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European Technical Assessment Body for construction products



European Technical Assessment

ETA-24/1063 of 27 January 2025

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the **European Technical Assessment:**

Trade name of the construction product

Product family to which the construction product belongs

Manufacturer

Manufacturing plant

This European Technical Assessment contains

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

Deutsches Institut für Bautechnik

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry

Metal Injection anchors for use in masonry

AC MARCA ADHESIVES, S.A. Av. Carrilet 293-299 08907 L Hospitalet de LI. **SPANIEN**

AC MARCA ADHESIVES, S.A., Plant1 Germany

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

EAD 330076-01-0604, Edition 10/2022

European Technical Assessment ETA-24/1063

English translation prepared by DIBt



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Specific Part

1 Technical description of the product

The "Ceys Injection system TACO QUÍMICO VINYLESTER for masonry" is a bonded anchor (injection type) consisting of a mortar cartridge with injection mortar TACO QUÍMICO VINYLESTER, 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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4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with the European Assessment Document EAD 330076-01-0604 the applicable European legal act is: [97/177/EC].

The system to be applied is: 1

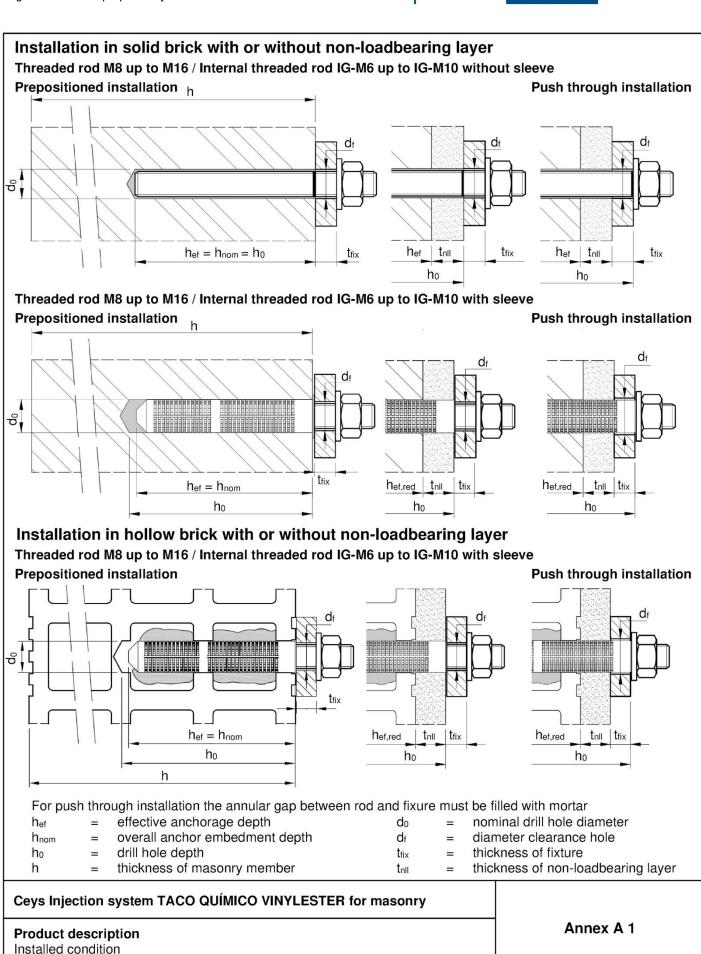
5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document

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

Issued in Berlin on 27 January 2025 by Deutsches Institut für Bautechnik

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

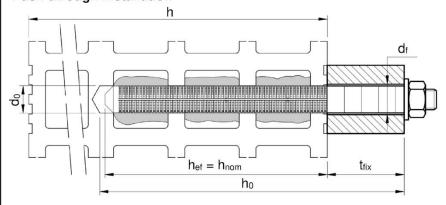


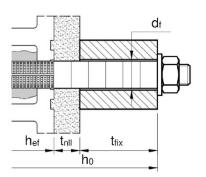




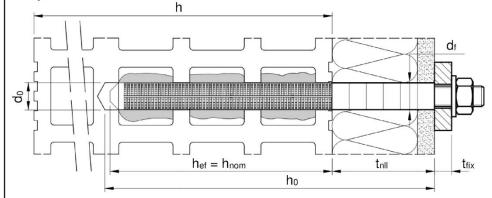
Installation in hollow brick with or without non-loadbearing layer and / or thermal isolation

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

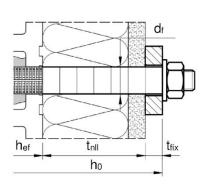




Prepositioned installation



Push through installation



hef = effective anchorage depth

h_{nom} = overall anchor embedment depth

 h_0 = drill hole depth

h = thickness of masonry member

d₀ = nominal drill hole diameter

d_f = diameter clearance hole

t_{fix} = thickness of fixture

t_{nll} = thickness of non-loadbearing layer

Ceys Injection system TACO QUÍMICO VINYLESTER 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



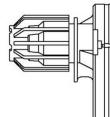
Imprint:

TACO QUÍMICO VINYLESTER

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

Side-by-Side Cartridge:

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



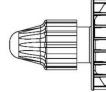
Imprint:

TACO QUÍMICO VINYLESTER

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

Foil Tube Cartridge:

165 ml and 300 ml

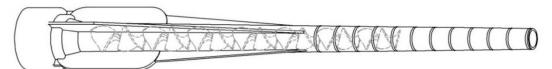


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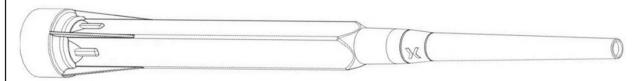
TACO QUÍMICO VINYLESTER

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

Static mixer CRW 14W



Static mixer PM-19E



Mixer extension VL



Ceys Injection system TACO QUÍMICO VINYLESTER for masonry

Product description

Injection system

Annex A 3



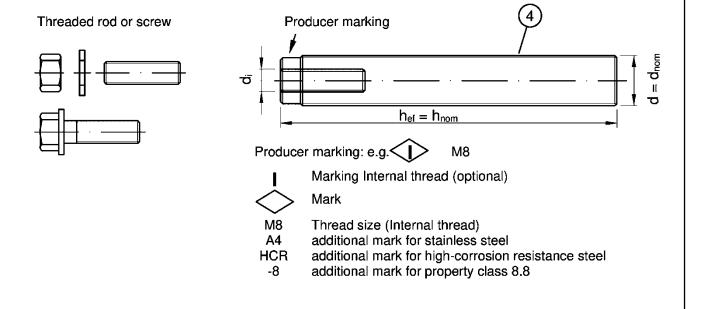
Threaded rod M8 up to M16 with washer and hexagon nut

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

Commercial standard rod with:

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

Internal threaded rod IG-M6 to IG-M10

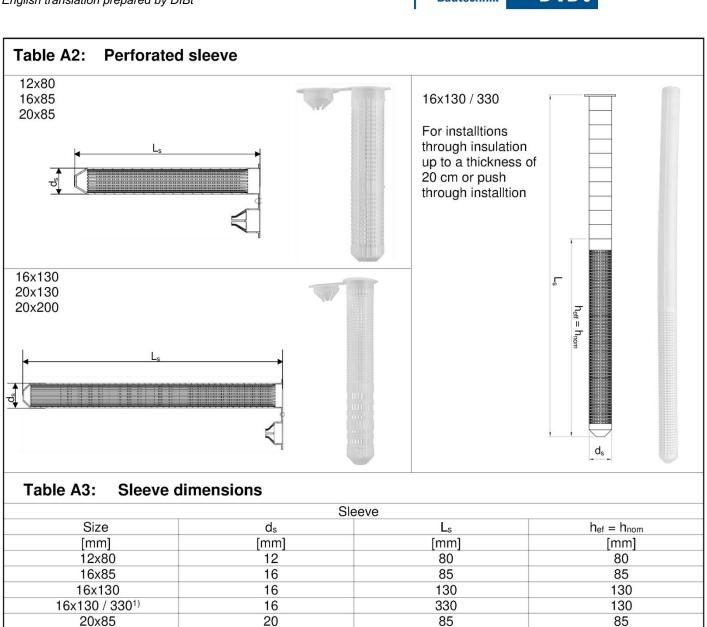


Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Product description Threaded rod and Internal threaded rod	Annex A 4



)~-·	ble A1: Materials	Motorial					
	Designation I, zinc plated (Steel acc. to E	Material	1 100	20:2017)			
		acc. to EN ISO 4042:202		03.2017)			
				EN ISO 10684:2004+AC	:2009 or		
st	nerardized ≥ 45 µm a	acc. to EN ISO 17668:20)16				
		Property class		Characteristic steel ultimate tensile strength	Characteristic steel yield strength	Elongation a fracture	
	Threaded rod		4.6	f _{uk} = 400 N/mm ²	$f_{yk} = 240 \text{ N/mm}^2$	$A_5 > 8\%$	
1			4.8	f _{uk} = 400 N/mm ²	f _{VK} = 320 N/mm ²	A ₅ > 8%	
•	Timedada red	acc. to	5.6	f _{uk} = 500 N/mm ²	f _{VK} = 300 N/mm ²	A ₅ > 8%	
		EN ISO 898-1:2013		f _{uk} = 500 N/mm²	f _{VK} = 400 N/mm ²	A ₅ > 8%	
				f _{uk} = 800 N/mm ²	f _{yk} = 640 N/mm ²	A ₅ > 8%	
			4	for anchor rod class 4.6	or 4.8	<u> </u>	
2	Hexagon nut	acc. to EN ISO 898-2:2022	5	for anchor rod class 5.6	or 5.8		
	_	EN 150 696-2.2022	8	for anchor rod class 8.8			
3	Washer			alvanised or sherardized			
_	1	(e.g.: EN ISO 887:200	6, EN	ISO 7089:2000, EN ISO			
	Internal three ded	Property class		Characteristic steel ultimate tensile strength	Characteristic steel vield strength	Flongation a fracture	
4	Internal threaded anchor rod ²⁾	acc. to	5.8		f _{VK} = 400 N/mm ²	A ₅ > 8%	
		EN ISO 898-1:2013	8.8	f _{uk} = 800 N/mm ²	f _{VK} = 640 N/mm ²	A ₅ > 8%	
Sta	inless steel A2 (Material 1.43	01 / 1.4307 / 1.4311 / 1.4			1		
	inless steel A4 (Material 1.44) h corrosion resistance steel				88-1:2014)		
		Property class		Characteristic steel ultimate tensile strength	Characteristic steel yield strength	Elongation a fracture	
1	Threaded rod ¹⁾		50	f _{uk} = 500 N/mm ²	f _{yk} = 210 N/mm ²	A ₅ > 8%	
		acc. to EN ISO 3506-1:2020	70	f _{uk} = 700 N/mm ²	f _{yk} = 450 N/mm ²	A ₅ > 8%	
		EN 130 3300-1.2020	80	f _{uk} = 800 N/mm ²	f _{yk} = 600 N/mm ²	A ₅ > 8%	
		acc. to	50	for anchor rod class 50			
2	Hexagon nut ¹⁾	EN ISO 3506-1:2020	70	for anchor rod class 70			
			80	for anchor rod class 80			
3	Washer	Stainless steel A2, A4 (e.g.: EN ISO 887:200		CR LISO 7089:2000, EN ISO	7093:2000 or EN IS	O 7094:200	
		1		Characteristic steel	Characteristic steel		
	Internal threaded	Property class		ultimate tensile strength		fracture	
4	anchor rod ²⁾	acc. to	50	f _{uk} = 500 N/mm ²	$f_{yk} = 210 \text{ N/mm}^2$	A ₅ > 8%	
		EN ISO 3506-1:2020	70	f _{uk} = 700 N/mm ²	f _{VK} = 450 N/mm ²	A ₅ > 8%	
	, roperty class 80 only for stainles Ising internally threaded anchor nd strength class of the internall	rod screws and threaded		incl. nut and washer) must	at least correspond to	the material	
a				Γ <u></u>			
a Pla	stic perforated sleeve						
a Pla	stic perforated sleeve ve sleeve			Polypropylene (PP)			
a Pla	•			Polypropylene (PP)			
a Pla Sie	•	QUÍMICO VINYLESTE	R for				





1) In Annxes C4 – C56 this sleeve is covered with 16x130

20

20

Table A4: Steel parts

20x130

20x200

	Ancho	or rod	
Size	$d = d_{nom}$	di	I _{ges}
[mm]	[mm]	[mm]	[mm]
IG-M6 ¹⁾	10	6	with alastra by Carre
IG-M8 ¹⁾	12	8	with sleeve: hef - 5mm without sleeve: hef
IG-M10 ¹⁾	16	10	without sleeve. Her
M8	8	-	$h_{ef} + t_{fix} + 9,5$
M10	10	-	$h_{ef} + t_{fix} + 11,5$
M12	12	-	$h_{ef} + t_{fix} + 17,5$
M16	16	-	$h_{ef} + t_{fix} + 20,0$

130

200

130

200

1) Internal threaded rod with metric external thread

Ceys In	jection system TACO QUÍMICO VINYLESTER for masonry	
	t description and steel parts	Annex A 6



Specifications of intend	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							
	Mortar strength class of the masonry M2,5 at minimum according to EN 998-2:2016. For other bricks in solid masonry and in hollow masonry or in autoclaved aerated concrete, the characteristic resistance of the anchor may be determined by job site tests according to EOTA TR 053, Edition July 2022 under consideration of the β-factor according to Annex C 1, Table C1.							
Hole drilling	See Annex C 4 – C 56							
Use category	Condition d/d: Installation and use in dry masonry Condition w/w: Installation and use in dry or wet masonry (incl. w/d installation in wet masonry and use in dry masonry)							
Temperature Range	T _a : - 40°C to +40°C (max. short term temperature +40°C and max. long term temperature +24°C) T _b : - 40°C to +80°C (max. short term temperature +80°C and max. long term temperature +50°C) T _a : - 40°C to +120°C (max. short term temperature +120°C and max. long term temperature +72°C)							

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

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions (all materials).
- For all other conditions according to EN 1993-1-4:2006+ A2:2020 corresponding to corrosion resistance classes to Table A1 (stainless steel and high corrosion resistant steel).

Design:

- Verifiable calculation notes and drawings are prepared taking account the relevant masonry in the region of the anchorage, the loads to be transmitted and their transmission to the supports of the structure. The position of the anchor is indicated on the design drawings.
- The anchorages are designed in accordance with the EOTA TR 054, Edition July 2022, under the responsibility of an engineer experienced in anchorages and masonry work.
- Applies to all bricks if no other values are specified:
 - $N_{Rk} = N_{Rk,b} = N_{Rk,p} = N_{Rk,b,c} = N_{Rk,p,c}$
 - $V_{Rk} = V_{Rk,b} = V_{Rk,c,ll} = V_{Rk,c,\perp}$
- For the calculation of pulling out a brick under tension loading N_{Rk,pb} or pushing out a brick under shear loading V_{Rk,pb} see EOTA Technical Report TR 054, Edition July 2022.
- N_{Rk,s}, V_{Rk,s} and M⁰_{Rk,s} see Annexes C 1 C 2
- For application with sleeve with drill bit size ≤ 15mm installed in joints not filled with mortar:
 - N_{Rk,p,j} = 0,18 * N_{Rk,p} and N_{Rk,b,j} = 0,18 * N_{Rk,b} (N_{Rk,p} = N_{Rk,b} see Annex C 4 to C 56)
 - $V_{Rk,c,j} = 0.15 * V_{Rk,c}$ and $V_{Rk,b,j} = 0.15 * V_{Rk,b}$ ($V_{Rk,b}$ see Annex C 4 to C 56; and $V_{Rk,c}$ see Annex C 3)
- Application without sleeve installed in joints not filled with mortar is not allowed.

Installation:

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

Ceys Injection system TACO QUÍMICO VINYLESTER 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
Hollow light weigh EN 771-4:2011+A1		cc. to		Hollow light weigh EN 771-3:2011+A1	t concrete brick a :2015	acc. to	
AAC ρ = 0,35 - 0,60 ≥ 499x240x249 Table C4 - C10	1	M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200	VBL ρ≥ 0,6 ≥ 240x300x113 Table C187 - C193		M8 - M16 IG-M6 - IG-M10	12x8 16x13 20x8 20x13 20x20
	Hollow light v	veight cond	crete brid	ck acc. to EN 771-3	3:2011+A1:2015		
HBL 16DF ρ≥ 1,0 500x250x240 Table C172 - C179		M8 - M16 IG-M6 - IG-M10	16x85 16x130 20x85 20x130 20x200	Bloc creux B40 ρ≥ 0,8 495x195x190 Table C180 - C186	EE	M8 - M16 IG-M6 - IG-M10	16x13 20x13
	Calcium si	lica bricks	acc. to E	N 771-2:2011+A1:	2015		
KS ρ≥ 2,0 ≥ 240x115x71 Table C11 - C18		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200	KSL-3DF ρ≥ 1,4 240x175x113 Table C19 - C25		M8 - M16 IG-M6 - IG-M10	16x85 16x13 20x85 20x13
KSL-8DF ρ≥ 1,4 248x240x238 Table C26 - C32		M8 - M16 IG-M6 - IG-M10	16x130 20x130 20x200	KSL-12DF ρ≥ 1,4 498x175x238 Table C33 - C40		M8 - M16 IG-M6 - IG-M10	16x13 20x13
	Solid	l clay brick	s acc. to	EN 771-1:2011+A	1:2015		
Mz-1DF ρ≥ 2,0 ≥ 240x115x55 Table C41 - C47		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200	Mz – 2 DF ρ ≥ 2,0 ≥ 240x115x113 Table C48 - C55		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x13 20x85 20x13 20x20
Ceys Injection sy	stem TACO QUÍM	ICO VINYL	ESTER f	or masonry		nnex B 2	



Naming Density [kg/dm³] Dimensions LxBxH [mm] Annex	Picture	Anchor rods	Perforated sleeve	Naming Density [kg/dm³] Dimensions LxBxH [mm] Annex	Picture	Anchor rods	Perforated
	Hollov	w clay brick	s acc. to	EN 771-1:2011+A	1:2015		
Hlz-10DF ρ≥ 1,25 300x240x249 Table C56 - C63		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200	Porotherm Homebric ρ≥0,7 500x200x299 Table C64 - C70		M8 - M16 IG-M6 - IG-M10	12x8 16x8 16x1 20x8 20x1
BGV Thermo		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130	Brique creuse C40 p ≥ 0,7 500x200x200 Table C92 - C98		M8 - M16 IG-M6 - IG-M10	12x8 16x8 16x1 20x8 20x1
Calibric R+ ρ ≥ 0,6 500x200x314 Table C78 - C84		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130	Blocchi Leggeri ρ ≥ 0,6 250x120x250 Table C99 - C105		M8 - M16 IG-M6 - IG-M10	12x8 16x8 16x1 20x8 20x1
Urbanbric ρ ≥ 0,7 560x200x274 Table C85 - C91		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130	Doppio Uni ρ≥ 0,9 250x120x120 Table C106 - C112		M8 - M16 IG-M6 - IG-M10	12x8 16x8 16x1 20x8 20x1
	Hollow clay brick	s with ther	mal insu	lation acc. to EN 7	71-1:2011+A1:201	15	
Coriso WS07 ρ≥ 0,55 248x365x249 Mineral wool Table C113 - C119		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200	T8P ρ≥ 0,56 248x365x249 Perlite Table C128 - C134		M8 - M16 IG-M6 - IG-M10	12x8 16x8 16x1; 20x8 20x1; 20x2
T7MW ρ≥ 0,59 248x365x249 Mineral wool Table C120 - C127		M8 - M16 IG-M6 - IG-M10	12x80 16x85 16x130 20x85 20x130 20x200	MZ90-G ρ ≥ 0,68 248x365x249 Mineral wool Table C135 - C141		M8 - M16 IG-M6 - IG-M10	12x8 16x8 16x13 20x8 20x13 20x20
	stem TACO QUÍM						



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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Intended use Brick types and properties with corresponding fastening elements	Annex B 4



Table B2:		Installation parameters in autoaerted AAC and solid masonry (without sleeve) for prepositioned or push through installation										
Anchor size				M8	M10	IG-M6	M12	IG-M8	M16	IG-M10		
Nominal drill hole	e diameter	do	[mm]	10	1	2	1	4		18		
Drill hole depth	h ₀	[mm]	h _{ef} + t _{fix} 1)									
Effective anchor	h _{ef}	[mm]	80	≥	90	≥ 100		≥ 100				
Diameter of	Prepositioned installation	d _f ≤	[mm]	9	12 7		14	9	18	12		
clearance hole in the fixture	Push through installation	d _f ≤	[mm]	12	14	14	16	16	20	20		
Maximum install	ation torque	T _{inst}	[Nm]	See Annexes C 4 – C 56								
Minimum thickne	h _{min}	[mm]	h _{ef} + 30									
Minimum spacing		s _{min}	[mm]			Coo An	2000 C	4 C E C				
Minimum edge di	stance	C _{min}	[mm]	See Annexes C 4 – C 56								

¹⁾ Consider t_{fix} in case of push through installation.

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

Anchor size			M8		M8 / M10 IG-M6	1		M12 / M16 -M8 / IG-N		
F	Perforated	sleeve	12x80	16х85	16x130	16x130/330	20x85	20x130	20x200	
Nominal drill hole diameter	d ₀	[mm]	12	16	16	16	20	20	20	
Drill hole depth	h ₀	[mm]	85	90	135	330	90	135	205	
Effective anchorage depth	h _{ef}	[mm]	80	85	130	130	85	130	200	
Diameter of clearance hole in the fixture	d _f ≤	[mm]	9					85 130 9 (IG-M8) / 12 (IG-		
Maximum installation torque	T _{inst}	[Nm]			See Ar	nexes C	4 – C 56			
Minimum thickness of member	h _{min}	[mm]	115	115	195	195	115	195	240	
Minimum spacing	s _{min}	[mm]								
Minimum edge distance	C _{min}	[mm]		85 90 135 330 90 135 80 85 130 130 85 130 9 7 (IG-M6) / 9 (IG-M8) / 12 (IG-M 9 (M8) / 12 (M10) 14 (M12) / 18 (M1 See Annexes C 4 – C 56						

Ceys Injection system TACO QUÍMICO VINYLESTER 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		
		Perforated	sleeve	16x130	16x130/330	20x130	20x200	
Nominal drill hol	e diameter	d ₀	[mm]	16	16	20	20	
Drill hole depth	Drill hole depth		$h_{ef} + 5mm + t_{nll} + t_{fix}^{1}$					
Effective embedment	Prepositioned installation	h _{ef}	[mm]	130	130	130	200	
depth	Push through installation	h _{ef}	[mm]	85	130	85	85	
Maximum thickn loadbearing laye		max t _{nll}	[mm]	45	200	45	115	
Diameter of clearance hole	Prepositioned installation	d _f ≤	[mm]		7 (IG-M6) / 9 (M8) / 12 (M10)		2 (IG-M10) / / 18 (M16)	
in the fixture	Push through installation	d _f ≤	[mm]	1	8	2	2	
Maximum install	ation torque	T _{inst}	[Nm]		See Annexe	s C 4 – C 56		
Minimum thickne	ess of member	h _{min}	[mm]	195 (115)	195	195 (115)	240 (115)	
Minimum spacin	g	S _{min}	[mm]		See Anneve	s C 4 – C 56		
Minimum edge o	distance	c _{min}	[mm]		Oce Alliexe	3 0 4 – 0 30		

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Intended use Installation parameters	Annex B 6



Table B5: Parar	neter cleaning and	installation to	ools		
	- Adding the state of the state		*********		
Anchor rod	Perforated sleeve	d₀ Drill bit - Ø HD, CA	d₀ Brush - Ø		d _{b,min} min. Brush - Ø
[mm]		[mm]		[mm]	[mm]
	Autoaerted ACC	and solid maso	nry (witho	ut sleeve)	•
M8	-	10	RBT10	12	10,5
M10	-	12	RBT12	14	12,5
M12	-	14	RBT14	16	14,5
M16	-	18	RBT18	20	18,5
	Solid and	hollow masonry	(with slee	ve)	
M8	12x80	12	RBT12	14	12,5
	16x85				
M8 / M10 / IG-M6	16x130	16	RBT16	18	16,5
	16x130/330			100000000000000000000000000000000000000	3,700
M40 / M40 /	20x85				
M12 / M16 / IG-M8 / IG-M10	20x130	20	RBT20	22	20,5
19-1018 / 19-10110	20x200				

Cleaning and installation tools

Hand pump (Volume ≥ 750 ml)



Compressed air tool (min 6 bar)



Brush RBT



Brush extension RBL



Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Intended use Cleaning and installation tools	Annex B 7



Tempera	ture in bas	se material	Maximum working time	Minimum curing time 1)
	T		^t work	t _{cure}
- 10°C	to	- 6°C	90 min ²⁾	24 h
- 5°C	to	- 1 °C	90 min	14 h
0°C	to	+ 4°C	45 min	7 h
+ 5°C	to	+ 9°C	25 min	2 h
+ 10°C	to	+ 19°C	15 min	80 min
+ 20 °C	to	+ 24 °C	6 min	45 min
+ 25°C	to	+ 29°C	4 min	25 min
+ 30°C	to	+ 39°C	2 min	20 min
	+ 40 °C		1,5 min	15 min
Cartr	ridge tempe	erature	+5°C to	+40°C

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Intended use Working and curing time	Annex B 8

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

Intended use

Installation instructions



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

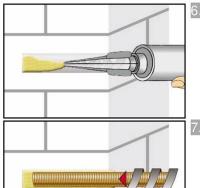
Z1000709.24 8.06.04-247/24

Annex B 9



Installation instructions (continuation)

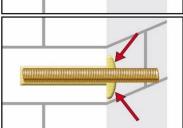
Installation without sleeve



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



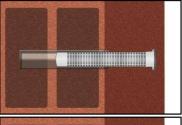
Insert the anchor rod while turning slightly up to the embedment mark.



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

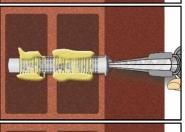
Otherwise, the installation must be repeated starting from step 6 before the maximum working time t_{work} has expired.

Installation with sleeve



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

For installation with sleeve 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 VL shall be used.)

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

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



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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry

Intended use

Installation instructions (continuation)

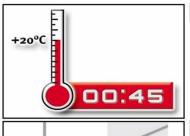
Annex B 10

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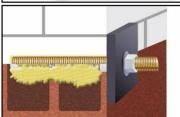
English translation prepared by DIBt



Installation instructions (continuation)



Temperature related curing time t_{cure} (Annex B 8) must be observed. Do not move or load the fastener during curing time.



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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry

Intended use
Installation instructions (continuation)

Annex B 11



					Anchor	age				β-Factor				
Base material	anchor	anchor size Perforated sleeve SH all sizes with and without SH d₀ ≤ 14 mm with SH d₀ ≤ 16 mm without SH d₀ ≥ 16 mm without SH all sizes without SH without SH without SH without SH without SH d₀ ≤ 12 mm with and without SH d₀ ≥ 16 mm with and without SH haracteristic steel resistant				ما م سالم		T _a : 40°C / 24°C		T _b : 80°C / 50°C		T _c : 120°C / 72°C		
					h _{ef}		•	d/d	w/d w/w	d/d	w/d w/w	d/d	w/d w/w	
Autoclaved aerated concrete	all siz				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 5H		all		0),93	0,93	0,87	0,87	0,65	0,65	
Calcium silica bricks	d₀ ≤ 14	mm			- 400 ···		0	,93	0,80	0,87	0,74	0,65	0,56	
DITCKS	d₀ ≥ 16	mm	without S	·H	≤ 100 r	nm	0	,93	0,93	0,87	0,87	0,65	0,65	
	all siz	es	without S	Н	> 100 r	nm	0	,93	0,56	0,87	0,52	0,65	0,40	
			with SH	ı	all		0),86	0,86	0,86	0,86	0,73	0,73	
Clay Bricks	all siz	es	without S	Н	≤ 100 r	nm	0	,93	0,80	0,87	0,74	0,65	0,56	
•			without S	н	> 100 r	nm	-	,86	0,43	0,86	0,43	0,73	0,37	
	d₀ ≤ 12	mm	with and	1			_	,93	0,80	0,87	0,74	0,65	0,56	
Concrete bricks					all		_	,93	0,93	0,87	0,87	0,65	0,65	
Table C2: C	haracte	ristic	steel resi	stand	ce									
Anchor size						M	3	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Cross section area				As	[mm²]	36,	6	58	84,3	157	-	-	-	
Characteristic ten	sion resis	stance	Steel failu	re ¹⁾	•			•	•	•	•		•	
Steel, Property class			nd 4.8	N _{Rk,s}	s [kN]	15 (13)	23 (21)	34	63	_3)	_3)	_3)	
		5.6 aı	nd 5.8	N _{Rk} ,	s [kN]	18 (1	17)	29 (27)	42	78	10	17	29	
		8.8		N _{Rk} ,		29 (27)		46 (43)	67	125	16	27	46	
Stainless steel A2,	A4 and	50		N _{Rk,}		18	·	29	42	79	_3)	_3)	_3)	
HCR, class	A4 and	70		N _{Rk,}		26	3	41	59	110	14	26	41	
(A2 only class 50 a	nd 70)	80			s [kN]	29	_	46	67	126	_3)	_3)	_3)	
Characteristic ten	sion resis	stance	Partial fac	tor ²⁾	-									
			nd 5.6	γ _{Ms,N}	v [-]			2	2,0			_3)		
Steel, Property clas	S	4.8, 5	5.8 and 8.8	γ _{Ms,N}					1,5	•				
Stainless steel A2,	Δ4 and	50		γ _{Ms,N}			2,86				_3)			
HCR, class	A-T alla	70		γ _{Ms,N}						1,87				
(A2 only class 50 a	nd 70)	80		γ _{Ms,N}		1 1		1	,6	<u> </u>		_3)		
Characteristic she	ar resista	ance, S	teel failure	witho	out lever	arm ¹	l)				-			
			nd 4.8	V ⁰ Rk	ss [kN]	7 (6		12 (10)	17	31	_3)	_3)	_3)	
Steel, Property clas	s	5.6 aı	nd 5.8	V^0_{Rk}	_{.,s} [kN]	9 (8	3)	15 (13)	21	39	5	9	15	
Steel, Property class		8.8		V^0_{Rk}	ss [kN]	15 (1	13)	23 (21)	34	63	8	14	23	
Stainless steel A2,	A4 and	50		$ V^0_{Rk}$	_{.s} [kN]	9		15	21	39	_3)	_3)	_3)	
HCR, class		70		V_{Rk}	_{i,s} [[kN]	13	}	20	30	55	7	13	20	
(A2 only class 50 and 70)		80		V ⁰ Rk	,s [kN]	15	5	23	34	63	_3)	_3)	_3)	
Ceys Injection s	votom T		NIÍMICO VI			A # # * *		5 F S S						
Performances	ysteili 17		OUNICO VI	14 T L C	SIEN I	Ji IIId	5 01	y			Anne	ex C 1		



Table C2: Characte	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	er arm	1)								
	4.6 and 4.8	M ⁰ Rk,s	[Nm]	15 (13)	30 (27)	52	133	_3)	_3)	_3)	
Steel, Property class	5.6 and 5.8	М ⁰ Rk,s	[Nm]	19 (16)	37 (33)	65	166	8	19	37	
	8.8	М ⁰ Rk,s	[Nm]	30 (26)	60 (53)	105	266	12	30	60	
Stainless steel A2, A4 and	50	М ⁰ Rk,s	[Nm]	19	37	66	167	_3)	_3)	_3)	
HCR, class	70	М ⁰ Rk,s	[Nm]	26	52	92	232	11	26	52	
(A2 only class 50 and 70)	80	M ⁰ Rk,s	[Nm]	30	59	105	266	_3)	_3)	_3)	
Characteristic shear resista	ınce, Partial facto	r ²⁾						•			
Stool Property class	4.6 and 5.6	γ _{Ms,V}	[-]		1,6	57			_3)		
Steel, Property class	4.8, 5.8 and 8.8	γ _{Ms,V}	[-]				1,25				
Stainless steel A2, A4 and	50	γMs,V	[-]		2,3	18			_3)		
HCR, class	70	γ _{Ms,V}	[-]				1,56				
(A2 only class 50 and 70)	80	γ _{Ms,V}	[-]		1,3	3			_3)		

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

Table C3: Characteristic steel resistance under fire exposure 1)

Anchor size		М8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Characteristic tension resistance, S										
	R30	$N_{Rk,s,fi}$	[kN]	1,1	1,7	3,0	5,7	0,3	1,1	1,7
Steel, Property class 5.8, and higher; Stainless steel A2, A4 and HCR,	R60	$N_{Rk,s,fi}$	[kN]	0,9	1,4	2,3	4,2	0,2	0,9	1,4
class 50 and higher	R90	$N_{Rk,s,fi}$	[kN]	0,7	1,0	1,6	3,0	0,2	0,7	1,0
3	R120	N _{Rk,s,fi}	[kN]	0,5	0,8	1,2	2,2	0,1	0,5	0,8
Characteristic shear resistance, Ste	el failure	without	lever a	arm						
	R30	$V_{Rk,s,fi}$	[kN]	1,1	1,7	3,0	5,7	0,3	1,1	1,7
Steel, Property class 5.8, and higher; Stainless steel A2, A4 and HCR,	R60	$V_{Rk,s,fi}$	[kN]	0,9	1,4	2,3	4,2	0,2	0,9	1,4
class 50 and higher	R90	$V_{Rk,s,fi}$	[kN]	0,7	1,0	1,6	3,0	0,2	0,7	1,0
3	R120	$V_{Rk,s,fi}$	[kN]	0,5	0,8	1,2	2,2	0,1	0,5	0,8
Characteristic shear resistance, Ste	el failure	with lev	er arm	1						
	R30	$M_{Rk,s,fi}$	[Nm]	1,1	2,2	4,7	12,0	0,2	1,1	2,2
Steel, Property class 5.8, and higher;	R60	M _{Rk,s,fi}	[Nm]	0,9	1,8	3,5	9,0	0,2	0,9	1,8
Stainless steel A2, A4 and HCR, class 50 and higher	R90	M _{Rk,s,fi}	[Nm]	0,7	1,3	2,5	6,3	0,1	0,7	1,3
	R120	M _{Rk,s,fi}	[Nm]	0,5	1,0	1,8	4,7	0,1	0,5	1,0

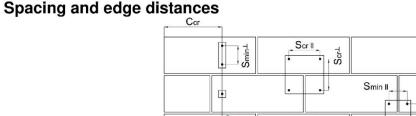
¹⁾ partial factor in case of fire is 1,0 for all steel types and load directions.

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances	Annex C 2
Characteristic steel resistance under tension and shear load – under fire exposure	

²⁾ in absence of national regulation

³⁾ Fastener type not part of the ETA





Scril Smin II Smin II

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

 $V_{RK,c} = \alpha_{g \parallel,V \parallel} \alpha_{g \perp,V \parallel} V_{RK,b}$ resp. $V_{RK,c \perp} = \alpha_{g \parallel,V \perp} \alpha_{g \perp,V \perp} V_{RK,b}$ (for $c \ge c_{min}$)

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances Definition of the reduction- and group factors	Annex C 3



Brick type: Autoclaved aerated concrete - AAC

Table C4: Stone description

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



Table C5: Installation parameter

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

Table C6: Reduction factors for single anchors at the edge

-	ension load		Shear load								
	ension load		Perpendic	ular to the fr	ee edge	Parallel to the free edge					
	with c ≥	αedge, N	· 	with c ≥	αedge, V⊥	1	with c ≥	αedge, V II			
	50	0,85		50	0,12		50	0,70			
	30	0,65		125	0,50	Ţ	125	0,85			
	150	1,00		210	1,00	7	150	1,00			

Table C7: Factors for anchor groups under tension load

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

Table C8: Factors for anchor groups under shear load

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry

Performances Autoclaved Aerated Concrete - AAC

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

Annex C 4



Brick type: Aut	oclave	d aerat	ed concr	ete – AA	C						
Table C9: Ch	aracte	istic val	ues of ter	sion and	shear loa	d resista	nces				
	d)			Charac	cteristic Res	istances w	rith c≥c _{cr}	and s ≥ s _{cr}			
	Perforated sleeve	Effecitve Anchorage depth		Use condition							
	l sle			الم/الم			w/d		d/d		
	atec			d/d			w/w	w/d w/w			
Anchor size	rfor	And							All		
	Pe		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		
	ds	h _{ef}		I Jrk,b = Nrk,p	1)		l Nek,b = Nek,	1)	V _{Rk,b} ¹⁾		
	[mm]	[mm]		*HK,D — 1 *HK,F	•	[kN]	ч пк,b — тчпк,	I ♣ UK,U			
Normalise	d mear	compre	ssive stren	ght f _b ≥ 2	N/mm²;	Density ρ	≥ 0,35 kg/d	lm³			
M8	-	80	1,2	0,9	0,9	0,9	0,9	0,9	1,5		
M10 / IG-M6	-	90	1,2	0,9	0,9	0,9	0,9	0,9	2,5		
M12 / M16 / IG-M8 / IG-M10	-	100	2,0	1,5	1,5	1,5	1,5	1,5	2,5		
M8	12	80	1,2	0,9	0,9	0,9	0,9	0,9	1,5		
M8 / M10/ IG-M6	16	≥ 85	1,2	0,9	0,9	0,9	0,9	0,9	2,5		
M12 / M16 / IG-M8 / IG-M10	20	≥ 85	2,0	1,5	1,5	1,5	1,5	1,5	2,5		
1) $N_{Rk,b,c} = N_{Rk,p,c}$ and	d V _{Rk,c II} =	= V _{Rk,c} ⊥ace	cording to An	nex C 3							
				Charac	cteristic Res	istances w	rith c≥c _{or}	and s ≥ s _{cr}			
	eve	Effecitve Anchorage depth				Use condit		- Ci			
	S Š					w/d	d/d				
	Perforated sleeve			d/d			w/w		w/d w/w		
Anchor size			Ancle							All	
	Per		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature ranges		
	ds	h _{ef}	N	$J_{Rk,b} = N_{Rk,p}$	1)	1	$N_{Rk,b} = N_{Rk,b}$	1) p	$V_{Rk,b}^{(1)}$		
	[mm]	[mm]				[kN]					
			ssive stren	· -	· ·	0.5		≥ 0,50 kg/d			
M8 M10 /	-	80	3,0	2,5	2,0	2,5	2,0	2,0	4,5		
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	12	80	3,0	2,5	2,0	2,5	2,0	2,0	4,5		
M8 / M10/ IG-M6	16	≥ 85	3,0	2,5	2,0	2,5	2,0	2,0	7,5		
M12 / M16 / IG-M8 / IG-M10	20	≥ 85	5,0	4,5	4,0	4,5	4,0	4,0	7,5		
1) N _{Rk,b,c} = N _{Rk,p,c} and	d V _{Rk,c II} =	= V _{Rk,c} ⊥ace	cording to An	nex C3			.				
Ceys Injection sys	stem TA	CO QUÍN	IICO VINYL	ESTER fo	r masonry						
Performances auto Characteristic Resis					Annex C	5					



Brick type: Aut	oclave	ed aerat	ed concr	ete – AA	C							
		Effecitve Anchorage depth	Characteristic Resistances with c ≥ c _{cr} and s ≥ s _{cr}									
				Use condition								
	d sleeve		d/d				d/d w/d w/w					
Anchor size	Perforated sleeve	And	40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges			
	"	h _{ef}	N	Jrk,b = Nrk,p	1)	1	1) p	$V_{Rk,b}^{1)}$				
		[mm]		,		[kN]						
Normalise	ed meai	n compre	ssive strer	ıght f₀≥6	N/mm²;		Density ρ	≥ 0,60 kg/d	lm³			
M8	-	80	4,0	3,5	3,0	3,5	3,0	3,0	6,0			
M10 / IG-M6	-	90	4,0	3,5	3,0	3,5	3,0	3,0	10,0			
M12 / M16 / IG-M8 / IG-M10	-	100	7,0	6,0	5,5	6,5	5,5	5,5	10,0			
M8	12	80	4,0	3,5	3,0	3,5	3,0	3,0	6,0			
M8 / M10/ IG-M6	16	≥ 85	4,0	3,5	3,0	3,5	3,0	3,0	10,0			
M12 / M16 / IG-M8 / IG-M10	20	≥ 85	7,0	6,0	5,5	6,5	5,5	5,5	10,0			

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

Table C10: Displacements

Anchor size	hef	δη / Ν	δΝ0	δN∞	δv / V	δνο	δ∨∞
Alichor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,1	0,1*N _{Rk} / 2,8	2 *δN0	0,3	0,3*V _{Rk} /2,8	1,5*δ∨0
M16	all	,	,		0,1	0,1*V _{Rk} /2,8	1,5*δ∨ο

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances autoclaved aerated concrete – AAC Characteristic Resistances and Displacements	Annex C 6



Brick type: Solid calcium silica brick KS-NF

Table C11: Stone description

Brick type		Solid calcium silica brick KS-NF
Density	ρ [kg/dm³]	≥ 2,0
Normalised mean compressive strenght	f _b [N/mm ²]	≥ 28
Conversion factor for low compressive strengths	/er	$(f_b / 28)^{0,5} \le 1,0$
Code		EN 771-2:2011+A1:2015
Producer (Country)		e.g. Wemding (DE)
Brick dimensions	[mm]	≥ 240 x 115 x 71
Drilling method		Hammer drilling



Table C12: Installation parameter

Anchor size			M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Installation torque	T _{inst}	[Nm]	≤ 10	≤ 10	≤ 15	≤ 15	≤ 10	≤ 10	≤ 10
Char. Edge distance (under fire conditions)	Ccr; (Ccr,fi)	[mm]	(for s	hear load		150 (2 h _{ef}	the free e	dge: c _{cr} =	240)
Minimum Edge Distance	Cmin	[mm]	,			60			,
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]				240 (4 h _{ef}))		
(under fire conditions)	Scr, ⊥; (Scr,fi, ⊥)	[mm]				150 (4 hef)	(
Minimum Spacing	Smin, II; Smin, ⊥	[mm]	mm] 75						

Table C13: Reduction factors for single anchors at the edge

	Tension load			Shear load perpendicular to free edge			Shear load parallel to free edge		
	with c ≥	αedge, N		with c ≥	αedge, V ⊥		with c ≥	αedge, V II	
	60 ¹⁾	0,50		60	0,30		60	0,60	
•	100 ¹⁾	0,50	→	100	0,50		100	1,00	
	150 ¹⁾	1,00		240	1,00		150	1.00	
	180	1,00		240	1,00		130	1,00	

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

Table C14: Factors for anchor groups under tension load

Anchor position parallel to hor. joint			Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	$\alpha_g \perp$, N
	60 ¹⁾	75	0,70		60 ¹⁾	75	1,15
	150 ¹⁾	75	1,40		150 ¹⁾	75	2,00
• •	150 ¹⁾	240	2,00		150 ¹⁾	150	2,00
	180 ²⁾	75	1,00		180 ²⁾	75	1,15
	180 ²⁾	240	1,70	180 ²⁾	1002)	150	2,00
	240 ²⁾	240	2,00		100-7	150	2,00

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

Table C15: Factors for anchor groups under shear load

	Ancho	r position pa	rallel to hor.	joint	Anchor	position perpe	ndicular to ho	r. joint	
Shear load		with c ≥	with s ≥	α _g II,V ⊥	1	with c ≥	with s ≥	$\alpha_{g\perp,V\perp}$	
perpendicular	• • •	60	75	0,75		60	75	0,90	
to the free		150	75	2,00		150	75	2,00	
edge		150	240	2,00		150	150	2,00	
Shear load		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	αg ⊥,V II	
parallel to the	the	e l	60	75	2,00	•	60	75	2,00
free edge			150	75	2,00	•	150	75	2,00
nee eage		150	240	2,00	i i i i i i i i i i i i i i i i i i i	150	150	2,00	

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry

Performances solid calcium silica brick KS-NF

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

Annex C7

²⁾ Only for application with hef = 200mm and without sleeve



Brick type: Solid calcium silica brick KS-NF

Table C16: Characteristic values of tension and shear load resistances

				Chara	cteristic Res	sistances v	vith c≥c _{cr}	and s ≥ s _{cr}			
	go .	<u>, o</u>	Use condition								
	Perforated sleeve	Effecitve Anchorage depth		d/d			w/d		d/d		
	S	育芸草					w/w		w/w (w/d)		
Anchor size	tec	# ₹ C							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			
	e l								ranges		
	ď	h _{ef}	ľ	$N_{Rk,b} = N_{Rk,i}$	2) p	1	$N_{Rk,b} = N_{Rk,b}$	2) p	$V_{Rk,b}^{2)}$		
	[mm]			[kN]							
		Normalis	ed mean c	ompressi	ve strength	f _b ≥ 28 N/	mm² 1)				
M8	-	80									
M10 / IG-M6	-	≥ 90	7,0	6,5	5,0	6,0	5,5	4,0			
M12 / IG-M8	-	≥ 100									
M16 / IG-M10	-	≥ 100	7,0	6,5	5,0	7,0	6,5	5,0			
M10/M12/M16/											
IG-M6 / IG-M8 /	-	200	9,0	8,5	6,5	5,5	5,0	4,0	7,0		
IG-M10			_		_						
M8	SH 12	80	7,0	6,5	5,0	6,0	5,5	4,0			
M8 / M10/ IG-M6	SH 16	≥ 85									
M12 / M16 / IG-M8 / IG-M10	SH 20	≥ 85	7,0	6,5	5,0	7,0	6,5	5,0			

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

Table C17: Displacements

Anohor sizo	hef	δη / Ν	δΝ0	δN∞	δv / V	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0.1	0.4*NL. / 9.5	0****	0,3	0,3*V _{Rk} /3,5	1,5*δ∨ο
M16	all	0,1	0,1*N _{Rk} / 3,5	2*δΝο	0,1	0,1*V _{Rk} /3,5	1,5*δ∨ο

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

		Effective	Characteristic Resistances NRk,b,fi = NRk,p,fi = VRk,b,fi					
Ancher size	Perforated	anchorage depth						
Anchor size	sleeve	h _{ef}	R30	R60	R90	R120		
		[mm]						
M8	-	80						
M10 / IG-M6	-	≥ 90	0,48	0.41	0,34	0,30		
M12 / IG-M8	-	≥ 100	0,40	0,41	0,34	0,30		
M16 / IG-M10	-	≥ 100						
M8	SH 12	80						
M8 / M10 /IG-M6	SH 16	≥ 85	0,47	0,26	_ 1)	_ 1)		
M12 / M16 / IG-M8 /IG-M10	SH 20	≥ 85	0,47	0,20	- '/	- ',		

¹⁾ no performance assessed

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances solid calcium silica brick KS-NF Characteristic Resistances and Displacements	Annex C 8

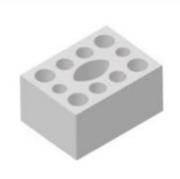
²⁾ $N_{Rk,b,c} = N_{Rk,p,c}$ and $V_{Rk,c \mid I} = V_{Rk,c} \perp$ according to Annex C 3



Brick type: Hollow Calcium silica brick KSL-3DF

Table C19: Stone description

Brick type		Hollow calcium silica brick KSL-3DF
Density	ρ [kg/dm³]	≥ 1,4
Normalised mean compressive strenght	f_b [N/mm ²]	≥ 14
Conversion factor for lov compressive 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



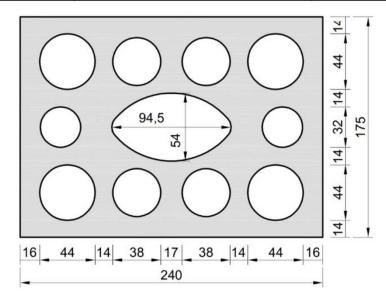


Table C20: Installation parameter

	p								
Anchor size		[-]	M8 M10 M12 M16 IG-M6 IG-M8 IG-M						
Installation torque	Tinst	[Nm]	≤5 ≤5 ≤8 ≤8 ≤5 ≤8 :						
Char. Edge distance	Ccr	[mm]	120	(for shear	loads perp	endicular t	the free	edge: c _{cr} =	240)
Minimum Edge Distance	Cmin	[mm]	60						
Characteristic Specing	s _{cr, II} [mm] 240								
Characteristic Spacing Scr, \(\precedef \) [mm] 120									
Minimum Spacing	Smin, II;	[mm]	120						
William Spacing	Smin, ⊥	Limin				120			

Table C21: Reduction factors for single anchors at the edge

,	ension load		Shear load								
'	ension load	Perpendicular to the free edge Parallel to the free edge		Perpendicular to the free edge Parallel to the							
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II			
•	60	1,00	→	60	0,30	1	60	1,00			
	120	1,00		240	1,00		120	1,00			

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry

Performances hollow calcium silica brick KSL-3DF

Description of the stone, Installation parameters, Reductionfactors

Annex C 9



Brick type: Hollow Calcium silica brick KSL-3DF Table C22: Factors for anchor groups under tension load Anchor position parallel to hor. joint Anchor position perpendicular to hor. joint

7311	chor position pe	aranci to noi. je	,,,,,	Andrior position perpendicular to nor. Joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	$\alpha_{g\perp\!\!\!\!\!\perp,N}$	
	60	120	1,50	•	60	120	1,00	
	120	120	2,00		00	120	1,00	
.,	120	240	2,00	.,	120	120	2,00	

Table C23: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	. joint	Anchor position perpendicular to hor. joint			
Shear load		with c ≥	with s ≥	αg II,V ⊥		with c ≥	with s ≥	$\alpha_g \perp$, v \perp
perpendicular	•••	60	120	0,30		60	120	0,30
to the free		120	120	1,00		00	120	0,30
edge	***************************************	120	240	2,00		240	120	2,00
Shear load		with c ≥	with s ≥	αg II,V II	ļ	with c ≥	with s ≥	αg ⊥,V II
parallel to the	••	60	120	1,00	•	60	120	1,00
free edge		120	120	1,60	•	00	120	1,00
lice eage	.,	120	240	2,00		120	120	2,00

Table C24: Characteristic values of tension and shear load resistances

				Charac	cteristic Res	istances w	rith c≥c _{cr} a	and s ≥ s _{cr}					
		Effecitve Anchorage depth		Use condition									
Anchor size	Perforated sleeve			d/d			d/d w/d w/w						
Anchor size	rate	Ā							All				
	rfol		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C					
	Pe								ranges				
		h _{ef}	N	$J_{Rk,b} = N_{Rk,p}$	2)	1	$N_{Rk,b} = N_{Rk,b}$	2) p	$V_{Rk,b}^{(2)}$				
		[mm]				[kN]							
		Normalis	ed mean c	ompressi	ve strength	f _b ≥ 14 N/	mm² 1)						
M8 / M10/	16	≥ 85	2,5	2,5	1,5	2,5	2,5	1,5	6,0				
IG-M6	10	130	2,5	2,5	2,0	2,5	2,5	2,0	6,0				
M12 / M16 / IG-M8 / IG-M10	20	≥ 85	6,5	6,0	4,5	6,5	6,0	4,5	6,0				

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

Table C25: Displacements

Anghor size	hef	δη / Ν	δΝο	δN∞	δv / V	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δN0	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all			- 3.10	0,31	0,31*V _{Rk} / 3,5	1,5*δνο

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow calcium silica brick KSL-3DF Group factors, characteristic Resistances and Displacements	Annex C 10

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



Brick type: Hollow Calcium silica brick KSL-8DI	Brick type:	Hollow	Calcium	silica	brick	KSL-8D	F
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Table C26: Stone description

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



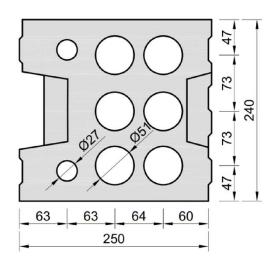


Table C27: Installation parameter

Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Installation torque	Tinst	[Nm]	≤5 ≤5 ≤8 ≤8 ≤5 ≤8						
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: c _{cr} = 250)						
Minimum Edge Distance	Cmin	[mm]	50						
Characteristic Spacing	Scr, II	[mm]	n] 250						
Characteristic Spacing	Scr, ⊥	[mm]				120			
Minimum Spacing	Smin, II;	[mm]	50						
William Spacing	Smin, ⊥	[mm]				30			

Table C28: Reduction factors for single anchors at the edge

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry

Performances hollow calcium silica brick KSL-8DF

Description of the stone, Installation parameters, Reductionfactors

Annex C 11



Brick type: Hollow Calcium silica brick KSL-8DF

Table C29: Factors for anchor groups under tension load

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

Table C30: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint			
Shear load		with c ≥	with s ≥	αg II,V ⊥		with c ≥	with s ≥	$\alpha_g \perp$, v \perp
perpendicular		50	50	0,45		50	50	0,45
to the free		250	50	1,15		250	50	1,20
edge	.,	250	250	2,00		250	250	2,00
Shear load		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	αg ⊥,V II
parallel to the	•	50	50	1,30		50	50	1,00
free edge		120	250	2,00		120	250	2,00

Table C31: Characteristic values of tension and shear load resistances

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$								
				Use condition							
	eve	Effecitve Anchorage depth					w/d		d/d		
	S _e	Effecitve Anchorage depth		d/d			w/w		w/d		
Anchor size	O	# 5 5					w/w				
	ate	An							All		
	Perforated sleeve		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	Temperature		
									ranges		
		h _{ef}	$N_{Rk,b} = N_{Rk,p}^{2}$			1	$V_{Rk,b}^{(2)}$				
		[mm]		[kN]							
		Normalis	sed mean c	ompressi	ve strength	f _b ≥ 12 N/	mm² 1)				
M8 / M10/ IG-M6	16	130	5,0	4,5	3,5	5,0	4,5	3,5	3,5		
M12 / M16 / IG-M8 / IG-M10	20	≥ 130	5,0	4,5	3,5	5,0	4,5	3,5	6,0		

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

Table C32: Displacements

Anchoroiza	hef	δη / Ν	δΝο	δN∞	δv / V	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δN0	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all	*		_ = 5110	0,31	0,31*V _{Rk} / 3,5	1,5*δ∨0

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow calcium silica brick KSL-8DF Group factors, characteristic Resistances and Displacements	Annex C 12

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



Brick type: Hollow Calcium silica brick KSL-12DF

Table C33: Stone description

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



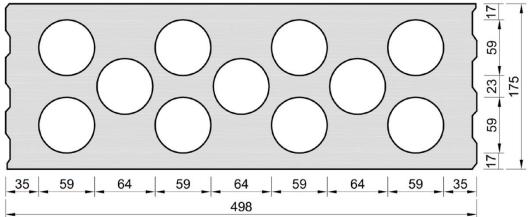


Table C34: Installation parameter

37 Not Approximate 1 19 (100 mg/s) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1											
Anchor size	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10			
Installation torque	Tinst	[Nm]	≤ 4	≤ 4	≤ 5	≤ 5	≤ 4	≤ 5	≤ 5		
Char. Edge distance	Ccr; (Ccr,fi)	[mm]	/5	1	500)						
(under fire conditions)	,,,,,,		(for shear loads perpendicular to the free edge: c _{cr} = 500)								
Minimum Edge Distance	Cmin	[mm]	50								
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]	500 (4 h _{ef})								
(under fire conditions)	Scr, ⊥; (Scr,fi, ⊥)	[mm]	120 (4 h _{ef})								
Minimum Spacing	[mm]	50									

Table C35: Reduction factors for single anchors at the edge

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

Table C36: Factors for anchor groups under tension load

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry

Performances hollow calcium silica brick KSL-12DF

Description of the stone, Installation parameters, Reductionfactors

Annex C 13

free edge



120

250

2,00

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

2,00

Table C38: Characteristic values of tension and shear load resistances

500

120

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

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

Table C39: Displacements

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / V	δνο	δ∨∞
7	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δN0	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all		-,, -	2110	0,31	0,31*V _{Rk} / 3,5	1,5*δνο

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

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

¹⁾ no performance assessed

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow calcium silica brick KSL-12DF Group factors, characteristic Resistances and Displacements	Annex C 14

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



Brick type: Solid clay brick 1DF

Table C41: Stone description

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

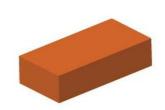


Table C42: Installation parameter

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]	m] 150 (for shear loads perpendicular to the free edge				edge: c _{cr} =	240)		
Minimum Edge Distance	imum Edge Distance cmin			60						
Characteristic Cassing	Scr, II	[mm]	240							
Characteristic Spacing	Scr, ⊥	[mm]				130				
Minimum Spacing	Smin, II;	[mm]				65				
Triminani Spasing	Smin, ⊥	[]				00				

Table C43: Reduction factors for single anchors at the edge

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

Table C44: Factors for anchor groups under tension load

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

Table C45: Factors for anchor groups under shear load

	Anchor	Anchor position parallel to hor. joint			Anchor position perpendicular to hor. joint			
Shear load		with c ≥	with s ≥	α _g II,V ⊥	1	with c ≥	with s ≥	$\alpha_{g\perp}, v_{\perp}$
perpendicular		60	65	0,40	•	60	65	0,30
to the free		240	65	2,00		240	65	2,00
edge		240	240	2,00	-	240	130	2,00
Shear load		with c ≥	with s ≥	α _g II,V II		with c ≥	with s ≥	αg ⊥,V II
parallel to the	60	65	1,75	•	60	65	1,10	
free edge		150	65	2,00	•	150	65	2,00
liee eage	·	150	240	2,00	ļI	150	130	2,00

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances solid clay brick 1DF Description of the stone, Installation parameters, Reduction- and Group factors	Annex C 15



Brick type: Sol	id clay	brick 1	DF								
Table C46: Ch	aracte	ristic val	ues of ter	sion and	shear loa	d resista	nces				
			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$								
						Use condit	ion				
	Perforated sleeve	Effecitve Anchorage depth					w/d		d/d w/d		
	sle	Effecitve inchoragi depth		d/d			w/w				
Anchor size	Ited	∰ Sp		1					W/W All		
	fora		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C			
	-er								ranges		
	_	h _{ef}	١	$J_{Rk,b} = N_{Rk,p}$	2)	1	$N_{Rk,b} = N_{Rk,j}$	2) p	V _{Rk,b} ²⁾		
		[mm]				[kN]					
		Normalis	sed mean o	ompressi	ve strength	f _b ≥ 20 N/	mm² 1)		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	12	80									
M8 / M10/ IG-M6	16		7,0	6,0	6,0	7,0	6,0	6,0	8,0		
M12 / IG-M8	20	≥ 85									
M16 / IG-M10	20	≥ 85	8,0	6,5	6,5	8,0	6,5	6,5	12,0		

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

Table C47: Displacements

Anchor size	hef	δ _N / N	δΝο	δN∞	δv / V	δνο	δ∨∞
Alichor Size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,1	0,1*N _{Rk} / 3,5	2*δN0	0,3	0,3*V _{Rk} / 3,5	1,5*δνο
M16	all		3,113,110,10		0,1	0,1*V _{Rk} /3,5	1,5*δvo

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances solid clay brick 1DF Characteristic Resistances and Displacements	Annex C 16

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



Brick type: Solid clay brick 2DF

Table C48: Stone description

Brick type		Solid clay brick Mz- 2DF	
Density	ρ [kg/dm³]	≥ 2,0	
Normalised mean compressive strenght	≥ 28		
Conversion factor for lowe strengths	$(f_b / 28)^{0.5} \le 1.0$		
Code		EN 771-1:2011+A1:2015	
Producer (Country)		e.g. Wienerberger (DE)	
Brick dimensions	[mm]	≥ 240 x 115 x 113	
Drilling method	200	Hammer drilling	



Table C49: Installation parameter

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

Table C50: Reduction factors for single anchors at the edge

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

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

Table C51: Factors for anchor groups under tension load

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 ¹⁾	50	1,50		50 ¹⁾	50	0,80	
	150 ¹⁾	240	2,00		150 ¹⁾	240	2,00	
	180 ²⁾	60	1,00		180 ²⁾	60	1,00	
	180 ²⁾	240	1,55	 	180 ²⁾	100	2,00	
	240 ²⁾	240	2,00			120	2,00	

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

Table C52: Factors for anchor groups under shear load

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry

Performances solid clay brick 2DF

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

Annex C 17

²⁾ Only for application with hef = 200mm and without sleeve



Brick type: Solid clay brick 2DF

Table C53: Characteristic values of tension and shear load resistances

Table 055. Characteristic values of tension and shear load resistances											
				Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$							
	Perforated sleeve	Effecitve Anchorage depth	Use condition								
Anchor size				d/d			d/d w/d w/w				
			40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges		
	"	h _{ef}	N	$N_{Rk,b} = N_{Rk,p}$	2)	$N_{Rk,b} = N_{Rk,p}^{2)}$			V _{Rk,b} ²⁾		
		[mm]				[kN]		•			
Normalised mean compressive strength f _b ≥ 28 N/mm ^{2 1)}											
M8	-	80	0.0	0.0	7.5	0.0	0.0	7.5	0.5		
M10 / IG-M6	-	≥ 90	9,0	9,0	7,5	9,0	9,0	7,5	9,5		
M12 / IG-M8	-	≥ 100	9,0	9,0	7,5	9,0	9,0	7,5	12		
M16 / IG-M10	-	≥ 100	9,0	9,0	7,5	9,0	9,0	7,5	12 ³⁾		
M10 / M12 / IG-M6 / IG-M8	-	200	11,5	11,5	10,0	6,0	6,0	5,0	8,0		
M16 / IG-M10	-	200	11,5	11,5	10,0	6,0	6,0	5,0	12,0		
M8	12	80			7.5	0.0	0.0	7.5	0.5		
M8 / M10/ IG-M6	16	≥ 85	9,0	9,0	7,5	9,0	9,0	7,5	9,5		
M12 / IG-M8	20	≥ 85	9,0	9,0	7,5	9,0	9,0	7,5	12,0		
M16 / IG-M10	20	≥ 85	9,0	9,0	7,5	9,0	9,0	7,5	12,0 ³⁾		

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

Table C54: Displacements

Anchor size	hef	δn / N	δΝο	δN∞	δv / V	δνο	δ∨∞
Alichor Size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,1	0,1*N _{Rk} / 3,5	2*δΝο	0,3	0,3*V _{Rk} / 3,5	1,5*δνο
M16	all		,	- 3.10	0,1	0,1*V _{Rk} /3,5	1,5*δνο

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

						•				
		Effecitve	Characteristic Resistances							
Anchor size	Perforated	Anchorage depth	$N_{Rk,b,fi} = N_{Rk,p,fi} = V_{Rk,b,fi}$							
Anchor size	sleeve	h _{ef}	R30	R60	R90	R120				
		[mm]								
M8	-	80								
M10 / IG-M6	-	≥ 90	0.51	0,44	0,36	0.22				
M12 / IG-M8	-	≥ 100	0,51	0,44	0,30	0,33				
M16 / IG-M10	-	≥ 100								
M8	12	80	0,36	0,26	0,15	0,10				
M8 / M10 /IG-	16	≥ 85	0,36	0,26	0,15	0,10				
M6	10	130	0,92	0,74	0,57	0,49				
M12/M16/	20	≥ 85	0,36	0,26	0,15	0,10				
IG-M8 /IG-M10	20	≥ 130	0,92	0,74	0,57	0,49				

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances solid clay brick 2DF Characteristic Resistances and Displacements	Annex C 18

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

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



Brick type: Hollow clay brick 10 DF

Table C56: Stone description

Brick type		Hollow clay brick HLZ-10DF	
Density	ρ [kg/dm³]	≥ 1,25	
Normalised mean compressive strenght	f _b [N/mm ²]	≥ 20	
Conversion factor for low strengths	$(f_b / 20)^{0.5} \le 1.0$		
Code		EN 771-1:2011+A1:2015	
Producer (Country)		e.g. Wienerberger (DE)	
Brick dimensions	[mm]	300 x 240 x 249	
Drilling method		Rotary drilling	



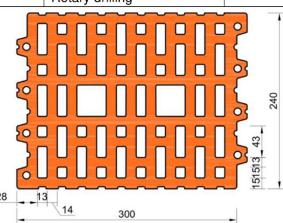


Table C57: Installation parameter

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

Table C58: 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		with c ≥	αedge, V⊥		with c ≥	αedge, V II		
•	50	1,00		50	0,20	<u> </u>	50	1,00		
	120	1,00		300	1,00		120	1,00		

Table C59: Factors for anchor groups under tension load

Anchor position parallel to hor. joint				Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, N	
• •	50	50	1,55		50	50	1,00	
	120	300	2,00		120	250	2,00	

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry

Performances hollow clay brick HLZ 10DF

Description of the stone, Installation parameters, Reductionfactors

Annex C 19



Brick type:	Brick type: Hollow clay brick 10 DF											
Table C60: Factors for anchor groups under shear load												
	Anchor	Anchor position parallel to hor. joint Anchor position perpendicular to hor. joint										
Shear load		with c ≥	with s ≥	α _g II,V ⊥		with c ≥	with s ≥	$\alpha_{g\perp,V\perp}$				
perpendicular	•••	50	50	0,30		50	50	0,20				
to the free		300	50	1,40		300	50	1,00				
edge		300	300	2,00		300	250	2,00				
Shear load		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	α _{g ⊥,} ν II				
parallel to the	•	50	50	1,85	1 1	50	50	1,00				
free edge		120	300	2,00		120	250	2.00				

Table C61: Characteristic values of tension and shear load resistances

D. SPANISCO, SCHOOL D. SAMER R. MICHOEL CO. CO. CO.						Carrier Committee of the Committee of th						
		Effective Anchorage depth		Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$								
				Use condition								
Anchor size	Perforated sleeve			d/d			d/d w/d w/w					
			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> </u>	h _{ef}	$N_{Rk,b} = N_{Rk,p}^{2}$			1	$N_{Rk,b} = N_{Rk,b}$	2) p	V _{Rk,b} ²⁾			
		[mm]				[kN]						
		Normalis	sed mean c	ompressi	ve strength	f _b ≥ 20 N/	mm² 1)					
M8	12	80	0.5	0.5	0.0	0.5	0.5	0.0	0.0			
M8 / M10/ IG-M6	16	≥ 85	2,5	2,5	2,0	2,5	2,5	2,0	8,0			
M12 / IG-M8	20	≥ 85	5,0	5,0	4,5	5,0	5,0	4,5	8,0			
M16 / IG-M10	20	≥ 85	5,0	5,0	4,5	5,0	5,0	4,5	11,5			

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

Table C62: Displacements

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / V	δνο	δ∨∞
	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δN0	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all	0,10		2 0140	0,31	0,31*V _{Rk} / 3,5	1,5*δνο

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

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick HLZ 10DF Group factors, characteristic Resistances and Displacements	Annex C 20

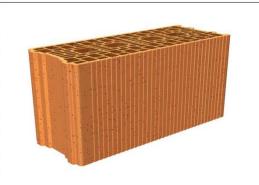
²⁾ $N_{Rk,b,c} = N_{Rk,p,c}$ and $V_{Rk,c | II} = V_{Rk,c} \perp$ according to Annex C 3



Brick type: Hollow Clay brick Porotherm Homebric

Table C64: Stone description

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



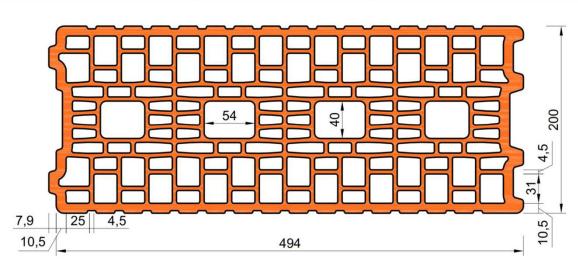


Table C65: Installation parameter

Anchor size	(2)	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque	T _{inst}	[Nm]	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	
Char. Edge distance	Ccr	[mm]	, , , , , , , , , , , , , , , , , , , ,						500)	
Minimum Edge Distance	Cmin	[mm]	120							
Characteristic Spacing	Scr, II	[mm]	500							
	Scr, ⊥	[mm]		300						
Minimum Spacing Smin		[mm]	120							
g	Smin, ⊥	[]				0				

Table C66: Reduction factors for single anchors at the edge

-	Tension load			Shear load						
Tension load			Perpendic	ular to the fr	ee edge	Parallel to the free edge				
11	with c ≥	αedge, N	1	with c ≥	αedge, V⊥		with c ≥	αedge, V II		
	120	1,00		120	0,30		120	0,60		
	120	1,00		250	0,60	Ţ I	120	0,60		
	120	1,00		500	1,00		200	1,00		

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry

Performances hollow clay brick Porotherm Homebric

Description of the stone, Installation parameters, Reductionfactors

Annex C 21



Brick type: Hollow Clay brick Porotherm Homebric

Table C67: Factors for anchor groups under tension load

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

Table C68: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	. joint	Anchor position perpendicular to hor. joint			
		with c ≥	with s ≥	αg II,V ⊥		with c ≥	with s ≥	αg ⊥, V ⊥
Shear load		120	100	0,30		120	100	0,30
perpendicular to the free edge	•••	250	100	0,60		250	100	0,60
		500	100	1,00		120	300	2,00
ougo		120	500	2,00				
Shear load		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	α _{g ⊥,} ν II
parallel to the free edge	• •	120	100	1,00		120	100	1,00
		120	500	2,00		120	300	2,00

Table C69: Characteristic values of tension and shear load resistances

1 44010 0 0 0 1 1											
				Charac	cteristic Res	istances w	vith c≥c _{cr} a	and s ≥ s _{cr}			
		Effective Anchorage depth	Use condition								
	Perforated sleeve						w/d		d/d		
	<u>e</u>	話さま		d/d			w/w		w/d		
A	Ö	ffectiv ichora depth					VV/ VV		w/w		
Anchor size	ate	A							All		
	Į į		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		
	Jer								ranges		
		h _{ef}	N	$J_{Rk,b} = N_{Rk,p}$	2)	1	$N_{Rk,b} = N_{Rk,b}$	2) p	$V_{Rk,b}^{(2)}$		
		[mm]				[kN]					
		Normalis	sed mean c	ompressiv	ve strength	f _b ≥ 10 N/	mm ^{2 1)}				
M8	12	80			1,	2			3,0		
M8 / M10/	16	≥ 85			1,	2			3,0		
IG-M6	16	130			1,	5	3,5				
M12 / M16/	20	≥ 85		1,2				4,0			
IG-M8 / IG-M10	20	≥ 130			1,	5			4,0		

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

Table C70: Displacements

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / V	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δN0	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all		2 2 33 33 33 33 33 33		0,31	0,31*V _{Rk} / 3,5	1,5 *δvo

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick Porotherm Homebric Group factors, characteristic Resistances and Displacements	Annex C 22

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

Table C73:



Brick type: Hollow Clay brick BGV Thermo Table C71: Stone description Hollow clay brick Brick type **BGV Thermo** Density ρ [kg/dm³] ≥ 0,60 Normalised mean f_b [N/mm²] ≥ 10 compressive strenght Conversion factor for lower compressive $(f_b / 10)^{0,5} \le 1,0$ strengths EN 771-1:2011+A1:2015 Code Producer (Country) e.g. Leroux (FR) [mm] Brick dimensions 500 x 200 x 314 Drilling method Rotary drilling

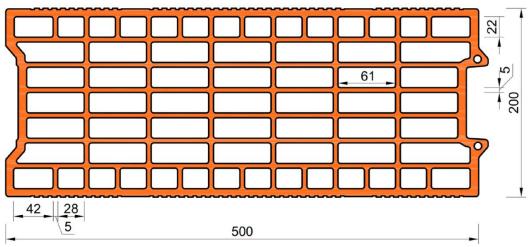


Table C72: Installation parameter										
Anchor size	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	[Nm]	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2		
Char. Edge distance c _{cr} [mm] 120 (for shear lo					loads perp	endicular t	o the free e	edge: c _{cr} =	500)	
Minimum Edge Distance	Cmin	[mm]	120							
Characteristic Spacing	Scr, II	[mm]	500							
Characteristic Spacing	Scr, ⊥	[mm]				315				
Minimum Spacing Smin, II; Smin, ⊥		[mm]	120							

Table 073. Reduction factors for single anchors at the edge										
7	Tension load			Shear load						
Tension load			Perpendicular to the free edge			Parallel to the free edge				
+	with c ≥	αedge, N	· · · · · · · · · · · · · · · · · · ·	with c ≥	αedge, V⊥	1	with c ≥	αedge, V II		
	120	1.00		120	0,30	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	120	0,60		
	120 1,00	1,00		250	0,60	Ţ	120	0,00		
	120	1,00		500	1,00		250	1,00		

Reduction factors for single anchors at the edge

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick BGV Thermo Description of the stone, Installation parameters, Reductionfactors	Annex C 23



Brick type: Hollow Clay brick BGV Thermo Table C74: Factors for anchor groups under tension load Anchor position parallel to hor. joint Anchor position perpendicular to hor. joint with c ≥ with s ≥ with c ≥ with s ≥ α_g 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 groups under shear load

Anchor position parallel to hor joint

	Anchor	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint			
Shear load		with c ≥	with s ≥	αg II,V⊥		with c ≥	with s ≥	$\alpha_g \perp$, v \perp
perpendicular to the free	•••	120	100	1,00		120	100	1,00
edge		120	500	2,00		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		120	500	2,00		120	315	2,00

Table C76: Characteristic values of tension and shear load resistances

to residence out to service and the services		A CONTRACTOR OF THE PARTY OF TH	pro-summer to resolve designation								
				Chara	cteristic Res	sistances w	/ith c ≥ c _{cr} a	and s ≥ s _{cr}			
	200	Effecitve Anchorage depth	Use condition								
Anchor size	d sleeve		d/d				d/d w/d w/w				
	ate	A							All		
	Perforated		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature		
									ranges		
	h _{ei}		$N_{Rk,b} = N_{Rk,p}^{2)}$			1	$V_{Rk,b}^{(2)}$				
		[mm]				[kN]					
		Normalis	sed mean d	ompressi	ve strength	f _b ≥ 10 N/	mm² 1)				
M8	12	80		275	0,	9			3,5		
M8 / M10/	16	≥ 85			0,	9			3,5		
IG-M6	10	130	2	,0	1,5	2	,0	1,5	4,0		
M12 / M16	20	≥ 85			0,	9			4,0		
IG-M8 / IG-M10	20	≥ 130	2	,0	1,5	2	,0	1,5	4,0		

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

Table C77: Displacements

Anchor size	hef	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 _{Rk} / 3,5	2*δΝο	0,55	0,55*V _{Rk} / 3,5	1,5*δνο	
M16	all				0,31	0,31*V _{Rk} / 3,5	1,5*δνο	

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Performances hollow clay brick BGV Thermo Group factors, characteristic Resistances and Displacements	Annex C 24

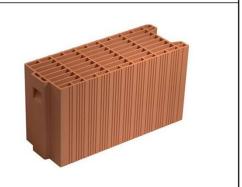
²⁾ $N_{Rk,b,c} = N_{Rk,p,c}$ and $V_{Rk,c | II} = V_{Rk,c} \perp$ according to Annex C 3



Brick type: Hollow Clay brick Calibric R+

Table C78: Stone description

Brick type		Hollow clay brick Calibric R+	
Density	ρ [kg/dm³]	≥ 0,60	
Normalised mean compressive strenght	f _b [N/mm²]	≥ 12	
Conversion factor for lowe strengths	$(f_b / 12)^{0.5} \le 1.0$		
Code		EN 771-1:2011+A1:2015	
Producer (Country)		e.g. Leroux (FR)	
Brick dimensions	[mm]	500 x 200 x 314	
Drilling method		Rotary drilling	
Code Producer (Country) Brick dimensions	[mm]	EN 771-1:2011+A1:2015 e.g. Leroux (FR) 500 x 200 x 314	



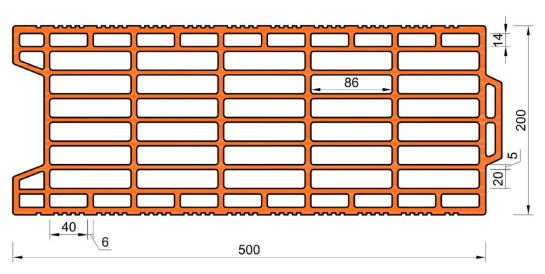


Table C79: Installation parameter

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

Table C80: Reduction factors for single anchors at the edge

Tension load		Shear load						
Tension load			Perpendicular to the free edge			Parallel to the free edge		
+1	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II
	120	1,00		120	0,15		120	0,30
	120	1,00		250	0,30	Ţ	120	0,50
	120	1,00		500	1,00		250	1,00

Ceys Injection system TACO QUÍMICO	O VINYLESTER for masonry
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Performances hollow clay brick Calibric R+

Description of the stone, Installation parameters, Reductionfactors

Annex C 25



Brick type: Hollow Clay brick Calibric R+

Table C81: Factors for anchor groups under tension load

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

Table C82: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	. joint	Anchor position perpendicular to hor. joint			
Shear load		with c ≥	with s ≥	α _g II,V ⊥		with c ≥	with s ≥	$\alpha_g \perp$, $v \perp$
perpendicular to the free edge	•••	120	100	1,00		120	100	1,00
		120	500	2,00		120	315	2,00
Shear load parallel to the free edge		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	α _{g ⊥,} ν II
		120	100	1,00		120	100	1,00
		120	500	2,00		120	315	2,00

Table C83: Characteristic values of tension and shear load resistances

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$							
			Use condition							
	eve	Effective Anchorage depth						d/d		
	<u>0</u>	E & E		d/d			w/d		w/d	
Anabaraiza	Ö	ffectiv ichora depth					w/w			
Anchor size	ate	A							All	
	Perforated sleeve		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature	
									ranges	
		h _{ef}	$N_{Bk,b} = N_{Bk,p}^{2)}$			1	$V_{Rk,b}^{2)}$			
		[mm]	[kN]							
		Normalis	sed mean o	compressi	ve strengt	h f _b ≥ 12 N	/mm² ¹⁾			
M8	12	80	1,2	1,2	0,9	1,2	1,2	0,9	4,0	
M8 / M10/	16	≥ 85	1,2	1,2	0,9	1,2	1,2	0,9	5,5	
IG-M6	16	130	1,5	1,5	1,2	1,5	1,5	1,2	5,5	
M12 / M16 IG-M8 /IG-M10	20	≥ 85	1,2	1,2	0,9	1,2	1,2	0,9	8,5	
	20	≥ 130	1,5	1,5	1,2	1,5	1,5	1,2	8,5	

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

Table C84: Displacements

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow Clay brick Calibric R+ Group factors, characteristic Resistances and Displacements	Annex C 26

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



Brick type: Hollow Clay brick Urbanbric Table C85: Stone description Hollow clay brick Brick type Urbanbric Density ≥ 0,70 ρ [kg/dm³] Normalised mean $f_b [N/mm^2]$ ≥ 12 compressive strenght Conversion factor for lower compressive $(f_b / 12)^{0.5} \le 1.0$ strengths EN 771-1:2011+A1:2015 Code Producer (Country) e.g. Imerys (FR) [mm] **Brick dimensions** 560 x 200 x 274 Drilling method Rotary drilling 5,5 Ø40 5 63 9 40_ 9,5 560 Table C86: Installation parameter Anchor size **M8** M10 M12 M16 IG-M6 IG-M8 IG-M10 [-] ≤ 2 ≤ 2 ≤ 2 ≤ 2 ≤ 2 ≤ 2 ≤ 2 Installation torque Tinst [Nm] Char. Edge distance [mm] 120 (for shear loads perpendicular to the free edge: $c_{cr} = 500$) Ccr Minimum Edge Distance 120 [mm] Cmin [mm] 560 Scr, II Characteristic Spacing 275 [mm] Scr, ⊥ Smin, II; Minimum Spacing [mm] 100 Smin, \bot Table C87: Reduction factors for single anchors at the edge

Table correction lactors for onigination of at the dage									
Tension load			Shear load						
			Perpendic	ular to the fr	ee edge	Parallel to the free edge			
ļ <u>1</u>	with c ≥	αedge, N	†	with c ≥	αedge, V⊥	1	with c ≥	αedge, V II	
•	120	120 1,00		120	0,25	•	120	0,50	
				250	0,50				
- in the second	120	1,00	i i i i i i i i i i i i i i i i i i i	500	1,00		250	1,00	

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick Urbanbric Description of the stone, Installation parameters, Reductionfactors	Annex C 27



Brick type: Hollow Clay brick Urbanbric

Table C88: Factors for anchor groups under tension load

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

Table C89: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint				
Shear load		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		120	275	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		120	560	2,00		120	275	2,00	

Table C90: Characteristic values of tension and shear load resistances

		Effective Anchorage depth		Charac	cteristic Res	istances w	ith c≥c _{cr} a	and s ≥ s _{cr}						
	•			Use condition										
Anchor size	Perforated sleeve			d/d				d/d w/d w/w						
			40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges					
		h _{ef}	N	$J_{Rk,b} = N_{Rk,p}$	2)	1	$N_{Rk,b} = N_{Rk,p}$	2)	V _{Rk,b} ²⁾					
		[mm]				[kN]								
		Normalis	ed mean c	ompressi	ve strength	f _b ≥ 12 N/	mm ^{2 1)}							
M8	12	80	1,2	1,2	0,9	1,2	1,2	0,9	4,5					
M8 / M10/	16	≥ 85	1,2	1,2	0,9	1,2	1,2	0,9	4,5					
IG-M6	10	130	3,0	3,0	2,5	3,0	3,0	2,5	4,5					
M12 / M16	20	≥ 85	1,2	1,2	0,9	1,2	1,2	0,9	5,0					
IG-M8 / IG-M10	20	≥ 130	3,0	3,0	2,5	3,0	3,0	2,5	5,0					

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

Table C91: Displacements

Anchor size	hef	δ_N / N	δΝο	δN∞	δv / V	δνο	δ∨∞
Alichor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δN0	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all			_ 3110	0,31	0,31*V _{Rk} / 3,5	1,5*δνο

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick Urbanbric Group factors, characteristic Resistances and Displacements	Annex C 28

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



Brick type: Hollow Clay brick Brique creuse C40

Table C92: Stone description

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



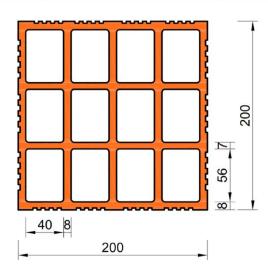


Table C93: Installation parameter

51. Art 100 (4.00 (1.00)											
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	Tinst	[Nm]	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2		
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: c _{cr} = 500)								
Minimum Edge Distance	Cmin	[mm]	120								
Characteristic Spacing	Scr, II	[mm]	500								
Characteristic Spacing	Scr, ⊥	[mm]	200								
Minimum Spacing	Smin, II;	[mm]	200								
Willimum Spacing	Smin, ⊥	[mm]	200								

Table C94: Reduction factors for single anchors at the edge

Tension loa	d		Shear load						
			Perpendic	ular to the fr	ee edge	Parallel to the free edge			
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II	
•	120	1,00	→	120	0,83	1 <u>†</u>	120	1,00	
	120	1,00		500	1,00		250	1,00	

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick Brique Creuse C40 Description of the stone, Installation parameters, Reductionfactors	Annex C 29



Table C95:	Fac	tors fo	r ancho	r gro	ups	unde	er ten	sion	loa	d					
Anch			arallel to		oint				Ar	ncho				cular to hor.	joint
	with	ıc≥	with s	5 ≥	(Xg II, N					with	nc≥	V	vith s ≥	αg⊥, N
	12	20	500)		2,00			120		20		200	2,00	
Table C96:	Fac	tors fo	r ancho	r gro	ups	unde	er she	ear Ic	oad						
		Ancho	or position	5177			joint			And	chor po			ndicular to h	nor. joint
Shear load	H		with c	≥	with s	5 ≥	αg II,	V⊥				with c ≥		with s ≥	α _{g ⊥} , v ⊥
perpendicular to the free edge		•••	120		500		2,0	00		1		120		200	2,00
Shear load	H		with c	≥	with s	5 ≥	αg II,	V II	F			with c≥	2	with s ≥	αg ⊥,V II
parallel to the free edge		•••	120		500)	2,0	0		1	,	120		200	2,00
Table C97:	Cha	aracter	istic val	ues d	of ten	sion	and	shea	ar Io	ad	resist	ances			
						С	harac	terist	ic Re	esist	tances	with c≥ d	c _{cr} a	and s≥s _{cr}	
			0							Us	se cond	ition			
Perforated sleeve		d sleeve	Effective Anchorage depth		d/d								w/d w/w		d/d w/d w/w
		erforate	An	40°C	/24°C	80°C	/50°C	120°C	C/72°(C 40	0°C/24°0	C 80°C/50)°C	120°C/72°C	All temperature ranges
		h _{ef}		Ν	J Rk,b =	N _{Rk,p}	2)				$N_{Rk,b} = N_{Rk,b}$	V _{Rk,p}	2)	$V_{Rk,b}^{(2)}$	
			[mm]								[kN]				
			Normalis	ed m	ean c	ompi	ressiv	e str	eng	th f _b	₂ ≥ 12 N	<u>l/mm² 1)</u>			
M8 M8 / M10/		12	80	-											
IG-M6 M12 / M16 /	×	16	≥ 85	1	,2	1	,2 0,9),9	1,2		1,2		0,9	1,5
IG-M8 / IG-M1	0	20	≥ 85				11'-1'-		1					Table 00	0.5
 For lower corwith higher st N_{Rk,b,c} = N_{Rk,p} Table C98: 	trength ,c and	hs, the s	hown valu · V _{Rk,c} ⊥aco	es are	valid v	withou	it conv			onve	ersion ta	ctor accor	aing	to Table C9	2. For stones
Ancho	r ciza		hef	δι	n/N		δΝ	10		δN∞	• 6	5v / V		δνο	δ∨∞
			[mm]	[m	m/kN]		[mı	m]		[mm	n] [n	nm/kN]		[mm]	[mm]
M8 – I IG-M6			all		0,13	0	,13*Ni	n. / 3	5 ,	2*δN	10	0,55	0,	,55*V _{Rk} / 3,5	1,5*δ∨o
M1		<u> </u>	all	┤ `	3,13	0,	, 10 14	чк / О,	³ ⁴	2 ON		0,31	0,	,31*V _{Rk} / 3,5	1,5*δνο
Ceys Injection								r mas	sonr	у				Annex C	20



Brick type: Hollow Clay brick Blocchi Leggeri

Table C99: Stone description

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



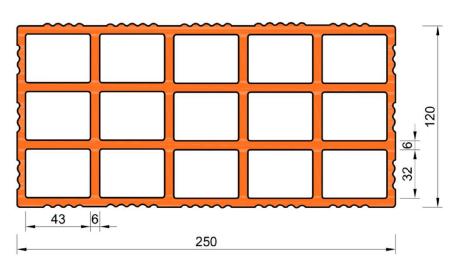


Table C100: Installation parameter

Tubic O Too. Inistanta	on pan	unicici									
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	Tinst	[Nm]	$[m] \qquad \leq 2 $								
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: $c_{cr} = 250$)								
Minimum Edge Distance	Cmin	[mm]	60								
Characteristic Spacing	Scr, II	[mm]	250								
Characteristic Spacing	Scr, ⊥	[mm]	250								
Minimum Spacing	Smin, II;	[mm]	100								
William Spacing	Smin, ⊥	[[[]]]				100					

Table C101: Reduction factors for single anchors at the edge

"	Tension load			Shear load								
'	ension load		Perpendic	ular to the fr	ee edge	Parallel to the free edge						
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II				
•	60	1,00		60	0,40	1 1	60	0,40				
	120	1,00		250	1,00		120	1,00				

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick Blocchi Leggeri Description of the stone, Installation parameters, Reductionfactors	Annex C 31



Brick type: Hollow Clay brick Blocchi Leggeri Table C102: Factors for anchor groups under tension load

An	chor position pa	arallel to hor. jo	oint	Anchor position perpendicular to hor. joint			
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, N
• •	60	100	1,00		60	100	2,00
	120	250	2,00		120	250	2,00

Table C103: Factors for anchor groups under shear load

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

Table C104: Characteristic values of tension and shear load resistances

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$								
		Effective Anchorage depth		Use condition							
	d sleeve		d/d			w/d w/w			d/d w/d w/w		
Anchor size	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		
	<u> </u>	h _{ef}	$N_{Rk,b} = N_{Rk,p}^{2}$			1	V _{Rk,b} ²⁾				
		[mm]				[kN]					
		Normalis	sed mean c	ompressi	ve strength	f _b ≥ 12 N/	mm² 1)				
M8	12	80									
M8 / M10/ IG-M6	16	≥ 85	0,6	0,6	0,6	0,6	0,6	0,6	3,5		
M12 / M16 / IG-M8 / IG-M10	20	≥ 85	35						**		

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

Table C105: Displacements

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick Blocchi Leggeri Group factors, characteristic Resistances and Displacements	Annex C 32

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



Brick type: Hollow Clay brick Doppio Uni

Table C106: Stone description

Brick type		Hollow clay brick Doppio Uni
Density	ρ [kg/dm³]	≥ 0,90
Normalised mean compressive strenght	f_b [N/mm ²]	≥ 28
Conversion factor for low strengths	er compressive	$(f_b / 28)^{0.5} \le 1.0$
Code		EN 771-1:2011+A1:2015
Producer (Country)		e.g. Wienerberger (IT)
Brick dimensions	[mm]	250 x 120 x 120
Drilling method		Rotary drilling



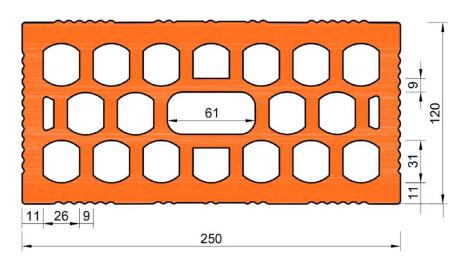


Table C107: Installation parameter

E provided that a service the contraction of the co										
Anchor size					M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque	Tinst	[Nm]	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: $c_{cr} = 250$)							
Minimum Edge Distance	Cmin	[mm]	100							
Characteristic Spacing	Scr, II	[mm]	250							
Characteristic Spacing	Scr, ⊥	[mm]	120							
Minimum Spacing	Smin, II;	[mm]	100							
Williman Spacing	Smin, ⊥	[iiiiii]	100							

Table C108: Reduction factors for single anchors at the edge

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick Doppio Uni Description of the stone, Installation parameters, Reductionfactors	Annex C 33



Brick type: Hollow Clay brick Doppio Uni

Table C109: Factors for anchor groups under tension load

Anchor position parallel to hor. joint				Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	α _{g ⊥, N}	
• •	100	100	1,00		100	120	2,00	
	120	250	2,00		120	120	2,00	

Table C110: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	. joint	Anchor position perpendicular to hor. joint			
Shear load perpendicular to the free edge		with c ≥	with s ≥	α _g II,V ⊥		with c ≥	with s ≥	$\alpha_g \perp$, v \perp
		100	100	1,00		100	100	1,00
		250	250	2,00		250	120	2,00
Shear load parallel to the free edge		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	αg ⊥,V II
		100	100	1,00		100	100	1,00
		120	250	2,00		120	120	2,00

Table C111: Characteristic values of tension and shear load resistances

				Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$							
			Use condition								
Anahamaiaa	Perforate Sleeve		d/d			w/d w/w			d/d w/d w/w		
Anchor size	forate	Effective Anchorage depth	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		
)er								ranges		
		h _{ef}	N	$N_{Rk,b} = N_{Rk,p}^{2)}$		$N_{Rk,b} = N_{Rk,p}^{2}$			$V_{Rk,b}^{(2)}$		
		[mm]				[kN]					
		Normalis	ed mean c	ompressiv	ve strength	f _b ≥ 28 N/	mm² 1)				
M8	12	80									
M8 / M10/ IG-M6	16	≥ 85	1,2	1,2	0,9	1,2	1,2	0,9	2,5		
M12 / M16 / IG-M8 / IG-M10	20	≥ 85									

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

Table C112: Displacements

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / V	δνο	δ∨∞
Alichor Size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δN0	0,55	0,55*V _{Rk} / 3,5	1,5*δvo
M16	all	1990 * 49400			0,31	0,31*V _{Rk} / 3,5	1,5 *δvo

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick Doppio Uni Group factors, characteristic Resistances and Displacements	Annex C 34

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



Brick type: Hollow clay brick Coriso WS07 with insulation

Table C113: Stone description

Brick type		Hollow clay brick Coriso WS07
Insulationmaterial		Rock wool
Density	ρ [kg/dm³]	≥ 0,55
Normalised mean compressive strenght	f_b [N/mm ²]	≥ 6
Conversion factor for lowe strengths	er compressive	$(f_b / 6)^{0,5} \le 1,0$
Code		EN 771-1:2011+A1:2015
Producer (Country)		e.g. Unipor (DE)
Brick dimensions	[mm]	248 x 365 x 249
Drilling method		Rotary drilling



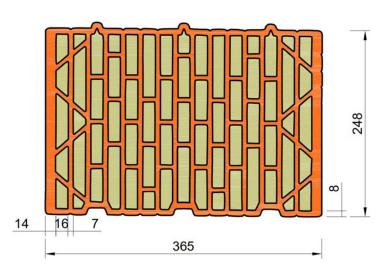


Table C114: Installation parameter

Anchor size	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	Tinst	[Nm]	≤ 5	≤ 5	≤ 10	≤ 10	≤ 5	≤ 5	≤ 5	
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: ccr = 250)							
Minimum Edge Distance	Cmin	[mm]	50							
Characteristic Specing	Scr, II	[mm]		250						
Characteristic Spacing Scr, \(\text{ [mm]} \)						250				
Minimum Spacing	Smin, II;	[mm]	50							
Williman Spacing	Smin, ⊥	[[,,,,,,]		50						

Table C115: Reduction factors for single anchors at the edge

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

Ceys Injection system TACO QUIMICO VINYLESTER for masor	ıry

Performances hollow clay brick Coriso WS07 with insulationDescription of the stone, Installation parameters, Reduction factors

Annex C 35



Brick type: Hollow clay brick Coriso WS07 with insulation

Table C116: Factors for anchor groups under tension load

thor position pa	arallel to hor. jo	oint	Ancho	r position perp	endicular to ho	r. joint
with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, N
50	50	1,50		50	50	1,00
120	250	2,00		120	250	2,00
	with c ≥ 50	$\begin{array}{c c} \text{with c} \geq & \text{with s} \geq \\ \hline 50 & 50 \\ \end{array}$	50 50 1,50	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

Table C117: Factors for anchor groups under shear load

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

Table C118: Characteristic values of tension and shear load resistances

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$								
		_	Use condition								
	Perforated sleeve	Effective Anchorage depth					w/d		d/d		
	sle	Effective inchoragi depth		d/d			w/w		w/d		
Anchor size	Ø	# 5 8							w/w		
Anchor Size	ate	_ A							All		
	for		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature		
) el								ranges		
	_	h _{ef}	N	$I_{Rk,b} = N_{Rk,p}$	2)	N	$J_{Rk,b} = N_{Rk,p}$	2)	$V_{Rk,b}^{(2)}$		
		[mm]				[kN]					
		Normali	sed mean d	compressi	ve strengtl	n f _b ≥6 N/n	nm² ¹⁾				
M8	12	80		1000							
M8 / M10/ IG-M6	16	≥ 85	1,5	1,5	1,5	1,5	1,5	1,5	5,0		
M12 / M16 / IG-M8 / IG-M10	20	≥ 85									

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

Table C119: Displacements

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / V	δνο	δ∨∞
Alichor Size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δN0	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all	. 1775,750.00			0,31	0,31*V _{Rk} / 3,5	1,5*δ∨0

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow Clay brick Coriso WS07 with insulation Group factors, characteristic Resistances and Displacements	Annex C 36

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



Brick type: Hollow clay brick T7 MW with insulation

Table C120: Stone description

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



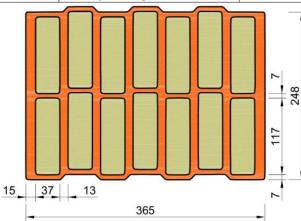


Table C121: Installation parameter

M									in the second se	
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque	T _{inst}	[Nm]	≤ 5	≤ 5	≤ 10	≤ 10	≤ 5	≤ 5	≤ 5	
Char. Edge distance (under fire conditions)	C _{cr;} (C _{cr,fi})	[mm]	/for c	boor loos		120 (2 h _{ef}	•	daoro	250)	
,	sadindring Co. Communication (Co.)		(for shear loads perpendicular to the free edge: $c_{cr} = 250$)							
Minimum Edge Distance	Cmin	[mm]				50				
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]	m] 250 (4 h _{ef})							
(under fire conditions)	$S_{cr, \perp; (S_{cr,fi, \perp})}$	[mm] 250 (4 h _{ef})								
Minimum Spacing	[mm]	50								
	197								The state of the s	

Table C122: Reduction factors for single anchors at the edge

_	ension load		Shear load							
'	ension load		Perpendic	ular to the fr	ee edge	Parallel to the free edge				
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II		
•	50	1,00		50	0,35	 	50	1,00		
	120	1,00		250	1,00		120	1,00		

Table C123: Factors for anchor groups under tension load

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry

Performances hollow clay brick T7 MW with insulation

Description of the stone, Installation parameters, Reductionfactors

Annex C 37



Brick type: Hollow clay brick T7 MW with insulation												
Table C124: Factors for anchor groups under shear load												
	Anchor position parallel to hor. joint Anchor position perpendicular to hor. joint											
Shear load perpendicular		with c ≥	with s ≥	α _g II,V⊥		with c ≥	with s ≥	$\alpha_{g\perp,V\perp}$				
		50	50	0,60		50	50	0,40				
to the free		250	50	1,55		250	50	1,00				
edge		250	250	2,00		250	250	2,00				
Shear load		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	α _{g ⊥,} ν II				
parallel to the	•	50	50	2,00		50	50	1,20				
free edge	-	120	250	2,00		120	250	2,00				

Table C125: Characteristic values of tension and shear load resistances

			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$									
		_		Use condition								
Anchor size	Perforated sleeve Effective Anchorage	Effective Anchorage depth	d/d				d/d w/d w/w					
			40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges			
	<u> </u>	h _{ef}	$N_{Rk,b} = N_{Rk,p}^{(2)}$			١	J _{Rk,b} = N _{Rk,p}	2)	V _{Rk,b} ²⁾			
		[mm]				[kN]						
		Normali	sed mean o	compressi	ve strengtl	n f _b ≥8 N/n	nm² ¹⁾					
M8	12	80										
M8 / M10/ IG-M6	16	≥ 85				2,0	2,0		3,0			
M12 / IG-M8	20	≥ 85	2,0	2,0	1,5			1,5	**			
M16 / IG-M10	20	≥ 85							4,5			

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

Table C126: **Displacements**

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / V	δνο	δ∨∞
Alichor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δN0	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all		,	- 5110	0,31	0,31*V _{Rk} / 3,5	1,5*δ∨0

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

		Effecitve	Characteristic Resistances					
Anchor size	Perforated	Anchorage depth $N_{Rk,b,fi} = N_{Rk,p,fi} = V_{Rk,b,fi}$						
	sleeve	h _{ef}	R30	R60	R90	R120		
		[mm]	[kN]					
M8 / M10 /IG-M6	16	130		200.00000	VII. 81 M	UMMONS.		
M12 / M16 / IG-M8 IG-M10	20	≥ 130	0,64	0,37	0,11	-1)		

¹⁾ no performance assessed

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick T7 MW with insulation Group factors, characteristic Resistances and Displacements	Annex C 38

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



Brick type: Hollow clay brick T8 P with insulation

Table C128: Stone description

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



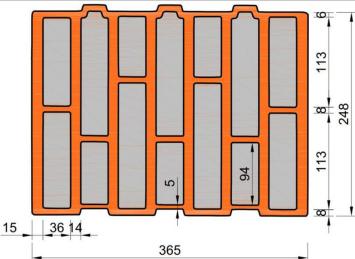


Table C129: Installation parameter

Table Gizer inicianati	Table 6 1201 Instantation parameter												
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10				
Installation torque	Tinst	[Nm]	-				≤ 4	≤ 4					
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: $c_{cr} = 250$)										
Minimum Edge Distance	Cmin	[mm]	50										
Characteristic Spacing	Scr, II	[mm]	250										
Characteristic Spacing	Scr, ⊥	[mm]		250									
Minimum Spacing	Smin, II;	[mm]	50										
Timmen spasing	Smin, ⊥	[]		00									

Table C130: Reduction factors for single anchors at the edge

Description of the stone, Installation parameters, Reductionfactors

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick T8 P with insulation	Annex C 39



Brick type: Hollow clay brick T8 P with insulation

Table C131: Factors for anchor groups under tension load

An	chor position pa	arallel to hor. jo	oint	Ancho	r position perp	endicular to ho	r. joint
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, N
• •	50	50	1,30		50	50	1,10
	120	250	2,00		120	250	2,00

Table C132: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint			
Shear load perpendicular to the free edge	·	with c ≥	with s ≥	α _g II,V ⊥	1	with c ≥	with s ≥	αg⊥, V⊥
	•••	50	50	0,40		50	50	0,30
		250	50	1,35		250	50	1,20
		250	250	2,00		250	250	2,00
Shear load		with c ≥	with s ≥	αg II,V II		with c ≥	with s ≥	α _{g ⊥,} ν II
parallel to the free edge		50	50	1,70] [50	50	1,00
		120	250	2,00		120	250	2,00

Table C133: Characteristic values of tension and shear load resistances

30 307-499-884-0190-80 No. P. C.							HE SERVE CONTRACTOR			
				Charac	teristic Res	istances w	ith c≥c _{cr} a	and s ≥ s _{cr}		
			Use condition							
	eve	Effective Anchorage depth					w/d		d/d	
Auchor size Seeve	Se Se	Effective Anchorage depth		d/d			w/u w/w		w/d	
	g	# 5 A					VV/ VV		w/w	
	ate	¥							All	
	ģ		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature	
	Per								ranges	
		h _{ef}	$N_{Rk,b} = N_{Rk,p}^{2}$			1	$N_{Rk,b} = N_{Rk,p}^{2)}$			
		[mm]				[kN]				
		Normali	sed mean o	compressi	ve strengtl	n f _b ≥6 N/n	nm² 1)			
M8	12	80		1009						
M8 / M10/ IG-M6	16	≥ 85	1,5	1,5	1,5	1,5	1,5	1,5	4,5	
M12 / IG-M8	20	≥ 85		50						
M16 / IG-M10	20	≥ 85	2,5	2,5	2,0	2,5	2,5	2,0	7,0	

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

Table C134: Displacements

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick T8 P with insulation Group factors, characteristic Resistances and Displacements	Annex C 40

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



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

Table C135: Stone description

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



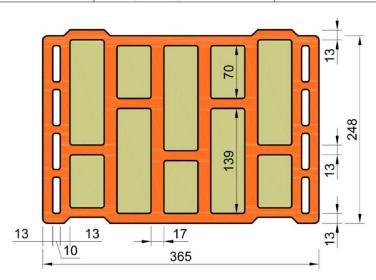


Table C136: Installation parameter

Tubic 0100. Ilistaliati	Table 0100. Installation parameter										
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	Tinst	[Nm]	≤4 ≤4 ≤10 ≤10 ≤4 ≤4 ≤4								
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: c _{cr} = 250)								
Minimum Edge Distance	Cmin	[mm]		50							
Characteristic Spacing	Scr, II	[mm]		250							
Characteristic Spacing	Scr, ⊥	[mm]	250								
Minimum Spacing	Smin, II;	[mm]	50								
William Spacing	Smin, ⊥	[iiiiii]	30								

Table C137: Reduction factors for single anchors at the edge

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick Thermoplan MZ90-G with insulation Description of the stone, Installation parameters, Reductionfactors	Annex C 41



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

Table C138: Factors for anchor groups under tension load

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

Table C139: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	joint	Anchor position perpendicular to hor. joint			
Shear load perpendicular to the free edge		with c ≥	with s ≥	α _g II,V ⊥	1	with c ≥	with s ≥	$\alpha_{g}\bot,v\bot$
	•••	50	50	0,75		50	50	0,50
		250	50	2,00		250	50	1,70
		250	250	2,00		250	250	2,00
Shear load		with c ≥	with s ≥	α _g II,V II		with c ≥	with s ≥	α _{g ⊥,} ν II
parallel to the free edge		50	50	1,65]	50	50	1,15
		120	250	2,00		120	250	2,00

Table C140: Characteristic values of tension and shear load resistances

2) 39/40/20/20/20/20 19/2/ 2011 31/4/20/20 Bestinati	1						HE SHOW TO SHOW SHOW			
		Characteristic Resistances with c ≥ c _{cr} and s :								
			Use condition							
	Perforated sleeve	Effective Anchorage depth					w/d		d/d	
	see.	Effective Anchorage depth	d/d w/w			w/d				
Anchor size	g	e de life					w/w			
Anchor Size	ate	A 4							All	
	ģ		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature	
	Per					5295			Sales	ranges
	_	hef	$N_{Rk,b} = N_{Rk,p}^{2}$			<u> </u>	$N_{Rk,b} = N_{Rk,j}$	2)	$V_{Rk,b}^{(2)}$	
		[mm]				[kN]				
		Normalis	sed mean c	ompressiv	e strength	f _b ≥ 12 N/	mm² 1)			
M8	12	80		9						
M8 / M10/ IG-M6	16	≥ 85	3,0	3,0	2,5	3,0	3,0	2,5	4,0	
M12 / IG-M8	20	≥ 85	-			2				
M16 / IG-M10	20	≥ 85	3,5	3,5	3,0	3,5	3,5	3,0	7,5	

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

Table C141: Displacements

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick Thermoplan MZ90-G with insulation Group factors, characteristic Resistances and Displacements	Annex C 42

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



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

Table C142: Stone description

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



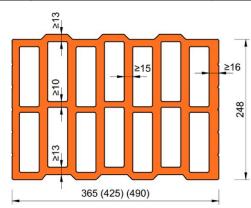


Table C143: Installation parameter

Analasu sina		гэ	140	N440	1440	1440	IO MC	10 140	10 1440
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Installation torque	T _{inst}	[Nm]	≤ 5	≤ 5	≤ 10	≤ 10	≤ 5	≤ 5	≤ 5
Char. Edge distance	0 (0 %)	[mm]				120 (2 h _{ef})		
(under fire conditions)	Ccr; (Ccr,fi)	[mm]	(for shear loads perpendicular to the free edge: $c_{cr} = 250$)						
Minimum Edge Distance	Cmin	[mm]	m] 50						
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]	[mm] 250 (4 h _{ef})						
(under fire conditions)	Scr, ⊥; (Scr,fi, ⊥)	[mm] 250 (4 h _{ef})							
Minimum Spacing	Smin, II; Smin, ⊥	[mm] 50							

Table C144: Reduction factors for single anchors at the edge

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

Table C145: Factors for anchor groups under tension load

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry

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

Annex C 43

free edge



120

250

2,00

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

2,00

Table C147: Characteristic values of tension and shear load resistances

250

120

3				Chara	toriotic Doc	istanasa	ithasa									
				Charac	cteristic Res	istances w	$ \mathbf{u} \mathbf{c} \ge \mathbf{c}_{cr}$	and s ≥ s _{cr}								
	-		Use condition													
) Š	ye ye					/-1		d/d							
	<u> 96</u>	ffectiv ichora depth		d/d			w/d		w/d							
A make made a	000	Effective Anchorage depth				4	w/w w/w									
Anchor size	Perforated sleeve	A E							All							
	وَ		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							
l l) er	5														ranges
		h _{ef}	$N_{Rk,b} = N_{Rk,p}^{2}$			$N_{Rk,b} = N_{Rk,p}^{2}$			$V_{Rk,b}^{(2)}$							
		[mm]	[kN]													
		Normali	sed mean o	compressi	ve strengtl	n f _b ≥8 N/n	nm² ¹⁾									
M8	12	80														
M8 / M10/ IG-M6	16	≥ 85	2.0	2.0	1.5	2.0	2.0	1.5	3,0							
M12 / IG-M8	20	≥ 85	2,0	2,0	1,5	2,0	2,0	1,5								
M16 / IG-M10	20	≥ 85							4,5							

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

Table C148: Displacements

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

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

		Effecitve	Characteristic Resistances					
Anchor oizo	Perforated	Anchorage depth	$N_{Rk,b,fi} = N_{Rk,p,fi} = V_{Rk,b,fi}$					
Anchor size sleev	sleeve h _{ef}		R30	R60	R90	R120		
		[mm]		[kN]				
M8 / M10 /IG-M6	16	130				70.00		
M12 / M16 / IG-M8 IG-M10	20	≥ 130	0,64	0,37	0,11	_1)		

¹⁾ no performance assessed

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick Poroton FZ7,5 with insulation Group factors, characteristic Resistances and Displacements	Annex C 44

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



Brick type: Hollow clay brick Poroton FZ9 with insulation

Table C150: Stone description

Brick type		Hollow clay brick Poroton FZ9
Insulation material		Rock wool
Density	ρ [kg/dm³]	≥ 0,90
Normalised mean compressive strenght	f _b [N/mm²]	≥ 10
Conversion factor for lower strengths	r compressive	$(f_b / 10)^{0.5} \le 1.0$
Code		EN 771-1:2011+A1:2015
Producer (Country)		e.g. Schlagmann (DE)
Brick dimensions	[mm]	248 x 365 x 249
Drilling method		Rotary drilling



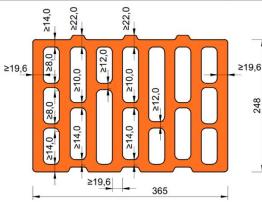


Table C151: Installation parameter

Anchor size			M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Installation torque	T _{inst}	[Nm]	≤ 5	≤ 5	≤ 10	≤ 10	≤ 5	≤ 5	≤ 5
Char. Edge distance	0 (0 ")	[mm]	,			120 (2 h _{ef})		
(under fire conditions)	Ccr; (Ccr,fi)	[[iiiiii]	(for shear loads perpendicular to the free edge: C _{cr} = 250)						
Minimum Edge Distance	Cmin	[mm]	50						
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]			2	250 (4 h _{ef})		
(under fire conditions)	$S_{cr, \perp;}(S_{cr,fi, \perp})$	[mm]	mm] 250 (4 h _{ef})						
Minimum Spacing	Smin, II; Smin, ⊥	[mm]	m] 50						

Table C152: Reduction factors for single anchors at the edge

Tension load			Shear load						
Terision load			Perpendicular to the free edge			Parallel to the free edge			
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II	
•	50	1,00		50	0,35	•	50	1,00	
	120	1,00		250	1,00		120	1,00	

Table C153: Factors for anchor groups under tension load

An	chor position pa	arallel to hor. jo	oint	Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, N	
• •	50	50	1,40		50	50	1,15	
	120	250	2,00		120	250	2,00	

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry

Performances hollow clay brick Poroton FZ9 with insulationDescription of the stone, Installation parameters, Reduction factors

Annex C 45



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

Table C155: Characteristic values of tension and shear load resistances

		1		01			:41 >					
				Cnarac	cteristic Res	sistances w	ith $c \ge c_{cr}$	and s ≥ s _{cr}				
		-		Use condition								
) se	/e					/-1		d/d			
	l je	ffectiv ichora depth		d/d			w/d w/w		w/d			
A	9	Effective Anchorage depth					w/w					
Anchor size	Perforated sleeve								All			
	for		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature			
	Je.								ranges			
		hef	N	$J_{Rk,b} = N_{Rk,p}$	2)	l 1	$V_{Rk,b}^{(2)}$					
		[mm]										
		Normalis	sed mean c	ompressiv	ve strength	f _b ≥ 10 N/	mm² 1)					
M8	12	80										
M8 / M10/ IG-M6	16	≥ 85	2.0	2.0	1.5	2,0	2,0	1,5	3,0			
M12 / IG-M8	20	≥ 85	2,0	2,0	1,5							
M16 / IG-M10	20	≥ 85							4,5			

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

Table C156: Displacements

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

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

I			Effecitve	Characteristic Resistances					
١	Anchor size Perforat	Perforated	Anchorage depth	$N_{Rk,b,fi} = N_{Rk,p,fi} = V_{Rk,b,fi}$					
١	Anchor size sleeve		h _{ef}	R30	R60	R90	R120		
			[mm]	[kN]					
	M8 / M10 /IG-M6	16	130	200			100000		
	M12 / M16 / IG-M8 IG-M10	20	≥ 130	0,64	0,37	0,11	_1)		

¹⁾ no performance assessed

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick Poroton FZ9 with insulation Group factors, characteristic Resistances and Displacements	Annex C 46

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



Brick type: Hollow clay brick Poroton S9 with insulation

Table C158: Stone description

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



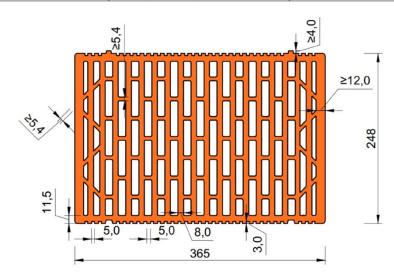


Table C159: Installation parameter

Table Cites instantan	Table 6 1001 motaliation parameter									
Anchor size	[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	Tinst	[Nm]	≤ 5	≤ 5	≤ 10	≤ 10	≤ 5	≤ 5	≤ 5	
Char. Edge distance	Ccr	[mm]	m] 120 (for shear loads perpendicular to the free edge: c _{cr} = 250)							
Minimum Edge Distance	Cmin	[mm]	50							
Characteristic Spacing	Scr, II	[mm]	250							
Characteristic Spacing	Scr, ⊥	[mm]		250						
Minimum Spacing	Smin, II;	[mm]	50							
William Spacing	Smin, ⊥	[iiiiii]		30						

Table C160: Reduction factors for single anchors at the edge

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

Cevs Injection s	system TACO QUIMICO	VINYLESTER for masonry

Performances hollow clay brick Poroton S9 with insulationDescription of the stone, Installation parameters, Reduction factors

Annex C 47



Brick type: Hollow clay brick Poroton S9 with insulation

Table C161: Factors for anchor groups under tension load

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

Table C162: Factors for anchor groups under shear load

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

Table C163: Characteristic values of tension and shear load resistances

	0			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$								
				Use condition								
	Perforated sleeve	Effective Anchorage depth					w/d		d/d			
	sle	Effective inchoragi depth		d/d			w/w		w/d			
Anchor size	g	# 5 9							w/w			
Anonor size	ate	A 4							All			
	for		40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	temperature			
	Pe								ranges			
		h _{ef}	$N_{Rk,b} = N_{Rk,p}^{2}$			N	$J_{Rk,b} = N_{Rk,p}$	2)	$V_{Rk,b}^{(2)}$			
		[mm]	[kN]									
		Normalis	sed mean c	ompressiv	e strength	f _b ≥ 12 N/ı	mm² 1)					
M8	12	80										
M8 / M10/ IG-M6	16	≥ 85	1,5	1,5	1,5	1,5	1,5	1,5	5,0			
M12 / M16 / IG-M8 / IG-M10	20	≥ 85										

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

Table C164: Displacements

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick Poroton S9 with insulation Group factors, characteristic Resistances and Displacements	Annex C 48

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



Brick type: Hollow clay brick Thermopor TV8+ with insulation

Table C165: Stone description

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



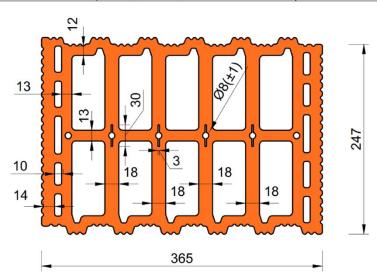


Table C166: Installation parameter

Table 0100. Ilistaliati	Table 0100. Ilistaliation parameter										
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10		
Installation torque	T _{inst}	[Nm]	≤ 4	≤ 4	≤ 10	≤ 10	≤ 4	≤ 4	≤ 4		
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: $c_{cr} = 250$)								
Minimum Edge Distance	Cmin	[mm]	50								
Characteristic Spacing	Scr, II	[mm]		250							
Characteristic Spacing	Scr, ⊥	[mm]		250							
Minimum Spacing	Smin, II;	[mm]	50								
I willing	Smin, ⊥	[iiiiii]		30							

Table C167: Reduction factors for single anchors at the edge

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick Thermopor TV8+ with insulation Description of the stone, Installation parameters, Reductionfactors	Annex C 49



Brick type: Hollow clay brick Thermopor TV8+ with insulation

Table C168: Factors for anchor groups under tension load

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

Table C169: Factors for anchor groups under shear load

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

Table C170: Characteristic values of tension and shear load resistances

					(40 A) 10 10 10 10 10 10 10 10 10 10 10 10 10		1007-0-0 - 000-01					
			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$									
				Use condition								
	eve.	Effective Anchorage depth					w/d		d/d			
	sle	Effective Anchorage depth		d/d			w/w		w/d			
Anchor size	g								w/w			
Anchor Size	Perforated sleeve	¥		80°C/50°C 1	120°C/72°C	40°C/24°C			All			
			40°C/24°C				80°C/50°C	120°C/72°C	temperature			
									ranges			
		h _{ef}	$N_{Rk,b} = N_{Rk,p}^{2}$			1	$N_{Rk,b} = N_{Rk,j}$	2)	V _{Rk,b} ²⁾			
		[mm]				[kN]						
		Normalis	sed mean c	ompressiv	e strength	f _b ≥ 10 N/	mm² 1)					
M8	12	80										
M8 / M10/ IG-M6	16	≥ 85	3,0	3,0	2,5	3,0	3,0	2,5	3,5			
M12 / IG-M8	20	≥ 85		100								
M16 / IG-M10	20	≥ 85	3,5	3,5	3,0	3,5	3,5	3,0	7,0			

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

Table C171: Displacements

Secretarian security and the secretarian secretarian security and the second secretarian security and the second second security and the second									
Angharaiza	hef	δn / N	δΝ0	δN∞	δv / V	δνο	δ∨∞		
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]		
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δΝο	0,55	0,55*V _{Rk} / 3,5	1,5*δνο		
M16	all				0,31	0,31*V _{Rk} / 3,5	1,5*δνο		

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow clay brick Thermopor TV8+ with insulation Group factors, characteristic Resistances and Displacements	Annex C 50

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



Brick type: Hollow light weight concrete brick HBL 16DF

Table C172: Stone description

Brick type		Hollow light weight concrete brick HBL 16DF
Density	ρ [kg/dm³]	≥ 1,0
Normalised mean compressive strenght	f _b [N/mm ²]	≥ 3,1
Conversion factor for low strengths	er compressive	$(f_b/3,1)^{0,5} \le 1,0$
Code		EN 771-3:2011+A1:2015
Producer (Country)		e.g. KLB Klimaleichtblock (DE)
Brick dimensions	[mm]	500 x 250 x 240
Drilling method		Rotary drilling



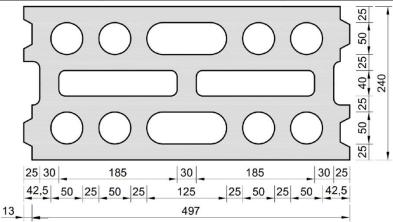


Table C173: Installation parameter

30 30 30 30 30 30 30 30 30 30 30 30 30 3	The state of the s								
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10
Installation torque	T _{inst}	$[Nm] \leq 2 \qquad \leq 2 \qquad \leq 5 \qquad \leq 2 \qquad \leq 5$						≤ 5	≤ 5
Char. Edge distance (under fire conditions)	Cer; (Cer,fi)	[mm]	120 (2 h_{ef}) (for shear loads perpendicular to the free edge: $c_{cr} = 250$						= 250)
Minimum Edge Distance	Cmin	[mm]	18		0. (6.)	50		1000	
Characteristic Spacing	Scr, II; (Scr,fi, II)	[mm]							
(under fire conditions)	Scr, ⊥; (Scr,fi, ⊥)	[mm]							
Minimum Spacing	Smin, II; Smin, ⊥	[mm]	1						

Table C174: Reduction factors for single anchors at the edge

Tension load				Shear load							
	ension load		Perpendic	ular to the fr	ee edge	Paralle	el to the free	edge			
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II			
•	50	1,00		50	0,30	<u> </u>	50	1,00			
	120	1.00		250	1.00		120	1.00			

Table C175: Factors for anchor groups under tension load

And	Anchor position parallel to hor. joint Anchor position perpendicular to hor. joint					r. joint	
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, N
• •	50	50	2,00		50	50	1,55
	120	500	2,00		120	250	2,00

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry

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

free edge



120

250

2,00

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

2,00

Table C177: Characteristic values of tension and shear load resistances

500

120

se carecons vios symptotics in accounty	AND THE PROPERTY OF STREET	Action to select the selection of	processing or endings and conserv	50 to 5 c 4 6 m 52 to 5 m 5 m 5 m 5 m 5 m 5 m 5 m 5 m 5 m 5	1. (Application of the property of the control of t		POSTERIO ESTE POST				
			Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$								
			Use condition								
	eve	Effective Anchorage depth					w/d		d/d		
	<u>8</u>	ffectiv ichora depth		d/d			w/w		w/d		
Anchor size	g	불호형		VV/VV		w/w					
Anchor size	ate	A							All		
	Į į		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		
	Pe								ranges		
		h _{ef}	N	$J_{Rk,b} = N_{Rk,p}$	2)	N	$J_{Rk,b} = N_{Rk,p}$	2)	$V_{Rk,b}^{(2)}$		
		[mm]		[kN]							
		Normalis	ed mean c	ompressiv	e strength	f _b ≥ 3,1 N/	mm² 1)				
M8 / M10/ IG-M6	16	≥ 85	1,2	1,2	0,9	1,2	1,2	0,9	2,0		
M12 / IG-M8	20	≥ 85	1.5	1.5	1.0	1 5	1.5	10	3,0		
M16 / IG-M10	20	≥ 85	1,5	1,5	1,2	1,5	1,5	1,2	5,0		

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

Table C178: Displacements

Anchor size	hef	δη / Ν	δΝο	δN∞	δv / V	δνο	δ∨∞
Anchor size	[mm]	[mm/kN]	[mm]	[mm]	[mm/kN]	[mm]	[mm]
M8 – M12 / IG-M6 – M10	all	0,13	0,13*N _{Rk} / 3,5	2*δΝο	0,55	0,55*V _{Rk} / 3,5	1,5*δνο
M16	all	2000 * 100000	and Commentee and Control (Control (Con	3110	0,31	0,31*V _{Rk} / 3,5	1,5*δνο

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

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

¹⁾ no performance assessed

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow light weight concrete brick HBL 16DF Group factors, characteristic Resistances and Displacements	Annex C 52

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



Brick type: Hollow concrete brick Bloc Creux B40

Table C180: Stone description

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



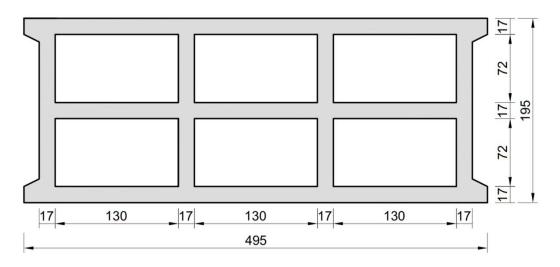


Table C181: Installation parameter

at all the production of the p										
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque	Tinst	[Nm]							≤ 4	
Char. Edge distance	Ccr	[mm]	120 (for shear loads perpendicular to the free edge: $c_{cr} = 170$)					170)		
Minimum Edge Distance	Cmin	[mm]	50							
Characteristic Spacing	Scr, II	[mm]	170							
Characteristic Spacing	Scr, ⊥	[mm]				200		≤ 4		
Minimum Spacing	Smin, II;	[mm]	50							
William Opacing	Smin, ⊥	[[[[]		JU						

Table C182: Reduction factors for single anchors at the edge

Tension load			Snear load							
'	ension load		Perpendicular to the free edge			Parallel to the free edge				
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II		
• [50	1,00	→	50	0,35] <u>†</u> [50	1,00		
	120	1,00		170	1,00		120	1,00		

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow concrete brick Bloc Creux B40 Description of the stone, Installation parameters, Reductionfactors	Annex C 53



Brick type: Hollow concrete brick Bloc Creux B40 Table C183: Factors for anchor groups under tension load

An	chor position pa	arallel to hor. jo	oint	Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, N	
	50	50	1,50		50	50	1,40	
	50	170	2,00		50	200	2,00	
	120	170	2,00		120	200	2,00	

Table C184: Factors for anchor groups under shear load

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

Table C185: Characteristic values of tension and shear load resistances

	Perfor ade Sleeve Prochage		Characteristic Resistances with $c \ge c_{cr}$ and $s \ge s_{cr}$									
		Effective Anchorage		Use condition								
Anchor size			d/d				d/d w/d w/w					
			40°C/24°C	80°C/50°C	120°C/72°C	40°C/24°C	80°C/50°C	120°C/72°C	All temperature ranges			
		h _{ef}	$N_{Rk,b} = N_{Rk,p}^{2}$			1	V _{Rk,b} ²⁾					
		[mm]		[kN]								
		Normalis	ed mean c	ompressiv	e strength	f _b ≥ 5,2 N/	mm ^{2 1)}					
M8 / M10/ IG-M6	16	130	2,0	1.5	1.0	2,0	1.5	1.2	6,0			
M12 / M16 / IG-M8 / IG-M10	20	≥ 130	2,0	1,5	1,2	2,0	1,5	1,2	0,0			

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

Table C186: Displacements

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

Ceys Injection system TACO QUÍMICO VINYLESTER for masonry	
Performances hollow concrete brick Bloc Creux B40 Group factors, characteristic Resistances and Displacements	Annex C 54

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



Brick type: Solid light weight concrete brick

Table C187: Stone description

Brick type		Solid light weight concrete brick	
Density	ρ [kg/dm³]	≥ 0,6	
Normalised mean compressive strenght	f _b [N/mm²]	≥ 2	
Conversion factor for low strengths	$(f_b / 2)^{0,5} \le 1,0$		
Code		EN 771-3:2011+A1:2015	
Producer (Country)		e.g. Bisotherm (DE)	
Brick dimensions	[mm]	≥ 240 x 300 x 113	
Drilling method		Rotary drilling	



Table C188: Installation parameter

Table Cites Intelandin	on pan	u								
Anchor size		[-]	M8	M10	M12	M16	IG-M6	IG-M8	IG-M10	
Installation torque	Tinst	[Nm]	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	
Char. Edge distance	Ccr	[mm]	150							
Minimum Edge Distance	Cmin	[mm]	60							
Characteristic Spacing	Scr, II	[mm]		300						
Characteristic Spacing	Scr, ⊥	[mm]	300							
Minimum Spacing	Smin, II;	[mm]				120				
I willing opacing	Smin, ⊥	[iiiiii]				120				

Table C189: Reduction factors for single anchors at the edge

Tension load			Shear load						
	ension load		Perpendicular to the free edge			Parallel to the free edge			
	with c ≥	αedge, N		with c ≥	αedge, V⊥		with c ≥	αedge, V II	
•	60	1,00	→	60	0,25	1 !	60	0,40	
	150	1,00		150	1,00		100	1,00	

Table C190: Factors for anchor groups under tension load

An	chor position p	arallel to hor. jo	oint	Anchor position perpendicular to hor. joint				
	with c ≥	with s ≥	αg II, N		with c ≥	with s ≥	αg⊥, N	
• •	60	120	1,00		60	120	1,00	
	150	300	2,00		150	300	2,00	

Table C191: Factors for anchor groups under shear load

	Anchor	position pa	rallel to hor.	. joint	Anchor position perpendicular to hor. joint			
Shear load perpendicular to the free edge		with c ≥	with s ≥	α _g II,V ⊥	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
	·	with c ≥	with s ≥	α _g II,V II		with c ≥	with s ≥	α _{g ⊥,} ν II
Shear load	••	60	120	0,40		60	120	0,40
parallel to the free edge		100	120	1,00		100	120	1,00
	-james de la companya	150	300	2,00		150	300	2,00

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Performances solid light weight concrete brick

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

Annex C 55



Brick type: Solid light weight concrete brick

Table C192: Characteristic values of tension and shear load resistances

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

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

Table C193: Displacements

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

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Characteristic Resistances and Displacements

Annex C 56

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