2,00	i i a reconstituit constituit de la cons	120	

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

				Charac	cteristic Res	istances w	ith c≥c <sub>cr</sub> a	and s ≥ s <sub>cr</sub>	
	20	1.5				Use condit	ion		
Auchania	d sleeve	Effective Anchorage depth		d/d			w/d w/w		d/d w/d w/w
Anchor size	Perforated sleeve	An	40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges
		h <sub>ef</sub>	1	N <sub>Rk,b</sub> = N <sub>Rk,p</sub>	2)		V <sub>Rk,b</sub> = N <sub>Rk,i</sub>	2) p	V <sub>Rk,b</sub> <sup>2)</sup>
		[mm]				[kN]			
		Normalis	sed mean o	ompressi	ve strength	f <sub>b</sub> ≥ 12 N/	mm <sup>2 1)</sup>		
M8	SH 12	80	10000	1					
M8 / M10/ IG-M6	SH 16	≥ 85	0,6	0,6	0,6	0,6	0,6	0,6	3,5
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85							

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

#### Table C105: Displacements

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

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry	
Performances hollow clay brick Blocchi Leggeri	Annex C 32
Group factors, characteristic Resistances and Displacements	

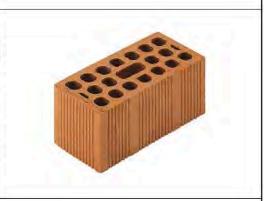
<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c|l} = V_{Rk,c} \perp$  according to Annex C 3

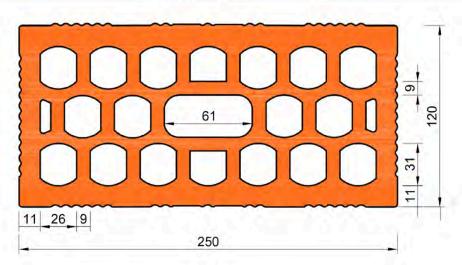


## Brick type: Hollow Clay brick Doppio Uni

### Table C106: Stone description

7.7	Hollow clay brick Doppio Uni
ρ [kg/dm³]	≥ 0,90
f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 28
ver compressive	$(f_b / 28)^{0.5} \le 1.0$
	EN 771-1:2011+A1:2015
	e.g. Wienerberger (IT)
[mm]	250 x 120 x 120
	Rotary drilling
	f <sub>b</sub> [N/mm²] ver compressive





### Table C107: Installation parameter

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 perp	endicular t	to the free	edge: c <sub>cr</sub> =	250)
Minimum Edge Distance	Cmin	[mm]				100		46.6	N. A.
Characteristic Chasins	Scr, II	[mm]				250			
Characteristic Spacing	Scr, ⊥	[mm]				120			
Minimum Spacing	Smin, II;	[mm]				100			

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

-	ension load				Shea	r load		
	ension load		Perpendic	ular to the fr	ee edge	Paralle	l to the free	edge
	with c ≥	αedge, N	( Construction Hammers	with c ≥	αedge, V⊥		with c ≥	αedge, VII
	100	1,00	<b>→</b>	100	0,50		100	1,00
	120	1,00	1	250	1,00	1,	120	1,00

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for	r
masonry	

#### Performances hollow clay brick Doppio Uni

Description of the stone, Installation parameters, Reductionfactors

Annex C 33

8.06.04-419/25



••	with c ≥ 100 120	with s	hor. joint			Anchor	oositio	n perpen	dicular to hor.	joint
			5 ≥	αg II, N			with	C≥	with s ≥	αg⊥, N
	120	100		1,00	1		10	0	120	2,00
		250		2,00	Jane 1	ersel.	120		120	2,00
Shear load	actors fo	r ancho	r groups	under sh	ear loa	d				
Shear load	Ancho	or position	parallel to	hor. joint		Anch	or pos	ition per	pendicular to I	nor, joint
		with c	≥ with	s≥ αgi	I,V 1			with c ≥	with s ≥	αg⊥, V⊥
perpendicular		100	100	1,0	00			100	100	1,00
to the free edge		250	250	2,0	00			250	120	2,00
Shear load		with c	≥ with :	s≥ α <sub>g</sub> ι	I,VII			with c ≥	with s ≥	α <sub>g ⊥,</sub> ∨
parallel to the		100	100			1	1	100	100	1,00
free edge		120	250	2,0	00			120	120	2,00
Table C111: C	haracter	istic val	ues of ter	sion and	shear	load re	sista	nces		
				76 12 00010191		300 300 7 2 1	100		and s≥s <sub>cr</sub>	
		12					condit		,	
	Perforated sleeve	age (						w/d		d/d
	<u>8</u>	ecti hora epth		d/d				w/w		w/d
Anchor size	te d	Effective Anchorage depth						A 67ACS		w/w All
	ora	4	40°C/24°C	80°C/50°C	120°C/7	2°C 40°0	C/24°C	80°C/50°	C 120°C/72°C	temperatur
	Ψ.				1000 500			22.202	2 (102) (2)(0)(2)	
	l ē									ranges
	Pe	h <sub>ef</sub>		$I_{Rk,b} = N_{Rk,b}$	2)			$N_{RK,b} = N_{I}$	2) Rk,p	V <sub>Rk,b</sub> <sup>2)</sup>
	P	h <sub>ef</sub>	ľ	$I_{Rk,b} = N_{Rk,b}$	2)		[kN]	$N_{Rk,b} = N_{l}$	2) Rk,p	
		[mm]	ed mean c			ıgth f <sub>b</sub> ≥	[kN]		2) Rk,p	
M8		[mm]				ıgth f <sub>b</sub> ≥	[kN]		2) Rk,p	
M8 M8 / M10/ IG-M6		[mm] Normalis					[kN]		2) Rk,p	
M8 / M10/ IG-M6 M12 / M16 / IG-M8 / IG-M10	SH 12 SH 16 SH 20	[mm]  Normalis  80  ≥ 85  ≥ 85	ed mean o	1,2	ve stren		[kN] <b>28 N</b> / 1,2	mm <sup>2 1)</sup>	0,9	V <sub>RK,b</sub> <sup>2)</sup> 2,5
M8 / M10/ IG-M6 M12 / M16 /	SH 12 SH 16 SH 20 ressive strengths, the send V <sub>Rk,c II</sub> =	[mm]  Normalis  80  ≥ 85  ≥ 85  engths resis hown value  VRK,c + accoments	1,2 stances muses are valid cording to Ar	1,2 t be multipli without con-	0,9	convers	[kN] 28 N/ 1,2 on fact	mm <sup>2 1)</sup> 1,2 or accord	0,9 ing to Table C1	2,5 06. For stone
M8 / M10/ IG-M6 M12 / M16 / IG-M8 / IG-M10 1) For lower comp with higher stre 2) N <sub>Rk,b,c</sub> = N <sub>Rk,p,c</sub> a	SH 12 SH 16 SH 20 ressive strengths, the send V <sub>Rk,c II</sub> =	[mm]  Normalis  80  ≥ 85  ≥ 85  engths resis hown value  VRk,c±acc nents  hef	1,2 stances muses are valid cording to Ar	1,2 t be multipli without con-	0,9 ed by the version.	convers	[kN] 28 N/ 1,2 on fact	nmm <sup>2 1)</sup> 1,2 or accord	0,9 ing to Table C1	2,5 2,5 06. For stone
M8 / M10/ IG-M6  M12 / M16 / IG-M8 / IG-M10  1) For lower comp with higher stree 2) N <sub>Rk,b,c</sub> = N <sub>Rk,p,c</sub> a  Table C112: C	SH 12 SH 16 SH 20 ressive strengths, the send V <sub>Rk,c II</sub> =	[mm]  Normalis  80  ≥ 85  ≥ 85  engths resis hown value  VRK,c + accoments	1,2 stances muses are valid cording to Ar	1,2 t be multipli without con-	0,9	convers	[kN] 28 N/ 1,2 on fact δ\ [mr	nmm <sup>2 1)</sup> 1,2 or accord	0,9 ing to Table C1 δνο [mm]	2,5 2,5 06. For stone δ∨∞ [mm]
M8 / M10/ IG-M6 M12 / M16 / IG-M8 / IG-M10 1) For lower comp with higher stree 2) N <sub>Rk,b,c</sub> = N <sub>Rk,p,c</sub> a Table C112: E	SH 12 SH 16 SH 20 ressive strengths, the send V <sub>Rk,c II</sub> =	[mm]  Normalis  80  ≥ 85  ≥ 85  engths resis hown value  VRk,c±acc nents  hef	1,2 stances muses are valid cording to Ar	1,2  t be multipli without commex C 3	0,9 ed by the version.	convers	[kN] 28 N/ 1,2 on fact δ\ [mr	nmm <sup>2 1)</sup> 1,2 or accord	0,9 ing to Table C1	2,5  2,5  06. For stone  δ∨∞  [mm]

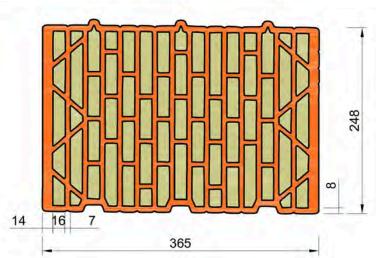


### Brick type: Hollow clay brick Coriso WS07 with insulation

### Table C113: Stone description

Rock wool ≥ 0,55
≥ 0,55
≥ 6
$(f_b / 6)^{0.5} \le 1.0$
EN 771-1:2011+A1:2015
e.g. Unipor (DE)
248 x 365 x 249
Rotary drilling





### Table C114: Installation parameter

Anchor size	19 - 1	[-]	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]							250)
Minimum Edge Distance	Cmin	[mm]	50						
Observation delice Occupies	Scr, II	[mm]	250						
Characteristic Spacing	Scr, ⊥	[mm]				250			
Minimum Spacing	Smin, II; Smin, ⊥	[mm]				50	•		

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

3 7	Tension load			Shear load							
	ension load		Perpendic	ular to the fr	ee edge	Paralle	Parallel to the free edge				
1	with c ≥	αedge, N	( Entertainment plantings	with c ≥	αedge, V⊥	1   1   1   1   1   1   1   1   1   1	with c ≥	αedge, VII			
•	50	1,00		50	0,30	•	50	1,00			
	120	1,00	·	250	1,00	-	120	1,00			

Sympafix Injection system C100-PLUS and C100-PLUS NO	ORDIC for
masonry	

Performances hollow clay brick Coriso WS07 with insulation Description of the stone, Installation parameters, Reductionfactors

Shear load

free edge

parallel to the



with c ≥

50

120

with s ≥

50

250

αg⊥,VII

1,00

2,00

#### Brick type: Hollow clay brick Coriso WS07 with insulation Table C116: 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 αg⊥, N 50 50 1,50 50 1,00 50 120 250 2,00 120 250 2,00 Table C117: Factors for anchor groups under shear load Anchor position parallel to hor. joint Anchor position perpendicular to hor, joint with c ≥ with s ≥ with c ≥ with s ≥ αg II,V⊥ $\alpha_{g\perp}, v_{\perp}$ Shear load 0,40 perpendicular 50 50 50 50 0,40 to the free 250 50 1,00 250 50 1,20 edge 250 250 2,00 250 250 2.00

αg II,V II

1,65

2,00

Table C118: Characteristic values of tension and shear load resistances

with s ≥

50

250

with c ≥

50

120

				Charac	cteristic Res	istances w	ith c≥c <sub>cr</sub>	and s≥s <sub>cr</sub>					
				Use condition									
Amahasaina	d sleeve	Effective Anchorage depth		d/d	=		w/d w/w		d/d w/d w/w				
Anchor size	Perforated sleeve	An	40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges				
		h <sub>ef</sub>	1	J <sub>Rk,b</sub> = N <sub>Rk,p</sub>	2)		N <sub>Rk,b</sub> = N <sub>Rk,</sub>	2) p	V <sub>Rk,b</sub> <sup>2)</sup>				
L		[mm]				[kN]							
		Normali	sed mean	compressi	ive strengtl	n f <sub>b</sub> ≥ 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	5,0				
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85		1,0									

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

### Table C119: Displacements

Anchor size	hef	δN/N	δΝο	δN∞	δv / V	δνο	δV∞
Afficial size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δηο	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δ∨ο
M16	all		3112 33000 312	2 0110	0,31	0,31*V <sub>Rk</sub> /3,5	1,5*δνο

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry	
Performances hollow Clay brick Coriso WS07 with insulation Group factors, characteristic Resistances and Displacements	Annex C 36

<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c|i|} = V_{Rk,c} \perp$  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/dm<sup>3</sup>] ≥ 0,59 Normalised mean f<sub>b</sub> [N/mm<sup>2</sup>] ≥ 8 compressive strenght Conversion factor for lower compressive $(f_b / 8)^{0.5} \le 1.0$ strengths EN 771-1:2011+A1:2015 Code Producer (Country) e.g. Wienerberger (DE) [mm] **Brick dimensions** 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	Tinst							≤ 5	≤ 5
Char. Edge distance (under fire conditions)	C <sub>cr;</sub> (C <sub>cr,fi</sub> )	[mm]	(for shear loads perpendicular to the free edge: c <sub>cr</sub> = 2						
Minimum Edge Distance	Cmin	[mm]				50			
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]	250 (4 hef)						
(under fire conditions)	Scr, \(\pm; \((\mathbb{S}\cr, \text{fi}, \pm)\)	[mm]	250 (4 h <sub>ef</sub> )						
Minimum Spacing	Smin, II; Smin, ±	[mm]		50					

365

Table C122: Reduction factors for single anchors at the edge

37 13

15

			Shear load								
	ension load		Perpendic	ular to the fr	ee edge	Parallel to the free edge					
1	with c ≥	αedge, N	(finesian paners)	with c ≥	αedge, V⊥	otronomies and the second	with c ≥	αedge, V II			
•	50	1,00		50	0,35	•	50	1,00			
	120	1,00	(hansandama)	250	1,00		120	1,00			

Table C123: Factors for anchor groups under tension load

And	chor position p	arallel to hor. jo	int	Anchor position perpendicular to hor. joint					
	with c ≥	with s ≥	αg II, N	Tressress Tressress L	with c≥	with s ≥	αg⊥, N		
	50	50	1,40		50	50	1,15		
	120	250	2,00		120	250	2,00		

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for	r
masonry	

Performances hollow clay brick T7 MW with insulation
Description of the stone, Installation parameters, Reductionfactors

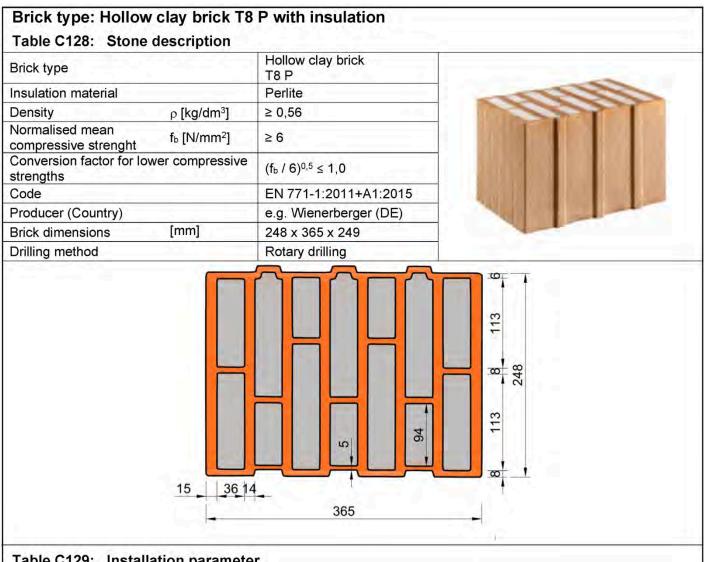


		F-1-1-1	r groups  n parallel to		Jai Idat		or non	ition norm	andicular to	hor joint
0.000.000.000	Anche			1000		Anci		with c≥	endicular to with s ≥	
Shear load		with c	A CONTRACTOR OF THE PARTY OF TH	3 "	the same of the sa		3-	with c ≥		α <sub>g ⊥, V ⊥</sub>
perpendicular to the free		250	50 50	0,6			-	250	50 50	0,40
edge		250	250	1,5	Cha.	lli-		250	250	1,00 2,00
		with c			1949			with c ≥	with s ≥	
Shear load		50	2 With \$	- Co		•		50	50	αg⊥,V∥
parallel to the free edge	la l	120	250	2,0		•	<u> </u>	120	250	1,20 2,00
	D. Charles		A				5450		250	2,00
Table C125: C	haracter	istic val	ues of ter	sion and	shear	oad re	sista	nces		
				Chara	cteristic F	Resista	nces w	ith c≥c <sub>cr</sub>	and s ≥ s <sub>cr</sub>	
	0	d)				Use	condit	ion		
	Perforated sleeve	Effective Anchorage depth				w/d		d/d		
	8	Effective inchorage depth		d/d				w/w		w/d w/w
Anchor size	ted	₽ o b								All
	lorg l	r Si	40°C/24°C	80°C/50°C	120°C/72	2°C 40°C	C/24°C	80°C/50°C	120°C/72°C	
	Je J				1	1		10-40		ranges
	III EX	hef	1	I <sub>Rk,b</sub> = N <sub>Rk,p</sub>	2)		1	N <sub>Rk,b</sub> = N <sub>Rk</sub>	2) p	V <sub>Rk,b</sub> <sup>2)</sup>
		[mm]					[kN]			
			sed mean	compress	ive strer	igth fb	≥ 8 N/r	nm² 1)	7	
M8	SH 12	80						1	81	1 , 31
M8 / M10/ IG-M6	SH 16	≥ 85	2,0	2,0	1,5	31	2,0	2,0	1,5	3,0
M12 / IG-M8	SH 20	≥ 85	2,0	2,0	1,3		2,0	2,0	1,5	
M16 / IG-M10	SH 20	≥ 85								4,5
<ol> <li>For lower comp with higher stre</li> <li>N<sub>Rk,b,c</sub> = N<sub>Rk,p,c</sub> &amp;</li> </ol>	ngths, the s	hown valu : V <sub>Rk,c</sub> ⊥ac	es are valid	without conv						
Table C126:	i70	hef	δN/N	δι	NO ON	δΝ∞	δι	//V	δνο	δ∨∞
		[mm]	[mm/kN]	[m	m]	[mm]	[mr	n/kN]	[mm]	[mm]
Anchor s					La Se Te	2*δΝο	0	,55	),55*V <sub>Rk</sub> / 3,5	5 1,5*δνο
	2/	all	0,13	0,13*N	Rk / 3,5	2 0110				
Anchor s	2/	all	0,13	0,13*N	Rk / 3,5	2 0110	0	,31 0	,31*V <sub>Rk</sub> /3,5	5 1,5*δvo
Anchor s M8 – M1 IG-M6 – I M16	2 / M10	all	.58.5						Aver and	
Anchor s M8 – M1 IG-M6 – I	2 / M10	all	.58.5			oad re	sista		ler fire exp	
Anchor s M8 – M1 IG-M6 – I M16 Table C127: C	2 / M10 Character	all istic val	ues of ter	sion and	l shear l	oad re	esista racteris	nces und	ler fire exp ances	osure
Anchor s M8 – M1 IG-M6 – I M16	2 / M10 Character	all istic val	ues of ter iffecitve orage depth	sion and		oad re	esista racteris	nces und stic Resista V <sub>Rk,p,fi</sub> = V <sub>F</sub>	ler fire exp	
Anchor s  M8 – M1 IG-M6 – I  M16  Table C127: C	2 / M10 Character Perforat sleeve	all istic val ed Anche	ues of ter iffecitve orage depth her [mm]	sion and	l shear l	oad re	esista racteris	nces und	ler fire exp ances	osure
Anchor s M8 – M1 IG-M6 – I M16 Table C127: C	2 / M10 Character	all istic val Eed Anch	ues of ter iffecitve orage depth	nsion and	l shear l	oad re	esista racteris	nces und stic Resista N <sub>Rk,p,fi</sub> = V <sub>F</sub> [kN]	ler fire exp ances	osure

Z205556.25 8.06.04-419/25

Performances hollow clay brick T7 MW with insulation Group factors, characteristic Resistances and Displacements





Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque	Tinst	[Nm]	≤ 4	≤ 4	≤ 10	≤ 10	≤ 4	≤ 4	≤ 4	
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: c <sub>cr</sub> = 250)							
Minimum Edge Distance	Cmin	[mm]	50							
Characteristic Spacing	Scr, II	[mm]	250							
Characteristic Spacing	Scr, ⊥	[mm]	250							
Minimum Spacing	Smin, II;	[mm]	15 =	50						

#### Table C130: 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, N αedge, V⊥ Cledge, VII 50 1,00 50 0,25 50 1,00 250 120 1,00 1,00 120 1,00

Sympafix Injection system C100-PLUS and C100-PLUS 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

And	chor position p	arallel to hor. jo	int	Ancho	r position perp	endicular 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	d ansan Person	120	250	2,00

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

	Anchor	position pa	rallel to hor.	joint	Anchor p	osition perpe	endicular to he	or. joint
Shear load perpendicular		with c ≥	with s ≥	αg II,V⊥	January 11, 11, 11, 11, 11, 11, 11, 11, 11, 11	with c ≥	with s ≥	$\alpha_{g\perp, V\perp}$
	50	50	0,40		50	50	0,30	
to the free		250	50	1,35		250	50	1,20
edge		250	250	2,00		250	250	2,00
Shear load parallel to the free edge	) in a second persons of	with c ≥	with s ≥	αg II,V II	-	with c ≥	with s ≥	αg⊥,VII
		50	50	1,70	1	50	50	1,00
	h	120	250	2,00		120	250	2,00

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

				Charac	cteristic Res	sistances w	ith c≥c <sub>cr</sub>	and s ≥ s <sub>cr</sub>			
		Effective Anchorage depth	Use condition								
Anchor size	d sleeve			d/d			w/d w/w		d/d w/d w/w		
	Perforated sleeve		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges		
		h <sub>ef</sub>	$N_{Rk,b} = N_{Rk,p}^{2}$			$N_{Rk,b} = N_{Rk,p}^{2}$			V <sub>Rk,b</sub> <sup>2)</sup>		
		[mm]				[kN]					
		Normali	sed mean	compress	ive strengt	h f <sub>b</sub> ≥ 6 N/r	nm² 1)				
M8	SH 12	80				120					
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					15.0				
M16 / IG-M10	SH 20	≥ 85	2,5	2,5	2,0	2,5	2,5	2,0	7,0		

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

### Table C134: Displacements

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

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for
masonry

### Performances hollow clay brick T8 P with insulation

Group factors, characteristic Resistances and Displacements

Annex C 40

<sup>2)</sup> N<sub>Rk,b,c</sub> = N<sub>Rk,p,c</sub> and V<sub>Rk,c II</sub> = V<sub>Rk,c \(^{\perp}\)</sub> according to Annex C 3

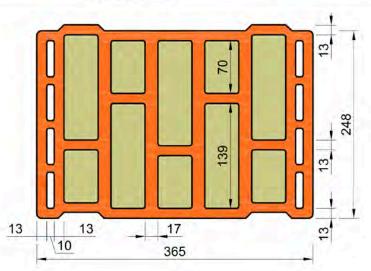


### Brick type: Hollow clay brick Thermoplan MZ90-G with insulation

Table C135: Stone description

Brick type	35 3 5	Hollow clay brick Thermoplan MZ90-G			
Insulation material		Rock wool			
Density	ρ [kg/dm³]	≥ 0,68			
Normalised mean compressive strenght	≥ 12				
Conversion factor for low strengths	ver 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

Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Installation torque	Tinst	[Nm]	≤ 4	≤ 4	≤ 10	≤ 10	≤ 4	≤ 4	≤ 4
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: c <sub>cr</sub> = 250)						250)
Minimum Edge Distance	Cmin	[mm]	50						
14 19 16 17 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Scr, II	[mm]	250						
Characteristic Spacing	Scr, ⊥	[mm]	250						
Minimum Spacing	Smin, II;	[mm]	50						_3

Table C137: Reduction factors for single anchors at the edge

	Tanaian laad			Shear load							
Tension load			Perpendic	ular to the fr	ee edge	Parallel to the free edge					
The second	with c ≥	αedge, N	(Asmessulamen	with c ≥	αedge, V⊥	( bear on process	with c ≥	αedge, VII			
•	50	1,00		50	0,25	•	50	1,00			
	120	1,00		250	1,00		120	1,00			

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for	r
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

And	Anchor position parallel to hor. joint				r position perp	endicular to ho	. 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	- Lancarionnal	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 ≥	αg II,V⊥	January 1941	with c ≥	with s ≥	αg⊥, V⊥	
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	- Accesses the const	250	250	2,00	
Shear load	) becomes of houses.	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	hansan Kasan	120	250	2,00	Tanana da assari	120	250	2,00	

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

				Charac	cteristic Res	sistances with $c \ge c_{cr}$ and $s \ge s_{cr}$								
	4	Effective Anchorage depth		Use condition										
Anchor size	Perforated sleeve		d/d			w/d w/w			d/d w/d w/w					
	erforate	Ar	40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges					
		h <sub>ef</sub>	1	I <sub>Rk,b</sub> = N <sub>Rk,p</sub>	2)		$N_{Rk,b} = N_{Rk,b}$	2) p	V <sub>Rk,b</sub> <sup>2)</sup>					
		[mm]		[kN]										
		Normalis	sed mean o	ompressi	ve strength	f <sub>b</sub> ≥ 12 N/	mm <sup>2 1)</sup>							
M8	SH 12	80												
M8 / M10/ IG-M6	SH 16	≥ 85	3,0	3,0	2,5	3,0	3,0	2,5	4,0					
M12 / IG-M8	SH 20	≥ 85												
M16 / IG-M10	SH 20	≥ 85	3,5	3,5	3,0	3,5	3,5	3,0	7,5					

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

A walkan alaa	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 <sub>Rk</sub> / 3,5	2*δηο	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δ∨ο
M16	all	V 1		2 0110	0,31	0,31*V <sub>Rk</sub> / 3,5	1,5*δνο

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for	
masonry	

Performances hollow clay brick Thermoplan MZ90-G with insulation Group factors, characteristic Resistances and Displacements

Annex C 42

<sup>2)</sup> N<sub>Rk,b,c</sub> = N<sub>Rk,p,c</sub> and V<sub>Rk,c II</sub> = V<sub>Rk,c \(^{\perp}\)</sub> according to Annex C 3

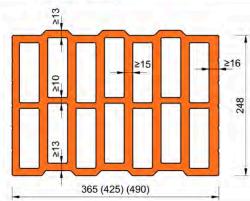


### Brick type: Hollow clay brick Poroton FZ7,5 with insulation

### Table C142: Stone description

Brick type	Hollow clay brick Poroton FZ7,5					
Insulation material		Rock wool				
Density	ρ [kg/dm³]	≥ 0,70				
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 8				
Conversion factor for low strengths	$(f_b / 8)^{0.5} \le 1.0$					
Code		EN 771-1:2011+A1:2015				
Producer (Country)		e.g. Schlagmann (DE)				
Brick dimensions	[mm]	248 x 365 x 249				
Drilling method		Rotary drilling				





### Table C143: Installation parameter

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

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

	Tension load			Shear load							
rension load			Perpendic	ular to the fr	ee edge	Parallel to the free edge					
	with c ≥	αedge, N	( file-mail-on place and in	with c ≥	αedge, V⊥	observed sequences of	with c≥	αedge, VII			
	50	1,00		50	0,35		50	1,00			
- Landelland	120	1,00		250	1,00	Landani	120	1,00			

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

And	chor position p	arallel to hor. jo	int	Ancho	position perp	endicular to hor	. joint
1	with c ≥	with s ≥	αg II, N		with c≥	with s ≥	αg⊥, N
	50	50	1,40		50	50	1,15
ļ	120	250	2,00		120	250	2,00

# Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

Performances hollow clay brick Poroton FZ7,5 with insulation Description of the stone, Installation parameters, Reductionfactors



Anchor size  M8  M8  M12 / IG-M8  M12 / IG-M8  M16 / IG-M10  SH 2  NRK,b,c = NRK,p,c and VRK,c	with c  50  250  250  250  with c  50  250  Authorized to the point of the point o	50 50 250 ≥ with s 50 250 lues of ter 40°C/24°C	s ≥ αg I 0,6 1,8 0 2,1 s ≥ αg I 2,0 0 2,1 nsion and Chara	55 55 50 60 60 60 60 60 60 60 60 60 6	oad resi Resistance Use co	with 50 25 25 with 50 12 stances es with c ndition  V V V V V V V V V V V V V V V V V V	C ≥ ) 0 0 0 C ≥ ) 0 0  ×/d v/w	120°C/72°C	αg ⊥, ∨ ⊥ 0,40 1,00 2,00 αg ⊥, ∨ Ⅱ 1,20 2,00  d/d w/d w/d w/w All
M8 SH 1  M8 SH 1  M8 SH 1  M8 / M10/ IG-M6 SH 1  M12 / IG-M8 SH 2  M16 / IG-M10 SH 2  1) For lower compressive swith higher strengths, the	50 250 250 with c 50 120 eristic va  Auchorage hef [mm] Normali 2 80 ≥ 85 0 ≥ 85	50 50 250 ≥ with s 50 250 lues of ter 40°C/24°C	0,6 1,5 2,0 2,0 5 ≥ αg1 2,0 2,0 Chara  d/d  80°C/50°C  NRk,b = NRk,6	55 55 50 60 60 60 60 60 60 60 60 60 6	Resistance Use co  2°C 40°C/2  [k gth f <sub>b</sub> ≥ 8	stances es with c ndition  NRK,b	0 0 0 c ≥ 0 0 s ≥ c <sub>cr</sub> ; v/d v/w :/50°C = N <sub>Rk</sub> ,	50 50 250 with s ≥ 50 250 and s ≥ s <sub>cr</sub>	0,40 1,00 2,00 α <sub>g ⊥,∨ II</sub> 1,20 2,00  d/d w/d w/w All temperatur ranges
M8 SH 1  M8 SH 1  M8 SH 1  M8 / M10/ IG-M6 SH 1  M12 / IG-M8 SH 2  M16 / IG-M10 SH 2  1) For lower compressive swith higher strengths, the	250 250 250 250 with c 50 120 eristic va    hef [mm]   Normali   80   ≥ 85   0 ≥ 85	50 250 ≥ with s 50 250 1ues of ter 40°C/24°C	1,3 0 2,4 5 ≥ αg 1 2,4 0 2,4 0 2,4 nsion and Chara  d/d  80°C/50°C  N <sub>Rk,b</sub> = N <sub>Rk,i</sub> compress	120°C/72	Resistance Use co  2°C 40°C/2  [k gth f <sub>b</sub> ≥ 8	25 25 with 50 12 stances es with c ndition  V V V V NRk,b	0 0 c ≥ 0 0 5 ≥ c <sub>cr</sub> ; v/d v/w	50 250 with s ≥ 50 250 and s ≥ s <sub>cr</sub>	1,00 2,00 α <sub>g ⊥,∨ II</sub> 1,20 2,00  d/d w/d w/w All temperatur ranges
Anchor size  M8 SH 1  M8 / M10/ IG-M6 SH 1  M12 / IG-M8 SH 2  M16 / IG-M10 SH 2  The strengths, the strengths, the strengths, the strengths in the strengths in the strengths in the strengths, the strengths in the strength	250 with 0 50 120 eristic va    With 0 50   April 120   April 120	250 2 ≥ with s 50 250 1ues of ter 40°C/24°C	0 2,0 s ≥ αg1 2,0 2,0 Chara  d/d  80°C/50°C  NRk,b = NRk,0  compress	shear letteristic R	Resistance Use co  2°C 40°C/2  [k gth f <sub>b</sub> ≥ 8	with 50 12 stances es with c ndition V 4°C 80°C NRK,b	0 c ≥ 0 0 s ≥ c <sub>cr</sub> ; v/d v/w	250 with s ≥ 50 250  and s ≥ s <sub>cr</sub>	2,00  α <sub>g ⊥,∨ II</sub> 1,20  2,00  d/d w/d w/d w/w AII temperatu ranges
Shear load parallel to the free edge  Table C147: Charact  Anchor size  M8 SH 1  M8 / M10/ IG-M6 SH 1  M12 / IG-M8 SH 2  M16 / IG-M10 SH 2  1) For lower compressive swith higher strengths, the	with of 50 120 120 120 120 120 120 120 120 120 12	with s 50 250  lues of ter  40°C/24°C	s ≥ αg1 2,0 2,0 2,0 Chara d/d 80°C/50°C	shear locteristic R	Resistance Use co  2°C 40°C/2  [k gth f <sub>b</sub> ≥ 8	with 50 12 stances es with c ndition  V V 4°C 80°C  NRk,b	c ≥ ) 0  s ≥ c <sub>cr</sub> ;  v/d v/w  :/50°C  = N <sub>Rk</sub>	with s ≥ 50 250  and s ≥ s <sub>cr</sub>	d/d w/d w/w All temperatu ranges
Anchor size  M8 SH 1  M8 / M10/ IG-M6 SH 2  M16 / IG-M10 SH 2  Three edge  M8 SH 1  M9 SH 1  M12 / IG-M8 SH 2  M16 / IG-M10 SH 2  Three edge  M16 / IG-M10 SH 2  Three edge  M16 / IG-M10 SH 2  Three edge  Anchor size	50 120 eristic va    Herical   Heri	40°C/24°C	2,0 2,0 2,0 nsion and Chara d/d 80°C/50°C	shear locteristic R	Resistance Use co  2°C 40°C/2  [k gth f <sub>b</sub> ≥ 8	stances es with c ndition  4°C 80°C  NRK,6	0 5 ≥ C <sub>Cr</sub> : v/d v/w :/50°C = N <sub>Rk</sub> ,	250 ≥ with s ≥ 50 250  c <sub>cr</sub> and s ≥ s <sub>cr</sub> d w  50°C 120°C/72°C  N <sub>RK,p</sub> 0 1,5  rding to Table C1	d/d w/d w/w All temperatu ranges
M8 SH 1 M8 / M10/ IG-M6 SH 2 M16 / IG-M10 SH 2  Three edge  M8 SH 1 M8 / M10/ IG-M6 SH 1 M12 / IG-M8 SH 2 M16 / IG-M10 SH 2  Three edge  M8 SH 1 M8 / M10/ IG-M6 SH 1 M12 / IG-M8 SH 2 M16 / IG-M10 SH 2  Three edge	eristic va  Pristic va  Prist	do°C/24°C	Chara  d/d  80°C/50°C  NRk,b = NRk,	shear lecteristic R	Resistance Use co  2°C 40°C/2  [k gth f <sub>b</sub> ≥ 8	stances es with c ndition  V 4°C 80°C  NRK,b	0 s ≥ c <sub>cr</sub> ; v/d v/w :/50°C = N <sub>Rk</sub> ,	250  and s ≥ s <sub>cr</sub> 120°C/72°C	d/d w/d w/w All temperatu ranges
M8 SH 1 M8 / M10/ IG-M6 SH 1 M12 / IG-M8 SH 2 M16 / IG-M10 SH 2  1) For lower compressive swith higher strengths, the	eristic va    Herical Properties   Properties	40°C/24°C	d/d  80°C/50°C  NRk,b = NRk,	shear leader strength	Resistance Use co  2°C 40°C/2  [k gth f <sub>b</sub> ≥ 8	stances es with c ndition  4°C 80°C  NRk,b	s ≥ c <sub>cr</sub> s v/d v/w :/50°C = N <sub>Rk</sub> ,	and s ≥ s <sub>cr</sub>	d/d w/d w/w All temperatu ranges
M8 SH 1 M8 / M10/ IG-M6 SH 1 M12 / IG-M8 SH 2 M16 / IG-M10 SH 2  1) For lower compressive s with higher strengths, the	Hef Effective when the properties of the proper	40°C/24°C	d/d  80°C/50°C  NRk,b = NRk,	120°C/72	Resistance Use co  2°C 40°C/2  [k gth f <sub>b</sub> ≥ 8	es with condition  V 4°C 80°C  NRK,b	≥ c <sub>cr</sub> ; v/d v/w :/50°C = N <sub>Rk</sub> ,	120°C/72°C	w/d w/w All temperatu ranges
M8 SH 1 M8 / M10/ IG-M6 SH 1 M12 / IG-M8 SH 2 M16 / IG-M10 SH 2  1) For lower compressive s with higher strengths, the	Hef Effective when the properties of the proper	40°C/24°C	d/d  80°C/50°C  NRk,b = NRk,	120°C/72	Resistance Use co  2°C 40°C/2  [k gth f <sub>b</sub> ≥ 8	es with condition  V 4°C 80°C  NRK,b	≥ c <sub>cr</sub> ; v/d v/w :/50°C = N <sub>Rk</sub> ,	120°C/72°C	w/d w/w All temperatu ranges
M8 SH 1 M8 / M10 / IG-M6 SH 1 M12 / IG-M8 SH 2 M16 / IG-M10 SH 2  1) For lower compressive s with higher strengths, the	h <sub>ef</sub> [mm]  Normali 2 80 6 ≥ 85 0 ≥ 85	ised mean	d/d 80°C/50°C N <sub>Rk,b</sub> = N <sub>Rk,l</sub> compress	120°C/72	Use co 2°C 40°C/2 [k gth f₀≥ 8	ndition V 4°C 80°C N <sub>Rk,b</sub> :	v/d v/w :/50°C = N <sub>Rk</sub>	120°C/72°C	w/d w/w All temperatu ranges
M8 SH 1 M8 / M10 / IG-M6 SH 1 M12 / IG-M8 SH 2 M16 / IG-M10 SH 2  1) For lower compressive s with higher strengths, the	h <sub>ef</sub> [mm]  Normali 2 80 6 ≥ 85 0 ≥ 85	ised mean	80°C/50°C N <sub>Rk,b</sub> = N <sub>Rk,i</sub> compress	ive stren	(°C 40°C/2 [k gth f <sub>b</sub> ≥ 8	4°C 80°C N <sub>Rk,b</sub> :	v/w :/50°C = N <sub>Rk,</sub>	3)	w/d w/w All temperatu ranges
M8 SH 1 M8 / M10 / IG-M6 SH 1 M12 / IG-M8 SH 2 M16 / IG-M10 SH 2  1) For lower compressive swith higher strengths, the	h <sub>ef</sub> [mm]  Normali 2 80 6 ≥ 85 0 ≥ 85	ised mean	80°C/50°C N <sub>Rk,b</sub> = N <sub>Rk,i</sub> compress	ive stren	[k gth f₀≥8	V 4°C 80°C N <sub>Rk,b</sub> :	v/w :/50°C = N <sub>Rk,</sub>	3)	w/d w/w All temperatur ranges
M8 SH 1 M8 / M10 / IG-M6 SH 1 M12 / IG-M8 SH 2 M16 / IG-M10 SH 2  1) For lower compressive swith higher strengths, the	h <sub>ef</sub> [mm]  Normali 2 80 6 ≥ 85 0 ≥ 85	ised mean	N <sub>Rk,b</sub> = N <sub>Rk,l</sub>	ive stren	[k gth f₀≥8	4°C 80°C N <sub>Rk,b</sub> :	:/50°C = N <sub>Rk,</sub>	3)	All temperatu ranges
M8 SH 1 M8 / M10 / IG-M6 SH 1 M12 / IG-M8 SH 2 M16 / IG-M10 SH 2  1) For lower compressive swith higher strengths, the	h <sub>ef</sub> [mm]  Normali 2 80 6 ≥ 85 0 ≥ 85	ised mean	N <sub>Rk,b</sub> = N <sub>Rk,l</sub>	ive stren	[k gth f₀≥8	N <sub>Rk,b</sub> :	= N <sub>Rk,</sub>	3)	temperatu ranges
M8 SH 1 M8 / M10 / IG-M6 SH 1 M12 / IG-M8 SH 2 M16 / IG-M10 SH 2  1) For lower compressive swith higher strengths, the	[mm] Normali 2 80 6 ≥ 85 0 ≥ 85	ised mean	N <sub>Rk,b</sub> = N <sub>Rk,l</sub>	ive stren	[k gth f₀≥8	N <sub>Rk,b</sub> :	= N <sub>Rk,</sub>	3)	ranges
M8 SH 1 M8 / M10 / IG-M6 SH 1 M12 / IG-M8 SH 2 M16 / IG-M10 SH 2  1) For lower compressive swith higher strengths, the	[mm] Normali 2 80 6 ≥ 85 0 ≥ 85	ised mean	compress	ive stren	gth f <sub>b</sub> ≥ 8	N]		2) p	
M8 / M10 / IG-M6 SH 1 M12 / IG-M8 SH 2 M16 / IG-M10 SH 2  1) For lower compressive s with higher strengths, the	[mm] Normali 2 80 6 ≥ 85 0 ≥ 85	ised mean	compress	ive stren	gth f <sub>b</sub> ≥ 8	N]			V.IXI,D
M8 / M10 / IG-M6 SH 1 M12 / IG-M8 SH 2 M16 / IG-M10 SH 2  1) For lower compressive s with higher strengths, the	Normali 2 80 6 ≥ 85 0 ≥ 85		H		gth f <sub>b</sub> ≥ 8		1)	1 31	
M8 / M10 / IG-M6 SH 1 M12 / IG-M8 SH 2 M16 / IG-M10 SH 2  1) For lower compressive s with higher strengths, the	2 80 6 ≥ 85 0 ≥ 85		H					1 81	
M8 / M10 / IG-M6 SH 1 M12 / IG-M8 SH 2 M16 / IG-M10 SH 2  1) For lower compressive s with higher strengths, the	6 ≥ 85 0 ≥ 85	2,0	2.0	1.5					
M12 / IG-M8 SH 2  M16 / IG-M10 SH 2  1) For lower compressive swith higher strengths, the	) ≥ 85	2,0	2.0	1 5				A Val	3,0
M16 / IG-M10 SH 2  1) For lower compressive s with higher strengths, the		2,0	2,0	1,5	2,0	)   ;	2,0	1,5	0,0
For lower compressive s with higher strengths, the	1 2 00				1				4,5
with higher strengths, the	Control of the contro	stances mus	t be multipli	ad by the c	conversion	factor acc	cordina	n to Table C1	
2) $N_{Rk,b,c} = N_{Rk,p,c}$ and $V_{Rk,c}$	shown valu	ies are valid	without con-	ersion.		idoto, do	, , , , ,	9 10 10010 0 1	12. 1 01 010(1
	= V <sub>Rk,c</sub> + ac	cording to A	nnex C 3						
Table C148: Displac	ements								
Anchor size	hef	δN/N	δι	NO.	δΝ∞	δv/V	• [=	δνο	δV∞
	[mm	] [mm/kN	] [m	m]	[mm]	[mm/kN]		[mm]	[mm]
M8 – M12 /	all		2	1,00		0,55	0	,55*V <sub>Rk</sub> / 3,5	1,5*δνα
IG-M6 – M10 M16	all	0,13	0,13*N	Rk / 3,5	2*δΝ0	0,31		,31*V <sub>Rk</sub> / 3,5	1 2 3 3 3 3 3
		<u> </u>							
Table C149: Charact			nsion and	shear l			1 2 4 4 4 4	ler fire exp	osure
Dorfo		Effecitive				teristic R			
Anchor size Perfor		orage depti h <sub>ef</sub>		R30		$f_i = N_{Rk,p,t}$		R90	R120
0.00	,,,	[mm]		100		[kN]		1100	IVIZO
M8 / M10 /IG-M6 SH	16	130					li s		
M12 / M16 / IG-M8 IG-M10 SH	20	≥ 130	0	,64	0,37			0,11	-1)
no performance assess	ed								

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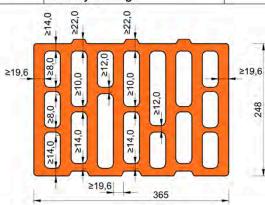
Group factors, characteristic Resistances and Displacements



# Brick type: Hollow clay brick Poroton FZ9 with insulation Table C150: Stone description

Brick type	Hollow clay brick Poroton FZ9				
Insulation material		Rock wool			
Density	ρ [kg/dm³]	≥ 0,90			
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 10			
Conversion factor for low strengths	$(f_b / 10)^{0.5} \le 1.0$				
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	Tinst	[Nm]	≤ 5	≤ 5	≤ 10	≤ 10	≤ 5	≤ 5	≤ 5
Char. Edge distance (under fire conditions)	C <sub>cr;</sub> (C <sub>cr,fi</sub> )	[mm]	120 (2 $h_{ef}$ ) (for shear loads perpendicular to the free edge: $c_{cr}$ = 250)						
Minimum Edge Distance	Cmin	[mm]							10.2
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]	250 (4 h <sub>ef</sub> )						
(under fire conditions)	Scr, $\perp$ ; (Scr,fi, $\perp$ )	[mm]	250 (4 h <sub>ef</sub> )						
Minimum Spacing	S <sub>min, II</sub> ; S <sub>min, ⊥</sub> [mm] 50								

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

	Tonsian load			Shear load							
Tension load			Perpendic	ular to the fr	ee edge	Parallel to the free edge					
	with c ≥	αedge, N	151 m 1 m 1 m 2 m 2 m 2 m 2 m 2 m 2 m 2 m	with c ≥	αedge, V⊥	· Parises and services	with c ≥	αedge, VII			
-9.	50	1,00		50	0,35	•	50	1,00			
	120	1,00	75	250	1,00		120	1.00			

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

And	chor position p	arallel to hor. jo	int	Ancho	Anchor position perpendicular to hor. joint				
1	with c ≥	with s ≥	αg II, N	1	with c ≥	with s ≥	αg⊥, N		
	50	50	1,40		50	50	1,15		
	120	250	2,00		120	250	2,00		

## Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

Performances hollow clay brick Poroton FZ9 with insulation Description of the stone, Installation parameters, Reductionfactors



		77-1-17-71	r groups parallel to		lour rouc		or nos	ition perne	endicular to I	nor joint
ALCERTACE V	Allon	with c		A 1	I,V I 4=	Allone	-	with c ≥	with s ≥	$\alpha_{g\perp, \vee\perp}$
Shear load perpendicular		50	50		60	1921	1=	50	50	0,40
to the free		250	50		55		•	250	50	1,00
edge		250	250		00			250	250	2,00
Shear load		with c			II,VII	- 191-	1	with c ≥	with s ≥	α <sub>g ⊥,</sub> v II
parallel to the		50	50		00	1		50	50	1,20
free edge		120	250		00			120	250	2,00
Table C155:	Character	istic val	ues of ter	To. 1 (0.1)		oad res	eietai	nces		
Table 0155.	Jilaractei	istic vai	ues or ter	All the second second		111/1/111	7 10 7 10 1		and s ≥ s <sub>cr</sub>	
				Ullara	iciensiic i				and s = scr	
	ø	e e				Use c	onaiti	on		d/d
	Perforated sleeve	Effective Anchorage depth		d/d				w/d		w/d
Anchor size	s p	cho			V	44/4/		w/w		w/w
Alichor Size	rate	A		2000		ad Last			ST . 4.	All
	يو		40°C/24°C	80°C/50°C	120°C/72	2°C 40°C	/24°C	80°C/50°C	120°C/72°C	temperature
	<u>a</u>	hef			$R_{k,b} = N_{Rk,p}^{2)}$				2)	ranges 2)
	[mm]		$N_{Rk,b} = N_{Rk,b}$	р	-	kN]	N <sub>Rk,b</sub> = N <sub>Rk</sub>	p	V <sub>Rk,b</sub> <sup>2)</sup>	
			ed mean o	omnrocci	ivo etroni			mm <sup>2</sup> 1)		
M8	SH 12	80	eu mean c	Jonipress	ive strent	gui ib =	10 14/			
M8 / M10/ IG-M6		≥ 85			1,5					3,0
			2,0	2,0		2	,0	2,0	1,5	3,0
M12 / IG-M8	SH 20	≥ 85								
M16 / IG-M10	SH 20	≥ 85		t has manificati	ad by the a		- fast		a ta Tabla C1	4,5
1) For lower comp with higher stre	ngths, the s	hown valu	es are valid	without con		Conversio	in lacti	or accordin	g to Table CT	SO. FOI STOILE
2) $N_{Rk,b,c} = N_{Rk,p,c}$			cording to Ar	nnex C 3						
Table C156:	Displacen	nents								
	size	hef	δn/N		N0	δΝ∞		//V	δνο	δν∞
		[mm]	[mm/kN]	[m	ım]	[mm]	[mr	n/kN]	[mm]	[mm]
Anchor		100,000	The second	0.40*	1 /25	Oto	0	,55	,55*V <sub>Rk</sub> /3,5	1,5*δνο
Anchor		all	0.12	0,13*N <sub>Rk</sub> / 3,5		2*δΝ0		,31 0	),31*V <sub>Rk</sub> / 3,5	1,5*δνο
Anchor M8 – M IG-M6 –		all	0,13	0,13*N	NRK 7 3,3					1,10000
Anchor M8 – M IG-M6 – M16	M10	all			7	oad ros				OSUTO
Anchor M8 – M IG-M6 – M16	M10	all	ues of ter		7		sista	nces und	ler fire exp	osure
Anchor M8 – M IG-M6 – M16 Table C157:	M10	all istic val	ues of ter	nsion and	7	Chara	s <b>ista</b> ı acteris	nces und	ler fire exp	osure
Anchor M8 – M IG-M6 – M16	M10 Character	istic val	ues of ter iffecitve orage depth	nsion and	7	Chara N <sub>Rk</sub>	s <b>ista</b> ı acteris	nces und stic Resista N <sub>Rk,p,fi</sub> = V <sub>F</sub>	ler fire exp	R120
Anchor  M8 – M IG-M6 –  M16  Table C157:  Anchor size	Character Perforat	all istic val E ed Anche	ues of ter iffecitve orage depth her [mm]	nsion and	d shear I	Chara N <sub>Rk</sub>	sistaı acteris , <sub>b,fi</sub> = 1	nces und	ler fire exp ances	
Anchor  M8 – M IG-M6 –  M16  Table C157:  Anchor size  M8 / M10 /IG-M6	Character Perforat	all istic val E ed Anche	ues of ter iffecitve orage depth	nsion and	d shear I	Chara N <sub>Rk</sub>	sistai acteris , <sub>b,fi</sub> = 1 R60	nces und stic Resista NRk,p,fi = VF	ler fire exp ances RK,b,fi R90	R120
Anchor  M8 – M IG-M6 –  M16  Table C157:  Anchor size	Character Perforat	all istic val Eed Ancho	ues of ter iffecitve orage depth her [mm]	nsion and	d shear I	Chara N <sub>Rk</sub>	sistaı acteris , <sub>b,fi</sub> = 1	nces und stic Resista NRk,p,fi = VF	ler fire exp ances	

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Performances hollow clay brick Poroton FZ9 with insulation Group factors, characteristic Resistances and Displacements

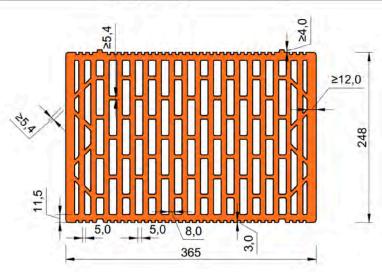


### Brick type: Hollow clay brick Poroton S9 with insulation

### Table C158: Stone description

Brick type	105-7	Hollow clay brick Poroton S9		
Insulationmaterial		Perlite		
Density	ρ [kg/dm³]	≥ 0,85		
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 12		
Conversion factor for low 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

Anchor size	Anchor size			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 <sub>cr</sub> = 250)							
Minimum Edge Distance	Cmin	[mm]	50							
マイザ ギーカーシャンテルコ!	Scr, II	[mm]	250							
Characteristic Spacing	Scr, ⊥	[mm]	250							
Minimum Spacing	Smin, II; Smin, ⊥	[mm]		50						

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

Tension load			Shear load							
	ension load		Perpendicular to the free edge			Parallel to the free edge				
1000	with c ≥	αedge, N	( to me son position	with c ≥	αedge, V⊥	(\$20000000)	with c ≥	αedge, VII		
•	50	1,00	I	50	0,30		50	1,00		
January 1	120	1,00		250	1,00		120	1,00		

# Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

Performances hollow clay brick Poroton S9 with insulation Description of the stone, Installation parameters, Reductionfactors



# Brick type: Hollow clay brick Poroton S9 with insulation Table C161: Factors for anchor groups under tension load

	Anchor position parallel to hor. joint				Anchor position perpendicular to hor. joint				
1		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	- Lancailana	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	ţ	with c ≥	with s ≥	αg II,V⊥	January 11 11 11 11 11 11 11 11 11 11 11 11 11	with c ≥	with s ≥	αg⊥, V⊥	
perpendicular		50	50	0,40		50	50	0,40	
to the free		250	50	1,00		250	50	1,20	
edge		250	250	2,00	- Accessors decision (	250	250	2,00	
Shear load	) in the second process of	with c ≥	with s ≥	αg II,V II	1	with c ≥	with s ≥	αg⊥,V∥	
parallel to the		50	50	1,65	1	50	50	1,00	
free edge	(Francisco Marcard	120	250	2,00	Tanana da sand	120	250	2,00	

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

7				Charac	cteristic Res	sistances with $c \ge c_{cr}$ and $s \ge s_{cr}$						
	40			Use condition								
Auchereine	Perforated sleeve	Effective Anchorage depth		d/d	=		w/d w/w		d/d w/d w/w			
Anchor size	erforate	Ar	40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	/24°C 80°C/50°C 120°C/72		All temperature ranges			
		h <sub>ef</sub>	1	$N_{Rk,b} = N_{Rk,p}^{2}$			N <sub>Rk,b</sub> = N <sub>Rk,</sub>	2) p	V <sub>Rk,b</sub> <sup>2)</sup>			
		[mm]				[kN]						
		Normalis	sed mean o	compressi	ve strength	f <sub>b</sub> ≥ 12 N/	mm <sup>2 1)</sup>					
M8	SH 12	80										
M8 / M10/ IG-M6	SH 16	≥ 85	1,5	1,5	1,5	1,5	1,5	1,5	5,0			
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85	16.5									

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

A nahar aina	hef	δη / Ν	δΝο	δN∞	δv / V	δνο	δV∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δΝο	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δ∨ο
M16	all		31.53.55.55	2 3,10	0,31	0,31*V <sub>Rk</sub> /3,5	1,5*δνο

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC fo	r
masonry	

Performances hollow clay brick Poroton S9 with insulation Group factors, characteristic Resistances and Displacements

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



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

Table C165: Stone description

Brick type	106 - 1	Hollow clay brick Thermopor TV8+
Insulation material		Rock wool
Density	ρ [kg/dm³]	≥ 0,70
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 10
Conversion factor for lov strengths	ver 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



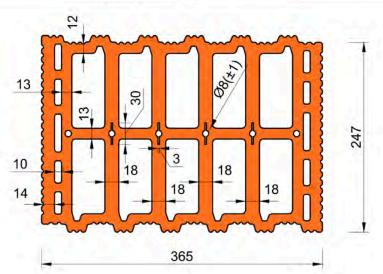


Table	C166	Installation	parameter
I abic	O 100.	motanation	Darameter

Anchor size	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	Tinst	[Nm]	Vm] ≤ 4	≤ 4	≤ 10	≤ 10	≤ 4	≤ 4	≤ 4	
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: ccr = 250)							
Minimum Edge Distance	Cmin	[mm]	50							
1. 19 F 10 1 - 17 6 11	Scr, II	[mm]	250							
Characteristic Spacing	Scr, ⊥	[mm]	250							
Minimum Spacing	Smin, II;	[mm]		50						

Table C167: Reduction factors for single anchors at the edge

PER N	anaian laad				Shea	ar load		
	ension load		Perpendic	ular to the fr	ee edge	Parallel to the free edge		
	with c ≥	αedge, N	(Asmessulamen	with c ≥	αedge, V⊥	( been son por ree	with c ≥	αedge, VII
•	50	1,00		50	0,25	•	50	1,00
Januari Lanca	120	1,00		250	1,00		120	1,00

Sympafix Injection s	ystem C100-PLUS and C100-PLUS NORDIC for
masonry	

### Performances hollow clay brick Thermopor TV8+ with insulation

Description of the stone, Installation parameters, Reductionfactors



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

Table C168: Factors for anchor groups under tension load

Ar	ichor position p	arallel to hor. jo	oint	Ancho	r position perp	endicular to ho	. 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	dersenferse	120	250	2,00

Table C169: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	joint	Anchor p	osition perpe	endicular to he	or. joint
Shear load		with c ≥	with s ≥	αg II,V ⊥	4	with c ≥	with s ≥	αg⊥, V⊥
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	-Aconomistations	250	250	2,00
Shear load		with c≥	with s ≥	αg II,V II	-	with c ≥	with s ≥	αg⊥,VII
parallel to the		50	50	1,65		50	50	1,15
free edge	100000000000000000000000000000000000000	120	250	2,00	Tanana da maria	120	250	2,00

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

				Charac	cteristic Res	sistances w	ith c≥c <sub>cr</sub>	and s ≥ s <sub>cr</sub>	
	4					Use condit	ion		
Anchor size Sleeve	d sleeve	Effective Anchorage depth	d/d				d/d w/d w/w		
Anchor size	erforate	A	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
	<u>a</u>	h <sub>ef</sub>	1	N <sub>Rk,b</sub> = N <sub>Rk,p</sub>	2)		N <sub>Rk,b</sub> = N <sub>Rk,</sub>	2) p	V <sub>Rk,b</sub> <sup>2)</sup>
		[mm]				[kN]			
		Normalis	sed mean o	ompressi	ve strength	f <sub>b</sub> ≥ 10 N/	mm <sup>2 1)</sup>		
M8	SH 12	80							
M8 / M10/ IG-M6	SH 16	≥ 85	3,0	3,0	2,5	3,0	3,0	2,5	3,5
M12 / IG-M8	SH 20	≥ 85							
M16 / IG-M10	SH 20	≥ 85	3,5	3,5	3,0	3,5	3,5	3,0	7,0

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

Anabanalaa	hef	δη/Ν	δΝο	δN∞	δv / V	δνο	δV∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N <sub>Rk</sub> / 3,5	2*δηο	0,55	0,55*V <sub>Rk</sub> / 3,5	1,5*δ∨ο
M16	all	7	27 - 5111/1/1007-123-1-1	2 0110	0,31	0,31*V <sub>Rk</sub> /3,5	1,5*δνο

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for	
masonry	

### Performances hollow clay brick Thermopor TV8+ with insulation Group factors, characteristic Resistances and Displacements

Annex C 50

<sup>2)</sup> N<sub>Rk,b,c</sub> = N<sub>Rk,p,c</sub> and V<sub>Rk,c II</sub> = V<sub>Rk,c \(^{\perp}\)</sub> according to Annex C 3

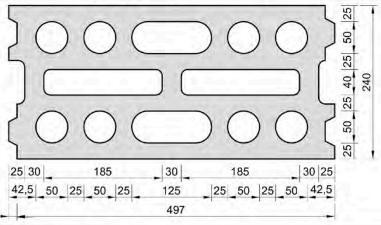


### Brick type: Hollow light weight concrete brick HBL 16DF

### Table C172: Stone description

	Hollow light weight concrete brick HBL 16DF
ρ [kg/dm³]	≥ 1,0
f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 3,1
ver compressive	$(f_b/3,1)^{0,5} \le 1,0$
	EN 771-3:2011+A1:2015
	e.g. KLB Klimaleichtblock (DE)
[mm]	500 x 250 x 240
	Rotary drilling
	f <sub>b</sub> [N/mm²] ver compressive





### Table C173: Installation parameter

Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque	Tinst	[Nm]	≤ 2	≤ 2	≤ 5	≤ 5	≤ 2	≤ 5	≤ 5	
Char. Edge distance (under fire conditions)	Ccr; (Ccr,fi)	(for snear loads perpendicular to the free edge.							c <sub>cr</sub> = 250)	
Minimum Edge Distance	Cmin	[mm]		** ***		50		-37, 37		
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]				500 (4 h <sub>e</sub>	f)			
(under fire conditions)	Scr, 1; (Scr,fi, 1)	[mm]				250 (4 h <sub>e</sub>	f)			
Minimum Spacing	Smin, II; Smin, 1	[mm]	4-2-5			50				

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

	Tanalan land				Shea	ar load		
11	Tension load		Perpendicular to the free edge			Parallel to the free edge		
San Assert Hereses	with c ≥	αedge, N	I file make street of	with c ≥	αedge, V⊥	( Asia estado es	with c ≥	αedge, VII
	50	1,00		50	0,30	•	50	1,00
1	120	1,00		250	1,00	· Farancia and America	120	1,00

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

And	chor position p	arallel to hor. jo	int	Ancho	nor position perpendicular to hor. joint				
1	with c ≥	with s ≥	αg II, N	100000000000000000000000000000000000000	with c ≥	with s ≥	αg⊥, N		
	50	50	2,00		50	50	1,55		
	120	500	2,00		120	250	2,00		

## Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

Performances hollow light weight concrete brick HBL 16DF Description of the stone, Installation parameters, Reductionfactors Annex C 51

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masonry



Brick type: He Table C176: F										
			n parallel to				chor pos	ition perpe	ndicular to I	hor. joint
Shear load	ana ana ang para ana a	with c	≥ with s	s≥   α <sub>g II</sub>	V L			with c ≥	with s ≥	α <sub>g⊥, V⊥</sub>
perpendicular	1000	50	50				<b>16</b>	50	50	0,35
to the free		120	50	2,0	00			120	50	1,15
edge		120	500	2,0	00	Common program	llian SI	120	250	2,00
		with c	≥ with s	s≥ αg II	,VII ±	er er en	postar 1	with c ≥	with s ≥	αg⊥,V∥
Shear load parallel to the	-	50	50	1,3	30	I	•	50	50	1,00
free edge	la la la la	120	250	2,0	00			30	30	1,00
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		120	500	2,0	00	04 50 104 50 10		120	250	2,00
Table C177: C	haracteri	stic val	ues of ter	sion and	shear	load	resista	nces		
	THE SET			Chara	cteristic l	Resis	tances w	ith c≥c <sub>cr</sub> a	and s≥s <sub>cr</sub>	
	m m	an.				Us	se conditi	on		
Anchor size Sleeve		Effective Anchorage depth	d/d					w/d w/w		d/d w/d w/w
Anchor size	erforate	An	40°C/24°C	80°C/50°C	120°C/7	2°C 4	0°C/24°C	80°C/50°C	120°C/72°C	All
	Δ.	h <sub>ef</sub>		J <sub>Rk,b</sub> = N <sub>Rk,p</sub>	2)	- 1		NRK,b = NRK,	2)	V <sub>Rk,b</sub> <sup>2)</sup>
		[mm]		ALV'D CALV'E			[kN]	VIN,U TVIN,		V IXX,D
			ed mean c	ompressiv	ve stren	ath f		mm <sup>2 1)</sup>		
M8 / M10/ IG-M6	1 1	≥ 85	1,2	1,2	0,9		1,2	1,2	0,9	2,0
M12 / IG-M8	SH 20	≥ 85	72.3	1						3,0
M16 / IG-M10	SH 20	≥ 85	1,5	1,5	1,2	911	1,5	1,5	1,2	5,0
				t be multibli		conve	ersion facti	or according	to Table C1	72. For stone
1) For lower comp with higher stree 2) N <sub>RK,b,c</sub> = N <sub>RK,p,c</sub> & Table C178: E	ressive streengths, the shand $V_{Rk,cll}$ =	nown valu V <sub>Rk,c</sub> ⊥ac	es are valid	without conv	version.					
<ol> <li>For lower comp with higher stree</li> <li>N<sub>RK,b,c</sub> = N<sub>RK,p,c</sub> at Table C178:</li> </ol>	ressive streingths, the shand V <sub>Rk,c II</sub> =	nown valu V <sub>Rk,c</sub> ⊥ac	es are valid	without conv		δΝ«	» δv	//V	δνο	δV∞
<ol> <li>For lower comp with higher street</li> <li>N<sub>Rk,b,c</sub> = N<sub>Rk,p,c</sub> &amp;</li> </ol>	ressive streingths, the shand V <sub>Rk,c II</sub> =	nown valu V <sub>Rk,c</sub> ⊥ac ents	es are valid cording to Ar	without conv nnex C 3	NO	δN•		r / V n/kN]	δvo [mm]	δ∨∞ [mm]
1) For lower comp with higher stre 2) N <sub>Rk,b,c</sub> = N <sub>Rk,p,c</sub> & <b>Table C178:</b> D Anchor s	ressive streingths, the shand V <sub>Rk,c II</sub> = Displacem	nown valu V <sub>Rk,c</sub> ⊥ac <b>ents</b> hef	es are valid cording to Ar	without convinnex C 3	N0 m]	[mn	n] [mr	n/kN]		[mm]
For lower comp with higher stre     N <sub>RK,b,c</sub> = N <sub>RK,p,c</sub> a      Table C178:    Anchor s	ressive streingths, the shand V <sub>Rk,c II</sub> = Displacem	nown valu V <sub>Rk,c</sub> ±ac ents hef [mm]	es are valid cording to Ar	without conv nnex C 3	N0 m]		n] [mr	n/kN] ,55 0	[mm]	[mm] 5 1,5*δ∨ο
1) For lower comp with higher stre 2) N <sub>Rk,b,c</sub> = N <sub>Rk,p,c</sub> a <b>Table C178:</b> D Anchor s M8 - M1 IG-M6 - I	ressive streingths, the shand V <sub>Rk,c II</sub> = Displacem Displacem Displacem Displacem	nown valu V <sub>Rk,c</sub> ± ac ents hef [mm] all	es are valid coording to Ar  δN / N  [mm/kN]  0,13	without convinnex C 3  δt [m] 0,13*N	N0 m] Rk / 3,5	[mn 2*δn	n] [mr 0 0	,55 0 ,31 0	[mm] ,55*V <sub>Rk</sub> / 3,5 ,31*V <sub>Rk</sub> / 3,5	[mm] 5 1,5*δνο 5 1,5*δνο
1) For lower comp with higher stree 2) NRK,b,c = NRK,p,c a  Table C178: D  Anchor s  M8 - M1 IG-M6 - I  M16  Table C179: C	ressive streingths, the shand V <sub>Rk,c II</sub> = Displacements  2 / M10  Characteria	nown valu V <sub>Rk,c</sub> ± ac ents hef [mm] all all stic val	8 are valid to Ar SN / N [mm/kN] 0,13  ues of ter Effecitive orage depth	without convinnex C 3  Str.  0,13*N  asion and	N0 m] Rk / 3,5	[mn 2*8n load	n] [mr 0 0 resistar naracteris N <sub>RK,b,fi</sub> = 1	n/kN] ,55 0 ,31 0 nces und stic Resista N <sub>Rk,p,fi</sub> = V <sub>R</sub>	[mm] ,55*V <sub>Rk</sub> /3,5 ,31*V <sub>Rk</sub> /3,5 <b>er fire exp</b> ances <sub>k,b,fi</sub>	[mm] 5 1,5*δνο 6 1,5*δνο cosure
1) For lower comp with higher stre 2) N <sub>Rk,b,c</sub> = N <sub>Rk,p,c</sub> & <b>Table C178:</b> D Anchor s M8 - M1 IG-M6 - I	ressive streingths, the shand V <sub>Rk,c II</sub> = Displacemize  2 / M10  Characteria	nown valu V <sub>Rk,c</sub> ± ac ents hef [mm] all all stic val	8 are valid to Ar SN / N [mm/kN] 0,13  ues of ter Effecitive orage depth her	without convinnex C 3  Str.  0,13*N  asion and	N0 m] Rk / 3,5	[mn 2*8n load	n] [mr 0 0 resistar	n/kN] ,55 0 ,31 0 nces und stic Resista N <sub>Rk,p,fi</sub> = V <sub>R</sub>	[mm] ,55*V <sub>Rk</sub> / 3,5 ,31*V <sub>Rk</sub> / 3,5 <b>er fire exp</b> ances	[mm] 5 1,5*δνο 5 1,5*δνο
1) For lower comp with higher stree 2) NRK,b,c = NRK,p,c a  Table C178: E  Anchor s  M8 - M1 IG-M6 - I  M16  Table C179: C	ressive streetingths, the stand V <sub>Rk,c,l</sub> = Displacements  ize  2 / M10  Characterial	nown valu V <sub>Rk,c</sub> ± ac ents hef [mm] all all stic val	8 are valid to Ar SN / N [mm/kN] 0,13  ues of ter orage depth her [mm]	without convinnex C 3  Str.  0,13*N  asion and	N0 m] Rk / 3,5	[mn 2*8n load	n] [mr 0 0 resistar naracteris N <sub>RK,b,fi</sub> = 1	n/kN] ,55 0 ,31 0 nces und stic Resista N <sub>Rk,p,fi</sub> = V <sub>R</sub>	[mm] ,55*V <sub>Rk</sub> /3,5 ,31*V <sub>Rk</sub> /3,5 <b>er fire exp</b> ances <sub>k,b,fi</sub>	[mm] 5 1,5*8vo 5 1,5*8vo cosure
1) For lower comp with higher stree 2) NRK,b,c = NRK,p,c of Table C178: D  Anchor s  M8 - M1 IG-M6 - I  M16  Table C179: C  Anchor size	ressive strenngths, the shand V <sub>Rk,c II</sub> = Displacemonize  2 / M10  Characterial Perforate sleeve  SH 16	nown valu V <sub>Rk,c</sub> ± ac ents hef [mm] all all stic val	ording to Ar  δN / N  [mm/kN]  0,13  ues of ter  ffecitve orage depth her [mm] 130	without convinex C 3  δt [m] 0,13*N  asion and	N0 m] Rk / 3,5	[mn 2*8n load	n] [mr 0 0 resistar naracteris N <sub>RK,b,fi</sub> = 1	n/kN] ,55 0 ,31 0 nces und stic Resista N <sub>Rk,p,fi</sub> = V <sub>R</sub>	[mm] ,55*V <sub>Rk</sub> /3,5 ,31*V <sub>Rk</sub> /3,5 <b>er fire exp</b> ances <sub>k,b,fi</sub>	[mm] 5 1,5*8vo 5 1,5*8vo cosure
1) For lower comp with higher stree 2) N <sub>RK,b,c</sub> = N <sub>RK,p,c</sub> a  Table C178: E  Anchor s  M8 - M1 IG-M6 - I  M16  Table C179: C	ressive streetingths, the stand V <sub>Rk,c,l</sub> = Displacements  ize  2 / M10  Characterial	nown valu V <sub>Rk,c</sub> ± ac ents hef [mm] all all stic val	8 are valid to Ar SN / N [mm/kN] 0,13  ues of ter orage depth her [mm]	without convinex C 3  String [m]  0,13*N  asion and fine [m]	NO m] Rk / 3,5 Shear	[mn 2*8n load	n] [mr 0 0 resistar naracteris N <sub>Rk,b,fi</sub> = 1 R60	n/kN] ,55 0 ,31 0 nces und stic Resista N <sub>Rk,p,fi</sub> = V <sub>R</sub> [kN]	[mm] ,55*V <sub>Rk</sub> / 3,5 ,31*V <sub>Rk</sub> / 3,5 <b>er fire exp</b> ances k,b,fi R90	[mm] 5 1,5*8vo 6 1,5*8vo cosure  R120

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Performances hollow light weight concrete brick HBL 16DF Group factors, characteristic Resistances and Displacements

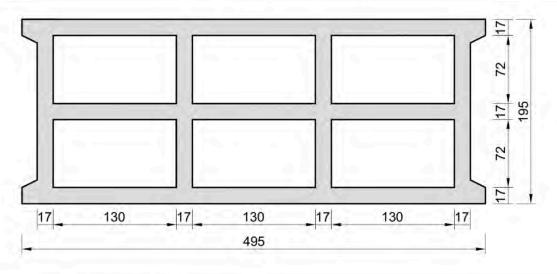


### Brick type: Hollow concrete brick Bloc Creux B40

### Table C180: Stone description

Hollow concrete brick Bloc Creux B40
≥ 0,8
≥ 5,2
$(f_b / 5,2)^{0,5} \le 1,0$
EN 772-1
e.g. Leroux (FR)
500 x 200 x 200
Rotary drilling





### Table C181: Installation parameter

Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Installation torque	Tinst	[Nm]	≤4 ≤4 ≤4 ≤4 ≤4				≤ 4		
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: c <sub>cr</sub> = 170)						170)
Minimum Edge Distance	Cmin	[mm]	50						
Kalendari I of the same water	Scr, II	[mm]		170					
Characteristic Spacing	Scr, ⊥	[mm]	200						
Minimum Spacing	Smin, II;	[mm]	50						

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

	Tonsion 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, VII			
•	50	1,00		50	0,35	•	50	1,00			
	120	1,00		170	1,00		120	1,00			

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for	
masonry	

#### Performances hollow concrete brick Bloc Creux B40

Description of the stone, Installation parameters, Reductionfactors



#### Brick type: Hollow concrete brick Bloc Creux B40 Table C183: 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 1,50 50 50 1,40 50 170 2,00 50 200 2,00 120 170 2.00 120 200 2,00

Table C184: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	joint	Anchor p	osition perpe	endicular to h	or. joint
Shear load		with c ≥	with s ≥	αg II,V⊥	4	with c ≥	with s ≥	αg⊥, V⊥
perpendicular to the free edge		50	50	0,55		50	50	0,35
	Debter	120	50	1,30		120	50	0,85
		120	170	2,00	grammally and	120	200	2,00
		with c≥	with s ≥	αg II,V II		with c ≥	with s ≥	αg⊥,VII
Shear load		50	50	1,10		50	50	1,00
parallel to the free edge	- MA	100	170	2.00		50	200	2,00
	(elementaria de la composition della composition	120	170	2,00	† armanaila anapl	120	200	2,00

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

				Charac	cteristic Res	istances w	rith c≥c <sub>cr</sub> :	and s ≥ s <sub>cr</sub>				
	Perfor	ated H O		2	Use condition							
A la Va				d/d	. 4		w/d w/w		d/d w/d w/w			
Anchor size	sleeve		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	C/50°C 120°C/72°C temperary				
	h <sub>ef</sub>			NRK,b = NRK,p	2)		V <sub>Rk,b</sub> <sup>2)</sup>					
		[mm]	33	[kN]								
		Normalis	ed mean c	ompressiv	e strength	f <sub>b</sub> ≥ 5,2 N/	mm <sup>2 1)</sup>					
M8 / M10/ IG-M6	SH 16	130	2.0	1.5	1.2	2.0	1.5	1.0	6.0			
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 130	2,0	1,5	1,2	2,0	1,5	1,2	6,0			

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

### Table C186: Displacements

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

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry	
Performances hollow concrete brick Bloc Creux B40	Annex C 54
Group factors, characteristic Resistances and Displacements	

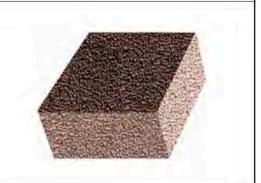
<sup>2)</sup>  $N_{Rk,b,c} = N_{Rk,p,c}$  and  $V_{Rk,c|I} = V_{Rk,c} \perp$  according to Annex C 3



Brick type:	Solid ligh	t weight	concrete	brick
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### Table C187: Stone description

Brick type	7:	Solid light weight concrete brick
Density	ρ [kg/dm³]	≥ 0,6
Normalised mean compressive strenght	f <sub>b</sub> [N/mm <sup>2</sup> ]	≥ 2
Conversion factor for low strengths	ver compressive	$(f_b / 2)^{0.5} \le 1.0$
Code	-	EN 771-3:2011+A1:2015
Producer (Country)		e.g. Bisotherm (DE)
Brick dimensions	[mm]	≥ 240 x 300 x 113
Drilling method		Rotary drilling



### Table C188: Installation parameter

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						
	Scr, II	[mm]				300			
Characteristic Spacing	sensic Spacing   s <sub>cr, ⊥</sub> [mm]   300								
Minimum Spacing	Smin, II;	[mm]	120					1	

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

<b>+</b>	Tonsian load			Shear load							
Tension load			Perpendicular to the free edge			Paralle	edge				
The second second	with c≥	αedge, N	1 100 1100 0 0 0 0 0 0 0 0 0 0 0 0 0 0	with c≥	αedge, V⊥	- Francisco Posterio	with c ≥	αedge, VII			
-701	60	1,00		60	0,25	• 1	60	0,40			
Language Teacher	150	1,00		150	1,00	inconstitution.	100	1,00			

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

And	hor position p	arallel to hor. jo	int	Anchor position perpendicular to hor. joint					
1	with c ≥	with s ≥	αg II, N	The same of the same of	with c≥	with s ≥	αg⊥, N		
• •	60	120	1,00		60	120	1,00		
i i i i i i i i i i i i i i i i i i i	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	ļ	with c ≥	with s ≥	αg II,V⊥	1	with c ≥	with s ≥	$\alpha_{g\perp,V\perp}$	
		60	120	0,25		60	120	0,25	
		150	120	1,00		150	120	1,00	
		150	300	2,00		150	300	2,00	
Shear load parallel to the free edge		with c ≥	with s ≥	αg II,V II	•	with c ≥	with s ≥	αg ⊥,V II	
		60	120	0,40		60	120	0,40	
		100	120	1,00	•	100	120	1,00	
	1	150	300	2,00		150	300	2,00	

# Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

### Performances solid light weight concrete brick

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



### Brick type: Solid light weight concrete brick

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

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

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

### Table C193: Displacements

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / V	δνο	δ∨∞
Andioi size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,1	0,1*N <sub>Rk</sub> / 3,5	2*δΝ0	0,3	0,3*V <sub>Rk</sub> / 3,5	1,5*δ∨0
M16	all	,	, , ,	_ = 5.115	0,1	0,1*V <sub>Rk</sub> /3,5	1,5*δ∨0

Sympafix Injection system C100-PLUS and C100-PLUS NORDIC for masonry

Performances solid light weight concrete brick
Characteristic Resistances and Displacements

Annex C 56

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