



HIT – CT 100 INJECTION MORTAR

Technical Datasheet

Update: Oct 23



HIT-CT 100 injection mortar

Anchor design (EN 1992-4) / Rods / Concrete

Injection mortar system




Hilti HIT-CT 100
330 ml foil pack
(also available as
500 ml foil pack)

Anchor rods:
HAS 5.8,
HAS 8.8,
HAS HDG,
HAS A4
(M8-M24)

HAS-U 5.8,
HAS-U 8.8,
HAS-U HDG,
HAS-U A4,
HAS-U HCR,
(M8-M24)

Benefits

-  technology: Makes installation steps faster, simpler and safer. Automatic borehole cleaning with hollow drill bits, accurate dosing with HDE and fast and safe torquing with the adaptive torque (AT) system.
- Optimized for environmental safety to meet high health and safety requirements (no hazard symbols)
- High performing mortar with a fast-curing time, suitable in base material temperatures between -5°C and 40°C
- Compliant with several environmental databases including BASTA, BVB, SUNDA HUS, SGBC and Nordic Swan
- Approved according to NSF / ANSI 61 "Drinking water system component-health effects".
- Suitable for uncracked and cracked concrete C20/25 to C50/60.
- Suitable for dry and water saturated concrete

Base material



Concrete
(non-cracked)



Concrete
(cracked)



Dry concrete



Wet
concrete



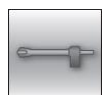
Static/
quasi-static

Load condition

Installation conditions



Hammer
drilling



Hollow drill bit
drilled holes /
Hilti **SafeSet**

Other information



PROFIS
Engineering
Software

Static and quasi-static design according to EN 1992-4 (for a single anchor) based on Hilti Technical Data

All data in this section applies to

- Correct setting (see setting instruction)
- No edge distance and spacing influence
- **Steel** failure (only indicated for Characteristic resistances)
- Minimum base material thickness, as specified in the table
- Embedment depth, as specified in the table
- Anchor material, as specified in the tables
- Concrete C20/25
- In-service temperate range I
(min. base material temperature -40°C, max. long term/short term base material temperature: +24°C/40°C)
- The following data are valid for short term loads only ($\psi_{sus} = 1,0$). For specific design cases involving permanent actions refer to PROFIS Engineering.

For hammer drilled holes, hammer drilled holes with Hilti hollow drill bit ^{a)}:

Embedment depth and base material thickness

Anchor- size			M8	M10	M12	M16	M20	M24
Embedment depth ^{b)}	h_{ef}	[mm]	80	90	110	130	170	210
Base material thickness	h_{min}	[mm]	110	120	140	160	220	270

b) The allowed range of embedment depth is shown in the setting details

Characteristic resistance

Anchor size				M8	M10	M12	M16	M20	M24
Uncracked concrete									
Tension	HAS 5.8, HAS-U 5.8	N_{Rk}	[kN]	16,1	22,6	33,2	52,2	85,4	126,6
	HAS 8.8, HAS-U 8.8			16,1	22,6	33,2	52,2	85,4	126,6
	HAS A4, HAS-U A4			16,1	22,6	33,2	52,2	85,4	126,6
	HAS-U HCR			16,1	22,6	33,2	52,2	85,4	126,6
Shear	HAS 5.8, HAS-U 5.8	V_{Rk}	[kN]	9,2	14,5	21,1	39,3	61,3	88,3
	HAS 8.8, HAS-U 8.8			14,6	23,2	33,7	62,8	98,0	141,2
	HAS A4, HAS-U A4			12,8	20,3	29,5	55,0	85,8	123,6
	HAS-U HCR			14,6	23,2	33,7	62,8	98,0	123,6
Cracked concrete									
Tension	HAS 5.8, HAS-U 5.8	N_{Rk}	[kN]	6,0	8,5	12,4	19,6	26,7	39,6
	HAS 8.8, HAS-U 8.8			6,0	8,5	12,4	19,6	26,7	39,6
	HAS A4, HAS-U A4			6,0	8,5	12,4	19,6	26,7	39,6
	HAS-U HCR			6,0	8,5	12,4	19,6	26,7	39,6
Shear	HAS 5.8, HAS-U 5.8	V_{Rk}	[kN]	9,2	14,5	21,1	39,2	53,4	79,1
	HAS 8.8, HAS-U 8.8			12,1	17,0	24,9	39,2	53,4	79,1
	HAS A4, HAS-U A4			12,1	17,0	24,9	39,2	53,4	79,1
	HAS-U HCR			12,1	17,0	24,9	39,2	53,4	79,1

a) Hilti hollow drill bit available for anchor rods and threaded rods with diameters M10-M24.

Design resistance

Anchor size		M8	M10	M12	M16	M20	M24		
Uncracked concrete									
Tension	HAS 5.8, HAS-U 5.8	N _{Rd}	[kN]	7,7	10,8	15,8	24,9	40,7	60,3
	HAS 8.8, HAS-U 8.8			7,7	10,8	15,8	24,9	40,7	60,3
	HAS A4, HAS-U A4			7,7	10,8	15,8	24,9	40,7	60,3
	HAS-U HCR			7,7	10,8	15,8	24,9	40,7	60,3
Shear	HAS 5.8, HAS-U 5.8	V _{Rd}	[kN]	7,3	11,6	16,9	31,4	49,0	70,6
	HAS 8.8, HAS-U 8.8			11,7	18,6	27,0	50,2	78,4	113,0
	HAS A4, HAS-U A4			8,2	13,0	18,9	35,2	55,0	79,2
	HAS-U HCR			11,7	18,6	27,0	50,2	78,4	70,6
Cracked concrete									
Tension	HAS 5.8, HAS-U 5.8	N _{Rd}	[kN]	2,9	4,0	5,9	9,3	12,7	18,8
	HAS 8.8, HAS-U 8.8			2,9	4,0	5,9	9,3	12,7	18,8
	HAS A4, HAS-U A4			2,9	4,0	5,9	9,3	12,7	18,8
	HAS-U HCR			2,9	4,0	5,9	9,3	12,7	18,8
Shear	HAS 5.8, HAS-U 5.8	V _{Rd}	[kN]	7,3	11,3	16,6	26,1	35,6	52,8
	HAS 8.8, HAS-U 8.8			8,0	11,3	16,6	26,1	35,6	52,8
	HAS A4, HAS-U A4			8,0	11,3	16,6	26,1	35,6	52,8
	HAS-U HCR			8,0	11,3	16,6	26,1	35,6	52,8

a) Hilti hollow drill bit available for anchor rods and threaded rods with diameters M10-M24.



Recommended loads ^{c)}

Anchor size		M8	M10	M12	M16	M20	M24	
Uncracked concrete								
Tension	HAS 5.8, HAS-U 5.8	N _{rec} [kN]	5,5	7,7	11,3	17,8	29,1	43,1
	HAS 8.8, HAS-U 8.8		5,5	7,7	11,3	17,8	29,1	43,1
	HAS A4, HAS-U A4		5,5	7,7	11,3	17,8	29,1	43,1
	HAS-U HCR		5,5	7,7	11,3	17,8	29,1	43,1
Shear	HAS 5.8, HAS-U 5.8	V _{rec} [kN]	5,2	8,3	12,0	22,4	35,0	50,4
	HAS 8.8, HAS-U 8.8		8,4	13,3	19,3	35,9	56,0	80,7
	HAS A4, HAS-U A4		5,9	9,3	13,5	25,2	39,3	56,6
	HAS-U HCR		8,4	13,3	19,3	35,9	56,0	50,4
Cracked concrete								
Tension	HAS 5.8, HAS-U 5.8	N _{rec} [kN]	2,1	2,9	4,2	6,7	9,1	13,5
	HAS 8.8, HAS-U 8.8		2,1	2,9	4,2	6,7	9,1	13,5
	HAS A4, HAS-U A4		2,1	2,9	4,2	6,7	9,1	13,5
	HAS-U HCR		2,1	2,9	4,2	6,7	9,1	13,5
Shear	HAS 5.8, HAS-U 5.8	V _{rec} [kN]	5,2	8,1	11,8	18,7	25,4	37,7
	HAS 8.8, HAS-U 8.8		5,7	8,1	11,8	18,7	25,4	37,7
	HAS A4, HAS-U A4		5,7	8,1	11,8	18,7	25,4	37,7
	HAS-U HCR		5,7	8,1	11,8	18,7	25,4	37,7

a) Hilti hollow drill bit available for anchor rods and threaded with diameters M10-M24.

c) With overall partial safety factor for action $\gamma=1,4$. The partial safety factors for action depend on the type of loading and shall be taken from national regulations.

Materials

Mechanical properties

Anchor size		M8	M10	M12	M16	M20	M24		
Nominal tensile strength	HAS 5.8, HAS-U 5.8	500	500	500	500	500	500		
	HAS 8.8, HAS-U 8.8	800	800	800	800	800	800		
	HAS A4, HAS-U A4	700	700	700	700	700	700		
	HAS-U HCR	800	800	800	800	800	700		
Yield strength	HAS 5.8, HAS-U 5.8	400	400	400	400	400	400		
	HAS 8.8, HAS-U 8.8	640	640	640	640	640	640		
	HAS A4, HAS-U A4	450	450	450	450	450	450		
	HAS-U HCR	640	640	640	640	640	400		
Stressed cross-section	HAS, HAS-U	A_s	[mm ²]	36,6	58,0	84,3	157	245	353
Moment of resistance	HAS, HAS-U	W	[mm ³]	31,2	62,3	109	277	541	935



Material quality for HAS and HAS-U

Part	Material
Zinc coated steel	
HAS 5.8 (HDG), HAS-U 5.8 (HDG)	Strength class 5.8; Elongation at fracture A5 > 8% ductile Electroplated zinc coated $\geq 5\mu\text{m}$; (HDG) hot dip galvanized $\geq 50\mu\text{m}$
HAS 8.8 (HDG), HAS-U 8.8 (HDG)	Strength class 8.8; Elongation at fracture A5 > 12% ductile Electroplated zinc coated $\geq 5\mu\text{m}$; (HDG) hot dip galvanized $\geq 50\mu\text{m}$
Washer	Electroplated zinc coated $\geq 5\mu\text{m}$, hot dip galvanized $\geq 50\mu\text{m}$
Nut	Strength class of nut adapted to strength class of threaded rod. Electroplated zinc coated $\geq 5\mu\text{m}$, (HDG) hot dip galvanized $\geq 50\mu\text{m}$
Stainless Steel	
HAS A4, HAS-U A4	Strength class 70 Elongation at fracture A5 > 12% ductile Stainless steel 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362 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 70 Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1:2014
High corrosion resistant steel	
HAS-U HCR	Strength class 80 for $\leq M20$ and class 70 for $> M20$, Elongation at fracture A5 > 8% ductile High corrosion resistance steel 1.4529; 1.4565;
Washer	High corrosion resistant steel 1.4529, 1.4565 EN 10088-1:2014
Nut	Strength class 80 for $\leq M20$ and class 70 for $> M20$, High corrosion resistant steel 1.4529, 1.4565 EN 10088-1:2014

Setting information

Base Material temperature during Installation:

-5°C to +40°C

In-service temperature range:

Hilti HIT-CT 100 injection mortar may be applied in the temperature ranges given below. An elevated base material temperature may lead to a reduction of the design bond resistance.

Temperature range	Base material temperature	Maximum long term base material temperature	Maximum short term base material temperature
Temperature range I	-40 °C to +40 °C	+24 °C	+40 °C
Temperature range II	-40 °C to +80 °C	+50 °C	+80 °C

Maximum short term base material temperature

Short-term elevated base material temperatures are those that occur over brief intervals, e.g., as a result of diurnal cycling.

Maximum long term base material temperature

Long term elevated base material temperatures are roughly constant over significant periods of time.

Curing and working time ^{a)}

Temperature of the base material	Maximum working time	Minimum curing time
T_{BM}	t_{work}	$t_{cure}^{a)}$
$-5^{\circ}\text{C} \leq T_{BM} \leq 0^{\circ}\text{C}$	$\leq 30 \text{ min}$	$\geq 6 \text{ h}$
$0^{\circ}\text{C} < T_{BM} \leq 5^{\circ}\text{C}$	$\leq 20 \text{ min}$	$\geq 5 \text{ h}$
$5^{\circ}\text{C} < T_{BM} \leq 10^{\circ}\text{C}$	$\leq 15 \text{ min}$	$\geq 4 \text{ h}$
$10^{\circ}\text{C} < T_{BM} \leq 20^{\circ}\text{C}$	$\leq 8 \text{ min}$	$\geq 4 \text{ h}$
$20^{\circ}\text{C} < T_{BM} \leq 30^{\circ}\text{C}$	$\leq 4 \text{ min}$	$\geq 3,5 \text{ h}$
$30^{\circ}\text{C} < T_{BM} \leq 40^{\circ}\text{C}$	$\leq 1,5 \text{ min}$	$\geq 3 \text{ h}$

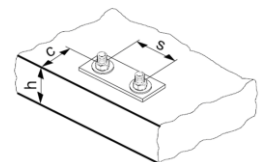
a) The curing time data are valid for dry base material only. In wet material the curing times must be doubled.

Setting details for HAS and HAS-U

Anchor size			M8	M10	M12	M16	M20	M24
Nominal 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 anchorage and drill hole depth range ^{a)}	h _{ef,min} = h ₀	[mm]	64	80	96	128	160	192
	h _{ef,max} = h ₀	[mm]	160	200	240	320	400	480
Minimum base material thickness	h _{min}	[mm]	h _{ef} + 30 mm ≥ 100 mm			h _{ef} + 2 d ₀		
Minimum spacing	s _{min}	[mm]	40	50	60	80	100	120
Minimum edge distance	c _{min}	[mm]	40	45	45	50	55	60
Maximum diameter of clearance hole in the fixture	d _f	[mm]	9	12	14	18	22	26
Maximum torque moment ^{b)}	T _{max}	[Nm]	10	20	40	80	150	200
Characteristic spacing for splitting failure	S _{cr,sp}	[mm]	2 C _{cr,sp}					
Characteristic edge distance for splitting failure ^{c)}	C _{cr,sp}	[mm]	1,0 · h _{ef} for h / h _{ef} ≥ 2,0					
			4,6 h _{ef} - 1,8 h for 2,0 > h / h _{ef} > 1,3					
			2,26 h _{ef} for h / h _{ef} ≤ 1,3					
Characteristic spacing for concrete cone failure	S _{cr,N}	[mm]	2 C _{cr,N}					
Characteristic edge distance for concrete cone failure ^{c)}	C _{cr,N}	[mm]	1,5 h _{ef}					

For spacing (edge distance) smaller than characteristic spacing (characteristic edge distance) the design loads have to be reduced.

- a) $h_{ef,min} \leq h_{ef} \leq h_{ef,max}$ (h_{ef}: embedment depth)
- b) Maximum recommended torque moment to avoid splitting failure during installation with min. spacing and/or edge distance
- c) h: base material thickness (h ≥ h_{min})

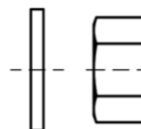


Steel Elements

HAS-U-...: M8 to M24



washer nut



Marking:

Steel grade number and length identification letter: e.g. 8L

HAS-...: M8 to M24



washer nut









HAS Color code marking:

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

Installation equipment

Anchor size	M8	M10	M12	M16	M20	M24
Rotary hammer	TE 2 (-A) – TE 16 (-A)				TE 40 – TE 80	
Other tools	Hilti Blow out pump ($h_{ef} < 10 \cdot d$), Compressed air gun, Set of cleaning brushes, Dispenser, Piston plug					

Cleaning, drilling and installation parameters

HAS, HAS-U	Drilling		Cleaning		Installation
	Hammer drill (HD) TE-CX TE-YX	Hollow Drill Bit (HDB) TE-CD TE-YD	Brush HIT-RB	Air nozzle HIT-RB	Piston plug HIT-SZ
	d_0 [mm]		size [mm]		
					
M8	10	-	10	-	-
M10	12	12	12	12	12
M12	14	14	14	14	14
M16	18	18	18	18	18
M20	22	22	22	22	22
M24	28	28	28	28	28

Setting instructions

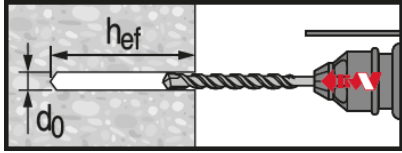
*For detailed information on installation see instruction for use given with the package of the product.



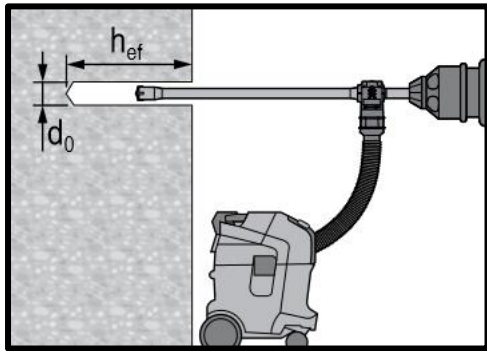
Safety regulations,

Review the Material Safety Data Sheet (MSDS) before use for proper and safe handling! Wear well-fitting protective goggles and protective gloves when working with Hilti HIT-CT 100.

Drilling



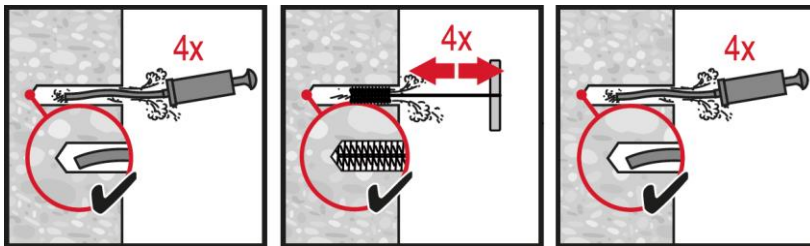
Hammer drilled hole (HD)



Hammer drilled hole with Hollow drill bit (HDB)

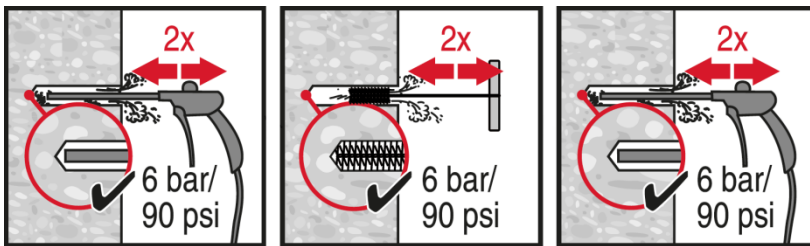
No cleaning required

Cleaning



Manual cleaning (MC)

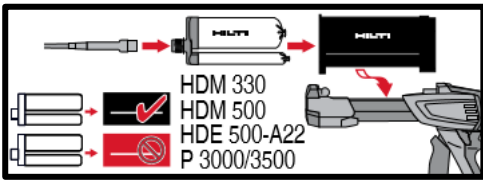
for drill diameters $d_0 \leq 20$ mm and drill hole depth $h_0 \leq 10 \cdot d$ in uncracked concrete



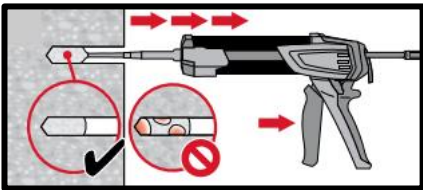
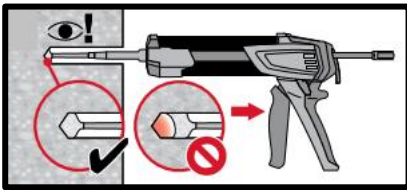
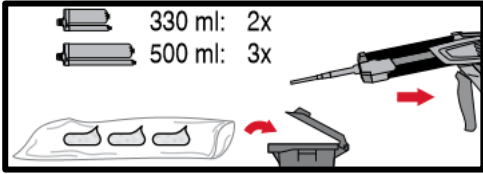
Compressed air cleaning (CAC)

for all drill hole diameters d_0 and drill hole depths $h_0 \leq 12 \cdot d$.

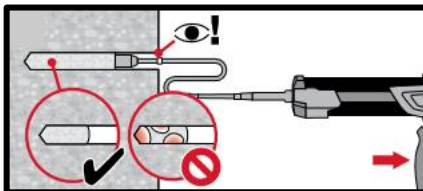
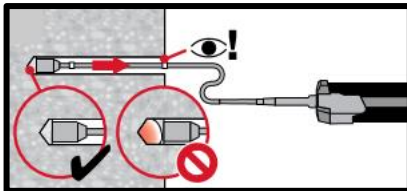
Injection



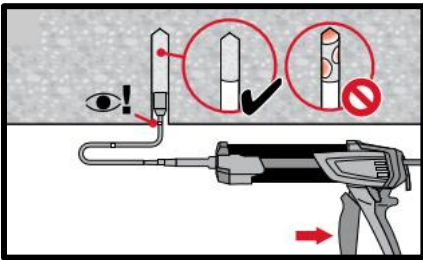
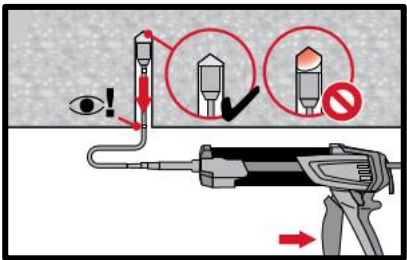
Injection system preparation



Injection method for drill hole depth
 $h_{ef} \leq 250 \text{ mm.}$

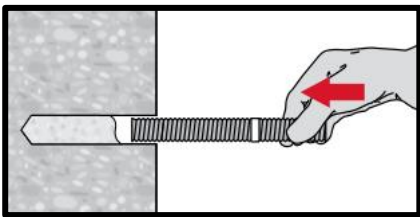


Injection method for drill hole depth
 $h_{ef} > 250 \text{ mm.}$

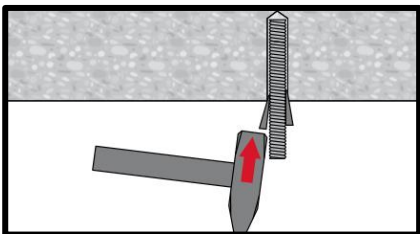


Injection method for overhead application

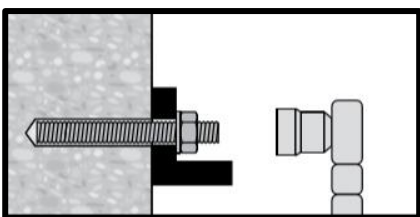
Setting the element



Setting element, observe working time " t_{work} ".



Setting element for overhead applications, observe working time " t_{work} ".



Loading the anchor after required curing time t_{cure}