HIT-RE 100-HC INJECTION MORTAR

Technical Datasheet

Update: Jan-23

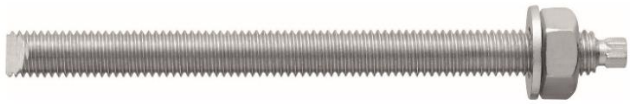
HIT-RE 100-HC injection mortar

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

Injection mortar system

Hilti HIT-RE 100-HC

580 ml hard cartridge



Anchor rods:
HAS-U
HAS-U HDG
HAS-U A4
HAS-U HCR
(M8-M30)

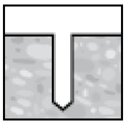
Benefits

- Suitable for cracked and uncracked concrete C 20/25 to C 50/60
- High loading capacity
- Suitable for dry and water saturated concrete
- Large diameter applications
- Long working time at elevated temperatures
- Odourless epoxy

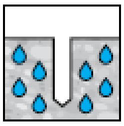
Base material

Concrete (uncracked)

Concrete (cracked)

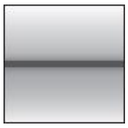


Dry concrete



Wet concrete

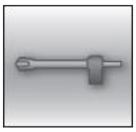
Load conditions



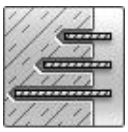
Static/ quasi-static

Installation conditions

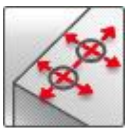
Hammer drilling



Hollow drill-bit drilling



Variable embedment depth



Small edge distance and spacing

Other informations

European Technical Assessment

CE conformity

A4 316

Corrosion resistance

HCR highMo

High corrosion resistance

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
European technical assessment a)	DIBt, Berlin	ETA-19/0148 / 2019-12-13

a) All data given in this section according to ETA-19/0148, issue 2019-12-13.

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
– Anchor HAS-U with strength 5.8
– Base material thickness, as specified in the table
– One typical embedment depth, as specified in the table
– Concrete C 20/25, $f_{ck,cube}$ = 25 N/mm²
– Temperate range I
(min. base material temperature -40°C, max. long term/short term base material temperature: +24°C/40°C)

Embedment depth and base material thickness

Anchor size		ETA-19/0148, issue 2019-12-13								Hilti technical data		
		M8	M10	M12	M16	M20	M24	M27	M30	M33	M36	M39
HAS-U												
Eff. anchorage depth	[mm]	80	90	110	125	170	210	240	270	300	330	360
Base material thickness	[mm]	110	120	140	160	220	270	300	340	380	410	450

Characteristic resistance

Anchor size			ETA-19/0148, issue 2019-12-13								Hilti technical data		
			M8	M10	M12	M16	M20	M24	M27	M30	M33	M36	M39
Non-cracked concrete													
Tension N_{Rk}	HAS-U 5.8	[kN]	18,0	29,0	42,0	68.7	109	150	183	218	256	295	336
	HAS-U 8.8		29,0	42,0	56,8	68,7	109	150	183	218	256	295	336
	HAS-U A4		26,0	41,0	56,8	68,7	109	150	183	218	256	295	336
	HAS-U HCR		29,0	42,0	56,8	68,7	109	150	183	218	256	295	336
Shear V_{Rk}	HAS-U 5.8	[kN]	9,0	15,0	21,0	39,0	61,0	88,0	115	140	174	204	244
	HAS-U 8.8		15,0	23,0	34,0	63,0	98,0	141	184	224	278	327	390
	HAS-U A4		13,0	20,0	30,0	55,0	86,0	124	115	140	174	204	244
	HAS-U HCR		15,0	23,0	34,0	63,0	98,0	124	161	196	174	204	244
Cracked concrete													
Tension N_{Rk}	HAS-U 5.8	[kN]	-	19,8	29,0	40,8	64,1	95,0	112	140	156	187	221
	HAS-U 8.8		-	19,8	29,0	40,8	64,1	95,0	112	140	156	187	221
	HAS-U A4		-	19,8	29,0	40,8	64,1	95,0	112	140	156	187	221
	HAS-U HCR		-	19,8	29,0	40,8	64,1	95,0	112	140	156	187	221
Shear V_{Rk}	HAS-U 5.8	[kN]	-	15,0	21,0	39,0	61,0	88,0	115	140	174	204	244
	HAS-U 8.8		-	23,0	34,0	63,0	98,0	141	184	224	278	327	390
	HAS-U A4		-	20,0	30,0	55,0	86,0	124	115	140	174	204	244
	HAS-U HCR		-	23,0	34,0	63,0	98,0	124	161	196	174	204	244

Design resistance

Anchor size			ETA-19/0148, issue 2019-12-13								Hilti technical data		
			M8	M10	M12	M16	M20	M24	M27	M30	M33	M36	M39
Non-cracked concrete													
Tension N_{Rd}	HAS-U 5.8	[kN]	12,0	19,3	27,0	32,7	51,9	71,3	87,1	104	122	140	160
	HAS-U 8.8		14,4	20,0	27,0	32,7	51,9	71,3	87,1	104	122	140	160
	HAS-U A4		13,9	20,0	27,0	32,7	51,9	71,3	80,4	98,3	121	140	160
	HAS-U HCR		14,4	20,0	27,0	32,7	51,9	71,3	87,1	104	122	140	160
Shear V_{Rd}	HAS-U 5.8	[kN]	7,2	12,0	16,8	31,2	48,8	70,4	92,0	112	139	163	195
	HAS-U 8.8		12,0	18,4	27,2	50,4	78,4	113	147	179	222	262	312
	HAS-U A4		8,3	12,8	19,2	35,3	55,1	79,5	48,3	58,8	73,1	85,7	103
	HAS-U HCR		12,0	18,4	27,2	50,4	78,4	70,9	92,0	157	87,0	102	122
Cracked concrete													
Tension N_{Rd}	HAS-U 5.8	[kN]	-	9,4	13,8	19,4	30,5	45,2	53,3	66,6	74,1	88,9	105
	HAS-U 8.8		-	9,4	13,8	19,4	30,5	45,2	53,3	66,6	74,1	88,9	105
	HAS-U A4		-	9,4	13,8	19,4	30,5	45,2	53,3	66,6	74,1	88,9	105
	HAS-U HCR		-	9,4	13,8	19,4	30,5	45,2	53,3	66,6	74,1	88,9	105
Shear V_{Rd}	HAS-U 5.8	[kN]	-	12,0	16,8	31,2	48,8	70,4	92,0	112	139	163	195
	HAS-U 8.8		-	18,4	27,2	50,4	78,4	113	147	179	207	249	294
	HAS-U A4		-	12,8	19,2	35,3	55,1	79,5	48,3	58,8	73,1	85,7	103
	HAS-U HCR		-	18,4	27,2	50,4	78,4	70,9	92,0	112	87,0	102	122

Recommended loads[a)]

Anchor size			ETA-19/0148, issue 2019-12-13								Hilti technical data		
			M8	M10	M12	M16	M20	M24	M27	M30	M33	M36	M39
Non-cracked concrete													
Tension N_{rec}	HAS-U 5.8	[kN]	8,6	13,8	19,3	23,4	37,1	50,9	62,2	74,2	86,9	100	114
	HAS-U 8.8		10,3	14,3	19,3	23,4	37,1	50,9	62,2	74,2	86,9	100	114
	HAS-U A4		9,9	14,3	19,3	23,4	37,1	50,9	57,4	70,2	86,7	100	114
	HAS-U HCR		10,3	14,3	19,3	23,4	37,1	50,9	62,2	74,2	86,9	100	114
Shear V_{rec}	HAS-U 5.8	[kN]	5,1	8,6	12,0	22,3	34,9	50,3	65,7	80,0	99,4	117	139
	HAS-U 8.8		8,6	13,1	19,4	36,0	56,0	80,6	105	128	159	187	223
	HAS-U A4		6,0	9,2	13,7	25,2	39,4	56,8	34,5	42,0	52,2	61,2	73,2
	HAS-U HCR		8,6	13,1	19,4	36,0	56,0	50,6	65,7	112	62,1	72,9	87,1
Cracked concrete													
Tension N_{rec}	HAS-U 5.8	[kN]	-	6,7	9,9	13,9	21,8	32,3	38,1	47,6	52,9	63,5	75,0
	HAS-U 8.8		-	6,7	9,9	13,9	21,8	32,3	38,1	47,6	52,9	63,5	75,0
	HAS-U A4		-	6,7	9,9	13,9	21,8	32,3	38,1	47,6	52,9	63,5	75,0
	HAS-U HCR		-	6,7	9,9	13,9	21,8	32,3	38,1	47,6	52,9	63,5	75,0
Shear V_{rec}	HAS-U 5.8	[kN]	-	8,6	12,0	22,3	34,9	50,3	65,7	80,0	99,4	117	139
	HAS-U 8.8		-	13,1	19,4	36,0	56,0	80,6	105	128	148	178	210
	HAS-U A4		-	9,2	13,7	25,2	39,4	56,8	34,5	42,0	52,2	61,2	73,2
	HAS-U HCR		-	13,1	19,4	36,0	56,0	50,6	65,7	80,0	62,1	72,9	87,1

a) 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	M27	M30
Nominal tensile strength f_{uk}	HAS-U 5.8	[N/mm²]	500	500	500	500	500	500	-	-
	HAS-U 8.8	[N/mm²]	800	800	800	800	800	800	800	800
	HAS-U A4	[N/mm²]	700	700	700	700	700	700	500	500
	HAS-U HCR	[N/mm²]	800	800	800	800	800	700	-	-
Yield strength f_{yk}	HAS-U 5.8	[N/mm²]	440	440	440	440	400	400	-	-
	HAS-U 8.8	[N/mm²]	640	640	640	640	640	640	640	640
	HAS-U A4	[N/mm²]	450	450	450	450	450	450	210	210
	HAS-U HCR	[N/mm²]	640	640	640	640	640	400	-	-
Stressed cross-section A_s	HAS-U	[mm²]	36,6	58,0	84,3	157	245	353	459	561
Moment of resistance W	HAS-U	[mm³]	31,2	62,3	109	277	541	935	1387	1874

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; (F) 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; (F) 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 corrosion resistance class III acc. to EN 1993-1-4:2006+A1:2015	
Threaded rod, HAS-U A4	Strength class 70 for ≤ M24 and strength class 50 for > M24; Elongation at fracture A5 > 8% ductile
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 corrosion resistance class V acc. to EN 1993-1-4:2006+A1:2015	
Threaded rod, HAS-U HCR	Strength class 80 for ≤ M20 and class 70 for > M20, Elongation at fracture A5 > 8% ductile
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 100-HC 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 + 40 °C	+ 24 °C	+ 40 °C
Temperature range II	-40 °C to + 58 °C	+ 35 °C	+ 58 °C
Temperature range III	-40 °C to + 70 °C	+ 43 °C	+ 70 °C

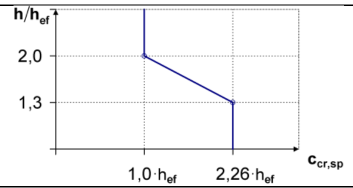
Max. short term base material temperature
Short term elevated base material temperatures are those that occur over brief intervals, e.g. as a result of diurnal cycling.
Max. long term base material temperature
Long term elevated base material temperatures are roughly constant over significant periods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

Working time and curing time

Temperature of the base material	Max. working time in which rebar can be inserted and adjusted t_{work}	Min. curing time before rebar can be fully loaded t_{cure}
5 °C ≤ T_{BM} < 10 °C	2,5 h	72 h
10 °C ≤ T_{BM} < 15 °C	2 h	48 h
15 °C ≤ T_{BM} < 20 °C	1 h	24 h
20 °C ≤ T_{BM} < 30 °C	40 min	18 h
30 °C ≤ T_{BM} ≤ 40 °C	20 min	6 h

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

Setting details for HAS-U

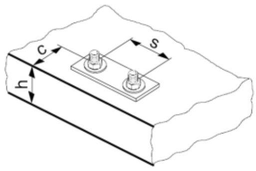
Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Nominal diameter of drill bit	d_0	[mm]	10	12	14	18	22	28	30	35
Diameter of element	d	[mm]	8	10	12	16	20	24	27	30
Effective anchorage and drill hole depth	h_{ef}	[mm]	60 to 160	60 to 200	70 to 240	80 to 320	90 to 400	96 to 480	108 to 540	120 to 600
Minimum base material thickness	h_{min}	[mm]	h_{ef} + 30 ≥ 100 mm			h_{ef} + 2 d_0				
Diameter of clearance hole in the fixture	d_f	[mm]	9	12	14	18	22	26	30	33
Minimum spacing	s_{min}	[mm]	40	50	60	75	90	115	120	140
Minimum edge distance	c_{min}	[mm]	40	45	45	50	55	60	75	80
Critical spacing for splitting failure	$s_{cr,sp}$	[mm]	2 $c_{cr,sp}$							
Critical edge distance for splitting failure a)	$c_{cr,sp}$	[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							
Critical spacing for concrete cone failure	$s_{cr,N}$	[mm]	2 $c_{cr,N}$							
Critical edge distance for concrete cone failure b)	$c_{cr,N}$	[mm]	1,5 h_{ef}							
Torque moment c)	T_{max}	[Nm]	10	20	40	80	150	200	270	300

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

a) $h_{ef,min} \le h_{ef} \le h_{ef,max}$ (h_{ef}: embedment depth) h: base material thickness ($h \ge h_{min}$)

b) The critical edge distance for concrete cone failure depends on the embedment depth h_{ef} and the design bond resistance. The simplified formula given in this table is on the save side.

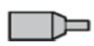
c) This is the maximun recommended torque moment to avoid splitting failure during installation for anchors with minimun spacing and/or edge distance.



Installation equipment

Anchor size	M8	M10	M12	M16	M20	M24	M27	M30
Rotary hammer	TE 2– TE 16				TE 40 – TE 80			
Other tools	Compressed air gun or blow out pump Set of cleaning brushes, dispenser, piston plug							

Drilling and cleaning parameters

HAS-U	Drill bit diameters d_0 [mm]		Installation size [mm]	
	Hammer drill (HD)	Hollow Drill Bit (HDB)	Brush HIT-RB	Piston plug HIT-SZ
				
M8	10	-	10	**-**
M10	12	12	12	**12**
M12	14	14	14	**14**
M16	18	18	18	**18**
M20	22	22	22	**22**
M24	28	28	28	**28**
M27	30	-	30	**30**
M30	35	35	35	**35**

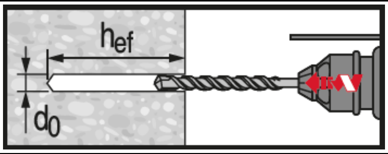
Setting instructions

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

Safety regulations.

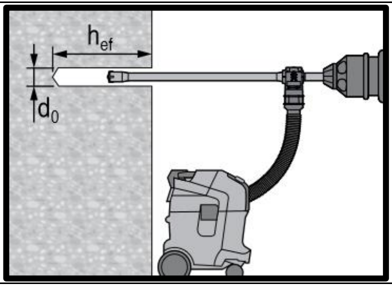
Review the Material Safety Data Sheet (MSDS) before use for proper and safe handling! Wear well-fitting protective goggles and protective gloves when working with Hilti HIT-RE 100-HC.

Drilling



Hammer drilled hole

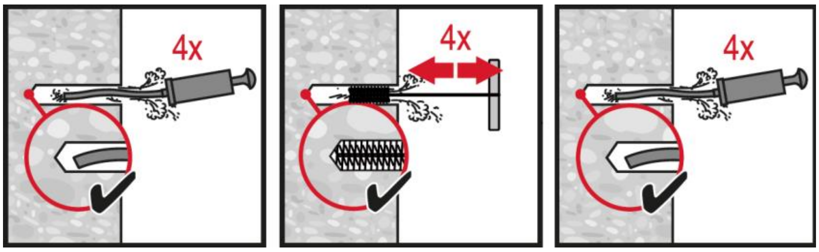
For dry and wet concrete.



Hammer drilled hole with Hollow Drilled Bit (HDB)

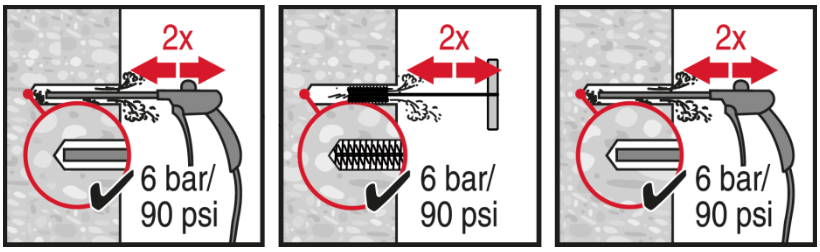
No cleaning required.

Cleaning

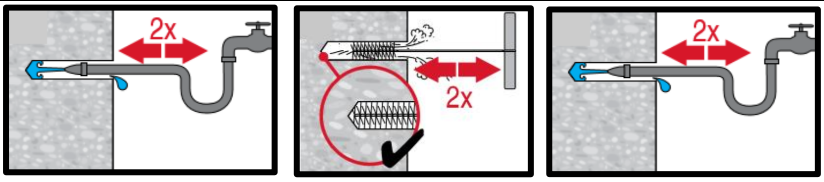


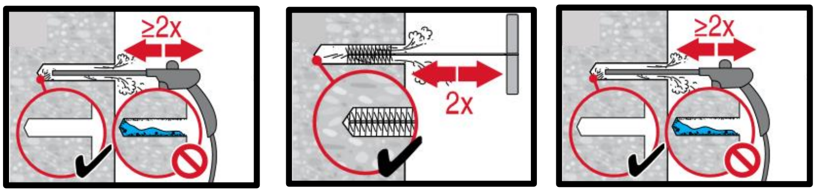
Manual cleaning (MC)
Non-cracked concrete only

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 $h_0 \leq 20 \cdot d$.

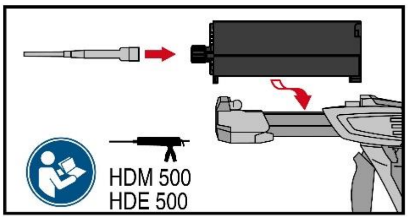


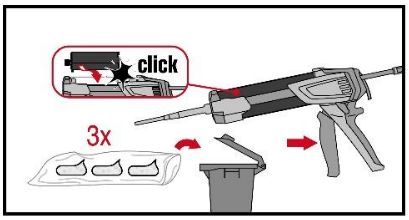


Compressed air cleaning (CAC)
cleaning of water-filled holes

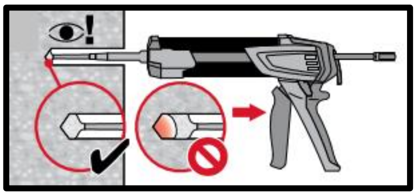
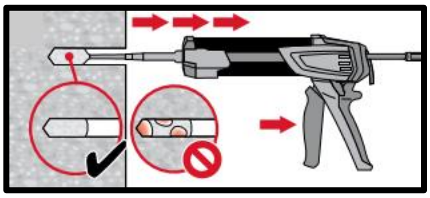
for all drill hole diameters d_0 and drill hole depths h_0 .

Injection system

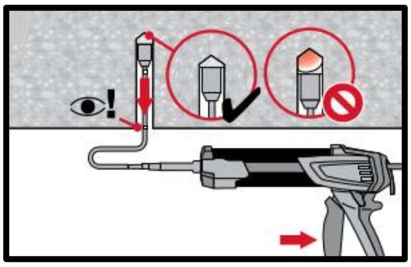
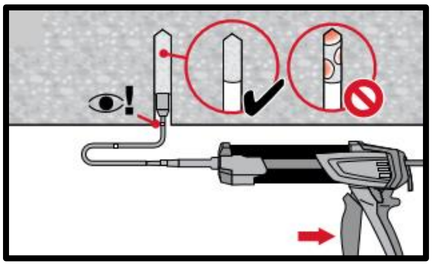




Injection system preparation.

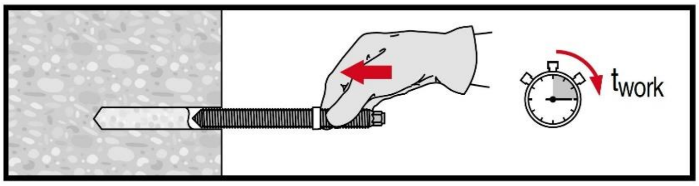



Injection method for drill hole depth h_{ef} ≤ 250 mm.

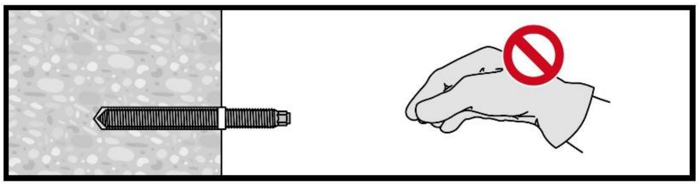



Injection method for overhead application and/or installation with embedment depth h_{ef} > 250 mm.

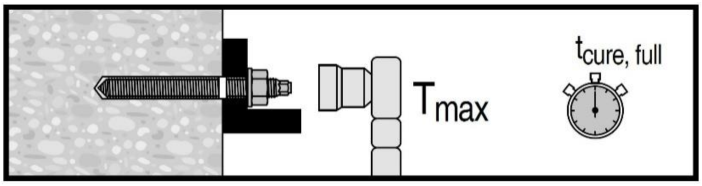
Setting the element



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} the anchor can be loaded.

HIT-RE 100-HC injection mortar

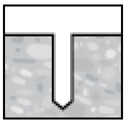
Anchor design (EN 1992-4) / Rebar elements / Concrete

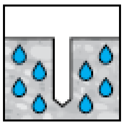
Injection mortar system		Benefits
	Hilti HIT-RE 100-HC 580 ml hard cartridge	- Suitable for cracked and uncracked concrete C 20/25 to C 50/60 - High loading capacity - Suitable for dry and water saturated concrete - Large diameter applications - Long working time at elevated temperatures - Odourless epoxy
	Rebar B500B (ϕ8-ϕ32)	

Base material

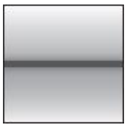

Concrete (uncracked)


Concrete (cracked)

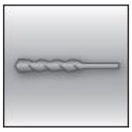

Dry concrete

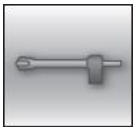

Wet concrete

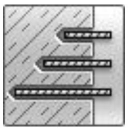
Load conditions

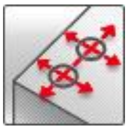

Static/ quasi-static

Installation conditions


Hammer drilling


Hollow drill-bit drilling


Variable embedment depth


Small edge distance and spacing

Other informations


European Technical Assessment


CE conformity

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
European technical assessment [a)]	DIBt, Berlin	ETA-19/0148 / 2019-12-13

a) All data given in this section according to ETA-19/0148, issue 2019-12-13.

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
-One typical embedment depth, as specified in the table
-One anchor material, as specified in the tables
-Concrete C 20/25, $f_{ck,cube}$ = 25 N/mm²
-Temperate range I
(min. base material temperature -40°C, max. long term/short term base material temperature: +24°C/40°C)

Embedment depth and base material thickness for static and quasi-static loading data

Anchor- size		ETA-19/0148, issue 2019-12-13											Hilti technical data	
		ϕ8	ϕ10	ϕ12	ϕ14	ϕ16	ϕ20	ϕ25	ϕ26	ϕ28	ϕ30	ϕ32	ϕ36	ϕ40
Typical embedment	[mm]	80	90	110	125	125	170	210	240	270	270	300	330	360
Base material thickness	[mm]	110	120	140	160	170	220	280	310	340	350	380	420	470

Characteristic resistance

Anchor- size B500 B		ETA-19/0148, issue 2019-12-13											Hilti technical data	
		ϕ8	ϕ10	ϕ12	ϕ14	ϕ16	ϕ20	ϕ25	ϕ26	ϕ28	ϕ30	ϕ32	ϕ36	ϕ40
Non-cracked concrete														
Tensile N_{Rk}	[kN]	24,1	33,9	49,8	60,5	68,7	109	150	183	218	218	256	295	336
Shear V_{Rk}	[kN]	14,0	22,0	31,0	42,0	55,0	86,0	135	146	169	194	221	280	346
Cracked concrete														
Tensile N_{Rk}	[kN]	-	12,7	18,7	22,0	25,1	37,4	57,7	58,8	71,3	76,3	90,5	112	136
Shear V_{Rk}	[kN]	-	22,0	31,0	42,0	50,3	74,8	116	118	143	153	181	224	271

Design resistance

Anchor- size B500 B		ETA-19/0148, issue 2019-12-13											Hilti technical data	
		ϕ8	ϕ10	ϕ12	ϕ14	ϕ16	ϕ20	ϕ25	ϕ26	ϕ28	ϕ30	ϕ32	ϕ36	ϕ40
Non-cracked concrete														
Tensile N_{Rd}	[kN]	11,5	16,2	23,7	28,8	32,7	51,9	71,3	87,1	104	104	122	140	160
Shear V_{Rd}	[kN]	9,3	14,7	20,7	28,0	36,7	57,3	90,0	97,3	113	129	147	187	231
Cracked concrete														
Tensile N_{Rd}	[kN]	-	6,1	8,9	10,5	12,0	17,8	27,5	28,0	33,9	36,4	43,1	53,3	64,6
Shear V_{Rd}	[kN]	-	14,7	20,7	28,0	33,5	49,8	77,0	78,4	95,0	102	121	149	181

Recommended loads [a)]

Anchor- size B500 B		ETA-19/0148, issue 2019-12-13											Hilti technical data	
		φ8	φ10	φ12	φ14	φ16	φ20	φ25	φ26	φ28	φ30	φ32	φ36	φ40
Non-cracked concrete														
Tensile N_{rec}	[kN]	8,2	11,5	16,9	20,6	23,4	37,1	50,9	62,2	74,2	74,2	86,9	100	114
Shear V_{rec}	[kN]	6,7	10,5	14,8	20,0	26,2	41,0	64,3	69,5	80,5	92,4	105	133	165
Cracked concrete														
Tensile N_{rec}	[kN]	-	4,3	6,3	7,5	8,5	12,7	19,6	20,0	24,2	26,0	30,8	38,1	46,2
Shear V_{rec}	[kN]	-	10,5	14,8	20,0	23,9	35,6	55,0	56,0	67,9	72,7	86,2	107	129

a) With overall partial safety factor for action γ=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		φ8	φ10	φ12	φ14	φ16	φ20	φ25	φ26	φ28	φ30	φ32
Nominal tensile strength f_{uk}	[N/mm²]	550	550	550	550	550	550	550	550	550	550	550
Yield strength f_{yk}	[N/mm²]	500	500	500	500	500	500	500	500	500	500	500
Stressed cross- section A_s	[mm²]	50,3	78,5	113,1	153,9	201,1	314,2	490,9	531	615,8	707	804,2
Moment of resistance W	[mm³]	50,3	98,2	169,6	269,4	402,1	785,4	1534	1726	2155	2651	3217

Material quality

Part	Material
Rebar EN 1992-1-1:2004	Bars and de-coiled rods class B or C With f_{yk} and k according to NDP or NCL of EN 1992-1-1/NA $f_{uk} = f_{tk} = k \cdot f_{yk}$

Setting information

Installation temperature
+ 5°C to + 40°C

Service temperature range
Hilti HIT-RE 100-HC 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 + 40 °C	+ 24 °C	+ 40 °C
Temperature range II	-40 °C to + 58 °C	+ 35 °C	+ 58 °C
Temperature range III	-40 °C to + 70 °C	+ 43 °C	+ 70 °C

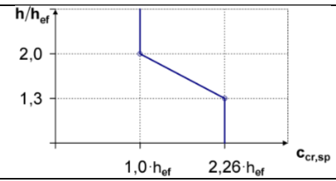
Max, short term base material temperature
Short term elevated base material temperatures are those that occur over brief intervals, e,g, as a result of diurnal cycling,
Max, long term base material temperature
Long term elevated base material temperatures are roughly constant over significant periods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

Working time and curing time

Temperature of the base material	Max, working time in which rebar can be inserted and adjusted t_{work}	Min, curing time before rebar can be fully loaded t_{cure}
5 °C ≤ T_{BM} < 10 °C	2,5 h	72 h
10 °C ≤ T_{BM} < 15 °C	2 h	48 h
15 °C ≤ T_{BM} < 20 °C	1 h	24 h
20 °C ≤ T_{BM} < 30 °C	40 min	18 h
30 °C ≤ T_{BM} ≤ 40 °C	20 min	6 h

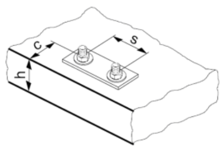
The curing time data are valid for dry base material only, In wet base material the curing times must be doubled,

Setting details

Anchor size			Ø8	Ø10	Ø12		Ø14	Ø16	Ø20	Ø25	Ø26	Ø28	Ø30	Ø32
Nominal diameter of drill bit	d_0	[mm]	10 / 12[a)]	12 / 14[a)]	14[a)]	16[a)]	18	20	25 / 24[a)]	32 / 30[a)]	32	35	37	40
Effective anchorage and drill hole depth range [b)]	$h_{ef,mn}$	[mm]	60	60	70	70	75	80	90	100	104	112	120	128
	$h_{ef,mx}$	[mm]	160	200	240	240	280	320	400	500	520	560	600	640
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	60	70	80	100	125	130	140	150	160
Minimum edge distance	c_{min}	[mm]	40	45	45	45	50	50	65	70	75	75	80	80
Critical spacing for splitting failure	$s_{cr,sp}$	[mm]	$2\ c_{cr,sp}$											
Critical edge distance for splitting failure [c)]	$c_{cr,sp}$	[mm]	**$1{,}0 \cdot h_{ef}$**			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								
Critical spacing for concrete cone failure	$s_{cr,N}$	[mm]	$2\ c_{cr,N}$											
Critical edge distance for concrete cone failure [d)]	$c_{cr,N}$	[mm]	$1{,}5\ h_{ef}$											

For spacing (edge distance) smaller than critical spacing (critical edge distance) the design loads have to be reduced,

a) Both given values for drill bit diameter can be used
b) $h_{ef,min} \le h_{ef} \le h_{ef,max}$ (h_{ef}: embedment depth)
c) h: base material thickness ($h \ge h_{min}$)
d) The critical edge distance for concrete cone failure depends on the embedment depth h_{ef} and the design bond resistance, The simplified formula given in this table is on the save side,



Installation equipment

Anchor size	ϕ8	ϕ10	ϕ12	ϕ14	ϕ16	ϕ20	ϕ25	ϕ26	ϕ28	ϕ30	ϕ32
Rotary hammer	TE 2– TE 16					TE 40 – TE 80					
Other tools	Compressed air gun or blow out pump Set of cleaning brushes, dispenser, piston plug										

Drilling and cleaning parameters

Rebar [mm]	Drill bit diameters d_0 [mm]		Installation size [mm]	
	Hammer drill (HD)	Hollow Drill Bit (HDB)	Brush HIT-RB	Piston plug HIT-SZ
				
ϕ8	10 / 12 a)	12	10 / 12 a)	12
ϕ10	12 / 14 a)	12 / 14 a)	12 / 14 a)	12 / 14 a)
ϕ12	14 / 16 a)	14 / 16 a)	14 / 16 a)	14 / 16 a)
ϕ14	18	18	18	18
ϕ16	20	20	20	20
ϕ20	24 / 25a)	24 / 25a)	24 / 25a)	24 / 25a)
ϕ25	30 / 32a)	32	30 / 32a)	30 / 32a)
ϕ26	32	32	32	32
ϕ28	35	35	35	35
ϕ30	37	-	37	37
ϕ32	40	-	40	40

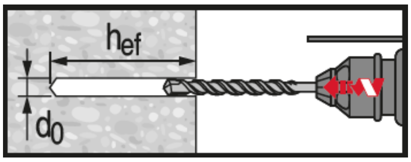
a) Both of the two given values can be used

Setting instructions

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

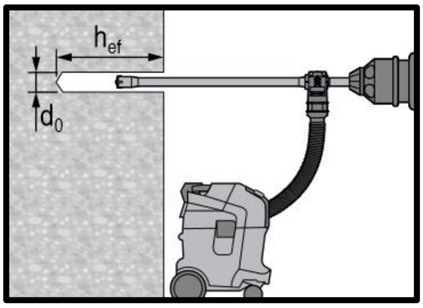
Safety regulations,

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 100-HC.



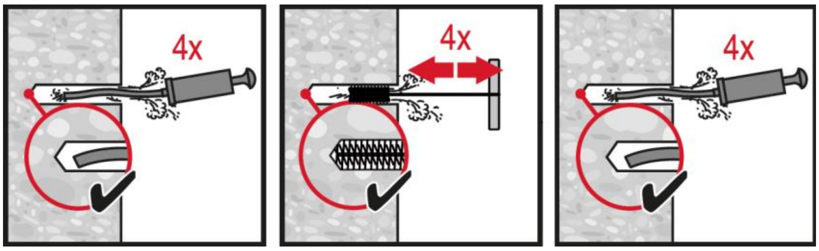
Hammer drilled hole

For dry and wet concrete,



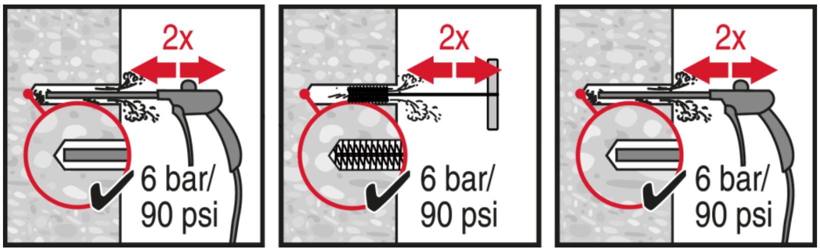
Hammer drilled hole with Hollow Drilled Bit (HDB)

No cleaning required,



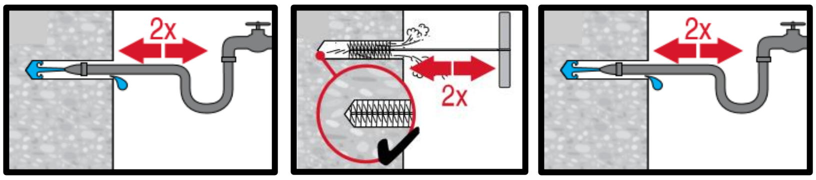
Manual cleaning (MC)
Non-cracked concrete only

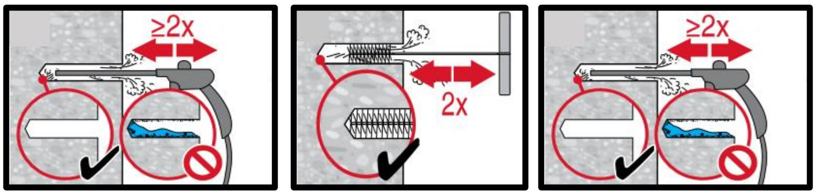
for drill diameters $d_0 \leq 20$ mm and drill hole depth $h_0 \leq 10 \cdot d$,



Hammer Drilling:

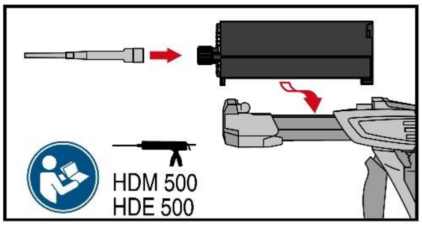
Compressed air cleaning (CAC)
for all drill hole diameters d_0 and drill hole depths $h_0 \leq 20 \cdot d$,

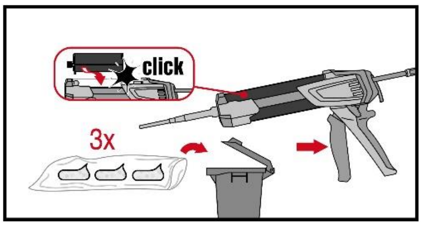




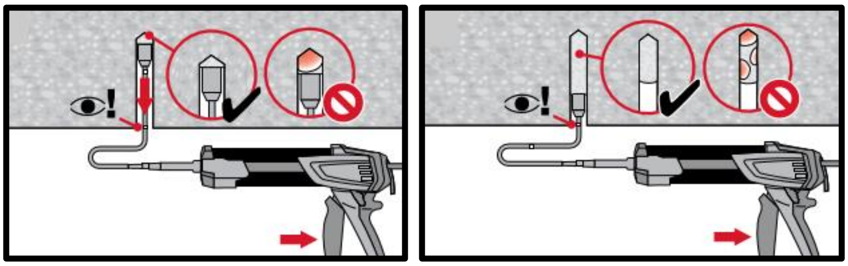
Compressed air cleaning (CAC)
cleaning of water-filled holes

for all drill hole diameters d_0 and drill hole depths h_0,

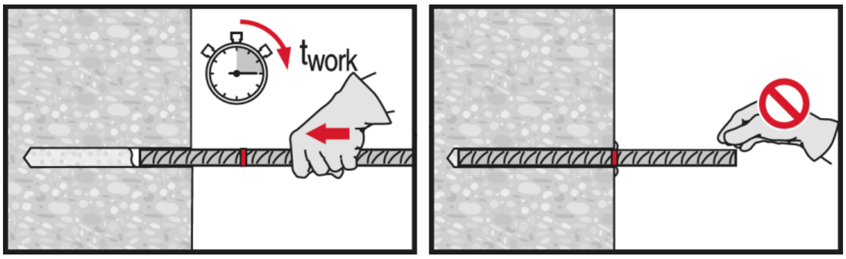




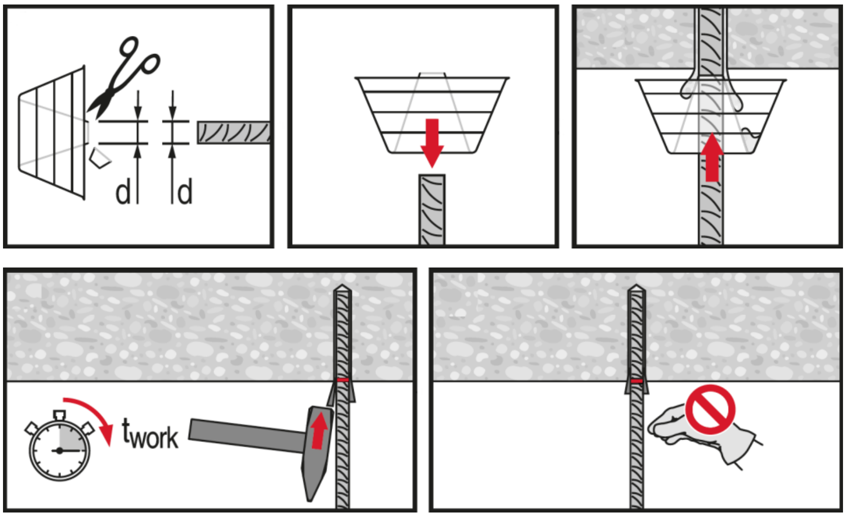
Injection system preparation,



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



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



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

HIT-RE 100-HC injection mortar

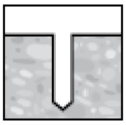
Rebar design (EOTA TR023) / Rebar elements / Concrete

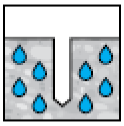
Injection mortar system		Benefits
	Hilti HIT-RE 100-HC 580 ml hard cartridge	- Suitable for concrete C 12/15 to C 50/60 - High loading capacity - Suitable for dry and water saturated concrete - For rebar diameters up to 40 mm - Non corrosive to rebar elements - Long working time at elevated temperatures - Suitable for embedment length till 3200 mm
	Rebar B500 B (ϕ8 - ϕ40)	

Base material

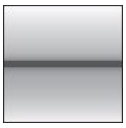

Concrete (uncracked)


Concrete (cracked)


Dry concrete

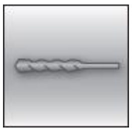

Wet concrete

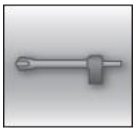
Load conditions


Static/ quasi-static


Fire resistance

Installation conditions


Hammer drilling


Hollow drill-bit drilling


Diamond coring

Other information


European Technical Assessment

CE conformity

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
European technical assessment a)	DIBt, Berlin	ETA-19/0149 / 2019-12-10

a) All data given in this section according to ETA-19/0149, issue 2019-12-10.

Basic design data

Static EC2 design

Design bond strength in N/mm² according to ETA-19/0149 for good bond conditions

Rebar-size	Concrete class								
	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
All allowed hammer drilling methods									
ϕ8 - ϕ32	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3
ϕ34	1,6	2,0	2,3	2,6	2,9	3,3	3,6	3,9	4,2
ϕ36	1,5	1,9	2,2	2,6	2,9	3,3	3,6	3,8	4,1
ϕ40	1,5	1,8	2,1	2,5	2,8	3,1	3,4	3,7	4,0
Diamond coring wet									
ϕ8 - ϕ32	1,6	2,0	2,3	2,7					
ϕ34	1,6	2,0	2,3	2,6					
ϕ36	1,5	1,9	2,2	2,6					
ϕ40	1,5	1,8	2,1	2,5					

For poor bond conditions multiply the values by 0,7, Values valid for non-cracked and cracked concrete

Minimum anchorage length and minimum lap length

The minimum anchorage length $\ell_{b,min}$ and the minimum overlap length $\ell_{0,min}$ according to EN 1992-1-1 shall be multiplied by the relevant **Amplification factor** in the table below,

Amplification factor α_{lb} for the min, anchorage length and min, lap length according to EN 1992-1-1 for:

Rebar - size	Concrete class								
	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
All allowed hammer drilling methods									
ϕ8 -ϕ40	1,0								
Diamond coring dry and wet									
ϕ8 -ϕ40	1,5								

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]	Anchorage length l_{bd} [mm]	Design value N_{Rd} [KN]	Mortar volume[2)] V_M [ml]
	$\alpha_1=\alpha_2=\alpha_3=\alpha_4=\alpha_5=1{,}0$			$\alpha_1=\alpha_3=\alpha_4=1{,}0$ α_2 or $\alpha_5=0{,}7$		
ϕ8	100	6,8	8	100	9,7	8
	170	11,5	13	140	13,6	11
	250	17,0	19	180	17,4	14
	322,1	21,9	24	**225,4**	21,9	17
ϕ10	121	10,3	11	121	14,7	11
	220	18,7	20	170	20,6	15
	310	26,3	28	230	27,9	21
	402,6	34,1	36	**281,8**	34,1	25
ϕ12	145	14,8	15	145	21,1	15
	260	26,5	27	210	30,5	22
	370	37,7	39	270	39,3	29
	483,1	49,2	51	**338,2**	49,2	36
ϕ14	169	20,1	20	169	28,7	20
	300	35,6	36	240	40,7	29
	430	51,1	52	320	54,3	39
	563,6	66,9	68	**394,5**	66,9	48

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]	Anchorage length l_{bd} [mm]	Design value N_{Rd} [KN]	Mortar volume[2] V_M [ml]
	$\alpha_1=\alpha_2=\alpha_3=\alpha_4=\alpha_5=1{,}0$			$\alpha_1=\alpha_3=\alpha_4=1{,}0$ α_2 or $\alpha_5=0{,}7$		
ϕ16	193	26,2	26	193	37,4	26
	340	46,1	46	280	54,3	38
	490	66,5	67	370	71,7	50
	644	87,4	87	**450,9**	87,4	61
ϕ18	217	33,1	33	217	47,3	33
	380	58	57	310	67,6	47
	540	82,4	81	410	89,4	62
	724,6	110,6	109	**507,2**	110,6	76
ϕ20	242	41,1	51	242	58,6	51
	390	66,2	83	350	84,8	74
	550	93,3	117	460	111,5	98
	805,2	136,6	171	**563,6**	136,6	120
ϕ22	266	49,6	75	266	70,9	75
	410	76,5	116	380	101,3	107
	560	104,5	158	500	133,3	141
	885,7	165,3	250	**620**	165,3	175
ϕ24	290	59	122	290	84,3	122
	430	87,5	182	420	122,1	177
	560	114	236	550	160	232
	966,2	196,7	408	**676,3**	196,7	286
ϕ25	302	64	114	302	91,5	114
	430	91,2	162	430	130,3	162
	570	120,9	214	570	172,7	214
	1006,4	213,4	378	**704,5**	213,4	265
ϕ28	350	83,1	145	338	114,7	140
	595	141,3	247	480	162,9	200
	875	207,8	364	635	215,5	264
	1127,2	267,7	469	**789**	267,7	328
ϕ30	374	95,2	165	374	136	165
	635	161,6	281	528	191,9	233
	935	237,9	413	700	254,5	309
	1207,7	307,3	534	**845,4**	307,3	374
ϕ32	400	108,6	217	400	155,1	217
	680	184,6	369	580	224,9	315
	1000	271,4	543	800	310,2	434
	1288,2	349,7	699	**901,8**	349,7	490
ϕ36	450	132,3	387	440	184,8	379
	765	225	658	640	268,8	551
	1125	330,8	968	900	378,1	774
	1505,0	442,6	1295	**1053,5**	442,6	907
ϕ40	500	157,1	520	485	217,7	505
	850	267	884	700	314,2	728
	1000	314,2	1040	990	444,3	1030
	1739,1	546,4	1810	**1217,4**	546,4	1267

1) Values corresponding to the minimum anchorage length, The maximum permissible load 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) The volume of mortar corresponds to the formula "$1{,}2*(d_0^2-d_s^2)*\pi*lb/4$" for hammer drilling

Pre-calculated values – overlap length

Rebar yield strength f_{yk}=500 N/mm², concrete c25/30, good bond conditions

Rebar-size	Overlap length l_0[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]
	$\alpha_1=\alpha_2=\alpha_3=\alpha_4=\alpha_5=1{,}0$			$\alpha_1=\alpha_3=\alpha_4=1{,}0$ α_2 or $\alpha_5=0{,}7$		
ϕ8	200	13,6	15	200	19,4	15
	240	16,3	18	210	20,4	16
	280	19	21	220	21,3	17
	322,1	21,9	24	**225,4**	21,9	17
ϕ10	200	17	18	200	24,2	18
	270	22,9	24	230	27,9	21
	340	28,8	31	250	30,3	23
	402,6	34,1	36	**281,8**	34,1	25
ϕ12	200	20,4	21	200	29,1	21
	290	29,5	31	250	36,4	26
	390	39,7	41	290	42,2	31
	483,1	49,2	51	**338,2**	49,2	36
ϕ14	210	24,9	25	210	35,6	25
	330	39,2	40	270	45,8	33
	450	53,4	54	330	56	40
	563,6	66,9	68	**394,5**	66,9	48
ϕ16	240	32,6	33	240	46,5	33
	370	50,2	50	310	60,1	42
	510	69,2	69	380	73,7	52
	644	87,4	87	**450,9**	87,4	61
ϕ18	270	41,2	41	270	58,9	41
	410	62,6	62	350	76,3	53
	560	85,5	84	430	93,8	65
	724,6	110,6	109	**507,2**	110,6	76
ϕ20	300	50,9	64	300	72,7	64
	430	72,9	91	390	94,5	83
	570	96,7	121	480	116,3	102
	805,2	136,6	171	**563,6**	136,6	120
ϕ22	330	61,6	93	330	88	93
	450	84	127	430	114,6	122
	580	108,2	164	520	138,6	147
	885,7	165,3	250	**620**	165,3	175
ϕ24	360	73,3	152	360	104,7	152
	470	95,7	198	470	136,7	198
	590	120,1	249	570	165,8	241
	966,2	196,7	408	**676,3**	196,7	286
ϕ25	375	79,5	141	375	113,6	141
	430	91,2	162	480	145,4	181
	570	120,9	214	590	178,7	222
	1006,4	213,4	378	**704,5**	213,4	265
ϕ28	420	99,8	175	420	142,5	175
	595	141,3	247	530	179,8	220
	875	207,8	364	635	215,5	264
	1127,2	267,7	469	**789**	267,7	328

Pre-calculated values – overlap length
Rebar yield strength f_{yk}=500 N/mm², concrete c25/30, good bond conditions

Rebar-size	Overlap length l_0[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]
	$\alpha_1=\alpha_2=\alpha_3=\alpha_4=\alpha_5=1,0$				$\alpha_1=\alpha_3=\alpha_4=1,0$ α_2 or $\alpha_5=0,7$		
ϕ30	450	114,5	199		450	163,6	199
	635	161,6	281		528	191,9	233
	935	237,9	413		700	254,5	309
	1207,7	307,3	534		**845,4**	307,3	374
ϕ32	480	130,3	261		480	186,1	261
	680	184,6	369		650	252	353
	1000	271,4	543		800	310,2	434
	1288,2	349,7	699		**901,8**	349,7	490
ϕ36	540	158,8	465		540	218,1	465
	765	225,0	658		720	290,0	620
	1125	330,8	968		900	363,5	774
	1505,0	442,6	1295		**1053,5**	442,6	907
ϕ40	600	188,5	624		600	269,3	624
	850	267,0	884		750	336,6	780
	1000	314,2	1040		990	444,3	1030
	1739,1	505,9	1676		**1217,4**	546,4	1267

1) Values corresponding to the minimum anchorage length, The maximum permissible load 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) The volume of mortar corresponds to the formula "$1,2*(d_0^2-d_s^2)*\pi*lb/4$" for hammer drilling

Fire resistance

The design method consists of four steps. First, determining a reduction factor KN(θ), which describes the proportion between bond resistance and temperature, based on pullout tests at various temperatures. Secondly, a thermal simulation using the Finite Elements method is carried out to determine the temperature figure along the rebar at certain time T during a fire. Thirdly, the bond resistances in case of fire are estimated using the first two steps. A fourth step, in case of the beam-wall connection, is the calculation of the characteristic maximal load by integration of the bond resistance. Thermal simulations, geometrics considerations and safety co-efficients are determined in accordance with Eurocode and standards.

Step 1
Reduction factor KN(θ)

Step 2
Finite Element simulation: Temperature profile for each rebar diameter and anchorage length along the bonding interface in relation to the fire exposure duration T.

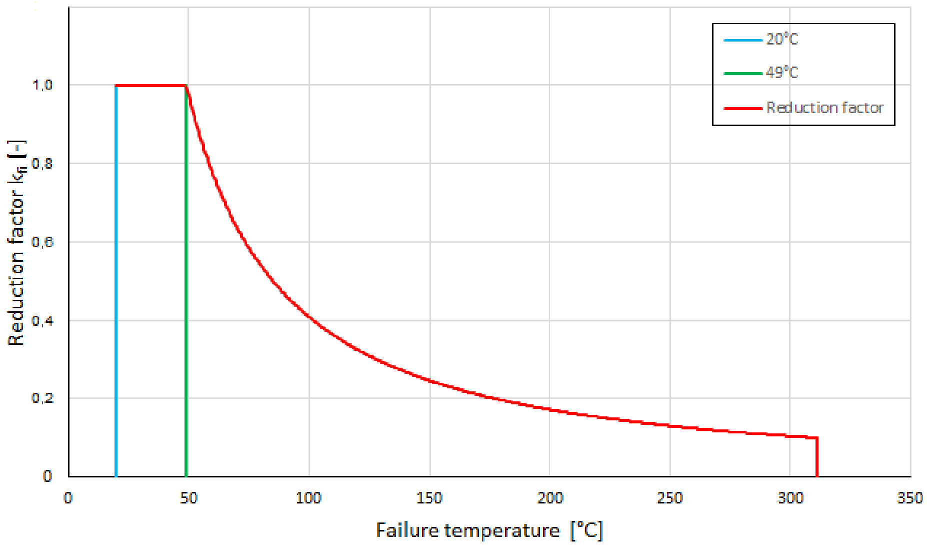
Step 3
Slab-slab connection: TRk along the bonding interface

Step 4
Characteristic maximal load

$$F_{bk} = Ø \cdot \pi \cdot \int_0^L \tau_{Rk} \cdot \big(T(x)\big) \cdot dx$$

Where:

τ_{Rk}: the characteristic bonding resistance [N/mm²].
T: the temperature [°].
F_{bk}: the characteristic maximum load applicable to the rebar at a given time [N].
L: the embedment length [mm].
Ø: the rebar diameter [mm].

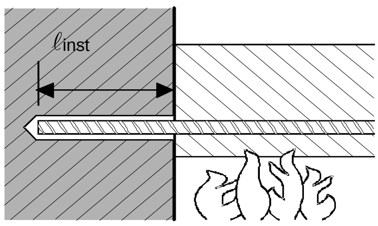


Relationship between temperature and the reduction factor

20°C ≤ θ ≤ 49°C	$k_N = 1$
50°C ≤ θ ≤311°C	$k_N = \frac{1285,7 * \theta^{-1,249}}{10}$
θ > 311°C	$k_N = 0$

This report uses the characteristic values of bond strength. Accordingly, the values of bond resistance and load resistance in case of fire are given as characteristic values

a) Anchoring application



Anchoring application beam-wall connections with a concrete cover of 20 mm

Maximum force ($F_{s,T,max}$) in rebar in conjunction with HIT-RE 100-HC as a function of embedment depth (ℓ_{inst}) for the fire resistance classes F30 to F240 according to EC2.

Rebar-size	$F_{s,T,max}$ [kN]	ℓ_{inst} [mm]	Fire resistance of bar [kN]					
			R30	R60	R90	R120	R180	R240
ϕ8	**16,8**	100	3,9	1,6	0,9	0,6	0,3	0,1
		110	4,6	1,9	1,1	0,7	0,4	0,1
		140	7,4	4,3	2,6	1,7	1,0	0,6
		160	9,1	6,1	4,0	2,7	1,6	1,0
		260	17,8	14,8	12,6	10,9	8,0	5,6
		290	20,4	17,4	15,2	13,5	10,6	8,0
		310	22,1	19,1	16,9	15,2	12,4	9,9
		330	23,8	20,8	18,7	16,9	14,1	11,6
		370	25,1	24,3	22,1	20,4	17,6	15,1
		400		25,1	24,7	23,0	20,2	17,7
ϕ10	**26,2**	110	5,6	2,3	1,3	0,8	0,5	0,1
		140	9,1	5,1	3,0	2,1	1,3	0,8
		160	11,3	7,3	4,6	3,2	1,9	1,2
		260	22,1	18,1	15,4	13,2	9,7	6,7
		290	25,4	21,4	18,6	16,4	13,0	9,6
		310	27,6	23,6	20,8	18,6	15,1	12,0
		340	30,8	26,8	24,0	21,9	18,4	15,2
		360	33,0	29,0	26,2	24,0	20,5	17,4
		380	35,1	31,1	28,4	26,2	22,7	19,6
		450	39,3	38,7	35,9	33,8	30,3	27,1

Maximum force ($F_{s,T,max}$) in rebar in conjunction with HIT-RE 100-HC as a function of embedment depth (ℓ_{inst}) for the fire resistance classes F30 to F240 according to EC2.

Rebar-size	$F_{s,T,max}$ [kN]	ℓ_{inst} [mm]	Fire resistance of bar [kN]					
			R30	R60	R90	R120	R180	R240
ϕ12	37,7	110	6,5	2,6	1,5	0,9	0,6	0,1
		140	10,7	5,8	3,4	2,4	1,4	0,9
		160	13,3	8,4	5,2	3,6	2,2	1,4
		260	26,4	21,4	18,0	15,4	11,1	7,7
		360	39,4	34,4	31,0	28,4	24,1	20,4
		390	43,3	38,3	34,9	32,3	28,0	24,3
		450	51,1	46,1	42,7	40,1	35,8	32,1
		500	56,5	52,6	49,2	46,6	42,3	38,6
ϕ14	51,3	160	15,5	9,3	5,8	4,0	2,5	1,6
		260	30,6	24,5	20,6	17,3	12,3	8,5
		360	45,8	39,7	35,7	32,5	27,4	23,1
		400	51,9	45,7	41,8	38,6	33,5	29,2
		450	59,5	53,3	49,4	46,2	41,1	36,8
		500	67,1	60,9	57,0	53,8	48,7	44,4
		550	74,6	68,5	64,6	61,3	56,3	51,9
ϕ16	67,0	180	21,0	13,6	9,0	6,4	4,0	2,7
		260	34,8	27,4	22,8	19,2	13,4	9,3
		360	52,2	44,8	40,1	36,5	30,7	25,7
		460	69,5	62,1	57,5	53,9	48,1	43,0
		500	76,4	69,1	64,4	60,8	55,0	49,9
		560	86,8	79,5	74,8	71,2	65,4	60,3
		600	93,8	86,4	81,7	78,1	72,3	67,3
ϕ20	104,7	220	34,3	24,6	18,4	13,4	8,2	6,1
		260	43,0	33,2	27,0	21,9	14,7	10,6
		360	64,7	54,9	48,7	43,6	36,2	30,3
		550	108,0	98,3	92,1	86,9	79,5	73,6
		600	116,7	106,9	100,7	95,6	88,2	82,3
		650	129,7	119,9	113,8	108,6	101,2	95,3
		700	138,4	128,6	122,4	117,3	109,9	104,0

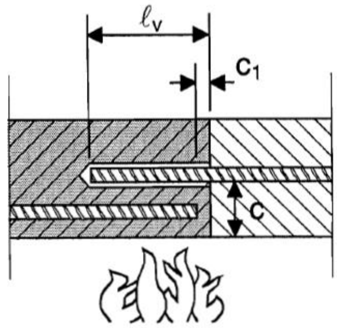
*For additional values please check GS 3,2/15-431-4 fire report,
Characteristic yield strength f_{yk} = 500 N/mm²

b) Overlap joint application

Max, bond stress, $f_{bd,FIRE}$, depending on actual clear concrete cover for classifying the fire resistance,

It must be verified that the actual force in the bar during a fire, $F_{s,T}$, can be taken up by the bar connection of the selected length, ℓ_{inst}, Note: Cold design for ULS is mandatory,

$F_{s,T} \leq (\ell_{inst} - c_f) \cdot \phi \cdot \pi \cdot f_{bd,FIRE}$ where: $(\ell_{inst} - c_f) \geq \ell_s$;



ℓ_s = lap length
ϕ = nominal diameter of bar
$\ell_{inst} - c_f$ = selected overlap joint length; this must be at least ℓ_s,
but may not be assumed to be more than 80 ϕ
$f_{bd,FIRE}$ = bond stress when exposed to fire

Critical temperature-dependent bond resistance, $f_{bk,FIRE}$, concerning “overlap joint” for Hilti HIT-RE 100-HC injection adhesive in relation to fire resistance class and required minimum concrete coverage c.

<table>
<tr><th>Concrete cover c_{nom}</th><th colspan="6">Characteristic bond resistance in case of fire, $f_{bk,fire}$ [N/mm²]</th></tr>
<tr><th>[mm]</th><th>R30</th><th>R60</th><th>R90</th><th>R120</th><th>R180</th><th>R240</th></tr>
<tr><td>50</td><td>1,1</td><td>0,4</td><td>0,0</td><td rowspan="2">0,0</td><td rowspan="4">0,0</td><td rowspan="5">0,0</td></tr>
<tr><td>60</td><td>1,6</td><td>0,6</td><td>0,4</td></tr>
<tr><td>70</td><td>2,2</td><td>0,8</td><td>0,5</td><td>0,4</td></tr>
<tr><td>80</td><td>3,0</td><td>1,1</td><td>0,6</td><td>0,5</td></tr>
<tr><td>90</td><td rowspan="21">3,5</td><td>1,4</td><td>0,8</td><td>0,6</td><td>0,4</td></tr>
<tr><td>100</td><td>1,8</td><td>1,1</td><td>0,7</td><td>0,5</td><td>0,3</td></tr>
<tr><td>110</td><td>2,3</td><td>1,3</td><td>0,9</td><td>0,5</td><td>0,4</td></tr>
<tr><td>120</td><td>2,9</td><td>1,6</td><td>1,1</td><td>0,6</td><td>0,5</td></tr>
<tr><td>130</td><td rowspan="17">3,5</td><td>2,0</td><td>1,3</td><td>0,8</td><td>0,5</td></tr>
<tr><td>140</td><td>2,4</td><td>1,6</td><td>0,9</td><td>0,6</td></tr>
<tr><td>150</td><td>2,8</td><td>1,9</td><td>1,1</td><td>0,7</td></tr>
<tr><td>160</td><td>3,3</td><td>2,2</td><td>1,3</td><td>0,9</td></tr>
<tr><td>170</td><td rowspan="13">3,5</td><td>2,6</td><td>1,5</td><td>1,0</td></tr>
<tr><td>180</td><td>3,0</td><td>1,7</td><td>1,1</td></tr>
<tr><td>190</td><td rowspan="11">3,5</td><td>1,9</td><td>1,3</td></tr>
<tr><td>200</td><td>2,2</td><td>1,5</td></tr>
<tr><td>210</td><td>2,5</td><td>1,7</td></tr>
<tr><td>220</td><td>2,8</td><td>1,9</td></tr>
<tr><td>230</td><td>3,2</td><td>2,1</td></tr>
<tr><td>240</td><td rowspan="6">3,5</td><td>2,3</td></tr>
<tr><td>250</td><td>2,6</td></tr>
<tr><td>260</td><td>2,8</td></tr>
<tr><td>270</td><td>3,1</td></tr>
<tr><td>280</td><td rowspan="2">3,5</td></tr>
<tr><td>290</td></tr>
</table>

Materials

Material quality

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

Fitness for use

Some creep tests have been conducted in accordance with ETAG guideline 001 part 5 and TR 023 in the following conditions: **in dry environment at 50 °C during 90 days,**
These tests show an excellent behaviour of the post-installed connection made with HIT-RE 100-HC: low displacements with long term stability, failure load after exposure above reference load,

Resistance to chemical substances

Chemical	Resistance
Acetic acid 100%	o
Acetic acid 10%	+
Hydrochloric Acid 20%	+
Nitric Acid 40%	-
Phosphoric Acid 40%	+
Sulphuric acid 40%	+
Ethyl acetate 100%	o
Acetone 100%	-
Ammoniac 5%	o
Diesel 100%	+
Gasoline 100%	+
Ethanol 96%	o
Machine oils 100%	+

Chemical	Resistance
Methanol 100%	o
Peroxide of hydrogen 30%	o
Solution of phenol (sat,)	-
Sodium hydroxide pH=14	+
Solution of chlorine (sat,)	+
Solution of hydrocarbons (60 % vol Toluene, 30 % vol Xylene,10 % vol Methyl naphtalene)	+
Salted solution 10%	+
sodium chloride	
Suspension of concrete (sat,)	+
Chloroform 100%	+
Xylene 100%	+

+ resistant
o resistant in short term (max, 48h) contact
- not resistant

Electrical Conductivity

HIT-RE 100-HC in the hardened state **is not conductive electrically**, Its electric resistivity is $1,4 \cdot 10^{10}\ \Omega \cdot m$ (DIN IEC 93 – 12,93), It is adapted well to realize electrically insulating anchorings (ex: railway applications, subway),

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

Service temperature range
Hilti HIT-RE 100-HC 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 +80 °C	+50 °C	+80 °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[a)]

Temperature IN the base material T_{BM}	Maximum working time t_{work}	Initial curing time $t_{cure,ini}$[b)]	Minimum curing time t_{cure}
$5\ °C \le T_{BM} < 9\ °C$	2,5 h	18 hours	72 hours
$10\ °C \le T_{BM} < 14\ °C$	2 h	12 hours	48 hours
$15\ °C \le T_{BM} < 19\ °C$	1 h	8 hours	24 hours
$20\ °C \le T_{BM} < 29\ °C$	40 min	6 hours	18 hours
$30\ °C \le T_{BM} \le 40\ °C$	20 min	2 hours	6 hours

a) The curing time data are valid for dry base material only, In wet base material the curing times must be doubled,
b) After $t_{cure,ini}$ has elapsed preparation work may continue

Setting information

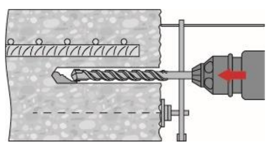
Installation equipment

Rebar – size	ϕ8-ϕ16	ϕ18-ϕ40
Rotary hammer	TE2(-A) – TE30(-A)	TE40 – TE80
Other tools	Blow out pump ($h_{ef} \le 10\cdot d$)	-
	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 $20\cdot\phi$ (for $\phi > 12$ mm)
b) Automatic brushing with round brush for all drill holes deeper than 250 mm (for ϕ 8 to ϕ 12) or deeper than $20\cdot\phi$ (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 **(HD)** and **(HDB)**[1)]	$\phi < 25$	$30 + 0{,}06 \cdot l_v \ge 2 \cdot \phi$	$30 + 0{,}02 \cdot l_v \ge 2 \cdot \phi$
	$\phi \ge 25$	$40 + 0{,}06 \cdot l_v \ge 2 \cdot \phi$	$40 + 0{,}02 \cdot l_v \ge 2 \cdot \phi$
Compressed air drilling **(CA)**	$\phi < 25$	$50 + 0{,}08 \cdot l_v$	$50 + 0{,}02 \cdot l_v$
	$\phi \ge 25$	$60 + 0{,}08 \cdot l_v \ge 2 \cdot \phi$	$60 + 0{,}02 \cdot l_v \ge 2 \cdot \phi$
Diamond coring dry **(PCC)** or wet **(DD)**	$\phi < 25$	Drill stand is used as drilling aid	$30 + 0{,}02 \cdot l_v \ge 2 \cdot \phi$
	$\phi \ge 25$		$40 + 0{,}02 \cdot l_v \ge 2 \cdot \phi$

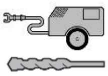


1) HDB = hollow drill bit Hilti TE-CD and TE-YD.

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

<table>
<tr><th>Dispenser</th><th colspan="3">HDM 500</th><th colspan="3">HDE 500</th></tr>
<tr><th>Mortar temperature</th><th>10-19ºC</th><th colspan="2">20-25ºC</th><th>10-19ºC</th><th colspan="2">20-25ºC</th></tr>
<tr><th>Base material temperature</th><th>5-20ºC</th><th>5-20ºC</th><th>>20ºC</th><th>5-20ºC</th><th>5-20ºC</th><th>>20ºC</th></tr>
<tr><th>ϕ [mm]</th><th colspan="6">$\ell_{v,max}$ [mm]</th></tr>
<tr><td>ϕ8 to ϕ12</td><td rowspan="7">500</td><td rowspan="3">1000</td><td rowspan="5">1000</td><td rowspan="7">500</td><td>1000</td><td>1000</td></tr>
<tr><td>ϕ14</td><td>1200</td><td>1200</td></tr>
<tr><td>ϕ16</td><td>1500</td><td rowspan="3">1500</td></tr>
<tr><td>ϕ18 to ϕ20</td><td rowspan="2">700</td><td>1300</td></tr>
<tr><td>ϕ22 to ϕ25</td><td>1000</td></tr>
<tr><td>ϕ26 to ϕ32</td><td rowspan="2">500</td><td rowspan="2">700</td><td>700</td><td rowspan="2">1000</td></tr>
<tr><td>ϕ34 to ϕ40</td><td>500</td></tr>
</table>

Drilling and cleaning diameters

Rebar [mm]	Drill bit diameters d_0 [mm]			Diamond core d_0 [mm]		Installation size [mm]	
	Hammer drill (HD)	Compressed air drill (CA)	Hollow Drill Bit (HDB)	Wet (DD)	Dry (PCC)[b)]	Brush HIT-RB	Air nozzle HIT-DL
							
ϕ8	12 (10[a)])	-	12	12 (10[a)])	-	12 (10[a)])	12 (10[a)])
ϕ10	14 (12[a)])	-	14 (12[a)])	14 (12[a)])	-	14 (12[a)])	14 (12[a)])
ϕ12	16 (14[a)])	-	16 (14[a)])	16 (14[a)])	-	16 (14[a)])	16 (14[a)])
	-	17	-	-	-	18	16
ϕ14	18	17	18	18	-	18	18
ϕ16	20	-	20	20	-	20	20
	-	20	-	-	-	22	20
ϕ18	22	22	22	22	-	22	22
ϕ20	25 (24[a)])	-	25	25	-	25 (24[a)])	25 (24[a)])
	-	26	-	-	-	28	25
ϕ22	28	28	28	28	-	28	28
ϕ24	32	32	32	32	-	32	32
	-	-	-	-	35	-	
ϕ25	32 (30[a)])	32 (30[a)])	32	32 (30[a)])	-	32 (30[a)])	
	-	-	-	-	35	-	
ϕ26	35	35	-	35	35	35	
ϕ28	35	35	-	35	35	35	
ϕ30	-	35	-	35	35	35	
	37	-	-	-	-	37	
ϕ32	40	40	-	40	47	40	
ϕ34	-	42	-	42	47	42	
	45	-	-	-	-	45	
ϕ36	45	45	-	-	47	45	
	-	-	-	47	-	47	
ϕ40	-	-	-	52	52	52	
	55	57	-	-	-	55	

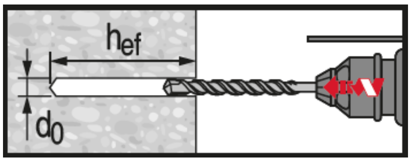
a) Both of a given values can be used,
b) No cleaning required,

Setting instructions

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

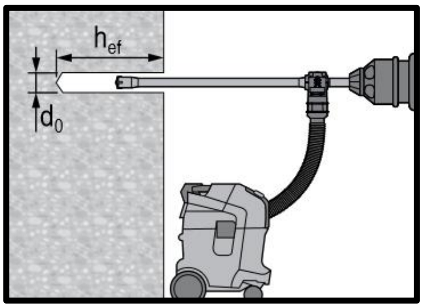
Safety regulations,

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 100-HC.



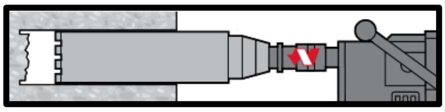
Hammer drilled hole

For dry and wet concrete,

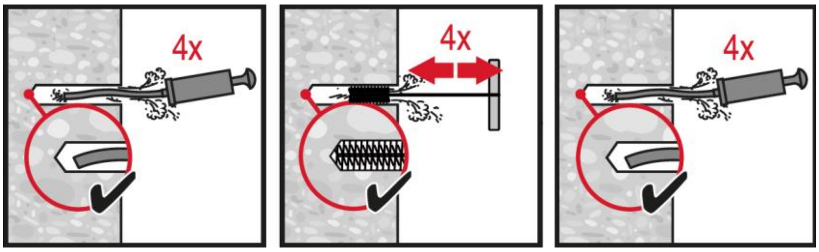


Hammer drilled hole with Hollow Drilled Bit (HDB)

No cleaning required,



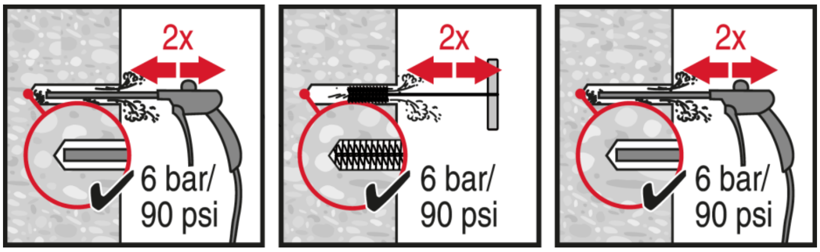
Diamond Drilling (DD)



Hammer Drilling:

Manual cleaning (MC)

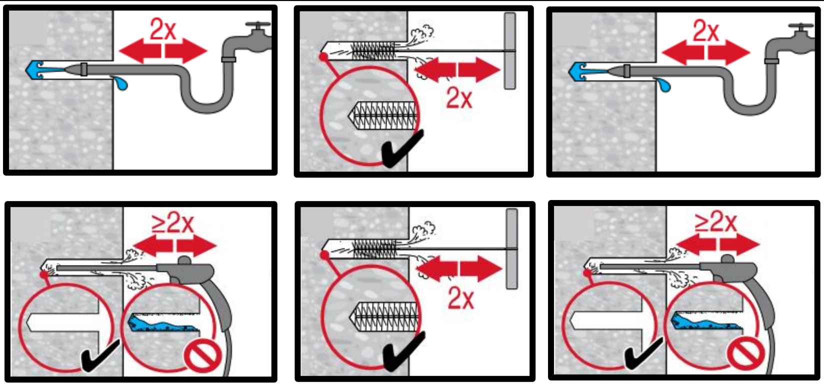
for drill diameters $d_0 \leq 20$ mm and drill hole depth $h_0 \leq 10 \cdot d$,



Hammer Drilling:

Compressed air cleaning (CAC)

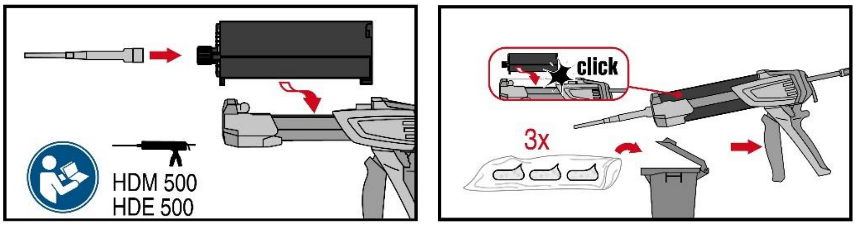
for all drill hole diameters d_0 and drill hole depths $h_0 \leq 20 \cdot d$,



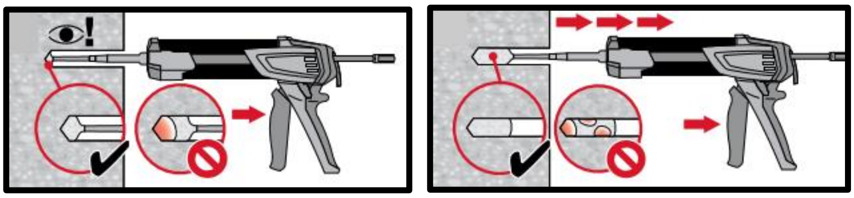
Wet diamond coring:

Compressed air cleaning (CAC)

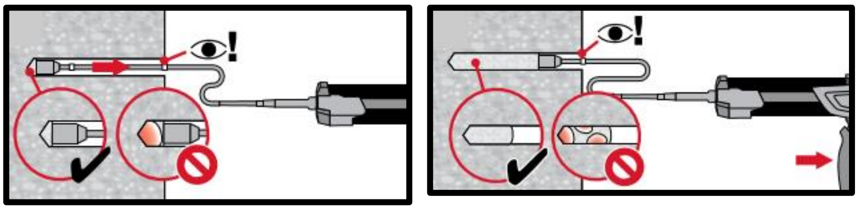
for all drill hole diameters d_0 and drill hole depths h_0,



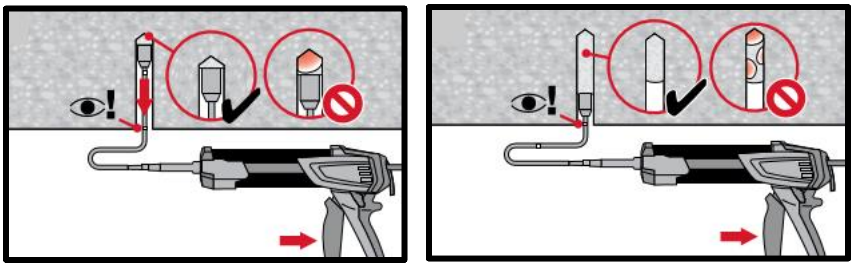
Injection system preparation,



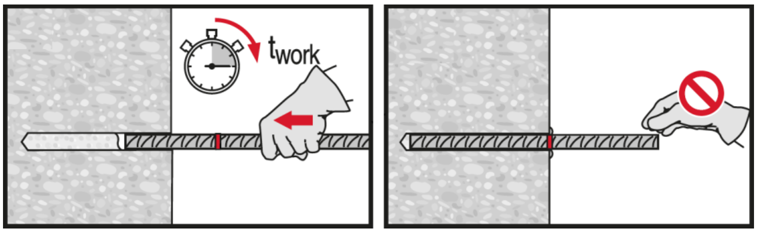
Injection method for drill hole depth $h_{ef} \leq 250$ mm,



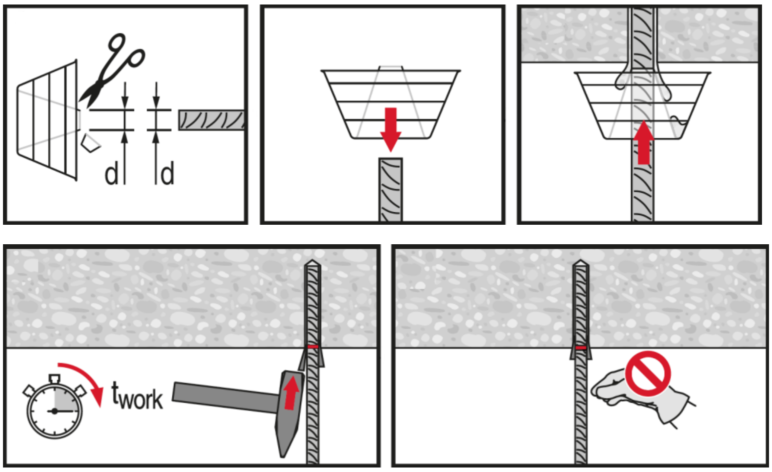
Injection method for drill hole depth $h_{ef} > 250$mm,



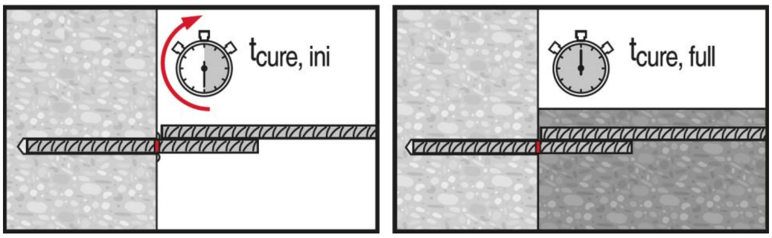
Injection method for overhead application,



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}",