

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



ETA-02/0024
ETAG 001-5

Option 1 for cracked concrete

Seismic performance category C1, C2



ETA-08/0266
ETAG 001-5

Post-installed rebar connection
(TR23)



ETA-10/0383
ETAG 029

Masonry
Use categories b, c or d
and d/d or w/w



See ICC-ES
Evaluation Report
at www.icc-es.org



Fire resistance
classification
R 120
Anchor types
see test report



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 146
- Internal threaded anchor RG MI, see page 159
- Rebar anchor FRA, see page 179
- Concrete steel bars, see page 185
- Injection anchor sleeves FIS H, see page 167
- Aerated concrete centring sleeve PBZ, see page PL
- Remedial wall tie VBS 8, see page 187
- Weather facing reconstruction system FWS II, see page 189
- Anchorings in waterfilled drill holes (only FIS V 410 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.

SEE ALSO



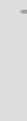
ANCHORS + SLEEVES

Page 144



DISPENSER

Page 195



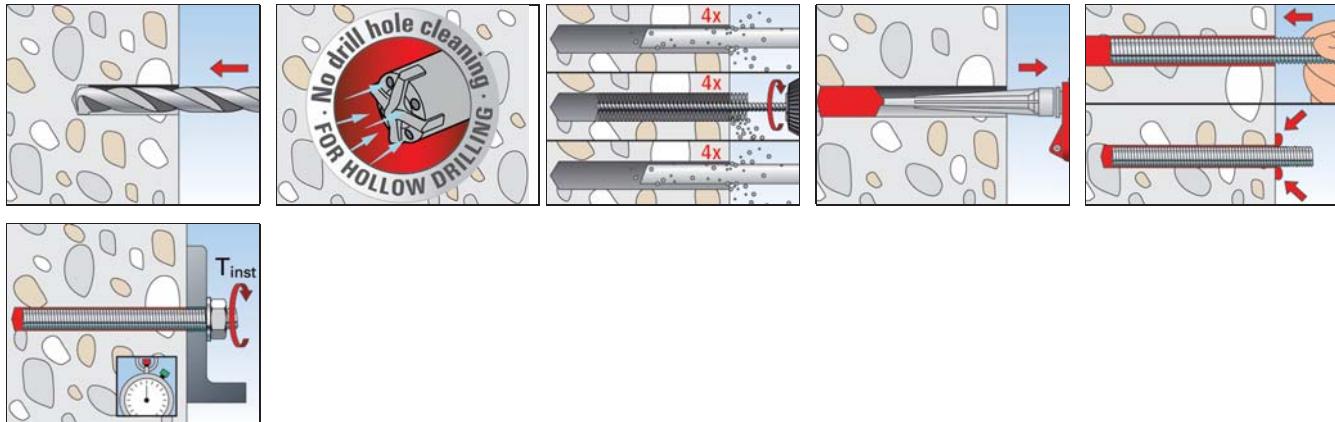
ACCESSORIES

Page 198

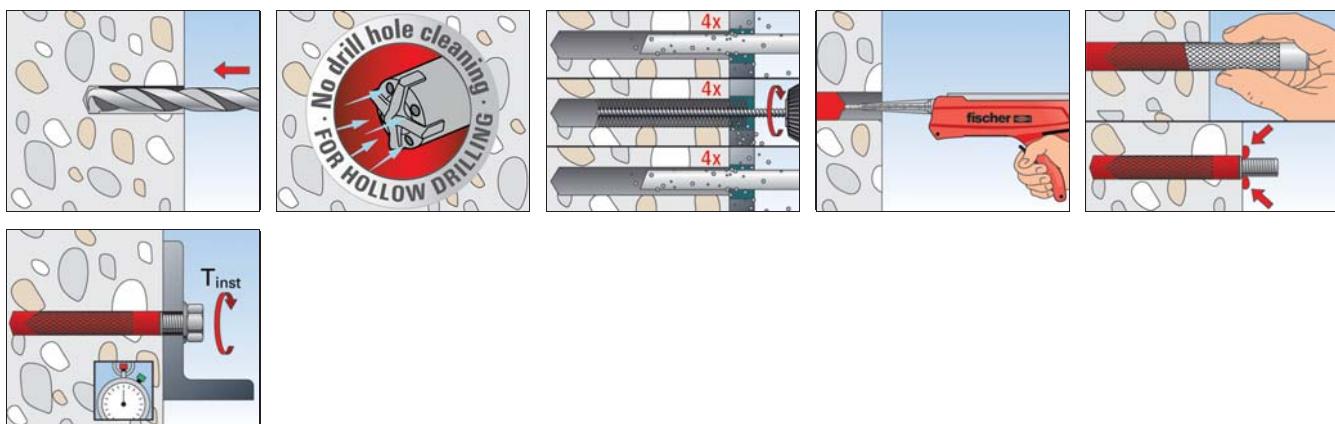
Chemical fixings

3

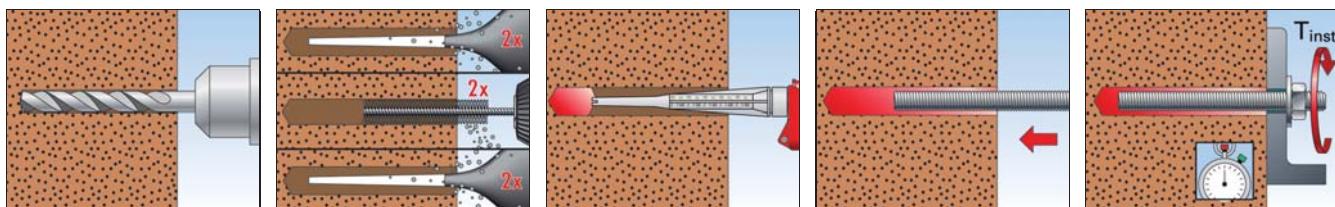
INSTALLATION IN CONCRETE WITH FIS V AND FIS A / RG M



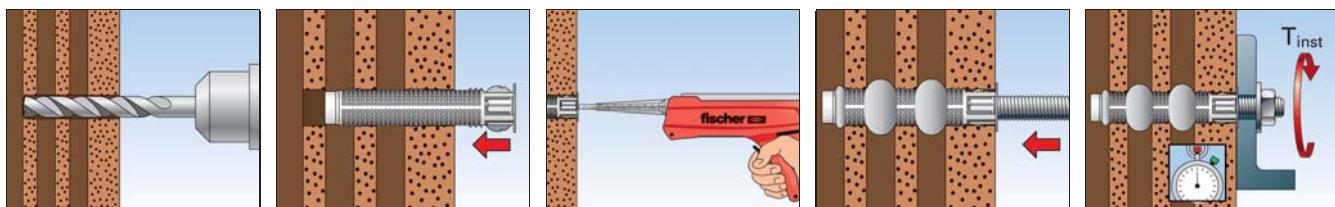
INSTALLATION IN CONCRETE WITH FIS V AND RG M I



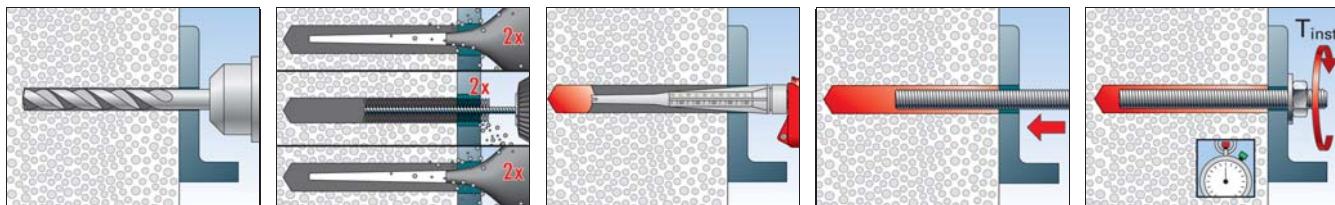
INSTALLATION IN SOLID BRICK WITH FIS V AND FIS A



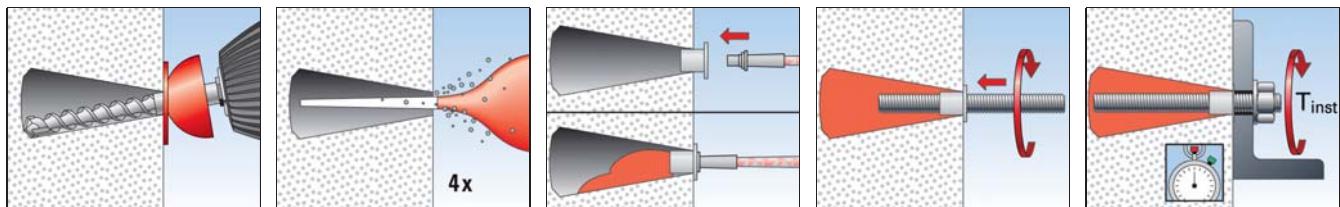
INSTALLATION IN HOLLOW BLOCKS WITH FIS V AND FIS HK + FIS A



INSTALLATION IN AERATED CONCRETE WITH FIS V AND FIS A / RG M



INSTALLATION IN UNDERCUT DRILL HOLE IN AERATED CONCRETE WITH FIS V AND FIS A / RG M



TECHNICAL DATA



Injection mortar **FIS V 300 T**



Injection mortar **FIS V 360 S**



Injection mortar **FIS V 410 C**



Static mixer **FIS MR Plus**

Item	Art.-No.	Approval			Languages on the cartridge	Scale unit	Contents	Sales unit
		DIBt	ETA	ICC				
FIS V 300 T	531573	●	■	▲	USA, RA, BR, MEX	150	1 cartridge 300 ml, 2 x FIS MR Plus	12
FIS V 360 S	094404	●	■	▲	DE, FR, NL, TR, HU, AR	180	1 cartridge 360 ml, 2 x FIS MR Plus	6
FIS V 360 S	094405	●	■	▲	EN, IT, PT, ES, ZH, JA	180	1 cartridge 360 ml, 2 x FIS MR Plus	6
FIS V 360 S	068435	●	■	▲	DA, SV, NO, FI, PL, EL	180	1 cartridge 360 ml, 2 x FIS MR Plus	6
FIS V 360 S	502283	●	■	▲	LT, LV, ET, UK, RU, KK	180	1 cartridge 360 ml, 2 x FIS MR Plus	6
FIS V 360 S	043994	●	■	▲	CS, SK, PL, HU, RO, RU	180	1 cartridge 360 ml, 2 x FIS MR Plus	6
FIS V 410 C	521431	●	■	▲	IT, EN, DE	200	1 cartridge 410 ml, 2 x FIS MR Plus	16
FIS V 410 C	534880	●	■	▲	PL, LT, LV, ET, RU	200	1 cartridge 410 ml, 2 x FIS MR Plus	12
FIS V 410 C	538131	●	■	▲	USA, RA, BR, MEX	200	1 cartridge 410 ml, 2 x FIS MR Plus	12
FIS MR Plus	545853	—	—	—	—	—	10 static mixer FIS MR Plus	10

TECHNICAL DATA



Injection mortar **FIS VW 300 T**



Injection mortar **FIS VW 360 S**



Injection mortar **FIS VW 380 C**



Static mixer **FIS MR Plus**

Item	Art.-No.	Approval			Languages on the cartridge	Scale unit	Contents	Sales unit
		DIBt	ETA					
FIS VW 300 T	507793	●	■	DE, EN, HR, SL, SR, BG	150	1 cartridge 300 ml, 2 x FIS MR Plus	12	
FIS VW 300 T	507795	●	■	SV, DA, NO, CS, SK, PL, RU	150	1 cartridge 360 ml, 2 x FIS MR Plus	12	
FIS VW 360 S	090753	●	■	DE, EN, FR, IT, NL, ES	180	1 cartridge 360 ml, 2 x FIS MR Plus	6	
FIS VW 360 S	043997	●	■	CS, SK, PL, HU, RO, RU	180	1 cartridge 360 ml, 2 x FIS MR Plus	6	
FIS VW 360 S	502284	●	■	RU, LT, LV, ET, UK, KK	180	1 cartridge 360 ml, 2 x FIS MR Plus	6	
FIS VW 380 C	519328	●	■	CS, SK, PL	190	1 cartridge 380 ml, 2 x FIS MR Plus	12	
FIS MR Plus	545853	—	—	—	—	—	10 static mixer FIS MR Plus	10

TECHNICAL DATA



Injection mortar
FIS VS 100 P



Injection mortar
FIS VS 150 C



Injection mortar
FIS VS 300 T



Injection mortar
FIS VS 360 S



Static mixer **FIS MR Plus**

Item	Art.-No.	Approval			Languages on the cartridge	Scale unit	Contents	Sales unit
		DIBt	ETA	ICC				
FIS VS 100 P	072525	●	■	▲	DE, EN, FR, IT, NL, ES	50	1 cartridge 100 ml, 2 x FIS MR Plus	6
FIS VS 150 C	045302	●	■	▲	DE, EN, FR, IT, NL, ES	70	1 cartridge 145 ml, 1 x FIS MR Plus	6
FIS VS 150 C Set	045303	●	■	▲	DE, EN, FR, IT, NL, ES	70	Set for hollow bricks: 1 cartridge 145 ml, 2 x FIS MR Plus, 6 x FIS H 16 x 85 K	6
FIS VS 300 T	093180	●	■	▲	DE, EN, FR, NL, ES, PT	150	1 cartridge 300 ml, 1 x FIS MR Plus	12
FIS VS 300 T	502285	●	■	▲	RU, LT, LV, ET, UK, KK	150	1 cartridge 300 ml, 1 x FIS MR Plus	12
FIS VS 300 T	044102	●	■	▲	CS, SK, PL, HU, RO, RU, EL	150	1 cartridge 300 ml, 1 x FIS MR Plus	12
FIS VS 300 T	093226	●	■	▲	PL, CS, DA, NO, SV, FI	150	1 cartridge 300 ml, 1 x FIS MR Plus	12
FIS VS 360 S	078664	●	■	▲	EN, ZH, ES, PT, JA	180	1 cartridge 360 ml, 2 x FIS MR Plus	6
FIS MR Plus	545853	—	—	—	—	—	10 static mixer FIS MR Plus	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			
FIS V 360 S HWK small	092430	●	■	▲	DE, FR, NL, TR, HU, AR	10 cartridges 360 ml, 20 x FIS MR Plus	1
FIS V 360 S HWK big	091936	●	■	▲	DE, FR, NL, TR, HU, AR	20 cartridges 360 ml, 40 x FIS MR Plus	1
FIS V 360 S HWK big	096554	●	■	▲	EN, IT, PT, ES, ZH, JA	20 cartridges 360 ml, 40 x FIS MR Plus	1
FIS V 360 S HWK big	503027	●	■	▲	CS, SK, PL, HU, RO, RU	12 cartridges 360 ml, 24 x FIS MR Plus, 1 x dispenser FIS DM S	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 ¹⁾	12 hrs.
		-10°C - - 5°C ¹⁾	8 hrs.
- 5°C - ± 0°C ¹⁾	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.

¹⁾ 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.

FIS DMS (511118)



APPLICATIONS

- Shuttle cartridges with 345, 360 and 390 ml content
- Cartridges with 150 ml content
- Multibond cartridges with 300 ml content
- Standard silicone cartridges

ADVANTAGES

- The 3-fold push rod distributes the extrusion forces equal over the cartridge and prevents the cartridge from tearing up.
- The robust glass fiber reinforced plastic housing increases the breaking strength of the dispenser and offers a long service life.
- The ergonomic design of the FIS DM S ensures a good balance and allows fatigue-free working.

FIS AM (58000)



APPLICATIONS

- Shuttle cartridges with 345, 360 and 390 ml content
- Cartridges with 150 ml content
- Multibond cartridges with 300 ml content
- Standard silicone cartridges

ADVANTAGES

- The robust design can withstand the high requirements of the job site and thus offers a long life.
- The infinitely variable feed allows the exact dosing and thus ensures easy handling.

KP M1 (53115)



APPLICATIONS

- Cartridges with 150 ml content
- Multibond cartridges with 300 ml content
- Standard silicone cartridges

ADVANTAGES

- The handy, robust solid metal construction for standard cartridges up to 310 ml bears up against requirements on the construction site and, as such, is also suitable for professional use.
- The continuous in-feed allows for a precise dosage, making it easy to use.
- The slim shape of the device allows for an exact application, even in difficult to reach spots, thus offering a high level of flexibility

KP M2 (53117)



APPLICATIONS

- Cartridges with 150 ml content
- Multibond cartridges with 300 ml content
- Standard silicone cartridges

ADVANTAGES

- The 18:1 transmission ratio enables the fast, low-energy application of even highly viscous materials, thus ensuring stress-free work.
- The robust design with the special, hardened drive block meets the tough requirements of a construction site and thus offers a long lifespan.
- The freely accessible cartridge makes it possible to perfectly align the extrusion nozzle, guaranteeing application-orientated work.

FIP C (42741)



APPLICATIONS

- Coaxial cartridges with 380 and 410 ml content

ADVANTAGES

- The robust design can withstand the high requirements of the job site and thus offers a long life.
- The infinitely variable feed allows the exact dosing and thus ensures easy handling.

FIS DMS-L (510992)



APPLICATIONS

- Cartridges with 585 ml content

ADVANTAGES

- The patented parallel lever of the FIS DM S-L allows a large and even force transmission and ensures fatigue-free working.
- The dropout protection on the cartridge holder provides a secure hold of the cartridge in the dispenser.

FIS DCD S (543629)



APPLICATIONS

- Shuttle cartridges with 345, 360 and 390 ml content
- Multibond cartridges with 300 ml content

ADVANTAGES

- The FIS DCD S has a dosing function which is controlled by a setting wheel. This allows for optimal adaptation to the processing conditions and ensures fast work progress.
- The robust battery dispenser is very light, fits comfortably in the hand and allows fatigue-free working.

FIS AP (58027)



APPLICATIONS

- Shuttle cartridges with 345, 360 and 390 ml content
- Cartridges with 150 ml content
- Multibond cartridges with 300 ml content
- Standard silicone cartridges

ADVANTAGES

- The fast venting minimises cartridge after-run, which facilitates clean work at the site.
- The reducing valve in the handle enables the optimum adjustment of the volume flow in line with the processing conditions.
- Due to the ergonomically formed handle, the dispensers fit nicely in your hand and make work less tiring.

FIS DP-S L (511125)



APPLICATIONS

- Cartridges with 585 ml content

ADVANTAGES

- The fast venting minimises cartridge after-run, which facilitates clean work at the site.
- The reducing valve in the handle enables the optimum adjustment of the volume flow in line with the processing conditions.
- Due to the ergonomically formed handle, the dispensers fit nicely in your hand and make work less tiring.

FIS DP-S XL (512401)



APPLICATIONS

- Cartridges with 1500 ml content

ADVANTAGES

- The fast venting minimises cartridge after-run, which facilitates clean work at the site.
- The reducing valve in the handle enables the optimum adjustment of the volume flow in line with the processing conditions.
- Due to the ergonomically formed handle, the dispensers fit nicely in your hand.
- In addition the dispencer has a carrying strap around which make work less tiring.



Bridges for traffic signs



Steel constructions

ADVANTAGES

- The system of anchor rod FIS A and an injection mortar for cracked concrete (M10 to M30) and non-cracked concrete (M6 to M30) can be individually selected based on requirements, thus allowing for a wide range of applications.
- Variable anchorage depths allow for ideal adaptation to the load to be applied, and ensure an optimised installation time and use of materials.
- Push-through installation is possible without any special parts through filling the annular gap with injection mortar.
- The wide range of approved steel types allows for use in all corrosion resistance classes and offers maximum application safety.

VERSIONS

- Zinc-plated steel
- Stainless steel

BUILDING MATERIALS

Approved for:

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

Also suitable for:

- Concrete C12/15

FUNCTIONING

- The system of threaded rod FIS A and an injection mortar for cracked concrete (M10 to M30) and non-cracked concrete (M6 to M30) can be individually selected based on requirements, thus allowing for a wide range of applications.
- The mortar is extruded bubble free from the drill hole base.
- The mortar bonds the entire surface of the threaded rod with the drill hole wall and seals the drill hole.
- The threaded rod is set manually, by lightly rotating it until it reaches the drill hole base.

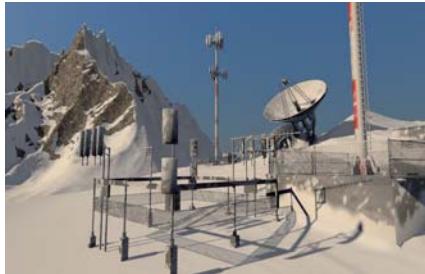
TECHNICAL DATA IN CONCRETE



Threaded rod **FIS A**

	Zinc plated, steel grade 5.8 Art.-No.	Zinc plated, steel grade 8.8 Art.-No.	Stainless steel Art.-No.	Approval		Drill hole diameter d_0 [mm]	Sales unit [pcs]
Item	gvz	gvz	A4	ETA	ICC		
FIS A M 6 x 70	046204	—	—	■	—	8	10
FIS A M 6 x 75	090243	—	090437	■	—	8	20
FIS A M 6 x 85	090272	—	—	■	—	8	20
FIS A M 6 x 110	090273	—	090439	■	—	8	20
FIS A M 8 x 90	090274	519390	090440	■	▲	10	10
FIS A M 8 x 110	090275	519391	090441	■	▲	10	10
FIS A M 8 x 130	090276	519392	090442	■	▲	10	10
FIS A M 8 x 175	090277	519393	090443	■	▲	10	10
FIS A M 8 x 1000	509214 1)	—	509230 1)	■	▲	10	10
FIS A M 8 x 1000	—	509222 1)	—	■	—	10	10
FIS A M 10 x 110	090278	—	090444	■	▲	12	10
FIS A M 10 x 130	090279	524170	090447	■	▲	12	10
FIS A M 10 x 150	090281	517935	090448	■	▲	12	10
FIS A M 10 x 170	044969	519395	044973	■	▲	12	10
FIS A M 10 x 190	—	517936	—	■	▲	12	10
FIS A M 10 x 200	090282	519396	090449	■	▲	12	10
FIS A M 10 x 1000	509215 1)	509223 1)	509231 1)	■	▲	12	10
FIS A M 12 x 120	044971	519397	044974	■	▲	14	10
FIS A M 12 x 140	090283	519398	090450	■	▲	14	10
FIS A M 12 x 160	090284	517937	090451	■	▲	14	10
FIS A M 12 x 180	090285	519399	090452	■	▲	14	10
FIS A M 12 x 200	—	517938	—	■	▲	14	10
FIS A M 12 x 210	090286	—	090453	■	▲	14	10
FIS A M 12 x 260	090287	—	090454	■	▲	14	10
FIS A M 12 x 1000	509216 1)	509224 1)	509232 1)	■	▲	14	10
FIS A M 16 x 130	044972	519400	044975	■	▲	18	10
FIS A M 16 x 175	090288	519401	090455	■	▲	18	10
FIS A M 16 x 200	090289	517939	090456	■	▲	18	10
FIS A M 16 x 250	090290	517940	090457	■	▲	18	10
FIS A M 16 x 300	090291	519402	090458	■	▲	18	10
FIS A M 16 x 1000	509217 1)	509225 1)	509233 1)	■	▲	18	10
FIS A M 20 x 245	090292	519404	090459	■	▲	24	10
FIS A M 20 x 290	090293	519406	090460	■	▲	24	10
FIS A M 20 x 1000	—	519410 1)	519427 1)	■	▲	24	10
FIS A M 24 x 290	090294	—	090461	■	▲	28	5
FIS A M 24 x 380	090295	—	090462	■	▲	28	5
FIS A M 24 x 1000	533881	—	—	■	▲	28	10
FIS A M 30 x 430	090297	—	090464	■	▲	35	5

1) Order washer and nut separately.



Steel constructions



Underwater applications

ADVANTAGES

- The wide range of the RG M from M8 to M30 opens up a wide range of applications and therefore offers great flexibility.
- The wide range of approved steel types for RG M allows for use in all corrosion resistance classes and offers the best possible application safety.
- Please refer to the approvals for the resin capsules and mortar used.

VERSIONS

- Zinc-plated steel
- Stainless steel

BUILDING MATERIALS

Approved for anchorings in:

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

Also suitable for:

- Natural stone with dense structure

FUNCTIONING

- Due to its oblique edge, the threaded rod RG M is particularly suitable for use in conjunction with resin capsules.
- The threaded rod RG M is set using a hammer drill and the accompanying setting tool in rotating and hitting motions.
- During setting, the oblique edge of the RG M destroys the capsule, and mixes and activates the mortar.
- Use with injection mortar is also possible. Here, the threaded rod is manually inserted into the drill hole with a light rotating movement until it reaches the base of the hole.

TECHNICAL DATA IN CONCRETE



Threaded rod **RG M**

Item	Zinc plated, steel grade 5.8	Zinc plated, steel grade 8.8	Stainless steel	Approval		Drill hole diameter d_0 [mm]	Sales unit [pcs]
	Art.-No.	Art.-No.	Art.-No.	ETA	ICC		
RG M 8 x 110	050256	—	050263	■	—	10	10
RG M 8 x 150	095698	—	050293	■	—	10	10
RG M 8 x 150	—	519443	—	—	—	10	10
RG M 10 x 110	535007	—	535009	—	—	12	10
RG M 10 x 130	050257	—	050264	■	—	12	10
RG M 10 x 165	050280	—	050294	■	—	12	10
RG M 10 x 190	050281	—	050296	■	—	12	10
RG M 10 x 220	—	519444	—	—	—	12	10
RG M 10 x 250	095703	—	095701	■	—	12	10
RG M 10 x 350	—	—	095709	—	—	12	10
RG M 10 x 350	095718	—	—	■	—	12	10
RG M 12 x 120	535010	—	535011	■	—	14	10
RG M 12 x 160	050258	—	050265	■	—	14	10
RG M 12 x 180	512248	—	512249	■	—	14	10
RG M 12 x 200	—	—	050576	■	—	14	10
RG M 12 x 220	—	519445	—	—	—	14	10
RG M 12 x 220	050283	—	050297	■	—	14	10
RG M 12 x 250	050284	—	095702	■	—	14	10
RG M 12 x 300	050285	—	095705	■	—	14	10
RG M 12 x 380	095720 2)	—	095710 1)	■	—	14	10

1) Straight cut, additional setting tool required

2) Straight cut, setting tool is enclosed.

TECHNICAL DATA IN CONCRETE



Threaded rod **RG M**

3

Chemical fixings

	Zinc plated, steel grade 5.8	Zinc plated, steel grade 8.8	Stainless steel	Approval		Drill hole diameter d_0 [mm]	Sales unit [pcs]
Item	Art.-No.	Art.-No.	Art.-No.	ETA	ICC		
RG M 16 x 165	050287	—	095704	■	—	18	10
RG M 16 x 140	542407	—	—	■	—	18	10
RG M 16 x 190	—	—	050266	—	—	18	10
RG M 16 x 190	050259	—	—	■	—	18	10
RG M 16 x 250	050288	—	050298	■	—	18	10
RG M 16 x 270	—	519446	—	—	—	18	10
RG M 16 x 300	050289	—	050299	■	—	18	10
RG M 16 x 380	095722 2)	—	095712 1)	■	—	18	10
RG M 16 x 500	095723 2)	—	095713 1)	■	—	18	10
RG M 20 x 220	512251	—	—	■	—	25	10
RG M 20 x 260	050260	—	050267	■	—	25	10
RG M 20 x 290	—	519447	—	—	—	25	10
RG M 20 x 350	095707	—	—	■	—	25	10
RG M 20 x 350	—	—	095706	—	—	25	10
RG M 20 x 500	095725 1)	—	—	■	—	25	10
RG M 24 x 295	—	519448 1)	—	—	—	28	10
RG M 24 x 300	050261 1)	—	050268 1)	■	—	28	10
RG M 24 x 400	095727 1)	—	095715 1)	■	—	28	10
RG M 24 x 600	095728 1)	—	—	■	—	28	5
RG M 30 x 380	050262 1)	—	090726 1)	■	—	35	5
RG M 30 x 500	095730 1)	—	—	■	—	35	5

1) Straight cut, additional setting tool required

2) Straight cut, setting tool is enclosed.

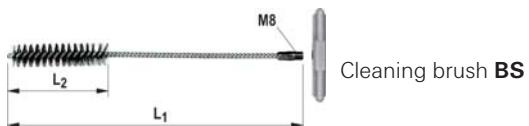
TECHNICAL DATA



Filling Sets for subsequent filling of the annular gap

Item	Art.-No.	For use with injection mortar	Match	Sales unit [pcs]
Filling Set M12	537218	FIS SB, FIS EM Plus, FIS V	FIS A M12	10
Filling Set M16	537219	FIS SB, FIS EM Plus, FIS V	FIS A M16	10
Filling Set M20	537220	FIS SB, FIS EM Plus, FIS V	FIS A M 20	10

ACCESSORIES DRILL HOLE CLEANING



Item	Art.-No.	Length L1 [mm]	Length L2 [mm]	Brush diameter [mm]	For drill diameter [mm]	Sales unit
BS ø 8	078177	120	50	9	8	1
BS ø 10	078178	120	50	11	10	1
BS ø 12	078179	150	80	13	12	1
BS ø 14	078180	250	80	16	14	1
BS ø 16/18	078181	250	80	20	16/18	1
BS ø 20/22	052277	180	80	25	20/22	1
BS ø 24	078182	300	100	26	24	1
BS ø 25	097806	300	100	27	25	1
FIS brush extension	508791	410	-	-	-	1
Compressed air nozzle D16-D19	511957	-	-	-	-	2
Compressed air nozzle D20-D25	511958 1)	-	-	-	-	2

1) Delivery time on request.



Compressed-air cleaning tool



Blow-out pump AB G



Centring wedge

Item	Art.-No.	Contents	Total length [mm]
Compressed-air cleaning tool	093286	-	-
Blow-out pump AB G	089300	-	370
Centring wedge	093076	10 wedges for overhead installation, from M16	-

LOADS

Injection system FIS V: Injection mortar FIS V with Threaded rod FIS A¹⁾

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) ²⁾³⁾⁴⁾⁵⁾¹¹⁾										Minimum spacings while reducing the load	
Type	Material fixing element	Min. member thickness h_{min} [mm]	Effective anchorage depth $h_{ef}^{(6)}$ [mm]	Maximum torque moment T_{max} [Nm]	Permissible tensile load $N_{perm}^{(7)}$ [kN]	Permissible shear load $V_{perm}^{(7)}$ [kN]	Required edge distance (with one edge) for		Required spacing for	Min. spacing $s_{min}^{(8)(9)}$ [mm]	Min. edge distance $c_{min}^{(8)(9)}$ [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	13,3	90	235	180		
		120	90		8,1		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	11,6	10,8	90	235	180	
		120	90		8,1		125	220	270		
		230	200		18,0		140	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	19,3	105	330	210		
		140	110		11,8		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	16,9	15,1	105	330	210	
		140	110		11,8		290	330			
		270	240		25,9		145	175	720		

LOADS

Injection system FIS V: Injection mortar FIS V with Threaded rod FIS A¹⁾

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) ²⁾³⁾⁴⁾⁵⁾¹¹⁾									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]	s_{cr} [mm]	$s_{min}^{(8)9)}$ [mm]
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	270	960	
FIS A M 20	5.8	140	90	120	14,6	29,3	135	530	270	85
		220	170		28,0	34,9	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		
FIS A M 24	5.8	160	96	150	15,5	31,0	145	520	290	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
		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	

LOADS

Injection system FIS V: Injection mortar FIS V with Threaded rod FIS A¹⁾

zinc plated steel / stainless steel / high corrosion resistant steel

Type	Material fixing element	Permissible loads of a single anchor in cracked normal concrete (concrete tension zone) of strength class C20/25 (~B25) ²⁾³⁾⁴⁾⁵⁾¹¹⁾							Minimum spacings while reducing the load		
		Min. member thickness h_{min} [mm]	Effective anchorage depth $h_{ef}^{6)}$ [mm]	Maximum torque moment T_{max} [Nm]	Permissible tensile load $N_{perm}^{7)}$ [kN]	Permissible shear load $V_{perm}^{7)}$ [kN]	Required edge distance (with one edge) for Max. tension load c [mm]	Required edge distance (with one edge) for Max. shear load c [mm]	Required spacing for Max. Load s_{cr} [mm]	Min. spacing $s_{min}^{8)9)}$ [mm]	Min. edge distance $c_{min}^{8)9)}$ [mm]
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	100,5		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.¹⁰⁾

¹⁾ Also valid for threaded rod RG M in the same property class.

²⁾ 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.

³⁾ 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.

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

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

⁶⁾ 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.

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

⁸⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

⁹⁾ 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.

¹⁰⁾ 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).

¹¹⁾ 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 A¹⁾

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) ²⁾³⁾⁴⁾⁵⁾										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 6	5.8	100	50	5	4,0	2,9	65	50	150	40	40
		60			4,8		50	45	180		
		110	72		4,0		70	45	220		
	8.8	100	50		4,0	4,6	65	70	150		
		60			4,8		65	65	180		
		110	72		5,8		55	55	220		
	A4-70	100	50		4,0	3,2	50	50	150		
		60			4,8		60	60	180		
		110	72		5,4		60	60	220		
FIS A M 8	5.8	100	60	10	7,9	5,1	90	70	180	40	40
		110	80		9,0		80	70	240		
		190	160		9,0		40	60	480		
	8.8	100	60		7,9	8,4	90	125	180		
		110	80		10,5		100	115	240		
		190	160		13,9		55	90	480		
	A4-70	100	60		7,9	5,9	90	85	180		
		110	80		9,8		75	75	240		
		190	160		9,8		40	70	480		
	C-70	100	60		7,9	7,3	90	105	180		
		110	80		10,5		100	95	240		
		190	160		12,2		40	80	480		
FIS A M 10	5.8	100	60	20	9,9	8,6	90	125	180	45	45
		120	90		13,8		115	105	270		
		230	200		13,8		45	85	600		
	8.8	100	60		9,9	13,3	90	200	180		
		120	90		14,8		125	170	270		
		230	200		22,1		70	115	600		
	A4-70	100	60		9,9	9,3	90	135	180		
		120	90		14,8		125	115	270		
		230	200		15,5		45	90	600		
	C-70	100	60		9,9	11,6	90	175	180		
		120	90		14,8		125	150	270		
		230	200		19,3		55	105	600		
FIS A M 12	5.8	100	70	40	13,8	12,0	140	175	210	55	55
		140	110		20,5		165	130	330		
		270	240		20,5		55	100	720		
	8.8	100	70		13,8	19,3	140	295	210		
		140	110		21,7		180	230	330		
		270	240		32,1		85	150	720		
	A4-70	100	70		13,8	13,5	140	200	210		
		140	110		21,7		180	150	330		
		270	240		22,5		55	110	720		
	C-70	100	70		13,8	16,9	140	255	210		
		140	110		21,7		180	195	330		
		270	240		28,1		65	135	720		

LOADS

Injection system FIS V: Injection mortar FIS V with Threaded rod FIS A¹⁾

zinc plated steel / stainless steel / high corrosion resistant steel

Type	Material fixing element	Permissible loads of a single anchor in non-cracked normal concrete (concrete compression zone) of strength class C20/25 (~B25) ²⁾³⁾⁴⁾⁵⁾							Minimum spacings while reducing the load	
		Min. member thickness <i>h_{min}</i> [mm]	Effective anchorage depth <i>h_{ef}</i> ⁶⁾ [mm]	Maximum torque moment <i>T_{max}</i> [Nm]	Permissible tensile load <i>N_{perm}</i> ⁷⁾ [kN]	Permissible shear load <i>V_{perm}</i> ⁷⁾ [kN]	Required edge distance (with one edge) for Max. tension load <i>c</i> [mm]	Required edge distance (with one edge) for Max. shear load <i>c</i> [mm]	Required spacing for Max. Load <i>s_{cr}</i> [mm]	Min. spacing <i>s_{min}</i> ⁸⁾⁹⁾ [mm]
FIS A M 16	5.8	120	80	60	17,2	22,3	160	305	240	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		245	405	375	
		360	320		59,8		135	220	960	
	A4-70	120	80		17,2	25,2	160	350	240	
		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
		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		340		510	
		450	400		93,3		230	290	1200	
	A4-70	140	90		20,5	39,3	170	500	270	
		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		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		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		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		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		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		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		495	690	750	
		600	540		153,0		355	385	1620	

LOADS

Injection system FIS V: Injection mortar FIS V with Threaded rod FIS A¹⁾

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) ²⁾³⁾⁴⁾⁵⁾									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]	$h_{\text{ef}}^{6)}$ [mm]	T_{\max} [Nm]	$N_{\text{perm}}^{7)}$ [kN]	$V_{\text{perm}}^{7)}$ [kN]	Max. tension load c [mm]	Max. shear load c [mm]	s_{cr} [mm]	$s_{\min}^{8)9)}$ [mm]
FIS A M 30	5.8	190	120	300	31,6	63,2	210	660	360	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	360	
		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	360	
		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.¹⁰⁾

¹⁾ Also valid for threaded rod RG M in the same property class.

²⁾ 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 $s \geq 3 \cdot h_{\text{ef}}$ and an edge distance $c \geq 1,5 \cdot h_{\text{ef}}$. Accurate data see ETA-02/0024.

³⁾ 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.

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

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

⁶⁾ 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.

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

⁸⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

⁹⁾ 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.

¹⁰⁾ 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).



3

Chemical fixings

ADVANTAGES

- The system internal threaded anchor RG M I and an injection mortar for concrete can be individually selected based on requirements, thus allowing for a wide range of applications.
- The internal threaded anchor RG M I allows for surface flush removal and reuse of the fixing point, and therefore offers the best possible flexibility.
- The metric internal thread allows for the use of standard screws or threaded rods for the ideal adaptation to suit the intended use.

VERSIONS

- Zinc-plated steel
- Stainless steel

BUILDING MATERIALS

Approved for:

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

Also suitable for:

- Concrete C12/15, non-cracked

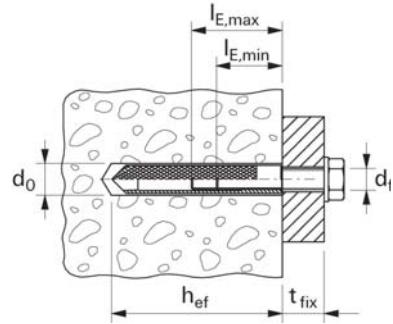
FUNCTIONING

- The injection system is suitable for pre-positioned installation when combined with the internal threaded anchor RG M I.
- The mortar is extruded bubble free from the drill hole base.
- The mortar bonds the entire surface of the internal threaded anchor with the drill hole wall and seals the drill hole.
- The internal threaded anchor is set manually, by lightly rotating it until it reaches the drill hole base.

TECHNICAL DATA



Internal threaded anchor RG M I



	Zinc-plated steel Art.-No.	Stainless steel Art.-No.	Approval ETA	Drill hole dia- meter d ₀ [mm]	Effect. anchorage depth h _{ef} [mm]	Min. bolt pene- tration l _{E,min} [mm]	Max. bolt pene- tration l _{E,max} [mm]		Sales unit [pcs]
Item	gvz	A4							
RG 8 x 75 M 5 I	048221 1)	—	—	10	75	8	14		10
RG 10 x 75 M 6 I	048222 1)	—	—	12	75	10	16		10
RG 12 x 90 M 8 I	050552 1)	050565 1)	—	14	90	8	18		10
RG 16 x 90 M 10 I	050553 1)	050566 1)	—	18	90	10	23		10
RG 18 x 125 M 12 I	050562 1)	050567 1)	—	20	125	12	26		10
RG 22 x 160 M 16 I	050563 1)	050568 1)	—	24	160	16	35		5
RG 28 x 200 M 20 I	050564 1)	050569 1)	—	32	200	20	45		5

1) Setting tool is included in each package.

LOADS

Injection system FIS V: Injection mortar FIS V with Internal threaded anchor RG M I
 zinc plated steel / stainless steel

Type	Screw material resp. screw surface	Min. member thickness	Effective anchorage depth	Maximum torque moment	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]	Minimum spacings while reducing the load	
							Max. tension load c [mm]	Max. shear load c [mm]		Min. spacing s _{min} ^{5) 6)} [mm]	Min. edge distance c _{min} ^{5) 6)} [mm]
RG M 8 I	5.8	120	90	10	9,0	5,3	70	65	270	55	55
	8.8				13,8	8,3	130	95			
	A4-70				9,9	5,9	80	70			
RG M 10 I	5.8	130	90	20	13,8	8,3	105	90	270	65	65
	8.8				19,0	13,3	175	155			
	A4-70				15,7	9,3	130	100			
RG M 12 I	5.8	170	125	40	20,5	12,1	155	110	375	75	75
	8.8				23,8	19,3	190	190			
	A4-70				22,5	13,5	175	125			
RG M 16 I	5.8	210	160	80	35,7	22,4	240	180	480	95	95
	8.8					35,8		320			
	A4-70					25,1		205			
RG M 20 I	5.8	270	200	120	54,8	35,4	335	245	600	125	125
	8.8					42,9		315			
	A4-70					39,4		285			

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

¹⁾ 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.

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

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

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

⁵⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

⁶⁾ 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.

⁷⁾ 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).

FIS H K



FIS H L



FIS H N



ADVANTAGES

- The grating structure of the FIS H K anchor sleeve is adapted for the injection mortars FIS V, FIS GREEN and FIS P Plus, and ensures sparing mortar use with the best interlock.
- The centring blades perfectly align the anchor in the anchor sleeve, and allow for use with various threaded rod diameters.
- The barbed hooks secure the anchor sleeve in the drill hole and allow for a trouble-free overhead installation.
- The geometry of the anchor sleeves allows for the bridging of non-bearing layers for a simple and convenient installation.

FUNCTIONING

- The system can be used with any of the following injection mortars: FIS V, FIS VW HIGH SPEED, FIS VS LOW SPEED, FIS GREEN or FIS P Plus. FIS P can be used but does not have approvals.
- The system is suitable for pre-positioned installation when combined with injection anchor sleeves and threaded rods FIS A or internal threaded anchors FIS E.
- The anchor sleeve is placed in the drill hole, and filled with injection mortar from the anchor sleeve base.
- Turning in the anchor causes the mortar to be pushed through the anchor sleeve's grating structure, so that it fits the base material perfectly. The load is borne by the interlock.

ADVANTAGES

- The metal anchor sleeve can be cut to the required length and thus allows for a range of usable lengths with just one produce, providing flexibility and cost-effectiveness.
- The grating structure of the anchor sleeve allows for uniform distribution of mortar in the drill hole and thus for secure hold.

FUNCTIONING

- The anchor sleeve is at first cut to the required length.
- The anchor sleeve is placed in the drill hole, and filled with injection mortar from the anchor sleeve base.
- Turning in the anchor causes the mortar to be pushed through the anchor sleeve's grating structure, so that it fits the base material perfectly.
- The load is borne by the interlock.

ADVANTAGE

- The net structure of the anchor sleeve allows for uniform distribution of mortar in the drill hole and thus for secure hold.

FUNCTIONING

- The anchor sleeve is placed in the drill hole, and filled with injection mortar from the anchor sleeve base.
- Turning in the anchor causes the mortar to be pushed through the anchor sleeve's grating structure, so that it fits the base material perfectly.
- The load is borne by the interlock.

TECHNICAL DATA



Injection anchor sleeve **FIS H K**

	Art.-No.	Approval ETA	Drill hole diameter d_0 [mm]	Drill hole depth acc. ETA [mm]	Effect. anchorage depth h_{ef} [mm]	Match	Fill quantity per sleeve [scale units]	Sales unit [pcs]
Item								
FIS H 12 x 50 K	041900	■	12	55	50	FIS A M6-M8	5	50
FIS H 12 x 85 K	041901	■	12	90	85	FIS A M6-M8	10	50
FIS H 16 x 85 K	041902	■	16	90	85	FIS A M8-M10, FIS E M6-M8	12	50
FIS H 16 x 130 K	041903	■	16	135	110	FIS A M8-M10	15	20
FIS H 20 x 85 K	041904	■	20	90	85	FIS A M12-M16, FIS E M10-M12	15	20
FIS H 20 x 130 K	046703	■	20	135	110	FIS A M12-M16	25	20
FIS H 20 x 200 K	046704	■	20	205	180	FIS A M12-M16	40	20

TECHNICAL DATA



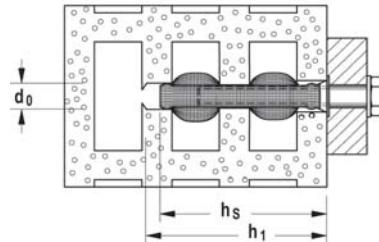
Injection anchor sleeve, 1 m length **FIS H L**

	Art.-No.	Drill hole diameter d_0 [mm]	Total length l [mm]	Match	Fill quantity per 10 cm	Sales unit [pcs]
FIS H 12 x 1000 L	050598	12	1000	Ø6 / M 6 - Ø8 / M 8	12	10
FIS H 16 x 1000 L	050599	16	1000	Ø10/M10 / Ø12/M12	14	10
FIS H 22 x 1000 L	045301	22	1000	Ø12/M12 - Ø16/M16	20	6
FIS H 30 x 1000 L	000645	30	1000	Ø16/M16 - Ø22/M22	26	4

TECHNICAL DATA



Injection anchor sleeve with net **FIS H N**



	Art.-No.	Drill hole diameter d_0 [mm]	Min. drill hole depth h_1 [mm]	Min. anchorage depth anchor h_v [mm]	Fill quantity per sleeve [scale units]	Match	Sales unit [pcs]
FIS H 16 x 85 N	050470	16	95	90	15	Ø8/M8	20
FIS H 18 x 85 N	050472	18	95	90	17	Ø10/M10	20
FIS H 20 x 85 N	050474	20	95	90	18	Ø12/M12	20

LOADS

Injection system FIS V with threaded rod FIS A⁴⁾

Highest permissible loads¹⁾ for a single anchor in solid brick masonry (without injection anchor sleeve) for pre-positioned or push-through installation.

For the design the complete assessment ETA-10/0383 has to be considered.

Type	Compressive-brick-strength f_b [N/mm ²]	Brick raw density ρ [kg/dm ³]	Minimum brick-dimensions ⁶⁾ (L x W x H) [mm]	Min. effective-anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Maximum torque $T_{inst,max}$ [Nm]	Permissible tensile load ³⁾ N_{perm} [kN]	Permissible shear load ³⁾ V_{perm} [kN]	Characteristic spacing parallel to bed joint $s_{cr \parallel}$ [mm]	Characteristic spacing perpendicular to bed joint $s_{cr \perp}$ [mm]	Min. spacing ²⁾ $s_{min \parallel} / s_{min \perp}$ [mm]	Characteristic resp. min. edge distance ²⁾ $c_{cr} = c_{min}$ [mm]
Solid brick Mz, NF acc. to EN 771-1												
M6	≥ 10	≥ 1,8	240x115x71 (NF)	50	115	4	1,14	0,71	240	75	240 / 75	100
M8				50		10	1,14	0,71				100
M10				50		10	1,00	1,14				100
M10				80		10	1,43	1,14				100
M10				200		10	3,42	2,43				150
M12				50		10	0,86	1,14				100
M12				80		10	1,57	1,14				100
M12				200		10	2,29	3,29				150
M6				50		4	1,57	1,14				100
M8				50		10	1,57	1,14				100
M10				50		10	1,43	1,71				100
M10	≥ 20	≥ 1,8	240x115x71 (NF)	80	115	10	2,00	1,71	240	75	240 / 75	100
M10				200		10	3,42	3,43				150
M12				50		10	1,29	1,57				100
M12				80		10	2,29	1,57				100
M12				200		10	3,29	3,43				150
Solid brick Mz, 2DF acc. to EN 771-1												
M6	≥ 10	≥ 1,8	240x115x113 (2DF)	50	115	4	0,86	0,71	240	115	120 / 115	60
M8				50		10	0,86	0,86				
M10				100		10	1,29	1,00				
M12				100		10	1,57	1,00				
M16				100		10	1,57	0,86				
M6				50		4	1,29	1,14				
M8				50		10	1,29	1,43				
M10				100		10	2,14	1,57				
M12				100		10	2,29	1,57				
M16				100		10	2,29	1,43				
Solid sand-lime brick KS acc. to EN 771												
M6	≥ 10	≥ 2,0	250x240x240	50	240	4	1,43	0,71	250	240	80 / 80	60
M8						10	2,00	1,29				
M10						10	2,00	1,29				
M12						10	2,00	1,29				
M16						10	1,57	1,29				
M6						4	2,14	1,14				
M8						10	2,57	1,86				
M10						10	2,57	1,86				
M12						10	2,57	1,86				
M16						4	2,43	1,43				
M6						10	2,57	2,57				
M8						10	2,57	2,57				
M10						10	2,57	2,57				
M12						10	2,57	2,57				
M16						10	2,57	2,57				

¹⁾ The required partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L = 1,4$ are considered.

²⁾ Minimum feasible spacings resp. edge distance. Details as well as to the distances to joints see assessment.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see assessment.

⁴⁾ Zinc-plated, stainless steel A4 and high corrosion-resistant steel C.

⁵⁾ The given loads are valid for installation and use of fixations in dry masonry - use category d/d - for temperatures in the substrate up to +50 °C (resp. short term up to 80 °C) and drill hole cleaning according to assessment. The given brick types in combination with the permissible loads are an extract of the assessment.

⁶⁾ Hole patterns see assessment.

LOADS

Injection system FIS V with threaded rod FIS A⁵⁾ and anchor sleeve FIS H.K

Highest permissible loads^{1) 6)} for a single anchor in solid brick masonry (with injection anchor sleeve) for pre-positioned installation.

For the design the complete assessment ETA-10/0383 has to be considered.

Type of anchor sleeve with threaded rod	Compressive-brick-strength f_b [N/mm ²]	Brick raw density ρ [kg/dm ³]	Minimum brick dimensions ⁶⁾ (L x W x H) [mm]	Min. effective anchorage depth ⁴⁾ h_{ef} [mm]	Min. member thickness h_{min} [mm]	Maximum torque $T_{inst,max}$ [Nm]	Permissible tensile load ³⁾ N_{perm} [kN]	Permissible shear load ³⁾ V_{perm} [kN]	Characteristic spacing parallel to bed joint $s_{cr \parallel}$ [mm]	Characteristic spacing perpendicular to bed joint $s_{cr \perp}$ [mm]	Min. spacing ²⁾ $s_{min \parallel} / s_{min \perp}$ [mm]	Characteristic resp. min. edge distance ²⁾ $c_{cr} = c_{min}$ [mm]
Solid brick Mz, 2DF acc. to EN 771-1												
16x85 M8	≥ 10	$\geq 1,8$	240x115x113 (2DF)	85	115	10	0,86	0,86	240	115	120 / 115	60
16x85 M10							0,86	1,00				
16x85 M8							1,29	1,43				
16x85 M10							1,29	1,57				
Solid sand-lime brick KS acc. to EN 771												
16x85 M8/M10	≥ 10	$\geq 2,0$	250x240x240	85	240	10	2,29	1,29	250	240	80 / 80	60
16x85 M8/M10							2,57	1,86				
16x85 M8/M10							2,57	2,57				
Lightweight concrete block Vbl acc. to EN 771-3												
12x85 M6	≥ 4		250x240x239	85		240	1,00	0,57	250	250	250 / 250	130
12x50 M8				50			0,57	0,86				
12x85 M8				85			1,00	0,86				
16x85 M10				85			1,14	1,00				
20x85 M12				85			1,43	1,29				
12x85 M6	≥ 6		250x240x239	85	240	4	1,43	0,86	250	250	250 / 250	130
12x50 M8				50			0,86	1,29				
12x85 M8				85			1,43	1,29				
16x85 M8 / M10				85			1,86	1,57				
20x85 M12 / M16				85			2,14	1,86				
12x85 M6	≥ 8		250x240x239	85		240	2,00	1,14	250	250	250 / 250	130
12x50 M8				50			1,14	1,71				
12x85 M8				85			2,00	1,71				
16x85 M8 / M10				85			2,43	2,00				
20x85 M12 / M16				85			2,57	2,43				

¹⁾ The required partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L = 1,4$ are considered.

²⁾ Minimum feasible spacings resp. edge distance. Details as well as to the distances to joints see assessment.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see assessment.

⁴⁾ The maximum anchorage depth is corresponding with the relevant anchor sleeves FIS H.K (see technical data).

⁵⁾ Zinc-plated, stainless steel A4 and high corrosion-resistant steel C.

⁶⁾ The given loads are valid for installation and use of fixations in dry masonry - use category d/d - for temperatures in the substrate up to +50 °C (resp. short term up to 80 °C) and drill hole cleaning according to assessment. The given brick types in combination with the permissible loads are an extract of the assessment.

⁷⁾ Hole patterns see assessment.

LOADS

Injection system FIS V with threaded rod FIS A⁵⁾ and anchor sleeve FIS H..K

Highest permissible loads^{1) 6)} for a single anchor in perforated brick masonry (with injection anchor sleeve) for pre-positioned installation. For the design the complete assessment ETA-10/O383 has to be considered.

Type of anchor sleeve with threaded rod	Compressive-brick-strength f_b [N/mm ²]	Brick raw density ρ [kg/dm ³]	Minimum brick-dimensions ⁷⁾ (L x W x H) [mm]	Min. effective anchorage depth ⁴⁾ h_{ef} [mm]	Min. member thickness h_{min} [mm]	Maximum torque $T_{inst,max}$ [Nm]	Permissible tensile load ³⁾ N_{perm} [kN]	Permissible shear load ³⁾ V_{perm} [kN]	Characteristic spacing parallel to bed joint $s_{cr\parallel}$ [mm]	Characteristic spacing perpendicular to bed joint $s_{cr\perp}$ [mm]	Min. spacing ²⁾ $s_{min\parallel} / s_{min\perp}$ [mm]	Characteristic resp. min. edge distance ²⁾ $c_{cr} = c_{min}$ [mm]
-----------------------------------------	-------------------------------------------------------------	------------------------------------------------------	---------------------------------------------------------------	------------------------------------------------------------------	--------------------------------------------	------------------------------------------	--------------------------------------------------------------	------------------------------------------------------------	---------------------------------------------------------------------------	----------------------------------------------------------------------------	-------------------------------------------------------------------------	-------------------------------------------------------------------------------------

Vertically perforated brick Hz, shape B acc. to EN 771-1

12x50 M6/M8	≥ 4	≥ 1,0	500x175x237 or 370x240x237	50	175	2,0	0,11	0,14	500 resp. 370	240	100 / 100	100
16x85 M8/M10	≥ 4			85			0,26	0,14				
20x130 M12/M16	≥ 4			130			0,34	0,17				
12x50 M6/M8	≥ 8			50			0,21	0,26				
16x85 M8/M10	≥ 8			85			0,57	0,26				
20x130 M12/M16	≥ 8			130			0,71	0,34				
12x50 M6/M8	≥ 12			50			0,34	0,43				
16x85 M8/M10	≥ 12			85			0,86	0,43				
20x130 M12/M16	≥ 12			130			1,14	0,57				

Vertically perforated brick Hz, acc. to EN 771-1

12x50 M6	≥ 6	≥ 1,4	240x115x113 (2DF)	50	115	2,0	0,21	0,34	240	115	240 / 115	80
12x85 M8	≥ 6			85			0,34	0,57				
16x85 M8/M10	≥ 6			85			0,21	0,43				
20x85 M12/M16	≥ 6			85			0,26	0,71				
12x50 M6	≥ 16			50			0,57	0,86				
12x85 M8	≥ 16			85			0,86	1,57				
16x85 M8/M10	≥ 16			85			0,57	1,00				
20x85 M12/M16	≥ 16			85			0,71	1,57				
12x50 M6	≥ 28			50			1,00	1,43				
12x85 M8	≥ 28			85			1,57	1,57				
16x85 M8/M10	≥ 28			85			1,00	1,57				
20x85 M12/M16	≥ 28			85			1,29	1,57				

Perforated sand-lime brick KSL acc. to EN 771-2

12x50 M6/M8	≥ 12	≥ 1,4	240x175x113	50	175	2,0	0,71	0,71	240	115	100 / 115	60
16x85 M8/M10	≥ 12			85			0,86	1,29				
20x85 M12	≥ 12			85			1,00	1,29				
12x50 M6/M8	≥ 20			50			1,29	1,14				
16x85 M8/M10	≥ 20			85			1,43	2,14				
20x85 M12	≥ 20			85			1,71	2,14				

Lightweight concrete hollow block Hbl acc. to EN 771-3

12x50 M6/M8	≥ 2	≥ 1,0	362x240x240	50	240	2,0	0,34	0,26	362	240	100 / 240	60
16x85 M8/M10	≥ 2			85			0,43	0,26				
20x200 M12/M16	≥ 2			180			0,71	0,26				
12x50 M6/M8	≥ 4			50			0,71	0,57				
16x85 M8/M10	≥ 4			85			0,86	0,57				
20x200 M12/M16	≥ 4			180			1,57	0,57				

¹⁾ The required partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L = 1,4$ are considered.

²⁾ Minimum feasible spacings resp. edge distance. Details as well as to the distances to joints see assessment.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see assessment.

⁴⁾ The maximum anchorage depth is corresponding with the relevant anchor sleeves FIS H..K (see technical data).

⁵⁾ Zinc-plated, stainless steel A4 and high corrosion-resistant steel C.

⁶⁾ The given loads are valid for installation and use of fixations in dry masonry - use category d/d - for temperatures in the substrate up to +50 °C (resp. short term up to 80 °C) and drill hole cleaning according to assessment. The given brick types in combination with the permissible loads are an extract of the assessment.

⁷⁾ Hole patterns see assessment.

ACCESSORIES



Cone drill **PBB**



Centring sleeve **PBZ**

Item	Art.-No.	Approval	Match	Contents				Sales unit [pcs]
Cone drill PBB	090634	■	M8 - M12; FIS E	1x cone drill PBB				1
Centring sleeve PBZ	090671	■	M8 - M12; FIS E	10x centring sleeve PBZ, 5x injection adapter				10

LOADS

Injection system FIS V with threaded rod FIS A⁴⁾

Highest permissible loads^{1) 5)} for a single anchor in aerated concrete.

For the design the complete assessment ETA-10/0383 has to be considered.

Type threaded rod	Compressive-brick-strength f_b [N/mm ²]	Brick raw density ρ [kg/dm ³]	Minimum brick dimensions (L x W x H) [mm]	Min. effective-anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Maximum torque $T_{inst,max}$ [Nm]	Permissible tensile load ³⁾ N_{perm} [kN]	Permissible shear load ³⁾ V_{perm} [kN]	Characteristic spacing parallel to bed joint $s_{cr \parallel}$ [mm]	Characteristic spacing perpendicular to bed joint $s_{cr \perp}$ [mm]	Min. spacing ²⁾ $s_{min \parallel} / s_{min \perp}$ [mm]	Characteristic resp. min. edge distance ²⁾ $c_{cr} = c_{min}$ [mm]
Aerated concrete acc. to EN 771-4												
M8 ⁶⁾							1	0,54	0,43			
M10 ⁶⁾							2	0,54	0,43			
M12 ⁶⁾							2	0,71	0,54			
M16 ⁶⁾							2	0,71	0,43			
M8 ⁶⁾							1	0,71	0,89			
M10 ⁶⁾							2	1,07	0,71			
M12 ⁶⁾							2	0,89	0,89			
M16 ⁶⁾							2	0,71	0,71			
M8 ⁶⁾							1	1,25	1,07			
M10 ⁶⁾							2	1,79	1,07			
M12 ⁶⁾							2	1,79	1,25			
M16 ⁶⁾							2	1,07	1,61			
M8, M10, M12 ⁷⁾	≥ 2	≥ 0,35						0,71	0,89			
M8, M10, M12 ⁷⁾	≥ 4	≥ 0,50						1,07	1,61			
M8, M10, M12 ⁷⁾	≥ 6	≥ 0,65						1,43	2,14			
M8, M10, M12 ⁷⁾								0,89	0,89			
M8, M10, M12 ⁷⁾								1,25	1,61			
M8, M10, M12 ⁷⁾								1,61	2,14			

¹⁾ The required partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L = 1,4$ are considered.

²⁾ Minimum feasible spacings resp. edge distance. Details as well as to the distances to joints see assessment.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see assessment.

⁴⁾ Zinc-plated, stainless steel A4 and high corrosion-resistant steel C.

⁵⁾ The given loads are valid for installation and use of fixations in dry masonry - use category d/d - for temperatures in the substrate up to +50 °C (resp. short term up to 80 °C) and drill hole cleaning according to assessment. The given brick types in combination with the permissible loads are an extract of the assessment.

⁶⁾ Cylindrical drill hole. Pre-positioned and push-through installation possible.

⁷⁾ Drill hole to be made with cone drill bit PBB. Pre-positioned installation only.