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European Technical Assessment

ETA-23/0705 of 16/01/2024

English translation prepared by CSTB - Original version in French language

General Part

Technical Assessment Body issuing the European Technical Assessment:	
Centre Scientifique et Technique du Batiment (CSTB)	
Trade name:	**Injection system Hilti HIT-CT 100**
Product family:	Bonded fastener with threaded rods for use in concrete for a working life of 50 years
Manufacturer:	Hilti Corporation Feldkircherstrasse 100 FL-9494 Schaan Principality of Liechtenstein
Manufacturing plants:	Hilti Plant
This European Technical Assessment contains:	17 pages including 14 pages of 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:	EAD 330499-02-0601 version September 2022
This Assessment replaces:	-
Corrigendum	

Specific Part

1 Technical description of the product

The Injection system Hilti HIT-CT 100 is a bonded fastener consisting of a foil pack with injection mortar Hilti HIT-CT 100 and a steel element.

These steel elements are Hilti HAS, HAS-U, Hilti meter rod AM in the range of M8 to M24 or a commercial threaded rod with washer and hexagon nut in the range of M8 to M24.

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

The illustration and the description of the product are given in Annexes A.

2 Specification of the intended use

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

The provisions made in this European technical assessment are based on an assumed working life of the fastener of 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

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	**Performance**
Characteristic resistance for static and quasi static loads, Displacements	See Annexes C1 to C3
Characteristic resistance for seismic performance category C1	No Performance Assessed (NPA)
Characteristic resistance for seismic performance category C2, Displacements	No Performance Assessed (NPA)

3.2 Safety in case of fire (BWR 2)

Essential characteristic	**Performance**
Reaction to fire	Fasteners satisfy requirements for Class A1
Resistance to fire	No Performance Assessed (NPA)

3.3 Hygiene, health and the environment (BWR 3)

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

3.4 Safety in use (BWR 4)

For Basic requirement Safety in use the same criteria are valid as for Basic Requirement Mechanical resistance and stability.

3.5 Protection against noise (BWR 5)

Not relevant.

3.6 Energy economy and heat retention (BWR 6)

Not relevant.

3.7 Sustainable use of natural resources (BWR 7)

For the sustainable use of natural resources no performance was determined for this product.

3.8 General aspects relating to fitness for use

Durability and Serviceability are only ensured if the specifications of intended use according to Annex B1 are kept.

4 Assessment and verification of constancy of performance (AVCP)

According to the Decision 96/582/EC of the European Commission[1], as amended, the system of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) given in the following table apply.

Product	Intended use	Level or class	System
Bonded fasteners for use in concrete	For fixing and/or supporting to concrete, structural elements (which contributes to the stability of the works) or heavy units	-	1

5 Technical details necessary for the implementation of the AVCP system, as planned in the relevant EAD

Technical details necessary for the implementation of the Assessment and verification of constancy of performance (AVCP) system are laid down in the control plan deposited at Centre Scientifique et Technique du Bâtiment.

The following standards are referred to in this European Technical Assessment:

- EN 1992-1-1:2004 + AC:2010 Eurocode 2: Design of concrete structures - Part 1-1: General rules and rules for buildings
- EN 1992-4:2018 Eurocode 2: Design of concrete structures – Part 4: Design of fastenings for use in concrete
- EN 1993-1-4:2006 + A1:2015 Eurocode 3: Design of steel structures, Part 1-4: General rules – Supplementary rules for stainless steels
- EN 10088-1:2014 Stainless steels – Part 1: List of stainless steels
- EN 206:2013 + A2:2021 Concrete: Specification, performance, production and conformity

1 Official Journal of the European Communities L 254 of 08.10.1996.

The control plan including confidential information is not included in the published part of this ETA.

The manufacturer shall, on the basis of a contract, involve a notified body approved in the field of fasteners for issuing the certificate of conformity CE based on the control plan.

The Notified Body shall visit the factory at least twice a year for surveillance of the manufacturer.

The original French version is signed by:

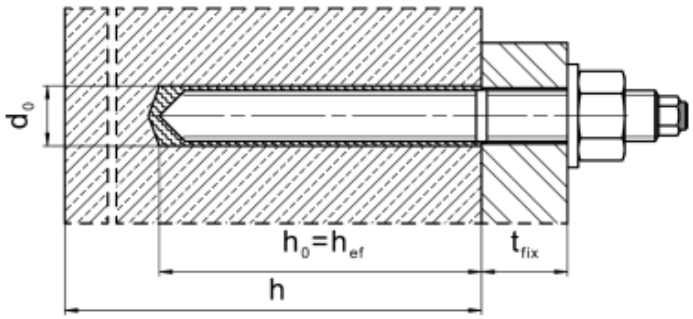
Loic Payet

Head of the Structure, Masonry, Partition Division

Installed condition

Figure A1:

Threaded rod, HAS …, HAS-U…, HAS-…, AM…

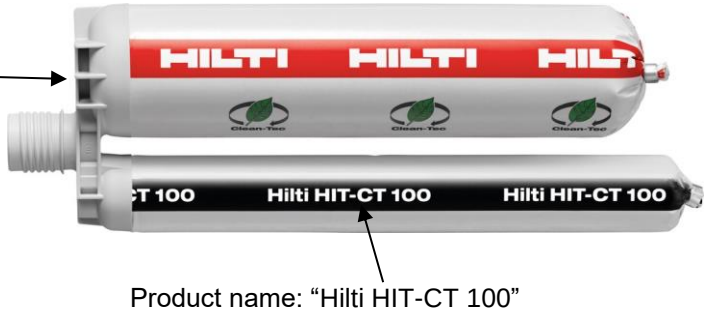


Product description: Injection mortar and steel elements

Injection mortar Hilti HIT-CT 100: hybrid system with resin, hardener and cement water component

330 ml and 500 ml

Marking:
HILTI HIT
Product name
Production time and line
Expiry date mm/yyyy



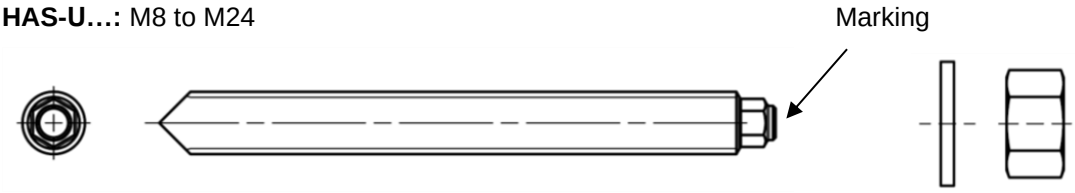
Product name: “Hilti HIT-CT 100”

Static mixer Hilti HIT-RE-M

Injection system Hilti HIT-CT 100	
Product description Installed condition	**Annex A1**

Steel elements

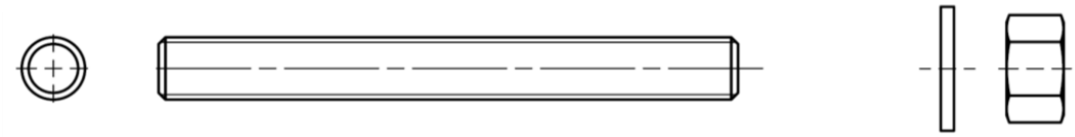
HAS-U…: M8 to M24



Marking: Steel grade number and length identification number

5 = HAS-U 5.8, 5.8 HDG
8 = HAS-U 8.8, 8.8. HDG
1 = HAS-U A4
2 = HAS-U HCR

HAS …: M8 to M24



HAS Color code marking:

5.8 = RAL 5010 (blue)
8.8 = RAL 1023 (yellow)
A4 = RAL 3000 (red)

AM … 8.8: (HDG) M8 to M24

Commercial standard threaded rod: M8 to M24.

- Materials and mechanical properties according to Table A2.
- Inspection certificate 3.1 according to EN 10204. The document shall be stored.
- Marking of embedment depth.

Table A2: Materials

Designation	Material
Steel elements made of zinc coated steel	
HAS 5.8 (HDG), HAS-U 5.8 (HDG), Threaded rod 5.8	Strength class 5.8, f_{uk} = 500 N/mm², f_{yk} = 400 N/mm² Elongation at fracture ($l_0 = 5d$) > 8% ductile Electroplated zinc coated ≥ 5 μm, (HDG) hot dip galvanized ≥ 50 μm
Threaded rod 6.8	Strength class 6.8, f_{uk} = 600 N/mm², f_{yk} = 480 N/mm² Elongation at fracture ($l_0 = 5d$) > 8% ductile Electroplated zinc coated ≥ 5 μm, hot dip galvanized ≥ 50 μm
HAS 8.8 (HDG), HAS-U 8.8 (HDG), AM 8.8, Threaded rod 8.8	Strength class 8.8, f_{uk} = 800 N/mm², f_{yk} = 640 N/mm² Elongation at fracture ($l_0 = 5d$) > 12% ductile Electroplated zinc coated ≥ 5 μm, (HDG) hot dip galvanized ≥ 50 μm
Washer	Electroplated zinc coated ≥ 5 μm, hot dip galvanized ≥ 50 μm
Nut	Nominal strength class equal or higher to nominal strength class of rod Electroplated zinc coated ≥ 5 μm, hot dip galvanized ≥ 50 μm
Steel elements made of stainless steel Corrosion resistance class (CRC II) acc. to EN 1993-1-4	
Threaded rod	For ≤ M24: strength class 70, $\boldsymbol{f_{uk}}$ = 700 N/mm², $\boldsymbol{f_{yk}}$ = 450 N/mm² Elongation at fracture ($\boldsymbol{l_0 = 5d}$) > 12% ductile Stainless steel 1.4301, 1.4307, 1.4311, 1.4541, 1.4306, 1.4567 EN 10088-1
Washer	Stainless steel 1.4301, 1.4307, 1.4311, 1.4541, 1.4306, 1.4567 EN 10088-1
Nut	For ≤ M24: strength class 70, $\boldsymbol{f_{uk}}$ = 700 N/mm², $\boldsymbol{f_{yk}}$ = 450 N/mm² Stainless steel 1.4301, 1.4307, 1.4311, 1.4541, 1.4306, 1.4567 EN 10088-1
Steel elements made of stainless steel Corrosion resistance class (CRC III) acc. to EN 1993-1-4	
HAS A4, HAS-U A4, Threaded rod A4	For ≤ M24: strength class 70, $\boldsymbol{f_{uk}}$ = 700 N/mm², $\boldsymbol{f_{yk}}$ = 450 N/mm² Elongation at fracture ($\boldsymbol{l_0 = 5d}$) > 12% ductile Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1
Washer	Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1
Nut	Nominal strength class equal or higher to nominal strength class of rod
Steel elements made of high corrosion resistant steel Corrosion resistance class (CRC V) acc. to EN 1993-1-4	
HAS-U HCR, Threaded rod	For ≤ M20: f_{uk} = 800 N/mm², f_{yk} = 640 N/mm² For > M20: f_{uk} = 700 N/mm², f_{yk} = 400 N/mm² Elongation at fracture ($l_0 = 5d$) > 12% ductile High corrosion resistant steel 1.4529, 1.4565 EN 10088-1
Washer	High corrosion resistant steel 1.4529, 1.4565 EN 10088-1
Nut	Nominal strength class equal or higher to nominal strength class of rod High corrosion resistant steel 1.4529, 1.4565 EN 10088-1

Specifications of intended use

Fasteners subject to:

- Static and quasi static loading.

Base material:

- Compacted reinforced or unreinforced normal weight concrete without fibres according to EN 206.
- Strength classes C20/25 to C50/60 according to EN 206.
- Cracked and uncracked concrete.

Temperature in the base material:

- **at installation**
  -5°C to +40°C for the standard variation of temperature after installation.
- **in-service**
  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 (all materials).
- For all other conditions according EN 1993-1-4 corresponding to corrosion resistance classes Annex A (stainless steel and high corrosion resistant steel).

Design:

- Fasteners are designed under the responsibility of an engineer experienced in fasteners and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the fastener is indicated on the design drawings (e. g. position of the fastener relative to reinforcement or to supports, etc.).
- The fasteners are designed in accordance with EN 1992-4.

Installation:

- Use category:
  - dry or wet concrete (not in water-filled drill holes): for all drilling techniques.
- Drilling technique:
  - hammer drilling,
  - hammer drilling with Hilti hollow drill bit TE-CD, TE-YD,
- Installation direction D3: downward, horizontal and upward (e.g., overhead) installation admissible for all elements.
- Fastener installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.

Table B1: Installation parameters of metric threaded rod according to Annex A

Metric threaded rod according to Annex A			**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
Effective embedment depth and drill hole depth	h_{ef}	[mm]	64 to 160	80 to 200	96 to 240	128 to 320	160 to 400	192 to 480
Maximum diameter of clearance hole in the fixture	d_f	[mm]	9	12	14	18	22	26
Minimum thickness of concrete member	h_{min}	[mm]	$h_{ef} + 30$ $\geq 100\ mm$			$h_{ef} + 2 \cdot d_0$		
Maximum installation torque	$\max. T_{inst}$	[Nm]	10	20	40	80	150	200
Minimum spacing	s_{min}	[mm]	40	50	60	75	90	115
Minimum edge distance	c_{min}	[mm]	40	45	50	50	55	60

Table B2: Working and curing time[1) 2)]

Temperature in the base material T	**Maximum working time t_{work}**	**Minimum curing time t_{cure}[1)]**
-5 °C … 0 °C	≤ 30 min	≥ 6 h
> 0 °C … 5 °C	≤ 20 min	≥ 5 h
> 5 °C … 10 °C	≤ 15 min	≥ 4 h
> 10 °C … 20 °C	≤ 8 min	≥ 4 h
> 20 °C … 30 °C	≤ 4 min	≥ 3,5 h
> 30 °C … 40 °C	≤ 1,5 min	≥ 3 h

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

2) The minimum temperature of the foil pack is +5°C.

Table B3: Parameters of cleaning and setting tools

Steel elements	**Drill and clean**			**Installation**
Metric threaded rod (Annex A)	Hammer drilling	Hollow drill bit TE-CD, TE-YD[1)]	Brush	Piston plug
				
Size	d_0 [mm]	d_0 [mm]	HIT-RB	HIT-SZ
M8	10	-	10	-
M10	12	12	12	12
M12	14	14	14	14
M16	18	18	18	18
M20	22	22	22	22
M24	28	28	28	28

1) With vacuum cleaner Hilti VC 10/20/40 (automatic filter cleaning activated, eco mode off) or a vacuum cleaner providing equivalent cleaning performance in combination with the specified Hilti hollow drill bit TE-CD or TE YD.

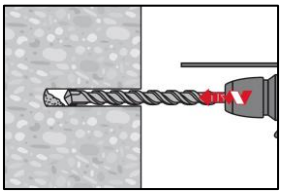
Table B4: Cleaning alternatives

Manual Cleaning (MC): Hilti hand pump for blowing out drill holes with diameters $d_0 \leq 20$ mm and drill hole depth $h_0 \leq 10d$	
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.	

Installation instructions

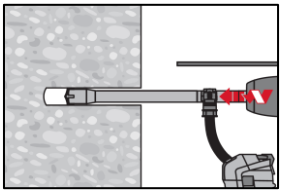
Hole drilling

a) Hammer drilling: For dry or wet concrete.



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

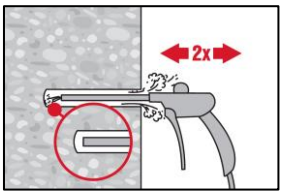
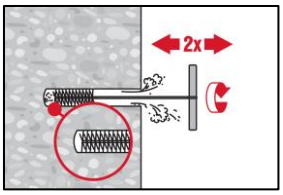
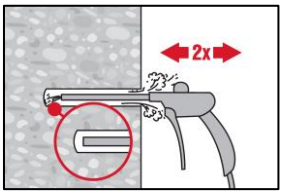
b) Hammer drilling with Hilti hollow drill bit TE-CD, TE-YD: For dry and wet concrete only.



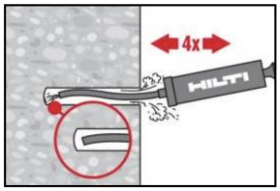
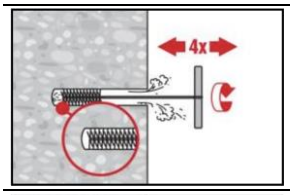
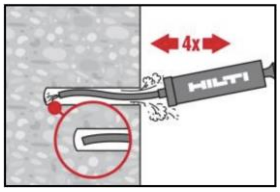
Drill hole to the required embedment depth with an appropriately sized Hilti hollow drill bit TE-CD or TE-YD attached to Hilti vacuum cleaner VC 10/20/40 (automatic filter cleaning activated, eco-mode off) or a vacuum cleaner providing equivalent performance in combination with the specified Hilti hollow drill bit TE-CD or TE-YD. This drilling system removes the dust and cleans the bore 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 the steel element, the drill hole must be free of dust and debris. Inadequate hole cleaning = poor load values.

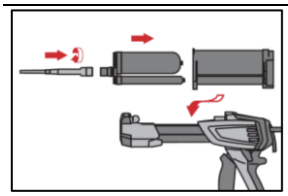
Compressed Air Cleaning (CAC): For all drill hole diameters d_0 and all drill hole depths h_0.

	Blow 2 times from the back of the hole (if needed with nozzle extension) over the whole length with oil-free compressed air (min. 6 bar at 6 m³/h) until return air stream is free of noticeable dust. For drill hole diameters ≥ 32 mm the compressor has to supply a minimum air flow of 140 m³/h.
	Brush 2 times with the specified brush (see Table B3) 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 ϕ ≥ drill hole ϕ) - 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.

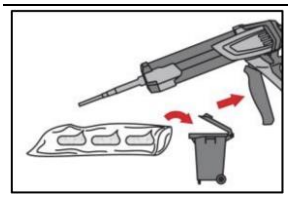
Manual Cleaning (MC): Uncracked concrete. For drill hole diameters $d_0 \leq 20$ mm and drill hole depths $h_0 \leq 10 \cdot d$.

	The Hilti hand pump may be used for blowing out drill holes up to diameters $d_0 \leq 20$ mm and drill hole depths $h_0 \leq 10 \cdot d$. 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 B3) 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 ϕ ≥ drill hole ϕ) - if not the brush is too small and must be replaced with the proper brush diameter.
	Blow out again with the Hilti hand pump at least 4 times until return air stream is free of noticeable dust.

Injection preparation

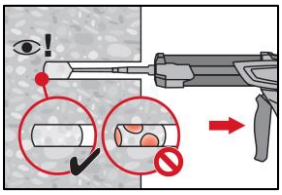


Tightly attach Hilti mixing nozzle HIT-RE-M to foil pack manifold. Do not modify the mixing nozzle.
Observe the instruction for use of the dispenser.
Check foil pack holder for proper function. Insert foil pack into foil pack holder and put holder into dispenser.

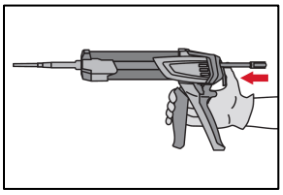


Discard initial adhesive. The foil pack opens automatically as dispensing is initiated.
Depending on the size of
the foil pack an initial amount of adhesive has to be discarded.
Discarded quantities are: 3 strokes for 330 ml foil pack,
4 strokes for 500 ml foil pack,
The minimum foil pack temperature is +5°C.

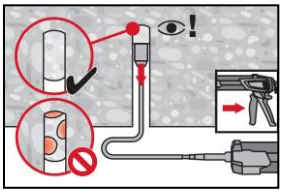
Inject adhesive from the back of the drill hole without forming air voids.



Inject the adhesive starting at the back of the hole, slowly withdrawing the mixer with each trigger pull.
Fill approximately 2/3 of the drill hole to ensure that the annular gap between the steel element 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 $h_{ef} > 250$ mm.
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 (see Table B3). 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 steel element

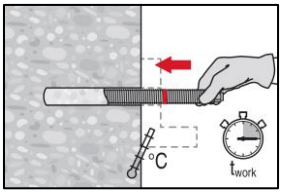
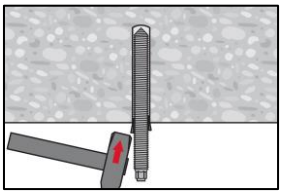
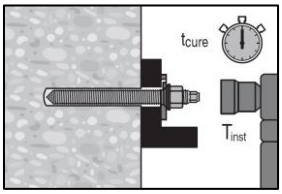
	Before use, verify that the steel element is dry and free of oil and other contaminants. Mark and set steel element to the required embedment depth before working time t_{work} has elapsed. The working time t_{work} is given in Table B2.
	For overhead installation use piston plugs and fix embedded parts with e.g., wedges.
	After required curing time t_{cure} (see Table B2) the fastening can be loaded. The applied installation torque shall not exceed the values max. T_{inst} given in Table B1.

Table C1: Essential characteristics for metric threaded rod according to Annex A under tension load in concrete

Metric threaded rod according to Annex A				**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
For a working life of 50									
Steel failure									
Characteristic resistance		$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$					
Partial factor grade 5.8, 6.8, 8.8 (Table A2)		$\gamma_{Ms,N}$ [1)]	[-]	1,5					
Partial factor HAS A4, HAS-U A4, Threaded rod: CRC II and III (Table A2)		$\gamma_{Ms,N}$ [1)]	[-]	1,87					
Partial factor HAS-U HCR, Threaded rod: CRC V (Table A2)		$\gamma_{Ms,N}$ [1)]	[-]	1,5					2,1
Installation factor									
Hammer drilling		γ_{inst}	[-]	1,4					
Hammer drilling with Hilti hollow drill bit TE-CD or TE-YD		γ_{inst}	[-]	1,4					
Concrete cone failure									
Factor for cracked concrete		$k_{cr,N}$	[-]	7,7					
Factor for uncracked concrete		$k_{ucr,N}$	[-]	11,0					
Edge distance		$c_{cr,N}$	[mm]	$1{,}5 \cdot h_{ef}$					
Spacing		$s_{cr,N}$	[mm]	$3{,}0 \cdot h_{ef}$					
Splitting failure									
Edge distance $c_{cr,sp}$ [mm] for		$h/h_{ef} \geq 2{,}0$		$1{,}0 \cdot h_{ef}$					
		$2{,}0 > h/h_{ef} > 1{,}3$		$4{,}6 \cdot h_{ef} - 1{,}8 \cdot h$					
		$h/h_{ef} \leq 1{,}3$		$2{,}26 \cdot h_{ef}$					
Spacing		$s_{cr,sp}$	[mm]	$2 \cdot c_{cr,sp}$					
Combined pullout and concrete cone failure									
Characteristic resistance in uncracked concrete C20/25 in **hammer drilled holes** and **hammer drilled holes with Hilti hollow drill bit TE-CD or TE-YD**									
Temperature range I:	24°C / 40°C	$\tau_{Rk,ucr}$	[N/mm²]	9	9	10	10	10	10
Temperature range II:	50°C / 80°C	$\tau_{Rk,ucr}$	[N/mm²]	8,5	8,5	9,5	9,5	9,5	9,5
Characteristic resistance in cracked concrete C20/25 in **hammer drilled holes** and **hammer drilled holes with Hilti hollow drill bit TE-CD or TE-YD**									
Temperature range I:	24°C / 40°C	$\tau_{Rk,cr}$	[N/mm²]	4	4,5	4,5	4,5	4	4
Temperature range II:	50°C / 80°C	$\tau_{Rk,cr}$	[N/mm²]	3,8	4,2	4,2	4,2	3,8	3,8
Influence factors ψ on bond resistance τ_{Rk}									
Influence of concrete strength									
in **hammer drilled holes** and **hammer drilled holes with Hilti hollow drill bit TE-CD or TE-YD, uncracked concrete**									
Temperature range I and II:		ψ_c	[-]	$(f_{ck}/20)^{0,07}$					
in **hammer drilled holes** and **hammer drilled holes with Hilti hollow drill bit TE-CD or TE-YD, cracked concrete**									
Temperature range I and II:		ψ_c	[-]	$(f_{ck}/20)^{0,14}$					
Influence of sustained load									
in **hammer drilled holes** and **hammer drilled holes with Hilti hollow drill bit TE-CD or TE-YD, uncracked and cracked concrete**									
Temperature range I:	24°C / 40°C	ψ^0_{sus}	[-]	0,6					
Temperature range II:	50°C / 80°C	ψ^0_{sus}	[-]	0,6					

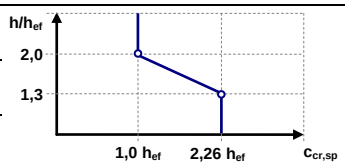


Table C2: Essential characteristics for metric threaded rod according to Annex A under shear load in concrete

Metric threaded rod according to Annex A			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
For a working life of 50 years								
Steel failure without lever arm								
Characteristic resistance	$V^0_{Rk,s}$	[kN]	$k_6 \cdot A_s \cdot f_{uk}$					
Factor grade 5.8	k_6	[-]	0,6					
Factor grade 6.8, 8.8	k_6	[-]	0,5					
Factor HAS A4, HAS-U A4, Threaded rod: CRC II and III (Table A2)	k_6	[-]	0,5					
Factor HAS-U HCR, Threaded rod: CRC V (Table A2)	k_6	[-]	0,5					
Partial factor grade 5.8, 6.8, 8.8	$\gamma_{Ms,V}$ [1)]	[-]	1,25					
Partial factor Factor HAS A4, HAS-U A4, Threaded rod: CRC II and III (Table A2)	$\gamma_{Ms,V}$ [1)]	[-]	1,56					
Partial factor HAS-U HCR, Threaded rod: CRC V (Table A2)	$\gamma_{Ms,V}$ [1)]	[-]	1,25					1,75
Ductility factor	k_7	[-]	1,0					
Steel failure with lever arm								
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	$1{,}2 \cdot W_{el} \cdot f_{uk}$					
Ductility factor	k_7	[-]	1,0					
Concrete pry-out failure								
Pry-out factor	k_8	[-]	2,0					
Concrete edge failure								
Effective length of fastener	l_f	[mm]	$\min(h_{ef};\ 20 \cdot d_{nom})$					
Outside diameter of fastener	d_{nom}	[mm]	8	10	12	16	20	24

1) In absence of national regulations.

Table C3: Displacements for threaded rod under tension load in concrete

Threaded rod, HAS-U…, HAS-…, AM…8.8			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Displacement in uncracked concrete								
Temperature range I: 24°C / 40°C	δ_{N0}	[mm/(N/mm²)]	0,03	0,03	0,04	0,04	0,06	0,07
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,03	0,03	0,04	0,04	0,06	0,07
Temperature range II: 50°C / 80°C	δ_{N0}	[mm/(N/mm²)]	0,03	0,03	0,04	0,04	0,06	0,07
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,03	0,03	0,04	0,04	0,06	0,07
Displacement in cracked concrete								
Temperature range I: 24°C / 40°C	δ_{N0}	[mm/(N/mm²)]	0,08	0,08	0,08	0,11	0,13	0,13
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,08	0,08	0,08	0,13	0,32	0,45
Temperature range II: 50°C / 80°C	δ_{N0}	[mm/(N/mm²)]	0,08	0,08	0,08	0,11	0,13	0,13
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,08	0,08	0,08	0,13	0,32	0,45

Table C4: Displacements for threaded rod under shear load in concrete

Metric threaded rod according to Annex A			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Displacement	δ_{V0}	[mm/kN]	0,06	0,06	0,05	0,04	0,04	0,03
	$\delta_{V\infty}$	[mm/kN]	0,09	0,08	0,08	0,06	0,06	0,05