

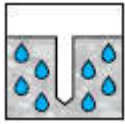
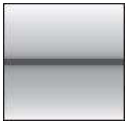

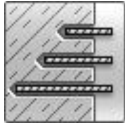



HIT-RE 10 injection mortar

Anchor design (ETAG 001) / Rebar elements / Concrete

Injection mortar system	Benefits
 <p>Hilti HIT-RE 10 580 ml hard cartridge</p>	<ul style="list-style-type: none"> - Suitable for non-cracked concrete C20/25 to C50/60 - Suitable for dry and water saturated concrete - Suitable for overhead fastenings
 <p>Rebar B500 B (φ8 - φ16)</p>	

Base material	Load condition
 <p>Concrete (non-cracked)</p>  <p>Dry concrete</p>  <p>Wet concrete</p>	 <p>Static/ quasi-static</p>
Installation conditions	Other information
 <p>Hammer drilling</p>  <p>Variable embedment depth</p>	 <p>PROFIS Rebar design Software</p>

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 Dat

Basic loading data (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
- One typical embedment depth, as specified in the table
- One anchor material, as specified in the tables
- Concrete C20/25, $f_{ck,cube} = 25 \text{ N/mm}^2$

Recommended loads for tension loading

Anchor- size			$\phi 8$	$\phi 10$	$\phi 12$	$\phi 14$	$\phi 16$
Temperature range I (20/43°C)							
Typical embedment depth	$h_{ef, min}$	[mm]	60	60	70	75	80
Base material thickness	h	[mm]	100	100	100	111	120
Tensile load	N_{rec}	[kN]	5,1	6,4	9,0	11,2	12,3
Temperature range II (43/55°C)							
Typical embedment depth	$h_{ef, min}$	[mm]	80	100	120	140	160
Base material thickness	h	[mm]	110	130	150	176	200
Tensile load	N_{rec}	[kN]	6,8	10,7	15,4	20,9	27,4
Temperature range III (55/70°C)							
Typical embedment depth	$h_{ef, min}$	[mm]	120	150	180	210	240
Base material thickness	h	[mm]	150	180	210	246	280
Tensile load	N_{rec}	[kN]	10,3	16,0	23,1	31,4	41,0
Temperature range IV (70/85°C)							
Typical embedment depth	$h_{ef, min}$	[mm]	60	60	70	75	80
Base material thickness	h	[mm]	100	100	100	111	120
Tensile load	N_{rec}	[kN]	3,6	4,5	6,3	7,9	9,6
Temperature range V (85/100°C)							
Typical embedment depth	$h_{ef, min}$	[mm]	80	100	120	140	160
Base material thickness	h	[mm]	110	130	150	176	200
Tensile load	N_{rec}	[kN]	4,8	7,5	10,8	14,7	19,1
Typical embedment depth	$h_{ef, min}$	[mm]	120	150	180	210	240
Base material thickness	h	[mm]	150	180	210	246	280
Tensile load	N_{rec}	[kN]	7,2	11,2	16,2	22,0	28,7

Recommended loads for shear loading

Anchor- size			$\phi 8$	$\phi 10$	$\phi 12$	$\phi 14$	$\phi 16$
Shear load	V_{rec}	[kN]	6,7	10,5	14,8	20,0	26,2

Materials

Anchor size		$\phi 8$	$\phi 10$	$\phi 12$	$\phi 14$	$\phi 16$
Nominal tensile strength f_{uk}	[N/mm ²]	550	550	550	550	550
Yield strength f_{yk}	[N/mm ²]	500	500	500	500	500
Stressed cross-section A_s	[mm ²]	50,3	78,5	113,1	153,9	201,1
Moment of resistance W	[mm ³]	50,3	98,2	169,6	269,4	402,1

Material quality

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

Setting

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	Max. long term base material temperature	Max. 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

Max. 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.

Max. long term base material temperature

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

Working time and curing time

Temperature of the base material	Max. working time t_{work}	Min. curing time $t_{cure}^{a)}$
$5^{\circ}\text{C} \leq T_{BM} \leq 10^{\circ}\text{C}$	5 h	72 h
$10^{\circ}\text{C} < T_{BM} \leq 15^{\circ}\text{C}$	2,5 h	48 h
$15^{\circ}\text{C} < T_{BM} \leq 20^{\circ}\text{C}$	2 h	36 h
$20^{\circ}\text{C} < T_{BM} \leq 30^{\circ}\text{C}$	60 min	24 h
$30^{\circ}\text{C} < T_{BM} \leq 40^{\circ}\text{C}$	30 min	12 h

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

Installation equipment

Anchor size	Ø8	Ø10	Ø12	Ø14	Ø16
Rotary hammer	TE 2(-A) – TE 30(-A)				
Other tools	Blow out pump ($h_{ef} \leq 10 \cdot d$) 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 ϕ 8 to ϕ 12) or deeper than $20 \cdot \phi$ (for $\phi > 12$ mm).

c) Automatic brushing with round brush for all drill holes deeper than 250 mm (for ϕ 8 to ϕ 12) or deeper than $20 \cdot \phi$ (for $\phi > 12$ mm).

Anchor size			Ø8	Ø10	Ø12	Ø14	Ø16
Nominal diameter of drill bit	d_0	[mm]	10 / 12 ^{d)}	12 / 14 ^{d)}	14 / 16 ^{d)}	18	20
Minimum base material thickness	h_{min}	[mm]	$h_{ef} + 30 \text{ mm} \geq 100 \text{ mm}$			$h_{ef} + 2 \cdot d_0$	
Effective anchorage depth (drill hole depth) $h_{ef} = h_0$	$h_{ef,min}$	[mm]	60	60	70	75	80
	$h_{ef,max}$	[mm]	160	200	240	280	320
Minimum spacing	s_{min}	[mm]	40	50	60	70	80
Minimum edge distance	c_{min}	[mm]	40	50	60	70	80

d) Both given drill bit diameter can be used

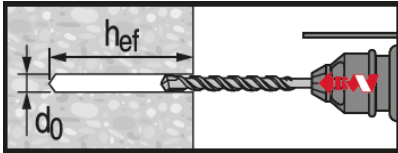
Setting instructions

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

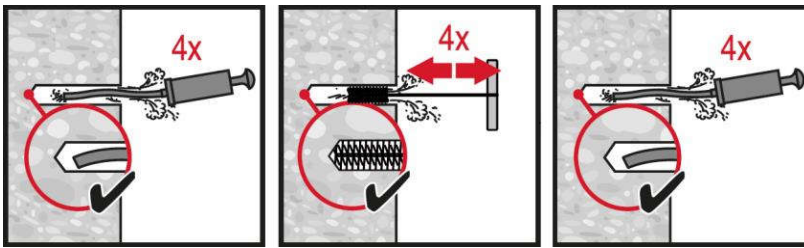


Safety regulations.

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

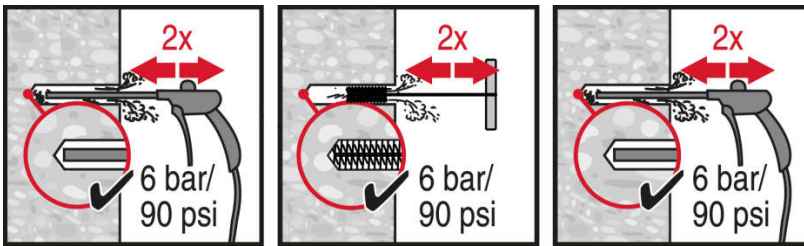


Hammer drilled hole (HD)

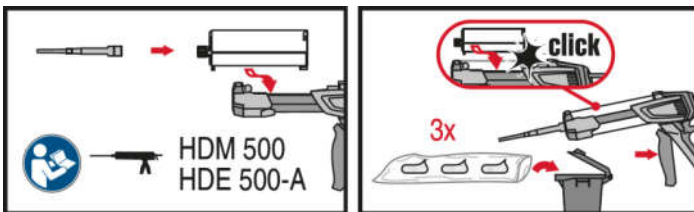


Manual cleaning (MC)

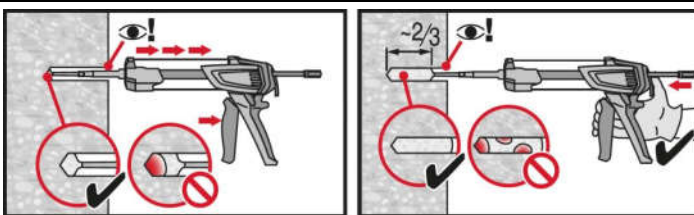
For element sizes $d \leq 16\text{mm}$ and embedment depth $h_{ef} \leq 10d$ only.
Brush bore hole with required steel brush HIT-RB.



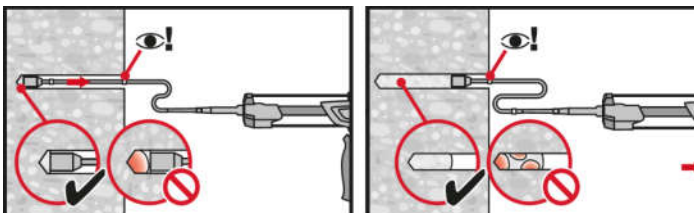
Compressed air cleaning (CAC)



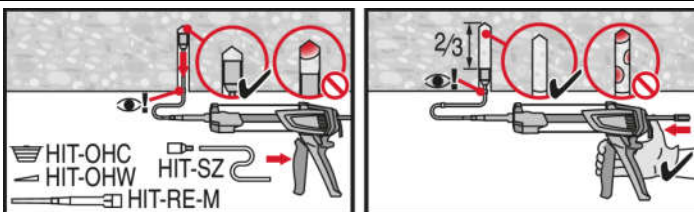
Injection system preparation.



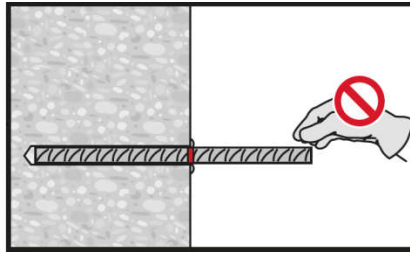
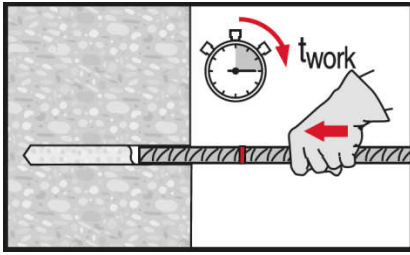
Injection method for drill hole depth $h_{ef} \leq 250\text{ mm}$.



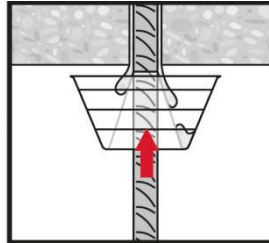
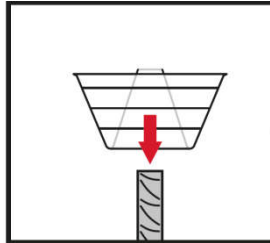
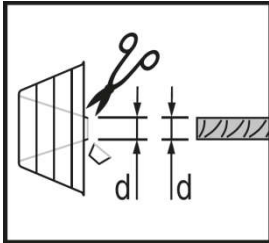
Injection method for drill hole depth $h_{ef} > 250\text{mm}$.



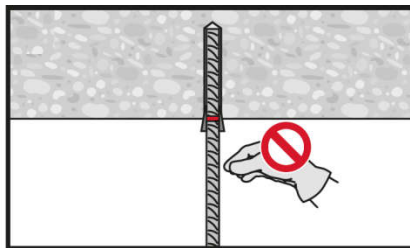
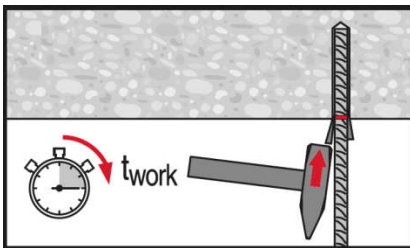
Injection method for overhead application.



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 **Benefits**



Hilti HIT-RE 10
580 ml hard
cartridges

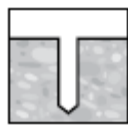
- Suitable for non-cracked concrete C20/25 to C50/60
- Suitable for dry and water saturated concrete
- Suitable for overhead fastenings

Rebar B500 B
($\phi 8 - \phi 16$)

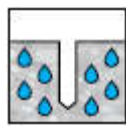
Base material **Load conditions**



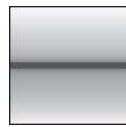
Concrete
(non-cracked)



Dry concrete



Wet concrete

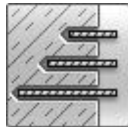


Static/
quasi-static

Installation conditions **Other information**



Hammer
drilling



Variable
embedment
depth



Corrosion
resistance
tested

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
Hilti Technical Data ^{a)}	Hilti	2017-11-28

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

Static and quasi-static loading

Pre-calculated values¹⁾ – anchorage length

Rebar yield strength $f_{yk} = 500 \text{ N/mm}^2$, concrete C25/30, good bond conditions

Rebar-size	Anchorage length	Design value	Mortar volume ²⁾		Overlap length	Design value	Mortar volume ²⁾
	l_{bd} [mm]	N_{Rd} [kN]	V_M [ml]		l_0 [mm]	N_{Rd} [kN]	V_M [ml]
ϕ8	<i>150</i>	<i>10,2</i>	(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	<i>181</i>	<i>15,4</i>	(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	<i>217</i>	<i>22,1</i>	(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	<i>254</i>	<i>30,1</i>	31		315	37,4	39
	350	41,6	43		400	47,5	49
	500	59,4	61		500	59,4	61
ϕ16	<i>290</i>	<i>39,3</i>	40		360	48,9	49
	400	54,3	55		400	54,3	55
	500	67,9	68		500	67,9	68

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: $1,2 \cdot (d_0^2 - d_s^2) \cdot \pi \cdot l_{bd} / 4$.

3) Value of mortar volume corresponds with minimal nominal diameter of drill bit (see table “Installation equipment”).

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.

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

Max 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.

Max long term base material temperature

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

Working time and curing time

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

a) The curing time data are valid for dry anchorage base only. For water saturated anchorage bases the curing times must be doubled.

Setting information

Rebar - size	Ø8	Ø10	Ø12	Ø14	Ø16
Nominal diameter of drill bit d_0 [mm]	10 / 12 ^{a)}	12 / 14 ^{a)}	14 / 16 ^{a)}	18	20
Rotary hammer	TE 2(-A) – TE 30(-A)				
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 $20 \cdot \phi$ (for $\phi > 12$ mm).

c) Automatic brushing with round brush for all drill holes deeper than 250 mm (for ϕ 8 to ϕ 12) or deeper than $20 \cdot \phi$ (for $\phi > 12$ 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	$\phi < 25$	$30 + 0,06 \cdot l_v \geq 2 \cdot \phi$	$30 + 0,02 \cdot l_v \geq 2 \cdot \phi$	

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

Rebar – size [mm]	Dispenser (HDM 500, HDE 500-A)
	$l_{v,max}$ [mm]
$\phi 8 - \phi 16$	500

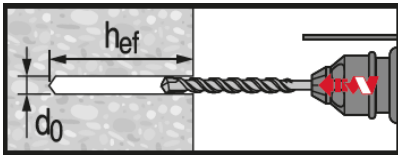
Setting instructions

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

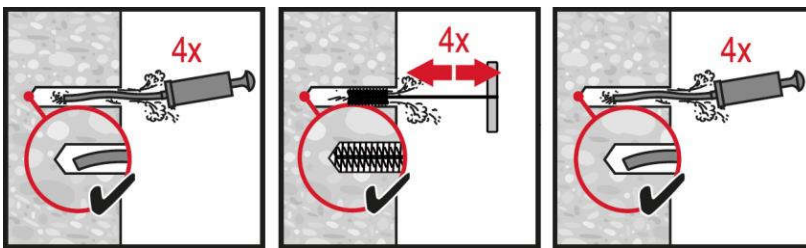


Safety regulations.

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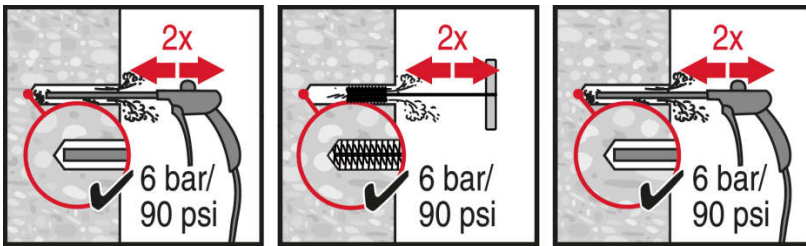


Hammer drilled hole



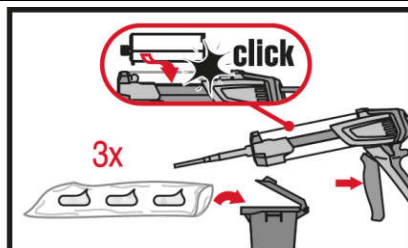
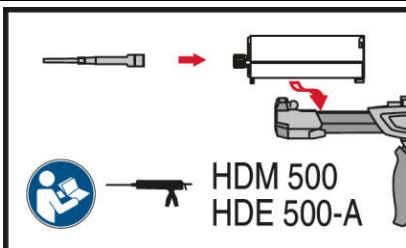
Manual cleaning (MC)

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

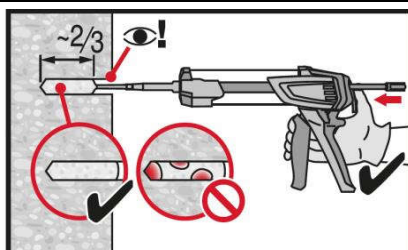
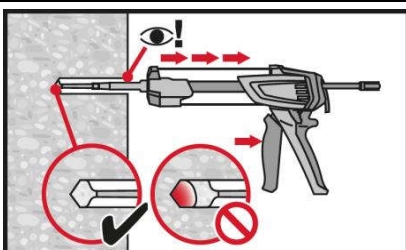


Compressed air cleaning (CAC)

for all drill hole diameters d_0 and drill hole depths $h_0 \leq 20 \cdot d$.

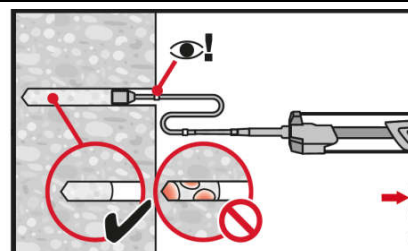
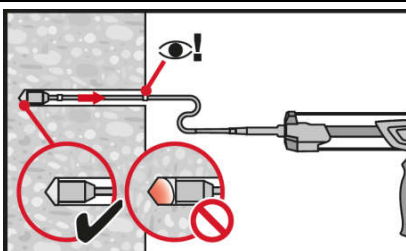


Injection system preparation.



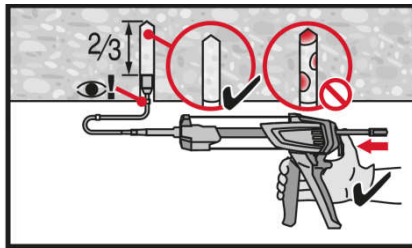
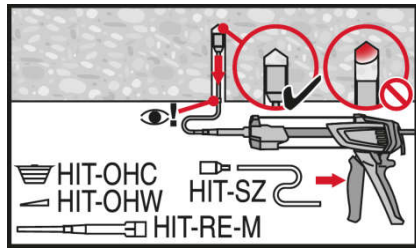
Injection method for drill hole depth

$h_{ef} \leq 250$ mm.

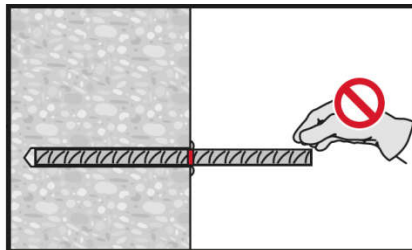
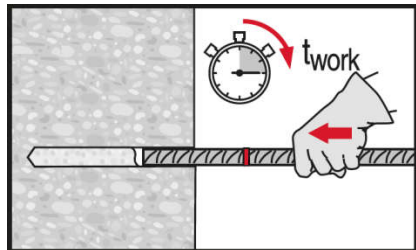


Injection method for drill hole depth

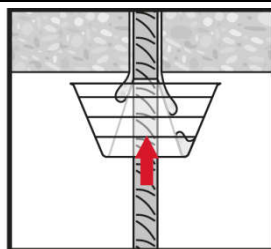
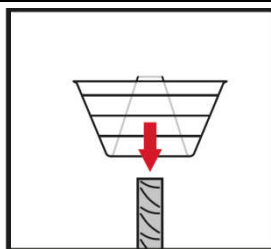
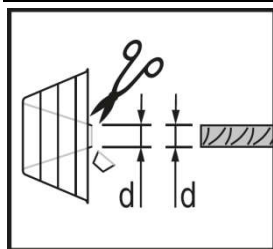
$h_{ef} > 250$ mm.



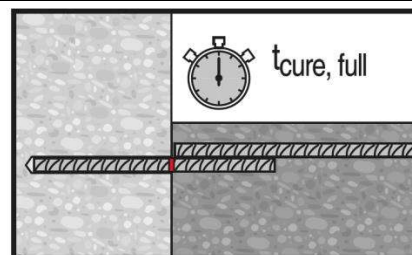
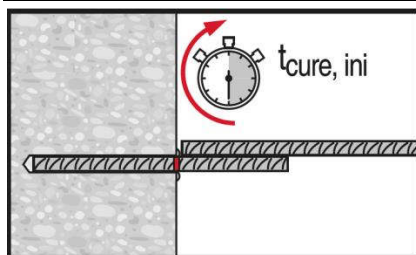
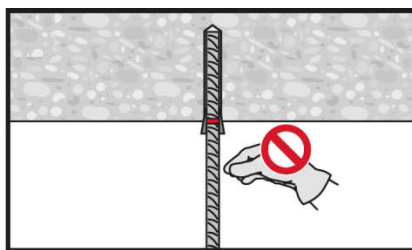
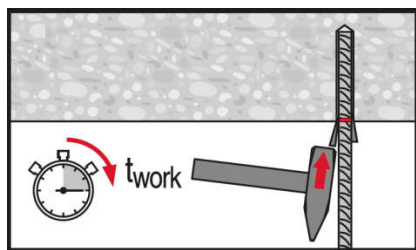
Injection method for overhead application.



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}".

