# Anchor Fastening Technology Manual

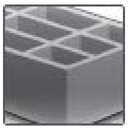
# Hilti HIT-HY 270 Injection mortar

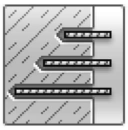
Version 2014-12

# Hilti HIT-HY 270 mortar for masonry

| Injection mortar system | | Benefits |
|---|---|---|
|  | Hilti HIT-HY 270 330 ml foil pack (also available as 500 ml foil pack) | - chemical injection fastening for the most common types of base materials:<br>- hollow and solid clay bricks, calcium silicate bricks, normal and light weight concrete blocks<br>- two-component hybrid mortar<br>- rapid curing<br>- versatile and convenient handling<br>- flexible setting depth and fastening thickness<br>- small edge distance and anchor spacing<br>- mortar filling control with HIT-SC sleeves<br>- suitable for overhead fastenings<br>- in-service temperatures:<br>short term: max.80°C<br>long term: max 50°C |
|  | Mixer | |
|  | HIT-V rod | |
|  | HIT-IC internal threaded sleeve | |
|  | HIT-SC composite sleeve | |


Solid brick


Hollow brick


Variable embedment depth


Fire resistance

Corrosion resistance

High corrosion resistance


PROFIS Anchor design software

## Approvals / certificates

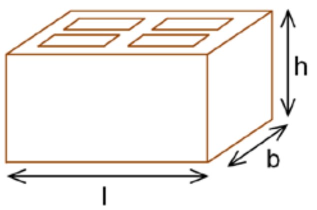
| Description | Authority / Laboratory | No. / date of issue |
|---|---|---|
| European Technical Assessment | DIBt, Berlin | ETA-13/1036 / 2014-12-15 |
| Fire test report | MFPA, Leipzig | PB 3.2/14-179-1 / 2014-09-05 |

## Brick types and properties

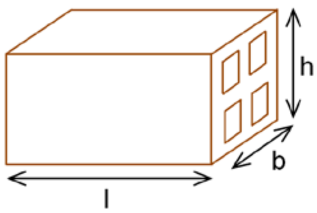
### Instruction to this technical data

- Identify/choose your brick (or brick type) and its geometrical/physical properties on the following tables. Information about edge and spacing criteria for every brick is available on pages 5/6.
- The pages referred on the last column of the table below contain the characteristic resistance loads for each respective brick. Notice that the data displayed on these tables is only valid for single anchors with distance to edge bigger that $c_{cr}$ – for other cases not covered, use PROFIS Anchor software or consult ETA-13/1036.
- The resistance loads provided by this technical data manual are valid only for the exact same masonry unit (hollow bricks) or for units with same base material and equal or higher size and compressive strength (solid bricks). For other cases, Jobsite tests must be performed – please consult page 14.

**Exterior brick dimensions**

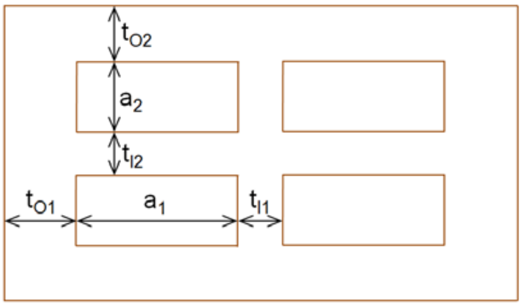


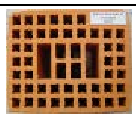
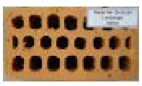

Generic bricks




Brick HC3

**Interior dimensions of the majority of the holes**



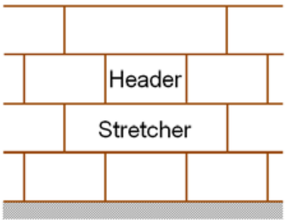

| Brick code | Data | Brick name | Image | Size [mm] | $t_O$ [mm] | $t_I$ [mm] | a [mm] | $f_b$ [N/mm$^2$] | ρ [kg/dm$^3$] | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| **Solid Clay** | | | | | | | | | | |
| SC1 | ETA | Solid clay brick Mz, 2DF |  | l: ≥240<br>b: ≥115<br>h: ≥113 | - | - | - | 12 | 2,0 | 9 |
| SC2 | Hilti Data | UK London yellow Multi Stock |  | l: 215<br>b: 100<br>h: 65 | - | - | - | 16 | 1,5 | 9 |
| **Hollow Clay** | | | | | | | | | | |
| HC1 | ETA | Hollow clay brick Hlz, 10DF |  | l: 300<br>b: 240<br>h: 238 | $t_{O1}$: 12<br>$t_{O2}$: 15 | $t_{I1}$: 11<br>$t_{I2}$: 15 | $a_1$: 10<br>$a_2$: 25 | 12/20 | 1,4 | 9 |
| HC2 | Hilti Data | Italy Mattone Alveolater 50 |  | l: 300<br>b: 245<br>h: 185 | $t_{O1}$: 12<br>$t_{O2}$: 12 | $t_{I1}$: 9<br>$t_{I2}$: 9 | $a_1$: 22<br>$a_2$: 25 | 16 | 1,0 | 9 |
| HC3 | Hilti Data | Italy Foratino 4 Fori |  | l: 240<br>b: 80<br>h: 120 | $t_{O1}$: 7<br>$t_{O2}$: 7 | $t_{I1}$: 6<br>$t_{I2}$: 6 | $a_1$: 30<br>$a_2$: 50 | 7 | 0,7 | 10 |
| HC4 | Hilti Data | Italy Doppio uni |  | l: 240<br>b: 120<br>h: 120 | $t_{O1}$: 12<br>$t_{O2}$: 12 | $t_{I1}$: 10<br>$t_{I2}$: 12 | $a_1$: 22<br>$a_2$: 24 | 27 | 1,1 | 10 |

## Brick types and properties (cont.)

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| HC5 | Hilti Data | UK Nostell Red Multi |  | l: 215<br>b: 102<br>h: 65 | $t_{O1}$: 23<br>$t_{O2}$: 21 | $t_{I1}$: 28<br>$t_{I2}$: -- | $a_1$: 38<br>$a_2$: 56 | 70 | 1,6 | 10 |
| **Solid Calcium Silicate** | | | | | | | | | | |
| SCS1 | ETA | Solid silica brick KS, 2DF |  | l: ≥240<br>b: ≥115<br>h: ≥113 | - | - | - | 12/28 | 2,0 | 11 |
| **Hollow Calcium Silicate** | | | | | | | | | | |
| HCS1 | ETA | Hollow silica brick KSL, 8DF |  | l: ≥248<br>b: ≥240<br>h: ≥238 | $t_{O1}$: 34<br>$t_{O2}$: 22 | $t_{I1}$: 11<br>$t_{I2}$: 20 | $a_1$: 52<br>$a_2$: 52 | 12/20 | 1,4 | 11 |
| **Solid Light weight concrete** | | | | | | | | | | |
| SLWC1 | ETA | Solid lightweight concrete brick Vbl, 2DF |  | l: ≥240<br>b: ≥115<br>h: ≥113 | - | - | - | 4/6 | 0,9 | 11 |
| SLWC2 | Hilti Data | Italy "Tufo" volcanic rock |  | l: 380<br>b: 270<br>h: 270 | - | - | - | 4,0 | 1,2 | 11 |
| **Hollow Light weight concrete** | | | | | | | | | | |
| HLWC1 | ETA | Hollow lightweight concrete brick Hbl, 16DF |  | l: 495<br>b: 240<br>h: 238 | $t_{O1}$: 25<br>$t_{O2}$: 51 | $t_{I1}$: 35<br>$t_{I2}$: 36 | $a_1$: 196<br>$a_2$: 52 | 2/6 | 0,7 | 12 |
| **Solid Normal weight concrete** | | | | | | | | | | |
| SNWC1 | ETA | Solid normal weight concrete brick Vbn, 2DF |  | l: ≥240<br>b: ≥115<br>h: ≥113 | - | - | - | 6/16 | 2,0 | 12 |
| SNWC2 | Hilti Data | UK Dense Concrete b=100mm |  | l: 440<br>b: 100<br>h: 215 | - | - | - | 14 | 2,0 | 12 |
| SNWC3 | Hilti Data | UK Dense Concrete b=140mm |  | l: 440<br>b: 140<br>h: 215 | - | - | - | 14 | 2,0 | 12 |
| **Hollow Normal weight concrete** | | | | | | | | | | |
| HNWC1 | ETA | Hollow normal weight concrete brick parpaing creux |  | l: 500<br>b: 200<br>h: 200 | $t_{O1}$: 15<br>$t_{O2}$: 15 | $t_{I1}$: 15<br>$t_{I2}$: 15 | $a_1$: 133<br>$a_2$: 75 | 4/10 | 0,9 | 13 |
| HNWC2 | Hilti Data | Italy Blocchi Cem |  | l: 500<br>b: 200<br>h: 200 | $t_{O1}$: 30<br>$t_{O2}$: 30 | $t_{I1}$: 30<br>$t_{I2}$: -- | $a_1$: 200<br>$a_2$: 135 | 8 | 1,0 | 13 |

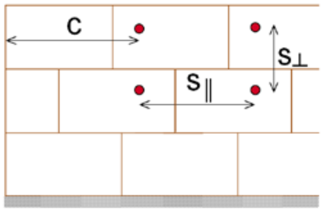
## Anchor installation parameters

### 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:

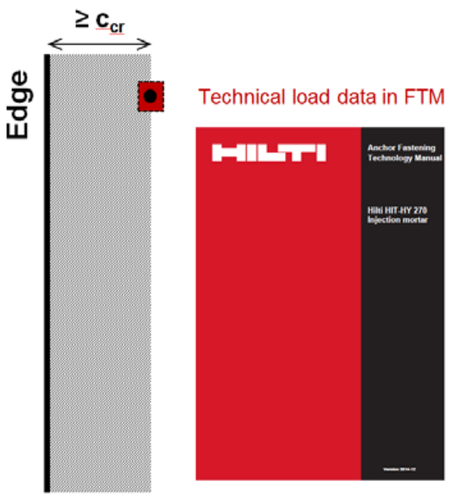



- c – Distance to the edge
- $s_{\parallel}$ - Spacing parallel to the bed joint
- $s_{\perp}$ - Spacing perpendicular to the bed joint

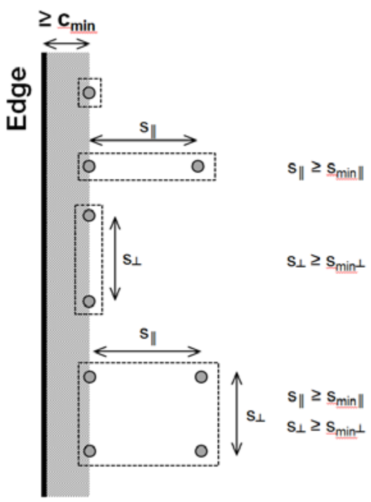
### Minimum and characteristic spacing and edge distance parameters

- $c_{min}$ – Minimum edge distance
- $c_{cr}$ – Characteristic edge distance
- $s_{min\parallel}$ - Min. spacing distance parallel to the bed joint
- $s_{cr\parallel}$ - Characteristic spacing distance parallel to the bed joint
- $s_{min\perp}$ - Min. spacing distance perpendicular to the bed joint
- $s_{cr\perp}$ - Characteristic spacing distance perpendicular to the bed joint

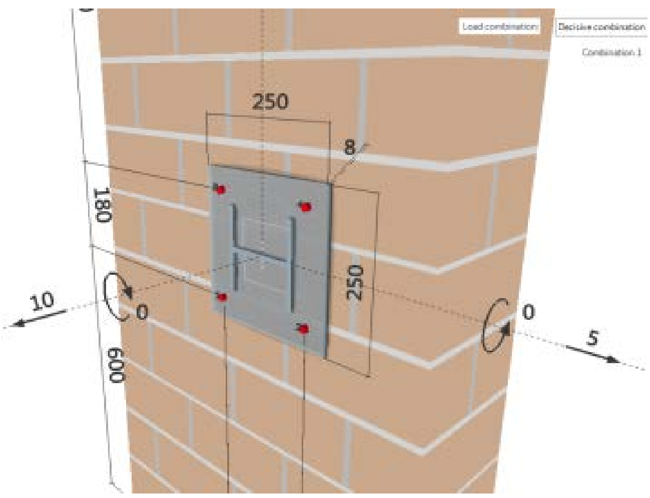
### Allowed anchor positions:




- This FTM includes the load data for single anchors in masonry with a distance to the edge bigger than the characteristic edge distance.
- For the cases not covered in this technical data, including anchor groups, please use PROFIS Anchor software or consult ETA-13/1036.




PROFIS Anchor software interface:



## Space and edge distances per brick

| Brick code | edge and spacing distances | | | | | |
|---|---|---|---|---|---|---|
| | $c_{min}$ [mm] | $c_{cr}$ [mm] | $s_{min}$ ∥ [mm] | $s_{min}$ ⊥ [mm] | $s_{cr}$ ∥ [mm] | $s_{cr}$ ⊥ [mm] |
| SC1, SC2, SCS1, SLWC1, SLWC2, SNWC1, SNWC2, SNWC3, Valid also for solid bricks with same base material and equal or higher size and compressive strength | 50 | 115 | 115 @ $c_{min}$<br>50 @ $c_{cr}$ | 115 @ $c_{min}$<br>50 @ $c_{cr}$ | b @ header<br>l @ stretcher | h |
| HC1, HC2 | 50 | Tension: 50<br>Shear: l/2 | 5 x $d_0$ @ $h_{ef}$ = 80<br>$s_{cr\,II}$ @ $h_{ef}$ > 80 | 5 x $d_0$ @ $h_{ef}$ = 80<br>$s_{cr}$ ⊥ @ $h_{ef}$ > 80 | l | h |
| HC3 | 50 | Tension: 50<br>Shear: l/2 | 5 x $d_0$ | 5 x $d_0$ | l/2 | h |
| HC4 | 50 | 115 | 115 @ $c_{min}$<br>50 @ $c_{cr}$ | 115 @ $c_{min}$<br>50 @ $c_{cr}$ | b @ header<br>l @ stretcher | h |
| HC5 | b | b | b | h | b | h |
| HCS1, HLWC1 | 50 | Tension: 50<br>Shear: l/2 | 50 | 50 | l | h |
| HNWC1, HNWC2 | 50 | Tension: 50<br>Shear: h | 50 | 50 | h | h |

## Anchor dimensions

| **Anchor size**<br>Threaded rod<br>HIT-V, HIT-V-R, HIT-V-HCR | **M8** | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| Embedment depth $h_{ef}$ [mm] | Variable length from 50 to 300 without HIT-SC sieve sleeve<br>Variable length from 50 to 160 with HIT-SC sieve sleeve | | | |

| **Anchor size**<br>Internal threaded sleeve<br>HIT-IC | **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)

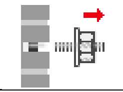
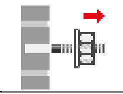
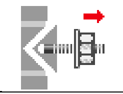
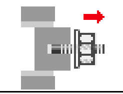
The load tables provide the characteristic resistance load for a single loaded anchor.

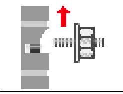
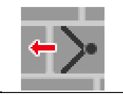
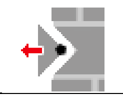
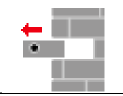
**All data in this section applies to**

- Edge distance $c \geq c_{cr}$. For other applications, use Hilti PROFIS Anchor 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,<br>Category **w/d** - **Installation in** dry or **wet** substrate and **use** in structures subject to **dry**, internal conditions (except calcium silicate bricks),<br>Category **w/w** - **Installation and use** in structures subject to dry or **wet** environmental conditions (except calcium silicate bricks). | |
| Installation direction | Masonry | horizontal | |
| 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

| Failure due to tension loads | | Condition |
|---|---|---|
| Failure of the metal part |  | $N^h_{Sd} \leq N_{Rk,s}/\gamma_{Ms}$ |
| Pull-out failure of the anchor |  | $N^h_{Sd} \leq N_{Rk,p}/\gamma_{Mm}$ |
| Brick breakout failure |  | $N_{Sd} \leq N_{Rk,b}/\gamma_{Mm}$<br>$N^g_{Sd} \leq N^g_{Rk}/\gamma_{Mm}$ |
| Pull out of one brick |  | $N_{Sd} \leq N_{Rk,pb}/\gamma_{Mm}$ |

| Failure due to shear loads | | Condition |
|---|---|---|
| Failure of the metal part |  | $V^h_{Sd} \leq V_{Rk,s}/\gamma_{Ms}$ |
| Local brick failure |  | $V_{Sd} \leq V_{Rk,b}/\gamma_{Mm}$<br>$V^g_{Sd} \leq V^g_{Rk}/\gamma_{Mm}$ |
| Brick edge failure |  | $V_{Sd} \leq V_{Rk,c}/\gamma_{Mm}$<br>$V^g_{Sd} \leq V^g_{Rk}/\gamma_{Mm}$ |
| Pushing out of one brick |  | $V_{Sd} \leq V_{Rk,pb}/\gamma_{Mm}$ |

- 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 Anchor software.

## Partial safety factors

| Base material | Failure (rupture) mode - Injection Anchor ($\gamma_{Mm}$ / $\gamma_{MAAC}$) |
|---|---|
| Masonry | 2,5 |

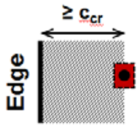
| Failure (rupture) mode - Metal part ($\gamma_{Ms}$) | | |
|---|---|---|
| Tension loading | Shear loading | |
| | if $f_{uk} \leq 800$ N/mm$^2$ and $f_{yk}/f_{uk} \leq 0{,}8$ | Other cases |
| 1,2 / ($f_{yk}$ / $f_{uk}$) ≥ 1,4 | 1,0 / ($f_{yk}$ / $f_{uk}$) ≥ 1,25 | 1,5 |

## Design steel resistance for threaded rods HIT-V

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

## Design steel resistance for internally threaded rods HIT-IC

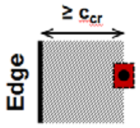
| Anchor size | | | M8 | M10 | M12 |
|---|---|---|---|---|---|
| $N_{Rd,s}$ | HIT-IC | [kN] | 3,9 | 4,8 | 9,1 |
| $V_{Rd,s}$ | HIT-V 5.8 | [kN] | 7,2 | 12,0 | 16,8 |
| | Screw 8.8 | [kN] | 12,0 | 18,4 | 27,2 |
| $M^0_{Rd,s}$ | HIT-V 5.8 | [kN] | 15,2 | 29,6 | 52,8 |
| | Screw 8.8 | [kN] | 24,0 | 48,0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




## Design tension and shear resistances at characteristic edge distance ($c \geq c_{cr}$) for single anchor applications

| Load type | Anchor size | $h_{ef}$ [mm] | $f_b$ [N/mm²] | w/w | | d/d | |
|---|---|---|---|---|---|---|---|
| | | | | Ta | Tb | Ta | Tb |
| | | | | Loads [kN] | | | |
|  | **SC1 - Solid clay brick Mz, 2DF (ETA data)** | | | | | | |
| $N_{Rd,p} = N_{Rd,b}$ ($c_{cr}$ = 115mm) | HIT-V M8, M10, M12, M16 w/ or w/o HIT-SC HIT-IC M8,M10, M12 w/ or w/o HIT-SC | ≥ 50 | 12 | 1,0 (1,2*) | 1,0 (1,2*) | 1,0 (1,2*) | 1,0 (1,2*) |
| | | ≥ 80 | 12 | 1,4 (1,8*) | 1,4 (1,8*) | 1,4 (1,8*) | 1,4 (1,8*) |
| | | ≥ 100 | 12 | 2,4 (2,8*) | 2,4 (2,8*) | 2,4 (2,8*) | 2,4 (2,8*) |
| $V_{Rd,b}$ ($c_{cr}$ = 115mm) | HIT-V M8, M10, M12, M16 w/ or w/o HIT-SC HIT-IC M8,M10, M12 w/ or w/o HIT-SC | all | 12 | 0,8 | 0,8 | 0,8 | 0,8 |
|  | **SC2 - Solid clay brick UK London yellow Multi Stock (Hilti data)** | | | | | | |
| $N_{Rd,p} = N_{Rd,b}$ ($c_{cr}$ = 100 mm) | HIT-V M8, M10, M12, M16 w/ HIT-SC HIT-IC M8, M10, M12 w/ HIT-SC | 50 | 16 | 1,0 (1,2*) | 1,0 (1,2*) | 1,0 (1,2*) | 1,0 (1,2*) |
| | | 80 | 16 | 1,4 (1,8*) | 1,4 (1,8*) | 1,4 (1,8*) | 1,4 (1,8*) |
| $V_{Rd,b}$ ($c_{cr}$ = 100 mm) | HIT-V M8, M10 w/ HIT-SC | 50 | 16 | 2,6 | 2,6 | 2,6 | 2,6 |
| | HIT-V M12, M16 w/ HIT-SC | 50 | 16 | 3,2 | 3,2 | 3,2 | 3,2 |
| | HIT-V M8, M10 w/ HIT-SC | 80 | 16 | 3,2 | 3,2 | 3,2 | 3,2 |
| | HIT-V M12, M16 w/ HIT-SC HIT-IC M8,M10, M12 w/ HIT-SC | 80 | 16 | 4,8 | 4,8 | 4,8 | 4,8 |
|  | **HC1 - Hollow clay brick Hlz, 10DF (ETA data)** | | | | | | |
| $N_{Rd,p} = N_{Rd,b}$ ($c_{cr}$ = 50mm) | HIT-V M8, M10, M12, M16 w/ HIT-SC | ≥ 80 | 12 | 0,6 | 0,6 | 0,6 | 0,6 |
| | | | 20 | 0,8 | 0,8 | 0,8 | 0,8 |
| | | ≥ 130 | 12 | 1,0 (1,2*) | 1,0 (1,2*) | 1,0 (1,2*) | 1,0 (1,2*) |
| | | | 20 | 1,4 (1,6*) | 1,4 (1,6*) | 1,4 (1,6*) | 1,4 (1,6*) |
| | HIT-IC M8, M10, M12 w/ HIT-SC | 80 | 12 | 0,6 | 0,6 | 0,6 | 0,6 |
| | | | 20 | 0,8 | 0,8 | 0,8 | 0,8 |
| $V_{Rd,b}$ ($c_{cr}$ = 150mm) | HIT-V M8, M10, M12 w/ HIT-SC HIT-IC M8 w/ HIT-SC w/ HIT-SC | ≥ 80 | 12 | 0,8 | 0,8 | 0,8 | 0,8 |
| | | | 20 | 1,2 | 1,2 | 1,2 | 1,2 |
| | HIT-V M16 w/ HIT-SC HIT-IC M10, M12 w/ HIT-SC | ≥ 80 | 12 | 1,4 | 1,4 | 1,4 | 1,4 |
| | | | 20 | 1,6 | 1,6 | 1,6 | 1,6 |
|  | **HC2 - Hollow clay brick Italy Mattone Alveolater 50 (Hilti data)** | | | | | | |
| $N_{Rd,p} = N_{Rd,b}$ ($c_{cr}$ = 50 mm) | HIT-V M8, M10, M12, M16 w/ HIT-SC HIT-IC M8, M10, M12 w/ HIT-SC | ≥ 80 | 16 | 0,8 | 0,8 | 0,8 | 0,8 |
| | HIT-V M8, M10, M12, M16 w/ HIT-SC | ≥ 130 | 16 | 1,6 (1,8*) | 1,6 (1,8*) | 1,6 (1,8*) | 1,6 (1,8*) |
| $V_{Rd,b}$ ($c_{cr}$ = 150 mm) | HIT-V M8, M10, M12, M16 w/ HIT-SC HIT-IC M8, M10, M12 w/ HIT-SC | ≥ 80 | 16 | 1,4 | 1,4 | 1,4 | 1,4 |
| | HIT-V M8, M10, M12, M16 w/ HIT-SC | ≥ 130 | 16 | 2,6 | 2,6 | 2,6 | 2,6 |

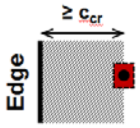
* Compressed Air Cleaning only




## Design tension and shear resistances at characteristic edge distance (c ≥ $c_{cr}$) for single anchor applications

| Load type | Anchor size | $h_{ef}$ [mm] | $f_b$ [N/mm²] | w/w | | d/d | |
|---|---|---|---|---|---|---|---|
| | | | | Ta | Tb | Ta | Tb |
| | | | | **Loads** [kN] | | | |
|  | **HC3 - Hollow clay brick<br>Italy Foratino 4 Fori (Hilti data)** | | | | | | |
| $N_{Rd,p}$ = $N_{Rd,b}$<br>($c_{cr}$ = 50 mm) | HIT-V M8, M10 w/ HIT-SC<br>HIT- IC M8 w/ HIT-SC | ≥ 80 | 4 | 0,4 | 0,4 | 0,4 | 0,4 |
| | HIT-V M8, M10 w/ HIT-SC | ≥ 130 | 4 | 1,0 (1,2*) | 1,0 (1,2*) | 1,0 (1,2*) | 1,0 (1,2*) |
| | HIT-V M12, M16 w/ HIT-SC<br>HIT-IC M10, M12 w/ HIT-SC | ≥ 80 | 4 | 0,8 (1,0*) | 0,8 (1,0*) | 0,8 (1,0*) | 0,8 (1,0*) |
| | | ≥ 130 | 4 | 1,6 (1,8*) | 1,6 (1,8*) | 1,6 (1,8*) | 1,6 (1,8*) |
| $V_{Rd,b}$<br>($c_{cr}$ = 120 mm) | HIT-V M8, M10 w/ HIT-SC<br>HIT- IC M8 w/ HIT-SC | ≥ 80 | 4 | 0,6 | 0,6 | 0,6 | 0,6 |
| | HIT-V M16 w/ HIT-SC<br>HIT-IC M10, M12 w/ HIT-SC | ≥ 80 | 4 | 1,0 | 1,0 | 1,0 | 1,0 |
|  | **HC4 - Hollow clay brick<br>Italy Doppio uni (Hilti data)** | | | | | | |
| $N_{Rd,p}$ = $N_{Rd,b}$<br>($c_{cr}$ = 50 mm) | HIT-V M8, M10, M12, M16 w/ HIT-SC | ≥ 50 | 27 | 0,4 | 0,4 | 0,4 | 0,4 |
| | HIT-V M8, M10, M12, M16 w/ HIT-SC<br>HIT-IC M8, M10, M12 w/ HIT-SC | ≥ 80 | 27 | 0,8 (1,0*) | 0,8 (1,0*) | 0,8 (1,0*) | 0,8 (1,0*) |
| | HIT-V M8, M10, M12, M16 w/ HIT-SC<br>HIT-IC M8, M10, M12 w/ HIT-SC | ≥ 130 | 27 | 1,6 (1,8*) | 1,6 (1,8*) | 1,6 (1,8*) | 1,6 (1,8*) |
| $V_{Rd,b}$<br>($c_{cr}$ = 120 mm) | HIT-V M8, M10, M12, M16 w/ HIT-SC | ≥ 50 | 27 | 1,6 | 1,6 | 1,6 | 1,6 |
| | HIT-V M8, M10, M12, M16 w/ HIT-SC<br>HIT-IC M8, M10, M12 w/ HIT-SC | ≥ 80 | 27 | 3,6 | 3,6 | 3,6 | 3,6 |
|  | **HC5 Hollow clay brick<br>UK Nostell Red Multi (Hilti data)** | | | | | | |
| $N_{Rd,p}$ = $N_{Rd,b}$<br>($c_{cr}$ = 50 mm) | HIT-V M8, M10, M12, M16 w/ HIT-SC | 50 | 70 | 0,8 | 0,8 | 0,8 | 0,8 |
| | HIT-V M8, M10, M12, M16 w/ HIT-SC<br>HIT-IC M8, M10, M12 w/ HIT-SC | 80 | 70 | 0,8 | 0,8 | 0,8 | 0,8 |
| $V_{Rd,b}$<br>($c_{cr}$ = 110 mm) | HIT-V M8, M10, M12, M16 w/ HIT-SC | 50 | 70 | 4,6 | 4,6 | 4,6 | 4,6 |
| | HIT-V M8, M10, M12, M16 w/ HIT-SC<br>HIT-IC M8, M10, M12 w/ HIT-SC | 80 | 70 | 4,8 | 4,8 | 4,8 | 4,8 |

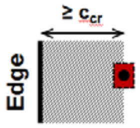
* Compressed Air Cleaning only




## Design tension and shear resistances at characteristic edge distance ($c \geq c_{cr}$) for single anchor applications

| Load type | Anchor size | $h_{ef}$ [mm] | $f_b$ [N/mm²] | w/w | | d/d | |
|---|---|---|---|---|---|---|---|
| | | | | Ta | Tb | Ta | Tb |
| | | | | Loads [kN] | | | |
|  | **SCS1 - Solid silica brick KS, 2DF (ETA data)** | | | | | | |
| $N_{Rd,p}$ = $N_{Rd,b}$ ($c_{cr}$ = 115mm) | HIT-V M8, M10, M12, M16 w/ or w/o HIT-SC<br>HIT-IC M8,M10, M12 w/ or w/o HIT-SC | all | 12 | - | - | 2,4 | 2,0 |
| | | | 28 | - | - | 3,6 | 3,0 |
| $V_{Rd,b}$ ($c_{cr}$ = 115mm) | HIT-V M8, M10, M12, M16 w/ or w/o HIT-SC<br>HIT-IC M8,M10, M12 w/ or w/o HIT-SC | all | 12 | - | - | 2,4 | 2,4 |
| | | | 28 | - | - | 3,6 | 3,6 |
|  | **HCS1 - Hollow silica brick KSL, 8DF (ETA data)** | | | | | | |
| $N_{Rd,p}$ = $N_{Rd,b}$ ($c_{cr}$ = 50mm) | HIT-V M8, M10, M12, M16 w/ HIT-SC | ≥ 80 | 12 | - | - | 1,6 | 1,2 |
| | | | 20 | - | - | 2,2 | 1,8 |
| | | ≥ 130 | 12 | - | - | 2,0 | 1,6 |
| | | | 20 | - | - | 3,0 | 2,4 |
| | HIT-IC M8, M10, M12 w/ HIT-SC | 80 | 12 | - | - | 1,6 | 1,2 |
| | | | 20 | - | - | 2,2 | 1,8 |
| $V_{Rd,b}$ ($c_{cr}$ = 125mm) | HIT-V M8 w/ HIT-SC | ≥ 80 | 12 | 2,4 | 2,4 | 2,4 | 2,4 |
| | | | 20 | 3,6 | 3,6 | 3,6 | 3,6 |
| | HIT-V M10 w/ HIT-SC | ≥ 80 | 12 | 3,6 | 3,6 | 3,6 | 3,6 |
| | | | 20 | 4,8 | 4,8 | 4,8 | 4,8 |
| | HIT-V M12, M16 w/ HIT-SC<br>HIT-IC M10, M12 w/ HIT-SC | ≥ 80 | 12 | 4,0 | 4,0 | 4,0 | 4,0 |
| | | | 20 | 4,8 | 4,8 | 4,8 | 4,8 |
|  | **SLWC1 - Solid lightweight concrete brick Vbl, 2DF (ETA data)** | | | | | | |
| $N_{Rd,p}$ = $N_{Rd,b}$ ($c_{cr}$ = 115mm) | HIT-V M8, M10, M12, M16 w/ or w/o HIT-SC<br>HIT-IC M8,M10, M12 w/ or w/o HIT-SC | ≥ 50 | 4 | 1,2 | 0,8 | 1,2 (1,4*) | 1,0 |
| | | | 6 | 1,4 | 1,2 | 1,6 | 1,2 (1,4*) |
| | | ≥ 80 | 4 | 1,8 | 1,4 | 2,0 | 1,6 (1,8*) |
| | | | 6 | 2,2 | 1,8 | 2,4 (2,6*) | 2,0 (2,2*) |
| | | ≥ 100 | 4 | 2,4 | 2,0 | 2,6 (2,8*) | 2,2 (2,4*) |
| | | | 6 | 3,0 | 2,4 | 3,2 (3,4*) | 2,6 (2,8*) |
| $V_{Rd,b}$ ($c_{cr}$ = 115mm) | HIT-V M8 w/ or w/o HIT-SC<br>HIT-IC M8 w/ or w/o HIT-SC | all | 4 | 0,8 | 0,8 | 0,8 | 0,8 |
| | | | 6 | 1,0 | 1,0 | 1,0 | 1,0 |
| | HIT-V M10, M12, M16 w/ or w/o HIT-SC<br>HIT-IC M10, M12 w/ or w/o HIT-SC | all | 4 | 1,0 | 1,0 | 1,0 | 1,0 |
| | | | 6 | 1,2 | 1,2 | 1,2 | 1,2 |
|  | **SLWC2 - Solid lightweight concrete brick Italy "Tufo" volcanic rock (Hilti data)** | | | | | | |
| $N_{Rd,p}$ = $N_{Rd,b}$ ($c_{cr}$ = 115 mm) | HIT-V M8 | ≥ 80 | 4 | 1,2 | 1,0 | 1,4 | 1,2 |
| | HIT-V M10 | ≥ 100 | 4 | 2,0 | 1,6 | 2,2 (2,4*) | 1,8 (2,0*) |
| | HIT-V M12 | ≥ 120 | 4 | 2,8 | 2,4 | 3,2 (3,4*) | 2,6 (2,8*) |
| | HIT-V M16 | ≥ 160 | 4 | 2,8 | 2,4 | 3,2 (3,4*) | 2,6 (2,8*) |
| $V_{Rd,b}$ ($c_{cr}$ = 115 mm) | HIT-V M8 | ≥ 80 | 4 | 0,8 | 0,8 | 0,8 | 0,8 |
| | HIT-V M10, M12, M16 | all | 4 | 1,8 | 1,8 | 1,8 | 1,8 |

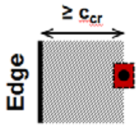
* Compressed Air Cleaning only




## Design tension and shear resistances at characteristic edge distance ($c \geq c_{cr}$) for single anchor applications

| Load type | Anchor size | $h_{ef}$ [mm] | $f_b$ [N/mm²] | w/w Ta | w/w Tb | d/d Ta | d/d Tb |
|---|---|---|---|---|---|---|---|
| | | | | **Loads** [kN] | | | |
|  | **HNWC1 - Hollow lightweight concrete brick Hbl, 16DF (ETA data)** | | | | | | |
| $N_{Rd,p} = N_{Rd,b}$ ($c_{cr}$ = 50mm) | HIT-V M8, M10, M12, M16 w/ HIT-SC | ≥ 80 | 2 | 0,4 | 0,3 | 0,6 | 0,4 |
| | | | 6 | 0,8 | 0,6 | 1,0 | 0,8 |
| | | ≥ 160 | 2 | 0,6 | 0,4 | 0,6 (0,8*) | 0,6 |
| | | | 6 | 1,0 (1,2*) | 0,8 | 1,2 (1,6*) | 1,0 |
| | HIT-IC M8, M10, M12 w/ HIT-SC | 80 | 2 | 0,4 | 0,3 | 0,6 | 0,4 |
| | | | 6 | 0,8 | 0,6 | 1,0 | 0,8 |
| $V_{Rd,b}$ ($c_{cr}$ = 250mm) | HIT-V M8, M10 w/ HIT-SC | ≥ 80 | 2 | 1,4 | 1,4 | 1,4 | 1,4 |
| | | | 6 | 2,4 | 2,4 | 2,4 | 2,4 |
| | HIT-V M12, M16 w/ HIT-SC<br>HIT-IC M8, M10, M12 w/ HIT-SC | ≥ 80 | 2 | 1,8 | 1,8 | 1,8 | 1,8 |
| | | | 6 | 3,2 | 3,2 | 3,2 | 3,2 |
|  | **SNWC1 - Solid normal weight concrete brick Vbn, 2DF (ETA data)** | | | | | | |
| $N_{Rd,p} = N_{Rd,b}$ ($c_{cr}$ = 115mm) | HIT-V M8, M10, M12, M16 w/ or w/o HIT-SC<br>HIT-IC M8,M10, M12 w/ or w/o HIT-SC | all | 6 | 1,2 | 1,0 | 1,2 | 1,0 |
| | | | 16 | 2,2 | 1,8 | 2,2 | 1,8 |
| $V_{Rd,b}$ ($c_{cr}$ = 115mm) | HIT-V M8, M10, M12, M16 w/ or w/o HIT-SC<br>HIT-IC M8,M10, M12 w/ or w/o HIT-SC | all | 6 | 1,6 | 1,6 | 1,6 | 1,6 |
| | | | 16 | 2,6 | 2,6 | 2,6 | 2,6 |
|  | **SNWC2 - Solid normal weight concrete brick UK Dense concrete b=100 mm (Hilti data)** | | | | | | |
| $N_{Rd,p} = N_{Rd,b}$ ($c_{cr}$ = 115 mm) | HIT-V M8, M10, M12, M16 w/ or w/o HIT-SC | 50 | 14 | 2,2 | 1,8 | 2,2 | 1,8 |
| $V_{Rd,b}$ ($c_{cr}$ = 220 mm) | HIT-V M8, M10, M12, M16 w/ or w/o HIT-SC | 50 | 14 | 4,2 | 4,2 | 4,2 | 4,2 |
|  | **SNWC3 - Solid normal weight concrete brick UK Dense concrete b=140 mm (Hilti data)** | | | | | | |
| $N_{Rd,p} = N_{Rd,b}$ ($c_{cr}$ = 115 mm) | HIT-V M8, M10, M12, M16 w/ or w/o HIT-SC | 50 | 14 | 2,2 | 1,8 | 2,2 | 1,8 |
| | HIT-V M8, M10, M12, M16 w/ or w/o HIT-SC<br>HIT-IC M8,M10, M12 w/ or w/o HIT-SC | 80 | 14 | 2,2 | 1,8 | 2,2 | 1,8 |
| $V_{Rd,b}$ ($c_{cr}$ = 220 mm) | HIT-V M8, M10, M12, M16 w/ or w/o HIT-SC | 50 | 14 | 4,2 | 4,2 | 4,2 | 4,2 |
| | HIT-V M8, M10 w/ or w/o HIT-SC | 80 | 14 | 4,2 | 4,2 | 4,2 | 4,2 |
| | HIT-V M12, M16 w/ or w/o HIT-SC<br>HIT-IC M8,M10, M12 w/ or w/o HIT-SC | 80 | 14 | 4,8 | 4,8 | 4,8 | 4,8 |

* Compressed Air Cleaning only



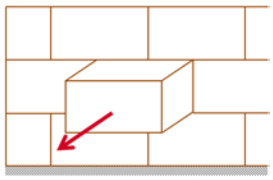

## Design tension and shear resistances at characteristic edge distance ($c \geq c_{cr}$) for single anchor applications

| Load type | Anchor size | $h_{ef}$ [mm] | $f_b$ [N/mm²] | w/w | | d/d | |
|---|---|---|---|---|---|---|---|
| | | | | Ta | Tb | Ta | Tb |
| | | | | Loads [kN] | | | |
|  | **HNWC1 - Hollow normal weight concrete brick Parpaing creux (ETA data)** | | | | | | |
| $N_{Rd,p} = N_{Rd,b}$ ($c_{cr}$ = 50mm) | HIT-V M8, M10, M12, M16 w/ HIT-SC HIT-IC M8, M10, M12 w/ HIT-SC | ≥ 50 | 4 | 0,3 | 0,3 | 0,3 | 0,3 |
| | | | 10 | 0,8 | 0,6 | 0,8 | 0,6 |
| | | ≥ 130 | 4 | 0,6 | 0,4 | 0,6 | 0,4 |
| | | | 10 | 1,0 | 0,8 | 1,0 | 0,8 |
| $V_{Rd,b}$ ($c_{cr}$ = 200mm) | HIT-V M8, M10, M12, M16 w/ HIT-SC HIT-IC M8, M10, M12 w/ HIT-SC | all | 4 | 1,4 | 1,4 | 1,4 | 1,4 |
| | | | 10 | 2,4 | 2,4 | 2,4 | 2,4 |
|  | **HNWC2 - Hollow normal weight concrete brick Italy Blocchi Cem (Hilti data)** | | | | | | |
| $N_{Rd,p} = N_{Rd,b}$ ($c_{cr}$ = 50 mm) | HIT-V M8, M10, M12, M16 w/ HIT-SC HIT-IC M8, M10, M12 w/ HIT-SC | ≥ 80 | 8 | 1,0 | 0,8 | 1,0 | 0,8 |
| $V_{Rd,b}$ ($c_{cr}$ = 200 mm) | HIT-V M8, M10 w/ HIT-SC HIT-IC M8 w/ HIT-SC | ≥ 80 | 8 | 4,0 | 4,0 | 4,0 | 4,0 |
| | HIT-V M12, M16 w/ HIT-SC HIT-IC M10, M12 w/ HIT-SC | ≥ 80 | 8 | 4,4 | 4,4 | 4,4 | 4,4 |

* Compressed Air Cleaning only

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

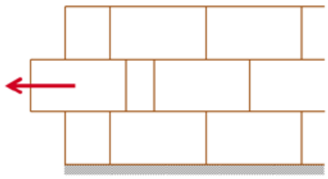
### Pull out of one brick (tension):



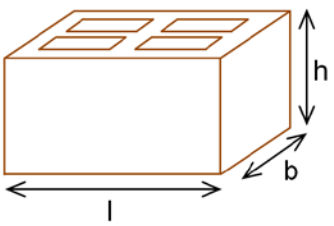
$N_{Rd,pb} = 2 \cdot l \cdot b \cdot (0,5 \cdot f_{vko} + 0,4 \cdot \sigma_d) / 2.5 \; (+ \, b \cdot h \cdot f_{vko} \; / 2.5)$*

* applicable if vertical joints are filled

### Pushing out of one brick (shear):



$V_{Rd,pb} = 2 \cdot l \cdot b \cdot (0,5 \cdot f_{vko} + 0,4 \cdot \sigma_d) / 2.5$




$\sigma_d$ = design compressive stress perpendicular to the shear (N/mm$^2$)
$f_{vko}$ = 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 |

## Jobsite test

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 job 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 $\beta$ factor, which considers the different influences of the product.

The $\beta$ 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 | 0,81 | 0,81 | 0,81 | 0,81 |
| | MC | 0,71 | 0,71 | 0,71 | 0,71 |
| 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 7

Applying the $\beta$ 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 HIT-V

| Part | Material |
|---|---|
| Threaded rod<br>HIT-V-5.8(F) | Strength class 5.8, A5 > 8% ductile<br>Electroplated zinc coated ≥ 5 μm; (F) Hot dip galvanized ≥ 45 μm |
| Threaded rod<br>HIT-V-8.8(F) | Strength class 8.8, A5 > 8% ductile<br>Electroplated zinc coated ≥ 5 μm; (F) Hot dip galvanized ≥ 45 μm |
| Threaded rod<br>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<br>HIT-V-HCR | High corrosion resistant steel, A5 > 8% ductil<br>1.4529, 1.4565 EN 10088-1: 2005 |
| 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 |
| Hexagon nut | Strength class 8<br>Electroplated zinc coated ≥ 5 μm<br>Hot dip galvanized ≥ 45 μm |
| | Strength class 70<br>Stainless steel grade A4 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362 |
| | Strength class 70<br>High corrosion resistant steel 1.4529, 1.4565 |

## Material quality HIT-IC

| Part | Material |
|---|---|
| Internal threaded sleeve HIT-IC | A5 > 8% ductile<br>Electroplated zinc coated ≥ 5 μm |

## Material quality HIT-SC

| Part | Material |
|---|---|
| Sieve sleeve HIT-SC | Body: Polyfort FPP 20T<br>Sieve: PA6.6 N500/200 |

## Base materials:

- Solid brick masonry. The characteristic 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 job site tests according to ETAG 029, Annex B under consideration of the β-factor according to Table page 14.

## Setting

### Installation equipment

| Anchor size | M6 | M8 | M10 | M12 | M16 |
|---|---|---|---|---|---|
| Rotary hammer | TE2 – TE30 | | | | |
| Other tools | compressed air gun or blow out pump, set of cleaning brushes, dispenser | | | | |

### Maximum working time and minimum curing time

| Temperature in the base material T | Maximum working time $t_{work}$ | minimum curing time $t_{cure}$ |
|---|---|---|
| -5 °C to -1 °C * | 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 39 °C | 2 min | 20 min |
| 40 °C | 1 min | 15 min |

The curing time data are valid for dry base material only. In wet base material the curing times must be doubled.
* For hollow bricks only.

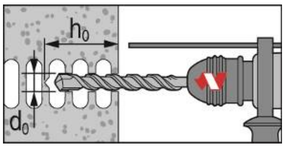
### Installation instructions

Anchor installation should be carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.

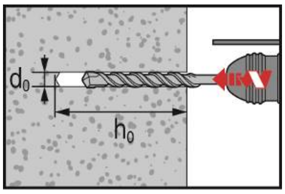
**Hole drilling**

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

**Hammer drilling**



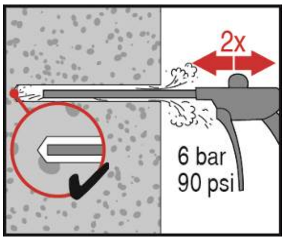

**in hollow bricks (use category c): rotary mode**
Drill hole to the required embedment depth with a hammer drill set in rotation mode using an appropriately sized carbide drill bit.



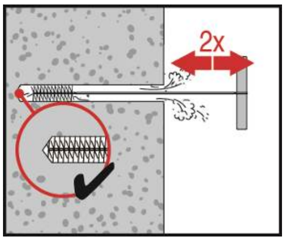

**in solid bricks (use category b): hammer mode**
Drill hole to the required embedment depth with a hammer drill set in hammer mode using an appropriately sized carbide drill bit.

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

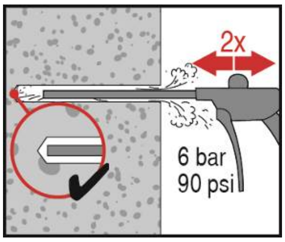
**Manual Cleaning (MC) or Compressed air cleaning (CAC) for hollow and solid bricks**




Blow 2 times from the back of the hole (if needed with nozzle extension) over the hole length with hand pump (drill hole diameter $d_0 \leq 18$ mm and drill hole depth up to $h_0 = 100$ mm) or oil-free compressed air (min. 6 bar at 6 m³/h; drill hole depth up to $h_0 = 300$ mm) until return air stream is free of noticeable dust.

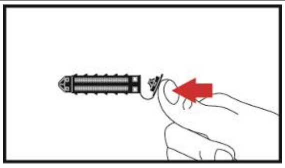



Brush 2 times with the specified brush by inserting the steel brush Hilti HIT-RB to the back of the hole (if needed with extension) in a twisting motion and removing it. The brush must produce natural resistance as it enters the drill hole (brush Ø ≥ drill hole Ø) - if not the brush is too small and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

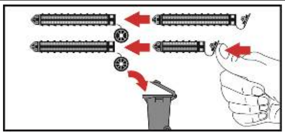



Blow again with hand pump or compressed air 2 times until return air stream is free of noticeable dust.

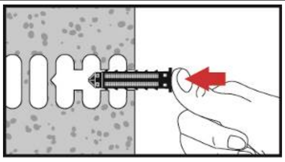
**Injection preparation in masonry with holes or voids: installation with sieve sleeve HIT-SC**



**Single sieve sleeve HIT-SC**
Close lid

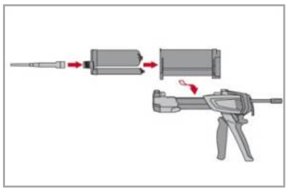


**Two sieve sleeves HIT-SC**
Plug sieve sleeves together. Discard superfluous lid.
Observe sieve sleeve order in case of different sieve sleeve lengths: shorter sleeve has to be plugged into longer sleeve.

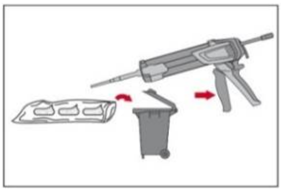


Insert sieve sleeve manually.
When using two sieve sleeves, longer sieve sleeve has to be be inserted first.

**For all applications**



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

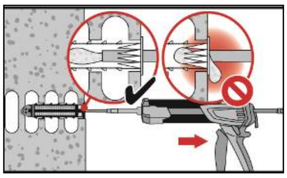


Discard initial adhesive. The foil pack opens automatically as dispensing is initiated. Depending on the size of the foil pack an initial amount of adhesive has to be discarded. Discarded quantities are

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

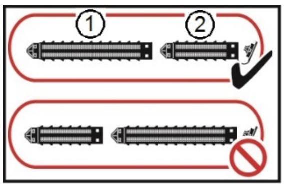
**Inject adhesive without forming air voids**

**Installation with sieve sleeve HIT-SC**



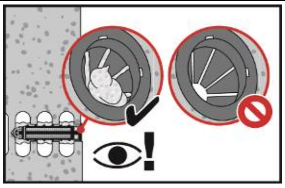
**Single sieve sleeve HIT-SC**

Insert mixer approximately 1 cm through the lid. Inject required amount of adhesive. Adhesive must emerge through the lid.
This is also applicable for overhead installation (no piston plug required).



**Two sieve sleeves HIT-SC**

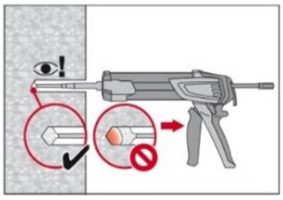
Use extension for installation with two sieve sleeves.
Insert mixer approximately 1 cm through the top of sieve sleeve “2” and inject required amount of adhesive into sieve sleeve “1”. Withdraw mixer to the point where it extends about 1 cm through the lid into the sleeve “2”. Continue injecting in Sieve sleeve “2” as described above.



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

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

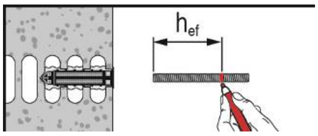
**Solid bricks: installation without sieve sleeve**



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

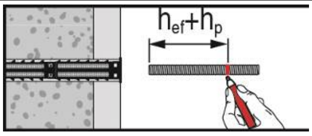
After injection is completed, depressurize the dispenser by pressing the release trigger. This will prevent further adhesive discharge from the mixer.

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



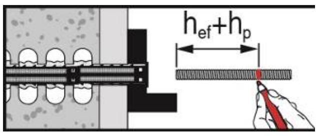

**HIT-V-…or HIT-IC in hollow and solid bricks:**
**Pre-setting**

Mark and set element to the required embedment depth until working time $t_{work}$ has elapsed. The working time $t_{work}$ is given in page 16.




**HIT-V-… in hollow and solid bricks:**
**setting through the non-loadbearing**

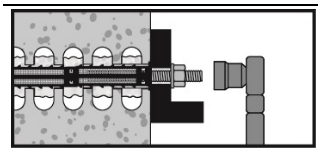
Mark and set element to the required embedment depth until working time $t_{work}$ has elapsed. The working time $t_{work}$ is given in page 16.




**HIT-V-… in hollow and solid bricks:**
**setting through the fixture**
**or through the non-loadbearing layer and the fixture**

Mark and set element to the required embedment depth until working time $t_{work}$ has elapsed. The working time $t_{work}$ is given in page 16.

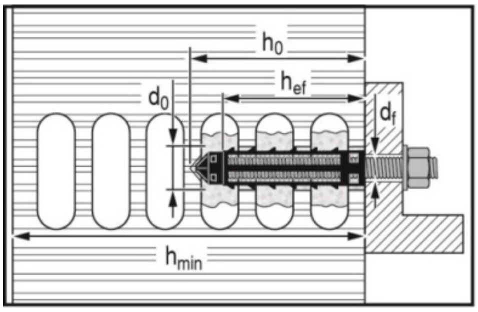
**Loading the anchor**



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

## Applications for hollow and solid bricks with sieve sleeves

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




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

**Installation parameters of threaded rod HIT-V with sieve sleeve HIT-SC in hollow and solid brick**

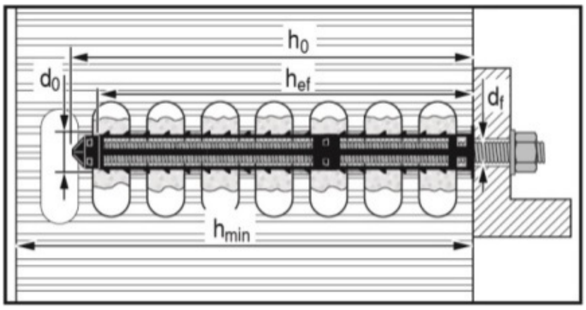
| HIT-V | | | M6 | M8 | | M10 | | M12 | | M16 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **with HIT-SC** | | | **12x85** | **16x50** | **16x85** | **16x50** | **16x85** | **18x50** | **18x85** | **22x50** | **22x85** |
| Nominal diameter of drill bit | $d_0$ | [mm] | 12 | 16 | 16 | 16 | 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 |
| Maximum torque moment for all brick types except “parpaing creux” | $T_{max}$ | [Nm] | 3 | 3 | 3 | 4 | 4 | 6 | 6 | 8 | 8 |
| Maximum torque moment for “parpaing creux” | $T_{max}$ | [Nm] | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 6 | 6 |

**Installation parameters of internal threaded sleeve HIT-IC with HIT-SC in hollow and solid brick**

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

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

**For installing HIT-V with embedments of 130 and 160 cm, two attached sleeves are used.**



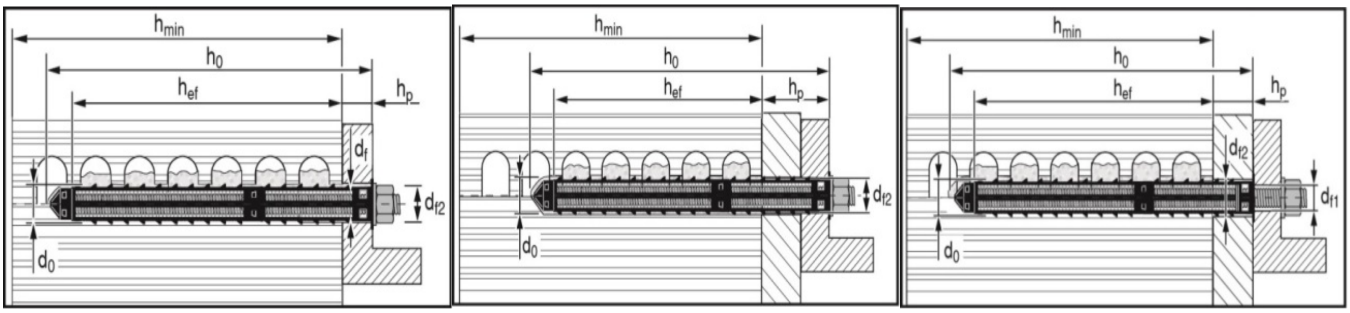

Hollow brick with threaded rod HIT-V and two sieve sleeves HIT-SC for deeper embedment depth

**Installation parameters of threaded rod HIT-V with two HIT-SC in hollow and solid brick for deeper embedment depth**

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

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

**For through fastenings with HIT-V, two attached sleeves are used.**



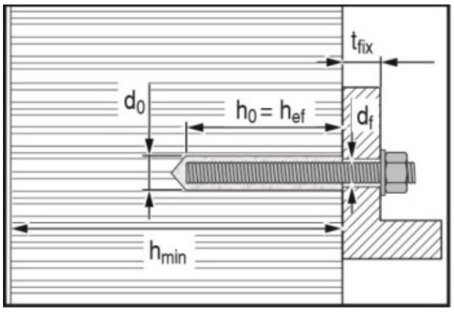

Hollow and solid brick with threaded rod HIT-V with two sieve sleeves HIT-SC for setting through the fixture and/or through the non-loadbearing layer

**Installation parameters of threaded rod HIT-V with two sieve sleeves HIT-SC for setting through the fixture and/or through the non- loadbearing layer in hollow and solid brick)**

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

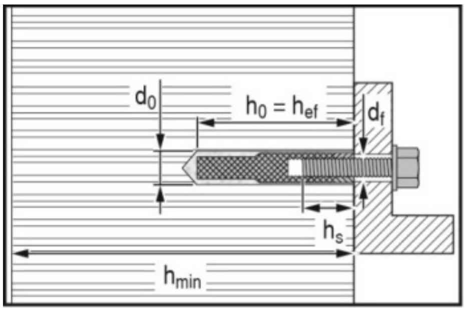
**Hilti recommends the anchoring in masonry always with sieve sleeve. Anchors can only be installed without sieve sleeves in solid bricks when it is guaranteed that it has not any hole or void.**




Solid brick with threaded rod HIT-V

**Installation parameters of threaded rods and HIT-V-… in solid brick**

| 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 internal threaded sleeve HIT-IC… in solid brick**

| 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 |