

## The versatile injection mortar for anchorings in masonry and cracked concrete



Rescue ladders



Column bases

### BUILDING MATERIALS

#### Approved for anchorings in:

- Concrete C20/25 to C50/60, cracked and non-cracked
- Hollow blocks made from lightweight concrete
- Hollow blocks made from concrete
- Vertically perforated brick
- Perforated sand-lime brick
- Solid sand-lime brick
- Aerated concrete
- Solid brick

#### Approved for:

- Rebar connections
- Remedial wall tie VBS 8
- Weather facing reconstruction system FWS II
- Stand-off installation Thermax

### CERTIFICATES



### ADVANTAGES

- The FIS V injection mortar has numerous system approvals, such as in cracked and non-cracked concrete, masonry and for special applications. FIS V is thus the universal injection mortar family with guaranteed reliability for practically all areas of application.
- FIS VW HIGH SPEED has a significantly shorter curing time than FIS V, thus also ensuring swift work progress even at low temperatures.
- FIS VS LOW SPEED with extended gelling time prevents premature curing of the mortar at higher temperatures and is ideally suited to large drill hole depths.
- The extensive range of accessories is ideally suited to the FIS V injection mortar family, increases the great flexibility of the system and thus allows for a broad range of applications.

### APPLICATIONS

#### Injection mortar for use with:

- Threaded rods FIS A, see page 142
- Internal threaded anchor RG MI, see page 160
- Rebar anchor FRA, see page 202
- Concrete steel bars, see page 212
- Injection anchor sleeves FIS H, see page 174
- Aerated concrete centring sleeve PBZ, see page 188
- Remedial wall tie VBS 8, see page 220
- Weather facing reconstruction system FWS II, see page 222
- Anchorings in waterfilled drill holes (only FIS V 4 10 C)

### FUNCTIONING

- The FIS V is a 2-component injection mortar based on vinyl ester hybrid.
- Resin and hardener are stored in two separate chambers and are not mixed and activated until extrusion through the static mixer.
- The injection cartridges are quick and easy to use with the fischer dispensers.
- Partially used cartridges can be reused, simply by changing the static mixer.

### FOR USE WITH



Equipment for concrete  
from page 142



Equipment for masonry  
from page 174



Equipment for special applications  
from page 222

## TECHNICAL DATA



Injection mortar **FIS V**



Injection mortar **FIS V 410 C**



Static mixer **FIS MR**

Item	Art.-No.	Approval			Languages on the cartridge	Scale unit	Contents	Sales unit
		DIBt	ETA	ICC				[pcs]
<b>FIS V 300 T</b>	<b>531573</b>	●	■	▲	USA, RA, BR, MEX	150	1 cartridge 300 ml, 2 x FIS MR	12
<b>FIS V 360 S</b>	<b>094404</b>	●	■	▲	D, F, NL, TR, H, UAE	180	1 cartridge 360 ml, 2 x FIS MR	6
<b>FIS V 360 S</b>	<b>094405</b>	●	■	▲	GB, I, P, E, PRC, JP	180	1 cartridge 360 ml, 2 x FIS MR	6
<b>FIS V 360 S</b>	<b>068435</b>	●	■	▲	DK, S, N, FIN, PL, GR	180	1 cartridge 360 ml, 2 x FIS MR	6
<b>FIS V 360 S</b>	<b>502283</b>	●	■	▲	LT, LV, EE, UA, RUS, KZ	180	1 cartridge 360 ml, 2 x FIS MR	6
<b>FIS V 360 S</b>	<b>043994</b>	●	■	▲	CZ, SK, PL, H, RO, RUS	180	1 cartridge 360 ml, 2 x FIS MR	6
<b>FIS V 410 C</b>	<b>521431</b>	●	■	▲	I, GB, D	200	1 cartridge 410 ml, 2 x FIS MR	16
<b>FIS V 410 C</b>	<b>534880</b>	●	■	▲	PL, LT, LV, EST, RUS	200	1 cartridge 410 ml, 2 x FIS MR	12
<b>FIS V 410 C</b>	<b>538131</b>	●	■	▲	USA, RA, BR, MEX	200	1 cartridge 410 ml, 2 x FIS MR	12
<b>FIS MR</b>	<b>096448</b>	—	—	—	—	—	10 static mixer	10

## TECHNICAL DATA



Injection mortar **FIS VW 360 S**



Injection mortar **FIS VW 300 T**



Static mixer **FIS MR**

Item	Art.-No.	Approval			Languages on the cartridge	Scale unit	Contents	Sales unit
		DIBt	ETA	ICC				[pcs]
<b>FIS VW 300 T</b>	<b>507793</b>	●	■	—	D, GB, HR, SLO, SRB, BG	150	1 cartridge 300 ml, 2 x FIS MR	12
<b>FIS VW 300 T</b>	<b>507795</b>	●	■	—	S, DK, N, CZ, SK, PL, RUS	150	1 cartridge 360 ml, 2 x FIS MR	12
<b>FIS VW 360 S</b>	<b>090753</b>	●	■	—	D, GB, F, I, NL, E	180	1 cartridge 360 ml, 2 x FIS MR	6
<b>FIS VW 360 S</b>	<b>043997</b>	●	■	—	CZ, SK, PL, H, RO, RUS	180	1 cartridge 360 ml, 2 x FIS MR	6
<b>FIS VW 360 S</b>	<b>502284</b>	●	■	—	RUS, LT, LV, EST, UA, KZ	180	1 cartridge 360 ml, 2 x FIS MR	6
<b>FIS VW 380 C</b>	<b>519328</b>	—	■	—	CZ, SK, PL	190	1 cartridge 380 ml, 2 x FIS MR	12
<b>FIS MR</b>	<b>096448</b>	—	—	—	—	—	10 static mixer	10

## TECHNICAL DATA



Injection mortar **FIS VS 150 C**



Injection mortar **FIS VS 300 T**



Static mixer **FIS MR**



Power-Injection **FIS VS 100 P**



Injection mortar **FIS VS 360 S**

Item	Art.-No.	Approval			Languages on the cartridge	Scale unit	Contents	Sales unit
		DIBt	ETA	ICC				[pcs]
<b>FIS VS 100 P</b>	<b>072525</b>	●	■	▲	D, GB, F, I, NL, E	50	1 cartridge 100 ml, 2 x FIS MR	6
<b>FIS VS 150 C</b>	<b>045302</b>	●	■	▲	D, GB, F, I, NL, E	70	1 cartridge 145 ml, 1 x FIS MR	6
<b>FIS VS 150 C Set</b>	<b>045303</b>	●	■	▲	D, GB, F, I, NL, E	70	Set for hollow bricks: 1 cartridge 145 ml, 2 x FIS MR, 6 x FIS H 16 x 85 K	6
<b>FIS VS 300 T</b>	<b>093180</b>	●	■	▲	D, GB, F, NL, E, P	150	1 cartridge 300 ml, 1 x FIS MR	12

## TECHNICAL DATA



Injection mortar **FIS VS 150 C**



Injection mortar **FIS VS 300 T**



Static mixer **FIS MR**



Power-Injection **FIS VS 100 P**



Injection mortar **FIS VS 360 S**

Item	Art.-No.	Approval			Languages on the cartridge	Scale unit	Contents	Sales unit
		DIBt	ETA	ICC				
<b>FIS VS 300 T</b>	<b>502285</b>	●	■	▲	RUS, LT, LV, EST, UA, KZ	150	1 cartridge 300 ml, 1 x FIS MR	[pcs] 12
<b>FIS VS 300 T</b>	<b>044102</b>	●	■	▲	CZ, SK, PL, H, RO, RUS, GR	150	1 cartridge 300 ml, 1 x FIS MR	12
<b>FIS VS 300 T</b>	<b>093226</b>	●	■	▲	PL, CZ, DK, N, S, FIN	150	1 cartridge 300 ml, 1 x FIS MR	12
<b>FIS VS 360 S</b>	<b>078664</b>	●	■	▲	GB, PRC, E, P, JP	180	1 cartridge 360 ml, 2 x FIS MR	6
<b>FIS MR</b>	<b>096448</b>	—	—	—	—	—	10 static mixer	10



**FIS V 360 S HWK small**



**FIS V 360 S HWK big**



**FIS V 360 S HWK big with dispenser FIS DM S**

Item	Art.-No.	Approval			Languages on the cartridge	Contents	Sales unit
		DIBt	ETA	ICC			
<b>FIS V 360 S HWK small</b>	<b>092430</b>	●	■	▲	D, F, NL, TR, H, UAE	10 cartridges 360 ml, 20 x FIS MR	[pcs] 1
<b>FIS V 360 S HWK big</b>	<b>091936</b>	●	■	▲	D, F, NL, TR, H, UAE	20 cartridges 360 ml, 40 x FIS MR	1
<b>FIS V 360 S HWK big</b>	<b>096554</b>	●	■	▲	GB, I, P, E, PRC, JP	20 cartridges 360 ml, 40 x FIS MR	1
<b>FIS V 360 S HWK big</b>	<b>503027</b>	●	■	▲	CZ, SK, PL, H, RO, RUS	12 cartridges 360 ml, 24 x FIS MR, 1 x dispenser FIS DM S	1



**FIS V 360 S in bucket**



**FIS V 410 C in bucket**

Item	Art.-No.	Approval			Languages on the cartridge	Contents	Sales unit
		DIBt	ETA	ICC			
<b>FIS V 360 S in bucket</b>	<b>503025</b>	●	■	▲	GB, I, P, E, PRC, JP	10 cartridges 360 ml, 20 x FIS MR	[pcs] 1
<b>FIS V 410 in bucket</b>	<b>531504</b>	●	■	—	GB, TR, RU	16 cartridge 410 ml, 32 x FIS MR	1



FIS VS 300 T in bucket



FIS VS 300 T HWK big

Item	Art.-No.	Approval			Languages on the cartridge	Contents	Sales unit
		DIBt	ETA	ICC			
FIS VS 300 T in bucket	518539	●	■	▲	CZ, SK, PL, H, RO, GR	20 cartridges 300 ml, 20 x FIS MR	1
FIS VS 300 T HWK big	517645	●	■	▲	D, GB, F, NL, E, P	20 cartridges 300 ml, 40 x FIS MR	1
FIS VS 300 T HWK small	518832	●	■	▲	D, GB, F, NL, E, P	10 cartridges 300 ml, 20 x FIS MR	1

### CURING TIME FIS V

Cartridge temperature (mortar)	Gelling time	Temperature at anchoring base	Curing time
		- 5°C - ± 0°C	24 hrs.
+ 0°C - + 5°C	13 min.	± 0°C - + 5°C	3 hrs.
+ 5°C - +10°C	9 min.	+ 5°C - +10°C	90 min.
+10°C - +20°C	5 min.	+10°C - +20°C	60 min.
+20°C - +30°C	4 min.	+20°C - +30°C	45 min.
+30°C - +40°C	2 min.	+30°C - +40°C	35 min.

The above times apply from the moment of contact between resin and hardener in the static mixer.

For installation, the cartridge temperature must be at least +5 °C. For longer installation times, i.e. when interruptions occur in work, the mixer should be replaced.

### CURING TIME FIS VW HIGH SPEED

Cartridge temperature (mortar)	Gelling time	Temperature at anchoring base	Curing time
		-15°C - -10°C <sup>1)</sup>	12 hrs.
		-10°C - - 5°C <sup>1)</sup>	8 hrs.
- 5°C - ± 0°C <sup>1)</sup>	5 min.	- 5°C - ± 0°C	3 hrs.
0°C - + 5°C	5 min.	± 0°C - + 5°C	90 min.
+ 5°C - +10°C	3 min.	+ 5°C - +10°C	45 min.
+10°C - +20°C	1 min.	+10°C - +20°C	30 min.

<sup>1)</sup> Without approval.

The above times apply from the moment of contact between resin and hardener in the static mixer.

For installation, the cartridge temperature must be at least +5 °C. For longer installation times, i.e. when interruptions occur in work, the mixer should be replaced.

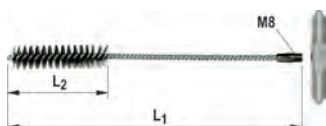
### CURING TIME FIS VS LOW SPEED

Cartridge temperature (mortar)	Gelling time	Temperature at anchoring base	Curing time
		± 0°C - + 5°C	6 hrs.
+ 5°C - +10°C	20 min.	+ 5°C - +10°C	3 hrs.
+10°C - +20°C	10 min.	+10°C - +20°C	2 hrs.
+20°C - +30°C	6 min.	+20°C - +30°C	60 min.
+30°C - +40°C	4 min.	+30°C - +40°C	30 min.

The above times apply from the moment of contact between resin and hardener in the static mixer.

For installation, the cartridge temperature must be at least +5 °C. For longer installation times, i.e. when interruptions occur in work, the mixer should be replaced.

## ACCESSORIES DRILL HOLE CLEANING



Cleaning brush **BS**

Item	Art.-No.	Length L <sub>1</sub> [mm]	Length L <sub>2</sub> [mm]	Brush diameter [mm]	For drill diameter [mm]	Sales unit [pcs]
<b>BS ø 8</b>	<b>078177</b>	120	50	9	8	1
<b>BS ø 10</b>	<b>078178</b>	120	50	11	10	1
<b>BS ø 12</b>	<b>078179</b>	150	80	13	12	1
<b>BS ø 14</b>	<b>078180</b>	250	80	16	14	1
<b>BS ø 16/18</b>	<b>078181</b>	250	80	20	16/18	1
<b>BS ø 20/22</b>	<b>052277</b>	180	80	25	20/22	1
<b>BS ø 24</b>	<b>078182</b>	300	100	26	24	1
<b>BS ø 25</b>	<b>097806</b>	300	100	27	25	1
<b>BS ø 28</b>	<b>078183</b>	350	100	30	28	1
<b>BS ø 35</b>	<b>078184</b>	400	100	40	30/32/35	1
<b>FIS brush extension</b>	<b>508791</b>	410	-	-	-	1
<b>SDS Chuck</b>	<b>530332</b>	-	-	-	-	1

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Chemical fixings



Compressed-air cleaning tool **ABP**



Blow-out pump **AB G**

Item	Art.-No.	Match	Sales unit [pcs]
<b>Compressed-air cleaning tool ABP</b>	<b>059456</b>	FIS A M 16 - M 30	1
<b>Blow-out pump AB G</b>	<b>089300</b>	-	1

## DISPENSER



Dispenser **FIS DM S**



Dispenser **FIS AM**



Cordless dispenser **FIS DC S**

Item	Art.-No.	Adapted for	Performance data	Sales unit [pcs]
<b>FIS DM S</b>	<b>511118</b>	FIS V 360 S, FIS HB 345 S, FIS HB 150 C, FIS EM 390 S, FIS VS 150 C, FIS P 360 S, FIS P 300 T, FIS SB 390 S, FIS PM 360 S, FIS VL 300 T and 1K-cartridges	-	1
<b>FIS AM</b>	<b>058000</b>	FIS V 360 S, FIS HB 345 S, FIS HB 150 C, FIS EM 390 S, FIS VS 150 C, FIS VW 360 S, FIS P 360 S, FIS P 300 T, FIS SB 390 S, FIS PM 360 S, FIS VL 300 T and 1K-cartridges	-	1
<b>FIS DC S</b>	<b>513423</b>	FIS V 360 S, FIS HB 345 S, FIS EM 390 S, FIS VS 300 T, FIS P 300 T, FIS SB 390 S, FIS PM 360 S, FIS VL 300 T and 1K-cartridges	Feed speed can be set from 120 - 240 mm/min Content: 1 dispenser 1 battery pack 10,8 V // 1,5 Ah // Li-ION 1 charger 10,8 V // 230 V with Euro plug	1
<b>Battery Pack</b>	<b>513425</b>	FIS DC S	Battery pack 10,8 V // 1,5 Ah // Li-ION	1





Pneumatic dispenser **FIS AP**



Dispenser **KP M2**

Item	Art.-No.	Adapted for	Performance data	Sales unit [pcs]
<b>FIS AP</b>	<b>058027</b>	FIS V 360 S, FIS HB 345 S, FIS HB 150 C, FIS EM 390 S, FIS VS 150 C, FIS VW 360 S, FIS P 360 S, FIS P 300 T, FIS SB 390 S, FIS PM 360 S, FIS VL 300 T and 1K-cartridges	Recommended pressure 6 bar air consumption max. 40 l/min	1
<b>KP M2</b>	<b>053117</b>	FIS VS 150 C, FIS HB 150 C, FIS VS 300 T, FIS VW 300 T, FIS P 300 T, FIS P Plus 380 C, FIS V 410 C, FIS VL 300 T and 1K-cartridges	–	1



Dispenser **FIS AC**

Item	Art.-No.	Adapted for	Sales unit [pcs]
<b>FIS AC</b>	<b>096497</b>	FIS P 380 C, FIS V 410 C, FIS P Plus 380 C, FIS VL 410 C	1

## ACCESSORIES



Injection adapter  
for drill Ø 12 - 25 mm



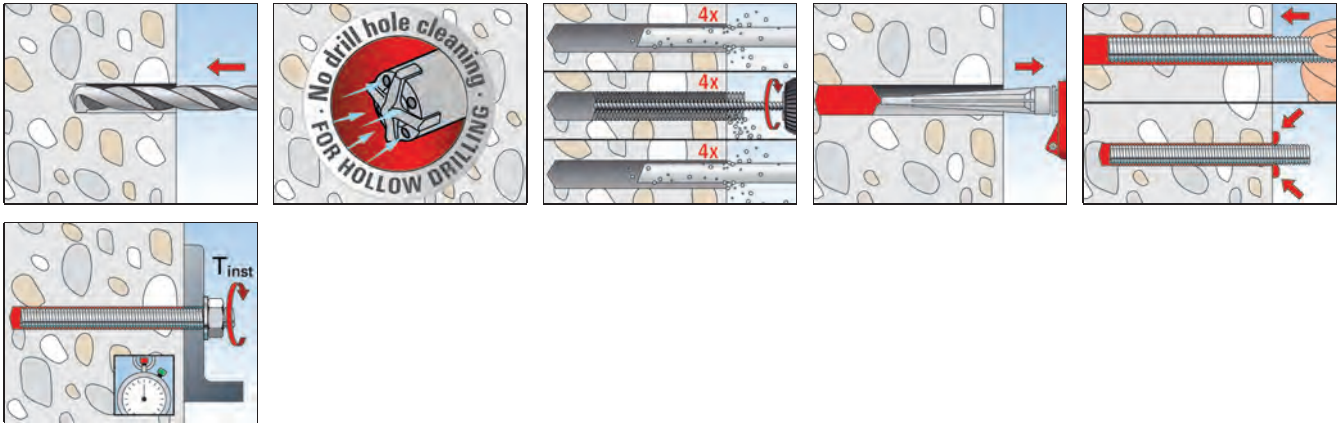
Injection adapter  
for drill Ø 30 - 55 mm



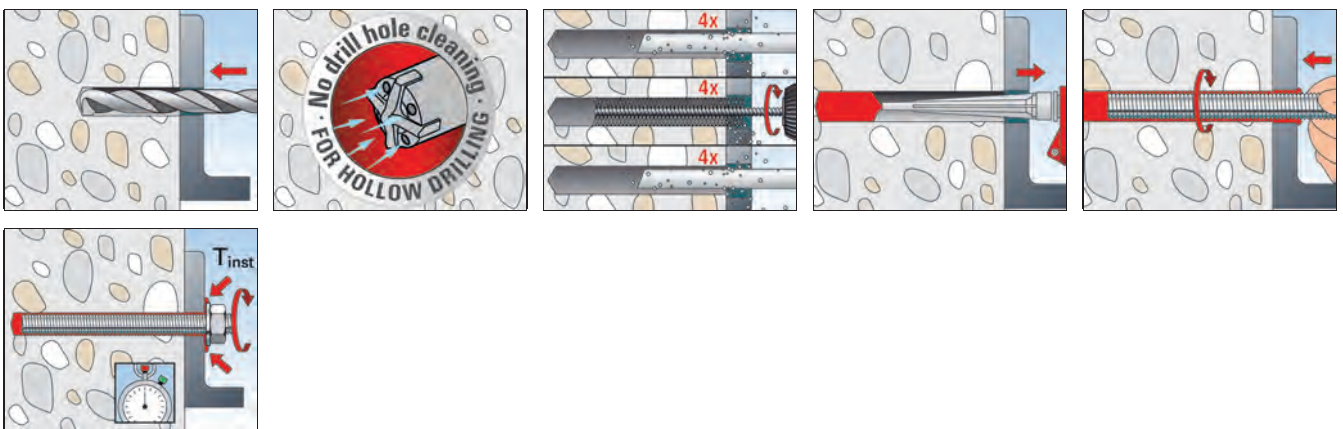
Extension tube

Item	Art.-No.	Colour	Length [mm]	Sales unit [pcs]
<b>Injection-adapter (Ø 9) for drill-Ø 12 mm</b>	<b>001497</b>	ecru	-	10
<b>Injection-adapter (Ø 9 for drill-Ø 14 mm</b>	<b>001498</b>	blue	-	10
<b>Injection-adapter (Ø 9) for drill-Ø 18 mm</b>	<b>001483</b>	yellow	-	10
<b>Injection-adapter (Ø 9) for drill-Ø 24 mm</b>	<b>520944</b>	transparent	-	10
<b>Injection-adapter (Ø 15) for drill-Ø 24 mm</b>	<b>520945</b>	transparent	-	10
<b>Injection-adapter (Ø 9) for drill-Ø 28 mm</b>	<b>520946</b>	transparent	-	10
<b>Injection-adapter (Ø 15) for drill-Ø 28 mm</b>	<b>520947</b>	transparent	-	10
<b>Injection-adapter (Ø 9) for drill-Ø 35 mm</b>	<b>090699</b>	brown	-	10
<b>Injection-adapter (Ø 15) for drill-Ø 35 mm</b>	<b>090701</b>	brown	-	10
<b>FIS Extension tube</b>	<b>048983</b>	-	1000	10
<b>FIS EXT Ø 15</b>	<b>530800</b>	transparent	10000	1

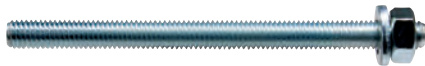
## PRE-POSITIONED INSTALLATION WITH FIS V



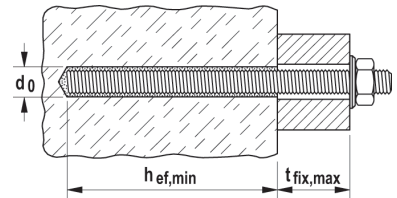
## PUSH-THROUGH INSTALLATION WITH FIS V



**TECHNICAL DATA**



Threaded rod FIS A



Item	zinc plated, steel grade 5.8	zinc plated, steel grade 8.8	stainless steel	Approval		Drill hole diameter $d_0$ [mm]	Min. / max. anchorage depth FIS V [mm]	Min. / max. usable length FIS V [mm]	Min. / max. filling quantity FIS V [scale units]	Sales unit [pcs]
	Art.-No.	Art.-No.	Art.-No.	ETA	ICC					
	gvz	gvz	A4							
FIS A M 6 x 70	046204	—	—	■	—	8	50/61	1/12	2	10
FIS A M 6 x 75	090243	—	090437	■	—	8	50/66	1/17	2	20
FIS A M 6 x 85	090272	—	—	■	—	8	50/72	5/27	2	20
FIS A M 6 x 110	090273	—	090439	■	—	8	50/72	30/52	2	20
FIS A M 8 x 90	090274	519390	090440	■	▲	10	60/78	1/19	2 / 3	10
FIS A M 8 x 110	090275	519391	090441	■	▲	10	60/98	1/39	2 / 3	10
FIS A M 8 x 130	090276	519392	090442	■	▲	10	60/118	1/59	2 / 4	10
FIS A M 8 x 175	090277	519393	090443	■	▲	10	60/160	4/104	2 / 5	10
FIS A M 8 x 1000	509214 1)	509222 1)	509230 1)	■	▲	10	60/160	—	2 / 5	10
FIS A M 10 x 110	090278	—	090444	■	▲	12	60/96	1/37	3 / 4	10
FIS A M 10 x 130	090279	—	090447	■	▲	12	60/116	1/57	3 / 5	10
FIS A M 10 x 130	—	524170	—	■	▲	12	60/116	1/57	3 / 5	10
FIS A M 10 x 150	090281	517935	090448	■	▲	12	60/136	1/77	3 / 5	10
FIS A M 10 x 170	044969	519395	044973	■	▲	12	60/156	1/97	3 / 6	10
FIS A M 10 x 190	—	517936	—	■	▲	12	60/176	1/117	3 / 7	10
FIS A M 10 x 200	090282	519396	090449	■	▲	12	60/186	1/127	3 / 7	10
FIS A M 10 x 1000	509215 1)	509223 1)	509231 1)	■	▲	12	60/200	—	3 / 7	10
FIS A M 12 x 120	044971	519397	044974	■	▲	14	70/103	1/34	3 / 5	10
FIS A M 12 x 140	090283	519398	090450	■	▲	14	70/123	1/54	3 / 6	10
FIS A M 12 x 160	090284	517937	090451	■	▲	14	70/143	1/74	3 / 7	10
FIS A M 12 x 180	090285	519399	090452	■	▲	14	70/163	1/94	3 / 7	10
FIS A M 12 x 200	—	517938	—	■	▲	14	70/183	1-114	3 / 8	10
FIS A M 12 x 210	090286	—	090453	■	▲	14	70/193	1/124	3 / 9	10
FIS A M 12 x 260	090287	—	090454	■	▲	14	70/240	4/174	3 / 10	10
FIS A M 12 x 1000	509216 1)	509224 1)	509232 1)	■	▲	14	70/240	—	3 / 10	10
FIS A M 16 x 130	044972	519400	044975	■	▲	18	80/109	1/30	5 / 7	10
FIS A M 16 x 175	090288	519401	090455	■	▲	18	80/154	1/75	5 / 10	10
FIS A M 16 x 200	090289	517939	090456	■	▲	18	80/179	1/100	5 / 11	10
FIS A M 16 x 250	090290	517940	090457	■	▲	18	80/229	1/150	5 / 14	10
FIS A M 16 x 300	090291	519402	090458	■	▲	18	80/279	1/200	5 / 17	10
FIS A M 16 x 1000	509217 1)	509225 1)	509233 1)	■	▲	18	80-320	—	5 / 19	10
FIS A M 20 x 245	090292	519404	090459	■	▲	24	90/220	1/131	11/28	10
FIS A M 20 x 290	090293	519406	090460	■	▲	24	90/265	1/176	11/32	10
FIS A M 20 x 1000	—	519410 1)	519427 1)	■	▲	24	90/400	—	11/48	10
FIS A M 24 x 290	090294	—	090461	■	▲	28	96/260	1/165	15/69	5
FIS A M 24 x 380	090295	—	090462	■	▲	28	96/350	1/255	15/52	5

1) Order washer and nut separately.

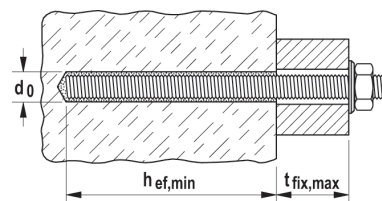
FIS A M 6 x ... : ETA-Approval in combination with FIS V, FIS VW, FIS VS



## TECHNICAL DATA



Threaded rod FIS A



Item	zinc plated, steel grade 5.8	zinc plated, steel grade 8.8	stainless steel	Approval		Drill hole diameter	Min. / max. anchorage depth FIS V	Min. / max. usable length FIS V	Min. / max. filling quantity FIS V	Sales unit
	Art.-No.	Art.-No.	Art.-No.	ETA	ICC	$d_0$ [mm]	[mm]	[mm]	[scale units]	[pcs]
	gvz	gvz	A4							
<b>FIS A M 24 x 1000</b>	<b>533881</b>	—	—	■	▲	28	96/480	-	15/69	10
<b>FIS A M 30 x 430</b>	<b>090297</b>	—	<b>090464</b>	■	▲	35	120/394	1/275	28/88	5

1) Order washer and nut separately.

FIS A M 6 x ... : ETA-Approval in combination with FIS V, FIS VW, FIS VS

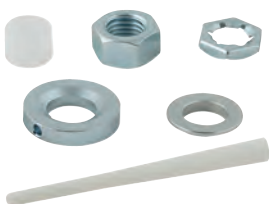
## TECHNICAL DATA



Hexagonal nut and washer

Item	zinc plated, steel grade 8.8	stainless steel	Width across nut	Washer (outer diameter x thickness)	Match	Sales unit
	Art.-No.	Art.-No.	$\circ$ SW [mm]	[mm]		[pcs]
	gvz	A4				
<b>Nut &amp; washer M8</b>	<b>510509</b>	<b>510513</b>	13	16 x 1,6	FIS A M8	50
<b>Nut &amp; washer M10</b>	<b>510510</b>	<b>510514</b>	17	20 x 2	FIS A M10	50
<b>Nut &amp; washer M12</b>	<b>510511</b>	<b>510515</b>	19	24 x 2,5	FIS A M12	25
<b>Nut &amp; washer M16</b>	<b>510512</b>	<b>510516</b>	24	30 x 3	FIS A M16	20
<b>Nut &amp; washer M20</b>	<b>519737</b>	<b>519738</b>	30	37 x 3	FIS A M20	10

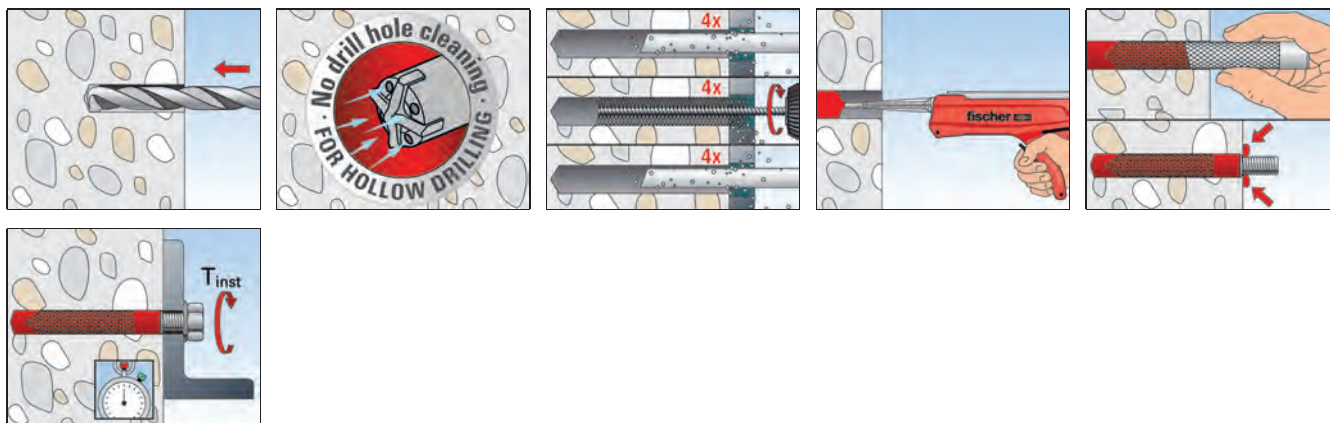
## TECHNICAL DATA



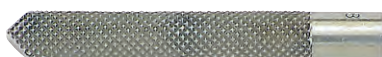
Dynamic Sets for subsequent filling of the annular gap

Item	Art.-No.	For use with injection mortar	Match	Sales unit [pcs]
<b>Dyn-Set M 12</b>	<b>537218</b>	FIS SB, FIS EM, FIS V	FIS A M 12	10
<b>Dyn-Set M 16</b>	<b>537219</b>	FIS SB, FIS EM, FIS V	FIS A M 16	10
<b>Dyn-Set M 20</b>	<b>537220</b>	FIS SB, FIS EM, FIS V	FIS A M 20	10

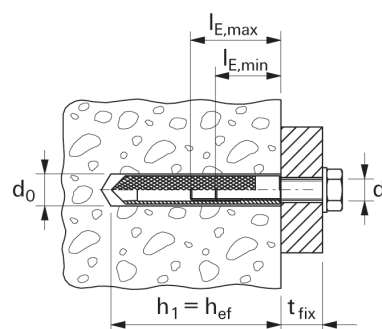
## INSTALLATION WITH FIS V



## TECHNICAL DATA



Internal threaded anchor **RG M I**



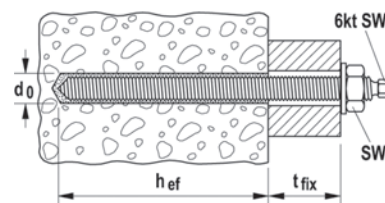
	zinc-plated steel	stainless steel	Approval	Drill hole diameter	Min. bolt penetration	Max. bolt penetration	Fill quantity	Sales unit
	Art.-No.	Art.-No.	ETA	$d_0$ [mm]	$l_{E,min}$ [mm]	$l_{E,max}$ [mm]	[scale units]	[pcs]
Item	gvz	A4						
<b>RG 8 x 75 M 5 I</b>	048221 <sup>1)</sup>	—	—	10	8	14	3	10
<b>RG 10 x 75 M 6 I</b>	048222 <sup>1)</sup>	—	—	12	10	16	3	10
<b>RG 12 x 90 M 8 I</b>	050552 <sup>1)</sup>	050565 <sup>1)</sup>	■	14	8	18	3	10
<b>RG 16 x 90 M 10 I</b>	050553 <sup>1)</sup>	050566 <sup>1)</sup>	■	18	10	23	4	10
<b>RG 18 x 125 M 12 I</b>	050562 <sup>1)</sup>	050567 <sup>1)</sup>	■	20	12	26	6	10
<b>RG 22 x 160 M 16 I</b>	050563 <sup>1)</sup>	050568 <sup>1)</sup>	■	24	16	35	8	5
<b>RG 28 x 200 M 20 I</b>	050564 <sup>1)</sup>	050569 <sup>1)</sup>	■	32	20	45	24	5

1) Setting tool is included in each package.

## TECHNICAL DATA



Threaded rod **RG M**



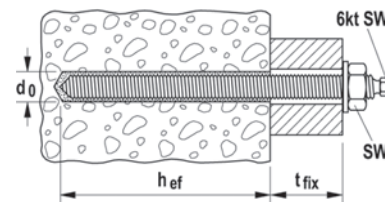
	zinc plated, steel grade 5.8	zinc plated, steel grade 8.8	stainless steel	Approval	Drill hole diameter	Effect. anchorage depth	Max. fixture thickness	Hexagon drive	Hexagon nut	Fits capsules	Sales unit
	Art.-No.	Art.-No.	Art.-No.	ETA	$d_0$ [mm]	$h_{ef}$ [mm]	$t_{fix}$ [mm]	6kt SW [mm]	○SW [mm]		[pcs]
Item	gvz	gvz	A4								
RG M 8 x 110	050256	—	050263	■	10	80	14	5	13	539796 RM II 8	10
RG M 8 x 150	095698	519443	050293	■	10	80	54	5	13	539796 RM II 8	10
RG M 10 x 130	050257	—	050264	■	12	90	20	7	17	539797 RM II 10	10
RG M 10 x 165	050280	—	050294	■	12	90	55	7	17	539797 RM II 10	10
RG M 10 x 190	050281	—	050296	■	12	90	80	7	17	539797 RM II 10	10
RG M 10 x 220	—	519444	—	■	12	90	110	7	17	539797 RM II 10	10
RG M 10 x 250	095703	—	095701	■	12	90	140	7	17	539797 RM II 10	10
RG M 10 x 350	—	—	095709	■	12	90	240	7	17	539797 RM II 10	10
RG M 10 x 350	095718	—	—	■	12	90	240	—	17	539797 RM II 10	10
RG M 12 x 160	050258	—	050265	■	14	110	26	8	19	539798 RM II 12	10
RG M 12 x 200	—	—	050576	■	14	110	26	8	19	539798 RM II 12	10
RG M 12 x 220	050283	—	050297	■	14	110	86	8	19	539798 RM II 12	10
RG M 12 x 250	050284	—	095702	■	14	110	116	8	19	539798 RM II 12	10
RG M 12 x 300	050285	—	095705	■	14	110	166	8	19	539798 RM II 12	10
RG M 12 x 380	095720 2)	—	095710 1)	■	14	110	246	8	19	539798 RM II 12	10
RG M 14 x 170	050286	—	—	—	16	120	38	10	22	539799 RM II 14	10
RG M 16 x 165	050287	—	095704	■	18	125	8	12	24	539800 RM II 16	10
RG M 16 x 190	050259	—	050266	■	18	125	33	12	24	539800 RM II 16	10
RG M 16 x 250	050288	—	050298	■	18	125	93	12	24	539800 RM II 16	10
RG M 16 x 270	—	519446	—	■	18	125	113	12	24	539800 RM II 16	10
RG M 16 x 300	050289	—	050299	■	18	125	143	12	24	539800 RM II 16	10
RG M 16 x 380	095722 2)	—	095712 1)	■	18	125	223	—	24	539800 RM II 16	10
RG M 16 x 500	095723 2)	—	095713 1)	■	18	125	343	—	24	539800 RM II 16	10
RG M 20 x 260	050260	—	050267	■	25	170	54	12	30	539802 RM II 20/22	10
RG M 20 x 290	—	519447	—	■	25	170	84	12	30	539802 RM II 20/22	10
RG M 20 x 350	095707	—	095706	■	25	170	124	12	30	539802 RM II 20/22	10
RG M 20 x 500	095725 1)	—	—	■	25	170	294	—	30	539802 RM II 20/22	10
RG M 22 x 280	512252	—	—	—	30	190	65	—	32	539802 RM II 20/22	5
RG M 24 x 295	—	519448 1)	—	■	28	210	56	—	36	539803 RM II 24	10
RG M 24 x 300	050261 1)	—	050268 1)	■	28	210	61	—	36	539803 RM II 24	10
RG M 24 x 400	095727 1)	—	095715 1)	■	28	210	161	—	36	539803 RM II 24	10
RG M 24 x 600	095728	—	—	■	28	210	361	—	36	539803 RM II 24	5

1) Straight cut, additional setting tool required

2) Straight cut, setting tool is enclosed.



Threaded rod **RG M**



	highly corrosion resistant steel	hot-dip galva- nised steel	Approval	Drill hole diameter	Effect. ancho- rage depth	Max. fixture thickness	Hexagon drive	Hexagon nut	Fits capsules	Sales unit
	Art.-No.	Art.-No.	ETA	$d_0$ [mm]	$h_{ef}$ [mm]	$t_{fix}$ [mm]	6kt SW [mm]	○SW [mm]		[pcs]
Item	C	fvz								
RG M 10 x 130	096217	—	■	12	90	20	7	17	539797 RM II 10	10
RG M 12 x 160	096218	512247	■	14	110	25	8	19	539798 RM II 12	10
RG M 16 x 165	—	537062	■	18	125	8	12	24	539800 RM II 16	10
RG M 16 x 190	096219	512250	■	18	125	35	12	24	539800 RM II 16	10

## LOADS

### Injection system FIS V: Injection mortar FIS V with Threaded rod FIS A <sup>1)</sup>

zinc plated steel / stainless steel / high corrosion resistant steel

Permissible loads of a single anchor in cracked normal concrete (concrete tension zone) of strength class C20/25 (~B25) <sup>2) 3) 4) 5) 11)</sup>										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 c	Max. shear load c				Max. Load s <sub>cr</sub>	s <sub>min</sub> <sup>8) 9)</sup>	c <sub>min</sub> <sup>8) 9)</sup>	
		h <sub>min</sub> [mm]	h <sub>ef</sub> <sup>6)</sup> [mm]	T <sub>max</sub> [Nm]	N <sub>perm</sub> <sup>7)</sup> [kN]	V <sub>perm</sub> <sup>7)</sup> [kN]	[mm]	[mm]	[mm]	[mm]	[mm]				
FIS A M 10	5.8	100	60	20	5,4	8,6	90	185	180	45	45				
		120	90		8,1		125	155	270						
		230	200		13,8		85	110	600						
	8.8	100	60		5,4	10,8	90	235	180						
		120	90		8,1	13,3	125	255	270						
		230	200		18,0		150	600							
	A4-70	100	60		5,4		9,3	90	200			180			
		120	90		8,1	125		170	270						
		230	200		15,5	100		115	600						
	C-70	100	60		5,4	10,8	90	235	180						
		120	90		8,1	11,6	125	220	270						
		230	200		18,0		140	600							
FIS A M 12	5.8	100	70	40	7,5		12,0	105	255	210	55	55			
		140	110		11,8	145		195	330						
		270	240		20,5	110		135	720						
	8.8	100	70		7,5	15,1	105	330	210						
		140	110		11,8	19,3	145	340	330						
		270	240		25,9		200	720							
	A4-70	100	70		7,5		13,5	105	290	210					
		140	110		11,8	145		225	330						
		270	240		22,5	125		145	720						
	C-70	100	70		7,5	15,1	105	330	210						
		140	110		11,8	16,9	145	290	330						
		270	240		25,9		175	720							
	FIS A M 16	5.8	120		80		60	11,5	22,3	120			445	240	65
			170		125	18,0		185		350			375		
			360		320	37,6		145		195			960		
8.8		120	80	11,5	23,0	120		460	240						
		170	125	18,0	35,9	185		600	375						
		360	320	46,0		320		960							
A4-70		120	80	11,5		23,0		120	460	240					
		170	125	18,0	25,2	185		400	375						
		360	320	42,0		165		215	960						
C-70		120	80	11,5		23,0		120	460	240					
		170	125	18,0	31,4	185		515	375						
		360	320	46,0		270		960							
FIS A M 20	5.8	140	90	120		14,6	29,3	135	530	270	85	85			
		220	170		28,0	225		455	510						
		450	400		58,6	195		260	1200						
	8.8	140	90		14,6	29,3	135	530	270						
		220	170		28,0	56,0	225	780	510						
		450	400		65,8		435	1200							
	A4-70	140	90		14,6		29,3	135	530	270					
		220	170		28,0	39,3	225	520	510						
		450	400		65,5		285	1200							
	C-70	140	90		14,6		29,3	135	530	270					
		220	170		28,0	49,0	225	670	510						
		450	400		65,8		370	1200							

Chemical fixings 3

## LOADS

### Injection system FIS V: Injection mortar FIS V with Threaded rod FIS A <sup>1)</sup>

zinc plated steel / stainless steel / high corrosion resistant steel

Permissible loads of a single anchor in cracked normal concrete (concrete tension zone) of strength class C20/25 (~B25) <sup>2) 3) 4) 5) 11)</sup>										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 c	Max. shear load c			
		h <sub>min</sub> [mm]	h <sub>ef</sub> <sup>6)</sup> [mm]	T <sub>max</sub> [Nm]	N <sub>perm</sub> <sup>7)</sup> [kN]	V <sub>perm</sub> <sup>7)</sup> [kN]	[mm]	[mm]	[mm]	[mm]	[mm]
FIS A M 24	5.8	160	96	150	15,5	31,0	145	520	290	105	105
		270	210		33,9	50,9	265	590	630		
		540	480		77,6		330	1440			
	8.8	160	96		15,5	31,0	145	520	290		
		270	210		33,9	67,9	265	825	630		
		540	480		77,6	80,7	570	1440			
	A4-70	160	96		15,5	31,0	145	520	290		
		270	210		33,9	56,6	265	670	630		
		540	480		77,6		360	1440			
	C-70	160	96		15,5	31,0	145	520	290		
		270	210		33,9	67,9	265	825	630		
		540	480		77,6	70,6	480	1440			
FIS A M 27	5.8	170	108	200	17,4	34,9	165	545	325	125	125
		310	250		40,4	65,7	290	695	750		
		600	540		87,2		390	1620			
	8.8	170	108		17,4	34,9	165	545	325		
		310	250		40,4	80,8	290	885	750		
		600	540		87,2	104,9	700	1620			
	A4-70	170	108		17,4	34,9	165	545	325		
		310	250		40,4	73,6	290	795	750		
		600	540		87,2		440	1620			
	C-70	170	108		17,4	34,9	165	545	325		
		310	250		40,4	80,8	290	885	750		
		600	540		87,2	91,8	590	1620			
FIS A M 30	5.8	190	120	300	21,5	43,1	180	630	360	140	140
		350	280		50,3	80,6	320	795	840		
		670	600		107,7		440	1800			
	8.8	190	120		21,5	43,1	180	630	360		
		350	280		50,3	100,5	320	1035	840		
		670	600		107,7	128,2	805	1800			
	A4-70	190	120		21,5	43,1	180	630	360		
		350	280		50,3	89,9	320	905	840		
		670	600		107,7		505	1800			
	C-70	190	120		21,5	43,1	180	630	360		
		350	280		50,3	100,5	320	1035	840		
		670	600		107,7	112,2	675	1800			

For the design the complete assessment ETA-02/0024 has to be considered. <sup>10)</sup>

<sup>1)</sup> Also valid for anchor rod RGM in the same property class.

<sup>2)</sup> The partial safety factors for material resistance as regulated in the ETA-02/0024 as well as a partial safety factor for load actions of  $\gamma_L = 1,4$  are considered. As an 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-02/0024.

<sup>3)</sup> The given loads are valid for injection mortar FIS V for fixations in dry and humid concrete for temperatures in the substrate up to 50 °C (resp. short term up to 80 °C. For drill hole cleaning see ETA-02/0024.

<sup>4)</sup> For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

<sup>5)</sup> Drill method hammer drilling. For further allowable application conditions see ETA-02/0024.

<sup>6)</sup> For the sizes M10 - M30 the min. anchorage depth and the max. anchorage depth are given. The anchorage depth can be chosen freely between these borders.

<sup>7)</sup> For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see ETA-02/0024.

<sup>8)</sup> Minimum possible axial spacings resp. edge distance while reducing the permissible load.

<sup>9)</sup> Minimum possible spacing resp. edge distance while reducing the permissible load for the required minimum member thickness. The combination of minimum edge distance and minimum spacing is not possible. One of both values has to be increased acc. ETA-02/0024.

<sup>10)</sup> The given loads refer to the European Technical Assessment ETA-02/0024, issue date 13/02/2017. Design of the loads according ETAG 001, Technical Report TR 029 (for static resp. quasi-static loads).

<sup>11)</sup> 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  $w_k \sim 0,3$  mm.



## LOADS

### Injection system FIS V: Injection mortar FIS V with Threaded rod FIS A <sup>1)</sup>

zinc plated steel / stainless steel / high corrosion resistant steel

Permissible loads of a single anchor in non-cracked normal concrete (concrete compression zone) of strength class C20/25 (~B25) <sup>2)3)4)5)</sup>										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 c	Max. shear load c				Max. Load s <sub>cr</sub>	s <sub>min</sub> <sup>8)9)</sup>	c <sub>min</sub> <sup>8)9)</sup>	
		h <sub>min</sub> [mm]	h <sub>ef</sub> <sup>6)</sup> [mm]	T <sub>max</sub> [Nm]	N <sub>perm</sub> <sup>7)</sup> [kN]	V <sub>perm</sub> <sup>7)</sup> [kN]	[mm]	[mm]	[mm]	[mm]	[mm]				
FIS A M 6	5.8	100	50	5	4,0	2,9	65	50	150	40	40				
			60		4,8				180						
			72		4,0				220						
	8.8	100	50		4,0	4,6	65	70	150						
			60		4,8				180						
			72		5,8				220						
	A4-70	100	50		4,0	3,2	60	55	150						
			60		4,8				180						
			72		5,4				220						
FIS A M 8	5.8	100	60	10	7,9	5,1	90	70	180	40	40				
			80		9,0		80	240							
			160		40		60	480							
	8.8	100	60		7,9	8,4	90	125	180						
			80		10,5		100	115	240						
			160		13,9		55	90	480						
	A4-70	100	60		7,9	5,9	90	85	180						
			80		9,8		75	240							
			160		40		70	480							
	C-70	100	60		7,9	7,3	90	105	180						
			80		10,5		100	95	240						
			160		12,2		40	80	480						
	FIS A M 10	5.8	100		60	20	9,9	8,6	90			125	180	45	45
					90		13,8		115			105	270		
					200		45		85			600			
8.8		100	60	9,9	13,3		90	200	180						
			90	14,8			125	170	270						
			200	22,1			70	115	600						
A4-70		100	60	9,9	9,3		90	135	180						
			90	14,8			125	115	270						
			200	15,5			45	90	600						
C-70		100	60	9,9	11,6		90	175	180						
			90	14,8			125	150	270						
			200	19,3			55	105	600						
FIS A M 12	5.8	100	70	40	13,8	12,0	140	175	210	55	55				
			110		20,5		165	130	330						
			240		55		100	720							
	8.8	100	70		13,8	19,3	140	295	210						
			110		21,7		180	230	330						
			240		32,1		85	150	720						
	A4-70	100	70		13,8	13,5	140	200	210						
			110		21,7		180	150	330						
			240		22,5		55	110	720						
	C-70	100	70		13,8	16,9	140	255	210						
			110		21,7		180	195	330						
			240		28,1		65	135	720						

Chemical fixings 3

## LOADS

### Injection system FIS V: Injection mortar FIS V with Threaded rod FIS A <sup>1)</sup>

zinc plated steel / stainless steel / high corrosion resistant steel

Permissible loads of a single anchor in non-cracked normal concrete (concrete compression zone) of strength class C20/25 (~B25) <sup>2)3)4)5)</sup>										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]	$h_{ef}^{6)}$ [mm]	$T_{max}$ [Nm]	$N_{perm}^{7)}$ [kN]	$V_{perm}^{7)}$ [kN]	Max. tension load $c$ [mm]	Max. shear load $c$ [mm]	Max. Load $s_{cr}$ [mm]	$s_{min}^{8)9)}$ [mm]	$c_{min}^{8)9)}$ [mm]
FIS A M 16	5.8	120	80	60	17,2	22,3	160	305	240	65	65
		170	125		29,9		245	235	375		
		360	320		37,6		65	150	960		
	8.8	120	80		17,2	34,4	160	495	240		
		170	125		29,9	35,9	245	405	375		
		360	320		59,8		135	220	960		
	A4-70	120	80		17,2		25,2	160	350		
		170	125		29,9	245		270	375		
		360	320		42,0	70		165	960		
	C-70	120	80	17,2	31,4	160	445	240			
		170	125	29,9		245	350	375			
		360	320	52,3		105	195	960			
FIS A M 20	5.8	140	90	120	20,5	34,9	170	435	270	85	85
		220	170		48,3		340	300	510		
		450	400		58,6		85	195	1200		
	8.8	140	90		20,5	41,1	170	525	270		
		220	170		48,3	56,0	340		510		
		450	400		93,3		230		290		
	A4-70	140	90		20,5		39,3	170	500		
		220	170		48,3	340		345	510		
		450	400		65,5	95		215	1200		
	C-70	140	90	20,5	41,1	170	525	270			
		220	170	48,3	49,0	340	450	510			
		450	400	81,7		140	260	1200			
FIS A M 24	5.8	160	96	150		22,6	45,2	170	540	290	105
		270	210		67,9	435		390	630		
		540	480		84,3	105		250	1440		
	8.8	160	96		22,6	45,2	170	540	290		
		270	210		67,9	80,7	435	675	630		
		540	480		134,5		360	365	1440		
	A4-70	160	96		22,6		45,2	170	540	290	
		270	210		67,9	56,6	435	445	630		
		540	480		94,4		120	270	1440		
	C-70	160	96	22,6	45,2		170	540	290		
		270	210	67,9	70,6	435	580	630			
		540	480	117,7		235	325	1440			
FIS A M 27	5.8	170	108	200		27,0	54,0	195	605	325	125
		310	250		85,8	495		460	750		
		600	540		109,5	125		295	1620		
	8.8	170	108		27,0	54,0	195	605	325		
		310	250		85,8	104,9	495	805	750		
		600	540		174,9		500	450	1620		
	A4-70	170	108		27,0		54,0	195	605	325	
		310	250		85,8	73,6	495	530	750		
		600	540		122,7		155	320	1620		
	C-70	170	108	27,0	54,0		195	605	325		
		310	250	85,8	91,8	495	690	750			
		600	540	153,0		355	385	1620			

## LOADS

### Injection system FIS V: Injection mortar FIS V with Threaded rod FIS A <sup>1)</sup>

zinc plated steel / stainless steel / high corrosion resistant steel

Permissible loads of a single anchor in non-cracked normal concrete (concrete compression zone) of strength class C20/25 (~B25) <sup>2)3)4)5)</sup>										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 c	Max. shear load c			
		h <sub>min</sub> [mm]	h <sub>ef</sub> <sup>6)</sup> [mm]	T <sub>max</sub> [Nm]	N <sub>perm</sub> <sup>7)</sup> [kN]	V <sub>perm</sub> <sup>7)</sup> [kN]	[mm]	[mm]	[mm]	[mm]	[mm]
FIS A M 30	5.8	190	120	300	31,6	63,2	210	660	360	140	140
		350	280		106,8	80,6	595	525	840		
		670	600		133,8		140	330	1800		
	8.8	190	120		31,6	63,2	210	660	360		
		350	280		106,8	128,2	595	920	840		
		670	600		213,7		610	515	1800		
	A4-70	190	120		31,6		63,2	210	660		
		350	280		106,8	89,9	595	600	840		
		670	600		150,0		195	365	1800		
	C-70	190	120		31,6		63,2	210	660		
		350	280		106,8	112,2	595	785	840		
		670	600		187,0		445	435	1800		

For the design the complete assessment ETA-02/0024 has to be considered. <sup>10)</sup>

<sup>1)</sup> Also valid for anchor rod RGM in the same property class.

<sup>2)</sup> The partial safety factors for material resistance as regulated in the ETA-02/0024 as well as a partial safety factor for load actions of  $\gamma_L = 1,4$  are considered. As an 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-02/0024.

<sup>3)</sup> The given loads are valid for injection mortar FIS V for fixations in dry and humid concrete for temperatures in the substrate up to 50 °C (resp. short term up to 80 °C. For drill hole cleaning see ETA-02/0024.

<sup>4)</sup> For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

<sup>5)</sup> Drill method hammer drilling. For further allowable application conditions see ETA-02/0024.

<sup>6)</sup> For the sizes M6 - M30 the min. anchorage depth and the max. anchorage depth are given. The anchorage depth can be chosen freely between these borders.

<sup>7)</sup> For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see ETA-02/0024.

<sup>8)</sup> Minimum possible axial spacings resp. edge distance while reducing the permissible load.

<sup>9)</sup> Minimum possible spacing resp. edge distance while reducing the permissible load for the required minimum member thickness. The combination of minimum edge distance and minimum spacing is not possible. One of both values has to be increased acc. ETA-02/0024.

<sup>10)</sup> The given loads refer to the European Technical Assessment ETA-02/0024, issue date 13/02/2017. Design of the loads according ETAG 001, Technical Report TR 029 (for static resp. quasi-static loads).

## LOADS

### Injection system FIS V: Injection mortar FIS V with Internal threaded anchor RG M I

zinc plated steel / stainless steel

Permissible loads of a single anchor in non-cracked normal concrete (concrete compression zone) of strength class C20/25 (~B25) <sup>1) 2) 3)</sup>										Minimum spacings while reducing the load	
Type	Screw material resp. screw surface	Min. member thickness $h_{min}$ [mm]	Effective anchorage depth $h_{ef}$ [mm]	Maximum torque moment $T_{max}$ [Nm]	Permissible tensile load $N_{perm}^{4)}$ [kN]	Permissible shear load $V_{perm}^{4)}$ [kN]	Required edge distance (with one edge) for		Required spacing for  Max. Load $s_{cr}$ [mm]	Min. spacing  $s_{min}^{5) 6)}$ [mm]	Min. edge distance  $c_{min}^{5) 6)}$ [mm]
							Max. tension load $c$ [mm]	Max. shear load $c$ [mm]			
RG M 8 I	5.8	120	90	10	9,0	5,3	70	65	270	55	55
	8.8						130	95			
	A4-70						80	70			
RG M 10 I	5.8	130	90	20	13,8	8,3	105	90	270	65	65
	8.8						175	155			
	A4-70						130	100			
RG M 12 I	5.8	170	125	40	20,5	12,1	155	110	375	75	75
	8.8						190	190			
	A4-70						175	125			
RG M 16 I	5.8	210	160	80	35,7	22,4	240	180	480	95	95
	8.8							320			
	A4-70							205			
RG M 20 I	5.8	270	200	120	54,8	35,4	335	245	600	125	125
	8.8							315			
	A4-70							285			

For the design the complete assessment ETA-02/0024 has to be considered. <sup>7)</sup>

<sup>1)</sup> The partial safety factors for material resistance as regulated in the ETA-02/0024 as well as a partial safety factor for load actions of  $\gamma_L = 1,4$  are considered. As an 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-02/0024.

<sup>2)</sup> For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

<sup>3)</sup> Drill method hammer drilling. For further allowable application conditions see ETA-02/0024.

<sup>4)</sup> For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see ETA-02/0024.

<sup>5)</sup> Minimum possible axial spacings resp. edge distance while reducing the permissible load.

<sup>6)</sup> Minimum possible spacing resp. edge distance while reducing the permissible load for the required minimum member thickness. The combination of minimum edge distance and minimum spacing is not possible. One of both values has to be increased acc. ETA-02/0024.

<sup>7)</sup> The given loads refer to the European Technical Assessment ETA-02/0024, issue date 13/02/2017. Design of the loads according ETAG 001, Technical Report TR 029 (for static resp. quasi-static loads).