Deutsches Institut für Bautechnik DIBt

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European Technical Assessment Body for construction products

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European Technical Assessment ETA-19/0160 of 14 January 2026

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	Injection system Hilti HIT-HY 270
Product family to which the construction product belongs	Metal Injection anchors for use in masonry
Manufacturer	Hilti Aktiengesellschaft 9494 SCHAAN FÜRSTENTUM LIECHTENSTEIN
Manufacturing plant	Hilti Werke
This European Technical Assessment contains	64 pages including 3 annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Article 95(4) of Regulation (EU) No 2024/3110, on the basis of	EAD 330076-01-0604
This version replaces	ETA-19/0160 issued on 30 October 2023

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Specific Part

1 Technical description of the product

The injection system Hilti HIT-HY 270 for masonry is a bonded anchor (injection type) consisting of a mortar cartridge with injection mortar Hilti HIT-HY 270, a perforated sieve sleeve and an anchor rod with hexagon nut and washer or an internal threaded sleeve. 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 B7 to B9, C1 to C35
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 C36 to C41

3.3 Hygiene, health and the environment (BWR 3)

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

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

In accordance with the European Assessment Document EAD 330076-01-0604 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 with Deutsches Institut für Bautechnik.

-	EN 10204:2004	Metallic products - Types of inspection documents
-	EN ISO 10684:1004+AC:2009	Fasteners - Hot dip galvanized coatings
-	EN 1993-1-4:2006+A1:2015	Eurocode 3: Design of steel structures - Part 1-4: General rules - Supplementary rules for stainless steels
-	EN 10088-1:2023	Stainless steels - Part 1: List of stainless steels
-	EN 998-2:2016	Specification for mortar for masonry - Part 2: Masonry mortar
-	TR 053:2022-07	Recommendations for testy of metal injection anchors for use in masonry to be carried out on construction works
-	TR 054:2023-12	Design methods for anchorages with metal injection anchors and screw anchors for use in masonry
-	EN 772-1:2011+A1:2015	Methods of test for masonry units - Part 1: Determination of compressive strength
-	EN 771-1:2011+A1:2015	Specification for masonry units - Part 1: Clay masonry units
-	EN 771-2:2011+A1:2015	Specification for masonry units - Part 2: Calcium silicate masonry units
-	EN 771-3:2011+A1:2015	Specification for masonry units - Part 3: Aggregate concrete masonry units

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Dipl.-Ing. Beatrix Wittstock
Head of Section

beglaubigt:
Baderschneider

Installed condition

Figure A1: **Hollow and solid brick with HAS… and HAS-U… and one sieve sleeve HIT-SC (see Table B6), or with internally threaded sleeve HIT-IC and one sieve sleeve HIT-SC (see Table B10)**

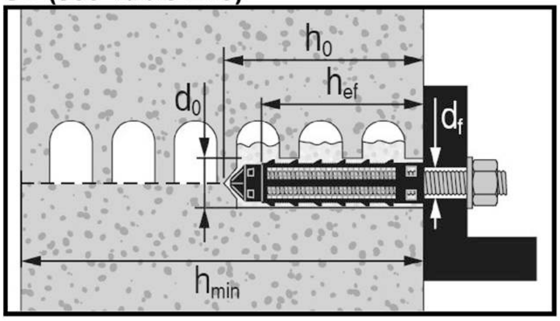


Figure A2: **Hollow and solid brick with HAS… and HAS-U… and two sieve sleeves HIT-SC for deeper embedment depth (see Table B7)**

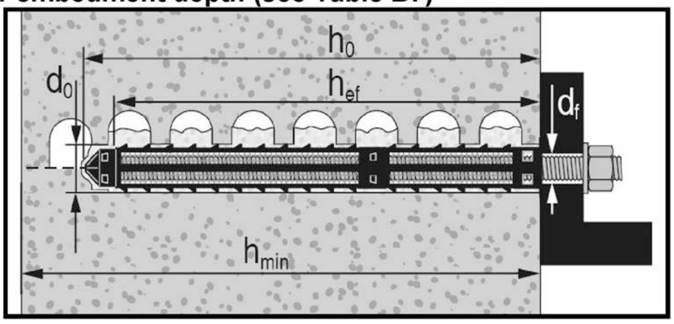
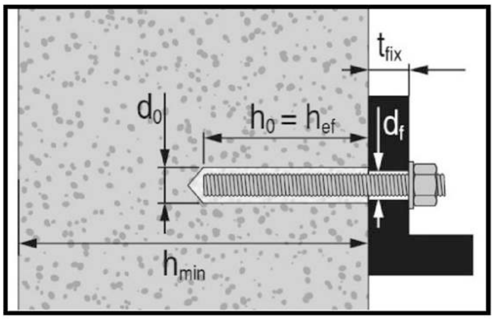


Figure A3: **Solid brick with HAS… and HAS-U… (see Table B5)**



Injection system Hilti HIT-HY 270	**Annex A1**
Product description Installed condition	

Figure A4: **Solid brick with internally threaded sleeve HIT-IC (see Table B9)**

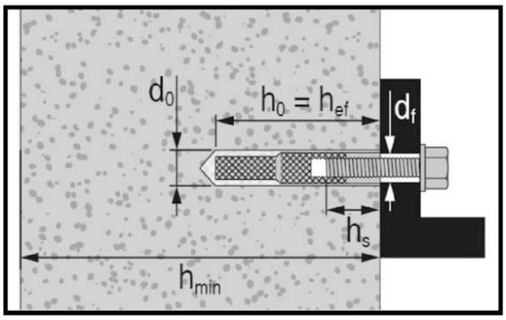
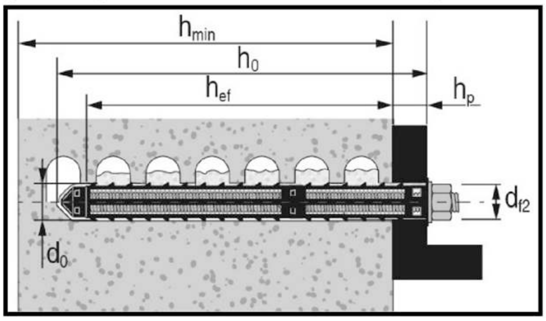
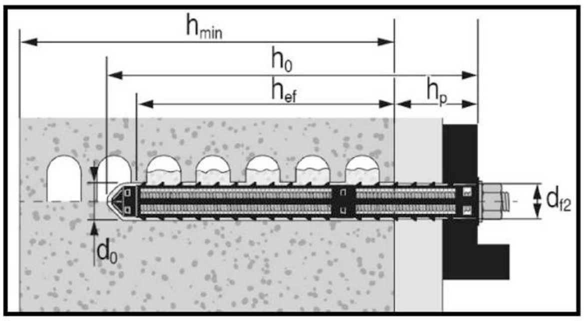


Figure A5: **Hollow and solid brick with HAS and HAS-U… with two sieve sleeves HIT-SC for setting through the fixture and/or through the non-loadbearing layer (see Table B8)**

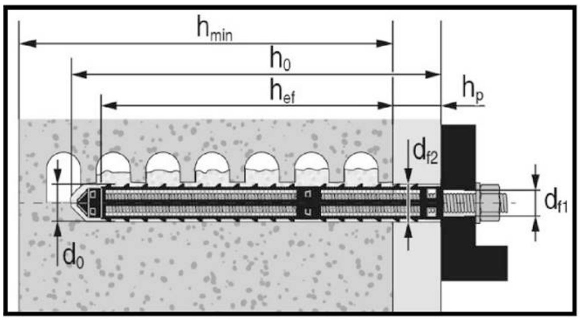
a)



b)



c)



Injection system Hilti HIT-HY 270	Annex A2
Product description Installed condition	

Product description: Injection mortar and steel elements

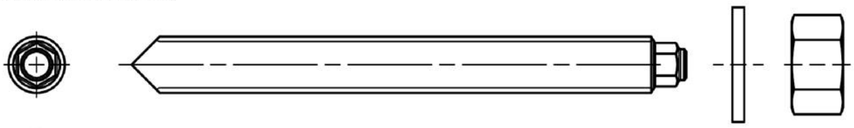
Injection mortar Hilti HIT-HY 270: hybrid system with aggregate
330 ml and 500 ml

Marking:
HILTI HIT-270
Production number and
production line
Expiry date mm/yyyy

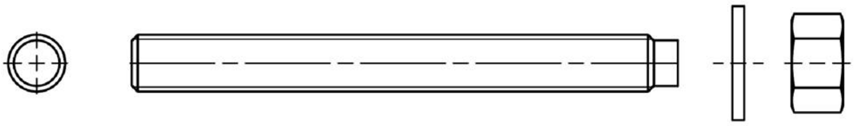
Product name: "Hilti HIT-HY 270"

Static mixer Hilti HIT-RE-M

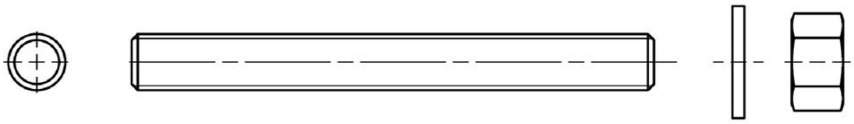
Steel elements



HAS-U-…: M6 to M16 **washer** **nut**

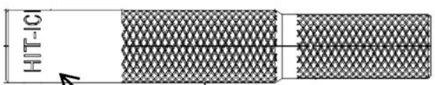


HIT-V-…: M6 to M16 **washer** **nut**



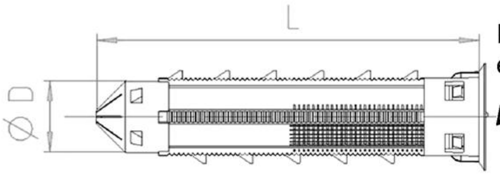
HAS…: M8 to M16 **washer** **nut**
Threaded rod: M8 to M16
Hilti AM 8.8 meter rod electroplated zinc coated: M8 to M16, 1m to 3m
Hilti AM HDG 8.8 meter rod hot dip galvanized: M8 to M16, 1m to 3m

Commercial standard threaded rod with:
- Materials, dimensions and mechanical properties acc. Table A1
- Inspection certificate 3.1 acc. to EN 10204. The document shall be stored.
- Marking of embedment depth
- For hot dip galvanized elements, the requirements of standard EN ISO 10684 shall be considered, especially with regards to the specified selection, e.g. which combination of nuts and rods to be avoided.



Marking:
e.g. HIT-IC M8x80

Internally threaded sleeve HIT-IC M8 to M12



Head marking:
e.g. HIT-SC 18x85

Sieve sleeve HIT- SC 12 to 22

Injection system Hilti HIT-HY 270	**Annex A3**
Product description Injection mortar / static mixer / steel elements / sieve sleeve	

Table A1: Materials

Steel elements made of zinc coated steel	
Threaded rod 4.6	Strength class 4.6, f_{uk} = 400 N/mm², f_{yk} = 240 N/mm² Elongation at fracture (l_0 = 5d) > 8% ductile Electroplated zinc coated ≥ 5 μm, (HDG) or (F) hot dip galvanized[1)] ≥ 50 μm
Threaded rod 5.6	Strength class 5.6, f_{uk} = 500 N/mm², f_{yk} = 300 N/mm² Elongation at fracture (l_0 = 5d) > 8% ductile Electroplated zinc coated ≥ 5 μm, (HDG) or (F) hot dip galvanized[1)] ≥ 50 μm
HAS 5.8 (HDG), HAS-U 5.8 (HDG), HIT-V 5.8 (F), Threaded rod 5.8	Strength class 5.8, f_{uk} = 500 N/mm², f_{yk} = 400 N/mm², Elongation at fracture (l_0=5d) > 8% ductile Electroplated zinc coated ≥ 5 μm, (HDG) hot dip galvanized[1)] ≥ 50 μm
Threaded rod 6.8	Strength class 6.8, f_{uk} = 600 N/mm², f_{yk} = 480 N/mm², Elongation at fracture (l_0=5d) > 8% ductile Electroplated zinc coated ≥ 5 μm or hot dip galvanized[1)] ≥ 50 μm
HAS 8.8 (HDG), HAS-U 8.8 (HDG), HIT-V 8.8 (F), AM 8.8 (HDG), Threaded rod 8.8	Strength class 8.8, f_{uk} = 800 N/mm², f_{yk} = 640 N/mm², Elongation at fracture (l_0=5d) > 12% ductile Electroplated zinc coated ≥ 5 μm, (HDG) hot dip galvanized[1)] ≥ 50 μm
Internally threaded sleeve HIT-IC	f_{uk} = 490 N/mm², f_{yk} = 390 N/mm² Rupture elongation (l_0 = 5d) (l_0=5d) > 8% ductile Electroplated zinc coated ≥ 5 μm
Washer	Electroplated zinc coated ≥ 5 mm, hot dip galvanized[1)] ≥ 50 μm
Nut	Strength class of nut adapted to strength class of threaded rod Electroplated zinc coated ≥ 5 μm, Hot dip galvanized[1)] ≥ 50 μm
Steel elements made of stainless steel **Corrosion resistance class (CRC) II according EN 1993-1-4**	
Threaded rod	Strength class 70 f_{uk} = 700 N/mm², f_{yk} = 450 N/mm², Rupture elongation (l_0 = 5d) > 12% ductile Stainless steel 1.4301, 1.4307, 1.4311, 1.4541, 1.4306, 1.4567 EN 10088-1
Washer	Stainless steel 1.4301, 1.4307, 1.4311, 1.4541, 1.4306, 1.4567 EN 10088-1
Nut	Strength class 70 f_{uk} = 700 N/mm², f_{yk} = 450 N/mm², Stainless steel 1.4301, 1.4307, 1.4311, 1.4541, 1.4306, 1.4567 EN 10088-1
Steel elements made of stainless steel **Corrosion resistance class (CRC) III according EN 1993-1-4**	
HAS A4, HAS-U A4, HIT-V-R	Strength class 70 f_{uk} = 700 N/mm², f_{yk} = 450 N/mm², Rupture elongation (l_0 = 5d) > 12% ductile
Threaded rod	Strength class 70 f_{uk} = 700 N/mm², f_{yk} = 450 N/mm², Rupture elongation (l_0 = 5d) > 12% ductile Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1
Washer	Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1
Nut	Strength class 70 f_{uk} = 700 N/mm², f_{yk} = 450 N/mm², Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1

Table A1: continued

Steel elements made of high corrosion resistant steel **Corrosion resistance class (CRC) V according EN 1993-1-4**	
HAS-U HCR, HIT-V-HCR	Strength class 80, f_{uk} = 800 N/mm², f_{yk} = 640 N/mm², Rupture elongation (l_0 = 5d) > 12% ductile
Threaded rod	Strength class 80, f_{uk} = 800 N/mm², f_{yk} = 640 N/mm², Rupture elongation (l_0 = 5d) > 12% ductile High corrosion resistant steel 1.4529, 1.4565 EN 10088-1
Washer	High corrosion resistant steel 1.4529, 1.4565 EN 10088-1
Nut	Strength class 80, f_{uk} = 800 N/mm², f_{yk} = 640 N/mm², High corrosion resistant steel 1.4529, 1.4565 EN 10088-1
Plastic parts	
Sieve sleeve HIT-SC	Frame: FPP 20T, Sieve: PA6.6 N500/200

[1)] For commercial standard hot dip galvanized threaded rods and nuts, the requirements of the standard EN ISO 10684 shall be considered.

Injection system Hilti HIT-HY 270

Product description
Materials

Annex A5

Specifications of intended use

Anchorages subject to:
- Static and quasi-static loadings.
- Fire exposure (applies only for steel grades 5.8 or higher).

Base material:
- Solid brick masonry (base material group b), according to Annex B4.
  Note: The characteristic resistances are also valid for larger brick sizes and larger compressive strengths of the masonry unit.
- Hollow brick masonry (base material group c), according to Annex B4, B5 and B6.
- Mortar strength class of the masonry: M2,5 at minimum according to EN 998-2 or as given in tables of Annex C.
- For masonry made of other solid, hollow or perforated bricks, the characteristic resistance of the anchor may be determined by job site tests according to EOTA Technical Report TR 053, under consideration of the β-factor according to Annex C1, Table C1.

Table B1: Overview use categories

		HIT-HY 270 with threaded rod, HAS…, HAS-U…, HIT-V-… or HIT-IC	
		In solid bricks (this covers also bricks with vertical perforation or grip holes of up to 15% cross section or frogs up to 20% based on the volume of the brick)	**In hollow bricks**
Hole drilling		Hammer mode, rotary mode	Rotary mode
Static and quasi static loading		Annex : C1 (steel), C5 to C26	Annex : C1 (steel), C27 to C35
Fire exposure		Annex : C36 to C37	Annex : C38 to C41
Use condition: dry or wet structure		Condition **d/d:** **Installation** in **dry** base material and **use** in structures subject to **dry,** internal conditions. Condition **w/d:** **Installation** in dry or **wet** base material and **use** in structures subject to **dry** internal conditions (except calcium silicate bricks). Condition **w/w:** **Installation** in dry or **wet** base material and **use** in structures subject to dry or **wet** environmental conditions (except calcium silicate bricks). Note: in shear direction all use conditions are allowed for any brick type.	
Installation direction	Masonry	Horizontal	
	Ceiling brick	Overhead	
Base material group		b (solid masonry)	c (hollow or perforated masonry)
Temperature in the base material at installation		+5° C to +40° C (Table B11)	-5° C to +40° C (Table B12)
In-service temperature	Temperature range Ta:	-40 °C to +40 °C	(max. long term temperature +24 °C and max. short term temperature +40 °C)
	Temperature range Tb:	-40 °C to +80 °C	(max. long term temperature +50 °C and max. short term temperature +80 °C)

Injection system Hilti HIT-HY 270	**Annex B1**
Intended Use Specifications	

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions
  (zinc coated steel, stainless steel or high corrosion resistant steel).
- For all other conditions according to EN 1993-1-4 accordingly to corrosion resistance class according to annex A4, table A1.

Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and masonry work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e. g. position of the anchor relative to supports, etc.).
- Anchorages under static or quasi-static loading are designed in accordance with:
  EOTA Technical Report TR 054 (included the design for fire exposure), Design method A.
  Applies to all bricks, if no other values are specified:
  $N_{Rk,b} = N_{Rk,p} = N_{Rk,b,c} = N_{Rk,p,c}$
  $V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$

  For the calculation of pulling out a brick under tension loading $\mathbf{N_{Rk,pb}}$ or
  pushing out a brick under shear loading $\mathbf{V_{Rk,pb}}$ see EOTA Technical Report TR 054.

  $\mathbf{N_{Rk,s}}$, $\mathbf{V_{Rk,s}}$ and $\mathbf{M^0_{Rk,s}}$ see annexes C1

  Factors for job site tests and displacements see annex C1 – C35

- In case of an actual brick compressive strength $f_{b,act}$ is smaller than the highest strength stated in the load table, the loads $N_{Rk,act}$ or $V_{Rk,act}$ can be calculated according to the following Equation:

$$N_{Rk,act} = N_{Rk} \cdot (f_{b,act}/f_b)^{\alpha} \quad \text{or} \quad V_{Rk,act} = V_{Rk} \cdot (f_{b,act}/f_b)^{\alpha}$$

with:

$N_{Rk,act}$ or $V_{Rk,act}$	=	Resistance of the fastener in the actual masonry unit
N_{Rk} or V_{Rk}	=	Resistance of the fastener in the masonry unit for the relevant f_b, as given in annex C5 to C35
$f_{b,act}$	=	Actual mean compressive strength of the masonry unit according to EN 772-1
f_b	=	Normalized mean compressive strength stated in annexes C5 to C35
α	=	0,5 for masonry units of clay or concrete and solid unit of calcium silicate
α	=	0,75 for masonry units of perforated calcium silicate

- For hollow brick masonry. The shear load vertical to the free edge must be transferred via the vertical joint. (Completely filled joint or direct contact.)

Installation:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- In the event of drilling into a cavity (grip hole or frog) in solid bricks, either use sieve sleeve HIT-SC or check loads with on-site testing according to EOTA Technical Report TR 053.

Injection system Hilti HIT-HY 270	**Annex B2**
Intended Use Specifications	

Table B2: Overview fastening elements

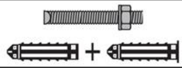
Fastening elements		All anchor		All anchor with HIT-SC	
		Threaded rod, e.g. HAS, HAS-U, HIT-V	Internally threaded sleeve HIT-IC	Threaded rod with sieve sleeve(s) HIT-SC	Internally threaded sleeve HIT-IC with sieve sleeve HIT-SC
	Picture				
	Sizes	M8, M10, M12, M16	M8, M10, M12	M8, M10, M12, M16 M6 with one sieve sleeve HIT-SC only	M8, M10, M12
Base material	Solid bricks	☑	☑	☑	☑
	Hollow bricks	-	-	☑	☑
	Hollow clay brick Ceiling brick 	-	-	M6 only h_{ef} = 80 mm	-

Table B3: Overview brick types and properties

Brick type	Picture	Brick size	Normalized mean Compressive strength f_b	Bulk density	Annex
[-]	[-]	[mm]	[N/mm²]	[kg/dm³]	[-]
Note: The data given in Annex C for <u>solid bricks</u> applies to <u>all brick manufacturers</u>. The characteristic resistances are also valid for larger brick sizes and/or larger compressive strengths of the masonry unit. Data for lower compressive strength can be calculated according to Annex B2.					
Solid clay brick EN 771-1		≥ 240x115x52	12 / 20 / 40	2,0	C5 to C8
Solid clay brick EN 771-1		≥ 240x115x72	10 / 20	2,0	C9 to C12
Solid clay brick EN 771-1		≥ 240x115x113	12 / 20	2,0	C13 to C16
Solid calcium silicate brick EN 771-2		≥ 240x115x113	12 / 28	2,0	C17 to C18
Solid calcium silicate brick EN 771-2		≥ 248x240x248	12 / 20 / 28	2,0	C19 to C22
Solid light weight concrete brick EN 771-3		≥ 240x115x113	4 / 6	0,9	C23 to C24
Solid normal weight concrete brick EN 771-3		≥ 240x115x113	6 / 16	2,0	C25 to C26
Note: The data given in Annex C for <u>hollow bricks</u> applies to all bricks with the same masonry material, properties (compressive strength and density) and geometry (size, geometry of holes, webs and shells). Data for lower compressive strength can be calculated according to Annex B2.					
Hollow clay brick EN 771-1		300x240x238	12 / 20	1,4	C27 to C28
Hollow calcium silicate brick EN 771-2		248x240x248	12 / 20	1,4	C29 to C30
Hollow lightweight concrete brick EN 771-3		495x240X238	2 / 6	0,7	C31 to C32
Hollow normal weight concrete brick EN 771-3		500x200x200	4 / 10	0,9	C33 to C34
Hollow clay brick EN 771-1 Ceiling brick		250x510x180	EN 15037-3 class R2	1,0	C35

Injection system Hilti HIT-HY 270

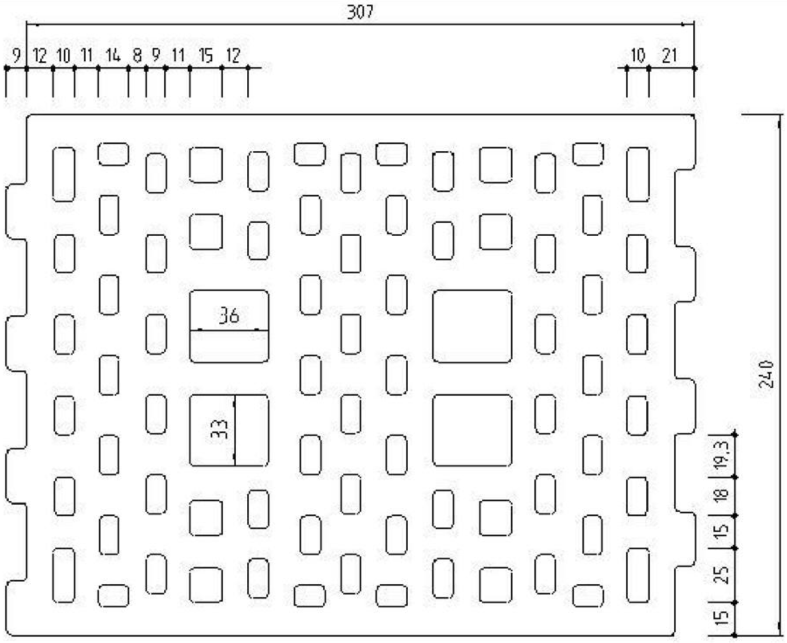
Intended Use
Overview brick types and properties

Annex B4

Table B4: Details of hollow bricks

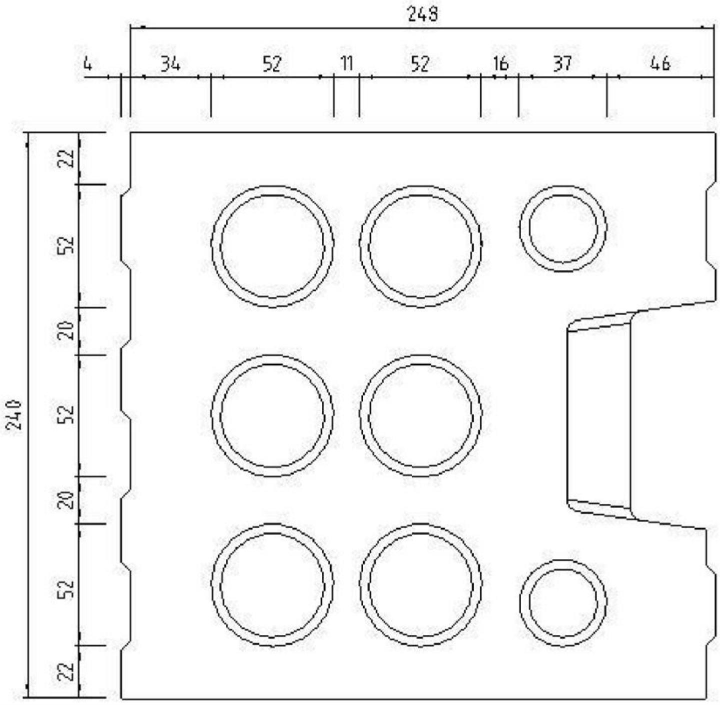
Hollow clay brick
EN 771-1

Rapis Ziegel
Hlz 12-1,4-10DF



Hollow calcium silicate brick
EN 771-2

KS Wemding
KSL-R(P) 12-1,4-8DF

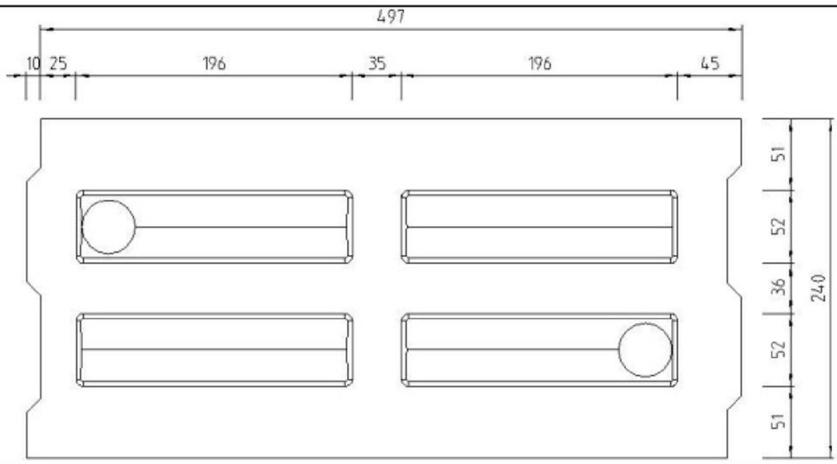


Injection system Hilti HIT-HY 270	Annex B5
Intended Use Details of hollow bricks	

Table B4: continued

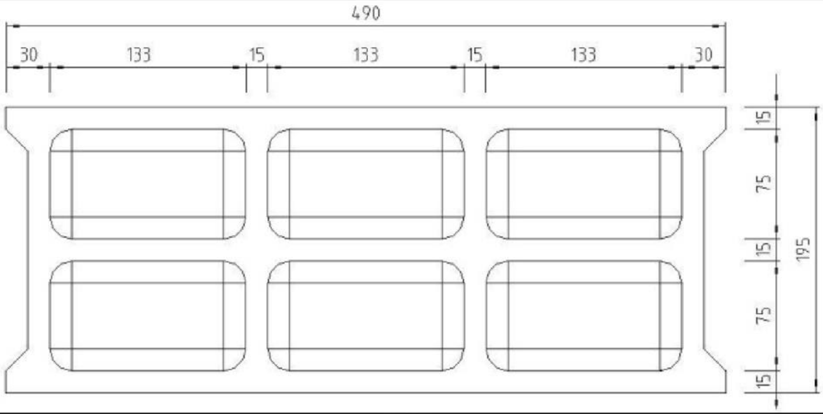
Hollow lightweight concrete brick EN 771-3

Knobel Betonwerk
Hbl 6-0,8-500x240x238



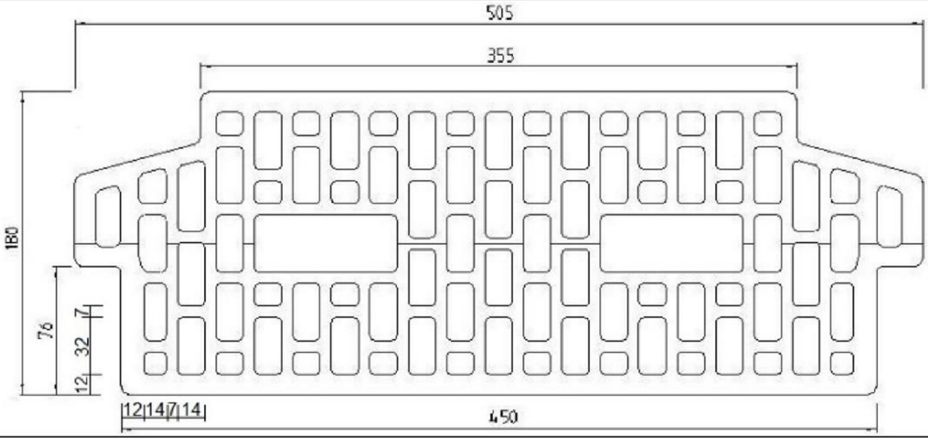
Hollow normal weight concrete brick EN 771-3

Parpaing creux
B40



Hollow clay brick EN 771-1

Ceiling brick
Fiedler Brick Ceiling
Type 18+0 or 18+3



Injection system Hilti HIT-HY 270	Annex B6
Intended Use Details of hollow bricks	

Table B5: Installation parameters of threaded rod, HAS…, HAS-U…, HIT-V-… in solid brick (Figure A3)

threaded rod, HAS…, HAS-U…, HIT-V-…			M8	M10	M12	M16
Nominal diameter of drill bit	d_0	[mm]	10	12	14	18
Drill hole depth = Effective embedment depth	$h_0 = h_{ef}$	[mm]	50…300	50…300	50…350	50…300
Maximum diameter of clearance hole in the fixture	d_f	[mm]	9	12	14	18
Minimum wall thickness	h_{min}	[mm]	h_0+30	h_0+30	h_0+30	h_0+36
Brush HIT-RB		[-]	10	12	14	18
Maximum torque moment	T_{max}	[Nm]	5	8	10	10

Table B6: Installation parameters of threaded rod, HAS…, HAS-U…, HIT-V-… with <u>one sieve sleeve HIT-SC</u> in hollow brick and solid brick (Figure A1)

threaded rod, HAS…, HAS-U…, HIT-V-…			M6	M8		M10		M12		M16	
with HIT-SC…			12x85	16x50	16x85	16x50	16x85	18x50	18x85	22x50	22x85
Nominal diameter of drill bit	d_0	[mm]	12	16	16	16	16	18	18	22	22
Drill hole depth	h_0	[mm]	95	60	95	60	95	60	95	60	95
Effective embedment depth	h_{ef}	[mm]	80	50	80	50	80	50	80	50	80
Maximum diameter of clearance hole in the fixture	d_f	[mm]	7	9	9	12	12	14	14	18	18
Minimum wall thickness	h_{min}	[mm]	115	80	115	80	115	80	115	80	115
Brush HIT-RB		[-]	12	16	16	16	16	18	18	22	22
Number of strokes HDM		[-]	5	4	6	4	6	4	8	6	10
Number of strokes HDE 500		[-]	4	3	5	3	5	3	6	5	8
Maximum torque moment for all brick types except “parpaing creux”	T_{max}	[Nm]	0	3	3	4	4	6	6	8	8
Maximum torque moment for “parpaing creux”	T_{max}	[Nm]	-	2	2	2	2	3	3	6	6

Table B7: Installation parameters of threaded rod, HAS…, HAS-U…, HIT-V-… with two sieve sleeve HIT-SC in hollow brick and solid brick for deeper embedment depth (Figure A2)

threaded rod, HAS…, HAS-U…, HIT-V-…			M8		M10		M12		M16	
with HIT-SC...			16x50+ 16x85	16x85+ 16x85	16x50+ 16x85	16x85+ 16x85	18x50+ 18x85	18x85+ 18x85	22x50+ 22x85	22x85+ 22x85
Nominal diameter of drill bit	d_0	[mm]	16	16	16	16	18	18	22	22
Drill hole depth	h_0	[mm]	145	180	145	180	145	180	145	180
Effective embedment depth	h_{ef}	[mm]	130	160	130	160	130	160	130	160
Maximum diameter of clearance hole in the fixture	d_f	[mm]	9	9	12	12	14	14	18	18
Minimum wall thickness	h_{min}	[mm]	195	230	195	230	195	230	195	230
Brush HIT-RB		[-]	16	16	16	16	18	18	22	22
Number of strokes HDM		[-]	4+6	6+6	4+6	6+6	4+8	8+8	6+10	10+10
Number of strokes HDE-500		[-]	3+5	5+5	3+5	5+5	3+6	6+6	5+8	8+8
Maximum torque moment	T_{max}	[Nm]	3	3	4	4	6	6	8	8

Table B8: Installation parameters of threaded rod, HAS…, HAS-U…, HIT-V-… with two sieve sleeves HIT-SC for setting through the fixture and/or through the non- loadbearing layer in hollow brick and solid brick (Figure A5)

threaded rod, HAS…, HAS-U…, HIT-V-…			M8		M10		M12		M16	
with HIT-SC…			16x50+ 16x85	16x85+ 16x85	16x50+ 16x85	16x85+ 16x85	18x50+ 18x85	18x85+ 18x85	22x50+ 22x85	22x85+ 22x85
Nominal diameter of drill bit	d_0	[mm]	16	16	16	16	18	18	22	22
Drill hole depth	h_0	[mm]	145	180	145	180	145	180	145	180
Min. effective embedment depth	$h_{ef,min}$	[mm]	80	80	80	80	80	80	80	80
Max. thickness of non-loadbearing layer and fixture (through setting)	$h_{p,max}$	[mm]	50	80	50	80	50	80	50	80
Max. diameter of clearance hole in the fixture (pre-setting)	d_{f1}	[mm]	9	9	12	12	14	14	18	18
Max. diameter of clearance hole in the fixture (through setting)	d_{f2}	[mm	17[1)]	17[1)]	17[1)]	17[1)]	19[1)]	19[1)]	23	23
Min. wall thickness	h_{min}	[mm]	h_{ef}+65	h_{ef}+70	h_{ef}+65	h_{ef}+70	h_{ef}+65	h_{ef}+70	h_{ef}+65	h_{ef}+70
Brush HIT-RB		[-]	16	16	16	16	18	18	22	22
Number of strokes HDM		[-]	4+6	6+6	4+6	6+6	4+8	8+8	6+10	10+10
Number of strokes HDE-500		[-]	3+5	5+5	3+5	5+5	5+8	8+8	5+8	8+8
Maximum torque moment for all brick types except “parpaing creux”	T_{max}	[Nm]	3	3	4	4	6	6	8	8
Maximum torque moment for “parpaing creux”	T_{max}	[Nm]	2	2	2	2	3	3	6	6

1) use of washer with outer diameter M8: ≥ 24 mm, M10: ≥ 30 mm, M12: ≥ 37 mm required

Injection system Hilti HIT-HY 270

Intended Use
Installation parameters

Annex B8

Table B9: Installation parameters of internally threaded sleeve HIT-IC… in solid brick (Figure A4)

HIT-IC…			**M8x80**	**M10x80**	**M12x80**
Nominal diameter of drill bit	d_0	[mm]	14	16	18
Drill hole depth = Effective embedment depth	$h_0 = h_{ef}$	[mm]	80	80	80
Thread engagement length	h_s	[mm]	8…75	10…75	12…75
Maximum diameter of clearance hole in the fixture	d_f	[mm]	9	12	14
Minimum wall thickness	h_{min}	[mm]	115	115	115
Brush HIT-RB		[-]	14	16	18
Maximum torque moment	T_{max}	[Nm]	5	8	10

Table B10: Installation parameters of internally threaded sleeve HIT-IC… with one sieve sleeve HIT-SC in hollow brick and solid brick (Figure A1)

HIT-IC…			**M8x80**	**M10x80**	**M12x80**
with HIT-SC…			**16x85**	**18x85**	**22x85**
Nominal diameter of drill bit	d_0	[mm]	16	18	22
Drill hole depth	h_0	[mm]	95	95	95
Effective embedment depth	h_{ef}	[mm]	80	80	80
Thread engagement length	h_s	[mm]	8…75	10…75	12…75
Maximum diameter of clearance hole in the fixture	d_f	[mm]	9	12	14
Minimum wall thickness	h_{min}	[mm]	115	115	115
Brush HIT-RB		[-]	16	18	22
Number of strokes HDM		[-]	6	8	10
Number of strokes HDE-500		[-]	5	6	8
Maximum torque moment	T_{max}	[Nm]	3	4	6

Table B11: Maximum working time and minimum curing time for solid bricks [1)]

Temperature in the base material T	Maximum working time t_{work}	minimum curing time t_{cure}
5 °C to 10 °C	10 min	2,5 h
> 10 °C to 20 °C	7 min	1,5 h
> 20 °C to 30 °C	4 min	30 min
> 30 °C to 40 °C	1 min	20 min

1) The curing time data are valid for dry base material only.
In wet base material the curing times must be doubled.

Table B12: Maximum working time and minimum curing time for hollow bricks [1)]

Temperature in the base material T	Maximum working time t_{work}	minimum curing time t_{cure}
-5 °C to 0 °C	10 min	6 h
> 0 °C to 5 °C	10 min	4 h
> 5 °C to 10 °C	10 min	2,5 h
> 10 °C to 20 °C	7 min	1,5 h
> 20 °C to 30 °C	4 min	30 min
> 30 °C to 40 °C	1 min	20 min

1) The curing time data are valid for dry base material only.
In wet base material the curing times must be doubled.

Table B13: Cleaning alternatives

Manual Cleaning (MC):
Hilti hand pump for blowing out drill hole diameter $d_0 \leq 20$ mm and drill hole depth up to $h_0 = 100$ mm.

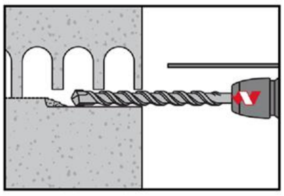
Compressed air cleaning (CAC):
Air nozzle with an orifice opening of minimum 3,5 mm in diameter

Installation instruction

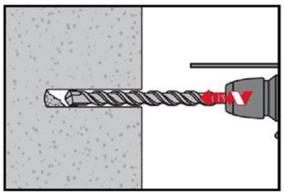
Hole drilling

If no significant resistance is felt over the entire depth of the hole when drilling (e.g. in unfilled butt joints), the anchor should not be set at this position.

Drilling mode



In hollow and solid bricks (base material group c): rotary mode
Drill hole to the required embedment depth with a hammer drill set in rotation mode using an appropriately sized carbide drill bit.
In the event of drilling into a cavity (grip hole or frog) in solid bricks, either use sieve sleeve HIT-SC or check loads with on-site testing according to EOTA Technical Report TR 053.

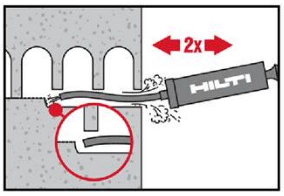


In solid bricks (base material group b): hammer mode
Drill hole to the required embedment depth with a hammer drill set in hammer mode using an appropriately sized carbide drill bit.
In the event of drilling into a cavity (grip hole or frog), either use sieve sleeve HIT-SC or check loads with on-site testing according to EOTA Technical Report TR 053.

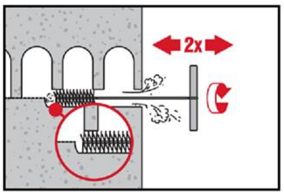
Drill hole cleaning

Just before setting the anchor, the drill hole must be free of dust and debris.
Inadequate hole cleaning = poor load values.

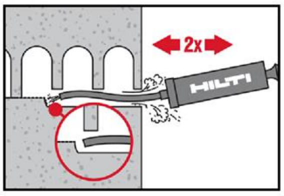
Manual Cleaning (MC): For hollow and solid bricks



The Hilti hand pump may be used for blowing out drill holes up to diameters $d_0 \leq 20$ mm and drill hole depths up to $h_0 = 100$ mm.
Blow out at least 2 times from the back of the drill hole until return air stream is free of noticeable dust

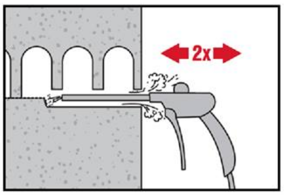


Brush 2 times with the specified steel brush (tables B5 to B8) by inserting the steel brush Hilti HIT-RB to the back of the hole (if needed with extension) in a twisting motion and removing it.
The brush must produce natural resistance as it enters the drill hole (brush Ø ≥ drill hole Ø) - if not the brush is too small and must be replaced with the proper brush diameter.

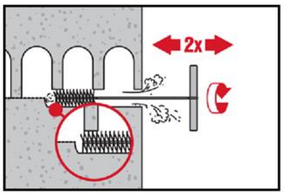


Blow out again with the Hilti hand pump at least 2 times until return air stream is free of noticeable dust.

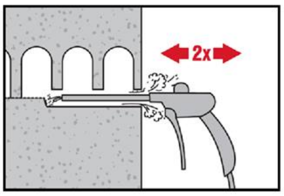
Compressed Air Cleaning (CAC): For hollow and solid bricks



Blow 2 times from the back of the hole (if needed with nozzle extension) over the hole length with oil-free compressed air (min. 6 bar at 6 m³/h; drill hole depth up to h_0 = 350 mm) until return air stream is free of noticeable dust.

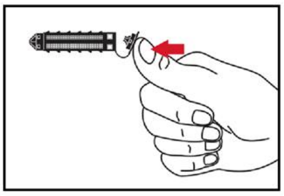


Brush 2 times with the specified steel brush (tables B5 to B8) by inserting the steel brush Hilti HIT-RB to the back of the hole (if needed with extension) in a twisting motion and removing it.
The brush must produce natural resistance as it enters the drill hole (brush Ø ≥ drill hole Ø) - if not the brush is too small and must be replaced with the proper brush diameter.

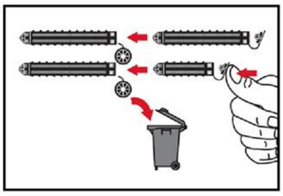


Blow again with Hilti hand pump or compressed air 2 times until return air stream is free of noticeable dust.

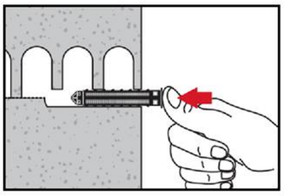
Injection preparation in masonry with holes or voids: installation with sieve sleeve HIT-SC



Single sieve sleeve HIT-SC
Close lid

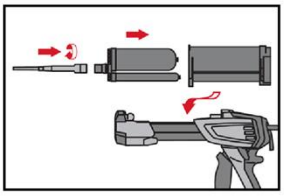


Two sieve sleeves HIT-SC
Plug sieve sleeves together. Discard superfluous lid.
Observe sieve sleeve order in case of different sieve sleeve lengths: shorter sleeve has to be plugged into longer sleeve.

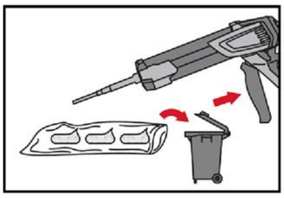


Insert sieve sleeve manually.
When using two sieve sleeves, longer sieve sleeve has to be inserted first.

For all applications



Tightly attach new Hilti mixing nozzle HIT-RE-M to foil pack manifold (snug fit). Do not modify the mixing nozzle.
Observe the instruction for use of the dispenser and foil pack.
Check foil pack holder for proper function. Do not use damaged foil packs / holders.
Insert foil pack into foil pack holder and put holder into HIT-dispenser.

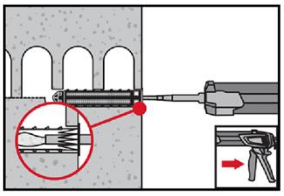


Discard initial adhesive. The foil pack opens automatically as dispensing is initiated. Depending on the size of the foil pack an initial amount of adhesive has to be discarded. Discarded quantities are

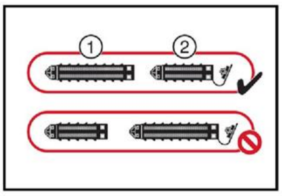
2 strokes	for 330 ml foil pack,
3 strokes	for 500 ml foil pack.

Inject adhesive without forming air voids

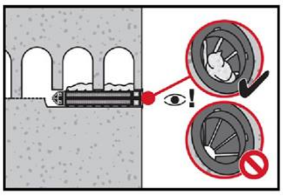
Installation with sieve sleeve HIT-SC



Single sieve sleeve HIT-SC
Insert mixer approximately 1 cm through the lid. Inject required amount of adhesive (see tables B5 to B8). Adhesive must emerge through the lid.



Two sieve sleeves HIT-SC
Use extension for installation with two sieve sleeves.
Insert mixer approximately 1 cm through the tip of sieve sleeve “2” and inject required amount of adhesive into sieve sleeve “1” (see tables B5 to B8). Withdraw mixer to the point where it extends about 1 cm through the lid into the sleeve “2”. Continue injecting in sieve sleeve “2” as described above.

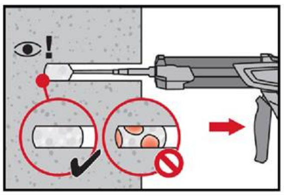


Control amount of injected mortar. Adhesive has to protrude into the lid.

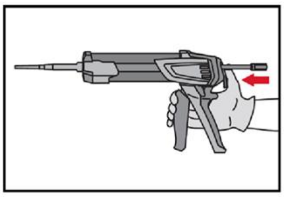
After injection is completed, depressurize the dispenser by pressing the release trigger. This will prevent further adhesive discharge from the mixer.

Injection system Hilti HIT-HY 270	**Annex B13**
Intended Use Installation instruction	

Solid bricks: installation without sieve sleeve

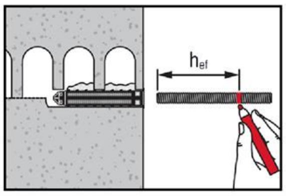


Inject the adhesive starting at the back of the hole, slowly withdrawing the mixer with each trigger pull.
Fill holes approximately 2/3 full to ensure that the annular gap between the anchor and the base material is completely filled with adhesive along the embedment length.

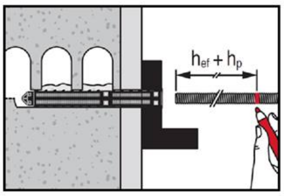


After injection is completed, depressurize the dispenser by pressing the release trigger. This will prevent further adhesive discharge from the mixer.

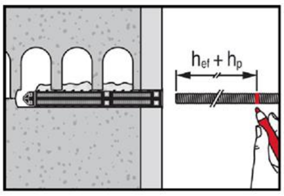
Setting the element: Before use, verify that the element is dry and free of oil and other contaminants.



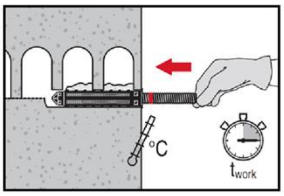
Threaded rods or HIT-IC in hollow and solid bricks:
Pre-setting (Figure A1 to Figure A4)
Mark the element to the required embedment depth h_{ef} acc. to Table B5 to B7.



Threaded rods in hollow and solid bricks:
setting through the fixture (Figure A5.a)
or through the non-loadbearing layer and the fixture (Figure A5.b)
Mark the element to the required embedment depth h_{ef} + h_p acc. to Table B8.

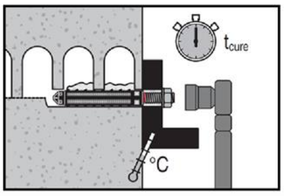


Threaded rods in hollow and solid bricks:
setting through the non-loadbearing (Figure A5.c)
Mark the element to the required embedment depth h_{ef} + h_p acc. to Table B8.



Set element to the required embedment depth until working time t_{work} has elapsed.
The working time t_{work} is given in Table B9 and Table B10.

Loading the anchor



After required curing time t_{cure} (see Table B9 and Table B10) the anchor can be loaded.
The applied installation torque shall not exceed the values T_{max} given in tables B5 to B8.

Injection system Hilti HIT-HY 270	**Annex B14**
Intended use Installation instruction	

Table C1: β-factor for job-site testing under tension loading

Use condition		**w/w and w/d**		**d/d**	
Temperature range		**Ta**	**Tb**	**Ta**	**Tb**
Base material	**Cleaning**				
Solid clay brick, $h_{ef} \leq$ 100mm EN 771-1	CAC	0,96	0,96	0,96	0,96
	MC	0,84	0,84	0,84	0,84
Solid clay brick, h_{ef} > 100mm EN 771-1	CAC	0,91	0,91	0,96	0,96
Solid calcium silicate brick, $h_{ef} \leq$ 100mm EN 771-2	CAC/MC	-[1)]	-[1)]	0,96	0,80
Solid calcium silicate brick, h_{ef} > 100mm EN 771-2	CAC	-[1)]	-[1)]	0,96	0,80
Solid light weight concrete brick EN 771-3	CAC	0,82	0,68	0,96	0,80
	MC	0,81	0,67	0,90	0,75
Solid normal weight concrete brick EN 771-3	CAC/MC	0,96	0,80	0,96	0,80
Hollow clay brick EN 771-1	CAC	0,96	0,96	0,96	0,96
	MC	0,84	0,84	0,84	0,84
Hollow calcium silicate brick EN 771-2	CAC/MC	-[1)]	-[1)]	0,96	0,80
Hollow light weight concrete brick EN 771-3	CAC	0,69	0,57	0,81	0,67
	MC	0,68	0,56	0,76	0,63
Hollow normal weight concrete brick EN 771-3	CAC/MC	0,96	0,80	0,96	0,80

[1)] No performance assessed

Injection system Hilti HIT-HY 270	**Annex C1**
Performances β-factors for job-site testing under tension load	

Table C2: Characteristic resistance to steel failure for threaded rods under tension and shear loading

				M6	M8	M10	M12	M16
Steel failure tension loads								
Characteristic resistance – commercial threaded rod 4.6, 5.6, 5.8, 6.8, 8.8, CRC II, III, V		$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$				
Characteristic resistance HAS, HAS-U, AM, HIT-V	5.8	$N_{Rk,s}$	[kN]	10,0	18,3	29,0	42,1	78,5
	5.8 HDG/ F			-[1]	16,6	26,8	42,1	78,5
	8.8			-[1]	29,3	46,4	67,4	125,6
	8.8 HDG/ F			-[1]	26,5	42,9	67,4	125,6
	A4 (70)			-[1]	25,6	40,6	59,0	109,9
	HCR (80)			-[1]	29,3	46,4	67,4	125,6
Partial factor grade 4.6, 5.6		$\gamma_{Ms,N}$	[-]	2,0				
Partial factor grade 5.8, 6.8, 8.8, HAS-U HCR, HIT-V-HCR, threaded rod CRC V		$\gamma_{Ms,N}$	[-]	1,5				
Partial factor HAS A4, HAS-U A4, HIT-V-R, threaded rod CRC II and III		$\gamma_{Ms,N}$	[-]	1,87				
Steel failure shear loads without lever arm								
Characteristic steel resistance grade 4.6, 5.6 and 5.8		$V_{Rk,s}$	[kN]	$0,6 \cdot A_s \cdot f_{uk}$				
Characteristic steel resistance grade 6.8, 8.8, 70 and 80, HAS A4, HAS-U A4, HIT-V-R, threaded rod CRC II and III, HAS-U HCR, HIT-V-HCR, Threaded rod CRC V		$V_{Rk,s}$	[kN]	$0,5 \cdot A_s \cdot f_{uk}$				
Partial factor grade 4.6, 5.6		$\gamma_{Ms,V}$	[-]	1,67				
Partial factor grade 5.8, 6.8, 8.8, HAS-U HCR, HIT-V-HCR, threaded rod CRC V		$\gamma_{Ms,V}$	[-]	1,25				
Partial factor HAS A4, HAS-U A4, HIT-V-R, threaded rod CRC II and III		$\gamma_{Ms,V}$	[-]	1,56				
Steel failure shear loads with lever arm								
Characteristic bending moment – commercial threaded rod 4.6, 5.6, 5.8, 6.8, 8.8, CRC II, III, V		$M^0_{Rk,s}$	[kN]	$1,2 \cdot W_{el} \cdot f_{uk}$				
Characteristic bending moment HAS, HAS-U, AM, HIT-V	5.8	$M^0_{Rk,s}$	[kN]	7,6	18,7	37,3	65,4	166,2
	5.8 HDG/ F			-[1]	16,1	33,2	65,4	166,2
	8.8			-[1]	29,9	59,8	104,6	265,9
	8.8 HDG/ F			-[1]	25,9	53,1	104,6	265,9
	A4 (70)			-[1]	26,2	52,3	91,5	232,6
	HCR (80)			-[1]	29,9	59,8	104,6	265,9

[1] steel element not available

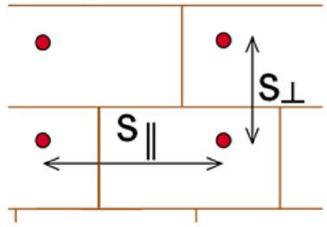
Table C3: Characteristic values to steel failure for internally threaded sleeve HIT-IC under tension and shear loading

			M8	M10	M12
Steel failure tension loads					
Characteristic resistance HIT-IC with commercial screw or threaded rod (grade ≥ 4.6)	$N_{Rk,s}$	[kN]	5,9	7,3	13,8
Partial factor	$\gamma_{Ms,N}$	[-]	1,50		
Steel failure shear loads without lever arm					
Characteristic resistance HIT-IC with commercial screw or threaded rod	$V_{Rk,s}$	[kN]	$0,5 \cdot A_s \cdot f_{uk}$		
Partial factor	$\gamma_{Ms,V}$	[-]	[1)]		
Steel failure shear loads with lever arm					
Characteristic resistance HIT-IC with commercial screw or threaded rod	$M_{Rk,s}$	[kN]	$1,2 \cdot W_{el} \cdot f_{uk}$		

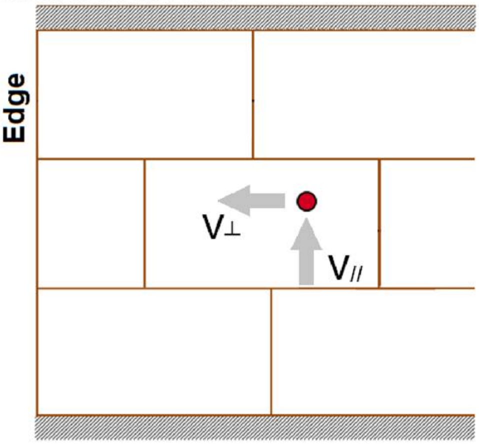
[1)] in absence of national regulations to be determined according to EOTA Technical Report TR 054, 2.2

Spacing dependent on edge distances for all anchor combinations:

Spacing

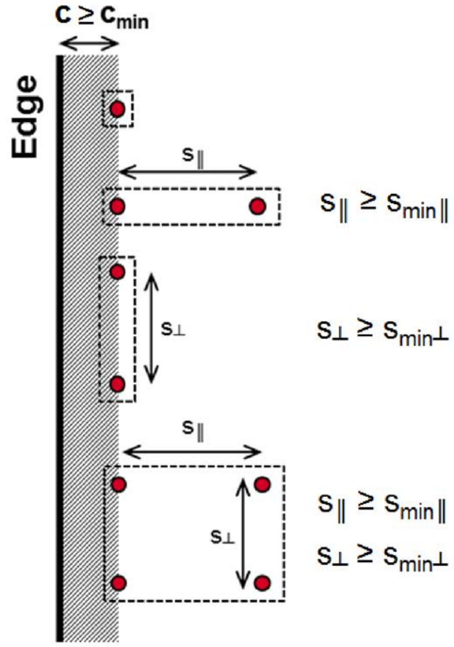


Shear load direction



Shear// (parallel to the free edge)
Shear⊥ (perpendicular to the free edge)

Edge distance [a)] and spacing



[a)] A vertical joint not filled with mortar is considered an edge and $c \geq c_{min}$ should be observed.

The characteristic values of resistance of an anchor group are calculated by using the related group-factors α_g according to Annexes C3 to C35:

Group of two anchors: $N^g_{Rk,b} = \alpha_{g,N} \cdot N_{Rk,b}$
$V^g_{Rk,b} = \alpha_{g,V} \cdot V_{Rk,b}$; $V^g_{RK,c,II} = \alpha_{g,V,\parallel} \cdot V_{Rk,c,\parallel}$; $V^g_{RK,c,\perp} = \alpha_{g,V,\perp} \cdot V_{Rk,c,\perp}$

Group of four anchors: $N^g_{Rk,b} = \alpha_{g\perp,N} \cdot \alpha_{g\parallel,N} \cdot N_{Rk,b}$
$V^g_{Rk,b} = \alpha_{g\parallel,V} \cdot \alpha_{g\perp,V} \cdot V_{Rk,b}$; $V^g_{RK,c,II} = \alpha_{g\parallel,V\parallel} \cdot \alpha_{g\perp,V\parallel} \cdot V_{Rk,c,\parallel}$; $V^g_{RK,c\perp} = \alpha_{g\parallel,V\perp} \cdot \alpha_{g\perp,V\perp} \cdot V_{Rk,c,\perp}$;

The group factors $\alpha_g < 2{,}0$ in following tables are based on $c \geq c_{min}$ and $s \geq s_{min}$. The group factor $\alpha_g = 2{,}0$ is valid for $c \geq c_{min}$ and $s \geq s_{cr}$.

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

Injection system Hilti HIT-HY 270	**Annex C4**
Performances Anchor spacing and edge distances	

Brick type: Solid clay brick Mz, 1DF

Table C4: Description of brick

Brick type			Mz, 1DF
Bulk density	ρ	[kg/dm³]	≥ 2,0
Normalized mean compressive strength	f_b	[N/mm²]	≥ 12, ≥ 20, ≥ 40
Code			EN 771 - 1
Brick manufacturer			all
Brick dimensions		[mm]	≥ 240 x 115 x 52

Table C5: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Use condition					w/w = w/d		d/d	
Temperature range					Ta	Tb	Ta	Tb
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]			
All anchor All anchor with HIT-SC according to Table B2	≥ 115	≥ 50	≥ 2,5	≥ 12	1,5 (2,0*)		1,5 (2,0*)	
				≥ 20	2,0 (2,5*)		2,0 (2,5*)	
				≥ 40	3,5 (4,0*)		3,5 (4,0*)	
		≥ 80		≥ 12	2,5 (3,0*)		2,5 (3,0*)	
				≥ 20	3,5 (4,0*)		3,5 (4,0*)	
				≥ 40	5,5 (6,5*)		5,5 (6,5*)	
		≥ 100		≥ 12	3,5 (4,0*)		3,5 (4,0*)	
				≥ 20	4,5 (5,0*)		4,5 (5,0*)	
				≥ 40	7,0 (8,0*)		7,0 (8,0*)	

Related edge and spacing distance and group factor α_g

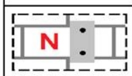
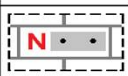
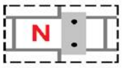
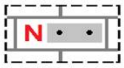
configuration	$s_{\perp}$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	≥ 55	1,0		≥ 75	1,35
	≥ 115	2,0		≥ 3 h_{ef}	2,0

Table C5: continued

Use condition						w/w = w/d		d/d	
Temperature range						Ta	Tb	Ta	Tb
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]			
Threaded rod	M12	≥ 150	≥ 100[1)]	≥ 5	≥ 20	6,0*		6,0*	
			≥ 200[1)]		≥ 20	9,5*		10,0*	
			≥ 300[1)]		≥ 20	13,0*		14,0*	
Threaded rod	M12	≥ 150	≥ 100[1)]	≥ 10	≥ 20	6,5*		6,5*	
			≥ 200[1)]		≥ 20	11,5*		12,5*	
			≥ 300[1)]		≥ 20	13,0*		14,0*	

Related edge and spacing distance and group factor α_g

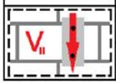
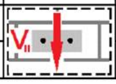
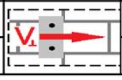
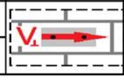
configuration	$s_{\perp}$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	≥ 50	1,0		≥ 50	1,0
	≥ 200	2,0		≥ 200	2,0

* CAC cleaning only
[1)] Linear interpolation for intermediate embedment depth values is allowed

Table C6: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading at edge distance

Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M8, M10 M8, M10 M8 M8	≥ 115	≥ 50	≥ 2,5	≥ 12	2,5	-[1)]
					≥ 20	3,0	-[1)]
					≥ 40	4,0	-[1)]
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M12, M16 M12, M16 M10, M12 M10, M12	≥ 115	≥ 50		≥ 12	3,5	-[1)]
					≥ 20	4,5	-[1)]
					≥ 40	5,5	-[1)]
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M8, M10 M8, M10 M8 M8	≥ 115	≥ 80		≥ 12	5,0	-[1)]
					≥ 20	6,0	-[1)]
					≥ 40	7,5	-[1)]
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M12, M16 M12, M16 M10, M12 M10, M12	≥ 115	≥ 80		≥ 12	6,5	-[1)]
					≥ 20	8,5	-[1)]
					≥ 40	10,5	-[1)]
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M8, M10 M8, M10 M8 M8	≥ 1,5 h_{ef}	≥ 50	≥ 2,5	≥ 12	2,5	[2)]
					≥ 20	3,0	[2)]
					≥ 40	4,0	[2)]
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M12, M16 M12, M16 M10, M12 M10, M12	≥ 1,5 h_{ef}	≥ 50		≥ 12	3,5	[2)]
					≥ 20	4,5	[2)]
					≥ 40	5,5	[2)]
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M8, M10 M8, M10 M8 M8	≥ 1,5 h_{ef}	≥ 80		≥ 12	5,0	[2)]
					≥ 20	6,0	[2)]
					≥ 40	7,5	[2)]
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M12, M16 M12, M16 M10, M12 M10, M12	≥ 1,5 h_{ef}	≥ 80		≥ 12	6,5	[2)]
					≥ 20	8,5	[2)]
					≥ 40	10,5	[2)]
Threaded rod with HIT-SC	M16	≥ 1,5 h_{ef}	≥ 160	≥ 2,5	≥ 12	11,0	[2)]
					≥ 20	14,0	[2)]
					≥ 40	17,0	[2)]

Related edge and spacing distance and group factor α_g

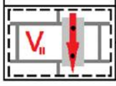
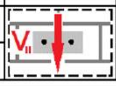
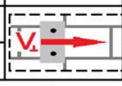
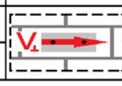
configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 55	1,0		≥ 75	2,0		≥ 55	1,0		≥ 115	1,0
	≥ 115	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

Injection system Hilti HIT-HY 270	**Annex C7**
Performances solid clay brick Mz, 1DF Characteristic values of resistance under shear load	

Table C6: continued

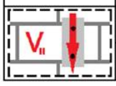
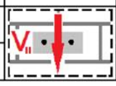
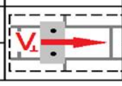
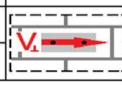
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod	M12	≥ 150	≥ 100	≥ 15	≥ 20	8,3	8,3

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 200	2,0		≥ 200	2,0		≥ 200	2,0		≥ 200	2,0

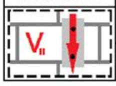
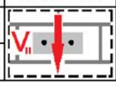
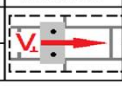
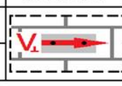
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod	M12	≥ 320	≥ 100	≥ 10	≥ 20	11,0	11,0
				≥ 15	≥ 20	15,5	15,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 200	2,0		≥ 200	2,0		≥ 200	1,5		≥ 200	1,7

Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod	M12	≥ 570	≥ 100	≥ 10	≥ 20	11,0	11,0
				≥ 15	≥ 20	16,5	16,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 200	2,0		≥ 200	2,0		≥ 200	2,0		≥ 200	2,0

[1] no performance assessed
[2] Calculation according to EOTA Technical Report TR 054, equation 4.7

Table C7: Displacements

h_{ef}	N	δ_{N0}	$\delta_{N\infty}$	V	δ_{V0}	$\delta_{V\infty}$
[mm]	[kN]	[mm]	[mm]	[kN]	[mm]	[mm]
50	1,2	0,1	0,2	1,4	0,5	0,75
80	2,1	0,1	0,2	2,1	1,1	1,65
100	3,9	0,2	0,4	3,0	1,3	1,95
200	3,3	0,03	0,06	4,7	0,6	0,9
300	4,3	0,04	0,08	4,7	0,6	0,9

Brick type: Solid clay brick Mz, NF

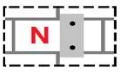
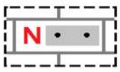
Table C8: Description of brick

Brick type			Mz, NF
Bulk density	ρ	[kg/dm³]	≥ 2,0
Normalized mean compressive strength	f_b	[N/mm²]	≥ 10, ≥ 20
Code			EN 771 - 1
Brick manufacturer			all
Brick dimensions		[mm]	≥ 240 x 115 x 71

Table C9: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Use condition					w/w = w/d		d/d	
Temperature range					Ta	Tb	Ta	Tb
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]			
All anchor All anchor with HIT-SC according to Table B2	≥ 50	≥ 50	≥ 2,5	≥ 10	1,5 (1,5*)		1,5 (1,5*)	
				≥ 20	2,0 (2,0*)		2,0 (2,0*)	
		≥ 80		≥ 10	2,5 (3,0*)		2,5 (3,0*)	
				≥ 20	3,5 (4,0*)		3,5 (4,0*)	

Related edge and spacing distance and group factor α_g

configuration	$s_{\perp}$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	-	-		≥ 50	1,0
	≥ 75	1,0		≥ 115	1,15
	≥ 150	2,0		≥ 3 h_{ef}	2,0

Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	w/w = w/d Ta	w/w = w/d Tb	d/d Ta	d/d Tb
All anchor All anchor with HIT-SC according to Table B2	≥ 150	≥ 100	≥ 2,5	≥ 10	4,0 (4,5*)		4,0 (4,5*)	
				≥ 20	5,5 (6,0*)		5,5 (6,0*)	

Related edge and spacing distance and group factor α_g

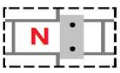
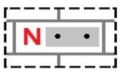
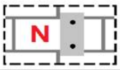
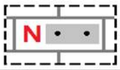
configuration	$s_{\perp}$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	-	-		≥ 50	0,75
	≥ 75	1,4		≥ 115	1,35
	≥ 150	2,0		≥ 3 h_{ef}	2,0

Table C9: continued

Use condition						w/w = w/d		d/d	
Temperature range						Ta	Tb	Ta	Tb
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]			
Threaded rod	M12	≥ 150	≥ 100[1)]	≥ 5	≥ 20	6,0*		6,0*	
			≥ 200[1)]		≥ 20	9,5*		10,0*	
			≥ 300[1)]		≥ 20	13,0*		14,0*	
Threaded rod	M12	≥ 150	≥ 100[1)]	≥ 10	≥ 20	6,5*		6,5*	
			≥ 200[1)]		≥ 20	11,5*		12,5*	
			≥ 300[1)]		≥ 20	13,0*		14,0*	

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	≥ 50	1,0		≥ 50	1,0
	≥ 200	2,0		≥ 200	2,0

* CAC cleaning only

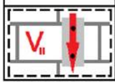
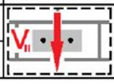
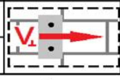
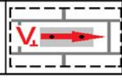
1) Linear interpolation for intermediate embedment depth values is allowed

Injection system Hilti HIT-HY 270	**Annex C10**
Performances solid clay brick Mz, NF Characteristic values of resistance under tension load	

Table C10: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading at edge distance

Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor All anchor with HIT-SC according to Table B2	≥ 50	≥ 50	≥ 2,5	≥ 10	3,0	3,0
				≥ 20	4,5	4,5
		≥ 50		≥ 10	4,0	4,0
				≥ 20	5,5	5,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	75	1,55		50	1,2		-[1)]	-[1)]		-[1)]	-[1)]
	150	2,0		115	2,0						

Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor All anchor with HIT-SC according to Table B2		≥ 1,5 h_{ef}	≥ 50	≥ 2,5	≥ 10	3,0	[2)]
					≥ 20	4,5	[2)]
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M8, M10 M8, M10 M8 M8	≥ 1,5 h_{ef}	≥ 80	≥ 2,5	≥ 10	5,0	[2)]
					≥ 20	7,0	[2)]
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M12, M16 M12, M16 M10, M12 M10, M12	≥ 1,5 h_{ef}	≥ 80		≥ 10	9,0	[2)]
					≥ 20	13,0	[2)]
Threaded rod Threaded rod with HIT-SC	M8, M10 M8, M10	≥ 1,5 h_{ef}	≥ 100		≥ 10	8,0	[2)]
					≥ 20	11,0	[2)]
Threaded rod Threaded rod with HIT-SC	M16 M16	≥ 1,5 h_{ef}	≥ 160		≥ 10	13,0	[2)]
					≥ 20	18,0	[2)]

Related edge and spacing distance and group factor α_g

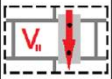
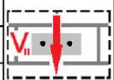
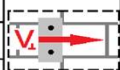
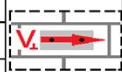
configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	-	-		≥ 50	1,2		-	-		≥ 50	1,6
	≥ 75	1,55		≥ 75	1,5		≥ 75	1,0		-	-
	≥ 150	2,0		≥ 115	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

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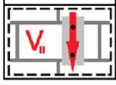
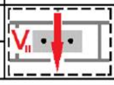
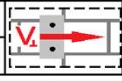
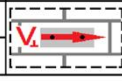
Table C10: continued

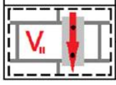
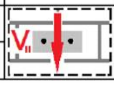
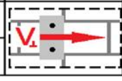
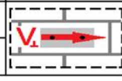
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod	M12	≥ 150	≥ 100	≥ 15	≥ 20	8,3	8,3

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 200	2,0		≥ 200	2,0		≥ 200	1,0		≥ 200	2,0

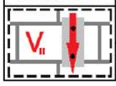
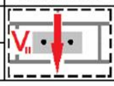
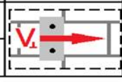
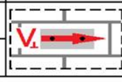
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod	M12	≥ 320	≥ 100	≥ 10	≥ 20	11,0	11,0
				≥ 15	≥ 20	15,5	15,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 200	2,0		≥ 200	2,0		≥ 200	1,5		≥ 200	1,7

Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod	M12	≥ 570	≥ 100	≥ 10	≥ 20	11,0	11,0
				≥ 15	≥ 20	16,5	16,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 200	2,0		≥ 200	2,0		≥ 200	2,0		≥ 200	2,0

1) no performance assessed 2) Calculation according to EOTA Technical Report TR 054, equation 4.7

Table C11: Displacements

h_{ef}	N	δ_{N0}	$\delta_{N\infty}$	V	δ_{V0}	$\delta_{V\infty}$
[mm]	[kN]	[mm]	[mm]	[kN]	[mm]	[mm]
50	0,8	0,1	0,2	1,6	0,8	1,2
80	1,5	0,1	0,2	2,1	0,8	1,2
100	2,3	0,1	0,2	2,1	0,8	1,2
200	3,3	0,03	0,06	4,7	0,6	0,9
300	4,3	0,04	0,08	4,7	0,6	0,9

Injection system Hilti HIT-HY 270

Performances solid clay brick Mz, NF
Characteristic values of resistance under shear load
Displacements

Annex C12

Brick type: Solid clay brick Mz, 2DF

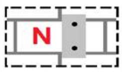
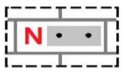
Table C12: Description of brick

Brick type			Mz, 2DF
Bulk density	ρ	[kg/dm³]	≥ 2,0
Normalized mean compressive strength	f_b	[N/mm²]	≥ 12, ≥ 20, ≥ 28
Code			EN 771 - 1
Brick manufacturer			all
Brick dimensions		[mm]	≥ 240 x 115 x 113

Table C13: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

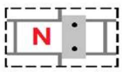
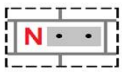
Use condition					w/w = w/d	d/d
Temperature range					Ta / Tb	Ta / Tb
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]	
All anchor All anchor with HIT-SC according to Table B2	≥ 50	≥ 50	≥ 2,5	≥ 12	1,5 (1,5*)	1,5 (1,5*)
				≥ 20	2,0 (2,0*)	2,0 (2,0*)
		≥ 80		≥ 12	3,0 (3,5*)	3,0 (3,5*)
				≥ 20	3,5 (4,0*)	3,5 (4,0*)

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	≥ 75	1,1		≥ 50	1,0
	≥ 115	1,45		≥ 115	1,15
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	w/w = w/d	d/d
All anchor All anchor with HIT-SC according to Table B2	≥ 115	≥ 50	≥ 2,5	≥ 12	2,5 (3,0*)	2,5 (3,0*)
				≥ 20	2,5 (3,0*)	2,5 (3,0*)
		≥ 80		≥ 12	3,5 (4,0*)	3,5 (4,0*)
				≥ 20	4,5 (5,5*)	4,5 (5,5*)
		≥ 100		≥ 12	6,0 (7,0*)	6,0 (7,0*)
				≥ 20	7,0 (8,0*)	7,0 (8,0*)

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	≥ 75	1,0		≥ 75	1,5
	≥ 115	1,6			
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

Injection system Hilti HIT-HY 270

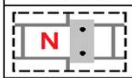
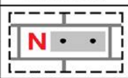
Performances solid clay brick Mz, 2DF
Characteristic values of resistance under tension load

Annex C13

Table C13: continued

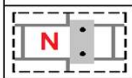
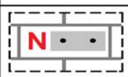
Use condition					w/w = w/d		d/d	
Temperature range					Ta	Tb	Ta	Tb
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]			
Threaded rod M12	≥ 150	≥ 200[1)]	≥ 5	≥ 20	9,5*		10,0*	
		≥ 300[1)]		≥ 20	13,0*		14,0*	
		≥ 160[1)]	≥ 10	≥ 20	9,5*		10,0*	
		≥ 200[1)]		≥ 20	11,5*		12,5*	
		≥ 300[1)]		≥ 20	13,0*		14,0*	

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	≥ 50	1,0		≥ 50	1,0
	≥ 200	2,0		≥ 200	2,0

Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	w/w = w/d	d/d
Threaded rod M12 Threaded rod with HIT-SC M12	≥ 240	≥ 160	≥ 2,5	≥ 20	10,0*	10,5*
				≥ 28	11,5*	12,0*

Related edge and spacing distance and group factor α_g

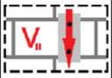
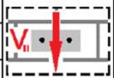
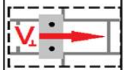
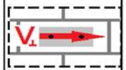
configuration	$s_\perp$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	≥ 160	1,6		≥ 110	1,5
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

* CAC cleaning only
[1)] Linear interpolation for intermediate embedment depth values is allowed

Table C14: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading at edge distance

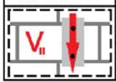
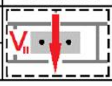
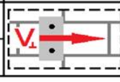
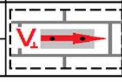
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor All anchor with HIT-SC according to Table B2		≥ 50	≥ 50	≥ 2,5	≥ 12	3,0	3,0
					≥ 20	4,0	4,0
			≥ 80		≥ 12	4,5	4,5
					≥ 20	5,5	5,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	75	0,7		115	2,0		-1)	-1)		-1)	-1)
	115	1,5									
	≥ 3 h_{ef}	2,0									

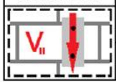
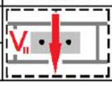
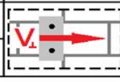
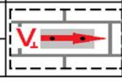
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor All anchor with HIT-SC according to Table B2		≥ 1,5 h_{ef}	≥ 50	≥ 2,5	≥ 12	5,5	2)
					≥ 20	7,0	2)
Threaded rod HIT-IC	M8, M10 M8	≥ 1,5 h_{ef}	≥ 80		≥ 12	8,0	2)
					≥ 20	10,0	2)
Threaded rod HIT-IC	M12 M10	≥ 1,5 h_{ef}	≥ 80		≥ 12	10,5	2)
					≥ 20	13,5	2)
Threaded rod HIT-IC	M16 M12	≥ 1,5 h_{ef}	≥ 80		≥ 12	13,0	2)
					≥ 20	16,0	2)

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 75	0,85		≥ 115	1,6		≥ 115	0,75		≥ 115	0,8
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

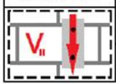
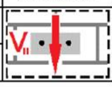
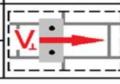
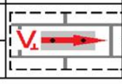
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod	M12	≥ 150	≥ 100	≥ 15	≥ 20	8,3	8,3

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 200	2,0		≥ 200	2,0		≥ 200	1,0		≥ 200	2,0

Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod	M12	≥ 320	≥ 100	≥ 10	≥ 20	11,0	11,0
				≥ 15	≥ 20	15,5	15,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 200	2,0		≥ 200	2,0		≥ 200	1,5		≥ 200	1,7

Injection system Hilti HIT-HY 270

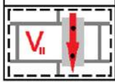
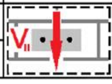
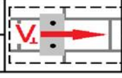
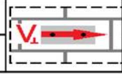
Performances solid clay brick Mz, 2DF
Characteristic values of resistance under shear load

Annex C15

Table C14: continued

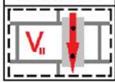
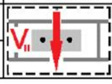
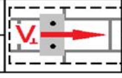
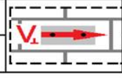
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod	M12	≥ 570	≥ 100	≥ 10	≥ 20	11,0	11,0
				≥ 15	≥ 20	16,5	16,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 200	2,0		≥ 200	2,0		≥ 200	2,0		≥ 200	2,0

Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod Threaded rod with HIT-SC	M12 M12	≥ 240	≥ 160	≥ 2,5	≥ 20	13,5	11,0
					≥ 28	-[1]	12,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 75	0,85		≥ 115	1,6		≥ 160	1,0		≥ 110	1,4
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

[1] no performance assessed
[2] Calculation according to EOTA Technical Report TR 054, equation 4.7

Table C15: Displacements

h_{ef}	N	δ_{N0}	$\delta_{N\infty}$	V	δ_{V0}	$\delta_{V\infty}$
[mm]	[kN]	[mm]	[mm]	[kN]	[mm]	[mm]
50	0,9	0,1	0,2	1,9	0,6	0,9
80	1,3	0,2	0,4	2,8	1,0	1,5
100	1,7	0,3	0,6	2,8	1,0	1,5
160	3,0	0,05	0,10	3,1	0,54	1,08
200	3,3	0,03	0,06	4,7	0,6	0,9
300	4,3	0,04	0,08	4,7	0,6	0,9

Brick type: Solid calcium silicate brick KS, 2DF

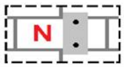
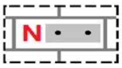
Table C16: Description of brick

Brick type			KS, 2DF
Bulk density	ρ	[kg/dm³]	≥ 2,0
Normalized mean compressive strength	f_b	[N/mm²]	≥ 12, ≥ 28
Code			EN 771 - 2
Brick manufacturer			all
Brick dimensions		[mm]	≥ 240 x 115 x 113

Table C17: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

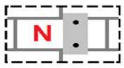
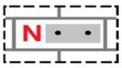
Use condition					w/w = w/d		d/d	
Temperature range					Ta	Tb	Ta	Tb
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]			
All anchor All anchor with HIT-SC according to Table B2	≥ 50	≥ 50	≥ 2,5	≥ 12	-[1)]	-[1)]	4,0	3,5
				≥ 28	-[1)]	-[1)]	6,5	5,5

Related edge and spacing distance and group factor α_g

configuration	s⊥ [mm]	$\alpha_{g,N}$ [-]	configuration	sII [mm]	$\alpha_{g,N}$ [-]
	≥ 115	2,0		≥ 115 (H)*	2,0
				≥ 240 (S)*	2,0

Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	w/w = w/d Ta	w/w = w/d Tb	d/d Ta	d/d Tb
All anchor All anchor with HIT-SC according to Table B2	≥ 115	≥ 50	≥ 2,5	≥ 12	-[1)]	-[1)]	6,0	5,0
				≥ 28	-[1)]	-[1)]	9,0	7,5

Related edge and spacing distance and group factor α_g

configuration	s⊥ [mm]	$\alpha_{g,N}$ [-]	configuration	sII [mm]	$\alpha_{g,N}$ [-]
	≥ 50	1,0		≥ 50	1,0
	≥ 115	1,45		≥ 115 (H)*	2,0
	≥ 150	2,0		≥ 240 (S)*	2,0

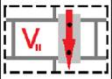
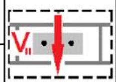
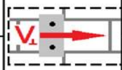
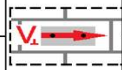
* (H) = Header, (S) = Stretcher
[1)] no performance assessed

Injection system Hilti HIT-HY 270	**Annex C17**
Performances solid clay brick KS, 2DF Characteristic values of resistance under tension load and group factor	

Table C18: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading at edge distance

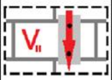
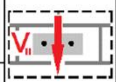
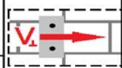
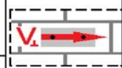
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor All anchor with HIT-SC according to Table B2	≥ 50	≥ 50	≥ 2,5	≥ 12	3,0	3,0
				≥ 28	4,5	4,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	-	-		≥ 115 (H)*	2,0		-	-		≥ 115 (H)*	2,0
	≥ 115	2,0		≥ 240 (S)*	2,0		≥ 115	2,0		≥ 240 (S)*	2,0

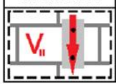
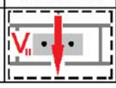
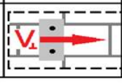
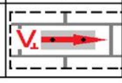
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor All anchor with HIT-SC according to Table B2	≥ 115	≥ 50	≥ 2,5	≥ 12	6,0	2)
				≥ 28	9,0	2)

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 50	0,45		≥ 50	0,45		≥ 50	0,45		≥ 50	0,45
	-	-		≥ 115 (H)*	2,0		-	-		≥ 115 (H)*	2,0
	≥ 115	2,0		≥ 240 (S)*	2,0		≥ 115	2,0		≥ 240 (S)*	2,0

Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M16 M16 M12 M12	≥ 1,5 h_{ef}	≥ 80	≥ 2,5	≥ 12	7,5	2)
					≥ 28	12,0	2)
Threaded rod with HIT-SC HIT-IC with HIT-SC	M16 M12	≥ 1,5 h_{ef}	≥ 160		≥ 12	15,0	2)
					≥ 28	23,0	2)

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

* (H) = Header, (S) = Stretcher
2) Calculation according to EOTA Technical Report TR 054, equation 4.7

Table C19: Displacements

h_{ef}	N	δ_{N0}	$\delta_{N\infty}$	V	δ_{V0}	$\delta_{V\infty}$
[mm]	[kN]	[mm]	[mm]	[kN]	[mm]	[mm]
≥ 50	2,5	0,3	0,6	2,5	1,0	1,5

Injection system Hilti HIT-HY 270

Performances solid silica brick KS, 2DF
Characteristic values of resistance under shear load and group factor
Displacements

Annex C18

Brick type: Solid calcium silicate brick KS, 8DF

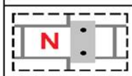
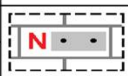
Table C20: Description of brick

Brick type		KS, 8DF	
Bulk density	ρ [kg/dm³]	≥ 2,0	
Normalized mean compressive strength	f_b [N/mm²]	≥ 12, ≥ 20, ≥ 28	
Code		EN 771 - 2	
Brick manufacturer		all	
Brick dimensions	[mm]	≥ 248 x 240 x 248	

Table C21: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Use condition						w/w = w/d		d/d	
Temperature range						Ta	Tb	Ta	Tb
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]			
All anchor All anchor with HIT-SC according to Table B2		≥ 50	≥ 50	≥ 2,5	≥ 12	-[1)]	-[1)]	4,0	3,5
					≥ 20	-[1)]	-[1)]	5,5	4,5
					≥ 28	-[1)]	-[1)]	6,5	5,0
Threaded rod	M8, M10		≥ 80		≥ 12	-[1)]	-[1)]	5,0	4,0
					≥ 20	-[1)]	-[1)]	6,5	5,5
					≥ 28	-[1)]	-[1)]	7,5	6,5
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M12 M8, M10 M8, M10 M8				≥ 12	-[1)]	-[1)]	7,0	5,5
					≥ 20	-[1)]	-[1)]	9,0	7,5
					≥ 28	-[1)]	-[1)]	10,5	8,5
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M16 M12, M16 M12 M10, M12				≥ 12	-[1)]	-[1)]	10,0	8,0
					≥ 20	-[1)]	-[1)]	12,0	10,5
					≥ 28	-[1)]	-[1)]	12,0	12,0
Threaded rod	M8, M10		≥ 100		≥ 12	-[1)]	-[1)]	8,0	6,5
					≥ 20	-[1)]	-[1)]	10,5	8,5
					≥ 28	-[1)]	-[1)]	12,0	10,0
Threaded rod Threaded rod with HIT-SC	M12 M8, M10				≥ 12	-[1)]	-[1)]	9,5	8,0
					≥ 20	-[1)]	-[1)]	12,0	10,0
					≥ 28	-[1)]	-[1)]	12,0	12,0
Threaded rod Threaded rod with HIT-SC	M16 M12, M16				≥ 12	-[1)]	-[1)]	12,0	10,5
					≥ 20	-[1)]	-[1)]	12,0	12,0
					≥ 28	-[1)]	-[1)]	13,0	12,0

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	≥ 50	1,0		≥ 50	1,0
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

Injection system Hilti HIT-HY 270

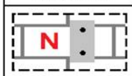
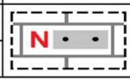
Performances solid clay brick KS, 8DF
Characteristic values of resistance under tension load

Annex C19

Table C21: continued

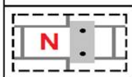
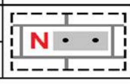
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	w/w = w/d Ta	w/w = w/d Tb	d/d Ta	d/d Tb
Use condition						w/w = w/d		d/d	
Temperature range						Ta	Tb	Ta	Tb
						$N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]			
All anchor All anchor with HIT-SC according to Table B2		≥ 120	≥ 50	≥ 2,5	≥ 12	-[1)]	-[1)]	7,0	5,5
					≥ 20	-[1)]	-[1)]	9,0	7,5
					≥ 28	-[1)]	-[1)]	10,5	8,5
Threaded rod M8, M10			≥ 80		≥ 12	-[1)]	-[1)]	8,5	7,0
					≥ 20	-[1)]	-[1)]	11,0	9,0
					≥ 28	-[1)]	-[1)]	12,0	10,5
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M12 M8, M10 M8, M10 M8				≥ 12	-[1)]	-[1)]	11,5	9,5
					≥ 20	-[1)]	-[1)]	12,0	12,0
					≥ 28	-[1)]	-[1)]	12,0	12,0
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M16 M12, M16 M12 M10, M12				≥ 12	-[1)]	-[1)]	12,0	12,0
					≥ 20	-[1)]	-[1)]	14,5	12,0
					≥ 28	-[1)]	-[1)]	17,5	14,0
Threaded rod	M8, M10		≥ 100		≥ 12	-[1)]	-[1)]	12,0	11,0
					≥ 20	-[1)]	-[1)]	12,0	12,0
					≥ 28	-[1)]	-[1)]	14,0	12,0
Threaded rod Threaded rod with HIT-SC	M12 M8, M10				≥ 12	-[1)]	-[1)]	12,0	12,0
					≥ 20	-[1)]	-[1)]	14,0	12,0
					≥ 28	-[1)]	-[1)]	16,5	14,0
Threaded rod Threaded rod with HIT-SC	M16 M12, M16	≥ 120	≥ 100	≥ 2,5	≥ 12	-[1)]	-[1)]	14,0	12,0
					≥ 20	-[1)]	-[1)]	18,5	15,5
					≥ 28	-[1)]	-[1)]	22,0	18,0

Related edge and spacing distance and group factor α_g

configuration	$s_{\perp}$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	≥ 50	1,0		≥ 50	1,0
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	w/w = w/d Ta	w/w = w/d Tb	d/d Ta	d/d Tb
Threaded rod	M12	≥ 240	≥ 160	Thin layer	20	-[1)]	-[1)]	18,5	15,5
					28	-[1)]	-[1)]	22,0	18,0

Related edge and spacing distance and group factor α_g

configuration	$s_{\perp}$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	≥ 160	1,2		≥ 110	1,25
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

* CAC cleaning only
1) no performance assessed

Injection system Hilti HIT-HY 270

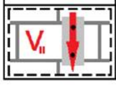
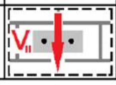
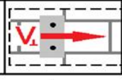
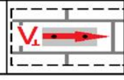
Performances solid clay brick KS, 8DF
Characteristic values of resistance under tension load and group factor

Annex C20

Table C22: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading at edge distance

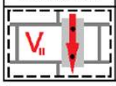
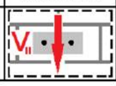
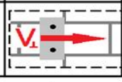
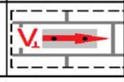
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor All anchor with HIT-SC according to Table B2		≥ 50	≥ 50	≥ 2,5	≥ 12	3,0	3,0
					≥ 20	4,0	4,0
					≥ 28	4,5	4,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 250	2,0		≥ 250	2,0		≥ 250	2,0		≥ 250	2,0

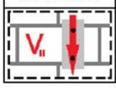
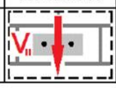
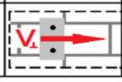
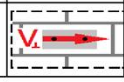
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod	M8, M10	≥ 120	≥ 80	≥ 2,5	≥ 12	9,0	3,0
					≥ 20	12,0	4,0
					≥ 28	14,0	4,5
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M12, M16 M12, M16 M8 to M12 M8 to M12	≥ 120	≥ 80	≥ 2,5	≥ 12	13,0	3,0
					≥ 20	16,5	4,0
					≥ 28	20,0	4,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

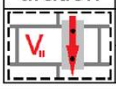
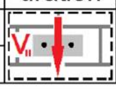
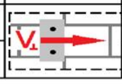
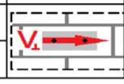
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod	M8, M10	≥ 1,5 h_{ef}	≥ 80	≥ 2,5	≥ 12	9,0	2)
					≥ 20	12,0	2)
					≥ 28	14,0	2)
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M12, M16 M12, M16 M8 to M12 M8 to M12	≥ 1,5 h_{ef}	≥ 80	≥ 2,5	≥ 12	13,0	2)
					≥ 20	16,5	2)
					≥ 28	20,0	2)

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod Threaded rod with HIT-SC	M12 M12	≥ 240	≥ 160	Thin layer	≥ 20	16,5	10,5
					≥ 28	20,0	12,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	-	-		-	-		≥ 160	1,0		≥ 110	1,0
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

2) Calculation according to EOTA Technical Report TR 054, equation 4.7

Injection system Hilti HIT-HY 270

Performances solid clay brick KS, 8DF
Characteristic values of resistance under shear load and group factor
Displacements

Annex C21

Table C23: Displacements

h_{ef}	N	δ_{N0}	$\delta_{N\infty}$	V	δ_{V0}	$\delta_{V\infty}$
[mm]	[kN]	[mm]	[mm]	[kN]	[mm]	[mm]
≥ 50	2,3	0,10	0,20	3,4	2,8	4,2
≥ 80	3,4	0,15	0,30	3,4	2,8	4,2
≥ 100	3,4	0,15	0,30	3,4	2,8	4,2
≥ 160	6,3	0,05	0,10	3,6	0,85	1,70

Brick type: Solid lightweight concrete brick Vbl, 2DF

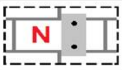
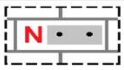
Table C24: Description of brick

Brick type			Vbl, 2DF
Bulk density	ρ	[kg/dm³]	≥ 0,9
Normalized mean compressive strength	f_b	[N/mm²]	≥ 4, ≥ 6
Code			EN 771 – 3
Brick manufacturer			all
Brick dimensions		[mm]	≥ 240 x 115 x 113

Table C25: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

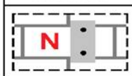
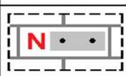
Use condition					w/w = w/d		d/d	
Temperature range					Ta	Tb	Ta	Tb
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]			
All anchor All anchor with HIT-SC according to Table B2	≥ 50	≥ 50	≥ 2,5	≥ 4	1,5	1,2	1,5	1,5
				≥ 6	2,0	1,5	2,0	1,5

Related edge and spacing distance and group factor α_g

configuration	s⊥ [mm]	$\alpha_{g,N}$ [-]	configuration	s‖ [mm]	$\alpha_{g,N}$ [-]
	≥ 115	1,0		≥ 115	1,0
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	w/w = w/d Ta	w/w = w/d Tb	d/d Ta	d/d Tb
All anchor All anchor with HIT-SC according to Table B2	≥ 115	≥ 50	≥ 2,5	≥ 4	3,0	2,0	3,0 (3,5*)	2,5
				≥ 6	3,5	3,0	4,0	3,0 (3,5*)
		≥ 80		≥ 4	4,5	3,5	5,0	4,0 (4,5*)
				≥ 6	5,5	4,5	6,0 (6,5*)	5,0 (5,5*)
		≥ 100		≥ 4	6,0	5,0	6,5 (7,0*)	5,5 (6,0*)
				≥ 6	7,5	6,0	8,0 (8,5*)	6,5 (7,0*)

Related edge and spacing distance and group factor α_g

configuration	s⊥ [mm]	$\alpha_{g,N}$ [-]	configuration	s‖ [mm]	$\alpha_{g,N}$ [-]
	≥ 50	1,0		≥ 50	1,0
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

* Compressed air cleaning only

Injection system Hilti HIT-HY 270

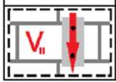
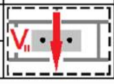
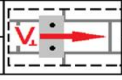
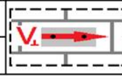
Performances solid clay brick Vbl, 2DF
Characteristic values of resistance under tension load and group factor

Annex C23

Table C26: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading at edge distance

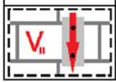
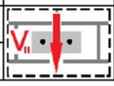
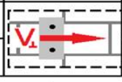
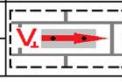
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor All anchor with HIT-SC according to Table B2		≥ 50	≥ 50	≥ 2,5	≥ 4	1,2	1,2
					≥ 6	1,5	1,5

Related edge and spacing distance and group factor α_g

config-uration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	config-uration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	config-uration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	config-uration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 115	1,0		≥ 115	1,0		≥ 115	1,0		≥ 115	1,0
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

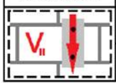
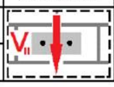
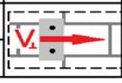
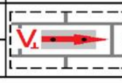
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod Threaded rod with HIT-SC	M8 M8	≥ 115	≥ 50	≥ 2,5	≥ 4	2,0	1,2
					≥ 6	2,5	1,5
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M10 to M16 M10 to M16 M8 to M12 M8 to M12	≥ 115	≥ 50		≥ 4	2,5	1,2
					≥ 6	3,0	1,5

Related edge and spacing distance and group factor α_g

config-uration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	config-uration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	config-uration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	config-uration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod Threaded rod with HIT-SC	M8 M8	≥ 1,5 h_{ef}	≥ 50	≥ 2,5	≥ 4	2,0	2)
					≥ 6	2,5	2)
Threaded rod Threaded rod with HIT-SC HIT-IC HIT-IC with HIT-SC	M10 to M16 M10 to M16 M8 to M12 M8 to M12	≥ 1,5 h_{ef}	≥ 50		≥ 4	2,5	2)
					≥ 6	3,0	2)

Related edge and spacing distance and group factor α_g

config-uration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	config-uration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	config-uration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	config-uration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

2) Calculation according to EOTA Technical Report TR 054, equation 4.7

Table C27: Displacements

h_{ef}	N	δ_{N0}	$\delta_{N\infty}$	V	δ_{V0}	$\delta_{V\infty}$
[mm]	[kN]	[mm]	[mm]	[kN]	[mm]	[mm]
≥ 50	2,5	0,3	0,6	1,8	2,0	3,0

Injection system Hilti HIT-HY 270

Performances solid clay brick Vbl, 2DF
Characteristic values of resistance under shear load and group factor
Disp[lacements

Annex C24

Brick type: Solid normal weight concrete brick Vbn, 2DF

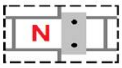
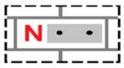
Table C28: Description of brick

Brick type			Vbn, 2DF
Bulk density	ρ	[kg/dm³]	≥ 2,0
Normalized mean compressive strength	f_b	[N/mm²]	≥ 6, ≥ 16
Code			EN 771 - 3
Brick manufacturer			all
Brick dimensions		[mm]	≥ 240 x 115 x 113

Table C29: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Use condition					w/w = w/d		d/d	
Temperature range					Ta	Tb	Ta	Tb
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]			
All anchor All anchor with HIT-SC according to Table B2	≥ 50	≥ 50	≥ 2,5	≥ 6	1,5	1,2	1,5	1,2
				≥ 16	2,5	2,0	2,5	2,0

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	≥ 115	1,0		≥ 115	1,0
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	w/w = w/d Ta	w/w = w/d Tb	d/d Ta	d/d Tb
All anchor All anchor with HIT-SC according to Table B2	≥ 115	≥ 50	≥ 2,5	≥ 6	3,0	2,5	3,0	2,5
				≥ 16	5,5	4,5	5,5	4,5

Related edge and spacing distance and group factor α_g

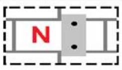
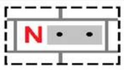
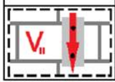
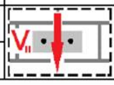
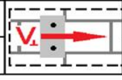
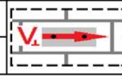
configuration	$s_\perp$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	≥ 50	1,0		≥ 50	1,0
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

Table C30: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading at edge distance

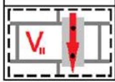
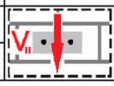
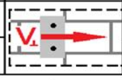
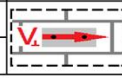
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor All anchor with HIT-SC according to Table B2	≥ 50	≥ 50	≥ 2,5	≥ 6	1,5	1,5
				≥ 16	3,0	3,0

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 115	1,0		≥ 115	1,0		≥ 115	1,0		≥ 115	1,0
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

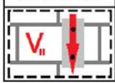
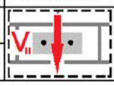
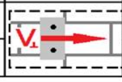
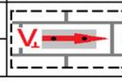
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor All anchor with HIT-SC according to Table B2	≥ 115	≥ 50	≥ 2,5	≥ 6	4,0	1,5
				≥ 16	6,5	3,0

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor All anchor with HIT-SC according to Table B2	≥ 1,5 h_{ef}	≥ 50	≥ 2,5	≥ 6	4,0	[2]
				≥ 16	6,5	[2]

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0		≥ 3 h_{ef}	2,0

[2] Calculation according to EOTA Technical Report TR 054, equation 4.7

Table C31: Displacements

h_{ef}	N	δ_{N0}	$\delta_{N\infty}$	V	δ_{V0}	$\delta_{V\infty}$
[mm]	[kN]	[mm]	[mm]	[kN]	[mm]	[mm]
≥ 50	1,5	0,3	0,6	1,8	2,0	3,0

Brick type: Hollow clay brick Hlz, 10DF

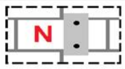
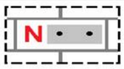
Table C32: Description of brick

Brick type	Hlz12-1,4-10 DF	
Bulk density ρ [kg/dm³]	≥ 1,4	
Normalized mean compressive strength f_b [N/mm²]	≥ 12, ≥ 20	
Code	EN 771 - 1	
Brick manufacturer	Rapis (D)	
Brick dimensions [mm]	300 x 240 x 238	Drawing of the brick see Table B4
Minimum wall thickness h_{min} [mm]	≥ 240	

Table C33: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

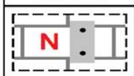
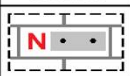
Use condition					w/w = w/d		d/d	
Temperature range					Ta	Tb	Ta	Tb
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]			
All anchor with HIT-SC according to Table B2	≥ 50	≥ 80	≥ 2,5	≥ 12	1,5 (2,0*)			
				≥ 20	2,0 (2,5*)			

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	≥ 5 d_0	1,0		≥ 5 d_0	1,0
	≥ 240	2,0		≥ 300	2,0

Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]
All anchor with HIT-SC according to Table B2	≥ 150	≥ 80	≥ 2,5	≥ 12	5,5 (6,0*)
				≥ 20	7,0 (8,0*)

Related edge and spacing distance and group factor α_g

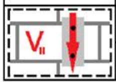
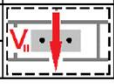
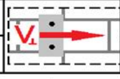
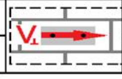
configuration	$s_\perp$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	≥ 240	2,0		≥ 300	2,0

* Compressed air cleaning only

Table C34: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading at edge distance

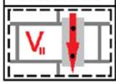
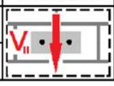
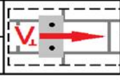
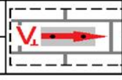
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor with HIT-SC according to Table B2	≥ 50	≥ 80	≥ 2,5	≥ 12	1,25	1,25
				≥ 20	1,25	1,25

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 5 d_0	1,0		≥ 5 d_0	1,0		≥ 5 d_0	1,0		≥ 5 d_0	1,0
	≥ 240	2,0		≥ 300	2,0		≥ 240	2,0		≥ 300	2,0

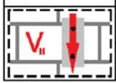
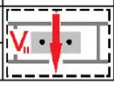
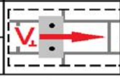
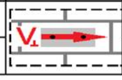
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor with HIT-SC according to Table B2	≥ 100 ≥ 6 d_0	≥ 80	≥ 2,5	≥ 12	2,5	1,25
				≥ 20	2,5	1,25

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 5 d_0	1,0		≥ 5 d_0	1,0		≥ 5 d_0	1,0		≥ 5 d_0	1,0
	≥ 240	2,0		≥ 300	2,0		≥ 240	2,0		≥ 300	2,0

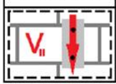
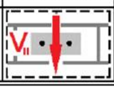
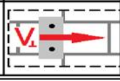
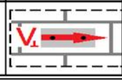
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor with HIT-SC according to Table B2	≥ 250	≥ 80	≥ 2,5	≥ 12	2,5	2,5
				≥ 20	2,5	2,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 5 d_0	1,0		≥ 5 d_0	1,0		≥ 5 d_0	1,0		≥ 5 d_0	1,0
	≥ 240	2,0		≥ 300	2,0		≥ 240	2,0		≥ 300	2,0

Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod with HIT-SC HIT-IC with HIT-SC	M8, M10 M8	≥ 300	≥ 80	≥ 2,5	≥ 12	4,5	4,5[1)]
					≥ 20	5,5	5,5[1)]
Threaded rod with HIT-SC HIT-IC with HIT-SC	M12, M16 M10, M12	≥ 300	≥ 80	≥ 2,5	≥ 12	9,5	9,5[1)]
					≥ 20	12,5	12,5[1)]
Threaded rod with HIT-SC HIT-IC with HIT-SC	M16 M12	≥ 300	≥ 160	≥ 2,5	≥ 12	18,5	18,5[1)]
					≥ 20	23,5	23,5[1)]

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 240	2,0		≥ 300	2,0		≥ 240	2,0		≥ 300	2,0

1) $V_{Rk,b}$ may be used as $V_{Rk,c\perp}$ if
- Horizontal joints are completely filled with mortar and
- Vertical joints are completely filled with mortar or the bricks have completely direct contact to each other.

Table C35: Displacements

h_{ef}	N	δ_{N0}	$\delta_{N\infty}$	V	δ_{V0}	$\delta_{V\infty}$
[mm]	[kN]	[mm]	[mm]	[kN]	[mm]	[mm]
≥ 80	2,5	0,4	0,8	1,7	1,0	1,5

Brick type: Hollow calcium silicate brick KSL, 8DF

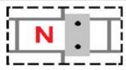
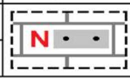
Table C36: Description of brick

Brick type		KSL-12-1,4-8 DF	 Drawing of the brick see Table B4
Bulk density	ρ [kg/dm³]	≥ 1,4	
Normalized mean compressive strength	f_b [N/mm²]	≥ 12, ≥ 20	
Code		EN 771 – 2	
Brick manufacturer		KS Wemding (D)	
Brick dimensions	[mm]	248 x 240 x 238	
Minimum wall thickness	h_{min} [mm]	≥ 240	

Table C37: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Use condition						w/w = w/d		d/d	
Temperature range						Ta	Tb	Ta	Tb
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]			
Threaded rod with HIT-SC HIT-IC with HIT-SC	M8 to M16 M8 to M12	≥ 50	≥ 80	≥ 2,5	≥ 12	-[1)]	-[1)]	4,0	3,0
					≥ 20	-[1)]	-[1)]	5,5	4,5
Threaded rod with HIT-SC	M8 to M16	≥ 50	≥ 130	≥ 2,5	≥ 12	-[1)]	-[1)]	5,0	4,0
					≥ 20	-[1)]	-[1)]	7,5	6,0

Related edge and spacing distance and group factor α_g

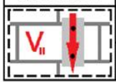
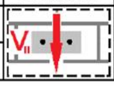
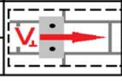
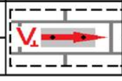
configuration	$s_\perp$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	≥ 50	1,0		≥ 50	1,0
	≥ 240	2,0		≥ 240	2,0

[1)] No performance assessed

Table C38: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading at edge distance

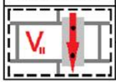
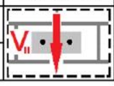
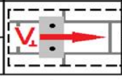
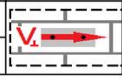
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,\parallel}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor with HIT-SC according to Table B2		≥ 50	≥ 80	≥ 2,5	≥ 12	4,0	4,0
					≥ 20	6,0	6,0

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\parallel}$ [-]	configuration	$s_\parallel$ [mm]	$\alpha_{g\parallel,V\parallel}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	$s_\parallel$ [mm]	$\alpha_{g\parallel,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 240	2,0		≥ 250	2,0		≥ 240	2,0		≥ 250	2,0

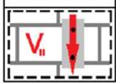
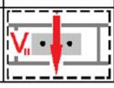
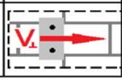
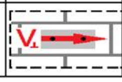
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,\parallel}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod with HIT-SC	M8	≥ 125	≥ 80	≥ 2,5	≥ 12	6,0	4,0
					≥ 20	9,0	6,0
Threaded rod with HIT-SC HIT-IC with HIT-SC	M10 M8				≥ 12	9,0	4,0
					≥ 20	13,0	6,0
Threaded rod with HIT-SC HIT-IC with HIT-SC	M12 to M16 M10, M12				≥ 12	18,0	4,0
					≥ 20	18,0	6,0

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\parallel}$ [-]	configuration	$s_\parallel$ [mm]	$\alpha_{g\parallel,V\parallel}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	$s_\parallel$ [mm]	$\alpha_{g\parallel,V\perp}$ [-]
							≥ 50	1,0		≥ 50	1,0
	≥ 240	2,0		≥ 250	2,0		≥ 240	2,0		≥ 250	2,0

Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,\parallel}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod with HIT-SC	M8	≥ 250	≥ 80	≥ 2,5	≥ 12	6,0	6,0[1)]
					≥ 20	9,0	9,0[1)]
Threaded rod with HIT-SC HIT-IC with HIT-SC	M10 M8				≥ 12	9,0	9,0[1)]
					≥ 20	13,0	9,0[1)]
Threaded rod with HIT-SC HIT-IC with HIT-SC	M12 to M16 M10, M12				≥ 12	18,0	9,0[1)]
					≥ 20	18,0	9,0[1)]

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\parallel}$ [-]	configuration	$s_\parallel$ [mm]	$\alpha_{g\parallel,V\parallel}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	$s_\parallel$ [mm]	$\alpha_{g\parallel,V\perp}$ [-]
	≥ 240	2,0		≥ 250	2,0		≥ 240	2,0		≥ 250	2,0

1) $V_{Rk,b}$ may be used as $V_{Rk,c\perp}$ if
- Horizontal joints are completely filled with mortar and
- Vertical joints are completely filled with mortar or the bricks have completely direct contact to each other

Table C39: Displacements

h_{ef}	N	δ_{N0}	$\delta_{N\infty}$	V	δ_{V0}	$\delta_{V\infty}$
[mm]	[kN]	[mm]	[mm]	[kN]	[mm]	[mm]
80	1,0	0,3	0,6	4,3	2,0	3,0
130	2,1	0,3	0,6	4,3	2,0	3,0

Brick type: Hollow lightweight concrete brick Hbl, 16DF

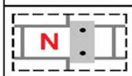
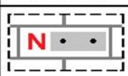
Table C40: Description of brick

Brick type		Hbl-4-0,7	
Bulk density	ρ [kg/dm³]	≥ 0,7	
Normalized mean compressive strength	f_b [N/mm²]	≥ 2, ≥ 6	
Code		EN 771-3	
Brick manufacturer		Knobel (D)	
Brick dimensions	[mm]	495 x 240 x 238	Drawing of the brick
Minimum wall thickness	h_{min} [mm]	≥ 240	see Table B4

Table C41: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

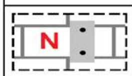
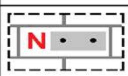
Use condition					w/w = w/d		d/d	
Temperature range					Ta	Tb	Ta	Tb
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]			
All anchor with HIT-SC according to Table B2	≥ 50	≥ 80	≥ 2,5	≥ 2	1,5	1,2	1,5	1,5
				≥ 6	2,5	2,0	3,0	2,5
Threaded rod with HIT-SC M8 to M16		≥ 160		≥ 2	2,0	1,5	2,0	1,5 (2,0*)
				≥ 6	3,5	2,5	3,5 (4,0*)	3,0

Related edge and spacing distance and group factor α_g

configuration	s⊥ [mm]	$\alpha_{g,N}$ [-]	configuration	s‖ [mm]	$\alpha_{g,N}$ [-]
	≥ 50	1,0		≥ 50	1,0
	≥ 240	2,0		≥ 240	2,0

Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	w/w = w/d Ta	w/w = w/d Tb	d/d Ta	d/d Tb
Threaded rod with HIT-SC M8, M10 HIT-IC with HIT-SC M8	≥ 125	≥ 80	≥ 2,5	≥ 2	3,5	3,0	4,0	3,0 (3,5*)
				≥ 6	6,0	5,0	6,5 (7,0*)	5,5 (6,0*)
Threaded rod with HIT-SC M12, M16 HIT-IC with HIT-SC M10, M12				≥ 2	4,0	3,5	4,5	3,5 (4,0*)
				≥ 6	7,0	6,0	8,0	6,5 (7,0*)

Related edge and spacing distance and group factor α_g

configuration	s⊥ [mm]	$\alpha_{g,N}$ [-]	configuration	s‖ [mm]	$\alpha_{g,N}$ [-]
	≥ 240	2,0		≥ 240	2,0

* Compressed air cleaning only

Injection system Hilti HIT-HY 270

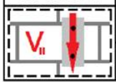
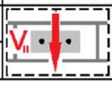
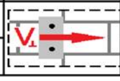
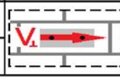
Performances hollow lightweight concrete brick Hbl, 16DF
Characteristic values of resistance under tension load and group factor

Annex C31

Table C42: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading at edge distance

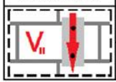
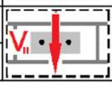
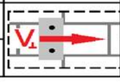
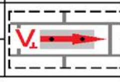
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor with HIT-SC according to Table B2	≥ 50	≥ 80	≥ 2,5	≥ 2	1,5	1,5
				≥ 6	3,0	3,0
	≥ 100 ≥ 6 d_0	≥ 80		≥ 2	2,5	1,5
	≥ 250	≥ 80		≥ 2	2,5	2,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 240	2,0		≥ 250	2,0		≥ 240	2,0		≥ 250	2,0

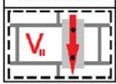
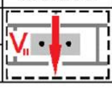
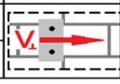
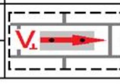
Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod with HIT-SC HIT-IC with HIT-SC	M8, M10 M8	≥ 250	≥ 80	≥ 2,5	≥ 2	4,0	2,5
					≥ 6	6,5	3,0
Threaded rod with HIT-SC HIT-IC with HIT-SC	M12 M10				≥ 2	5,5	2,5
					≥ 6	9,5	3,0
Threaded rod with HIT-SC HIT-IC with HIT-SC	M16 M12				≥ 2	6,0	2,5
					≥ 6	10,0	3,0

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 240	2,0		≥ 250	2,0		≥ 240	2,0		≥ 250	2,0

Fastening element		c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
Threaded rod with HIT-SC HIT-IC with HIT-SC	M8, M10 M8	≥ 500	≥ 80	≥ 2,5	≥ 2	4,0	4,0[1)]
					≥ 6	6,5	6,5[1)]
Threaded rod with HIT-SC HIT-IC with HIT-SC	M12 M10				≥ 2	5,5	5,5[1)]
					≥ 6	9,5	9,5[1)]
Threaded rod with HIT-SC HIT-IC with HIT-SC	M16 M12				≥ 2	6,0	6,0[1)]
					≥ 6	10,0	10,0[1)]

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,VII}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,VII}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	s_{II} [mm]	$\alpha_{gII,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 240	2,0		≥ 250	2,0		≥ 240	2,0		≥ 250	2,0

1) $V_{Rk,b}$ may be used as $V_{Rk,c\perp}$ if
- Horizontal joints are completely filled with mortar and
- Vertical joints are completely filled with mortar or the bricks have completely direct contact to each other.

Table C43: Displacements

h_{ef}	N	δ_{N0}	$\delta_{N\infty}$	V	δ_{V0}	$\delta_{V\infty}$
[mm]	[kN]	[mm]	[mm]	[kN]	[mm]	[mm]
80	0,8	0,20	0,4	2,3	1,0	1,5
160	1,1	0,25	0,5	2,3	1,0	1,5

Brick type: Hollow normal weight concrete brick - parpaing creux

Table C44: Description of brick

Brick type		B40	
Bulk density	ρ [kg/dm³]	≥ 0,9	
Normalized mean compressive strength	f_b [N/mm²]	≥ 4, ≥ 10	
Code		EN 771-3	
Brick manufacturer		Fabemi (F)	
Brick dimensions	[mm]	500 x 200 x 200	Drawing of the brick see Table B4
Minimum wall thickness	h_{min} [mm]	≥ 200	

Table C45: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Use condition					w/w = w/d		d/d	
Temperature range					Ta	Tb	Ta	Tb
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]			
All anchor with HIT-SC according to Table B2	≥ 50	≥ 50	≥ 2,5	≥ 4	0,9	0,9	0,9	0,9
				≥ 10	2,0	1,5	2,0	1,5
		≥ 130		≥ 4	1,5	1,2	1,5	1,2
				≥ 10	2,5	2,0	2,5	2,0

Related edge and spacing distance and group factor α_g

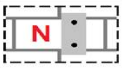
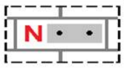
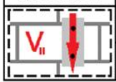
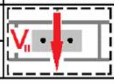
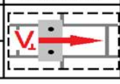
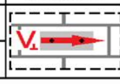
configuration	$s_{\perp}$ [mm]	$\alpha_{g,N}$ [-]	configuration	s_{II} [mm]	$\alpha_{g,N}$ [-]
	≥ 200	2,0		≥ 200	2,0

Table C46: Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading at edge distance

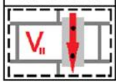
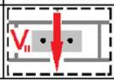
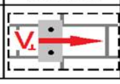
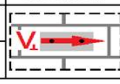
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor with HIT-SC according to Table B2	≥ 50	≥ 50	≥ 2,5	≥ 4	2,0	1,2
				≥ 10	3,0	1,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\parallel}$ [-]	configuration	$s_\parallel$ [mm]	$\alpha_{g\parallel,V\parallel}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	$s_\parallel$ [mm]	$\alpha_{g\parallel,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 200	2,0		≥ 200	2,0		≥ 200	2,0		≥ 200	2,0

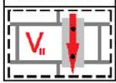
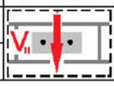
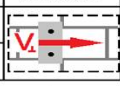
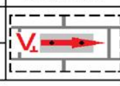
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor with HIT-SC according to Table B2	≥ 200	≥50	≥ 2,5	≥ 4	4,0	1,2
				≥ 10	6,5	1,5
		≥80		≥ 4	5,0	1,2
				≥ 10	7,5	1,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\parallel}$ [-]	configuration	$s_\parallel$ [mm]	$\alpha_{g\parallel,V\parallel}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	$s_\parallel$ [mm]	$\alpha_{g\parallel,V\perp}$ [-]
	≥ 200	2,0		≥ 200	2,0		≥ 50	1,0		≥ 50	1,0
							≥ 200	2,0		≥ 200	2,0

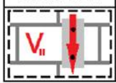
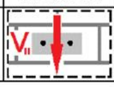
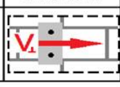
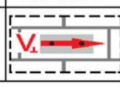
Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor with HIT-SC according to Table B2	≥ 250	≥ 50	≥ 2,5	≥ 4	4,0	2,5
				≥ 10	6,5	2,5

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\parallel}$ [-]	configuration	$s_\parallel$ [mm]	$\alpha_{g\parallel,V\parallel}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	$s_\parallel$ [mm]	$\alpha_{g\parallel,V\perp}$ [-]
	≥ 50	1,0		≥ 50	1,0		≥ 50	1,0		≥ 50	1,0
	≥ 200	2,0		≥ 200	2,0		≥ 200	2,0		≥ 200	2,0

Fastening element	c [mm]	h_{ef} [mm]	f_m [N/mm²]	f_b [N/mm²]	$V_{Rk,b} = V_{Rk,c,II}$ [kN]	$V_{Rk,c,\perp}$ [kN]
All anchor with HIT-SC according to Table B2	≥ 500	≥50	≥ 2,5	≥ 4	4,0	4,0[1)]
				10	6,5	6,5[1)]
		≥80		≥ 4	5,0	5,0[1)]
				10	7,5	7,5[1)]

Related edge and spacing distance and group factor α_g

configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\parallel}$ [-]	configuration	$s_\parallel$ [mm]	$\alpha_{g\parallel,V\parallel}$ [-]	configuration	$s_\perp$ [mm]	$\alpha_{g\perp,V\perp}$ [-]	configuration	$s_\parallel$ [mm]	$\alpha_{g\parallel,V\perp}$ [-]
	≥ 200	2,0		≥ 200	2,0		≥ 200	2,0		≥ 200	2,0

1) $V_{Rk,b}$ may be used as $V_{Rk,c\perp}$ if
- Horizontal joints are completely filled with mortar and
- Vertical joints are completely filled with mortar or the bricks have completely direct contact to each other.

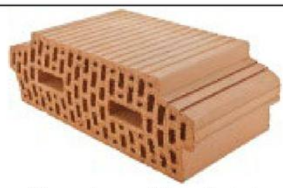
Table C47: Displacements

h_{ef} [mm]	N [kN]	δ_{N0} [mm]	$\delta_{N\infty}$ [mm]	V [kN]	δ_{V0} [mm]	$\delta_{V\infty}$ [mm]
≥ 50	0,7	0,5	1,0	1,7	1,0	1,5

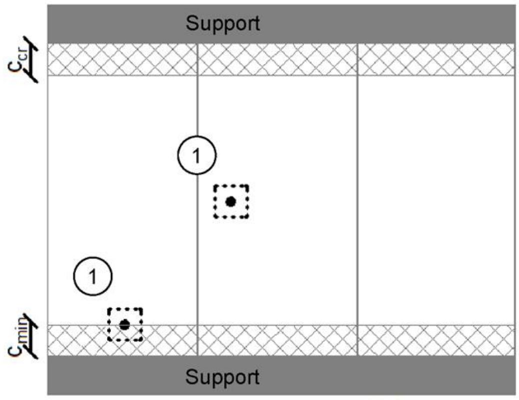
Brick type: Hollow clay brick for ceiling

Table C48: Description of brick

Brick type		Ds-1,0
Bulk density	$\rho \geq$ [kg/dm³]	1,0
Strenght		class R2
Code		EN 15037-3
Brick manufacturer		Fiedler Marktredwitz (D)
Brick dimensions	[mm]	510 x 250 x 180
Min. ceiling thickness	$h_{min} \geq$ [mm]	≥ 180



Drawing of the brick see Table B4



(1) Single fastening

Maximum one anchor per ceiling brick

Table C49: Installation parameter

Anchor type		Threaded rod M6 with HIT-SC 12x85
Edge distance	$c_{min} = c_{cr}$ [mm]	100 from support
Spacing	$s_{min\ II}$ [mm]	510
	$s_{min\ \perp} = s_{cr}$ [mm]	250

Table C50: Group factor

Group factor	$\alpha_{g,N}$ [-]	1

Table C51: Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

Use condition			w/w = w/d		d/d	
Temperature range			Ta	Tb	Ta	Tb
Fastening element	h_{ef} [mm]	Console load capacity [kN]	$N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]			
Threaded rod with HIT-SC M6	≥ 80	3	1,5	1,5	1,5	1,5

Table C52: Displacements

h_{ef}	N	δ_{N0}	$\delta_{N\infty}$
[mm]	[kN]	[mm]	[mm]
≥ 80	0,4	0,15	0,30

Fire resistance under tension and shear loading

Table C53: General installation parameters

			All anchors M6, M8, M10, M12 with and without HIT-SC
Edge distance	c_{min}	[mm]	$2 \cdot h_{ef}$
Spacing	s_{crII}	[mm]	$4 \cdot h_{ef}$
	$s_{cr\perp}$	[mm]	$4 \cdot h_{ef}$

Brick type: Solid clay brick

for threaded rods, HAS-U, HAS and HIT-IC and with and without HIT-SC

Table C54: Description of brick

Brick type			Mz	
Bulk density	ρ	[kg/dm³]	≥ 2,0	
Normalized mean compressive strength	f_b	[N/mm²]	≥ 20, ≥ 28	
Code			EN 771 - 1	
Brick manufacturer			all	
Brick dimensions		[mm]	≥ 240 x 115 x 52	

Table C55: Fire resistance under tension and shear loading for solid clay bricks

				M8	M10	M12	M8	M10	M12
Normalized mean compressive strength	f_b	[N/mm²]		≥ 20			≥ 28		
Embedment depth	h_{ef}	[mm]		≥ 80					
Characteristic resistance to failure under tension loading and under shear loading without lever arm	$N_{Rk,s,fi}$ $N_{Rk,p,fi}$ $N_{Rk,b,fi}$ $V_{Rk,s,fi}$ $V_{Rk,b,fi}$	[kN]	R30	0,81			0,96		
			R60	0,26			0,30		
Characteristic resistance to failure under shear loading with lever arm	$M^0_{Rk,s,fi}$	[Nm]	R30	0,83	0,52	0,36	0,98	0,62	0,43
			R60	0,27	0,17	0,12	0,31	0,19	0,13

Brick type: Solid silicate brick

for threaded rods, HAS-U, HAS and HIT-IC and with and without HIT-SC

Table C56: Description of brick

Brick type			KS
Bulk density	ρ	[kg/dm³]	≥ 2,0
Normalized mean compressive strength	f_b	[N/mm²]	≥ 12, ≥ 20
Code			EN 771 - 2
Brick manufacturer			all
Brick dimensions		[mm]	≥ 240 x 115 x 113

Table C57: Fire resistance under tension and shear loading for solid calcium silicate bricks

				M8	M10	M12	M8	M10	M12
Normalized mean compressive strength	f_b	[N/mm²]		≥ 12			≥ 20		
Embedment depth	h_{ef}	[mm]		≥ 80					
Characteristic resistance to failure under tension loading and under shear loading without lever arm	$N_{Rk,s,fi}$ $N_{Rk,p,fi}$ $N_{Rk,b,fi}$ $V_{Rk,s,fi}$ $V_{Rk,b,fi}$	[kN]	R30	0,11			0,15		
			R60	0,06			0,09		
Characteristic resistance to failure under shear loading with lever arm	$M^0_{Rk,s,fi}$	[Nm]	R30	0,11	0,07	0,05	0,15	0,10	0,07
			R60	0,06	0,04	0,03	0,09	0,06	0,04

Brick type: Hollow clay brick

for threaded rods, HAS-U, HAS and HIT-IC and with HIT-SC

Table C58: Description of brick

Brick type		HIz12-1,4-10 DF	
Bulk density	ρ [kg/dm³]	≥ 1,4	
Normalized mean compressive strength	f_b [N/mm²]	≥ 12, ≥ 20	
Code		EN 771 - 1	
Brick manufacturer		Rapis (D)	
Brick dimensions	[mm]	300 x 240 x 238	
Minimum wall thickness	h_{min} [mm]	≥ 240	

Table C59: Fire resistance under tension and shear loading for hollow clay bricks

				M8	M10	M12	M8	M10	M12
Normalized mean compressive strength	f_b	[N/mm²]		≥ 12			≥ 20		
Embedment depth	h_{ef}	[mm]		≥ 80					
Characteristic resistance to failure under tension loading and under shear loading without lever arm	$N_{Rk,s,fi}$ $N_{Rk,p,fi}$ $N_{Rk,b,fi}$ $V_{Rk,s,fi}$ $V_{Rk,b,fi}$	[kN]	R30	0,34			0,46		
			R60	0,21			0,28		
Characteristic resistance to failure under shear loading with lever arm	$M^0_{Rk,s,fi}$	[Nm]	R30	0,35	0,22	0,15	0,47	0,30	0,20
			R60	0,22	0,14	0,09	0,29	0,18	0,12
Embedment depth	h_{ef}	[mm]		≥ 130					
Characteristic resistance to failure under tension loading and under shear loading without lever arm	$N_{Rk,s,fi}$ $N_{Rk,p,fi}$ $N_{Rk,b,fi}$ $V_{Rk,s,fi}$ $V_{Rk,b,fi}$	[kN]	R30	0,92	1,29	1,72	0,92	1,51	2,25
			R60	0,66	0,92	1,22	0,68	1,09	1,60
			R90	0,40	0,40	0,40	0,45	0,45	0,45
Characteristic resistance to failure under shear loading with lever arm	$M^0_{Rk,s,fi}$	[Nm]	R30	0,94	0,83	0,76	0,94	0,98	1,00
			R60	0,68	0,59	0,54	0,70	0,70	0,71
			R90	0,41	0,26	0,18	0,46	0,29	0,20

Brick type: Hollow calcium silicate brick

for threaded rods, HAS-U, HAS and HIT-IC and with HIT-SC

Table C60: Description of brick

Brick type		KSL-12-1,4-8 DF	
Bulk density	ρ [kg/dm³]	≥ 1,4	
Normalized mean compressive strength	f_b [N/mm²]	≥ 12, ≥ 16	
Code		EN 771 – 2	
Brick manufacturer		KS Wemding (D)	
Brick dimensions	[mm]	248 x 240 x 238	
Minimum wall thickness	h_{min} [mm]	≥ 240	

Table C61: Fire resistance under tension and shear loading for hollow calcium silicate bricks

				M8	M10	M12	M8	M10	M12
Normalized mean compressive strength	f_b	[N/mm²]		≥ 12			≥ 16		
Embedment depth	h_{ef}	[mm]		≥ 80					
Characteristic resistance to failure under tension loading and under shear loading without lever arm	$N_{Rk,s,fi}$ $N_{Rk,p,fi}$ $N_{Rk,b,fi}$ $V_{Rk,s,fi}$ $V_{Rk,b,fi}$	[kN]	R30	0,11			0,15		
			R60	-	-	0,06	-	-	0,09
Characteristic resistance to failure under shear loading with lever arm	$M^0_{Rk,s,fi}$	[Nm]	R30	0,11	0,07	0,05	0,15	0,10	0,07
			R60	-	-	0,03	-	-	0,04
Embedment depth	h_{ef}	[mm]		≥ 130					
Characteristic resistance to failure under tension loading and under shear loading without lever arm	$N_{Rk,s,fi}$ $N_{Rk,p,fi}$ $N_{Rk,b,fi}$ $V_{Rk,s,fi}$ $V_{Rk,b,fi}$	[kN]	R30	0,11			0,15		
			R60	0,06			0,09		
Characteristic resistance to failure under shear loading with lever arm	$M^0_{Rk,s,fi}$	[Nm]	R30	0,11	0,07	0,05	0,15	0,10	0,07
			R60	0,06	0,04	0,03	0,09	0,06	0,04

Brick type: Hollow lightweight concrete brick

for threaded rods, HAS-U, HAS and HIT-IC and with HIT-SC

Table C62: Description of brick

Brick type		Hbl-4-0,7	
Bulk density	ρ [kg/dm³]	≥ 0,7	
Normalized mean compressive strength	f_b [N/mm²]	≥ 2, ≥ 6	
Code		EN 771-3	
Brick manufacturer		Knobel (D)	
Brick dimensions	[mm]	495 x 240 x 238	
Minimum wall thickness	h_{min} [mm]	≥ 240	

Table C63: Fire resistance under tension and shear loading for hollow lightweight concrete bricks

				M8	M10	M12	M8	M10	M12
Normalized mean compressive strength	f_b	[N/mm²]		≥ 2			≥ 6		
Embedment depth	h_{ef}	[mm]		≥ 130					
Characteristic resistance to failure under tension loading and under shear loading without lever arm	$N_{Rk,s,fi}$ $N_{Rk,p,fi}$ $N_{Rk,b,fi}$ $V_{Rk,s,fi}$ $V_{Rk,b,fi}$	[kN]	R30	0,47			0,92		
			R60	0,38			0,68		
Characteristic resistance to failure under shear loading with lever arm	$M^0_{Rk,s,fi}$	[Nm]	R30	0,48	0,30	0,21	0,94	0,59	0,41
			R60	0,39	0,25	0,17	0,70	0,44	0,30

Brick type: Hollow clay brick for ceiling
for threaded rods, HAS-U, HAS and with HIT-SC

Table C64: Description of brick

Brick type		Ds-1,0	
Bulk density	ρ [kg/dm³]	≥ 1,0	
strength	f_b [N/mm²]	class R2	
Code		EN 15037-3	
Brick manufacturer		Fiedler Marktredwitz (D)	
Brick dimensions	[mm]	510 x 250 x 180	
Minimum wall thickness	h_{min} [mm]	≥ 180	

Table C65: Fire resistance under tension and shear loading for hollow ceiling brick

				M6
Compressive strength	f_b	[N/mm²]		≥ R2
Embedment depth	h_{ef}	[mm]		≥ 80
Characteristic resistance to failure under tension loading and under shear loading without lever arm	$N_{Rk,s,fi}$ $N_{Rk,p,fi}$ $N_{Rk,b,fi}$ $V_{Rk,s,fi}$ $V_{Rk,b,fi}$	[kN]	R30	0,11
Characteristic resistance to failure under shear loading with lever arm	$M^0_{Rk,s,fi}$	[Nm]	R30	0,08