

HIT-HY 270 injection mortar

Anchor design (ETAG 029) / Rods&Sleeves / Masonry

Masonry

Chemical anchors

Mechanical anchors

Plastic/Light duty metal anchors

Insulation anchors

Injection mortar system



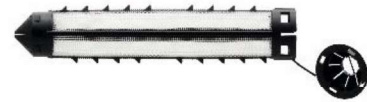
Hilti HIT-HY 270
330 ml foil pack
(also available as
500 ml foil pack)



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



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

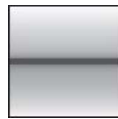
Base material



Solid brick



Hollow brick



Static/
quasi-static



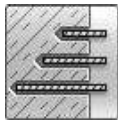
Fire
resistance

Load conditions

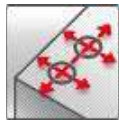
Installation conditions



Hammer
drill bit
(Hammer
mode and
rotary mode)



Variable
embedment
depth



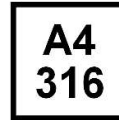
Small edge
distance and
spacing



European
Technical
Assessment



CE
conformity



Corrosion
resistance



High
corrosion
resistance



PROFIS
Engineering
design
software

Other informations

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
European technical assessment	DIBt, Berlin	ETA-13/1036 / 2017-12-12
Hilti Technical Data ^{a)}	Hilti	2017-12-12
Fire test report	MFPA, Leipzig	PB 3.2/14-179-1 / 2014-09-05

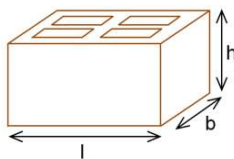
a) Hilti Technical Data is based on testing and assessment by Hilti following EAD 330076-00-0604, EOTA TR053 and TR054

Brick types and properties

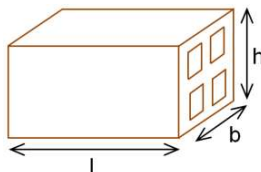
Instruction to this technical data

- 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 referred 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 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

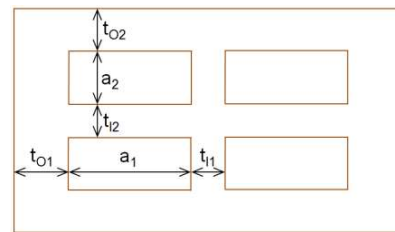


Generic bricks



Bricks HC5, CC1 and CC2

Interior dimensions of the majority of the holes



Brick types and properties

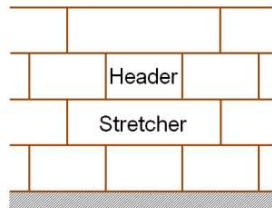
Brick code	Data	Brick name	Image	Size [mm]	t_0 [mm]	t_1 [mm]	a [mm]	f_b [N/mm ²]	ρ [kg/dm ³]	Page
Solid clay										
SC1	ETA	Solid clay brick Mz, 1DF		l: ≥ 240 b: ≥ 115 h: ≥ 52	-	-	-	12 20 40	2,0	8
SC2	ETA	Solid clay brick Mz, NF		l: ≥ 240 b: ≥ 115 h: ≥ 72	-	-	-	10 20	2,0	9
SC3	ETA	Solid clay brick Mz, 2DF		l: ≥ 240 b: ≥ 115 h: ≥ 113	-	-	-	12 20	2,0	9
SC4	Hilti Data	UK London yellow Multi Stock		l: 215 b: 100 h: 65	-	-	-	16	1,5	10
SC5	Hilti Data	Australian common dry pressed		l: 230 b: 110 h: 76	-	-	-	25	2,0	10
Hollow clay										
HC1	ETA	Hollow clay brick Hz, 10DF		l: 300 b: 240 h: 238	t_{01} : 12 t_{02} : 15	t_{11} : 11 t_{12} : 15	a_1 : 10 a_2 : 25	12 20	1,4	10
HC2	Hilti Data	Italy Mattone Alveolater 50		l: 300 b: 245 h: 185	t_{01} : 12 t_{02} : 12	t_{11} : 9 t_{12} : 9	a_1 : 22 a_2 : 25	16	1,0	10
HC3	Hilti Data	Spain Termoarcilla		l: 300 b: 192 h: 190	t_{01} : 9 t_{02} : 9	t_{11} : 7 t_{12} : 7	a_1 : 17 a_2 : --	22	0,9	10
HC4	Hilti Data	Belgium Wienerberger Thermobrick		l: 285 b: 135 h: 138	t_{01} : 10 t_{02} : 10	t_{11} : 7 t_{12} : 7	a_1 : 14 a_2 : 34	21	0,9	10
HC5	Hilti Data	Spain Hueco doble		l: 232 b: 115 h: 78	t_{01} : 9 t_{02} : 9	t_{11} : 8 t_{12} : 8	a_1 : 28 a_2 : 28	4	0,8	11

Brick code	Data	Brick name	Image	Size [mm]	t ₀ [mm]	t ₁ [mm]	a [mm]	f _b [N/mm ²]	ρ [kg/dm ³]	Page
HC6	Hilti Data	Belgium Wienerberger Powerbrick		l: 285 b: 135 h: 135	t ₀₁ : 16 t ₀₂ : 12	t ₁₁ : 10 t ₁₂ : 10	a ₁ : 12 a ₂ : 31	41	1,2	11
HC7	Hilti Data	Italy Doppio uni		l: 240 b: 120 h: 120	t ₀₁ : 12 t ₀₂ : 12	t ₁₁ : 10 t ₁₂ : 12	a ₁ : 22 a ₂ : 24	27	1,1	11
HC8	Hilti Data	Spain Ladrillo cara vista		l: 240 b: 115 h: 49	t ₀₁ : 13 t ₀₂ : 16	t ₁₁ : 7 t ₁₂ : 7	a ₁ : 30 a ₂ : 33	42	1,2	11
HC9	Hilti Data	Spain Clinker mediterraneo		l: 240 b: 115 h: 49	t ₀₁ : 17 t ₀₂ : 17	t ₁₁ : 7 t ₁₂ : 7	a ₁ : 29 a ₂ : 29	78	1,3	11
HC10	Hilti Data	UK Nostell red multi		l: 215 b: 102 h: 65	t ₀₁ : 23 t ₀₂ : 21	t ₁₁ : 28 t ₁₂ : --	a ₁ : 38 a ₂ : 56	70	1,6	11
HC11	Hilti Data	Australian common standard		l: 330 b: 110 h: 76	t ₀₁ : 20 t ₀₂ : 16	t ₁₁ : 16 t ₁₂ : 20	a ₁ : 25 a ₂ : 36	84	1,5	12
Clay Ceiling										
CC1	ETA	Clay ceiling brick Ds-1,0		l: 250 b: 510 h: 180	t ₀₁ : 12 t ₀₂ : 12	t ₁₁ : 7 t ₁₂ : 7	a ₁ : 14 a ₂ : 32	3	1,0	12
CC2	Hilti Data	Italy Mattone rosso		l: 250 b: 400 h: 180	t ₀₁ : 9 t ₀₂ : 9	t ₁₁ : 7 t ₁₂ : 7	a ₁ : 69 a ₂ : 55	26	0,6	12
Solid Calcium Silicate										
SCS1	ETA	Solid silica brick KS, 2DF		l: ≥ 240 b: ≥ 115 h: ≥ 113	-	-	-	12 28	2,0	12
SCS2	ETA	Solid silica brick KS, 8DF		l: ≥ 248 b: ≥ 240 h: ≥ 248	-	-	-	12 20 28	2,0	13
Hollow Calcium Silicate										
HCS1	ETA	Hollow silica brick KSL, 8DF		l: 248 b: 240 h: 238	t ₀₁ : 34 t ₀₂ : 22	t ₁₁ : 11 t ₁₂ : 20	a ₁ : 52 a ₂ : 52	12 20	1,4	13
HCS2	Hilti Data	Germany KSL 12		l: 240 b: 175 h: 113	t ₀₁ : 18 t ₀₂ : 20	t ₁₁ : -- t ₁₂ : --	a ₁ : -- a ₂ : --	12	1,6	13
Solid Light weight concrete										
SLWC 1	ETA	Solid lightweight concrete brick Vbl, 2DF		l: ≥ 240 b: ≥ 115 h: ≥ 113	-	-	-	4 6	0,9	14
SLWC 2	Hilti Data	Sweden Leca typ 3		l: 550 b: 190 h: 190	-	-	-	3	0,6	14
SLWC 3	Hilti Data	Italy "Tufo" volcanic rock		l: 380 b: 270 h: 270	-	-	-	4	1,2	14
Hollow Light weight concrete										
HLW C1	ETA	Hollow lightweight concrete brick Hbl, 16DF		l: 495 b: 240 h: 238	t ₀₁ : 25 t ₀₂ : 51	t ₁₁ : 35 t ₁₂ : 36	a ₁ : 196 a ₂ : 52	2 6	0,7	14

Brick code	Data	Brick name	Image	Size [mm]	t ₀ [mm]	t ₁ [mm]	a [mm]	f _b [N/mm ²]	ρ [kg/dm ³]	Page
HLWC 2	Hilti Data	Germany Hbl 2		l: 248 b: 300 h: 248	t ₀₁ : 17 t ₀₂ : 21	t ₁₁ : 24 t ₁₂ : 22	a ₁ : 87 a ₂ : 40	2	0,6	14
HLWC 3	Hilti Data	Germany Hbl 4		l: 248 b: 240 h: 248	t ₀₁ : 48 t ₀₂ : 41	t ₁₁ : -- t ₁₂ : 62	a ₁ : 140 a ₂ : 49	4	0,7	15
Solid Normal weight concrete										
SNW C1	ETA	Solid normal weight concrete brick Vbn, 2DF		l: ≥ 240 b: ≥ 115 h: ≥ 113	-	-	-	6 16	2,0	15
SNW C2	Hilti Data	UK Dense Concrete b=100mm		l: 440 b: 100 h: 215	-	-	-	14	2,0	15
SNW C3	Hilti Data	UK Dense concrete b=140mm		l: 440 b: 140 h: 215	-	-	-	14	2,0	15
Hollow Normal weight concrete										
HNW C1	ETA	Hollow normal weight concrete brick parpaing		l: 500 b: 200 h: 200	t ₀₁ : 15 t ₀₂ : 15	t ₁₁ : 15 t ₁₂ : 15	a ₁ : 133 a ₂ : 75	4 10	0,9	15
HNW C2	Hilti Data	Italy Blocchi Cem		l: 500 b: 200 h: 200	t ₀₁ : 30 t ₀₂ : 30	t ₁₁ : 30 t ₁₂ : --	a ₁ : 200 a ₂ : 135	8	1,0	16
HNW C3	Hilti Data	Germany Hbn 4		l: 365 b: 240 h: 238	t ₀₁ : 26 t ₀₂ : 35	t ₁₁ : 26 t ₁₂ : 26	a ₁ : 128 a ₂ : 62	4 10	1,4	16
HNW C4	Hilti Data	UK (b=215 mm)		l: 440 b: 215 h: 215	t ₀₁ : 48 t ₀₂ : 48	t ₁₁ : 40 t ₁₂ : --	a ₁ : 150 a ₂ : 120	10	1,2	16
HNW C5	Hilti Data	UK (b=138 mm)		l: 440 b: 138 h: 215	t ₀₁ : 48 t ₀₂ : 38	t ₁₁ : 48 t ₁₂ : --	a ₁ : 150 a ₂ : 60	13	1,5	16
HNW C6	Hilti Data	UK (b=112 mm)		l: 440 b: 112 h: 215	t ₀₁ : 30 t ₀₂ : 30	t ₁₁ : 30 t ₁₂ : --	a ₁ : 50 a ₂ : 50	7	1,3	16
HNW C7	Hilti Data	Finland Standard concrete brick		l: 600 b: 500 h: 92	t ₀₁ : 32 t ₀₂ : 15	t ₁₁ : 32 t ₁₂ : --	a ₁ : 62 a ₂ : 62	6	0,9	16
HNW C8	Hilti Data	Australian block system 200		l: 390 b: 190 h: 190	t ₀₁ : 30 t ₀₂ : 30	t ₁₁ : 30 t ₁₂ : --	a ₁ : 150 a ₂ : 130	15	1,1	16

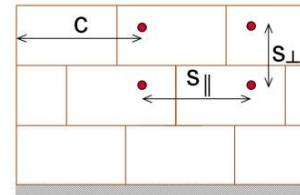
Anchor installation parameters

Brick position:



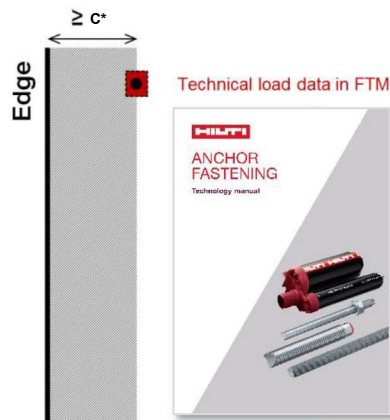
- **Header (H):** The longest dimension of the brick represents the width of the wall
- **Stretcher (S):** The longest dimension of the brick represents the length of the wall

Spacing and edge distance:

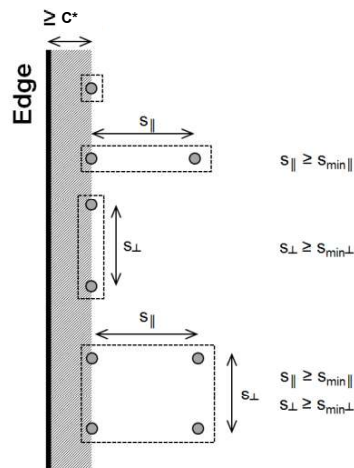


- c - Distance to the edge
- s_{||} - Spacing parallel to the bed joint
- s_⊥ - Spacing perpendicular to the bed joint

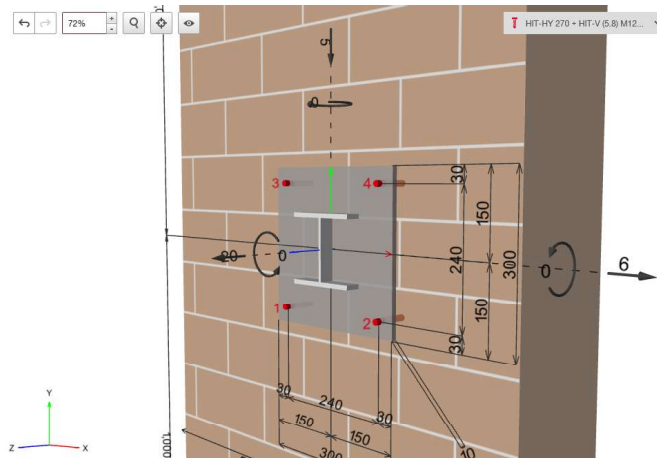
Allowed anchor positions:



- 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.



PROFIS Engineering software interface:



Anchor dimensions for HIT-V

Anchor size		M6	M8	M10	M12	M16
Embedment depth	with HIT-SC	Variable length from 50 to 160				
	without HIT-SC	Variable length from 50 to 300				

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 are designed in accordance with: ETAG 029, Annex C, 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 $c \geq c^*$. 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 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
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		$V_{Sd} \leq V_{Rd,pb} = V_{Rk,pb} / \gamma_{Mm}$

- Notice that loads are affected by a series of factors such as visibility/filling of joints, factors for anchor groups, spacing and edge distance.
- 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 $f_{uk} \leq 800 \text{ N/mm}^2$ and $f_{yk}/f_{uk} \leq 0,8$	if $f_{uk} > 800 \text{ N/mm}^2$ 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

Anchor size		M6	M8	M10	M12	M16
$N_{Rd,s}$	HIT-V 5.8(F)	6,7	12,0	19,3	28,0	52,7
	HIT-V 8.8(F)	10,7	19,3	30,7	44,7	84,0
	HIT-V-R	7,5	13,9	21,9	31,6	58,8
	HIT-V-HCR	10,7	19,3	30,7	44,7	84,0
$V_{Rd,s}$	HIT-V 5.8(F)	4,0	7,2	12,0	16,8	31,2
	HIT-V 8.8(F)	6,4	12,0	18,4	27,2	50,4
	HIT-V-R	4,5	8,3	12,8	19,2	35,3
	HIT-V-HCR	6,4	12,0	18,4	27,2	50,4
$M_{Rd,s}$	HIT-V 5.8(F)	6,4	15,2	29,6	52,8	133,6
	HIT-V 8.8(F)	9,6	24,0	48,0	84,0	212,8
	HIT-V-R	7,1	16,7	33,4	59,1	149,7
	HIT-V-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	[Nm]	3,9	4,8	9,1
$V_{Rd,s}$	HIT-V 5.8	[Nm]	7,2	12,0	16,8
	Screw 8.8		12,0	18,4	27,2
$M_{Rd,s}$	HIT-V 5.8	[Nm]	15,2	29,6	52,8
	Screw 8.8		24,0	48,0	84,0

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

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

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 ($c \geq c^*$) for single anchor applications

Load type	Anchor size	h_{ef} [mm]	f_b [N/mm ²]	w/w and w/d		d/d	
				Ta	Tb	Ta	Tb
Loads [kN]							
SC2 – Solid clay brick Mz, NF (ETA data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 50$ mm)	HIT-V M8, M10, M12, M16	≥ 50	10	0,6 (0,6 ^a)			
			20	0,8 (0,8 ^a)			
	HIT-V + HIT-SC M8, M10, M12, M16	≥ 80	10	1,0 (1,2 ^a)			
			20	1,4 (1,6 ^a)			
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 150$ mm)	HIT-IC M8, M10, M12	≥ 100	10	1,6 (1,8 ^a)			
			HIT-IC + HIT-SC M8, M10, M12	20	2,2 (2,4 ^a)		
$V_{Rd,bII}$ ($c \geq 50$ mm)	HIT-V M8, M10, M12, M16	≥ 50	10	1,2			
			20	1,8			
	HIT-V + HIT-SC M8, M10, M12, M16	≥ 80	10	1,6			
			HIT-IC M8, M10, M12	20	2,2		
$V_{Rd,bII}$ ($c \geq 1,5 h_{ef}$)	HIT-V M8, M10, M12, M16	≥ 50	10	1,2			
			20	1,8			
	HIT-V + HIT-SC M8, M10	≥ 80	10	2,0			
			HIT-IC M8	20	2,8		
HIT-V + HIT-SC M8, M10	≥ 100	10	3,2				
		HIT-IC + HIT-SC M8	20	4,4			
$V_{Rd,b}$ ($c \geq 1,5 h_{ef}$)	HIT-V M12, M16	≥ 80	10	3,6			
			HIT-V + HIT-SC M12, M16	20	4,8		
	HIT-IC M10, M12	≥ 80	10	3,6			
			HIT-IC + HIT-SC M10, M12	20	4,8		
SC3 - Solid clay brick Mz, 2DF (ETA data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 115$ mm)	HIT-V M8, M10, M12, M16	≥ 50	12	1,0 (1,2 ^a)			
			20	1,0 (1,2 ^a)			
	HIT-V + HIT-SC M8, M10, M12, M16	≥ 80	12	1,4 (1,6 ^a)			
			20	1,8 (2,2 ^a)			
	HIT-IC M8, M10, M12	≥ 100	12	2,4 (2,8 ^a)			
			HIT-IC + HIT-SC M8, M10, M12	20	2,8 (3,2 ^a)		
$V_{Rd,b}$ ($c \geq 1,5 h_{ef}$)	HIT-V M8, M10, M12, M16	≥ 50	12	2,2			
			20	2,8			
	HIT-V + HIT-SC M8, M10	≥ 80	12	3,2			
			HIT-IC M8	20	4,0		
	HIT-V + HIT-SC M12	≥ 80	12	4,2			
			HIT-IC M10	20	4,8		
	HIT-V + HIT-SC M16	≥ 80	12	4,8			
			HIT-IC M12	20	4,8		

a) Compressed Air Cleaning only

Masonry
 Chemical anchors
 Mechanical anchors
 Plastic/Light duty metal anchors
 Insulation anchors

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

Load type	Anchor size	h_{ef} [mm]	f_b [N/mm ²]	w/w and w/d		d/d	
				Ta	Tb	Ta	Tb
Loads [kN]							
 SC4 - Solid clay brick UK London yellow Multi Stock (Hilti data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 100$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	16	1,4 (1,6 ^a)		
	HIT-V + HIT-SC	M8, M10	≥ 80		2,2 (2,6 ^a)		
	HIT-V + HIT-SC	M12, M16			2,6 (3,0 ^a)		
	HIT-IC + HIT-SC	M8, M10, M12					
$V_{Rd,b}$ ($c \geq 1,5 h_{ef}$)	HIT-V + HIT-SC	M8, M10	≥ 50	16	2,6		
	HIT-V + HIT-SC	M12, M16	≥ 80		3,2		
	HIT-V + HIT-SC	M8, M10			3,2		
	HIT-IC + HIT-SC	M8, M10, M12			4,8		
 SC5 - Solid clay brick AUS Common dry pressed (Hilti data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 110$ mm)	HIT-V	M8, M10, M12	80	25	2,6 (3,0 ^a)		
	HIT-IC	M8, M10, M12					
$V_{Rd,b II}$ ($c \geq 110$ mm)	HIT-V	M8, M10	80	25	3,8		
	HIT-IC	M8			4,8		
	HIT-V	M12					
 HC1 - Hollow clay brick Hiz, 10DF (ETA data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 150$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80	12	2,2 (2,4 ^a)		
	HIT-IC + HIT-SC	M8, M10, M12		20	2,8 (3,2 ^a)		
$V_{Rd,b II}$ ($c \geq 300$ mm)	HIT-V + HIT-SC	M8, M10	≥ 80	12	1,8		
	HIT-IC + HIT-SC	M8		20	2,2		
	HIT-V + HIT-SC	M12, M16		12	3,8		
	HIT-IC + HIT-SC	M10, M12		20	4,0		
 HC2 - Hollow clay brick Italy Mattone Alveolater 50 (Hilti data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 50$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80	16	1,8 (2,0 ^a)		
	HIT-IC + HIT-SC	M8, M10, M12	≥ 130		2,6 (3,0 ^a)		
	HIT-V + HIT-SC	M8, M10, M12, M16					
$V_{Rd,b}$ ($c \geq 150$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80	16	1,4		
	HIT-IC + HIT-SC	M8, M10, M12	≥ 130		2,6		
	HIT-V + HIT-SC	M8, M10, M12, M16					
 HC3 - Hollow clay brick Spain Termoarcilla (Hilti data)							
$N_{Rd,p} = N_{Rd,b}$ ($c_{cr} = 50$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	22	0,6 (0,8 ^a)		
	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80		1,0 (1,2 ^a)		
	HIT-IC + HIT-SC	M8, M10, M12					
$V_{Rd,b}$ ($c \geq 150$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	22	1,8		
 HC4 - Hollow clay brick Belgium Wienerberger Thermobrick (Hilti data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 150$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	21	0,5 (0,6 ^a)		
	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80		2,2 (2,6 ^a)		
	HIT-IC + HIT-SC	M8, M10, M12					
$V_{Rd,b}$ ($c \geq 150$ mm)	HIT-V + HIT-SC	M8, M10	≥ 50	21	2,4		
	HIT-V + HIT-SC	M12, M16			2,8		
	HIT-IC + HIT-SC	M8, M10, M12					

a) Compressed Air Cleaning only

Masonry







Chemical anchors

Mechanical anchors

Plastic/Light duty metal anchors





Insulation anchors

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

Load type	Anchor size	h_{ef} [mm]	f_b [N/mm ²]	w/w and w/d		d/d	
				Ta	Tb	Ta	Tb
Loads [kN]							
 HC5 - Hollow clay brick Spain Hueco doble (Hilti data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 120$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	4	0,4		
	HIT-V + HIT-SC	M8	80		0,8 (1,0 ^a)		
	HIT-V + HIT-SC	M10			1,0 (1,2 ^a)		
	HIT-IC + HIT-SC	M8, M10, M12			1,4 (1,6 ^a)		
	HIT-V + HIT-SC	M12, M16					
$V_{Rd,b}$ ($c \geq 120$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	4	1,2		
	HIT-IC + HIT-SC	M8, M10, M12					
 HC6 - Hollow clay brick Belgium Wienerberger Powerbrick (Hilti data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 50$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	41	1,6 (1,8 ^a)		
	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80		2,6 (2,8 ^a)		
	HIT-IC + HIT-SC	M8, M10, M12					
$V_{Rd,b}$ ($c \geq 150$ mm)	HIT-V + HIT-SC	M8, M10	≥ 50	41	2,6		
	HIT-V + HIT-SC	M12, M16			4,8		
	HIT-IC + HIT-SC	M8, M10, M12					
 HC7 - Hollow clay brick Italy Doppio uni (Hilti data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 50$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	27	0,6		
	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80		1,0 (1,2 ^a)		
	HIT-IC + HIT-SC	M8, M10, M12	≥ 130		2,8 (3,2 ^a)		
	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50		1,6		
$V_{Rd,b}$ ($c \geq 150$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	27	3,6		
	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80				
	HIT-IC + HIT-SC	M8, M10, M12					
 HC8 - Hollow clay brick Spain Ladrillo cara vista (Hilti data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 115$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	42	0,6 (0,8 ^a)		
	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80		2,2 (2,6 ^a)		
	HIT-IC + HIT-SC	M8, M10, M12					
$V_{Rd,b}$ ($c \geq 115$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	42	1,8		
	HIT-IC + HIT-SC	M8, M10, M12					
 HC9 - Hollow clay brick Spain Clinker mediterraneo (Hilti data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 115$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	78	0,6 (0,8 ^a)		
	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80		2,0 (2,2 ^a)		
	HIT-IC + HIT-SC	M8, M10, M12					
$V_{Rd,b}$ ($c \geq 115$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	78	2,0		
	HIT-IC + HIT-SC	M8, M10, M12					
 HC10 Hollow clay brick UK Nostell Red Multi (Hilti data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 105$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	70	2,4 (2,8 ^a)		
	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80		2,8 (3,2 ^a)		
	HIT-IC + HIT-SC	M8, M10, M12					
$V_{Rd,b}$ ($c \geq 105$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	70	4,6		
	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80		4,8		
	HIT-IC + HIT-SC	M8, M10, M12					

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 ($c \geq c^*$) for single anchor applications

Load type	Anchor size	h_{ef} [mm]	f_b [N/mm ²]	w/w and w/d		d/d	
				Ta	Tb	Ta	Tb
Loads [kN]							
 HC11 Hollow clay brick AUS Common standard (Hilti data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 110$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	84	0,6 (0,8 ^a)		
	HIT-V + HIT-SC	M8, M10	≥ 80		2,6 (3,0 ^a)		
	HIT-IC + HIT-SC	M8			2,8 (3,2 ^a)		
	HIT-V + HIT-SC	M12, M16					
$V_{Rd,b II}$ ($c \geq 110$ mm)	HIT-V + HIT-SC	M8, M10	≥ 50	84	2,0		
	HIT-V + HIT-SC	M12, M16	≥ 80		2,8		
	HIT-V + HIT-SC	M16			3,8		
	HIT-IC + HIT-SC	M8, M10, M12					
 CC1 - Ceiling Hollow clay brick "Ds-1,0" (ETA data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 100$ mm)	HIT-V + HIT-SC	M6	≥ 80	3	0,6		
 CC2 - Ceiling Hollow clay brick Italy Mattone rosso (Hilti data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 100$ mm)	HIT-V + HIT-SC	M6, M8, M10, M12	≥ 80	26	0,6		
 SCS1 - Solid silica brick KS, 2DF (ETA data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 115$ mm)	HIT-V	M8, M10, M12, M16	≥ 50	12	-	2,4	2,0
			≥ 80	28	-	3,6	3,0
	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80	12	-	2,4	2,0
				28	-	3,6	3,0
				HIT-IC + HIT-SC	M8, M10, M12		
$V_{Rd,b II}$ ($c \geq 115$ mm)	HIT-V	M8, M10, M12, M16	≥ 50	12	-	2,4	
			≥ 80	28	-	3,6	
	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80	12	-	2,4	
				28	-	3,6	
				HIT-IC + HIT-SC	M8, M10, M12		

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 ($c \geq c^*$) for single anchor applications

Load type	Anchor size	h_{ef} [mm]	f_b [N/mm ²]	w/w and w/d		d/d		
				Ta	Tb	Ta	Tb	
Loads [kN]								
SCS2- Solid silica brick KS, 8DF (ETA data)								
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 120$ mm)	HIT-V	M8, M10, M12, M16	≥ 50	12	-	2,8	2,2	
				20	-	3,6	3,0	
				28	-	4,2	3,4	
	HIT-V	M8, M10	≥ 80	12	-	3,4	2,8	
				20	-	4,4	3,6	
				28	-	4,8	4,2	
	HIT-V	M12	≥ 80	12	-	4,6	3,8	
	HIT-V + HIT-SC	M8, M10		≥ 20	-	4,8		
	HIT-IC	M8, M10						
	HIT-IC + HIT-SC	M8						
	HIT-V	M16	≥ 12	≥ 12	-	4,8		
	HIT-V + HIT-SC	M12, M16						
HIT-IC	M12							
HIT-IC + HIT-SC	M10, M12							
HIT-V	M8, M10	≥ 100	12	-	4,8	4,4		
			≥ 20	-	4,8			
			≥ 12	-	4,8			
$V_{Rd,b II}$ ($c \geq 120$ mm)	HIT-V	M8, M10	≥ 50	12	-	3,6		
			≥ 20	-	4,8			
	HIT-V	M12, M16	≥ 50	≥ 12	-	4,8		
			≥ 80	≥ 12	-	4,8		
				≥ 12	-	4,8		
HCS1 - Hollow silica brick KSL, 8DF (ETA data)								
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 50$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80	12	-	-	1,6	1,2
				20	-	-	2,2	1,8
	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 130	12	-	-	2,0	1,6
				20	-	-	3,0	2,4
$V_{Rd,b II}$ ($c \geq 125$ mm)	HIT-V + HIT-SC	M8	≥ 80	12	-	2,4		
				20	-	3,6		
	HIT-V + HIT-SC	M10		12	-	3,6		
				20	-	4,8		
	HIT-V + HIT-SC	M12, M16		12	-	4,8		
				20	-	4,8		
HSC2 - Hollow silica brick Germany KSL, 3DF (Hilti data)								
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 50$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80	12	-	-	2,0	1,6
					HIT-IC + HIT-SC	M8, M10, M12		
$V_{Rd,b}$ ($c \geq 120$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80	12	-		2,0	
					HIT-IC + HIT-SC	M8, M10, M12		

a) Compressed Air Cleaning only

Masonry
 Chemical anchors
 Mechanical anchors
 Plastic/Light duty metal anchors
 Insulation anchors

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

Load type	Anchor size	h_{ef} [mm]	f_b [N/mm ²]	w/w and w/d		d/d	
				Ta	Tb	Ta	Tb
Loads [kN]							
SLWC1 - Solid lightweight concrete brick Vbl, 2DF (ETA data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 115$ mm)	HIT-V 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 + 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)
6	3,0	2,4		3,2 (3,4 ^a)	2,6 (2,8 ^a)		
$V_{Rd,bII}$ ($c \geq 115$ mm)	HIT-V M8, M10, M12, M16	≥ 50	4	0,8			
			6	1,0			
	HIT-V + HIT-SC M10, M12, M16 HIT-IC M8, M10, M12 HIT-IC + HIT-SC M8, M10, M12	≥ 80	4	1,0			
			6	1,2			
			6	1,2			
SLWC2 - Solid lightweight concrete brick Sweden Leca typ 3 (Hilti data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 115$ mm)	HIT-V + HIT-SC M8, M10, M12, M16	≥ 80	3	2,2	1,8	2,4 (2,6 ^a)	2,0 (2,2 ^a)
	HIT-IC + HIT-SC M8, M10, M12						
$V_{Rd,b}$ ($c \geq 115$ mm)	HIT-V + 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)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 115$ mm)	HIT-V M8	≥ 80	4	1,2	1,0	1,4	1,2
	HIT-V M10			1,6	1,2	1,8	1,4 (1,6 ^a)
	HIT-V M12			1,8	1,6	2,0	1,8
	HIT-V M16			2,2	1,8	2,4 (2,6 ^a)	2,0 (2,2 ^a)
$V_{Rd,b}$ ($c \geq 115$ mm)	HIT-V M8	≥ 80	4	0,8			
	HIT-V M10, M12, M16			1,8			
HLWC1 - Hollow lightweight concrete brick Hbl, 16DF (ETA data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 125$ mm)	HIT-V + HIT-SC M8, M10	≥ 80	2	1,4	1,2	1,6	1,2 (1,4 ^a)
	HIT-IC + HIT-SC M8		6	2,4	2,0	2,6 (2,8 ^a)	2,2 (2,4 ^a)
	HIT-V + 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)
$V_{Rd,b}$ ($c \geq 250$ mm)	HIT-V + HIT-SC M8, M10	≥ 80	2	1,6			
	HIT-IC + HIT-SC M8		6	2,6			
	HIT-V + HIT-SC M12 HIT-IC + HIT-SC M10		2	2,2			
			6	3,8			
	HIT-V + HIT-SC M16 HIT-IC + HIT-SC M12		2	2,4			
			6	4,0			
HLWC2 - Hollow lightweight concrete brick Germany - Hbl 2, 10DF (Hilti data)							
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 50$ mm)	HIT-V + HIT-SC M8, M10, M12, M16	≥ 80	2	0,6	0,5	0,6	0,5 (0,6 ^a)
	HIT-IC + HIT-SC M8, M10, M12						
$V_{Rd,b}$ ($c \geq 250$ mm)	HIT-V + HIT-SC M8, M10, M12, M16	≥ 80	2	0,6			
	HIT-IC + HIT-SC M8, M10, M12						

a) Compressed Air Cleaning only

Masonry




Chemical anchors

Mechanical anchors

Plastic/Light duty metal anchors

Insulation anchors








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

Load type	Anchor size	h_{ef} [mm]	f_b [N/mm ²]	w/w and w/d		d/d		
				Ta	Tb	Ta	Tb	
Loads [kN]								
 HLWC3 - Hollow lightweight concrete brick Germany - Hbl 4, 8DF (Hilti data)								
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 50$ mm)	HIT-V + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12	≥ 80	4	0,6	0,6	0,8	0,6
$V_{Rd,b}$ ($c \geq 250$ mm)	HIT-V + HIT-SC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12	≥ 80	4	1,4			
 SNWC1 - Solid normal weight concrete brick Vbn, 2DF (ETA data)								
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 115$ mm)	HIT-V HIT-V + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	$\geq 80^{b)}$	6	1,2	1,0	1,2	1,0
	HIT-IC HIT-IC + HIT-SC	M8, M10, M12 M8, M10, M12		16	2,2	1,8	2,2	1,8
$V_{Rd,b}$ ($c \geq 115$ mm)	HIT-V HIT-V + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	$\geq 80^{b)}$	6	1,6			
	HIT-IC HIT-IC + HIT-SC	M8, M10, M12 M8, M10, M12		16	2,6			
 SNWC2 - Solid normal weight concrete brick UK Dense concrete b=100 mm (Hilti data)								
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 115$ mm)	HIT-V HIT-V + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	50	14	2,2	1,8	2,2	1,8
$V_{Rd,b}$ ($c \geq 115$ mm)	HIT-V HIT-V + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	50	14	4,2			
 SNWC3 - Solid normal weight concrete brick UK Dense concrete b=140 mm (Hilti data)								
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 115$ mm)	HIT-V HIT-V + HIT-SC HIT-IC HIT-IC + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16 M8, M10, M12 M8, M10, M12	≥ 50	14	2,2	1,8	2,2	1,8
$V_{Rd,b}$ ($c \geq 115$ mm)	HIT-V HIT-V + HIT-SC	M8, M10, M12, M16 M8, M10, M12, M16	50	14	4,2			
	HIT-V HIT-V + HIT-SC	M8, M10 M8, M10	80		4,2			
	HIT-V HIT-V + HIT-SC	M12, M16 M12, M16			4,8			
	HIT-IC HIT-IC + HIT-SC	M8, M10, M12 M8, M10, M12	4,8					
 HNWC1 - Hollow normal weight concrete brick Parpaing creux (ETA data)								
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 50$ mm)	HIT-V + HIT-SC HIT-IC + HIT-SC	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	M8, M10, M12, M16	≥ 130	4	0,6	0,5	0,6	0,5
				10	1,0	0,8	1,0	0,8
$V_{Rd,b}$ ($c \geq 200$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	4	1,6			
				10	2,6			
	HIT-V + HIT-SC HIT-IC + HIT-SC	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

Masonry
Chemical anchors
Mechanical anchors
Plastic/Light duty metal anchors
Insulation anchors

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

Load type	Anchor size	h_{ef} [mm]	f_b [N/mm ²]	w/w and w/d		d/d		
				Ta	Tb	Ta	Tb	
Loads [kN]								
 HNWC2 - Hollow normal weight concrete brick Italy Blocchi Cem (Hilti data)								
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 50$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	8	1,0	0,8	1,0	0,8
	HIT-IC + HIT-SC	M8, M10, M12						
$V_{Rd,b}$ ($c \geq 200$ mm)	HIT-V + HIT-SC	M8, M10	≥ 50	8	4,0			
	HIT-IC + HIT-SC	M8			4,4			
	HIT-V + HIT-SC	M12, M16						
	HIT-IC + HIT-SC	M10, M12						
 HNWC3 - Hollow normal weight concrete brick Germany Hbn 4, 12DF (Hilti data)								
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 50$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80	4	0,6	0,5	0,6	0,5
	HIT-IC + HIT-SC	M8, M10, M12		10	1,0	0,8	1,0	0,8
$V_{Rd,b}$ ($c \geq 240$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 80	4	2,2			
	HIT-IC + HIT-SC	M8, M10, M12		10	3,6			
 HNWC4 - Hollow normal weight concrete brick UK (b=215 mm) (Hilti data)								
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 50$ mm)	HIT-V + HIT-SC	M8	80	10	0,4	0,4	0,4	0,4
	HIT-V + HIT-SC	M10, M12, M16		10	1,0	0,8	1,0	0,8
$V_{Rd,b}$ ($c \geq 220$ mm)	HIT-V + HIT-SC	M8	80	10	1,4			
	HIT-V + HIT-SC	M10		10	2,0			
	HIT-V + HIT-SC	M12, M16		10	2,8			
 HNWC5 - Hollow normal weight concrete brick UK (b=138 mm) (Hilti data)								
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 50$ mm)	HIT-V + HIT-SC	M8	80	13	0,6	0,6	0,6	0,6
	HIT-V + HIT-SC	M10, M12, M16			1,0	0,8	1,0	0,8
$V_{Rd,b}$ ($c \geq 220$ mm)	HIT-V + HIT-SC	M8	80	13	1,4			
	HIT-V + HIT-SC	M10			2,0			
	HIT-V + HIT-SC	M12, M16			2,8			
 HNWC6 - Hollow normal weight concrete brick UK (b=112 mm) (Hilti data)								
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 50$ mm)	HIT-V + HIT-SC	M8	50	7	0,6	0,6	0,6	0,6
	HIT-V + HIT-SC	M10, M12, M16			1,0	0,8	1,0	0,8
$V_{Rd,b}$ ($c \geq 100$ mm)	HIT-V + HIT-SC	M8	50	7	1,4			
	HIT-V + HIT-SC	M10			2,0			
	HIT-V + HIT-SC	M12, M16			2,8			
 HNWC7 - Hollow normal weight concrete brick Finland "Standard Concrete Brick" (Hilti data)								
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 50$ mm)	HIT-V + HIT-SC	M8, M10	50	6	0,6	0,4	0,6	0,4
	HIT-V + HIT-SC	M12, M16			0,8	0,6	0,8	0,6
$V_{Rd,b}$ ($c \geq 100$ mm)	HIT-V + HIT-SC	M8	50	6	1,0			
	HIT-V + HIT-SC	M10			1,4			
	HIT-V + HIT-SC	M12, M16			1,6			
 HNWC8 - Hollow normal weight concrete brick AUS Block system 200 (Hilti data)								
$N_{Rd,p} = N_{Rd,b}$ ($c \geq 50$ mm)	HIT-V + HIT-SC	M8, M10, M12, M16	≥ 50	15	1,0	0,8	1,0	0,8
	HIT-IC + HIT-SC	M8, M10, M12						
$V_{Rd,b}$ ($c \geq 200$ mm)	HIT-V + HIT-SC	M8, M10	≥ 50	15	2,0			
	HIT-V + HIT-SC	M12, M16			3,2			
	HIT-IC + HIT-SC	M8, M10, M12						

a) Compressed Air Cleaning only

Masonry

Chemical anchors

Mechanical anchors

Plastic/Light duty metal anchors

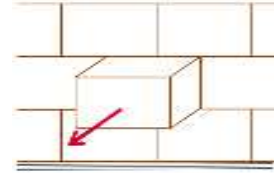
Insulation anchors

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

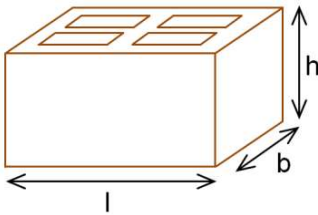
$$N_{Rd,pb} = 2 \cdot l \cdot b \cdot (0,5 \cdot f_{vko} + 0,4 \cdot \sigma_d) / (2,5 \cdot 1000) \quad [\text{kN}]$$

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

* this equation is applicable if the vertical joints are filled


Pushing out of one brick (shear):

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



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/mm ²]
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

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 ETAG029, Annex B.

For the evaluation of test results, the characteristic resistance may be obtained taking into account the β factor, which considers the different influences of the product.

The β factor for the brick types covered by the Hilti HIT-HY 270 ETA is provided on the following table:

Use categories		w/w and w/d		d/d	
Temperature range		Ta*	Tb*	Ta*	Tb*
Base material	Cleaning				
Solid clay brick EN 771-1	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

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

Applying the β factor from the table above, the characteristic tension resistance N_{Rk} can be obtained. Characteristic shear resistance V_{Rk} can also be directly derived from N_{Rk} . For detailed procedure consult ETAG 029, Annex B.

Materials
Material quality

Part	Material
Threaded rod HIT-V 5.8 (F)	Strength class 5.8, A5 > 8% ductile Electroplated zinc coated $\geq 5 \mu\text{m}$; (F) Hot dip galvanized $\geq 45 \mu\text{m}$
Threaded rod HIT-V 8.8 (F)	Strength class 8.8, A5 > 8% ductile Electroplated zinc coated $\geq 5 \mu\text{m}$; (F) Hot dip galvanized $\geq 45 \mu\text{m}$
Threaded rod HIT-V-R	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	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 $\geq 5 \mu\text{m}$, ; hot dipped galvanized $\geq 45 \mu\text{m}$
	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 $\geq 5 \mu\text{m}$
Sieve sleeve HIT-SC	Frame: Polyfort FPP 20T ; Sieve: PA6.6 N500/200

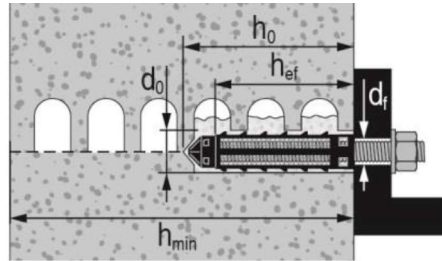
Base materials:

- Solid brick masonry. The resistances are also valid for larger brick sizes and larger compressive strengths of the masonry unit.
- Hollow brick masonry
- 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 ETAG 029, Annex B under consideration of the β -factor according to the table on page 21.

Installation parameters

Applications for hollow and solid bricks with sieve sleeves

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



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

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

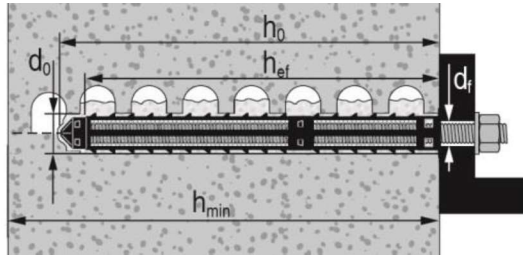
HIT-V		M6	M8		M10		M12		M16	
with HIT-SC		12x85	16x50	16x85	16x50	16x85	18x50	18x85	22x50	22x85
Nominal diameter of drill bit	d_0 [mm]	12	16	16	16	16	18	18	22	22
Drill hole depth	h_0 [mm]	95	60	95	60	95	60	95	60	95
Effective embedment depth	h_{ef} [mm]	80	50	80	50	80	50	80	50	80
Maximum diameter of clearance 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
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 and HIT-IC with embedments of 130 and 160 mm, two attached sleeves are used.



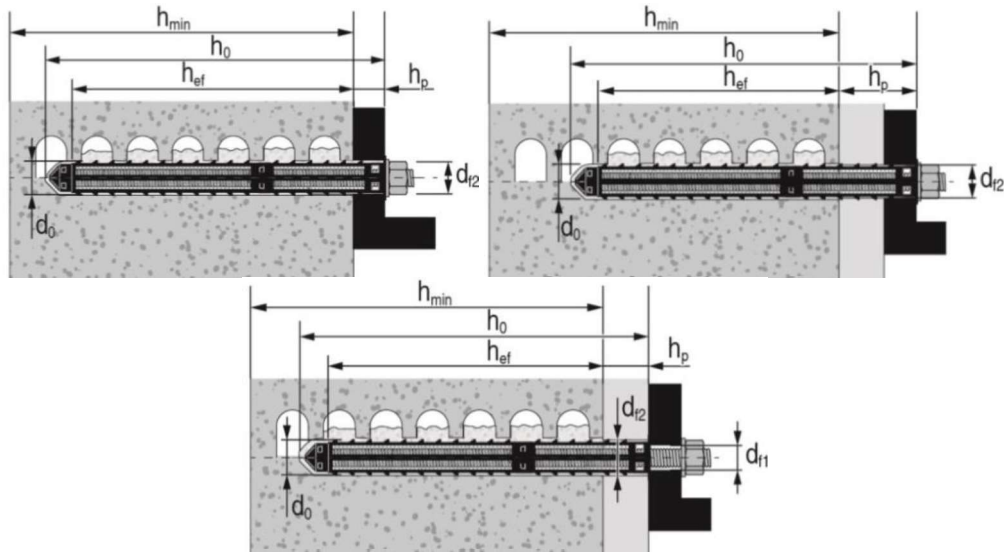
Hollow brick with threaded rod HIT-V and two sieve sleeves HIT-SC for deeper embedment depth

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

HIT-V			M8		M10		M12		M16	
with HIT-SC			16x50 +	16x85 +	16x50 +	16x85 +	18x50 +	18x85 +	22x50 +	22x85 +
			16x85	16x85	16x85	16x85	18x85	18x85	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, two attached sleeves are used.



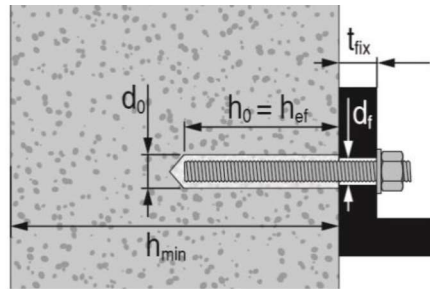
Hollow and solid brick with threaded rod HIT-V with two sieve sleeves HIT-SC for setting through the fixture and/or through the non-loadbearing layer

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

HIT-V			M8		M10		M12		M16	
with HIT-SC			16x50 +	16x85 +	16x50 +	16x85 +	18x50 +	18x85 +	22x50 +	22x85 +
			16x85	16x85	16x85	16x85	18x85	18x85	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.

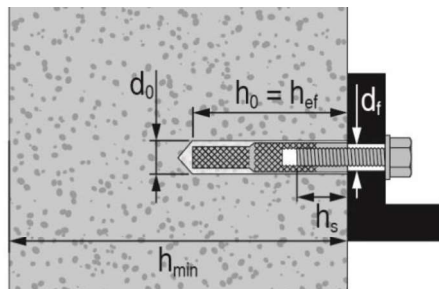
Hilti recommends the anchoring in masonry always with sieve sleeve. Anchors can only be installed without sieve sleeves in solid bricks when it is guaranteed that it has not any hole or void.



Solid brick with threaded rod HIT-V

Installation parameters of HIT-V in solid bricks

Threaded rods and 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...300	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



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

Installation equipment

Anchor size	M6	M8	M10	M12	M16
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 ^{a)}	HIT-V + sieve sleeve	HIT-IC ^{a)}	HIT-IC + sieve sleeve	Hammer drill	Brush HIT-RB
				d ₀ [mm]	size [mm]
-	-	-	-	8	8
M8	-	-	-	10	10
M10	-	-	-	12	12
M12	-	M8	-	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

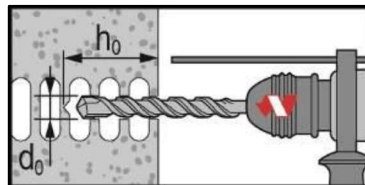
*For detailed information on installation see instruction for use given with the package of the product.



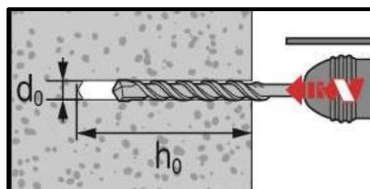
Safety regulations.

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

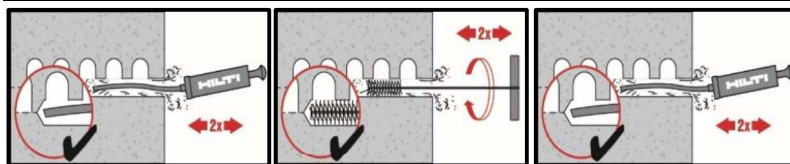


In hollow bricks: rotary mode



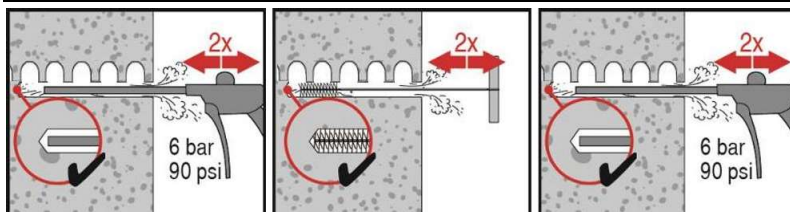
In solid bricks: hammer mode

Cleaning



Manual cleaning (MC)

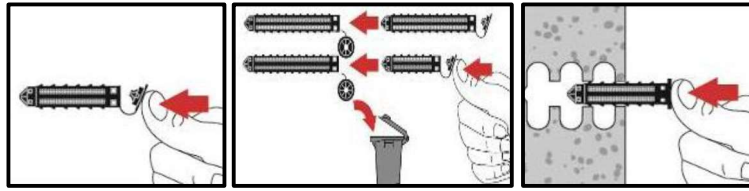
For drill hole diameter $d_0 \leq 18$ mm and drill hole depth $h_0 \leq 100$ mm



Compressed air cleaning (CAC)

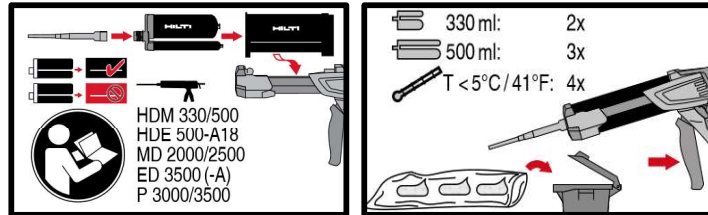
For drill hole depth $h_0 \leq 300$ mm

Injection preparation for hollow and solid bricks with sieve sleeve



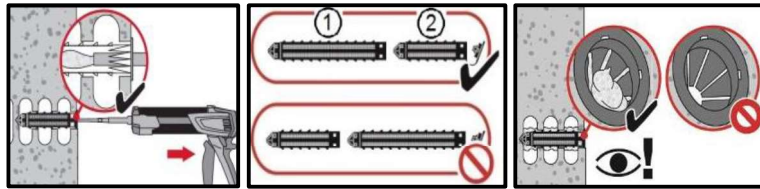
Close lid and insert sieve sleeve manually.

All applications

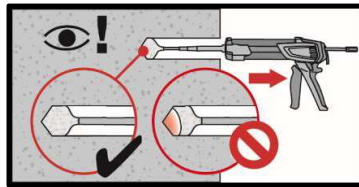


Injection system preparation.

Inject the adhesive without forming air voids

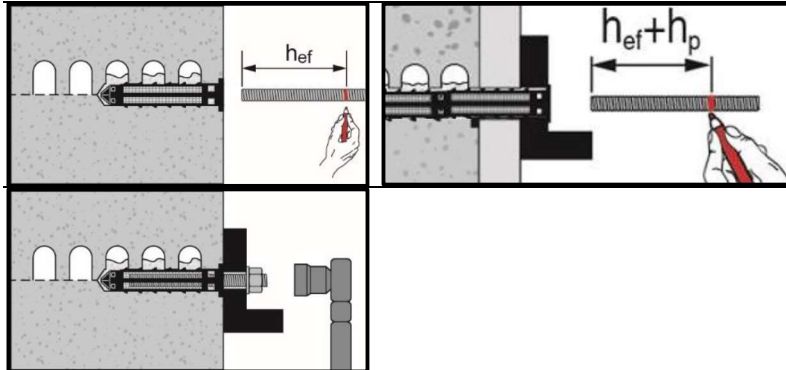


Injection method 1 for Installation with sieve sleeve HIT-SC. Use extension for installation with two sieve sleeves.



Injection method 2 for installation in solid bricks without sieve sleeve

Setting de 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 exceed the values T_{max} .