



fischer epoxy mortar FIS EM Plus

The powerful injection mortar for rebar connections and cracked concrete



fischer FIS EM Plus

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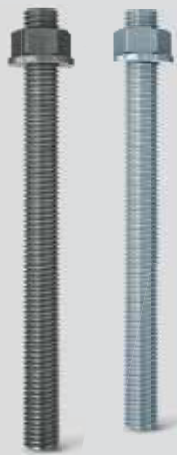


Optimized formulation for even
more power in concrete.

Assessment for seismic applications.

Anchor rod FIS A

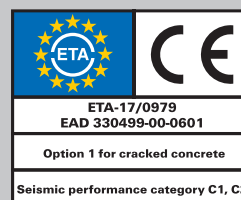
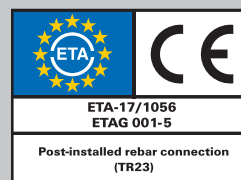
Available in galvanised
or stainless steel.



Your advantages at a glance

- The optimised formulation of the epoxy mortar FIS EM Plus leads to improved load values in cracked and non-cracked concrete.
- The mortar can be used for rebar connections from diameter 8 to 40 mm.
- With the threaded rod FIS A, the loads to be introduced can be designed variably by selecting the anchorage depth.
- Temporary and detachable fixing points are possible with the internal threaded anchor RG M I.
- FIS EM Plus is to be processed for use on site even at low temperatures down to 0 °C (outside of the evaluation even down to -5 °C).
- The mortar is approved for diamond-drilled and water-filled drill holes as well as seismic applications in performance categories C1, C2 and thus offers safety under extreme conditions.

Approvals



fischer FIS EM Plus Installation

Building materials



Approved for anchoring in:

- Concrete C20/25 to C50/60, cracked and non-cracked

Also suitable for:

- Natural stone with dense structure

Function

- The epoxy resin mortar FIS EM Plus combined with the FIS A threaded rod, is suitable for pre-positioned and push-through installation and with the internal threaded anchor RG M I for pre-positioned installation.
- Resin and hardener are stored in two separate chambers and are not mixed and activated until extrusion through the injection capsule in the static mixer.
- The mortar is injected bubble-free from the drill hole base.
- The mortar bonds the entire surface of the anchor with the drill hole wall and seals off the drill hole.
- The anchor is set manually by lightly rotating it until it reaches the drill hole base.
- During push-through installation, the annular gap between the anchor rod and attachment is filled with FIS EM Plus.



Threaded rod FIS A

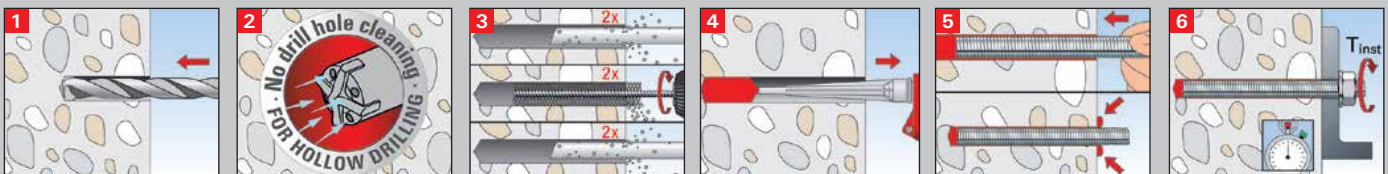
Processing and curing times

Temperature at anchoring base [°C]	- 5 to -1 ²⁾	0 to +4	+5 to +9	+ 10 to +19	+ 20 to +29	+ 30 to +40
Maximum processing time [minutes]	180	150	120	30	14	7
Minimum curing time ¹⁾ [hours]	200	90	40	18	10	5

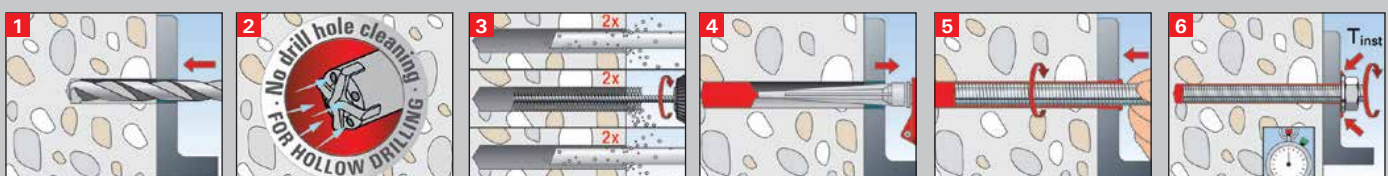
¹⁾ In damp concrete and water-filled drill holes, the curing time is to be doubled.

²⁾ Not covered by ETA

Pre-positioned installation

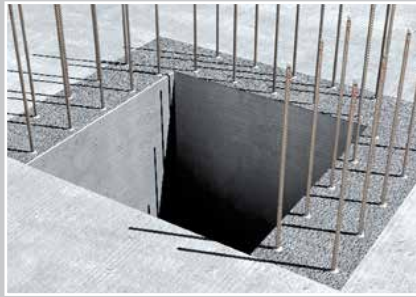
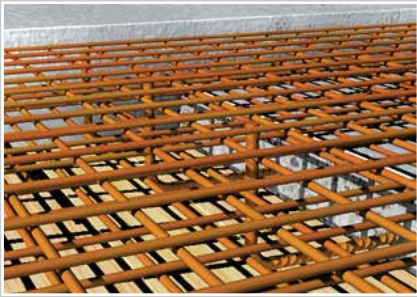


Push-through installation

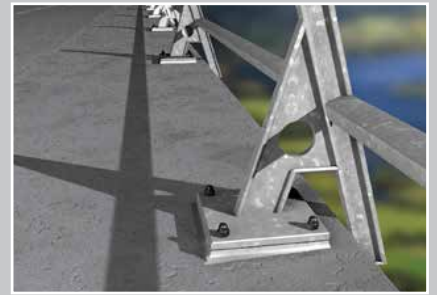


fischer FIS EM Plus Applications

Rebar connections



Rail fixings, sound barriers and railings



Shear connectors for concrete layers and needlings



Seismic applications, diamond-drilled and water-filled drill holes



fischer FIS EM Plus Assortment



FIS EM Plus 390 S



FIS EM Plus 585 S



FIS EM Plus 1500 S



FIS MR Plus

FIS UMR

Epoxy mortar FIS EM Plus

Type	Art.-No.	Approval			Languages on the cartridge	Content	Sales unit [pcs]
		DIBt	ETA	ICC			
FIS EM Plus 390 S	544154	●	■	▲	DE, EN, FR, NL, ES, PT	1 cartridge 390 ml + 2 x mixing nozzles FIS MR Plus	6
FIS EM Plus 585 S	544166	●	■	▲	DE, EN, FR, NL, ES, PT	1 cartridge 585 ml + 2 x mixing nozzles FIS UMR	6
FIS MR Plus	545853	–	–	–	–	10 mixing nozzles for FIS EM Plus 390 S	10



FIS DM S



FIS AM



FIS DM S-L



FIS DCD S



FIS DP S-L



FIS AP



FIS DP S-XL

Dispensers

Type	Art.-No.	Description	Sales unit [pcs]
FIS DM S	511118	Manual dispenser for FIS EM Plus 390 S	1
FIS AM	058000	Manual dispenser for FIS EM Plus 390 S	1
FIS DM S-L	510992	Manual dispenser for FIS EM Plus 585 S	1



Compressed air cleaning tool ABP



Centring wedge

Compressed air cleaning tool, blow-out pump and centring device

Type	Art.-No.	Description	Sales unit [pcs]
Compressed air cleaning gun ABP	59456	–	1
Centring device	093076	–	10



FIS A zinc-plated steel



FIS A stainless steel

Anchor rod FIS A for installation with FIS EM Plus

Type	Art.-No.			Drill hole diameter d_0 [mm]	Min. anchorage depth $h_{ef, min}$ [mm]	Max. usable length $t_{fix}, h_{ef, min}$ [mm]	Min. fill quantity FIS EM Plus $h_{ef, min}$ [scale units]	Max. anchorage depth $h_{ef, max}$ [mm]	Max. usable length $t_{fix}, h_{ef, max}$ [mm]	Max. fill quantity FIS EM Plus $h_{ef, max}$ [scale units]	Sales unit [pcs]
	Zinc-plated steel	Zinc-plated steel	Stainless steel								
	grade 5.8	grade 8.8	A4-70								
FIS A M 8 x 90	090274	519390	090440	10	60	19	2	78	1	3	10
FIS A M 8 x 110	090275	519391	090441	10	60	39	2	98	1	3	10
FIS A M 8 x 130	090276	519392	090442	10	60	59	2	118	1	4	10
FIS A M 8 x 175	090277	519393	090443	10	60	104	2	160	4	5	10
FIS A M 8 x 1000	509214	509222	509230	10	60	-	2	160	-	5	10
FIS A M 10 x 110	090278	-	090444	12	60	37	3	96	1	4	10
FIS A M 10 x 130	090279	-	090447	12	60	57	3	116	1	5	10
FIS A M 10 x 150	090281	517935	090448	12	60	77	3	136	1	5	10
FIS A M 10 x 170	044969	519395	044973	12	60	97	3	156	1	6	10
FIS A M 10 x 190	-	517936	519420	12	60	117	3	176	1	7	10
FIS A M 10 x 200	090282	519396	090449	12	60	127	3	186	1	7	10
FIS A M 10 x 1000*	509215	509223	509231	12	60	-	3	200	-	7	10
FIS A M 12 x 120	044971	519397	044974	14	70	34	3	103	1	5	10
FIS A M 12 x 140	090283	519398	090450	14	70	54	3	123	1	6	10
FIS A M 12 x 160	090284	517937	090451	14	70	74	3	143	1	7	10
FIS A M 12 x 180	090285	519399	090452	14	70	94	3	163	1	7	10
FIS A M 12 x 200	-	517938	519421	14	70	114	3	183	1	8	10
FIS A M 12 x 210	090286	-	090453	14	70	124	3	193	1	9	10
FIS A M 12 x 260	090287	-	090454	14	70	174	3	240	4	10	10
FIS A M 12 x 1000*	509216	509224	509232	14	70	-	3	240	-	10	10
FIS A M 16 x 130	044972	519400	044975	18	80	30	5	109	1	7	10
FIS A M 16 x 175	090288	519401	090455	18	80	75	5	154	1	10	10
FIS A M 16 x 200	090289	517939	090456	18	80	100	5	179	1	11	10
FIS A M 16 x 250	090290	517940	090457	18	80	150	5	229	1	14	10
FIS A M 16 x 300	090291	519402	090458	18	80	200	5	279	1	17	10
FIS A M 16 x 1000*	509217	509225	509233	18	80	-	5	320	-	19	10
FIS A M 20 x 245	090292	519404	090459	24	90	131	11	220	1	28	10
FIS A M 20 x 290	090293	519406	090460	24	90	176	11	265	1	32	10
FIS A M 20 x 1000*	-	519410	519427	24	90	-	11	400	-	48	10
FIS A M 24 x 290	090294	-	090468	28	96	165	15	260	1	39	5
FIS A M 24 x 380	090295	-	090462	28	96	255	15	350	1	52	5
FIS A M 30 x 340	090296	-	090463	35	120	185	28	304	1	67	5
FIS A M 30 x 430	090297	-	090464	35	120	275	28	394	1	88	5

* excluding nuts and washers - FIS A highly corrosion-resistant steel 1.4529 on request. Additional sizes on request.

fischer FIS EM Plus

Loads

Injection system FIS EM Plus: Injection resin FIS EM Plus with Threaded rod FIS A²⁾

zinc plated steel 5.8 / zinc plated steel 8.8 / stainless steel A4-70 / high corrosion resistant steel C-70

Permissible loads of a single anchor in cracked normal concrete (concrete tension zone) of strength clas C20/25 (~B25) ^{1) 3) 4) 8)}										Minimum spacings while reducing the load		
Type	Material fixing element	Min. member thickness	Effective anchorage depth	Maximum torque moment	Permissible tensile load	Permissible shear load	Required edge distance (with one edge) for		Required spacing for	Min. spacing	Min. edge distance	
							Max. tension load	Max. shear load				
		h_{min} [mm]	h_{ef} [mm]	T_{max} [Nm]	$N_{perm}^{5)}$ [kN]	$V_{perm}^{5)}$ [kN]	c [mm]	c [mm]	s_{cr} [mm]	$s_{min}^{6)}$ [mm]	$c_{min}^{6)}$ [mm]	
FIS A M 8	5.8	100	60	10	5,4	5,1	90	105	180	40	40	
		110	80		7,2		120	95				
		190	160		9,0		65	80				480
	8.8	100	60		5,4	8,6	90	185	180			
		110	80		7,2		120	170	240			
		190	160		13,8		115	480				
FIS A M 10	5.8	100	60	20	6,7	8,6	90	185	180	45	45	
		120	90		10,1		135	155				270
		230	200		13,8		70	110				600
	8.8	100	60		6,7	13,1	90	295	180			
		120	90		10,1		135	250	270			
		230	200		22,4		150	150	600			
FIS A M 12	5.8	100	70	40	10,0	12,0	105	255	210	55	45	
		140	110		17,8		165	195				330
		270	240		20,5		60	135				720
	8.8	100	70		10,0	19,4	105	435	210			
		140	110		17,8		165	340	330			
		270	240		32,4		145	200	720			
FIS A M 16	5.8	120	80	60	12,3	22,3	120	445	240	65	50	
		170	125		24,0		190	350				375
		360	320		37,6		95	195				960
	8.8	120	80		12,3	24,5	120	495	240			
		170	125		24,0		190	600	375			
		360	320		60,0		36,0	225	320			960

Permissible loads of a single anchor in cracked normal concrete (concrete tension zone) of strength class C20/25 (~B25) ^{1) 3) 4) 8)}										Minimum spacings while reducing the load	
Type	Material fixing element	Min. member thickness	Effective anchorage depth	Maximum torque moment	Permissible tensile load	Permissible shear load	Required edge distance (with one edge) for		Required spacing for	Min. spacing	Min. edge distance
		h_{min} [mm]	h_{ef} [mm]	T_{max} [Nm]	$N_{perm}^{5)}$ [kN]	$V_{perm}^{5)}$ [kN]	Max. tension load c [mm]	Max. shear load c [mm]	Max. Load S_{cr} [mm]	$s_{min}^{6)}$ [mm]	$c_{min}^{6)}$ [mm]
FIS A M 20	5.8	140	90	120	14,6	29,3	135	530	270	85	55
		220	170		38,0	34,9	255	455	510		
		450	400		58,6		115	260	1200		
	8.8	140	90		14,6	29,3	135	530	270		
		220	170		38,0	56,0	255	780	510		
		450	400		93,3		340	435	1200		
FIS A M 24	5.8	160	96	150	16,1	32,2	145	545	290	105	60
		270	210		52,2	50,9	315	590	630		
		540	480		84,3		160	330	1440		
	8.8	160	96		16,1	32,2	145	545	290		
		270	210		52,2	80,6	315	1005	630		
		540	480		134,3		475	570	1440		
FIS A M 27	5.8	170	108	200	19,2	38,5	165	610	325	120	75
		310	250		67,8	65,7	375	695	750		
		600	540		109,5		240	390	1620		
	8.8	170	108		19,2	38,5	165	610	325		
		310	250		67,8	105,1	375	1200	750		
		600	540		175,2		615	700	1620		
FIS A M 30	5.8	190	120	300	22,5	45,1	180	665	360	140	80
		350	280		80,3	80,6	420	795	840		
		670	600		133,8		300	440	1800		
	8.8	190	120		22,5	45,1	180	665	360		
		350	280		80,3	128,6	420	1375	840		
		670	600		213,8		725	805	1800		

*Also Available in Stainless Steel and High Corrosion Resistance Steel

For the design the complete assessment ETA-17/0979 has to be considered. ⁷⁾

¹⁾ The partial safety factors for material resistance as regulated in the ETA-17/0979 as well as a partial safety factor for load actions of $\gamma_L = 1,4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \cdot h_{ef}$ and an edge distance $c \geq 1,5 \cdot h_{ef}$. Accurate data see ETA-17/0979

²⁾ Also valid for anchor rod RG M in the same property class.

³⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

⁴⁾ Drill method hammer drilling resp. hollow drilling. For further allowable drill methods and application conditions see ETA-17/0979.

⁵⁾ For combinations of tensile loads and shear loads or for shear loads with lever arm (bending moments) as well as reduced edge distances or spacings (anchor groups) we recommend to use our anchor design software C-FIX.

⁶⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

⁷⁾ The given loads refer to the European Technical Assessment ETA-17/0979, issue date 06/04/2018. Design of the loads according to FprEN 1992-4:2017 and TR 055 (for static resp. quasi-static loads).

⁸⁾ A reinforcement in the concrete to prevent splitting is required. The width of the cracks has to be limited under consideration of the splitting forces at $w_k \sim 0,3\text{mm}$.

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