Hybrid Injection System with ETA Assessment for Post-Installed Rebar

Use Conditions

- Installation in Reinforced and Un-reinforced Concrete C12/15 to C50/60. for Post Installed Rebar Ø8-32 mm
- For Hammer/Compressed Air drilled Holes
- Installation in Dry and Wet Holes
- Not to be installed in flooded holes.
- Fire Rated

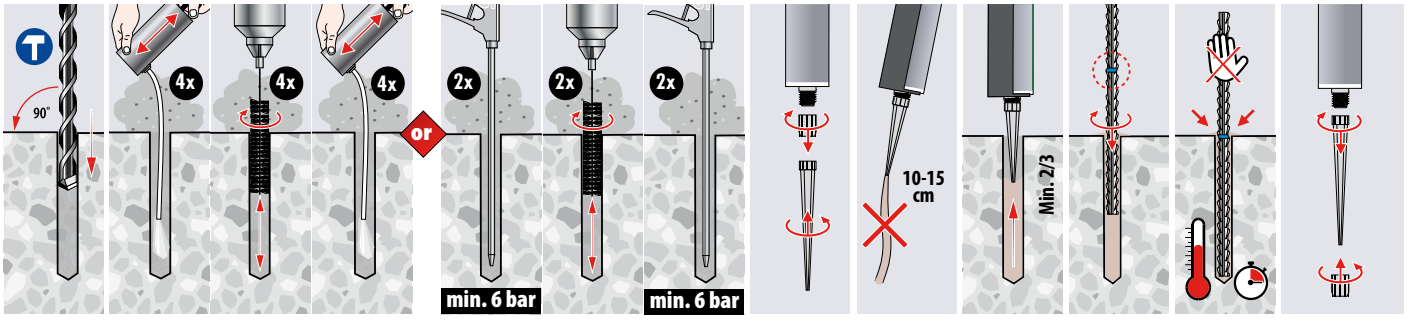
Typical Applications

- Infrastructure Construction (Roads, Viaducts, Harbours, High Rise Construction)

Approvals & Test Reports

ETA - 16/0962 | F120 | ETA - 16/0958 | C1 SEISMIC C1: M8 - M30/Ø8- 32 | ÉMISSIONS DANS L'AIR INTÉRIEUR A+ | C2 SEISMIC C2: M12 | LEED Tested

Installation Procedures



1) Blow out with Hand Pump for Bore Hole Diameter D_0 ≤20 mm, Bore Hole Depth h_0 ≤10 d_s only.

Curing Times[2)]

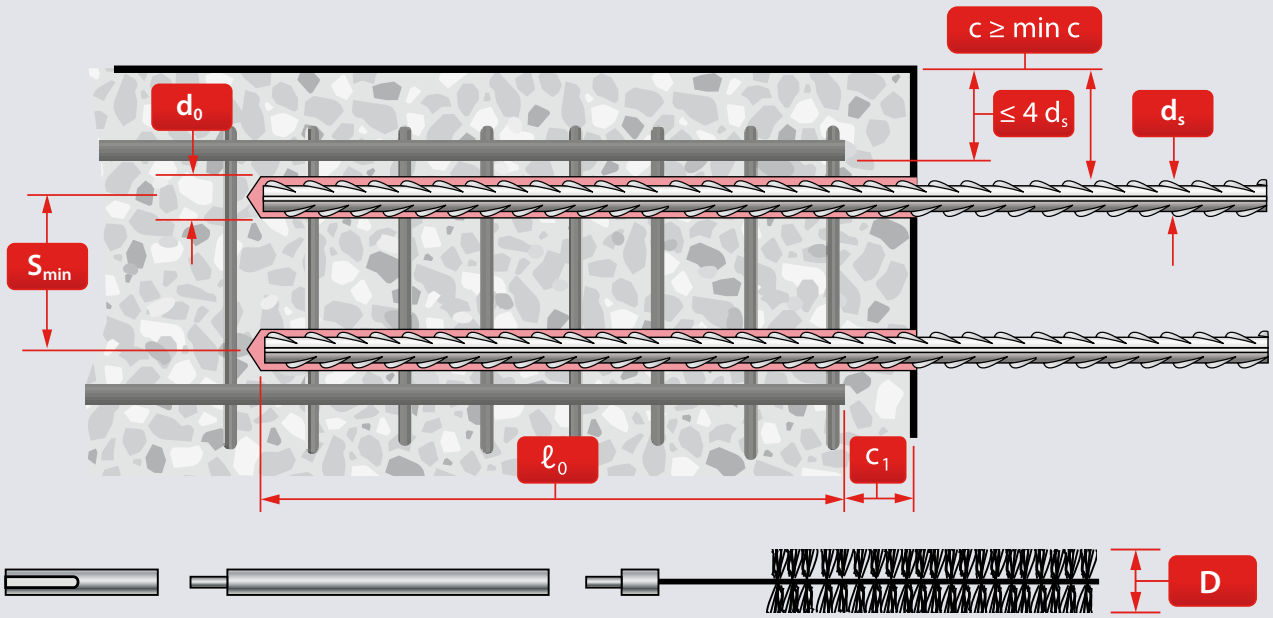
Temperature[3)]	°C	-5 to -1	0 to +4	+5 to +9	+10 to + 14	+15 to +19	+20 to +29	+30 to +40
Processing Time		50 min	25 min	15 min	10 min	6 min	3 min	2 min
Curing Time Dry Holes		5 h	3,5 h	2 h	1h	40 min	30 min	30 min
Curing Time Wet Holes		10 h	7 h	4 h	2h	80 min	60 min	60 min

2) Cartridge Temperature must be between +5°C and +40°C. 3) Concrete Temperature

Hybrid

ETA - 16/0962

Specification Data for the use in reinforced & unreinforced Concrete and Hammer/Air Drilled Holes according to EC2 and ETAG TR023



Installation Dimensions

Rebar Size	d_s		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Hole Diameter	d_0	[mm]	12	14	16	18	20	25	32	35	40
Min. Anchoring Length	$\ell_{b,min}$	[mm]	113	142	170	198	227	284	354	397	454
Min. Lap Length	$\ell_{0,min}$	[mm]	200	200	200	210	240	300	375	420	480
Design Anchoring Length	ℓ_{bd}	[mm]	378	473	567	662	756	945	1181	1323	1512
Max. Embedment Depth	ℓ_{max}	[mm]	1000	1000	1200	1400	1600	2000	2000	2000	2000
Min. Spacing	S_{min}	[mm]	50	50	60	70	80	100	125	140	160
Required Volume per cm Embedment Depth	V_s	[ml/cm]	0,75	0,90	1,06	1,21	1,36	2,12	3,76	4,16	5,43

Steel Brush & Piston Plug Dimensions

Rebar Size	d_s		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Brush Diameter	D	[mm]	14	16	18	20	22	27	34	37	41,5
Min. Brush Diameter	D_{min}	[mm]	12,5	14,5	16,5	18,5	20,5	25,5	32,5	35,5	40,5
Piston Plug	#	--		14	16	18	20	25	32	35	40

Performance Data[1)]

1) **Performance Data:** Loads in kN for a single Rebar Dowel in Compressed Air Cleaned Holes and Concrete C20/C25. Temperature 50°C/80°C for long/short term. No influence of Edge- or Center to Center Distances.
2) **Ultimate Bond Resistance:** Valid for all drilling methods for good conditions. For all other bond conditions multiply by 0.7
3) **Recommended Loads:** incl. Safety factor $\gamma_G = 1,4$.

Minimum Concrete Cover

Drilling Method		d_s [mm]	Without Drilling Guide [mm]	With Drilling Guide [mm]
Hammer Drilling	**HD**	<25	30 + 0,06·ℓv ≥ 2ds	30 + 0,02·ℓv ≥ 2ds
		=25	40 + 0,06·ℓv ≥ 2ds	40 + 0,02·ℓv ≥ 2ds
Compressed Air Drilling	**CD**	<25	50 + 0,08·ℓv	50 + 0,02·ℓv
		=25	60 + 0,08·ℓv	60 + 0,02·ℓv

Design Values of Ultimate Bond Resistance[2)] f_{bd} in N/mm²

Rebar	Concrete Class								
	C12/15	C16/20	C20-25	C25-30	C30/37	C35/45	C40/50	C45/55	C50/60
Ø8 - 32 mm	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3

Design Resistance Dry/Wet Holes

Rebar Size ▶ d_s	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
▼ Embedment Depth ℓ,b									
113	6,5								
142	8,2	10,3							
170	9,8	12,3	14,7						
190	11,0	13,7	16,5						
198	11,4	14,3	17,2	20,0					
213	12,3	15,4	18,5	21,5					
227	13,1	16,4	19,7	23,0	26,2				
255	14,7	18,4	22,1	25,8	29,5				
284	16,4	20,5	24,6	28,7	32,8	41,0			
298	17,2	21,5	25,8	30,1	34,5	43,1			
312	18,0	22,5	27,1	31,6	36,1	45,1			
340	19,7	24,6	29,5	34,4	39,3	49,1			
354	20,5	25,6	30,7	35,8	40,9	51,2	63,9		
397	21,9	28,7	34,4	40,2	45,9	57,4	71,7	80,3	
425		30,7	36,9	43,0	49,1	61,4	76,8	86,0	
454		32,8	39,4	45,9	52,5	65,6	82,0	91,9	105,0
468		33,8	40,6	47,3	54,1	67,6	84,5	94,7	108,2
482		34,1	41,8	48,8	55,7	69,7	87,1	97,5	111,4
520			45,1	52,6	60,1	75,1	93,9	105,2	120,2
532			46,1	53,8	61,5	76,9	96,1	107,6	123,0
595			49,2	60,2	68,8	86,0	107,5	120,4	137,6
681				66,9	78,7	98,4	123,0	137,8	157,5
728					84,2	105,2	131,5	147,3	168,3
800					87,4	115,6	144,5	161,9	185,0
932						134,7	168,4	188,6	215,5
1000						136,6	180,6	202,3	231,2
1100							198,7	222,6	254,3
1200							213,4	242,8	277,5
1400								267,7	323,7
1600									349,7
2000									
Nrd,s	21,9	34,1	49,2	66,9	87,4	136,6	213,4	267,7	349,7

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