HIT-1
INJECTION MORTAR

Technical Datasheet

Update: Jan-23

HIT-1 / HIT-1 CE injection mortar

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

Injection mortar system

Hilti HIT-1 / HIT-1 CE

300 ml tube cartridge

Anchor rods:
HAS-U
HAS-U HDG
HAS-U A4
HAS-U HCR
(M8-M16)

Benefits

- Chemical injection fastening
- Two-component hybrid mortar
- Rapid curing
- Suitable for overhead fastenings
- Versatile and convenient handling
- Clean and simple in use
- Small edge distance and anchor spacing
- Always correct mixing ratio
- In-service temperatures:

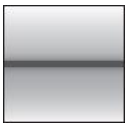
Base material

Concrete (non-cracked)

Dry concrete

Wet concrete

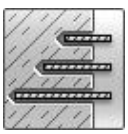
Load conditions



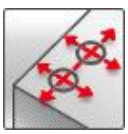
Static/ quasi-static

Installation conditions

Hammer drilling



Variable embedment depth



Small edge distance and spacing

Other information

European Technical Assessment

CE conformity

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
European Technical Assessment a)	TTIC, Prague	ETA-17/0005 / 2017-02-20

a) All data given in this section according to ETA-17/0005, issue 2017-02-20.

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 table
- Embedment depth as specified in the table
- Load values valid for holes drilled with TE rotary hammers in hammering mode
- Diamond coring is not permitted
- Concrete C 20/25, $f_{ck,cube}$ = 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

Anchor size				M8			M10			M12			M16		
Embedment depth [b]	h_{ef}	[mm]		60	80	160	60	100	200	70	120	240	80	160	320
Base material thickness	h	[mm]		100	110	190	100	130	210	100	150	270	116	196	356

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 ; $h_{ef} = h_{ef,max}$ = 20d

Recommended loads

Anchor size				M8			M10			M12			M16		
Non-cracked concrete															
Tension	HAS-U 5.8	N_{rec}	[kN]	4,2	5,6	8,7	5,2	8,7	13,8	7,3	12,6	20,1	9,6	19,1	37,4
Shear	HAS-U 5.8	V_{rec}	[kN]		5,2			8,3			12,0			22,4	

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-M16 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-M16 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-1 / HIT-1 CE 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.

Working time and curing time [a]:

Temperature of the base material	Maximum working time	Minimum curing time
T_{BM}	t_{work}	t_{cure}
-5˚C ≤ T_{BM} < 0˚C	1,5 h	6 h
0˚C ≤ T_{BM} < 5˚C	45 min	3 h
5˚C ≤ T_{BM} < 10˚C	25 min	2 h
10˚C ≤ T_{BM} < 15˚C	20 min	100 min
15˚C ≤ T_{BM} < 20˚C	15 min	80 min
20˚C ≤ T_{BM} < 30˚C	6 min	45 min
30˚C ≤ T_{BM} < 34˚C	4 min	25 min
35˚C ≤ T_{BM} < 40˚C	2 min	20 min

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

Installation equipment

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

a) 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)
b) 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

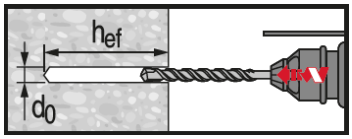
Setting instructions

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

Safety regulations.

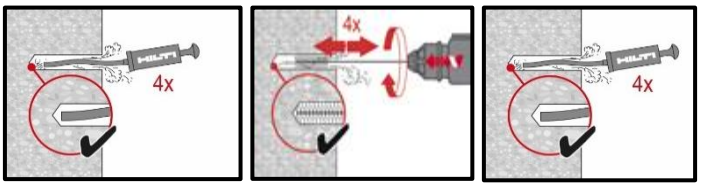
Review the Material Safety Data Sheet (MSDS) before use for proper and safe handling! Wear well-fitting protective goggles and protective gloves when working with Hilti HIT-1 / HIT-1 CE.

Drilling



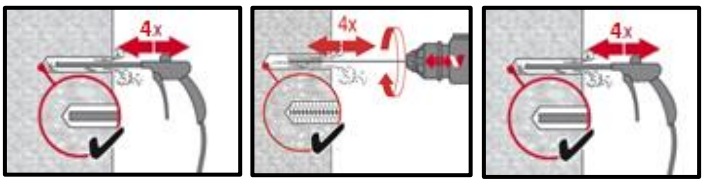
Hammer drilled hole (HD)
For dry and wet concrete only

Cleaning



Manual cleaning with machine brushing (MCMC)

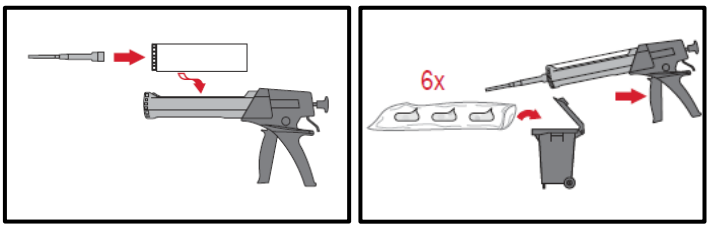
For drill diameters $d_0 \leq 20$ mm and drill hole depth $h_0 \leq 10 \cdot d$.



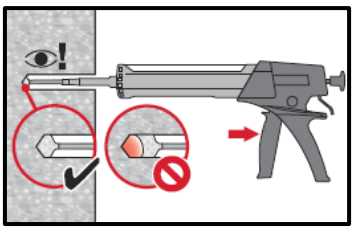
Compressed air cleaning with machine brushing (CACMB)

For drill diameters d_0 and all drill hole depth h_0.

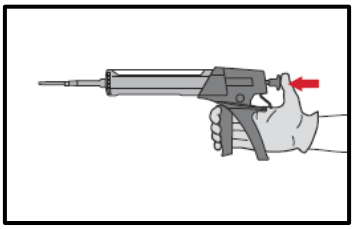
Injection system



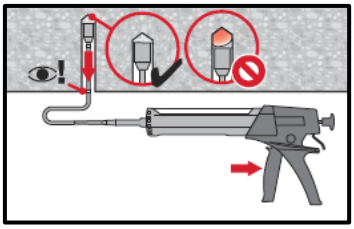
Injection system preparation



Injection method for drill hole depth (approx.2/3 full)

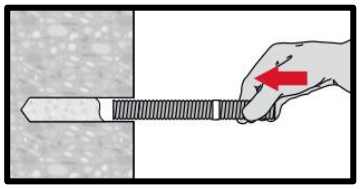


Depressurization of the dispenser.

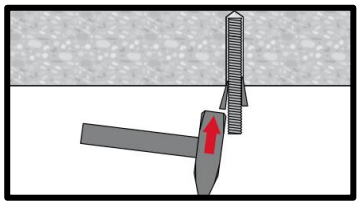


Injection method for overhead application and/or installation with embedment depth $h_{ef} > 250$ mm.

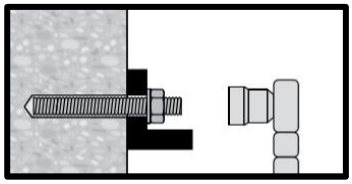
Setting the element



Setting the 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} the anchor can be loaded.

HIT-1 / HIT-1 CE injection mortar

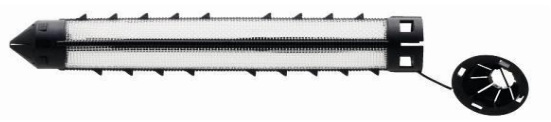
Anchor design (ETAG 029) / Rods and Sleeves / Masonry

Injection mortar system

Hilti HIT-1 / HIT-1 CE

300 ml tube cartridge

Anchor rods:
HAS-U
HAS-U HDG
HAS-U A4
HAS-U HCR
(M8-M12)

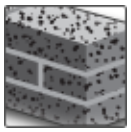


Sieve sleeve:
HIT-SC
(16)

Benefits

- Hollow and solid masonry: clay bricks
- Two-component hybrid mortar
- Rapid curing
- Suitable for overhead fastenings
- Versatile and convenient handling
- Flexible setting depth and fastening thickness
- Small edge distance and anchor spacing
- Mortar filling control with HIT-SC sleeves

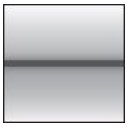
Base material



Solid bricks

Hollow bricks

Load conditions



Static/
quasi-static

Installation conditions

Hammer/rotary drilling

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

- Load values valid for holes drilled with TE rotary hammers in hammer mode for solid bricks
- Load values valid for holes drilled with TE rotary hammers in rotary mode for hollow bricks
- Correct anchor setting (see instruction for use, setting details)
- Steel quality of fastening elements: see data below
- Threaded rods of appropriate size (diameter and length) and a minimum steel quality of 5.6 can be used
- Base material temperature during installation and curing must be between 0°C through +40°C
- In-service temperature ranges:
  Ta = -40°C to +40°C (max. long term temperature +24 °C and max.short term temperature +40 °C)
  Tb = -40°C to +80°C (max. long term temperature +50 °C and max.short term temperature +80 °C)

Recommended loads for solid and hollow bricks

Load type	Anchor size		h_{ef} [mm]	f_b [N/mm²]	Ta	Tb
					Loads [kN]	
	Solid clay brick					
N_{Rec}	HAS-U	M8	80	28	0,7	0,4
		M10	90		0,7	0,4
		M12	100		0,7	0,4
	HAS-U + HIT-SC M16x85	M8	80	28	0,9	0,6
		M10			0,9	0,6
		M12			0,9	0,6
V_{Rec}	HAS-U	M8	80	28	1,3	
		M10	90		1,7	
		M12	100		2,5	
	HAS-U + HIT-SC M16x85	M8	80	28	1,3	
		M10			1,6	
		M12			1,7	
	Hollow brick – Hlz 12					
N_{Rec}	HAS-U + HIT-SC M16x85	M8	80	12	0,35	0,20
		M10			0,35	0,20
		M12			0,45	0,25
V_{Rec}	HAS-U + HIT-SC M16x85	M8, M10, M12	80	12	1,4	
	Hollow brick – Doppio Uni					
N_{Rec}	HAS-U + HIT-SC M16x85	M8	80	28	0,25	0,15
		M10			0,25	0,20
		M12			0,35	0,20
V_{Rec}	HAS-U + HIT-SC M16x85	M8, M10, M12	80	28	0,85	

Due to the wide variety of bricks, site tests have to be performed for determination of load values for all applications outside of the above mentioned base materials and/or setting conditions.

Materials

Material quality

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-M12 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-M12 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
Sieve sleeve	
HIT-SC sleeve	Frame: FPP 20T, Sieve: PA6,6 N500/200

Setting information

Installation temperature range:
0°C to +40°C

Service temperature range
Hilti HIT-1 / HIT-1 CE 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

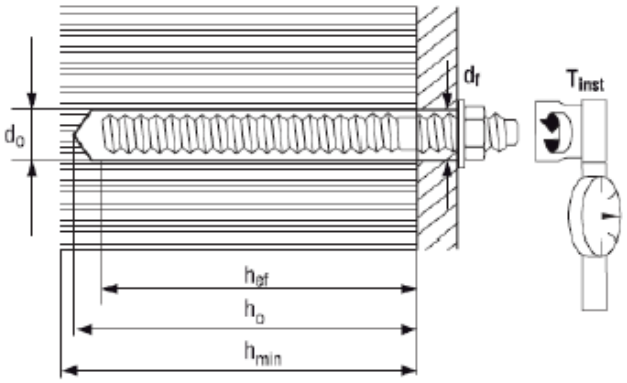
Maximum short term base material temperature
Short term elevated base material temperatures are those that occur over brief intervals, e.g. as a result of diurnal cycling.
Maximum long term base material temperature
Long term elevated base material temperatures are roughly constant over significant periods of time.

Working time and curing time:

Temperature of the base material	Maximum working time	Minimum curing time
T_{BM}	t_{work}	t_{cure}
0˚C ≤ T_{BM} < 5˚C	45 min	3 h
5˚C ≤ T_{BM} < 10˚C	25 min	2 h
10˚C ≤ T_{BM} < 20˚C	15 min	100 min
20˚C ≤ T_{BM} < 30˚C	6 min	45 min
30˚C ≤ T_{BM} < 40˚C	2 min	25 min

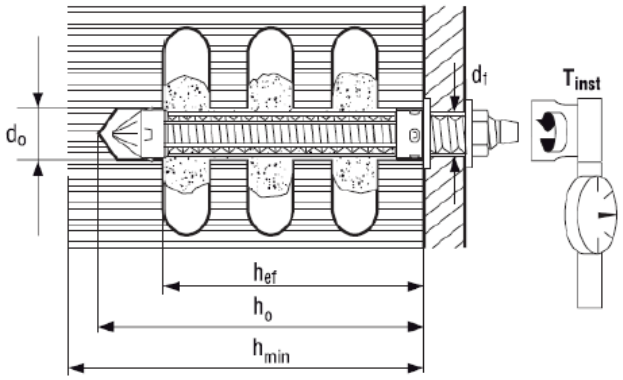
Setting details for solid bricks

Anchor size			M8		M10		M12	
Sieve sleeve	HIT-SC		-	16x85	-	16x85	-	16x85
Nominal diameter of drill bit	d_0	[mm]	10	16	12	16	14	18
Maximum diameter of clearance hole in the fixture	d_f	[mm]	9	9	12	12	14	14
Effective anchorage depth	h_{ef}	[mm]	80	80	90	80	100	80
Hole depth	h_0	[mm]	80	95	90	95	100	95
Minimum base material thickness	h_{min}	[mm]	115	115	115	115	115	115
Maximum torque moment	T_{max}	[Nm]	6	6	10	8	10	8



Setting details for hollow bricks

Anchor Size			M8		M10		M12	
			HLZ2	Doppio Uni	HLZ2	Doppio Uni	HLZ2	Doppio Uni
Sieve sleeve	HIT-SC		16x85		16x85		16x85	
Nominal diameter of drill bit	d_0	[mm]	16		16		18	
Maximum diameter of clearance hole in the fixture	d_f	[mm]	9		12		14	
Effective anchorage depth	h_{ef}	[mm]	80		80		80	
Hole depth	h_0	[mm]	95		95		95	
Minimum base material thickness	h_{min}	[mm]	115		115		115	
Maximum torque moment	T_{max}	[Nm]	4		4		4	



Installation equipment

Anchor – size	M8	M10	M12
Rotary hammer	TE2(-A) – TE30(-A)		
Other tools	Blow out pump Set of cleaning brushes, dispenser		

Cleaning and setting parameters for solid and hollow bricks

HAS-U	Sieve sleeve HIT-SC	Drilling	Cleaning
		Hammer drilling	Brush HIT-RB
		d_0 [mm]	size [mm]
			
M8 [a]	-	10	10
M10 [a]	-	12	12
M12 [a]	-	14	14
M8	HIT-SC 16x85	16	16
M10	HIT-SC 16x85	16	16
M12	HIT-SC 18x85	18	18

a) Installation without the sieve sleeve HIT-SC can be used only in case of solid bricks.

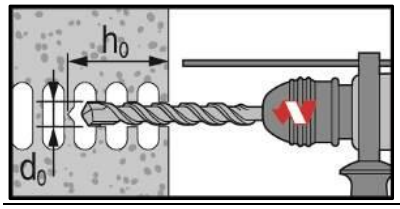
Setting instructions

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

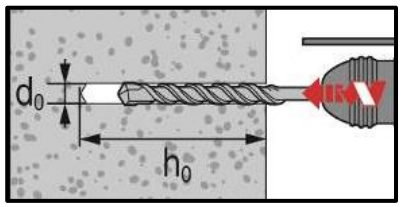
Safety regulations.

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-1 / HIT-1 CE.

Drilling

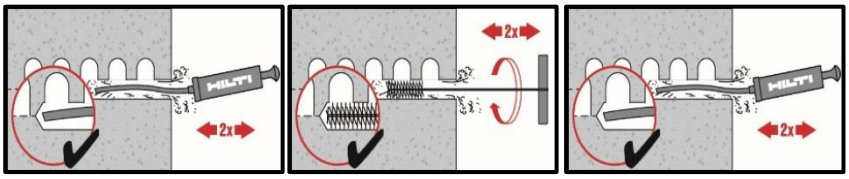


In hollow bricks: rotary mode



In solid bricks: hammer mode

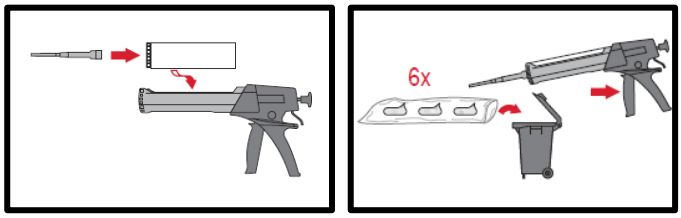
Cleaning



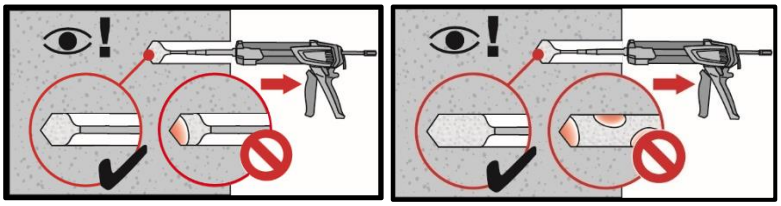
Manual cleaning (MC)

Instructions for solid bricks without sieve sleeve

Injection system

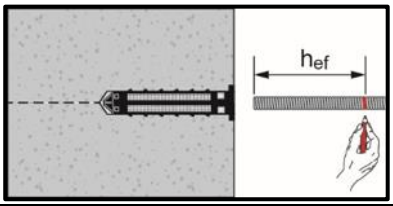


Injection system preparation.

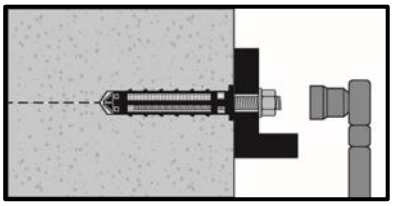


Injection method for drill hole

Setting the element



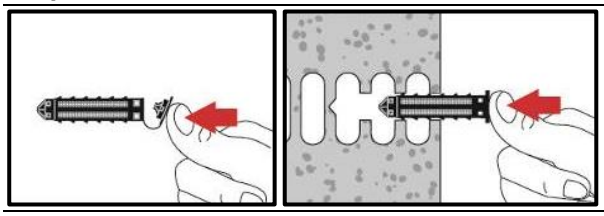
Presetting element, observe working time "t_{work}",



Loading the anchor: After required curing time t_{cure} the anchor can be loaded.

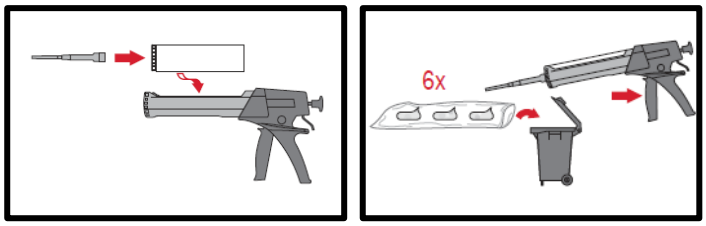
Instructions for hollow and solid bricks with sieve sleeve

Preparation of the sieve sleeve



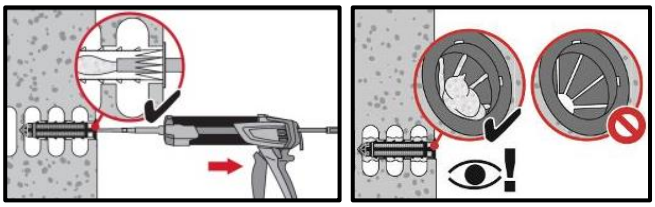
Close lid and insert sieve sleeve manually

Injection system



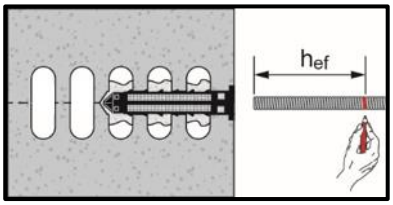
Injection system preparation.

Injection system: hollow bricks

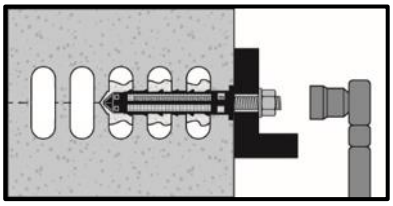


Installation with sieve sleeve HIT-SC

Setting the element



Presetting element, observe working time “t_{work}”,



Loading the anchor: After required curing time t_{cure} the anchor can be loaded.