Injection mortar FIS V

The high-performance hybrid mortar in the shuttle cartridge.

OVERVIEW

Injection mortar **FIS V 360 S**, styrene free

Static mixer **FIS S**

Injection mortar **FIS V 950 S**, styrene free

Approvals:

- European Technical Approval Option 7 in conjunction with Threaded rods FIS A resp. RG M for non-cracked concrete.
- German approval (DIBt) in conjunction with injection anchor sleeve FIS H M and injection anchor parts FIS G and FIS E for solid and hollow bricks (solid brick also without anchor sleeve).
- German approval (DIBt) for aerated cement in conjunction with cone drill PBB, centering sleeve PBZ and Threaded rod FIS G.
- German approval (DIBt) for reinforcement bars.
- German approval (DIBt) for Remedial wall tie VBS 8.
- German approval (DIBt) for Weather facing renovation system FWS.
- ICC-Approval for threaded rods and rebars

For fixing of:

- Steel constructions
- Railings
- Hand-rails
- Consoles
- Ladders
- Machines
- Cable trays
- Staircases
- Gates
- Facades
- Window elements
- High racks
- Canopies
- Stand-off installations

For load data see page 54

DESCRIPTION

- Styrene-free, quick-curing high-performance hybrid mortar (contains vinyl ester resin and cement).
- Resin and cement as well as water and hardener are stored in two separate chambers and are not mixed and activated until pushed through the static mixer.
- Partially-used cartridges can easily be reused by changing the static mixer.

Advantages/Benefits

- High-performance hybrid mortar for high loads in almost all building materials.
- Universal fixing system for a broad range of applications on building sites.
- Expansion-free anchoring allows low axial spacings and edge distances.
- Extensive range of accessories for a wide variety of applications.
- Ergonomic injection guns for quick and easy installation.
- A variety of approvals cover many applications in nearly all building material and guarantee maximum safety.
- First injection system world-wide with approvals for concrete, reinforcement bars, solid bricks, perforated bricks and aircrete.

Accessories / Recommended loads

- For fixing in concrete
- For fixing in masonry
- For fixing in aerated concrete
- For reinforcement bars
- Appropriate injection guns

FIXING PRINCIPLES

In detail: The general principles for installation, the correct drilling procedure and much more on page 303.

STANDARDS

You will find everything that has standards on page 313 under the keyword approvals.

TECHNICAL DATA

Injection mortar **FIS V 360 S**, styrene free

Injection mortar **FIS V 950 S**, styrene free

Type	Art.-No.	ID	approvals ● DIBt ■ ETA		contents	languages on the lable	shelf life	qty. per box
							months	pcs.
FIS V 360 S	**94405**	9	●	■	1 cartridge 360 ml + 2 static mixer	-	18	6
FIS V 950 S	**17101**	1	●	■	1 cartridge 950 ml + 2 static mixer	D, GB, F, NL, I, E, P, JP, PRC	18	6
FIS S	**61223**	1			10 static mixer FIS V 360 S	-	-	10

FIS V 360 S HWK big

FIS V 360 S HWK small

Type	Art.-No.	ID	contents	languages on the lable	qty. per box
					pcs.
FIS V 360 S HWK big	**96554**	2	20 x FIS V 360 S cartridges + 360 ml/560 g, 40 x static mixers	D, GB, F, NL,	-
FIS V 360 S HWK small	**92430**	3	10 x FIS V 360 S cartridges + 360 ml/560 g, 20 x static mixers	D, GB, F, NL,	-

CURING TIME

Gelling and curing time of fischer FIS V

Cartridge temperature (mortar)	**Gelling time**	**Temperature at anchoring base**	**Curing time**
		- 5°C – ± 0°C	24 hrs.
		± 0°C – + 5°C	3 hrs.
+ 5°C – + 10°C	13 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.

Injection technique for concrete

TECHNICAL DATA

Cleaning brush for concrete

Compressed-air cleaning gun **ABP**

Type	Art.-No.	ID	for thread M	qty. per box pcs.
BS ø 8	**78177**	7	M 6	1
BS ø 10	**78178**	4	M 8	1
BS ø 12	**78179**	1	M 10	1
BS ø 14	**78180**	7	M 12	1
BS ø 18	**78181**	4	M 16	1
BS ø 24	**78182**	1	M 20	1
BS ø 28	**78183**	8	M 24	1
BS ø 35	**78184**	5	M 30	1
ABP	**59456**	8	-	1

LOADS - INJECTION MORTAR FIS V, FIS VS AND FIS VW

Mean ultimate loads, design resistant and recommended loads for single anchors of fischer Injection system FIS V and FIS VS, FIS VW used with fischer threaded rods with large axial spacing and edge distance.

					Non-cracked concrete															
Anchor size					**M 6**		**M 8**		**M 10**		**M 12**		**M 16**		**M 20**		**M 24**		**M30**	
Effektive anchorage depth = Drill hole depth	$h_{01} = h_{ef1}$	[mm]			50		65		80		95		125		160		190		240	
	$h_{02} = h_{ef2}$	[mm]			60		80		90		110		140		170		240		280	
	$h_{03} = h_{ef3}$	[mm]			75		95		110		120		170		210		285		340	
Drill hole diameter	d_0	[mm]			8		10		12		14		18		24		28		35	
Mean ultimate loads N_u and V_u [kN]																				
					gvz	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**
Tensile	0°	N_u	[kN]	h_{ef1}	10.5*	14.1*	19.0*	25.6*	30.2*	40.6*	43.8*	58.4	81.6*	93.2	127.4	127.4	176.9	176.9	248.1	248.1
			[kN]	h_{ef2}	10.5*	14.1*	19.0*	25.6*	30.2*	40.6*	43.8*	59.0*	81.6*	104.4	127.4*	135.4	183.6*	223.5	289.5	289.5
			[kN]	h_{ef3}	10.5*	14.1*	19.0*	25.6*	30.2*	40.6*	43.8*	59.0*	81.6*	109.9*	127.4*	167.2	183.6*	247.1*	291.7*	351.5
Shear	90°	V_u	[kN]		6.3*	8.4*	11.4*	15.4*	18.1*	24.4*	26.3*	35.4*	49.0*	65.9*	76.4*	102.9*	110.1*	148.3*	175.0*	235.6*
Design resistant loads N_{Rd} and V_{Rd} [kN]																				
					gvz	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**
Tensile	0°	N_{Rd}	[kN]	h_{ef1}	4.7	4.7	8.2	8.2	12.6	12.6	17.9	17.9	31.4	31.4	40.2	40.2	57.3	57.3	67.8	67.8
			[kN]	h_{ef2}	5.7	5.7	10.1	10.1	14.1	14.1	20.7	20.7	35.2	35.2	42.7	42.7	72.4	72.4	79.2	79.2
			[kN]	h_{ef3}	7.1	7.1	11.9	11.9	17.3	17.3	22.6	22.6	42.7	42.7	52.8	52.8	85.9	85.9	96.1	96.1
Shear	90°	V_{Rd}	[kN]		4.2	4.5	7.6	8.2	12.1	13.0	17.5	18.9	32.6	35.3	51.0	55.0	73.4	79.2	116.7	125.9
Recommended loads N_{rec} and V_{rec} [kN]																				
					gvz	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**
Tensile	0°	N_{rec}	[kN]	h_{ef1}	3.4	3.4	5.9	5.9	9.0	9.0	12.8	12.8	22.4	22.4	28.7	28.7	40.9	40.9	48.4	48.4
			[kN]	h_{ef2}	4.1	4.1	7.2	7.2	10.1	10.1	14.8	14.8	25.1	25.1	30.5	30.5	51.7	51.7	56.6	56.6
			[kN]	h_{ef3}	5.1	5.1	8.5	8.5	12.4	12.4	16.1	16.1	30.5	30.5	37.7	37.7	61.4	61.4	68.6	68.6
Shear	90°	V_{rec}	[kN]		3.0	3.2	5.4	5.9	8.6	9.3	12.5	13.5	23.3	25.2	36.4	39.3	52.4	56.6	83.4	89.9
Recommended bending moment M_{rec} [Nm]																				
					gvz	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**	**gvz**	**A4**
		M_{rec}	[Nm]		4.5	4.9	11.4	11.9	22.3	23.8	38.9	42.1	98.9	106.7	193.1	207.9	333.1	359.4	668.0	720.7
Component dimensions, minimum axial spacings and edge distances																				
Min. axial spacing [1]		s_{min}	[mm]		40		40		45		55		65		85		105		140	
Min. edge distance [1]		c_{min}	[mm]		40		40		45		55		65		85		105		140	
Min. structural component thickness		h_{min1}	[mm]		100		100		110		125		165		210		250		310	
		h_{min2}	[mm]		100		110		120		140		180		220		300		350	
		h_{min3}	[mm]		115		125		140		150		210		260		345		410	
Required torque		T_{inst}	[Nm]		5		10		20		40		60		120		150		300	

* Steel failure decisive.

[1] For minimum axial spacing and minimum edge distance the above described loads have to be reduced (see "fischer Technical Handbook" or design software "CC-Compufix")!

Values given above are valid under the following assumptions: - Sufficient mechanical cleaning of the drill hole using stainless steel brushes.
- Dry concrete, temperature range 50°C long term temperature and 80°C short term temperature.

All values apply for concrete C 20/25 without edge or spacing influence.

Design resistant loads: material safety factor γ_M is included. Material safety factor γ_M depends on the type of anchor.

Recommended loads: material safety factor γ_M and safety factor for load γ_L = 1.4 are included.

The condition of application differ from those given in the European Technical Approval (ETA). For further detailed information about the ETA please contact the fischer technical service department.
RG M threaded rods can be used as an alternative. Please refer to page 64 for suitable threaded rods.
Higher loads are available using Premium Cleaning methods. Please contact Technical Department for details on 01491 827920.

Technical Data Sheet

fischer Injection mortar FIS V

FIS V 360 S, FIS V 950 S

Order numbers 94404, 94405, 68435, 17101

Product description: High performance hybrid mortar in shuttle cartridge, styrene free, colour: grey

Product data	**Testing method**	**Results**
Stability		
UV-resistance (sunlight)		Resistant
Temperature resistance		120°C
Water resistancy		Resistant
Water absorption		After 14 days: 0.8%
Cleaning agents		1% tenside solution: no effects
Long-term behaviour (Freezing and thawing resistance)	EOTA part 5	Approved suitability for outside applications

Physical properties		
Flexural strength	According to DIN EN 196-1	After 45 min: ≥ 15 N/mm^2
Compressive strength	According to DIN EN 196-1	After 45 min: ≥ 60 N/mm^2
Tensile strength	ISO 527	After 24 hours: 10 MPa
Elongation at break	ISO 527	After 24 hours: 0.47%
Elastic modulus	ISO 527	After 24 hours: 4.3 GPa
Shrinkage		< 0.8%
Hardness Shore A	ISO 868	After 45 min: 91
Thermal conductivity	DIN 52612	0.65 W/mK
Specific contact resistance	IEC 60093	21.9 ± 17.1 x 10^{9}Ωcm
pH-value		After 24 hours: > 12 (22°C)
Density		1.70 ± 0.1 g/cm^3

Workability features		
Viscosity (20°C)	Brookfield (Sp.7) 10 U/min	120 – 160 Pas
Open time (20°C)		5 min
Curing time (20°C)		60 min
Shelf life		18 months