HIT-RE 10
INJECTION MORTAR

Technical Datasheet

Update: Jan-23

Hilti HIT-RE 10 injection mortar

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

Injection mortar system

Hilti HIT-RE 10
580 ml hard
cartridge

HAS-U
(M8-M30)

Benefits

- Suitable for non-cracked concrete C20/25 to C50/60
- Suitable for dry and water saturated concrete
- Suitable for overhead fastenings

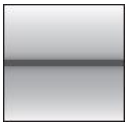
Base material

Concrete
(non-cracked)

Dry concrete

Wet concrete

Load conditions



Static/
quasi-static

Installation conditions

Hammer
drilling

Variable
embedment
depth

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
Hilti Technical Data [a)]	Hilti	2017-11-28

a) All data given in this section according to Hilti Technical Data

Static and quasi-static loading (for a single anchor)

All data in this section applies to

- Correct setting (see setting instruction)
- No edge distance and spacing influence
- Steel failure
- Base material thickness, as specified in the tables
- Embedment depth, as specified in the tables
- One anchor material, as specified in the tables
- Concrete C20/25, $f_{ck,cube}$ = 25 N/mm²
- In-service temperature range I (min. base material temperature -40°C, max. long/short term base material temperature: +24°C/+40°C)

Embedment depth [a] and base material thickness for M8-M12

Anchor size				M8				M10				M12			
Embedment depth [b]		h_{ef}	[mm]	60	80	120	160	60	100	150	200	70	120	180	240
Base material thickness		h	[mm]	100	110	150	190	100	130	180	230	100	150	210	270

Embedment depth [a] and base material thickness for M16-M20

Anchor size				M16				M20			
Embedment depth [b]		h_{ef}	[mm]	80	160	240	320	90	200	300	400
Base material thickness		h	[mm]	112	192	272	352	130	240	340	440

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

b) Recommended loads calculated for embedment depths $h_{ef} = h_{ef,min}$; h_{ef} = 10d ; h_{ef} = 15d ; $h_{ef} = h_{ef,max}$ = 20d

Recommended loads for M8-M12

Anchor size				M8				M10				M12			
Non-cracked concrete															
Tension	HAS-U 5.8	N_{rec}	[kN]	5,1	6,8	8,7	8,7	6,4	10,7	13,8	13,8	9,0	15,4	20,1	20,1
Shear	HAS-U 5.8	V_{rec}	[kN]	5,2				8,3				12,0			

Recommended loads for M16-M20

Anchor size				M16				M20			
Non-cracked concrete											
Tension	HAS-U 5.8	N_{rec}	[kN]	12,0	27,3	37,4	37,4	14,3	42,7	58,3	58,3
Shear	HAS-U 5.8	V_{rec}	[kN]	22,4				35,0			

Materials

Mechanical properties

Anchor size				M8	M10	M12	M16
Nominal tensile strength	HAS-U 5.8	f_{uk}	[N/mm²]	500	500	500	500
	HAS-U 8.8			800	800	800	800
	HAS-U-R			700	700	700	700
	HAS-U-HCR			800	800	800	800
Yield strength	HAS-U 5.8	f_{yk}	[N/mm²]	400	400	400	400
	HAS-U 8.8			640	640	640	640
	HAS-U-R			450	450	450	450
	HAS-U-HCR			640	640	640	640
Stressed cross-section	HAS-U	A_s	[mm²]	36,6	58,0	84,3	157
Moment of resistance	HAS-U	W	[mm³]	31,2	62,3	109	277

Material quality for HAS-U

Part	Material
Zinc coated steel	
Threaded rod, HAS-U 5.8 (HDG)	Strength class 5.8; Elongation at fracture A5 > 8% ductile Electroplated zinc coated ≥ 5μm; (HDG) hot dip galvanized ≥ 45 μm
Threaded rod, HAS-U 8.8 (HDG)	Strength class 8.8; Elongation at fracture A5 > 12% ductile Electroplated zinc coated ≥ 5μm; (HDG) hot dip galvanized ≥ 45 μm
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 ≥ 5μm, hot dip galvanized ≥ 45 μm
Stainless Steel	
Threaded rod, HAS-U A4	Strength class 70 for M8-M20 Elongation at fracture A5 > 8% ductile Stainless steel 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362
Washer	Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1:2014
Nut	Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1:2014
High corrosion resistant steel	
Threaded rod, HAS-U HCR	Strength class 80 for M8-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	High corrosion resistant steel 1.4529, 1.4565 EN 10088-1:2014

Setting information

Installation temperature range:
+5°C to +40°C

Service temperature range
Hilti HIT-RE 10 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 +43 °C	+20 °C	+43 °C
Temperature range II	-40 °C to +55 °C	+43 °C	+55 °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.

Working time and curing time [a]:

Temperature of the base material	Maximum working time	Minimum curing time
T_{BM}	t_{work}	t_{cure} [a]
5˚C ≤ T_{BM} ≤ 10˚C	5 h	72 h
10˚C < T_{BM} ≤ 15˚C	2,5 h	48 h
15˚C < T_{BM} ≤ 20˚C	2 h	36 h
20˚C < T_{BM} ≤ 30˚C	60 min	24 h
30˚C < T_{BM} ≤ 40˚C	30 min	12 h

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

Setting details

Anchor size			M8	M10	M12	M16	M20
Nominal diameter of element	d	[mm]	8	10	12	16	20
Nominal diameter of drill bit	d_0	[mm]	10	12	14	18	24
Maximum diameter of clearance hole in the fixture	d_f	[mm]	9	12	14	18	22
Minimum base material thickness	h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 mm			h_{ef} + 2d_0	
Effective anchorage depth (= drill hole depth)	$h_{ef,min} = h_0$	[mm]	60	60	70	80	90
	$h_{ef,max} = h_0$	[mm]	160	200	240	320	400
Maximum torque moment	T_{max}	[Nm]	10	20	40	80	150
Minimum spacing	s_{min}	[mm]	40	50	60	75	90
Minimum edge distance	c_{min}	[mm]	40	45	45	50	55

Installation equipment

Anchor size	M8	M10	M12	M16	M20
Rotary hammer	TE2(-A) – TE30(-A)				TE40 – TE80
Other tools	Blow out pump (h_{ef} ≤ 10·d)				-
	Compressed air gun[b)] Set of cleaning brushes[c)], dispenser, piston plug				

b) Compressed air gun with extension hose for all drill holes deeper than 250 mm (for M8 to M12) or deeper than 20·ϕ (for ϕ > 12 mm)
c) Automatic brushing with round brush for all drill holes deeper than 250 mm (for M8 to M12) or deeper than 20·ϕ (for ϕ > 12 mm)

Parameters of cleaning and setting tools

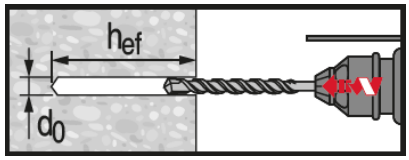
HAS-U	Drilling and cleaning		Installation
	Hammer drilling	Brush HIT-RB	Piston plug HIT-SZ
	d_0 [mm]	size [mm]	size [mm]
			
M8	10	10	10
M10	12	12	12
M12	14	14	14
M16	18	18	18
M20	24	24	24
M24	28	28	28
M27	30	30	30
M30	35	35	35

Setting instructions

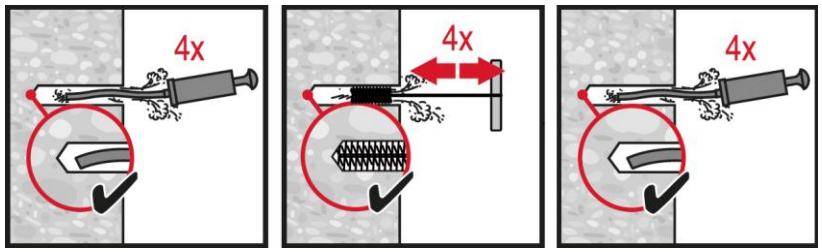
***For detailed information on installation see instruction for use given with the package of the product.**

Safety regulations.

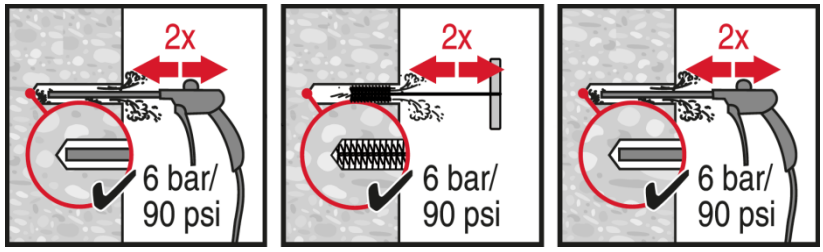
Review the Material Safety Data Sheet (MSDS) before use for proper and safe handling! Wear well-fitting protective goggles and protective gloves when working with Hilti HIT-RE 10.



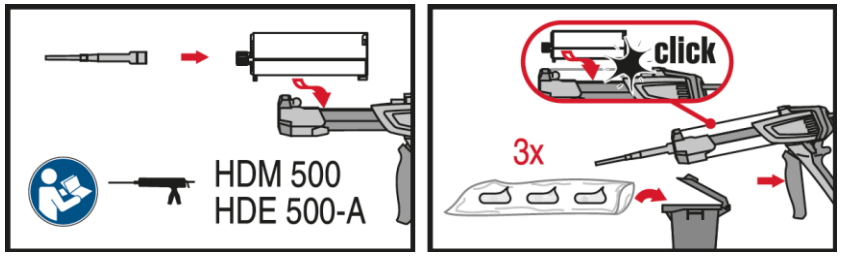
Hammer drilled hole



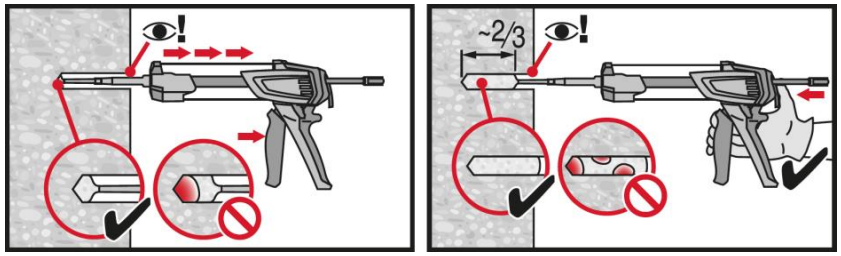
Manual cleaning (MC)
for drill diameters $d_0 \leq 20$ mm and drill hole depth $h_0 \leq 10 \cdot d$.



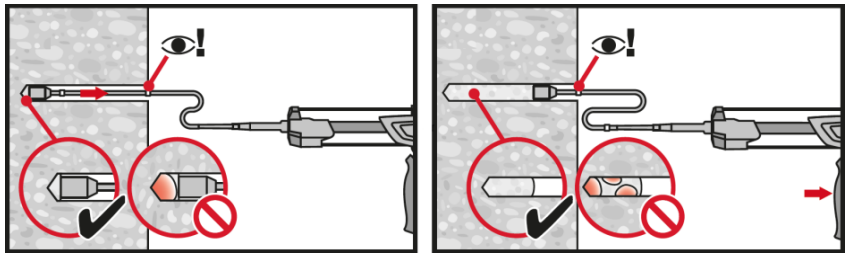
Compressed air cleaning (CAC)
for all drill hole diameters d_0 and drill hole depths $h_0 \leq 20 \cdot d$.



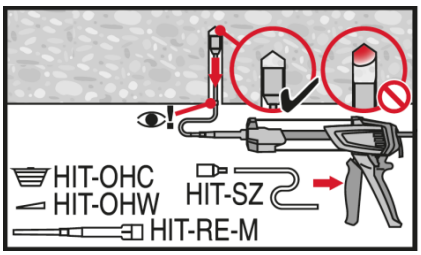
Injection system preparation.

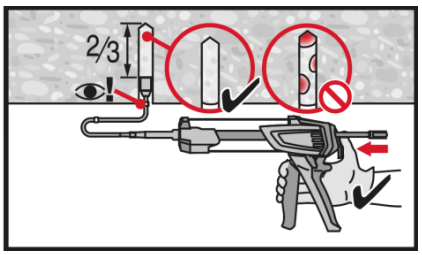


Injection method for drill hole depth $h_{ef} \leq 250$ mm.

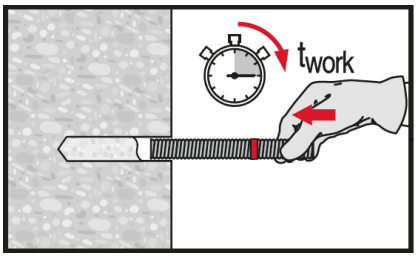


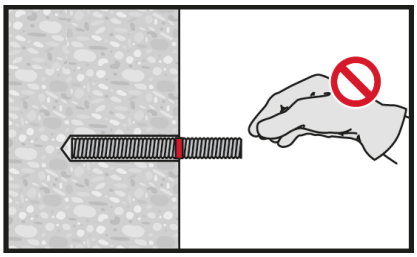
Injection method for drill hole depth $h_{ef} > 250$ mm.



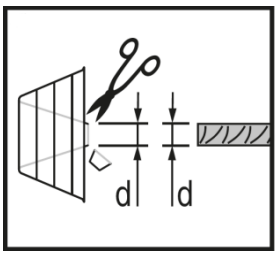


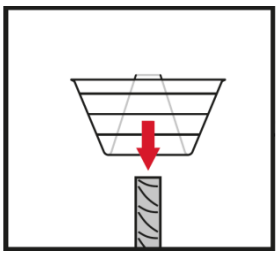
Injection method for overhead application.

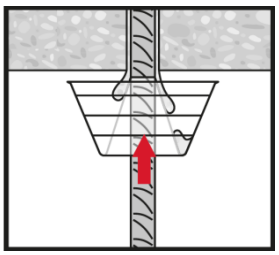


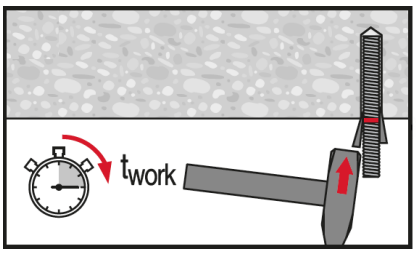


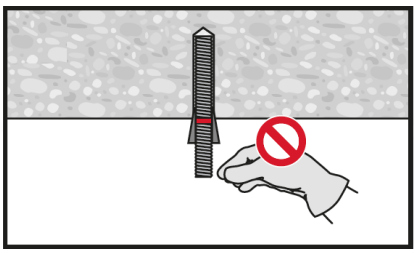
Setting element, observe working time "t_{work}".



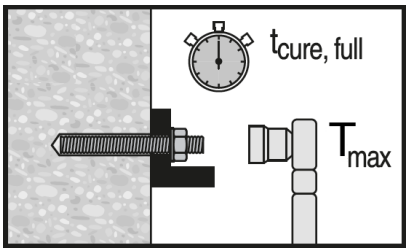


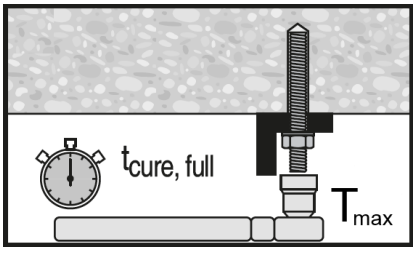






Setting element for overhead applications, observe working time "t_{work}".





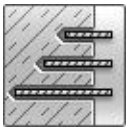
Apply full load only after curing time "t_{cure}", applied installation torque shall not exceed the values T_{max}.

HIT-RE 10 injection mortar

Anchor design (EN 1992-4) / Rebar elements / Concrete

Injection mortar system	Benefits
 Hilti HIT-RE 10 580 ml hard cartridge	- Suitable for non-cracked concrete C20/25 to C50/60 - Suitable for dry and water saturated concrete - Suitable for overhead fastenings
 Rebar B500 B (ϕ8 - ϕ32)	

Base material			Load condition
 Concrete (non-cracked)	 Dry concrete	 Wet concrete	 Static/ quasi-static

Installation conditions		Other information
 Hammer drilling	 Variable embedment depth	 PROFIS Engineering design Software

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
Hilti Technical Data [a)]	Hilti	2017-11-28

b) All data given in this section according to Hilti Technical Data

Static and quasi-static loading (for a single anchor)

All data in this section applies to

- Correct setting
- No edge distance and spacing influence
- Steel failure
- 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, $f_{ck,cube}$ = 25 N/mm²
- In-service temperature range I
  (min. base material temperature -40°C, max. long/short term base material temperature: +24°C/+40°C)

Embedment depth [a] and base material thickness for d8-d12

Anchor size			ϕ8				ϕ10				ϕ12			
Embedment depth [b]	h_{ef}	[mm]	60	80	120	160	60	100	150	200	70	120	180	240
Base material thickness	h	[mm]	100	110	150	190	100	130	180	230	100	150	210	270

Embedment depth [a] and base material thickness for d14-d20

Anchor size			ϕ14				ϕ16				ϕ20			
Embedment depth [b]	h_{ef}	[mm]	75	140	210	280	80	160	240	320	90	200	300	400
Base material thickness	h	[mm]	103	168	238	308	112	192	272	352	130	240	340	440

a) The allowed range of embedment depth is shown in the setting details
b) Recommended loads calculated for embedment depths $h_{ef} = h_{ef,min}$; h_{ef} = 10d ; h_{ef} = 15d ; $h_{ef} = h_{ef,max}$ = 20d

Recommended loads for d8-d12

Anchor size				ϕ8				ϕ10				ϕ12			
Non-cracked concrete															
Tension	Rebar B500B	N_{rec}	[kN]	5,1	6,8	10,3	13,7	6,4	10,7	16,0	21,4	9,0	15,4	23,1	30,8
Shear	Rebar B500B	V_{rec}	[kN]	8,0				12,6				17,7			

Recommended loads for d16-d20

Anchor size				ϕ14				ϕ16				ϕ20			
Non-cracked concrete															
Tension	Rebar B500B	N_{rec}	[kN]	10,9	20,9	31,4	41,9	12,0	27,3	41,0	54,7	14,3	42,7	64,1	85,4
Shear	Rebar B500B	V_{rec}	[kN]	24,0				31,4				40,0	49,1		

Materials

Mechanical properties for rebar B500 B

Anchor size			ϕ8	ϕ10	ϕ12	ϕ14	ϕ16	ϕ20
Nominal tensile strength	f_{uk}	[N/mm²]	550	550	550	550	550	550
Yield strength	f_{yk}	[N/mm²]	500	500	500	500	500	500
Stressed cross-section	A_s	[mm²]	50,3	78,5	113,1	153,9	201,1	314,2
Moment of resistance	W	[mm³]	50,3	98,2	169,6	269,4	402,1	785,4

Material quality

Part	Material
Rebar B500 B	Geometry and mechanical properties according to DIN 488-2:1986 or DIN 488-2

Setting information

Installation temperature range:
+10°C to +40°C

Service temperature range

Hilti HIT-RE 10 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 + 43 °C	+ 20 °C	+ 43 °C
Temperature range II	- 40 ºC to + 55 ºC	+ 43 ºC	+ 55 ºC

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.

Working time and curing time [a)]

Temperature of the base material	Maximum working time	Minimum curing time
T_{BM}	t_{work}	t_{cure} [a)]
5ºC ≤ T_{BM} ≤ 10ºC	5 h	72 h
10ºC < T_{BM} ≤ 15ºC	2,5 h	48 h
15ºC < T_{BM} ≤ 20ºC	2 h	36 h
20ºC < T_{BM} ≤ 30ºC	60 min	24 h
30ºC < T_{BM} ≤ 40ºC	30 min	12 h

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

Setting details

Anchor size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20
Nominal diameter of element	d	[mm]	8	10	12	14	16	20
Nominal diameter of drill bit	d_0	[mm]	10 / 12 a)	12 / 14 a)	14 / 16 a)	18	20	25
Effective anchorage depth (drill hole depth)	$h_{ef,min} = h_0$	[mm]	60	60	70	75	80	90
	$h_{ef,max} = h_0$	[mm]	160	200	240	280	320	400
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	70	80	100
Minimum edge distance	c_{min}	[mm]	40	50	60	70	80	100

a) both given values for drill bit diameter can be used

Installation equipment

Anchor size	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20
Rotary hammer	TE 2(-A) – TE 30(-A)					TE 40 – TE 80
Other tools	Blow out pump ($h_{ef} \leq 10 \cdot d$)					-
	Compressed air gun a) Set of cleaning brushes b), dispenser, piston plug					

a) Compressed air gun with extension hose for all drill holes deeper than 250 mm (for ϕ 8 to ϕ 12) or deeper than 20·ϕ (for ϕ > 12 mm).
b) Automatic brushing with round brush for all drill holes deeper than 250 mm (for ϕ 8 to ϕ 12) or deeper than 20·ϕ (for ϕ > 12 mm).

Parameters of cleaning and setting tools

Rebar size	Drilling and cleaning		Installation
	Hammer drilling	Brush HIT-RB	Piston plug HIT-SZ
	d_0 [mm]	size [mm]	size [mm]
			
Ø8	12 (10 a))	12 (10 a))	12 (10 a))
Ø10	14 (12 a))	14 (12 a))	14 (12 a))
Ø12	16 (14 a))	16 (14 a))	16 (14 a))
Ø14	18	18	18
Ø16	20	20	20
Ø20	25	25	25

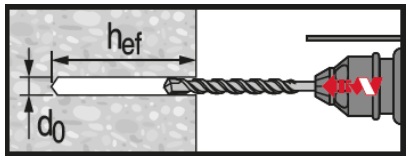
a) both given values for drill bit diameter can be used

Setting instructions

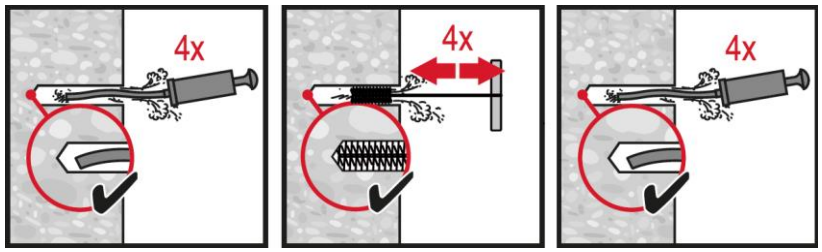
***For detailed information on installation see instruction for use given with the package of the product.**

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-RE 10



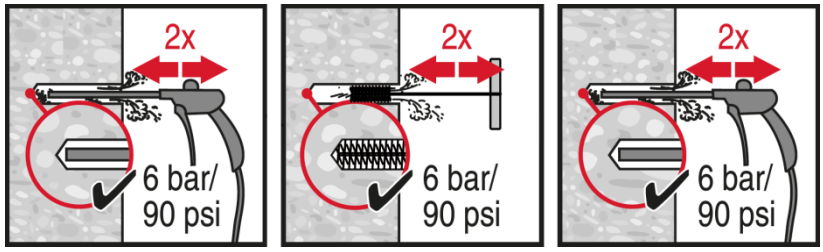
Hammer drilled hole (HD)



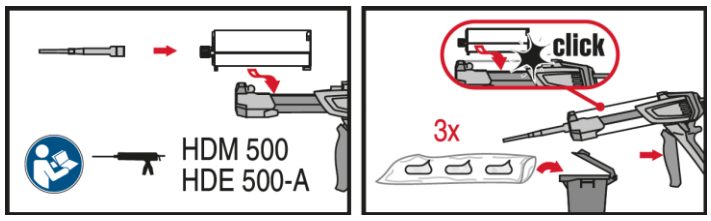
Manual cleaning (MC)

For element sizes d ≤ 16mm and embedment depth h_{ef} ≤ 10d only.

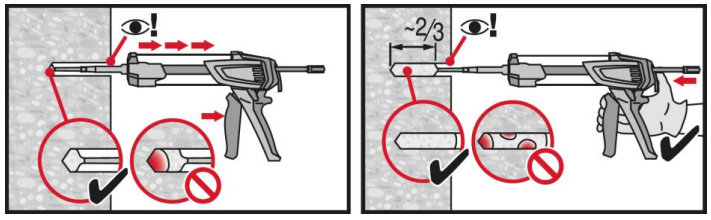
Brush bore hole with required steel brush HIT-RB.



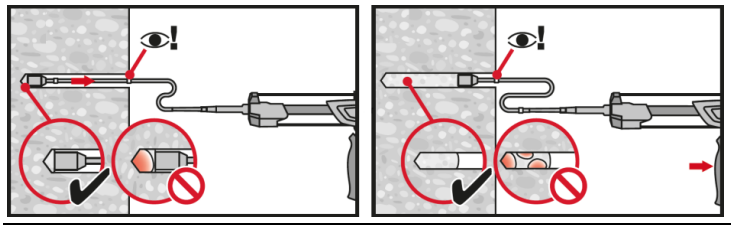
Compressed air cleaning (CAC)



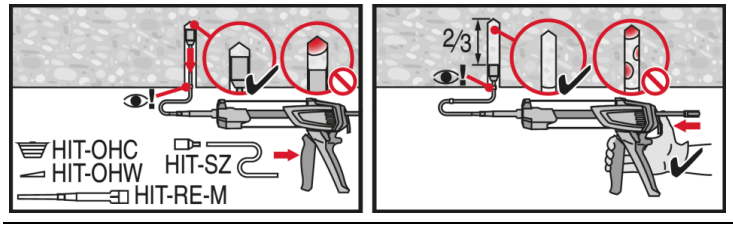
Injection system preparation.



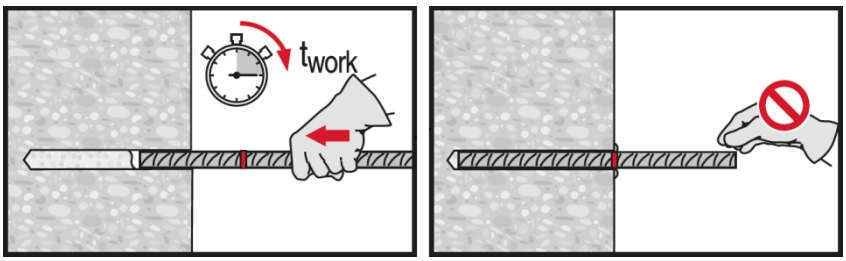
Injection method for drill hole depth h_{ef} ≤ 250 mm.



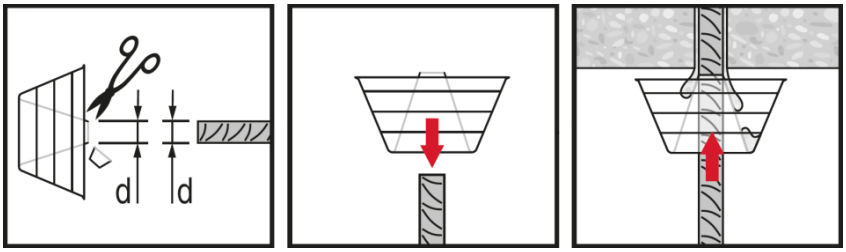
Injection method for drill hole depth h_{ef} > 250mm.

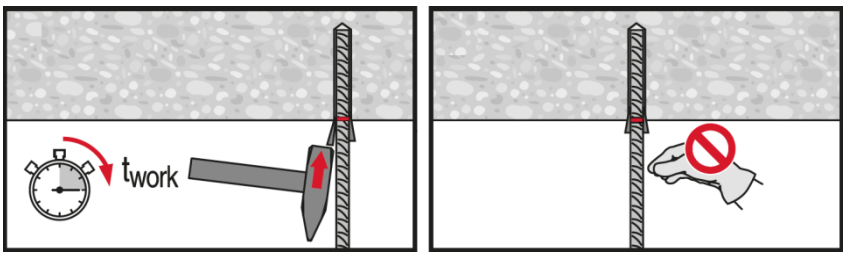


Injection method for overhead application.



Setting element, observe working time “t_{work}”.





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

HIT-RE 10 injection mortar

Rebar design (EN 1992-1) / Rebar elements / Concrete

Injection mortar system

Hilti HIT-RE 10 580 ml hard cartridges

Rebar B500 B

(ϕ8 - ϕ20)

Benefits

- Suitable for non-cracked concrete C20/25 to C50/60
- Suitable for dry and water saturated concrete
- Suitable for overhead fastenings

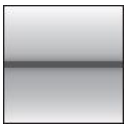
Base material

Concrete (non-cracked)

Dry concrete

Wet concrete

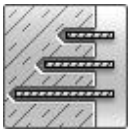
Load conditions



Static/ quasi-static

Installation conditions

Hammer drilling



Variable embedment depth

Other information

CRT

Corrosion resistance tested

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
Hilti Technical Data [a)]	Hilti	2017-11-28

a) All data given in this section according to Hilti Technical Data

Static and quasi-static loading

Pre-calculated values[1] – anchorage length

Rebar yield strength f_{yk} =500 N/mm², concrete C25/30, good bond conditions

Rebar-size	Anchorage length l_{bd} [mm]	Design value N_{Rd} [kN]	Mortar volume[2] V_M [ml]		Overlap length l_0 [mm]	Design value N_{Rd} [kN]	Mortar volume[2] V_M [ml]
ϕ8	150	10,2	(6)[3] 12		300	20,4	(11)[3] 23
	250	17,0	(9)[3] 19		310	21,0	(11)[3] 24
	322	**21,9**	(11)[3] 24		**322**	**21,9**	(11)[3] 25
ϕ10	181	15,4	(8)[3] 17		300	25,4	(13)[3] 28
	310	26,3	(13)[3] 29		350	29,7	(15)[3] 32
	403	**34,1**	(17)[3] 37		**403**	**34,1**	(17)[3] 37
ϕ12	217	22,1	(11)[3] 23		300	30,5	(15)[3] 32
	370	37,7	(19)[3] 40		400	40,7	(20)[3] 43
	483	**49,2**	(24)[3] 51		**483**	**49,2**	(24)[3] 51
ϕ14	254	30,1	31		315	37,4	39
	350	41,6	43		400	47,5	49
	500	59,4	61		500	59,4	61
ϕ16	290	39,3	40		360	48,9	49
	400	54,3	55		400	54,3	55
	500	67,9	68		500	67,9	68
ϕ20	362	61,5	77		450	76,3	96
	420	71,3	90		470	79,7	100
	500	84,8	107		500	84,8	107

1) Values italic letters correspond to the minimum anchorage length. The maximum permissible load (bold letters) is valid for “good bond conditions” as described in EN 1992-1-1. For all other conditions multiply by the value by 0,7.
2) Mortar volume according to the equation: $1{,}2\cdot(d_0^2-d_s^2)\cdot\pi\cdot l_{bd/0}/4$.
3) Value of mortar volume corresponds with minimal nominal diameter of drill bit (see table “Installation equipment”).

Materials

Material quality

Designation	Material
Reinforcing bars (rebars)	
Rebar EN 1992-1-1	Bars and de-coiled rods class B or C with fyk and k according to NDP or NCL of EN 1992-1-1 $f_{uk} = f_{tk} = k \cdot f_{yk}$

Fitness for use

Creep tests have been conducted in accordance with EAD 330087-00-0601 and TR 023 in the following conditions: **in dry environment at 43 °C during 90 days.**
These tests show an excellent behaviour of the post-installed connection made with HIT-RE 10: low displacements

Durability of Hilti-RE 10 injection mortar:

Condition	Comment	Resistance
Sulphurous atmosphere	23°C	+
High alkalinity	pH = 13,2, 23°C	+

Corrosion resistance of post-installed rebar:
Post-installed rebar connections made with Hilti-RE 10 injection mortar provide the same corrosion resistance as a cast-in-place rebar.

Setting information

Installation temperature range:
+5°C to +40°C

Service temperature range
Hilti HIT-RE 10 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 +43 °C	+20 °C	+43 °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.

Working time and curing time [a)]

Temperature of the base material	Maximum working time	Initial curing time	Minimum curing time
T_{BM}	t_{work}	$t_{cure,ini}$ [a)]	t_{cure} [a)]
5˚C ≤ T_{BM} ≤ 10˚C	5 h	30 h	72 h
10˚C < T_{BM} ≤ 15˚C	2,5 h	20 h	48 h
15˚C < T_{BM} ≤ 20˚C	2 h	15 h	36 h
20˚C < T_{BM} ≤ 30˚C	60 min	10 h	24 h
30˚C < T_{BM} ≤ 40˚C	30 min	5 h	12 h

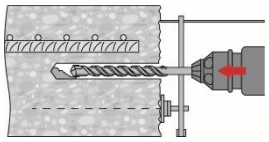
a) The curing time data are valid for dry anchorage base material only. For wet base materials the curing times must be doubled.

Installation equipment

Rebar - size	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20
Rotary hammer	TE 2(-A) – TE 30(-A)					TE 40 – TE 80
Other tools	Blow out pump ($h_{ef} \leq 10 \cdot d$)					-
	Compressed air gun[b)] Set of cleaning brushes[c)], dispenser, piston plug					

a) Both given drill bit diameter can be used.
b) Compressed air gun with extension hose for all drill holes deeper than 250 mm (for ϕ 8 to ϕ 12) or deeper than 20·ϕ (for ϕ > 12 mm).
c) Automatic brushing with round brush for all drill holes deeper than 250 mm (for ϕ 8 to ϕ 12) or deeper than 20·ϕ (for ϕ > 12 mm).

Minimum concrete cover c_{min} of the post-installed rebar

Drilling method	Rebar – size [mm]	Minimum concrete cover c_{min} [mm]		
		Without drilling aid	With drilling aid	
Hammer drilling	ϕ < 25	$30 + 0{,}06 \cdot l_v \geq 2 \cdot \phi$	$30 + 0{,}02 \cdot l_v \geq 2 \cdot \phi$	

Dispenser and corresponding maximum embedment depth $\ell_{v,max}$

Rebar – size [mm]	Dispenser (HDM 500, HDE 500-A)
	$\ell_{v,max}$ [mm]
ϕ8 - ϕ20	500

Parameters of cleaning and setting tools

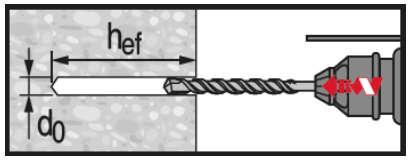
Rebar size	Drilling and cleaning		Installation
	Hammer drilling	Brush HIT-RB	Piston plug HIT-SZ
	d_0 [mm]	size [mm]	size [mm]
			
Ø8	12 (10 [a)])	12 (10 [a)])	12 (10 [a)])
Ø10	14 (12 [a)])	14 (12 [a)])	14 (12 [a)])
Ø12	16 (14 [a)])	16 (14 [a)])	16 (14 [a)])
Ø14	18	18	18
Ø16	20	20	20
Ø20	25	25	25

Setting instructions

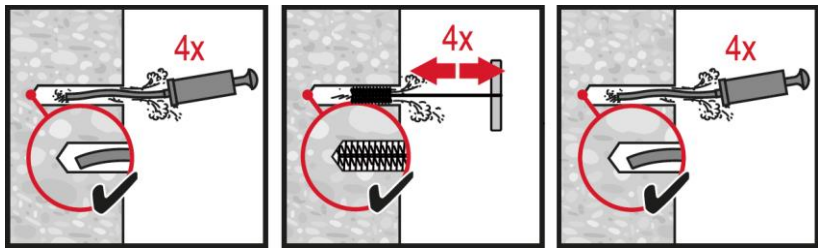
***For detailed information on installation see instruction for use given with the package of the product.**

Safety regulations.

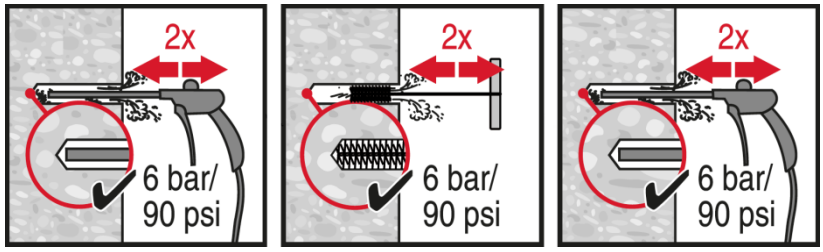
Review the Material Safety Data Sheet (MSDS) before use for proper and safe handling! Wear well-fitting protective goggles and protective gloves when working with Hilti HIT-RE 10.



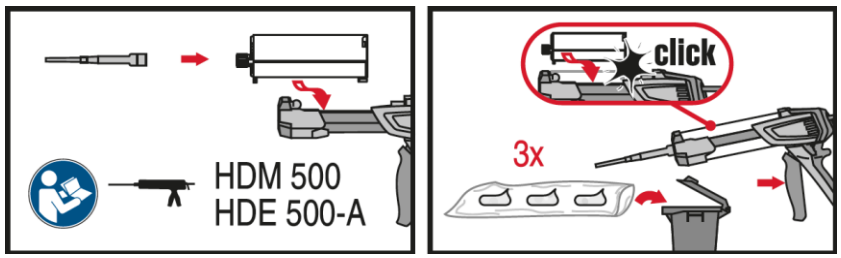
Hammer drilled hole



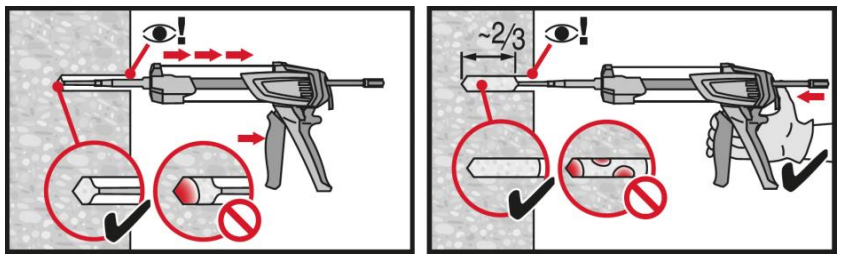
Manual cleaning (MC)
for drill diameters $d_0 \leq 20$ mm and drill hole depth $h_0 \leq 10 \cdot d$.



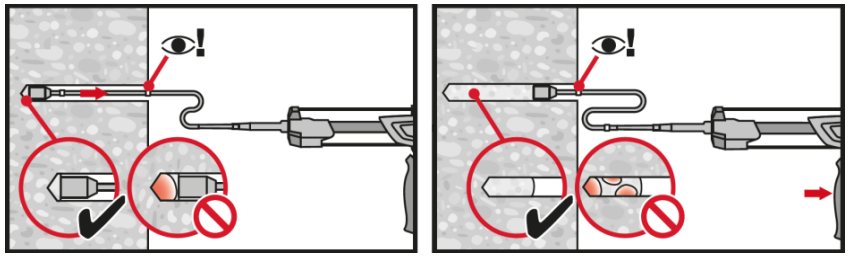
Compressed air cleaning (CAC)
for all drill hole diameters d_0 and drill hole depths $h_0 \leq 20 \cdot d$.



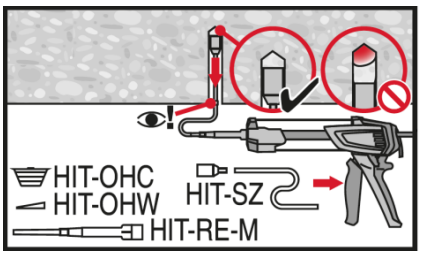
Injection system preparation.

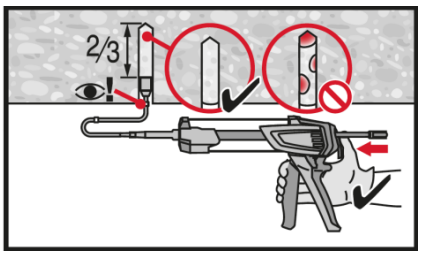


Injection method for drill hole depth $h_{ef} \leq 250$ mm.

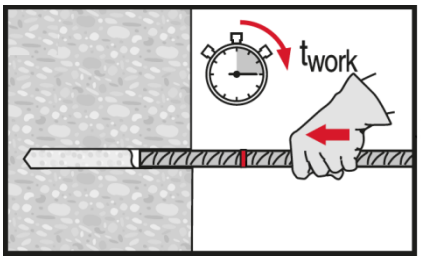


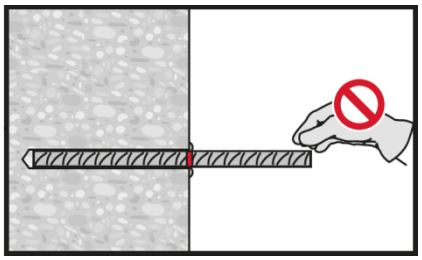
Injection method for drill hole depth $h_{ef} > 250$mm.



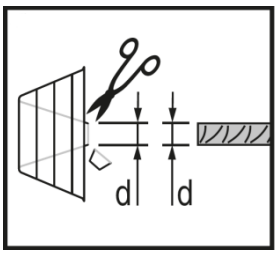


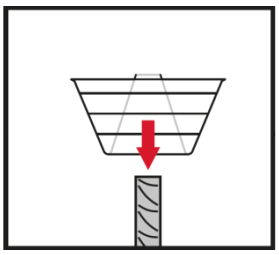
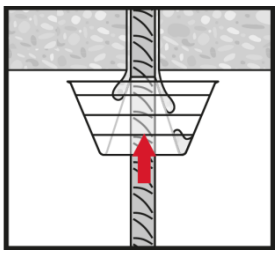
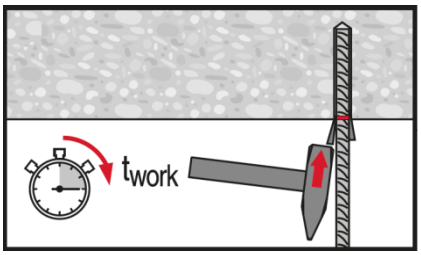
Injection method for overhead application.

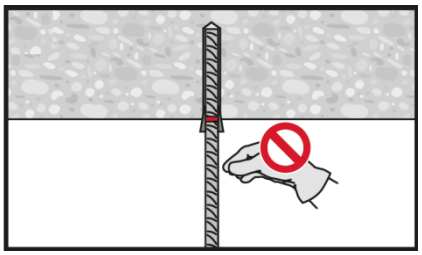




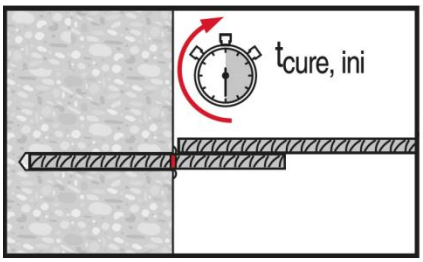
Setting element, observe working time "t_{work}".

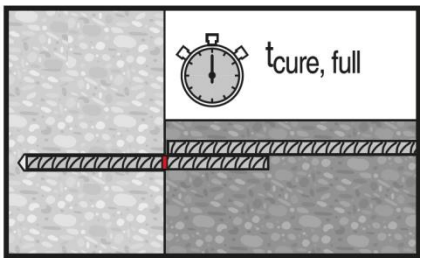




Setting element for overhead applications, observe working time "t_{work}".





Apply full load only after curing time "t_{cure}".