HIT-HY 170
INJECTION MORTAR

Technical Datasheet

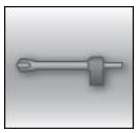
Update: Jan-23

HIT-HY 170 injection mortar

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

Injection mortar system	Benefits
 Hilti HIT-HY 170 330 ml foil pack (also available as 500 ml foil pack)	- Suitable for concrete C12/15 to C50/60 - Suitable for dry and water saturated concrete - High loading capacity and fast cure - High corrosion resistant - For rebar diameters up to 25 mm - Manual cleaning for drill hole sizes ≤ 20 mm and embedment depth h_{ef} ≤ 10d - Suitable for embedment depth up to 1000 mm depending on the rebar diameter
 Rebar B500 B (ϕ8 - ϕ25)	

Base material			Load conditions	
				
Concrete (Non-cracked)	Dry concrete	Water saturated concrete	Static/ quasi-static	Fire resistance

Installation conditions		Other informations	
			
Hammer drilled holes	Hollow drill-bit drilling	European Technical Assessment	CE conformity

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
European Technical Assessment [a)]	DIBt, Berlin	ETA-15/0297 / 2015-12-11

b) All data given in this section according to ETA-15/0297 issue 2015-12-11.

Static and quasi-static loading

Design bond strength

Design bond strength in N/mm² accord. to ETA-15/0297 for good bond conditions

All allowed drilling methods									
Rebar - size	**Concrete class**								
	C12/15	**C16/20**	**C20/25**	**C25/30**	**C30/37**	**C35/45**	**C40/50**	**C45/55**	**C50/60**
ϕ8 - ϕ12	1,6	2,0	2,3	2,7	3,0	3,4	3,7	3,7	3,7
ϕ14 - ϕ25	1,6	2,0	2,3	2,7	3,0	3,4	3,4	3,4	3,4

For all other bond conditions multiply the values by 0,7.

Minimum anchorage length and minimum lap length

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

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

All allowed drilling methods									
Rebar - size	**Concrete class**								
	C12/15	**C16/20**	**C20/25**	**C25/30**	**C30/37**	**C35/45**	**C40/50**	**C45/55**	**C50/60**
ϕ8 - ϕ25	1,0								

Pre-calculated values

Pre-calculated values[1] – anchorage length

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

Rebar [mm]	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	**21,9**	24	**226**	**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
	403	**34,2**	36	**281**	**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	**49,2**	51	**338**	**49,1**	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
	564	**67,0**	68	**394**	**66,8**	48
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	**451**	**87,4**	61
ϕ18	217	33,1	33	217	47,3	33
	380	58,0	57	310	67,6	47
	540	82,4	81	410	89,4	62
	700	**106,9**	106	**507**	**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
	700	**118,8**	148	**564**	**136,7**	120

Pre-calculated values[1] – anchorage length

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

Rebar [mm]	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 $\alpha_5=0,7$		
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
	700	**130,6**	198	**620**	**165,3**	175
ϕ24	290	59,0	122	290	84,3	122
	430	87,5	182	420	122,1	177
	560	114,0	236	550	160,0	232
	700	**142,5**	296	**676**	**196,6**	285
ϕ25	302	64,0	114	302	91,5	114
	430	91,2	162	430	130,3	162
	570	120,9	214	570	172,7	214
	700	**148,4**	263	**700**	**212,1**	263

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 “$1,2*(d_0^2-d_s^2)*\pi*l_b/4$” for hammer drilling

Pre-calculated values[1] – overlap length

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

Rebar [mm]	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	19,0	21	220	21,3	17
	322	**21,9**	24	**226**	**21,9**	17
ϕ10	200	17,0	18	200	24,2	18
	270	22,9	24	230	27,9	21
	340	28,8	31	250	30,3	23
	403	**34,2**	36	**281**	**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	**49,2**	51	**338**	**49,1**	36
ϕ14	210	24,9	25	210	35,6	25
	330	39,2	40	270	45,8	33
	450	53,4	54	330	56,0	40
	564	**67,0**	68	**394**	**66,8**	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	**451**	**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
	700	**106,9**	106	**507**	**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
	700	**118,8**	148	**564**	**136,7**	120
ϕ22	330	61,6	93	330	88,0	93
	450	84,0	127	430	114,6	122
	580	108,2	164	520	138,6	147
	700	**130,6**	198	**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

Pre-calculated values[1] – overlap length

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

Rebar [mm]	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 $\alpha_5=0,7$		
	700	**142,5**	296	**676**	**196,6**	285
ϕ25	375	79,5	141	375	113,6	141
	480	101,8	181	480	145,4	181
	590	125,1	222	590	178,7	222
	700	**148,4**	263	**700**	**212,1**	263

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

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-HY 170: low displacements with long term stability, failure load after exposure above reference load.

Resistance to chemical substance

Chemical substance	Comment	Resistance
Sulphuric acid	23°C	+
Alkaline medium	pH = 13,2, 23°C	+

Setting information

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

Service temperature range
Hilti HIT-HY 170 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

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} 1)
-5 °C ≤ T_{BM} ≤ 0 °C a)	10 min	12 hours
0 °C ≤ T_{BM} ≤ 5 °C a)	10 min	5 hours
5 °C ≤ T_{BM} ≤ 10 °C	8 min	2,5 hours
10°C ≤ T_{BM} ≤ 20 °C	5 min	1,5 hours
20 °C ≤ T_{BM} ≤ 30 °C	3 min	45 min
30 °C ≤ T_{BM} ≤ 40 °C	2 min	30 min

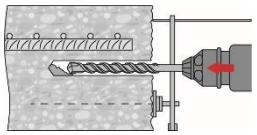
1) The curing time data are valid for dry base material only. In wet base material the curing times must be doubled.

Installation equipment

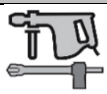
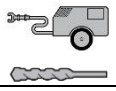
Rebar – size	ϕ8	ϕ10	ϕ12	ϕ14	ϕ16	ϕ18	ϕ20	ϕ22	ϕ24	ϕ25
Rotary hammer	TE2(-A) – TE30(-A)					TE40 – TE80				
Other tools	Blow out pump (h_{ef} ≤ 10·d)					-				
	Compressed air gun a) Set of cleaning brushes b), dispenser, piston plug									

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

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

Drilling method	Bar diameter [mm]	Minimum concrete cover c_{min} [mm]		
		Without drilling aid	With drilling aid	
Hammer drilling **(HD)**	ϕ < 25	30 + 0,06 · l_v ≥ 2 · ϕ	30 + 0,02 · l_v ≥ 2 · ϕ	
	ϕ ≥ 25	40 + 0,06 · l_v ≥ 2 · ϕ	40 + 0,02 · l_v ≥ 2 · ϕ	
Compressed air drilling **(CA)**	ϕ < 25	50 + 0,08 · l_v	50 + 0,02 · l_v	
	ϕ ≥ 25	60 + 0,08 · l_v ≥ 2 · ϕ	60 + 0,02 · l_v ≥ 2 · ϕ	

Drilling and cleaning parameteres

Rebar	Drilling			Cleaning		Installation
	Hammer drilling (HD)	Hollow Drill Bit (HDB)	Compressed air drilling (CA)	Brush HIT-RB	Air nozzle HIT-RB	Piston plug HIT-SZ
	d_0 [mm]			size [mm]		
						
ϕ8	10 a)	10 a)	-	10	10	10
	12	12	-	12	12	12
ϕ10	12 a)	12 a)	-	12	12	12
	14	14	-	14	14	14
ϕ12	14 a)	14 a)	-	14	14	14
	16	16	-	16	16	16
	-	-	17	18	16	16
ϕ14	18	18	-	18	18	18
	-	-	17	18	16	16
ϕ16	20	20	20	20	20	20
ϕ18	22	22	22	22	22	22
ϕ20	25	25	-	25	25	25
	-	-	26	28	25	25
ϕ22	28	28	28	28	28	28
ϕ24	32	32	32	32	32	32
ϕ25	32	32	32	32	32	32

a) Maximum installation length l=250 mm.

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

Rebar	Dispenser HDM 330, HDM 500, HDE 500
	$\ell_{v,max}$ [mm]
ϕ8 to ϕ16	1000
ϕ18 to ϕ25	700

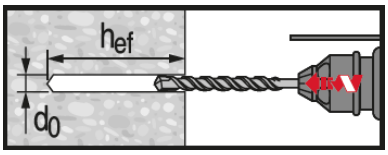
Setting instructions

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

Safety regulations.

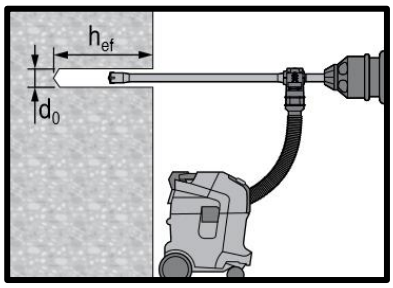
Review the Material Safety Data Sheet (MSDS) before use for proper and safe handling! Wear well-fitting protective goggles and protective gloves when working with Hilti HIT-HY 170.

Drilling



Hammer drilled hole

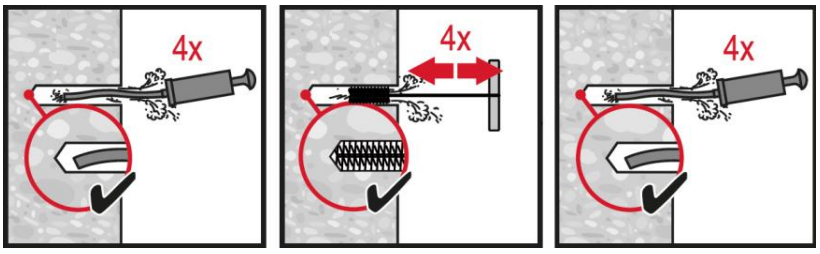
For dry and wet concrete.



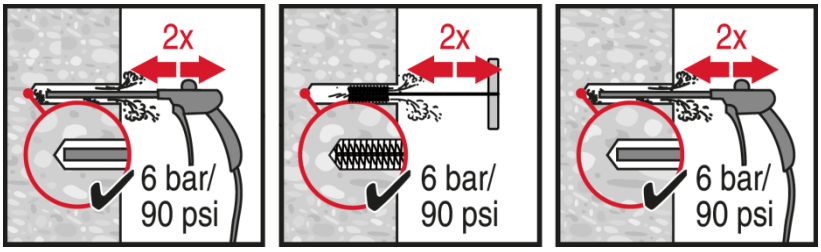
Hammer drilled hole with Hollow Drilled Bit (HDB)

No cleaning required.

Cleaning

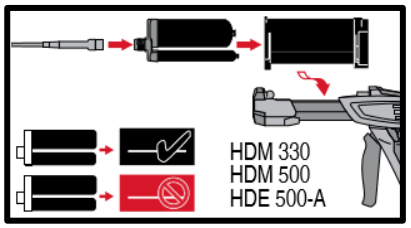


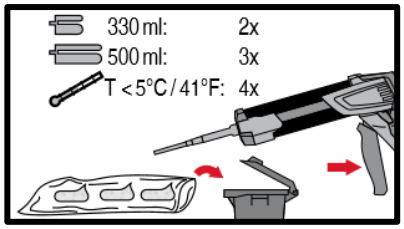
Manual cleaning (MC)
for drill diameters $d_0 \leq 20$ mm and drill hole depth $h_0 \leq 10 \cdot d$.



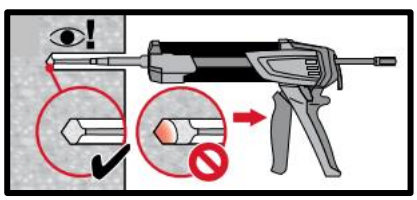
Compressed air cleaning (CAC)
for all drill hole diameters d_0 and drill hole depths $h_0 \leq 20 \cdot d$.

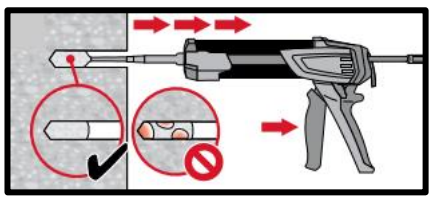
Injection system



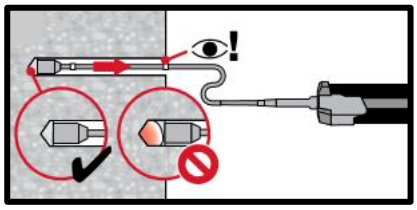


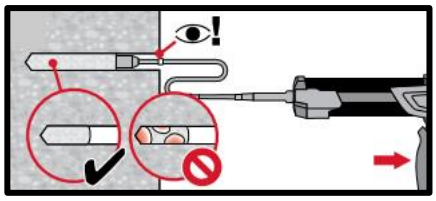
Injection system preparation.



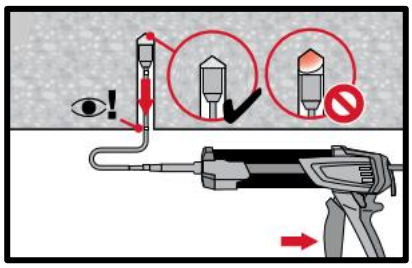


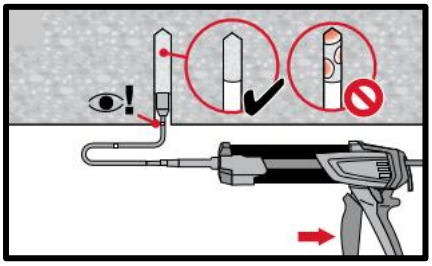
Injection method for drill hole depth $h_{ef} \leq 250$ mm.





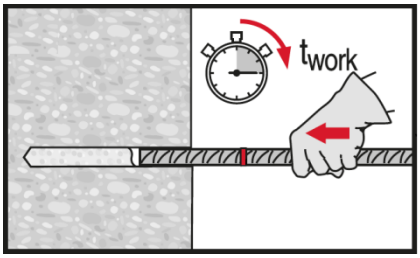
Injection method for drill hole depth h_{ef} > 250mm.

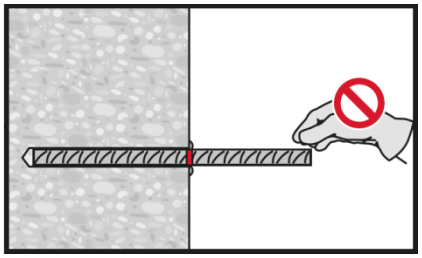




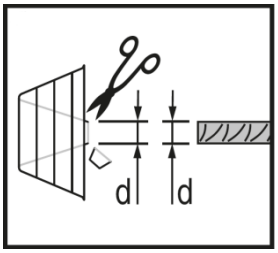
Injection method for overhead application.

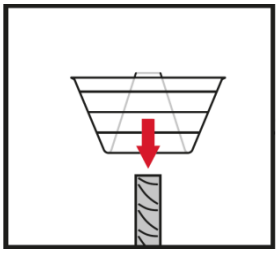
Setting the element

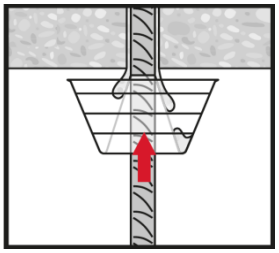


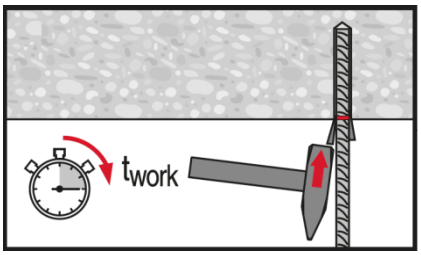


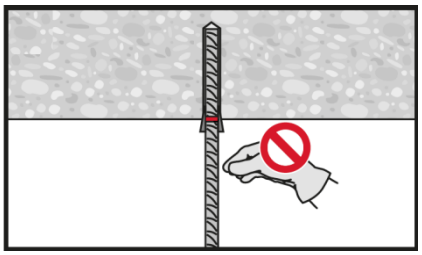
Setting element, observe working time "t_{work}".



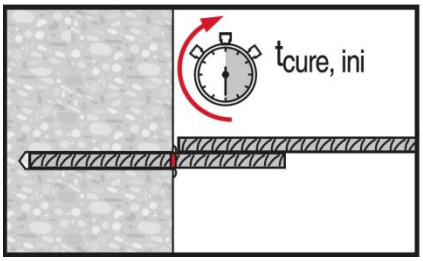


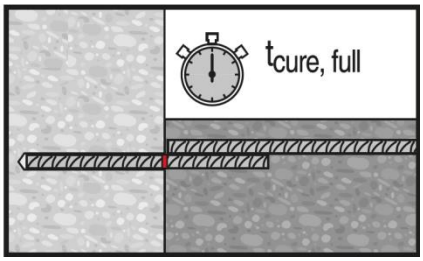






Setting element for overhead applications, observe working time "t_{work}".





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