Deutsches Institut für Bautechnik
DIBt

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Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment

ETA-14/0457 of 14 December 2017

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	Injection system Hilti HIT-HY 170
Product family to which the construction product belongs	Bonded anchor for use in concrete
Manufacturer	Hilti Aktiengesellschaft 9494 SCHAAN FÜRSTENTUM LIECHTENSTEIN
Manufacturing plant	Hilti Werke
This European Technical Assessment contains	19 pages including 3 annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	ETAG 001 Part 5: "Bonded anchors", April 2013, used as EAD according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011.
This version replaces	ETA-14/0457 issued on 10 March 2015

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Specific Part

1 Technical description of the product

The Injection system Hilti HIT-HY 170 is a bonded anchor consisting of a cartridge with injection mortar Hilti HIT-HY 170 and a steel element. The steel element consist of a threaded rod or HIT-V with washer and hexagon nut in the range of M8 to M24 or a internally threaded sleeve HIS-(R)-N in the range of M8 to M16.

The steel element is placed into a drilled hole filled with injection mortar and is anchored via the bond between metal part, injection mortar and concrete.

The product description is given in Annex A.

2 Specification of the intended use in accordance with the applicable European Assessment Document

The performances given in Section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchor of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance tension and shear loads	See Annex C1 to C3
Displacements under tension and shear loads	See Annex C4

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorages satisfy requirements for Class A1
Resistance to fire	No performance assessed

3.3 Hygiene, health and the environment (BWR 3)

Regarding dangerous substances there may be requirements (e.g. transposed European legislation and national laws, regulations and administrative provisions) applicable to the products falling within the scope of this European Technical Assessment. In order to meet the provisions of Regulation (EU) No 305/2011, these requirements need also to be complied with, when and where they apply.

3.4 Safety in use (BWR 4)

The essential characteristics regarding Safety in use are included under the Basic Works Requirement Mechanical resistance and stability.

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

In accordance with guideline for European technical approval ETAG 001, April 2013 used as European Assessment Document (EAD) according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011 the applicable European legal act is: [96/582/EC].

The system to be applied is: 1

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

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

Issued in Berlin on 14 December 2017 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Lange

Installed condition

Figure A1:
Threaded rod and HIT-V-…

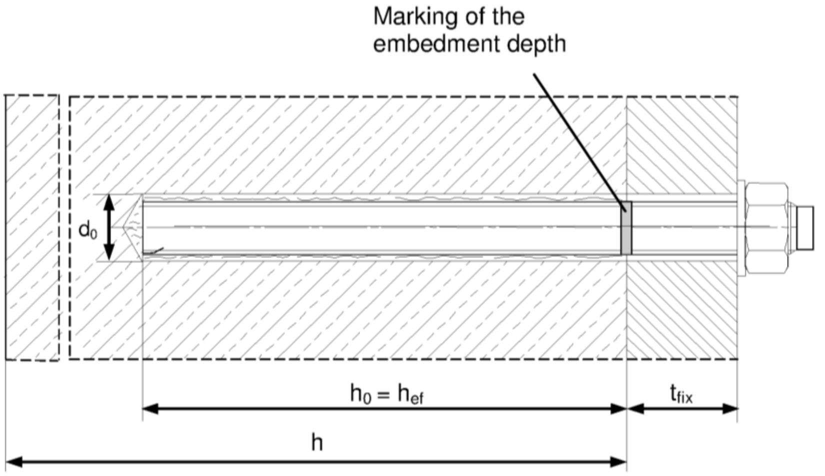
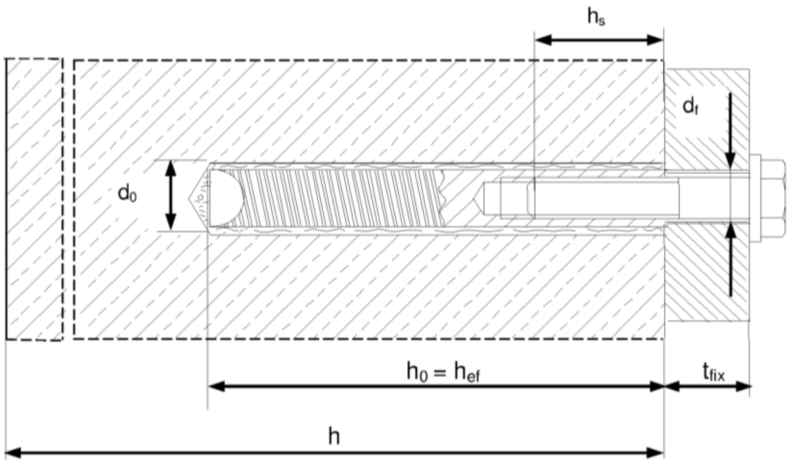


Figure A2:
Internally threaded sleeve HIS-(R)N



Injection system Hilti HIT-HY 170	
Product description Installed condition	**Annex A1**

Product description: Injection mortar and steel elements

Injection mortar Hilti HIT-HY 170: hybrid system with aggregate

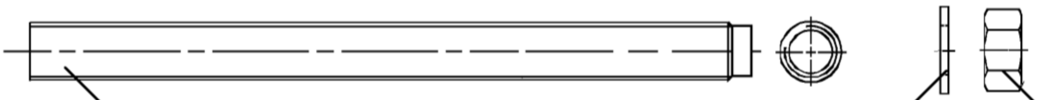
330 ml and 500 ml

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

Product name: “Hilti HIT-HY 170”

Static mixer Hilti HIT-RE-M

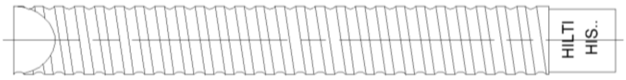
Steel elements



Threaded rod, HIT-V-...: M8 to M24 washer nut

Commercial standard threaded rod with:

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



Internally threaded sleeve: HIS-(R)N M8 to M16

Injection system Hilti HIT-HY 170	Annex A2
Product description Injection mortar / Static mixer / Steel elements	

Table A1: Materials

Designation	Material
Metal parts made of zinc coated steel	
Threaded rod HIT-V-5.8(F)	Strength class 5.8, f_{uk} = 500 N/mm²; f_{yk} = 400 N/mm² Elongation at fracture (l_0=5d) > 8% ductile Electroplated zinc coated ≥ 5 µm (F) Hot dip galvanized ≥ 45 µm
Threaded rod HIT-V-8.8(F)	Strength class 8.8 , f_{uk} = 800 N/mm², f_{yk} = 640 N/mm² Elongation at fracture (l_0=5d) > 12% ductile Electroplated zinc coated ≥ 5 µm (F) Hot dip galvanized ≥ 45 µm
Internally threaded sleeve HIS-N	Electroplated zinc coated ≥ 5µm
Washer	Electroplated zinc coated ≥ 5 µm Hot dip galvanized ≥ 45 µm
Nut	Strength class of nut adapted to strength class of threaded rod Electroplated zinc coated ≥ 5 µm Hot dip galvanized ≥ 45 µm
Metal parts made of stainless steel	
Threaded rod HIT-V-R	Strength class 70, f_{uk} = 700 N/mm², f_{yk} = 450 N/mm² Elongation at fracture (l_0=5d) > 8% ductile Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1:2014
Internally threaded sleeve HIS-RN	Stainless steel 1.4401, 1.4571 EN 10088-1:2014
Washer	Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1:2014
Nut	Strength class of nut adapted to strength class of threaded rod Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1:2014
Metal parts made of high corrosion resistant steel	
Threaded rod HIT-V-HCR	For ≤ M20: f_{uk} = 800 N/mm², f_{yk} = 640 N/mm² Elongation at fracture (l_0=5d) > 8% ductile For > M20: f_{uk} = 700 N/mm², f_{yk} = 400 N/mm² Elongation at fracture (l_0=5d) > 8% ductile High corrosion resistant steel 1.4529, 1.4565 EN 10088-1:2014
Washer	High corrosion resistant steel 1.4529, 1.4565 EN 10088-1:2014
Nut	Strength class of nut adapted to strength class of threaded rod High corrosion resistant steel 1.4529, 1.4565 EN 10088-1:2014

Specifications of intended use

Anchorages subject to:

- Static and quasi static loading: M8 to M24

Base material:

- Reinforced or unreinforced normal weight concrete according to EN 206:2013.
- Strength classes C20/25 to C50/60 according to EN 206:2013.
- Cracked and non-cracked concrete according to Table B1.

Table B1: Specifications of intended use

Anchorages subject to:		**HIT-HY 170 with …**	
Elements		Threaded rod, HIT-V-… 	HIS-(R)N 
Hammer drilling with hollow drill bit TE-CD or TE-YD 		✓	✓
Hammer drilling mode 		✓	✓
Static and quasi static loading in non-cracked concrete		M8 to M24 Table : C1, C2, C5, C6	M8 to M16 Table : C3, C4, C7, C8
Static and quasi static loading in cracked concrete		M10 to M16 Table : C1, C2, C5, C6	-
Temperature in the base material at installation		-5° C to +40° C	
In-service temperature	Temperature range I:	-40 °C to +40 °C	(max. long term temperature +24 °C and max. short term temperature +40 °C)
	Temperature range II:	-40 °C to +80 °C	(max. long term temperature +50 °C and max. short term temperature +80 °C)

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions
  (zinc coated steel, stainless steel or high corrosion resistant steel).
- Structures subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal conditions, if no particular aggressive conditions exist
  (stainless steel or high corrosion resistant steel).
- Structures subject to external atmospheric exposure and to permanently damp internal conditions, if other particular aggressive conditions exist
  (high corrosion resistant steel).
  Note: Particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution
  (e.g. in desulphurization plants or road tunnels where de-icing products are used).

Injection system Hilti HIT-HY 170	**Annex B1**
Intended Use Specifications	

Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete 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 reinforcement or to supports, etc.).
- Anchorages under static or quasi-static loading are designed in accordance with:
  "EOTA Technical Report TR 029, Edition September 2010".

Installation:

- Use category: dry or wet concrete (not in flooded holes)
- Overhead installation is admissible
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.

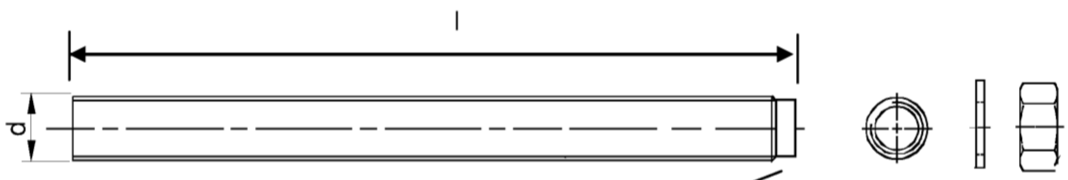
Deutsches Institut für Bautechnik

Table B2: Installation parameters of threaded rod, HIT-V-…

HIT-HY 170 with threaded rod, HIT-V-…			M8	M10	M12	M16	M20	M24
Diameter of element	d	[mm]	8	10	12	16	20	24
Nominal diameter of drill bit	d_0	[mm]	10	12	14	18	22	28
Range of effective embedment depth and depth of drilled hole	$h_{ef} = h_0$	[mm]	60 to 96	60 to 120	70 to 144	80 to 192	90 to 240	96 to 288
Maximum diameter of clearance hole in the fixture [1)]	d_f	[mm]	9	12	14	18	22	26
Minimum thickness of concrete member	h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 mm			$h_{ef} + 2 \cdot d_0$		
Maximum torque moment	T_{max}	[Nm]	10	20	40	80	150	200
Minimum spacing	s_{min}	[mm]	40	50	60	80	100	120
Minimum edge distance	c_{min}	[mm]	40	50	60	80	100	120

[1)] for larger clearance hole see "TR 029 section 1.1"

HIT-V-…



Marking:

5.8 - l	=	HIT-V-5.8	M…x l
5.8F - l	=	HIT-V-5.8F	M…x l
8.8 - l	=	HIT-V-8.8	M…x l
8.8F - l	=	HIT-V-8.8F	M…x l
R - l	=	HIT-V-R	M ...x l
HCR - l	=	HIT-V-HCR	M ...x l

Injection system Hilti HIT-HY 170

Intended Use
Installation parameters

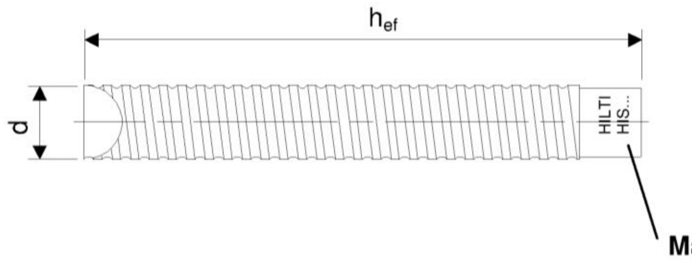
Annex B3

Table B3: Installation parameters of internally threaded sleeve HIS-(R)N

HIT-HY 170 with HIS-(R)N			**M8**	**M10**	**M12**	**M16**
Outer diameter of sleeve	d	[mm]	12,5	16,5	20,5	25,4
Nominal diameter of drill bit	d_0	[mm]	14	18	22	28
Effective embedment depth and drill hole depth	$h_{ef} = h_0$	[mm]	90	110	125	170
Maximum diameter of clearance hole in the fixture [1)]	d_f	[mm]	9	12	14	18
Minimum thickness of concrete member	h_{min}	[mm]	120	150	170	230
Maximum torque moment	T_{max}	[Nm]	10	20	40	80
Thread engagement length min-max	h_s	[mm]	8-20	10-25	12-30	16-40
Minimum spacing	s_{min}	[mm]	60	75	90	115
Minimum edge distance	c_{min}	[mm]	40	45	55	65

[1)] for larger clearance hole see “TR 029 section 1.1”

Internally threaded sleeve HIS-(R)N…



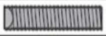
Marking:
Identifying mark - HILTI and
embossing "HIS-N" (for C-steel)
embossing "HIS-RN" (for stainless steel)

Table B4: Maximum working time and minimum curing time [1)]

Temperature in the base material T	Maximum working time t_{work}	Maximum curing time t_{cure}
-5°C to 0°C	10 min	12 h
> 0°C to 5°C	10 min	5 h
> 5°C to 10°C	8 min	2,5 h
> 10°C to 20°C	5 min	1,5 h
> 20°C to 30°C	3 min	45 min
> 30°C to 40°C	2 min	30 min

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

Table B5: Parameters of cleaning and setting tools

Elements		Drill and clean			Installation
HIT-V-…	HIS-(R)N	Hammer drilling	Hollow drill bit TE-CD, TE-YD	Brush	Piston plug
					
size	size	d_0 [mm]	d_0 [mm]	HIT-RB	HIT-SZ
M8	-	10	-	10	-
M10	-	12	12	12	12
M12	M8	14	14	14	14
M16	M10	18	18	18	18
M20	M12	22	22	22	22
M24	M16	28	28	28	28

Cleaning alternatives

Manual Cleaning (MC):
Hilti hand pump for blowing out drill holes with diameters $d_0 \leq 18$ mm and drill hole depths $h_0 \leq 10 \cdot d$

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

Automatic Cleaning (AC):
Cleaning is performed during drilling with Hilti TE-CD and TE-YD drilling system including vacuum cleaner.

Injection system Hilti HIT-HY 170

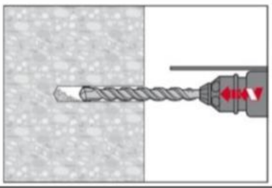
Intended Use
Minimum working and curing time
Cleaning and setting tools

Annex B5

Installation

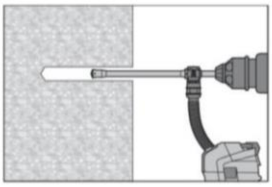
Hole drilling

a) Hammer drilling



Drill hole to the required embedment depth with a hammer drill set in rotation-hammer mode using an appropriately sized carbide drill bit.

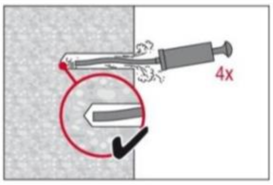
b) Hammer drilling with Hilti hollow drill bit: For dry and wet concrete only.



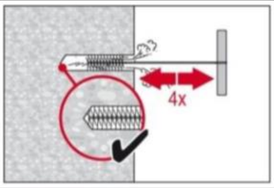
Drill hole to the required embedment depth with an appropriately sized Hilti TE-CD or TE-YD hollow drill bit with Hilti vacuum attachment. This drilling system removes the dust and cleans the drill hole during drilling when used in accordance with the user's manual. After drilling is completed, proceed to the "injection preparation" step in the installation instruction.

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

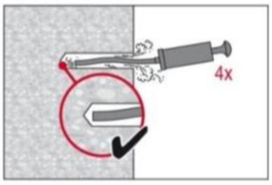
Manual Cleaning (MC) **Non-cracked concrete only**
for drill hole diameters $d_0 \leq 18$ mm and drill hole depths $h_0 \leq 10 \cdot d$



The Hilti manual pump may be used for blowing out drill holes up to diameters $d_0 \leq 18$ mm and embedment depths up to $h_{ef} \leq 10 \cdot d$.
Blow out at least 4 times from the back of the drill hole until return air stream is free of noticeable dust

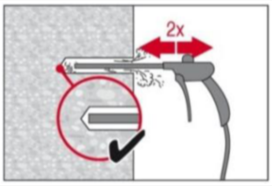


Brush 4 times with the specified brush (see Table B5) by inserting the steel brush Hilti HIT-RB to the back of the hole (if needed with extension) in a twisting motion and removing it.
The brush must produce natural resistance as it enters the drill hole (brush Ø ≥ drill hole Ø) - if not the brush is too small and must be replaced with the proper brush diameter.

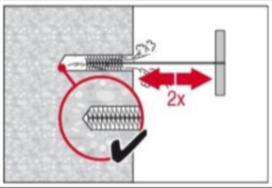


Blow out again with manual pump at least 4 times until return air stream is free of noticeable dust.

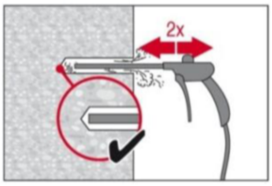
Compressed air cleaning (CAC) for all drill hole diameters d_0 and all drill hole depths h_0



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

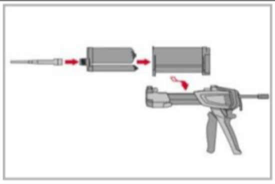


Brush 2 times with the specified brush (see Table B5) by inserting the steel brush Hilti HIT-RB to the back of the hole (if needed with extension) in a twisting motion and removing it.
The brush must produce natural resistance as it enters the drill hole (brush Ø ≥ drill hole Ø) - if not the brush is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

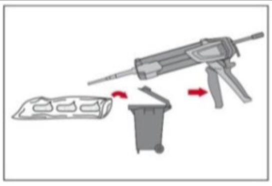


Blow again with compressed air 2 times until return air stream is free of noticeable dust.

Injection preparation



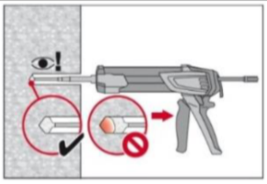
Tightly attach new Hilti mixing nozzle HIT-RE-M to foil pack manifold (snug fit). Do not modify the mixing nozzle.
Observe the instruction for use of the dispenser.
Check foil pack holder for proper function. Do not use damaged foil packs / holders.
Insert foil pack into foil pack holder and put holder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



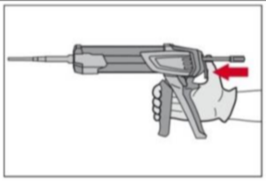
Discard initial adhesive. The foil pack opens automatically as dispensing is initiated. Depending on the size of the foil pack an initial amount of adhesive has to be discarded. Discarded quantities are

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

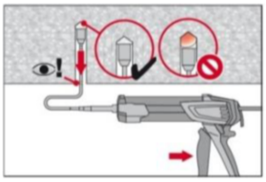
Inject adhesive from the back of the drill hole without forming air voids.



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 concrete is completely filled with adhesive along the embedment length.

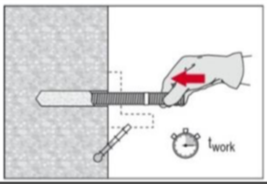


After injection is completed, depressurize the dispenser by pressing the release trigger. This will prevent further adhesive discharge from the mixer.

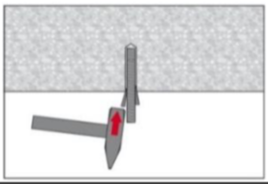


Overhead installation and/or installation with embedment depth h_{ef} > 250mm.
For overhead installation the injection is only possible with the aid of extensions and piston plugs. Assemble HIT-RE-M mixer, extension(s) and appropriately sized piston plug HIT-SZ (see Table B5). Insert piston plug to back of the hole and inject adhesive. During injection the piston plug will be naturally extruded out of the drill hole by the adhesive pressure

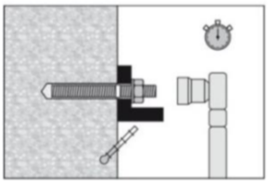
Setting the element



Before use, verify that the element is dry and free of oil and other contaminants. Mark and set element to the required embedment depth until working time t_{work} has elapsed. The working time t_{work} is given in Table B4



For overhead installation use piston plugs and fix embedded parts with e.g. wedges (HIT-OHW).



Loading the anchor: After required curing time t_{cure} (see Table B4) the anchor can be loaded.
The applied installation torque shall not exceed the values T_{max} given in Table B2 and Table B3.

Injection system Hilti HIT-HY 170

Intended Use
Installation instructions

Annex B8

Table C1: Characteristic values of resistance for threaded rod, HIT-V-… under tension loads in concrete

HIT-HY 170 with threaded rod, HIT-V-…			M8	M10	M12	M16	M20	M24
Installation safety factor	γ_2	[-]	1,0					
Steel failure								
Characteristic steel resistance	$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$					
Combined pullout and concrete cone failure								
Characteristic bond resistance in non-cracked concrete C20/25								
Temperature range I: 40 °C/24 °C	$\tau_{Rk,ucr}$	[N/mm²]	10,0					
Temperature range II: 80 °C/50 °C	$\tau_{Rk,ucr}$	[N/mm²]	7,5					
Characteristic bond resistance in cracked concrete C20/25								
Temperature range I: 40 °C/24 °C	$\tau_{Rk,cr}$	[N/mm²]	-	5,5			-	
Temperature range II: 80 °C/50 °C	$\tau_{Rk,cr}$	[N/mm²]	-	4,0			-	
Increasing factors for τ_{Rk} in concrete	ψ_c	C30/37	1,04					
		C40/50	1,07					
		C50/60	1,09					
Splitting failure								
Edge distance $c_{cr,sp}$ [mm] for		$h / h_{ef} \geq 2,0$	$1,0 \cdot h_{ef}$					
		$2,0 > h / h_{ef} > 1,3$	$4,6\ h_{ef} - 1,8\ h$					
		$h / h_{ef} \leq 1,3$	$2,26\ h_{ef}$					
Spacing	$s_{cr,sp}$	[mm]	$2 \cdot c_{cr,sp}$					

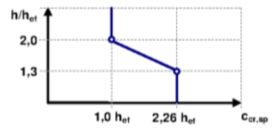


Table C2: Characteristic values of resistance for threaded rod, HIT-V-… under shear loads in concrete

HIT-HY 170 with threaded rod, HIT-V-…			M8	M10	M12	M16	M20	M24
Steel failure without lever arm								
Characteristic steel resistance	$V_{Rk,s}$	[kN]	$0,5 \cdot A_s \cdot f_{uk}$					
Steel failure with lever arm								
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	$1,2 \cdot W_{el} \cdot f_{uk}$					
Concrete pry-out failure								
Factor in equation (5.7) of Technical Report TR 029 for the design of bonded anchors	k	[-]	2,0					

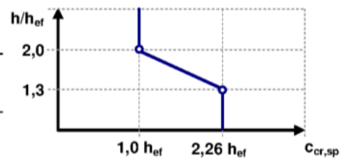
Injection system Hilti HIT-HY 170

Performances
Characteristic values of resistance under tension and shear loads in concrete
Design according to „EOTA Technical Report TR 029, Edition September 2010“

Annex C1

Table C3: Characteristic values of resistance for internally threaded sleeve HIS-(R)N under tension loads in non-cracked concrete

HIT-HY 170 with HIS-(R)N			**M8**	**M10**	**M12**	**M16**
Installation safety factor	γ_2	[-]	1,0			
Steel failure						
HIS-N with screw grade 8.8	$N_{Rk,s}$	[kN]	25	46	67	125
Partial safety factor	$\gamma_{Ms,N}$	[-]	1,50			
HIS-RN with screw grade 70	$N_{Rk,s}$	[kN]	26	41	59	110
Partial safety factor	$\gamma_{Ms,N}$	[-]	1,87			
Combined pullout and concrete cone failure						
Characteristic bond resistance in non-cracked concrete C20/25						
Temperature range I: 40 °C/24 °C	$\tau_{Rk,ucr}$	[N/mm²]	10,0			
Temperature range II: 80 °C/50 °C	$\tau_{Rk,ucr}$	[N/mm²]	7,5			
Increasing factors for $\tau_{Rk,ucr}$ in concrete	$\psi_{c,ucr}$	C30/37	1,04			
		C40/50	1,07			
		C50/60	1,09			
Splitting failure						
Edge distance $c_{cr,sp}$ [mm] for	$h / h_{ef} \geq 2{,}0$		$1{,}0 \cdot h_{ef}$			
	$2{,}0 > h / h_{ef} > 1{,}3$		$4{,}6\ h_{ef} - 1{,}8\ h$			
	$h / h_{ef} \leq 1{,}3$		$2{,}26\ h_{ef}$			
Spacing	$s_{cr,sp}$	[mm]	$2 \cdot c_{cr,sp}$			



Injection system Hilti HIT-HY 170

Performances
Characteristic values of resistance under tension loads in non-cracked concrete
Design according to „EOTA Technical Report TR 029, Edition September 2010“

Annex C2

Table C4: Characteristic values of resistance for internally threaded sleeve HIS-(R)N under shear loads in non-cracked concrete

HIT-HY 170 with HIS-(R)N			M8	M10	M12	M16
Steel failure without lever arm						
HIS-N with screw grade 8.8	$V_{Rk,s}$	[kN]	13	23	34	63
Partial safety factor	$\gamma_{Ms,V}$	[-]	1,25			
HIS-RN with screw grade 70	$V_{Rk,s}$	[kN]	13	20	30	55
Partial safety factor	$\gamma_{Ms,V}$	[-]	1,56			
Steel failure with lever arm						
HIS-N with screw grade 8.8	$M^0_{Rk,s}$	[Nm]	30	60	105	266
Partial safety factor	$\gamma_{Ms,V}$	[-]	1,25			
HIS-RN with screw grade 70	$M^0_{Rk,s}$	[Nm]	26	52	92	233
Partial safety factor	$\gamma_{Ms,V}$	[-]	1,56			
Concrete pry-out failure						
Factor in equation (5.7) of Technical Report TR 029 for the design of bonded anchors	k	[-]	2,0			

Table C5: Displacement under tension load

HIT-HY 170 with threaded rod, HIT-V-…			M8	M10	M12	M16	M20	M24
Non-cracked concrete								
Displacement	δ_{N0}	[mm/(N/mm²)]	0,07	0,07	0,07	0,08	0,08	0,09
Displacement	$\delta_{N\infty}$	[mm/(N/mm²)]	0,07	0,07	0,07	0,08	0,08	0,09
Cracked concrete								
Displacement	δ_{N0}	[mm/(N/mm²)]	-	0,07	0,07	0,06	-	-
Displacement	$\delta_{N\infty}$	[mm/(N/mm²)]	-	0,11	0,11	0,11	-	-

Table C6: Displacement under shear load

HIT-HY 170 with threaded rod, HIT-V-…			M8	M10	M12	M16	M20	M24
Displacement	δ_{V0}	[mm/(N/mm²)]	0,06	0,06	0,05	0,04	0,04	0,03
Displacement	$\delta_{V\infty}$	[mm/(N/mm²)]	0,09	0,08	0,08	0,06	0,06	0,05

Table C7: Displacement under tension load

HIT-HY 170 with HIS-(R)N			M8	M10	M12	M16
Non-cracked concrete						
Displacement	$\delta_{N\infty}$	[mm/(N/mm²)]	0,06	0,07	0,08	0,09
Displacement	$\delta_{N\infty}$	[mm/(N/mm²)]	0,06	0,07	0,08	0,09

Table C8: Displacement under shear load

HIT-HY 170 with HIS-(R)N			M8	M10	M12	M16
Displacement	δ_{V0}	[mm/(N/mm²)]	0,10	0,10	0,10	0,10
Displacement	$\delta_{V\infty}$	[mm/(N/mm²)]	0,15	0,15	0,15	0,15

Injection system Hilti HIT-HY 170	
Performances Displacements	**Annex C4**