HIT-HY 270
INJECTION MORTAR

Technical Datasheet

Update: Jan-23

HIT-HY 270 injection mortar

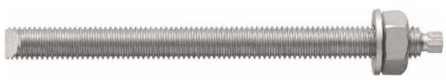
Anchor design (EOTA TR 054) / Rods and Sleeves / Masonry

Injection mortar system

Hilti HIT-HY 270

330 ml foil pack (also available as 500 ml foil pack)

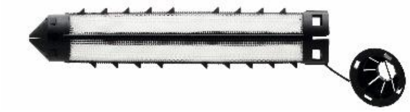
Anchor rod:
HIT-V
HIT-V-F
HIT-V-R
HIT-V-HCR rods
(M6-M16)



Anchor rod:
HAS-U
HAS-U HDG
HAS-U A4
HAS-U HCR rods
(M6-M16)

Rebar B500
(ϕ8, ϕ12)

Internally threaded sleeve:
HIT-IC (M8-M12)

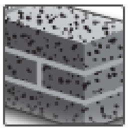


Sieve sleeves:
HIT-SC (12-22)

Benefits

- Chemical injection fastening for the most common types of base materials:
- Hollow and solid clay bricks, calcium silicate bricks, normal and light weight concrete blocks
- Two-component hybrid mortar
- Versatile and convenient handling with HDE dispenser
- Flexible setting depth and fastening thickness
- Small edge distance and anchor spacing
- Suitable for overhead fastenings
- ETA approved for seismic loads in solid clay bricks (Rosso Vivo, Rosso Classico)

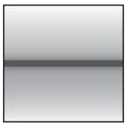
Base material



Solid brick

Hollow brick

Load conditions



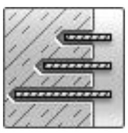
Static/ quasi-static

Seismic

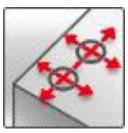
Fire resistance

Installation conditions

Hammer drilling



Variable embedment depth



Small edge distance and spacing

Other informations

European Technical Assessment

CE conformity

A4 316

Corrosion resistance

HCR highMo

High corrosion resistance

PROFIS Engineering design Software

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
European technical assessment	DIBt, Berlin	ETA-13/1036 / 2017-12-12
European technical assessment	DIBt, Berlin	ETA-19/0160 / 2019-04-29
European technical assessment	CSTB, Paris	ETA-22/0395 / 2022-08-11
Hilti Technical Data [a)]	Hilti	2019-05-20
Fire test report	MFPA, Leipzig	GS 6.1/19-035-5 / 2020-10-30

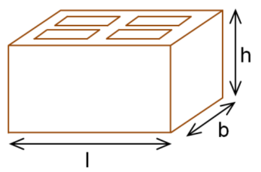
a) Hilti Technical Data is based on testing and assessment by Hilti following EAD 330076-00-0604, EOTA TR053 and TR054

Brick types and properties

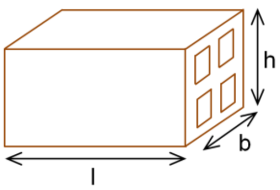
Instruction to this technical data

- Identify/choose your brick (or brick type) and its geometrical/physical properties on the following tables. Information about edge and spacing criteria is available on page 5.
  - The pages reffered on the last column of the table below contain the design resistance loads for pull-out failure of the anchor, brick breakout failure and local brick failure for each respective brick. Notice that the data displayed on these tables is only valid for single anchors with distance to edge such that loading capacity is not influenced by it – for other cases not covered, use PROFIS Engineering software, consult ETA-13/1036, ETA-19/0160, ETA-22/0395 or contact Hilti Engineering Team.
- The resistance loads provided by this technical data manual are valid only for exact same masonry unit (hollow bricks) or for units made of the same base material with equal or higher size and compressive strength (solid bricks). For other cases, on-site tests must be performed-please consult page 18.

Exterior brick dimensions

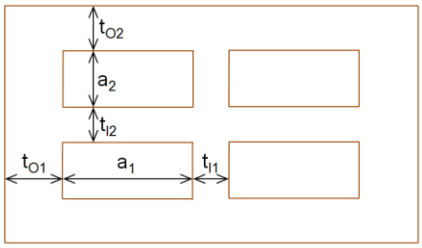


Generic bricks



Bricks HC5, CC1 and CC2

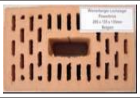
Interior dimensions of the majority of the holes



Brick types and properties

Brick code	Data	Brick name	Image	Size [mm]	t_O [mm]	t_I [mm]	a [mm]	f_b [N/mm^2]	ρ [kg/dm^3]	Page
Solid clay										
SC1	ETA	Solid clay brick Mz, 1DF		l: ≥ 240 b: ≥ 115 h: ≥ 52	-	-	-	12 20 40	2,0	10
SC2	ETA	Solid clay brick Mz, NF		l: ≥ 240 b: ≥ 115 h: ≥ 72	-	-	-	10 20	2,0	10
SC3	ETA	Solid clay brick Mz, 2DF		l: ≥ 240 b: ≥ 115 h: ≥ 113	-	-	-	12 20	2,0	11
SC4	Hilti Data	UK London yellow Multi Stock		l: 215 b: 100 h: 65	-	-	-	16	1,5	12
SC5	Hilti Data	Australian common dry pressed		l: 230 b: 110 h: 76	-	-	-	25	2,0	12
SC6	ETA	Rosso Classico Rosso Vivo		l: 250 b: 120 h: 55	-	-	-	18	1,6	12

Brick types and properties

Brick code	Data	Brick name	Image	Size [mm]	t_O [mm]	t_l [mm]	a [mm]	f_b [N/mm²]	ρ [kg/dm³]	Page
Hollow clay										
HC1	ETA	Hollow clay brick Hlz, 10DF		l: 300 b: 240 h: 238	t_{01}: 12 t_{02}: 15	t_{l1}: 11 t_{l2}: 15	a_1: 10 a_2: 25	12 20	1,4	13
HC2	Hilti Data	Italy Mattone Alveolater 50		l: 300 b: 245 h: 185	t_{01}: 12 t_{02}: 12	t_{l1}: 9 t_{l2}: 9	a_1: 22 a_2: 25	16	1,0	13
HC3	Hilti Data	Spain Termoarcilla		l: 300 b: 192 h: 190	t_{01}: 9 t_{02}: 9	t_{l1}: 7 t_{l2}: 7	a_1: 17 a_2: --	22	0,9	13
HC4	Hilti Data	Belgium Wienerberger Thermobrick		l: 285 b: 135 h: 138	t_{01}: 10 t_{02}: 10	t_{l1}: 7 t_{l2}: 7	a_1: 14 a_2: 34	21	0,9	13
HC5	Hilti Data	Spain Hueco doble		l: 232 b: 115 h: 78	t_{01}: 9 t_{02}: 9	t_{l1}: 8 t_{l2}: 8	a_1: 28 a_2: 28	4	0,8	14
HC6	Hilti Data	Belgium Wienerberger Powerbrick		l: 285 b: 135 h: 135	t_{01}: 16 t_{02}: 12	t_{l1}: 10 t_{l2}: 10	a_1: 12 a_2: 31	41	1,2	14
HC7	Hilti Data	Italy Doppio uni		l: 240 b: 120 h: 120	t_{01}: 12 t_{02}: 12	t_{l1}: 10 t_{l2}: 12	a_1: 22 a_2: 24	27	1,1	14
HC8	Hilti Data	Spain Ladrillo cara vista		l: 240 b: 115 h: 49	t_{01}: 13 t_{02}: 16	t_{l1}: 7 t_{l2}: 7	a_1: 30 a_2: 33	42	1,2	14
HC9	Hilti Data	Spain Clinker mediterraneo		l: 240 b: 115 h: 49	t_{01}: 17 t_{02}: 17	t_{l1}: 7 t_{l2}: 7	a_1: 29 a_2: 29	78	1,3	15
HC10	Hilti Data	UK Nostell red multi		l: 215 b: 102 h: 65	t_{01}: 23 t_{02}: 21	t_{l1}: 28 t_{l2}: --	a_1: 38 a_2: 56	70	1,6	15
HC11	Hilti Data	Australian common standard		l: 230 b: 110 h: 76	t_{01}: 20 t_{02}: 16	t_{l1}: 16 t_{l2}: 20	a_1: 25 a_2: 36	84	1,5	15
Clay Ceiling										
CC1	ETA	Clay ceiling brick Ds-1,0		l: 250 b: 510 h: 180	t_{01}: 12 t_{02}: 12	t_{l1}: 7 t_{l2}: 7	a_1: 14 a_2: 32	3	1,0	16
CC2	Hilti Data	Italy Mattone rosso		l: 250 b: 400 h: 180	t_{01}: 9 t_{02}: 9	t_{l1}: 7 t_{l2}: 7	a_1: 69 a_2: 55	26	0,6	16
Solid Calcium Silicate										
SCS1	ETA	Solid silica brick KS, 2DF		l: ≥ 240 b: ≥ 115 h: ≥ 113	-	-	-	12 28	2,0	16
SCS2	ETA	Solid silica brick KS, 8DF		l: ≥ 248 b: ≥ 240 h: ≥ 248	-	-	-	12 20 28	2,0	16

Brick types and properties

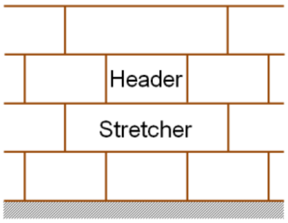
Brick code	Data	Brick name	Image	Size [mm]	t_O [mm]	t_I [mm]	a [mm]	f_b [N/mm^2]	ρ [kg/dm^3]	Page
Hollow Calcium Silicate										
HCS1	ETA	Hollow silica brick KSL, 8DF		l: 248 b: 240 h: 238	**t_{01}**: 34 **t_{02}**: 22	**t_{I1}**: 11 **t_{I2}**: 20	**a_1:** 52 **a_2:** 52	12 20	1,4	17
HCS2	Hilti Data	Germany KSL 12		l: 240 b: 175 h: 113	**t_{01}**: 18 **t_{02}**: 20	**t_{I1}**: -- **t_{I2}**: --	**a_1**: -- **a_2**: --	12	1,6	17
Solid Light weight concrete										
SLWC1	ETA	Solid lightweight concrete brick Vbl, 2DF		l: ≥ 240 b: ≥ 115 h: ≥ 113	-	-	-	4 6	0,9	18
SLWC2	Hilti Data	Sweden Leca typ 3		l: 550 b: 190 h: 190	-	-	-	3	0,6	18
SLWC3	Hilti Data	Italy "Tufo" volcanic rock		l: 380 b: 270 h: 270	-	-	-	4	1,2	18
Hollow Light weight concrete										
HLWC1	ETA	Hollow lightweight concrete brick Hbl, 16DF		l: 495 b: 240 h: 238	**t_{01}**: 25 **t_{02}**: 51	**t_{I1}**: 35 **t_{I2}**: 36	**a_1**: 196 **a_2**: 52	2 6	0,7	18
HLWC2	Hilti Data	Germany Hbl 2		l: 248 b: 300 h: 248	**t_{01}**: 17 **t_{02}**: 21	**t_{I1}**: 24 **t_{I2}**: 22	**a_1**: 87 **a_2**: 40	2	0,6	19
HLWC3	Hilti Data	Germany Hbl 4		l: 248 b: 240 h: 248	**t_{01}**: 48 **t_{02}**: 41	**t_{I1}**: -- **t_{I2}**: 62	**a_1**: 140 **a_2**: 49	4	0,7	19
Solid Normal weight concrete										
SNW C1	ETA	Solid normal weight concrete brick Vbn, 2DF		l: ≥ 240 b: ≥ 115 h: ≥ 113	-	-	-	6 16	2,0	19
SNW C2	Hilti Data	UK Dense Concrete b=100mm		l: 440 b: 100 h: 215	-	-	-	14	2,0	19
SNW C3	Hilti Data	UK Dense concrete b=140mm		l: 440 b: 140 h: 215	-	-	-	14	2,0	20

Brick types and properties

Brick code	Data	Brick name	Image	Size [mm]	t_O [mm]	t_l [mm]	a [mm]	f_b [N/mm^2]	ρ [kg/dm^3]	Page
Hollow Normal weight concrete										
HNWC1	ETA	Hollow normal weight concrete brick parpaing creux		l: 500 b: 200 h: 200	t_{01}: 15 t_{02}: 15	t_{l1}: 15 t_{l2}: 15	a_1: 133 a_2: 75	4 10	0,9	20
HNWC2	Hilti Data	Italy Blocchi Cem		l: 500 b: 200 h: 200	t_{01}: 30 t_{02}: 30	t_{l1}: 30 t_{l2}: --	a_1: 200 a_2: 135	8	1,0	21
HNWC3	Hilti Data	Germany Hbn 4		l: 365 b: 240 h: 238	t_{01}: 26 t_{02}: 35	t_{l1}: 26 t_{l2}: 26	a_1: 128 a_2: 62	4 10	1,4	21
HNWC4	Hilti Data	UK (b=215 mm)		l: 440 b: 215 h: 215	t_{01}: 48 t_{02}: 48	t_{l1}: 40 t_{l2}: --	a_1: 150 a_2: 120	10	1,2	21
HNWC5	Hilti Data	UK (b=138 mm)		l: 440 b: 138 h: 215	t_{01}: 48 t_{02}: 38	t_{l1}: 48 t_{l2}: --	a_1: 150 a_2: 60	13	1,5	21
HNWC6	Hilti Data	UK (b=112 mm)		l: 440 b: 112 h: 215	t_{01}: 30 t_{02}: 30	t_{l1}: **30** t_{l2}: --	a_1: 50 a_2: 50	7	1,3	21
HNWC7	Hilti Data	Finland Standard concrete brick		l: 600 b: 500 h: 92	t_{01}: 32 t_{02}: 15	t_{l1}: 32 t_{l2}: --	a_1: 62 a_2: 62	6	0,9	22
HNWC8	Hilti Data	Australian block system 200		l: 390 b: 190 h: 190	t_{01}: 30 t_{02}: 30	t_{l1}: 30 t_{l2}: --	a_1: 150 a_2: 130	15	1,1	22

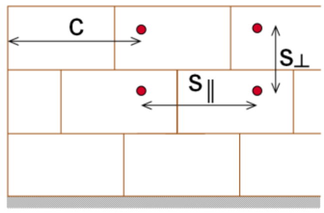
Anchor installation parameters

Brick position:



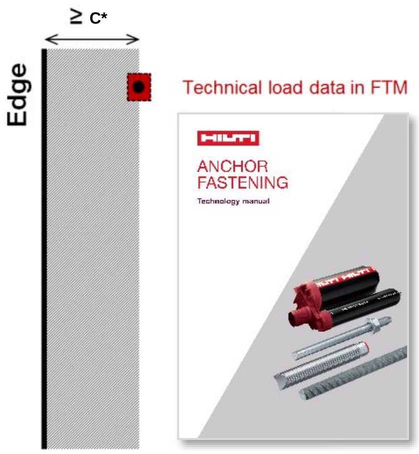
- **Header (H):** The longest dimension of the brick represents the width of the wall
- **Stretcher (S):** The longest dimension of the brick represents the length of the wall

Spacing and edge distance:

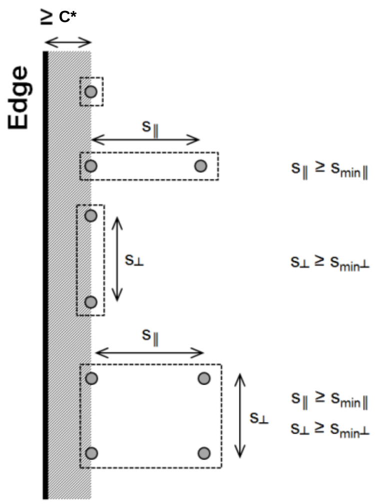


- c - Distance to the edge
- s ∥ - Spacing parallel to the bed joint
- s ⊥ - Spacing perpendicular to the bed joint

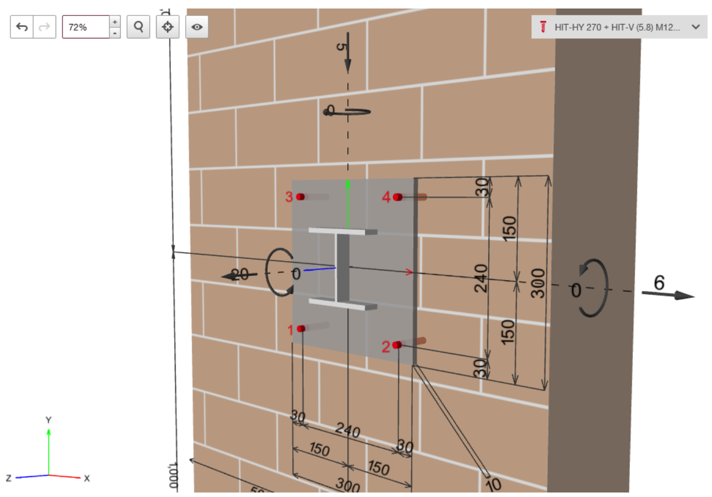
Allowed anchor positions:



- This FTM includes the load data for single anchors in masonry with a distance to edge equal to or greater than **c***.
- **c*** is the distance from the anchor to the edge of the wall, such that the loading capacity of the anchor is not influenced by the edge.
- Minimum spacing between anchors = MAX (3 x h_{ef} ; size of brick in respective direction). This applies for a (conservative) manual design/calculation of a baseplate using the load tables in this manual.
- For an optimized design or cases not covered in this technical data, including anchor groups, please use PROFIS Engineering software or consult ETA-13/1036, ETA-19/0160, or ETA-22/0395.



PROFIS Engineering software interface:



Anchor dimensions for HIT-V and HAS-U

Anchor size			M6	M8	M10	M12	M16
Embedment depth	with HIT-SC	h_{ef} [mm]	Variable length from 50 to 160				
	without HIT-SC		Variable length from 50 to 300*				

* For brick types SC6 resistance for h_{ef} up to 350 mm are provided in the ETA-22/0395.

Anchor dimensions for HIT-IC

Anchor size		M8x80	M10x80	M12x80
Embedment depth	h_{ef} [mm]	80	80	80

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 and seismic loading are designed in accordance with: EOTA TR054, Design method A

Basic loading data (for a single anchor)

The load tables provide the design resistance values for a single loaded anchor.

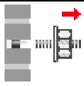
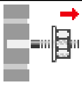
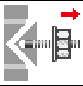
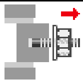
All data in this section applies to

- Edge distance c ≥ c*. For other applications, use Hilti PROFIS Engineering software.
- Correct anchor setting (see instruction for use, setting details)

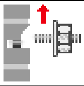
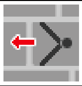
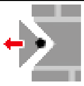
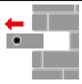
Anchorages subject to:		Hilti HIT-HY 270 with HIT-V, HAS-U or HIT-IC	
		in solid bricks	**in hollow bricks**
Hole drilling		hammer mode	rotary mode
Use category: dry or wet structure		Category **d/d** - **Installation and use** in structures subject to **dry**, internal conditions, Category **w/d** - **Installation in** dry or **wet** substrate and **use** in structures subject to **dry**, internal conditions (except calcium silicate bricks), Category **w/w** - **Installation and use** in structures subject to dry or **wet** environmental conditions (except calcium silicate bricks).	
Installation direction	Masonry	horizontal	
Installation direction	Ceiling brick	overhead	
Temperature in the base material at installation		+5° C to +40° C	-5° C to +40° C (HIT-V or HIT-IC) 0° C to +40° C (HAS-U)
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)

Design – Failure modes

The design tensile resistance is the lower value of:

Failure due to tension loads		Condition
Failure of the metal part		$N_{Sd}^{h} \leq N_{Rd,s} = N_{Rk,s}/\gamma_{Ms}$
Pull-out failure of the anchor		$N_{Sd}^{h} \leq N_{Rd,p} = N_{Rk,p}/\gamma_{Mm}$
Brick breakout failure		$N_{Sd} \leq N_{Rd,b} = N_{Rk,b}/\gamma_{Mm}$ $N_{Sd}^{g} \leq N_{Rd}^{g} = N_{Rk}^{g}/\gamma_{Mm}$
Pull out of one brick		$N_{Sd} \leq N_{Rd,pb} = N_{Rk,pb}/\gamma_{Mm}$

The design shear resistance is the lower value of:

Failure due to shear loads		Condition
Failure of the metal part		$V_{Sd}^{h} \leq V_{Rd,s} = V_{Rk,s}/\gamma_{Ms}$
Local brick failure		$V_{Sd} \leq V_{Rd,b} = V_{Rk,b}/\gamma_{Mm}$ $V_{Sd}^{g} \leq V_{Rd}^{g} = V_{Rk}^{g}/\gamma_{Mm}$
Brick edge failure		$V_{Sd} \leq V_{Rd,c} = V_{Rk,c}/\gamma_{Mm}$ $V_{Sd}^{g} \leq V_{Rd}^{g} = V_{Rk}^{g}/\gamma_{Mm}$
Pushing out of one brick		$V_{Sd} \leq V_{Rd,pb} = V_{Rk,pb}/\gamma_{Mm}$

- Loads and resistances are affected by a series of factors such as visibility/filling of joints, factors for anchor groups, spacing, edge distance, embedment depth, number of brick layers.
  For deeper embedment depth, where 2 or more bricks are penetrated, see TR 054, 4.2.5.
- For other applications not covered in this FTM, use Hilti PROFIS Engineering software.

Partial safety factors

Base material	Failure (rupture) mode - Injection Anchor (γ_{Mm})
Masonry	2,5

Failure (rupture) mode - Metal part (γ_{Ms})		
Tension loading	Shear loading	
	if $f_{uk} \leq 800$ N/mm² and $f_{yk}/f_{uk} \leq 0,8$	if $f_{uk} > 800$ N/mm² or $f_{yk}/f_{uk} > 0,8$
$1,2 / (f_{yk} / f_{uk}) \geq 1,4$	$1,0 / (f_{yk} / f_{uk}) \geq 1,25$	1,5

Design tension and shear resistances – Steel failure for threaded rods HIT-V and HAS-U

Anchor size			M6	M8	M10	M12	M16
$N_{Rd,s}$	HIT-V 5.8 (F) HAS-U 5.8 (HDG)	[kN]	6,7	12,2	19,3	28,1	52,3
	HIT-V 8.8 (F) HAS-U 8.8 (HDG)		10,7	19,5	30,9	45,0	83,7
	HIT-V-R HAS-U A4		7,5	13,7	21,7	31,6	58,8
	HIT-V-HCR HAS-U HCR		10,7	19,5	30,9	45,0	83,7
$V_{Rd,s}$	HIT-V 5.8 (F) HAS-U 5.8 (HDG)	[kN]	4,0	7,3	11,6	16,9	31,4
	HIT-V 8.8 (F) HAS-U 8.8 (HDG)		6,4	11,7	18,6	27,0	50,2
	HIT-V-R HAS-U A4		4,5	8,2	13,0	18,9	35,2
	HIT-V-HCR HAS-U HCR		6,4	11,7	18,6	27,0	50,2
$M_{Rd,s}$	HIT-V 5.8 (F) HAS-U 5.8 (HDG)	[Nm]	6,4	15,2	29,6	52,8	133,6
	HIT-V 8.8 (F) HAS-U 8.8 (HDG)		9,6	24,0	48,0	84,0	212,8
	HIT-V-R HAS-U A4		7,1	16,7	33,4	59,1	149,7
	HIT-V-HCR HAS-U HCR		9,6	24,0	48,0	84,0	212,8

Design tension and shear resistances – Steel failure for internally threaded rods HIT-IC

Anchor size			M8	M10	M12
$N_{Rd,s}$	HIT-IC	[kN]	3,9	4,8	9,1
$V_{Rd,s}$	HIT-V 5.8 HAS-U 5.8	[kN]	7,2	12,0	16,8
	Screw 8.8		12,0	18,4	27,2
$M_{Rd,s}$	HIT-V 5.8 HAS-U 5.8	[Nm]	15,2	29,6	52,8
	Screw 8.8		24,0	48,0	84,0

Static and quasi-static resistance (for a single anchor)

Design tension and shear resistances – Pull-out failure of the anchor, brick breakout failure and local brick failure at edge distance (c ≥ c*) for single anchor applications

Load type	Anchor size		h_{ef} [mm]	f_b [N/mm²]	w/w and w/d		d/d	
					Ta	Tb	Ta	Tb
					Loads [kN]			
	**SC1 – Solid clay brick Mz, 1DF (ETA data)**							
$N_{Rd,p} = N_{Rd,b}$ (c ≥ 115 mm)	HIT-V, HAS-U	M8, M10, M12, M16	≥ 50	12	0,6 (0,8[a])			
				20	0,8 (1,0[a])			
				40	1,4 (1,6[a])			
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12 M8, M10, M12	≥ 80	12	1,0 (1,2[a])			
				20	1,4 (1,6[a])			
				40	2,2 (2,6[a])			
			≥ 100	12	1,4 (1,6[a])			
				20	1,8 (2,0[a])			
				40	2,8 (3,2[a])			
$V_{Rd,b}$ (c ≥ 115 mm)	HIT-V, HAS-U	M8, M10	≥ 50	12	1,0			
				20	1,2			
				40	1,6			
	HIT-V, HAS-U	M12, M16	≥ 50	12	1,4			
				20	1,8			
				40	2,2			
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M8, M10 M8, M10 M8, M10 M8 M8	≥ 80	12	2,0			
				20	2,4			
				40	3,0			
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M12, M16 M12, M16 M12, M16 M10, M12 M10, M12	≥ 80	12	2,6			
				20	3,4			
				40	4,2			
	**SC2 – Solid clay brick Mz, NF (ETA data)**							
$N_{Rd,p} = N_{Rd,b}$ (c ≥ 50 mm)	HIT-V, HAS-U	M8, M10, M12, M16	≥ 50	10	0,6 (0,6[a])			
				20	0,8 (0,8[a])			
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12 M8, M10, M12	≥ 80	10	1,0 (1,2[a])			
				20	1,4 (1,6[a])			
$N_{Rd,p} = N_{Rd,b}$ (c ≥ 150 mm)			≥ 100	10	1,6 (1,8[a])			
				20	2,2 (2,4[a])			
$V_{Rd,b\,II}$ (c ≥ 50 mm)	HIT-V, HAS-U	M8, M10, M12, M16	≥ 50	10	1,2			
				20	1,8			
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12 M8, M10, M12	≥ 80	10	1,6			

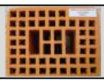
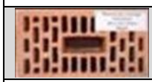
Load type	Anchor size		h_{ef} [mm]	f_b [N/mm²]	w/w and w/d		d/d	
					Ta	Tb	Ta	Tb
					Loads [kN]			
$V_{Rd,b\,II}$ (c ≥ 1,5 h_{ef})	HIT-V, HAS-U	M8, M10, M12, M16	≥ 50	10	1,2			
				20	1,8			
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M8, M10 M8, M10 M8, M10 M8 M8	≥ 80	10	2,0			
				20	2,8			
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10 M8, M10 M8, M10	≥ 100	10	3,2			
				20	4,4			
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M12, M16 M12, M16 M12, M16 M10, M12 M10, M12	≥ 80	10	3,6			
				20	4,8			
	**SC3 - Solid clay brick Mz, 2DF (ETA data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 115 mm)	HIT-V, HAS-U	M8, M10, M12, M16	≥ 50	12	1,0 (1,2[a])			
				20	1,0 (1,2[a])			
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12, M16 M8,M10, M12 M8,M10, M12	≥ 80	12	1,4 (1,6[a])			
				20	1,8 (2,2[a])			
			≥ 100	12	2,4 (2,8[a])			
				20	2,8 (3,2[a])			
$V_{Rd,b}$ (c ≥ 1,5 h_{ef})	HIT-V, HAS-U	M8, M10, M12, M16	≥ 50	12	2,2			
				20	2,8			
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M8, M10 M8, M10 M8, M10 M8 M8	≥ 80	12	3,2			
				20	4,0			
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M12 M12 M12 M10 M10	≥ 80	12	4,2			
				20	4,8			
$V_{Rd,b}$ (c ≥ 1,5 h_{ef})	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M16 M16 M16 M12 M12	≥ 80	12	4,8			
				20	4,8			

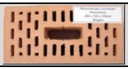
Load type	Anchor size		h_{ef} [mm]	f_b [N/mm²]	w/w and w/d		d/d	
					Ta	Tb	Ta	Tb
					Loads [kN]			
	**SC4 - Solid clay brick UK London yellow Multi Stock (Hilti data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 100 mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10, M12,M16 M8, M10, M12,M16	≥ 50	16	1,4 (1,6[a])			
	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10 M8, M10	≥ 80		2,2 (2,6[a])			
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M12, M16 M12, M16 M8, M10, M12			2,6 (3,0[a])			
$V_{Rd,b}$ (c ≥ 1,5 h_{ef})	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10 M8, M10	≥ 50	16	2,6			
	HIT-V + HIT-SC HAS-U + HIT-SC	M12, M16 M12, M16			3,2			
	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10 M8, M10	≥ 80		3,2			
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M12, M16 M12, M16 M8, M10, M12			4,8			
	**SC5 - Solid clay brick AUS Common dry pressed (Hilti data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 110 mm)	HIT-V, HAS-U HIT-IC	M8, M10, M12 M8,M10, M12	80	25	2,6 (3,0[a])			
$V_{Rd,b\ II}$ (c ≥ 110 mm)	HIT-V, HAS-U HIT-IC	M8, M10 M8	80	25	3,8			
	HIT-V, HAS-U HIT-IC	M12 M10, M12			4,8			
	**SC6 – Rosso Classico, Rosso Vivo (ETA data)[a,b]**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 150 mm)	Rebar Ø	8	100 200	18	2,4 3,8		2,4 4,0	
	Rebar Ø HIT-V, HAS-U	12 M12	50 300		0,24 5,2		0,24 5,6	
$V_{Rd,b\ II}$ (c ≥ 150 mm)	Rebar Ø	8	100	18	1,1			
	Rebar Ø HIT-V, HAS-U	12 M12						

a) Compressed Air Cleaning only

b) Linear interpolation for intermediate embedment depth values, according to ETA-22/0395.

Design tension and shear resistances – Pull-out failure of the anchor, brick breakout failure and local brick failure at edge distance (c ≥ c*) for single anchor applications

<table>
<tr><th rowspan="3">Load type</th><th rowspan="3" colspan="2">Anchor size</th><th rowspan="3">h_{ef} [mm]</th><th rowspan="3">f_b [N/mm²]</th><th colspan="2">w/w and w/d</th><th colspan="2">d/d</th></tr>
<tr><th>Ta</th><th>Tb</th><th>Ta</th><th>Tb</th></tr>
<tr><th colspan="4">Loads [kN]</th></tr>
<tr><td></td><td colspan="8">HC1 - Hollow clay brick
Hlz, 10DF (ETA data)</td></tr>
<tr><td rowspan="2">N_{Rd,p} = N_{Rd,b}
(c ≥ 150 mm)</td><td rowspan="2">HIT-V + HIT-SC
HAS-U + HIT-SC
HIT-IC + HIT-SC</td><td rowspan="2">M8, M10, M12, M16
M8, M10, M12, M16
M8, M10, M12</td><td rowspan="2">≥ 80</td><td>12</td><td colspan="4">2,2 (2,4[a])</td></tr>
<tr><td>20</td><td colspan="4">2,8 (3,2[a])</td></tr>
<tr><td rowspan="4">V_{Rd,b II}
(c ≥ 300 mm)</td><td rowspan="2">HIT-V + HIT-SC
HAS-U + HIT-SC
HIT-IC + HIT-SC</td><td rowspan="2">M8, M10
M8, M10
M8</td><td rowspan="4">≥ 80</td><td>12</td><td colspan="4">1,8</td></tr>
<tr><td>20</td><td colspan="4">2,2</td></tr>
<tr><td rowspan="2">HIT-V + HIT-SC
HAS-U + HIT-SC
HIT-IC + HIT-SC</td><td rowspan="2">M12, M16
M12, M16
M10, M12</td><td>12</td><td colspan="4">3,8</td></tr>
<tr><td>20</td><td colspan="4">4,0</td></tr>
<tr><td></td><td colspan="8">HC2 - Hollow clay brick
Italy Mattone Alveolater 50 (Hilti data)</td></tr>
<tr><td rowspan="2">N_{Rd,p} = N_{Rd,b}
(c ≥ 50 mm)</td><td>HIT-V + HIT-SC
HAS-U + HIT-SC
HIT-IC + HIT-SC</td><td>M8, M10, M12, M16
M8, M10, M12, M16
M8, M10, M12</td><td>≥ 80</td><td rowspan="2">16</td><td colspan="4">1,8 (2,0[a])</td></tr>
<tr><td>HIT-V + HIT-SC
HAS-U + HIT-SC</td><td>M8, M10, M12, M16
M8, M10, M12, M16</td><td>≥ 130</td><td colspan="4">2,6 (3,0[a])</td></tr>
<tr><td rowspan="2">V_{Rd,b}
(c ≥ 150 mm)</td><td>HIT-V + HIT-SC
HAS-U + HIT-SC
HIT-IC + HIT-SC</td><td>M8, M10, M12, M16
M8, M10, M12, M16
M8, M10, M12</td><td>≥ 80</td><td rowspan="2">16</td><td colspan="4">1,4</td></tr>
<tr><td>HIT-V + HIT-SC
HAS-U + HIT-SC</td><td>M8, M10, M12, M16
M8, M10, M12, M16</td><td>≥ 130</td><td colspan="4">2,6</td></tr>
<tr><td></td><td colspan="8">HC3 - Hollow clay brick
Spain Termoarcilla (Hilti data)</td></tr>
<tr><td rowspan="2">N_{Rd,p} = N_{Rd,b}
(c_{cr} = 50 mm)</td><td>HIT-V + HIT-SC
HAS-U + HIT-SC</td><td>M8, M10, M12, M16
M8, M10, M12, M16</td><td>≥ 50</td><td rowspan="2">22</td><td colspan="4">0,6 (0,8[a])</td></tr>
<tr><td>HIT-V + HIT-SC
HAS-U + HIT-SC
HIT-IC + HIT-SC</td><td>M8, M10, M12, M16
M8, M10, M12, M16
M8, M10, M12</td><td>≥ 80</td><td colspan="4">1,0 (1,2[a])</td></tr>
<tr><td>V_{Rd,b}
(c ≥ 150 mm)</td><td>HIT-V + HIT-SC
HAS-U + HIT-SC
HIT-IC + HIT-SC</td><td>M8, M10, M12, M16
M8, M10, M12, M16
M8, M10, M12</td><td>≥ 50</td><td>22</td><td colspan="4">1,8</td></tr>
<tr><td></td><td colspan="8">HC4 - Hollow clay brick
Belgium Wienerberger Thermobrick (Hilti data)</td></tr>
<tr><td rowspan="2">N_{Rd,p} = N_{Rd,b}
(c ≥ 150 mm)</td><td>HIT-V + HIT-SC
HAS-U + HIT-SC</td><td>M8, M10, M12, M16
M8, M10, M12, M16</td><td>≥ 50</td><td rowspan="2">21</td><td colspan="4">0,5 (0,6[a])</td></tr>
<tr><td>HIT-V + HIT-SC
HAS-U + HIT-SC
HIT-IC + HIT-SC</td><td>M8, M10, M12, M16
M8, M10, M12, M16
M8, M10, M12</td><td>≥ 80</td><td colspan="4">2,2 (2,6[a])</td></tr>
<tr><td rowspan="2">V_{Rd,b}
(c ≥ 150 mm)</td><td>HIT-V + HIT-SC
HAS-U + HIT-SC</td><td>M8, M10
M8, M10</td><td rowspan="2">≥ 50</td><td rowspan="2">21</td><td colspan="4">2,4</td></tr>
<tr><td>HIT-V + HIT-SC
HAS-U + HIT-SC
HIT-IC + HIT-SC</td><td>M12, M16
M12, M16
M8, M10, M12</td><td colspan="4">2,8</td></tr>
</table>

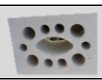
Load type	Anchor size		h_{ef} [mm]	f_b [N/mm²]	w/w and w/d		d/d	
					Ta	Tb	Ta	Tb
					Loads [kN]			
	**HC5 - Hollow clay brick Spain Hueco doble (Hilti data)**							
$N_{Rd,p} = N_{Rd,b}$ (c ≥ 120 mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	≥ 50	4	0,4			
	HIT-V + HIT-SC HAS-U + HIT-SC	M8 M8	80		0,8 (1,0[a])			
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M10 M10 M8, M10, M12			1,0 (1,2[a])			
	HIT-V + HIT-SC HAS-U + HIT-SC	M12, M16 M12, M16			1,4 (1,6[a])			
$V_{Rd,b}$ (c ≥ 120 mm)	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 50	4	1,2			
	**HC6 - Hollow clay brick Belgium Wienerberger Powerbrick (Hilti data)**							
$N_{Rd,p} = N_{Rd,b}$ (c ≥ 50 mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	≥ 50	41	1,6 (1,8[a])			
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 80		2,6 (2,8[a])			
$V_{Rd,b}$ (c ≥150 mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10 M8, M10	≥ 50	41	2,6			
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M12, M16 M12, M16 M8, M10, M12			4,8			
	**HC7 - Hollow clay brick Italy Doppio uni (Hilti data)**							
$N_{Rd,p} = N_{Rd,b}$ (c ≥ 50 mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	≥ 50	27	0,6			
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 80		1,0 (1,2[a])			
	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	≥ 130		2,8 (3,2[a])			
$V_{Rd,b}$ (c ≥ 150 mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	≥ 50	27	1,6			
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 80		3,6			
	**HC8 - Hollow clay brick Spain Ladrillo cara vista (Hilti data)**							
$N_{Rd,p} = N_{Rd,b}$ (c ≥ 115 mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	≥ 50	42	0,6 (0,8[a])			
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 80		2,2 (2,6[a])			
$V_{Rd,b}$ (c ≥ 115 mm)	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 50	42	1,8			

Load type	Anchor size		h_{ef} [mm]	f_b [N/mm²]	w/w and w/d		d/d	
					Ta	Tb	Ta	Tb
					Loads [kN]			
	**HC9 - Hollow clay brick Spain Clinker mediteraneo (Hilti data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 115mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	≥ 50	78	0,6 (0,8[a])			
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 80		2,0 (2,2[a])			
$V_{Rd,b}$ (c ≥ 115 mm)	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 50	78	2,0			
	**HC10 Hollow clay brick UK Nostell Red Multi (Hilti data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 105 mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	≥ 50	70	2,4 (2,8[a])			
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 80		2,8 (3,2[a])			
$V_{Rd,b}$ (c ≥ 105 mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	≥ 50	70	4,6			
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 80		4,8			
	**HC11 Hollow clay brick AUS Common standard (Hilti data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 110 mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	≥ 50	84	0,6 (0,8[a])			
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10 M8, M10 M8	≥ 80		2,6 (3,0[a])			
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M12, M16 M12, M16 M10, M12			2,8 (3,2[a])			
$V_{Rd,b\ II}$ (c ≥ 110 mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10 M8, M10	≥ 50	84	2,0			
	HIT-V + HIT-SC HAS-U + HIT-SC	M12, M16 M12, M16			2,8			
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M16 M16 M8, M10, M12	≥ 80		3,8			

a) Compressed Air Cleaning only

Design tension and shear resistances – Pull-out failure of the anchor, brick breakout failure and local brick failure at edge distance (c ≥ c*) for single anchor applications

Load type	Anchor size		h_{ef} [mm]	f_b [N/mm²]	w/w and w/d		d/d	
					Ta	Tb	Ta	Tb
					Loads [kN]			
	**CC1 - Ceiling Hollow clay brick “Ds-1,0” (ETA data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 100 mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M6 M6	≥ 80	3	0,6			
	**CC2 - Ceiling Hollow clay brick Italy Mattone rosso (Hilti data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 100 mm)	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M6, M8, M10, M12 M6, M8, M10, M12 M8,M10, M12	≥ 80	3	0,6			
	**SCS1 - Solid silica brick KS, 2DF (ETA data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 115 mm)	HIT-V, HAS-U	M8, M10, M12, M16	≥ 80	26	0,6			
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 115 mm) $V_{Rd,b\,II}$ (c ≥ 115 mm)	HIT-V, HAS-U	M8, M10, M12, M16	≥ 50	12	-		2,4	2,0
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12 M8, M10, M12		28	-		3,6	3,0
	HIT-V, HAS-U HIT-V + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	≥ 80	12	-		2,4	2,0
	HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC HIT-V, HAS-U	M8, M10, M12, M16 M8, M10, M12 M8, M10, M12 M8, M10, M12, M16		28	-		3,6	3,0
$V_{Rd,b\,II}$ (c ≥ 115 mm)	HIT-V, HAS-U	M8, M10, M12, M16	≥ 50	12	-		2,4	
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12 M8, M10, M12		28	-		3,6	
	HIT-V, HAS-U HIT-V + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	≥ 80	12	-		2,4	
	HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12 M8, M10, M12						

Load type	Anchor size		h_{ef} [mm]	f_b [N/mm²]	w/w and w/d Ta	w/w and w/d Tb	d/d Ta	d/d Tb
					Loads [kN]			
	**SCS2- Solid silica brick KS, 8DF (ETA data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 120 mm)	HIT-V, HAS-U	M8, M10, M12, M16	≥ 50	12	-		2,8	2,2
				20	-		3,6	3,0
				28	-		4,2	3,4
	HIT-V, HAS-U	M8, M10	≥ 80	12	-		3,4	2,8
				20	-		4,4	3,6
				28	-		4,8	4,2
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M12 M8, M10 M8, M10 M8, M10 M8		12	-		4,6	3,8
				≥ 20	-		4,8	
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M16 M12, M16 M12, M16 M12 M10, M12		≥ 12	-		4,8	
	HIT-V, HAS-U	M8, M10	≥ 100	12	-		4,8	4,4
				≥ 20	-		4,8	
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC	M12, M16 M8, M10, M12, M16 M8, M10, M12, M16		≥ 12	-		4,8	
$V_{Rd,b\ II}$ (c ≥ 120 mm)	HIT-V, HAS-U	M8, M10	≥ 50	12	-		3,6	
				≥ 20	-		4,8	
	HIT-V, HAS-U	M12, M16	≥ 50	≥ 12	-		4,8	
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12 M8, M10, M12	≥ 80	≥ 12	-		4,8	
	**HCS1 - Hollow silica brick KSL, 8DF (ETA data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 50 mm)	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 80	12	-	-	1,6	1,2
				20	-	-	2,2	1,8
	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	≥ 130	12	-	-	2,0	1,6
				20	-	-	3,0	2,4
$V_{Rd,b\ II}$ (c ≥ 125 mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M8 M8	≥ 80	12	-		2,4	
				20	-		3,6	
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M10 M10 M8		12	-		3,6	
				20	-		4,8	
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M12, M16 M12, M16 M10, M12		12	-		4,8	
				20	-		4,8	
	**HCS2 - Hollow silica brick Germany KSL, 3DF (Hilti data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 50 mm)	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 80	12	-	-	2,0	1,6
$V_{Rd,b}$ (c ≥ 120 mm)	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 80	12	-		2,0	

a) Compressed Air Cleaning only

Design tension and shear resistances – Pull-out failure of the anchor, brick breakout failure and local brick failure at edge distance (c ≥ c*) for single anchor applications

Load type	Anchor size	h_{ef} [mm]	f_b [N/mm²]	w/w and w/d Ta	w/w and w/d Tb	d/d Ta	d/d Tb
				Loads [kN]			
	**SLWC1 - Solid lightweight concrete brick Vbl, 2DF (ETA data)**						
$N_{Rd,p} = N_{Rd,b}$ (c ≥ 115 mm)	HIT-V, HAS-U M8, M10, M12, M16	≥ 50	4	1,2	0,8	1,2 (1,4[a])	1,0
			6	1,4	1,2	1,6	1,2 (1,4[a])
	HIT-V, HAS-U M8, M10, M12, M16 HIT-V + HIT-SC M8, M10, M12, M16 HAS-U + HIT-SC M8, M10, M12, M16 HIT-IC M8, M10, M12 HIT-IC + HIT-SC M8, M10, M12	≥ 80	4	1,8	1,4	2,0	1,6 (1,8[a])
			6	2,2	1,8	2,4 (2,6[a])	2,0 (2,2[a])
		≥ 100	4	2,4	2,0	2,6 (2,8[a])	2,2 (2,4[a])
			6	3,0	2,4	3,2 (3,4[a])	2,6 (2,8[a])
$V_{Rd,b\ II}$ (c ≥ 115 mm)	HIT-V, HAS-U M8, M10, M12, M16	≥ 50	4	0,8			
			6	1,0			
	HIT-V, HAS-U M10, M12, M16 HIT-V + HIT-SC M8, M10, M12, M16 HAS-U + HIT-SC M8, M10, M12, M16 HIT-IC M8, M10, M12 HIT-IC + HIT-SC M8, M10, M12	≥ 80	4	1,0			
			6	1,2			
	**SLWC2 - Solid lightweight concrete brick Sweden Leca typ 3 (Hilti data)**						
$N_{Rd,p} = N_{Rd,b}$ (c ≥ 115 mm)	HIT-V + HIT-SC M8, M10, M12, M16 HAS-U + HIT-SC M8, M10, M12, M16 HIT-IC + HIT-SC M8, M10, M12	≥ 80	3	2,2	1,8	2,4 (2,6[a])	2,0 (2,2[a])
$V_{Rd,b}$ (c ≥ 115 mm)	HIT-V + HIT-SC M8, M10, M12, M16 HAS-U + HIT-SC M8, M10, M12, M16	≥ 80	3	1,6			
	HIT-IC + HIT-SC M8, M10, M12			1,0			
	**SLWC3 - Solid lightweight concrete brick Italy “Tufo” volcanic rock (Hilti data)**						
$N_{Rd,p} = N_{Rd,b}$ (c ≥ 115 mm)	HIT-V, HAS-U M8	≥ 80	4	1,2	1,0	1,4	1,2
	HIT-V, HAS-U M10			1,6	1,2	1,8	1,4 (1,6[a])
	HIT-V, HAS-U M12			1,8	1,6	2,0	1,8
	HIT-V, HAS-U M16			2,2	1,8	2,4 (2,6[a])	2,0 (2,2[a])
$V_{Rd,b}$ (c ≥ 115 mm)	HIT-V, HAS-U M8	≥ 80	4	0,8			
	HIT-V, HAS-U M10, M12, M16			1,8			
	**HLWC1 - Hollow lightweight concrete brick Hbl, 16DF (ETA data)**						
$N_{Rd,p} = N_{Rd,b}$ (c ≥ 125 mm)	HIT-V + HIT-SC M8, M10 HAS-U + HIT-SC M8, M10 HIT-IC + HIT-SC M8	≥ 80	2	1,4	1,2	1,6	1,2 (1,4[a])
			6	2,4	2,0	2,6 (2,8[a])	2,2 (2,4[a])
	HIT-V + HIT-SC M12, M16 HAS-U + HIT-SC M12, M16 HIT-IC + HIT-SC M10, M12	≥ 80	2	1,6	1,4	1,8	1,4 (1,6[a])
			6	2,8	2,4	3,2	2,6 (2,8[a])
$V_{Rd,b}$ (c ≥ 250 mm)	HIT-V + HIT-SC M8, M10 HAS-U + HIT-SC M8, M10 HIT-IC + HIT-SC M8	≥ 80	2	1,6			
			6	2,6			
	HIT-V + HIT-SC M12 HAS-U + HIT-SC M12 HIT-IC + HIT-SC M10		2	2,2			
			6	3,8			
	HIT-V + HIT-SC M16 HAS-U + HIT-SC M16 HIT-IC + HIT-SC M12		2	2,4			
			6	4,0			

Load type	Anchor size		h_{ef} [mm]	f_b [N/mm²]	w/w and w/d		d/d	
					Ta	Tb	Ta	Tb
					Loads [kN]			
	**HLWC2 - Hollow lightweight concrete brick Germany - Hbl 2, 10DF (Hilti data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 50 mm)	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 80	2	0,6	0,5	0,6	0,5 (0,6[a])
$V_{Rd,b}$ (c ≥ 250 mm)	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 80	2	0,6			
	**HLWC3 - Hollow lightweight concrete brick Germany - Hbl 4, 8DF (Hilti data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 50 mm)	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 80	4	0,6	0,6	0,8	0,6
$V_{Rd,b}$ (c ≥ 250 mm)	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 80	4	1,4			

a) Compressed Air Cleaning only

Design tension and shear resistances – Pull-out failure of the anchor, brick breakout failure and local brick failure at edge distance (c ≥ c*) for single anchor applications

	**SNWC1 - Solid normal weight concrete brick Vbn, 2DF (ETA data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 115 mm)	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12, M16 M8,M10, M12 M8,M10, M12	≥ 80[b)]	6	1,2	1,0	1,2	1,0
				16	2,2	1,8	2,2	1,8
$V_{Rd,b}$ (c ≥ 115 mm)	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12 M8, M10, M12	≥ 80[b)]	6	1,6			
				16	2,6			
	**SNWC2 - Solid normal weight concrete brick UK Dense concrete b=100 mm (Hilti data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 115 mm)	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12, M16	50	14	2,2	1,8	2,2	1,8
$V_{Rd,b}$ (c ≥ 115 mm)	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12, M16	50	14	4,2			

Load type	Anchor size		h_{ef} [mm]	f_b [N/mm²]	w/w and w/d		d/d	
					Ta	Tb	Ta	Tb
					Loads [kN]			
	**SNWC3 - Solid normal weight concrete brick UK Dense concrete b=140 mm (Hilti data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 115 mm)	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12, M16 M8,M10, M12 M8,M10, M12	≥ 50	14	2,2	1,8	2,2	1,8
$V_{Rd,b}$ (c ≥ 115 mm)	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12, M16	50	14	4,2			
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10 M8, M10 M8, M10	80		4,2			
	HIT-V, HAS-U HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC HIT-IC + HIT-SC	M12, M16 M12, M16 M12, M16 M8,M10, M12 M8,M10, M12			4,8			
	**HNWC1 - Hollow normal weight concrete brick Parpaing creux (ETA data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 50 mm)	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8,M10, M12	≥ 50	4	0,36	0,36	0,36	0,36
				10	0,8	0,6	0,8	0,6
	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	≥ 130	4	0,6	0,5	0,6	0,5
				10	1,0	0,8	1,0	0,8
$V_{Rd,b}$ (c ≥ 200 mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	≥ 50	4	1,6			
				10	2,6			
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 80	4	2,0			
				10	3,0			

a) Compressed Air Cleaning only

b) ≥ 50 mm for HIT-V without HIT-SC

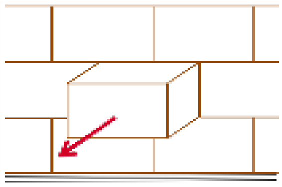
Design tension and shear resistances – Pull-out failure of the anchor, brick breakout failure and local brick failure at edge distance (c ≥ c*) for single anchor applications

Load type	Anchor size		h_{ef} [mm]	f_b [N/mm²]	w/w and w/d		d/d	
					Ta	Tb	Ta	Tb
					Loads [kN]			
	**HNWC2 - Hollow normal weight concrete brick Italy Blocchi Cem (Hilti data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 50 mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	8	1,0	0,8	1,0	0,8
	HAS-U + HIT-SC	M8, M10, M12, M16						
	HIT-IC + HIT-SC	M8, M10, M12						
$V_{Rd,b}$ (c ≥ 200 mm)	HIT-V + HIT-SC	M8, M10	≥ 50	8	4,0			
	HAS-U + HIT-SC	M8, M10						
	HIT-IC + HIT-SC	M8						
	HIT-V + HIT-SC	M12, M16			4,4			
	HAS-U + HIT-SC	M12, M16						
	HIT-IC + HIT-SC	M10, M12						
	**HNWC3 - Hollow normal weight concrete brick Germany Hbn 4, 12DF (Hilti data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 50 mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80	4	0,6	0,5	0,6	0,5
	HAS-U + HIT-SC	M8, M10, M12, M16		10	1,0	0,8	1,0	0,8
	HIT-IC + HIT-SC	M8, M10, M12						
$V_{Rd,b}$ (c ≥ 240 mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80	4	2,2			
	HAS-U + HIT-SC	M8, M10, M12, M16		10	3,6			
	HIT-IC + HIT-SC	M8, M10, M12						
	**HNWC4 - Hollow normal weight concrete brick UK (b=215 mm) (Hilti data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 50 mm)	HIT-V + HIT-SC	M8	80	10	0,4	0,4	0,4	0,4
	HAS-U + HIT-SC	M8						
	HIT-V + HIT-SC	M10, M12, M16			1,0	0,8	1,0	0,8
	HAS-U + HIT-SC	M10, M12, M16						
$V_{Rd,b}$ (c ≥ 220 mm)	HIT-V + HIT-SC	M8	80	10	1,4			
	HAS-U + HIT-SC	M8						
	HIT-V + HIT-SC	M10			2,0			
	HAS-U + HIT-SC	M10						
	HIT-V + HIT-SC	M12, M16			2,8			
	HAS-U + HIT-SC	M12, M16						
	**HNWC5 - Hollow normal weight concrete brick UK (b=138 mm) (Hilti data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 50 mm)	HIT-V + HIT-SC	M8	80	13	0,6	0,6	0,6	0,6
	HAS-U + HIT-SC	M8						
	HIT-V + HIT-SC	M10, M12, M16			1,0	0,8	1,0	0,8
	HAS-U + HIT-SC	M10, M12, M16						
$V_{Rd,b}$ (c ≥ 220 mm)	HIT-V + HIT-SC	M8	80	13	1,4			
	HAS-U + HIT-SC	M8						
	HIT-V + HIT-SC	M10			2,0			
	HAS-U + HIT-SC	M10						
	HIT-V + HIT-SC	M12, M16			2,8			
	HAS-U + HIT-SC	M12, M16						
	**HNWC6 - Hollow normal weight concrete brick UK (b=112 mm) (Hilti data)**							
$N_{Rd,p}$ = $N_{Rd,b}$ (c ≥ 50 mm)	HIT-V + HIT-SC	M8	50	7	0,6	0,6	0,6	0,6
	HAS-U + HIT-SC	M8						
	HIT-V + HIT-SC	M10, M12, M16			1,0	0,8	1,0	0,8
	HAS-U + HIT-SC	M10, M12, M16						
$V_{Rd,b}$ (c ≥ 100 mm)	HIT-V + HIT-SC	M8	50	7	1,4			
	HAS-U + HIT-SC	M8						
	HIT-V + HIT-SC	M10			2,0			
	HAS-U + HIT-SC	M10						
	HIT-V + HIT-SC	M12, M16			2,8			
	HAS-U + HIT-SC	M12, M16						

Load type	Anchor size		h_{ef} [mm]	f_b [N/mm²]	w/w and w/d		d/d	
					Ta	Tb	Ta	Tb
					Loads [kN]			
	**HNWC7 - Hollow normal weight concrete brick Finland "Standard Concrete Brick" (Hilti data)**							
$N_{Rd,p} = N_{Rd,b}$ (c ≥ 50 mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10 M8, M10	50	6	0,6	0,4	0,6	0,4
	HIT-V + HIT-SC HAS-U + HIT-SC	M12, M16 M12, M16			0,8	0,6	0,8	0,6
$V_{Rd,b}$ (c ≥ 100 mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M8 M8	50	6	1,0			
	HIT-V + HIT-SC HAS-U + HIT-SC	M10 M10			1,4			
	HIT-V + HIT-SC HAS-U + HIT-SC	M12, M16 M12, M16			1,6			
	**HNWC8 - Hollow normal weight concrete brick AUS Block system 200 (Hilti data)**							
$N_{Rd,p} = N_{Rd,b}$ (c ≥ 50 mm)	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12	≥ 50	15	1,0	0,8	1,0	0,8
$V_{Rd,b}$ (c ≥ 200 mm)	HIT-V + HIT-SC HAS-U + HIT-SC	M8, M10 M8, M10	≥ 50	15	2,0			
	HIT-V + HIT-SC HAS-U + HIT-SC HIT-IC + HIT-SC	M12, M16 M12, M16 M8, M10, M12			3,2			

a) Compressed Air Cleaning only

Design tension and shear resistance – Pull out / Pushing out of one brick failure modes

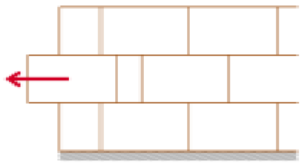


Pull out of one brick (tension):

$$N_{Rd,pb} = 2 \cdot l \cdot b \cdot (0{,}5 \cdot f_{vko} + 0{,}4 \cdot \sigma_d) / (2{,}5 \cdot 1000) \quad [kN]$$

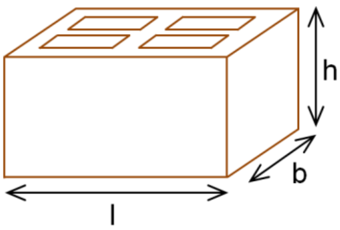
$$N_{Rd,pb} = (2 \cdot l \cdot b \cdot (0{,}5 \cdot f_{vko} + 0{,}4 \cdot \sigma_d) + b \cdot h \cdot f_{vko} / (2{,}5 \cdot 1000) \quad [kN]$$

* this equation is applicable if the vertical joints are filled



Pushing out of one brick (shear):

$$V_{Rd,pb} = 2 \cdot l \cdot b \cdot (0{,}5 \cdot f_{vko} + 0{,}4 \cdot \sigma_d) / (2{,}5 \cdot 1000) \quad [kN]$$



σ_d = design compressive stress perpendicular to the shear (N/mm²)
f_{vko} = initial shear strength according to EN 1996-1-1, Table 3.4

Brick type	Mortar strength	f_{vko} [N/mm²]
Clay brick	M2,5 to M9	0,20
	M10 to M20	0,30
All other types	M2,5 to M9	0,15
	M10 to M20	0,20

Seismic resistance

Design tension and shear resistances – Pull-out failure of the anchor, brick breakout failure and local brick failure at edge distance (c ≥ c*) for single anchor applications

Load type	Anchor size		h_{ef} [mm]	f_b [N/mm²]	w/w and w/d		d/d	
					Ta	Tb	Ta	Tb
					Loads [kN]			
	SC6 – Rosso Classico, Rosso Vivo (ETA data)[a,b]							
$N_{Rd,seis}$ = $N_{Rd,b,seis}$ (c ≥ 150 mm)	Rebar Ø	8	100	18	1,3		1,3	
			200		2,1		2,1	
	Rebar Ø HIT-V, HAS-U	12 M12	50		0,12		0,12	
			300		3,1		3,3	
$V_{Rd,b,seis\ II}$ (c ≥ 150 mm)	Rebar Ø8	8	100	18	0,6[c]			
	Rebar Ø HIT-V, HAS-U	12 M12			0,7[c]			

a) Compressed Air Cleaning only
b) Linear interpolation for intermediate embedment depth values, according to ETA-22/0395.
c) For usage of Hilti seismic filling set, α_{gap} = 1.0 can be applied for shear loads according to ETA-22/0395. In the given values α_{gap} = 1.0 was used.

On-site tests

For other bricks in solid or hollow masonry, not covered by the Hilti HIT-HY 270 ETA or this technical data manual, the characteristic resistance may be determined by on-site tension tests (pull-out tests or proof-load tests), according to EOTA TR053. For the evaluation of test results, the characteristic resistances shall be obtained taking into account reduction factors, which consider the different influences of the product. In case of static and quasi-static actions apply the β–factor and in case of seismic actions apply the factors α_N (tension loading) or α_V (shear loading) from the tables below. For fur consult EOTA TR053 and the respective ETA for HIT-HY 270.

Reduction factor β for static and quasi-static loads

Use categories			**w/w and w/d**		**d/d**	
Temperature range			**Ta***	**Tb***	**Ta***	**Tb***
Base material	**Steel element**	**Cleaning**				
Solid clay brick (EN 771-1)	HAS-U, HIT-V M8-M16	CAC	0,96	0,96	0,96	0,96
		MC	0,84	0,84	0,84	0,84
Solid calcium silicate brick (EN 771-2)		CAC/MC	-	-	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	-	-	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
Rosso Classico, Rosso Vivo (EN 771-1)	HAS-U, HIT-V M12, Rebar Ø8, Ø12	CAC	0,91	0,91	0,96	0,96

*Ta / Tb, w/w and d/d anchorage parameters, as defined on Table page 9

Reduction factors $\alpha_{N,seis}$, $\alpha_{V,seis}$ for seismic loads

Use categories				**w/w and w/d**		**d/d**	
Temperature range				**Ta***	**Tb***	**Ta***	**Tb***
Base material	**Steel element**	**h_{ef}**	**Cleaning**				
Solid clay brick (EN 771-1) Rosso Classico A6R55 or Rosso Vivo A6R55W	**Tension loads ($\alpha_{N,seis}$)**						
	Rebar Ø8	≥ 100	CAC	0,65	0,65	0,65	0,65
		≥ 200	CAC	0,53	0,53	0,55	0,55
	Rebar Ø12 ; HIT-V, HAS-U M12	≥ 50	CAC	0,56	0,56	0,56	0,56
		≥ 300	CAC	0,53	0,53	0,56	0,56
	Shear loads ($\alpha_{V,seis}$)						
	Rebar Ø8	≥ 100	CAC	0,36	0,36	0,36	0,36
	Rebar Ø12 ; HIT-V, HAS-U M12	≥ 100	CAC	0,20	0,20	0,20	0,20

Materials

Material quality

Part	Material
Threaded rod HIT-V 5.8 (F) HAS-U 5.8 (HDG)	Strength class 5.8, A5 > 8% ductile Electroplated zinc coated ≥ 5 µm; (F), (HDG) Hot dip galvanized ≥ 45 µm
Threaded rod HIT-V 8.8 (F) HAS-U 8.8 (HDG)	Strength class 8.8, A5 > 8% ductile Electroplated zinc coated ≥ 5 µm; (F), (HDG) Hot dip galvanized ≥ 45 µm
Threaded rod HIT-V-R HAS-U A4	Stainless steel grade A4 A5 > 8% ductile strength class 70, 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362
Threaded rod HIT-V-HCR HAS-U HCR	High corrosion resistant steel, A5 > 8% ductile 1.4529, 1.4565
Washer	Electroplated zinc coated, hot dip galvanized
	Stainless steel 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362
	High corrosion resistant steel 1.4529, 1.4565 EN 10088
Nut	Strength class 8 steel galvanized ≥ 5 µm, ; hot dipped galvanized ≥ 45 µm
	Strength class 70, stainless steel grade A4, 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362
	Strength class 70, high corrosion resistant steel,1.4529; 1.4565
Internally threaded sleeve HIT-IC	A5 > 8% ductile ; Electroplated zinc coated ≥ 5 µm
Sieve sleeve HIT-SC	Frame: Polyfort FPP 20T ; Sieve: PA6.6 N500/200

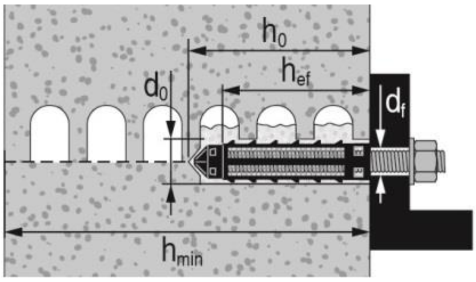
Base materials:

- Solid brick masonry. The resistances are also valid for larger brick sizes and larger compressive strengths of the masonry unit (in case of static and seismic loading)
- Hollow brick masonry (only in case of static loading)
- Mortar strength class of the masonry: M2,5 at minimum according to EN 998-2: 2010.
- For other bricks in solid masonry and in hollow or perforated masonry, the characteristic resistance of the anchor may be determined by on-site tests according to EOTA TR053 under consideration of the β-factor (for static loading) or α-factor (for seismic loading) according to the table on page 21.

Installation parameters

Applications for hollow and solid bricks with sieve sleeves

For installing HIT-V, HAS-U and HIT-IC with embedments of 50 and 80 mm, a single sieve sleeve is used.



Hollow brick with threaded rod HIT-V, HAS-U or internally threaded sleeve HIT-IC and a single sieve sleeve HIT-SC

Installation parameters of HIT-V / HAS-U with one sieve sleeve HIT-SC in hollow and solid brick

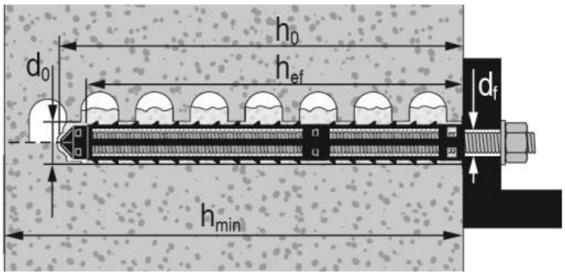
HIT-V / HAS-U			**M6**	**M8**		**M10**		**M12**		**M16**	
with HIT-SC			**12x85**	**16x50**	**16x85**	**16x50**	**16x85**	**18x50**	**18x85**	**22x50**	**22x85**
Nominal diameter of drill bit	d_0	[mm]	12	16	16	16	16	18	18	22	22
Drill hole depth	h_0	[mm]	95	60	95	60	95	60	95	60	95
Effective embedment 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
Nr. of strokes HDE 500-A	-	[-]	4	3	5	3	5	3	6	5	8
Max. 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

Installation parameters of HIT-IC with HIT-SC in hollow and solid brick

HIT-IC			**M8**	**M10**	**M12**
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

Applications for hollow and solid bricks with sieve sleeves (cont.)

For installing HIT-V, HAS-U and HIT-IC with embedments of 130 and 160 mm, two attached sleeves are used.



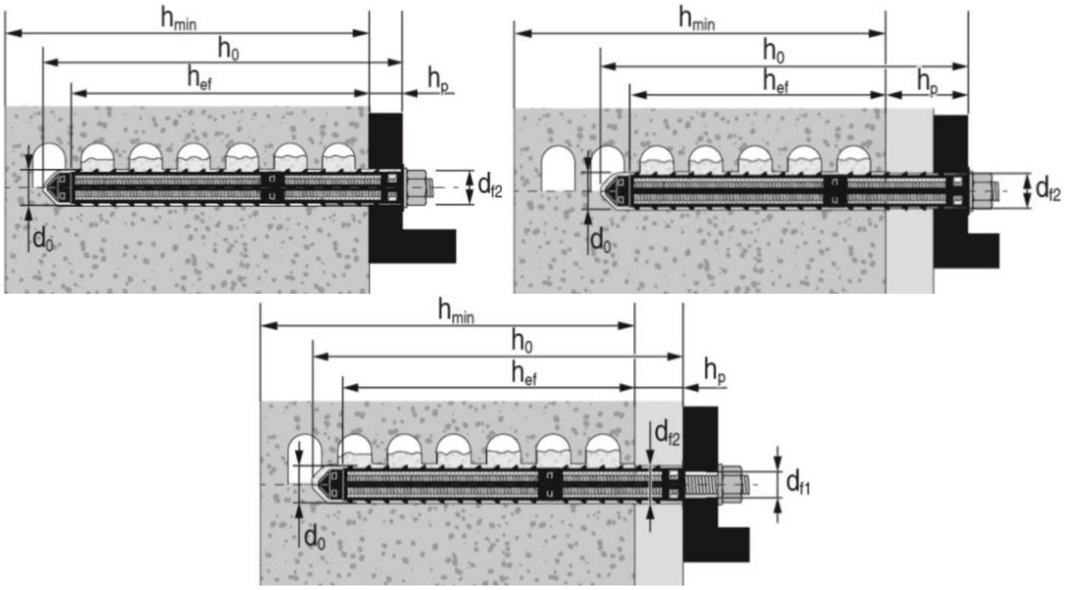
Hollow brick with threaded rod HIT-V / HAS-U and two sieve sleeves HIT-SC for deeper embedment depth

Installation parameters of HIT-V / HAS-U with two attached sleeves HIT-SC in hollow and solid brick

HIT-V / HAS-U			**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

Applications for hollow and solid bricks with sieve sleeves (cont.)

For through fastenings with HIT-V and HAS-U, two attached sleeves are used.



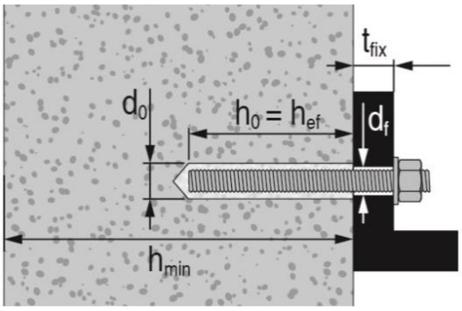
Hollow and solid brick with threaded rod HIT-V and HAS-U with two sieve sleeves HIT-SC for setting through the fixture and/or through the non-loadbearing layer

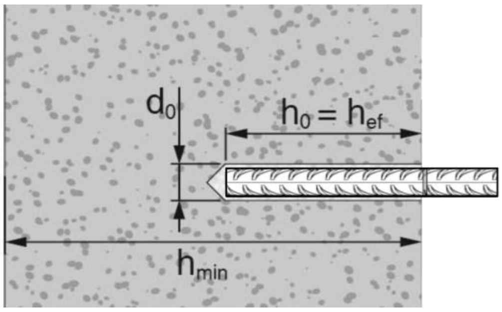
Installation parameters of HIT-V / HAS-U with two sieve sleeves throught the fixture and/or through the non-loadbearing layer in hollow and solid bricks

HIT-V / HAS-U			**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	$h_{ef,min}$	[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 fixture (through setting)	d_{f2}	[mm]	17	17	17	17	19	19	23	23
Minimum 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	-	[-]	3+5	5+5	3+5	5+5	5+8	8+8	5+8	8+8
Max. torque moment for all brick types except “parpaing creux”	T_{max}	[Nm]	3	3	4	4	6	6	8	8
Max. torque moment for “parpaing creux”	T_{max}	[Nm]	2	2	2	2	3	3	6	6

Applications for solid bricks without sieve sleeves.

Hilti recommends the anchoring in masonry always with sieve sleeve. Anchors can only be installed without sieve sleeves in solid bricks when it is guaranteed that it has not any hole or void.



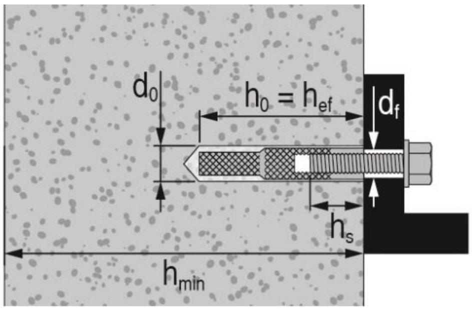


Solid brick with threaded rod HIT-V or HAS-U or Rebar

Installation parameters of HIT-V / HAS-U / Rebar in solid bricks

Type of element			**HAS-U, HIT-V**				**Rebar**	
Anchor size			**M8**	**M10**	**M12**	**M16**	**Ø8**	**Ø12**
Nominal diameter of drill bit	d_0	[mm]	10	12	14	18	12	14
Drill hole depth = Effective embedment depth	$h_0 = h_{ef}$	[mm]	50…300	50…300	50…350 a)	50…300	100…200	50…350 a)
Maximum diameter of clearance hole in the fixture	d_f	[mm]	9	12	14	18	9	14
Minimum wall thickness	h_{min}	[mm]	h_0+30	h_0+30	h_0+30	h_0+36	h_0+30; ≥ 250	
Brush HIT-RB	-	[-]	10	12	14	18	12	14
Maximum torque moment	T_{max}	[Nm]	5	8	h_{ef} < 100 mm : 5 h_{ef} ≥ 100 mm : 10	10	-	-

a) Additional details – see in ETA-22/0395



Solid brick with internal threaded sleeve HIT-IC

Installation parameters of HIT-IC in solid bricks

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

Working time and curing time for solid bricks

Temperature in the base material	Maximum working time	Minimum curing time
T_{BM}	t_{work}	t_{cure} 1)
5 °C to 9 °C	10 min	2,5 h
10 °C to 19 °C	7 min	1,5 h
20 °C to 29 °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.

Working time and curing time for hollow bricks

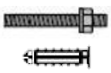
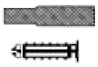
Temperature in the base material	Maximum working time	Minimum curing time
T_{BM}	t_{work}	t_{cure} 1)
-5 °C to -1 °C 2)	10 min	6 h
0 °C to 4 °C	10 min	4 h
5 °C to 9 °C	10 min	2,5 h
10 °C to 19 °C	7 min	1,5 h
20 °C to 29 °C	4 min	30 min
30 °C to 40 °C	1 min	20 min

1) The curing time data are valid for dry base material only. In wet base material, the curing times must be doubled;
2) Only for HIT-V anchor rods acc.to ETA-13/1036

Installation equipment

Type of steel element	HAS-U, HIT-V					Rebar	
Anchor size	**M6**	**M8**	**M10**	**M12**	**M16**	**Ø8**	**Ø12**
Rotary hammer	TE2(A) – TE30(A)						
Other tools	compressed air gun or blow out pump, set of cleaning brushes, dispenser						

Drilling and cleaning parameters

HIT-V / HAS-U a)	HIT-V / HAS-U + sieve sleeve	HIT-IC a)	HIT-IC + sieve sleeve	Rebar	Hammer drill d_0 [mm]	Brush HIT-RB size [mm]
						
M6	-	-	-	-	8	8
M8	-	-	-	**Ø8**	10	10
M10	-	-	-	-	12	12
M12	-	M8	-	**Ø12**	14	14
-	M8	M10	M8	-	16	16
-	M10	-	-	-	16	16
M16	M12	M12	M10	-	18	18
-	M16	-	M12	-	22	22

a) Installation without the sieve sleeve HIT-SC can be used only in case of solid bricks.

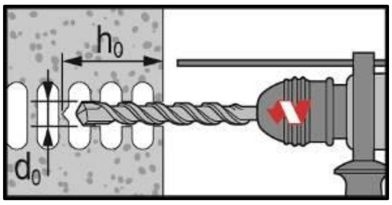
Setting instructions

***For detailed information on installation see instruction for use given with the package of the product.**

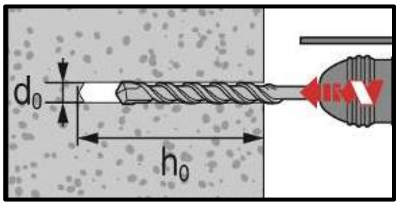
Safety regulations.

Review the Material Safety Data Sheet (MSDS) before use for proper and safe handling! Wear well-fitting protective goggles and protective gloves when working with Hilti HIT-HY 270.

Drilling

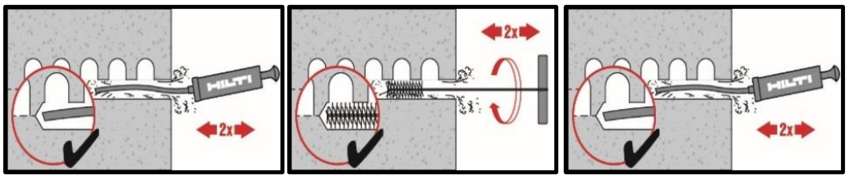


In hollow bricks: rotary mode



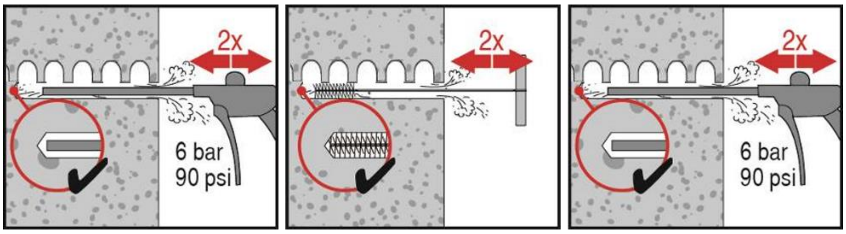
In solid bricks: hammer mode

Cleaning



Manual cleaning (MC)

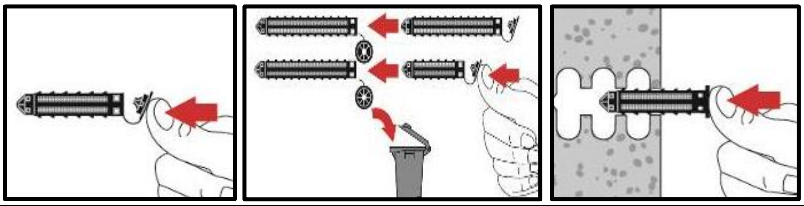
For drill hole diameter $d_0 \le 18$ mm and drill hole depth $h_0 \le 100$ mm



Compressed air cleaning (CAC)

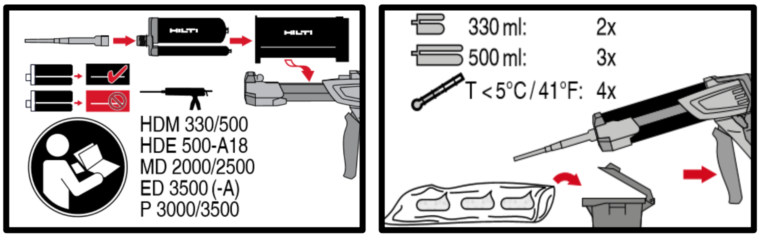
For drill hole depth $h_0 \le 300$ mm

Injection preparation for hollow and solid bricks with sieve sleeve



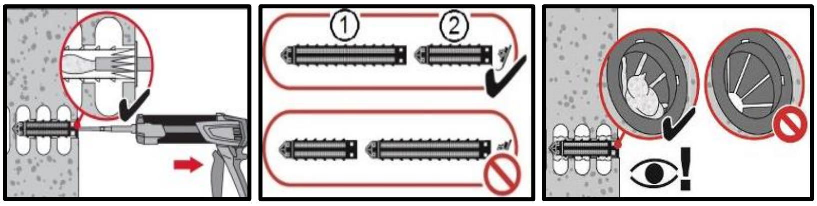
Close lid and insert sieve sleeve manually.

All applications

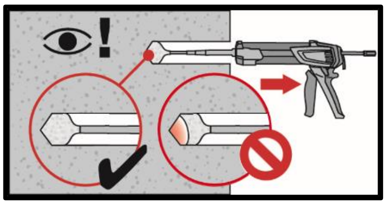


Injection system preparation.

Inject the adhesive without forming air voids

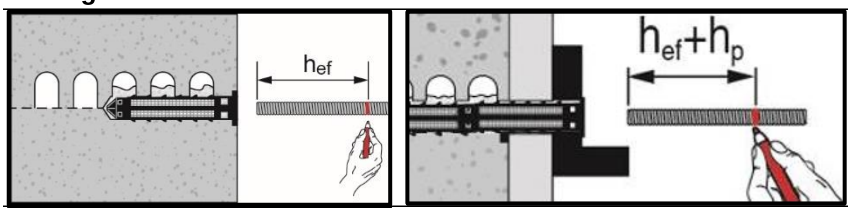


Injection method 1 for Installation with sieve sleeve HIT-SC. Use extension for installation with two sieve sleeves.

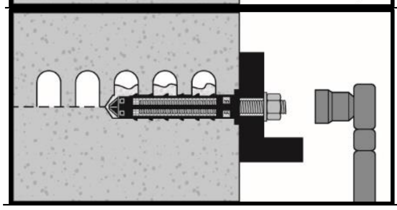


Injection method 2 for installation in solid bricks without sieve sleeve

Setting the element



Marking and setting element,to the required embedment depth, observing working time t_{work}.



Loading the anchor: After required curing time t_{cure} the anchor can be loaded. The applied installation torque shall not exceet the values T_{max}.