

De veelzijdige injectiemortel voor o.a. verankeringen in gescheurd beton en metselwerk



BOUWMATERIALEN

Goedgekeurd voor verankeringen in:

- Beton C20/25 tot C50/60, gescheurd en ongescheurd
- Holle bouwsteen van licht beton
- Holle bouwsteen van beton
- Geperforeerde baksteen
- Geperforeerde kalkzandsteen
- Volle kalkzandsteen
- Cellenbeton
- Volle baksteen

Goedgekeurd voor:

GOEDKEURINGEN



GOEDKEURINGEN



TOEPASSINGEN

- Staalwerkconstructies
- Houtconstructies
- Leuningen
- Gevelsystemen
- Trappen
- Staalconsoles
- Machines
- Masten
- Markiezen
- Hekwerk
- Consoles
- Pijpleidingen
- Traliewerk
- Satellietantennes

WERKING

- FIS V is een 2-componenten injectiemortel op basis van vinylesterhybride.
- Zowel de hars als de hardener zijn in aparte kamers verpakt en worden pas geactiveerd in de mengtuit.
- De injectiekokers kunnen snel en gebruiksvriendelijk samen met de fischer dispensers worden gebruikt.
- Gedeeltelijk verbruikte kokers kunnen opnieuw worden gebruikt door de mengtuit te vervangen.

TECHNISCHE GEGEVENS



Injectiemortel FIS V

Artikelnaam	Art.-Nr.	DIBt goedkeuring	Goed-keuring	Talen op het label	Inhoud	Verpakkingseenheid [Stuks]
FIS VS 300 T	093180		■	D, GB, F, NL, E, P		12
FIS V 360 S	094404		■	D, F, NL, TR, H, UAE	1 Koker 360 ml, 2 x FIS MR	6
FIS V 360 S HWK groot	091936		■	D, F, NL, TR, H, UAE	20 kokers 360 ml, 40 x mengtuit FIS MR	1
FIS V 360 S HWK klein	092430		■	D, F, NL, TR, H, UAE	10 kokers 360 ml, 20 x mengtuit FIS MR	1
Injectiemortel FIS VS 150 C	045302		■	D, GB, F, I, NL, E	1 Koker 145 ml, 1 x FIS MR	6
Injectiemortel FIS VS 150 C Set	045303		■	D, GB, F, I, NL, E	Set voor geperforeerd metselwerk: 1 koker 145 ml, 2 x mengtuit FIS MR, 6 x FIS H 16 x 85 K	6
Injectiemortel FIS VS 100 P	072525		■	D, GB, F, I, NL, E	1 Koker FIS VS 100 ml + 2 Mengtuiten	6
FIS VW 360 S	090753		■	D, GB, F, I, NL, E	1 Koker 360 ml, 2 x FIS MR	6

LOADS

Injection system FIS V with threaded rod FIS A (property class 5.8)

Highest permissible loads for a single anchor¹⁾⁶⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 02/0024 has to be considered.

Type	Min. effective anchorage depth $h_{ef,min}$ [mm]	Max. effective anchorage depth $h_{ef,max}$ [mm]	Min. member thickness h_{min} [mm]	Max. torque moment $T_{inst,max}$ [Nm]	Cracked concrete				Non-cracked concrete			
					Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]	Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	
FIS A M6 (5.8)	50		100	5,0					4,0	2,9	40	
		72	102	5,0					5,2	2,9	40	
FIS A M8 (5.8)	60		100	10,0					7,9	5,1	40	
		160	190	10,0					9,0	5,1	40	
FIS A M10 (5.8)	60		100	20,0	5,4	8,6	45	45	9,9	8,6	45	
		200	230	20,0	13,8	8,6	45	45	13,8	8,6	45	
FIS A M12 (5.8)	70		100	40,0	7,5	12,0	55	55	13,8	12,0	55	
		240	270	40,0	20,5	12,0	55	55	20,5	12,0	55	
FIS A M16 (5.8)	80		116	60,0	11,5	22,3	65	65	17,2	22,3	65	
		320	356	60,0	37,6	22,3	65	65	37,6	22,3	65	
FIS A M20 (5.8)	90		138	120,0	14,6	29,3	85	85	20,5	34,9	85	
		400	448	120,0	58,6	34,9	85	85	58,6	34,9	85	
FIS A M24 (5.8)	96		152	150,0	15,5	31,0	105	105	22,6	45,2	105	
		480	536	150,0	77,6	50,9	105	105	84,3	50,9	105	
FIS A M27 (5.8)	108		168	200,0	17,4	34,9	125	125	27,0	54,0	125	
		540	600	200,0	87,2	65,7	125	125	109,5	65,7	125	
FIS A M30 (5.8)	120		190	300,0	21,5	43,1	140	140	31,6	63,2	140	
		600	670	300,0	107,7	80,6	140	140	133,8	80,6	140	

¹⁾ The partial safety factors for material resistance as regulated in the approval 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 $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1,5 \times h_{ef}$.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

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

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

⁶⁾ The given loads are valid for temperatures in the substrate up to +50 °C (resp. short term to 80 °C). Erection of the drill hole by hammer drilling with best possible drill hole cleanliness according approval. The anchor may be installed in dry or wet concrete.

LOADS

Injection system FIS V, FIS VW, FIS VS with threaded rod FIS A (property class 8.8)

Highest permissible loads for a single anchor^{1) 6)} in concrete C20/25⁴⁾

For the design the complete approval ETA - 02/0024 has to be considered.

Type	Min. effective anchorage depth $h_{ef,min}$ [mm]	Max. effective anchorage depth $h_{ef,max}$ [mm]	Min. member thickness h_{min} [mm]	Max. torque moment $T_{inst,max}$ [Nm]	Cracked concrete				Non-cracked concrete			
					Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]	Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]
FIS A M6 (8.8)	50		100	5,0					4,0	4,6	40	40
		72	102	5,0					5,8	4,6	40	40
FIS A M8 (8.8)	60		100	10,0					7,9	8,6	40	40
		160	190	10,0					14,3	8,6	40	40
FIS A M10 (8.8)	60		100	20,0	5,4	10,8	45	45	9,9	13,1	45	45
		200	230	20,0	18,0	13,1	45	45	22,4	13,1	45	45
FIS A M12 (8.8)	70		100	40,0	7,5	15,1	55	55	13,8	19,4	55	55
		240	270	40,0	25,9	19,4	55	55	32,4	19,4	55	55
FIS A M16 (8.8)	80		116	60,0	11,5	23,0	65	65	17,2	36,0	65	65
		320	356	60,0	46,0	36,0	65	65	60,0	36,0	65	65
FIS A M20 (8.8)	90		138	120,0	14,6	29,3	85	85	20,5	41,1	85	85
		400	448	120,0	65,8	56,0	85	85	93,3	56,0	85	85
FIS A M24 (8.8)	96		152	150,0	15,5	31,0	105	105	22,6	45,2	105	105
		480	536	150,0	77,6	80,6	105	105	134,3	80,6	105	105
FIS A M27 (8.8)	108		168	200,0	17,4	34,9	125	125	27,0	54,0	125	125
		540	600	200,0	87,2	105,1	125	125	175,2	105,1	125	125
FIS A M30 (8.8)	120		190	300,0	21,5	43,1	140	140	31,6	63,2	140	140
		600	670	300,0	107,7	128,6	140	140	213,8	128,6	140	140

¹⁾ The partial safety factors for material resistance as regulated in the approval 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 $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1,5 \times h_{ef}$.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

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

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

⁶⁾ The given loads are valid for temperatures in the substrate up to +50 °C (resp. short term up to 80 °C). Erection of the drill hole by hammer drilling with best possible drill hole cleaning according approval. The anchor may be installed in dry or wet concrete.

LOADS

Injection system FIS V, FIS VW, FIS VS with threaded rod FIS A A4 (property class A4-70)

Highest permissible loads for a single anchor¹⁾⁶⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 02/0024 has to be considered.

Type	Min. effective anchorage depth $h_{ef,min}$ [mm]	Max. effective anchorage depth $h_{ef,max}$ [mm]	Min. member thickness h_{min} [mm]	Max. torque moment $T_{inst,max}$ [Nm]	Cracked concrete				Non-cracked concrete			
					Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]	Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	
FIS A M6 (A4-70)	50		100	5,0					4,0	3,2	40	
		72	102	5,0					5,3	3,2	40	
FIS A M8 (A4-70)	60		100	10,0					7,9	6,0	40	
		160	190	10,0					9,9	6,0	40	
FIS A M10 (A4-70)	60		100	20,0	5,4	9,2	45	45	9,9	9,2	45	
		200	230	20,0	15,7	9,2	45	45	15,7	9,2	45	
FIS A M12 (A4-70)	70		100	40,0	7,5	13,7	55	55	13,8	13,7	55	
		240	270	40,0	22,5	13,7	55	55	22,5	13,7	55	
FIS A M16 (A4-70)	80		116	60,0	11,5	23,0	65	65	17,2	25,2	65	
		320	356	60,0	42,0	25,2	65	65	42,0	25,2	65	
FIS A M20 (A4-70)	90		138	120,0	14,6	29,3	85	85	20,5	39,4	85	
		400	448	120,0	65,7	39,4	85	85	65,7	39,4	85	
FIS A M24 (A4-70)	96		152	150,0	15,5	31,0	105	105	22,6	45,2	105	
		480	536	150,0	77,6	56,8	105	105	94,3	56,8	105	
FIS A M27 (A4-70)	108		168	200,0	17,4	34,9	125	125	27,0	54,0	125	
		540	600	200,0	87,2	73,7	125	125	123,0	73,7	125	
FIS A M30 (A4-70)	120		190	300,0	21,5	43,1	140	140	31,6	63,2	140	
		600	670	300,0	107,7	90,2	140	140	150,1	90,2	140	

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

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

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

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

⁶⁾ The given loads are valid for temperatures in the substrate up to +50 °C (resp. short term up to 80 °C). Erection of the drill hole by hammer drilling with best possible drill hole cleanliness according approval. The anchor may be installed in dry or wet concrete.

LOADS

Injection system FIS V, FIS VW, FIS VS with threaded rod FIS A C (property class C-70)

Highest permissible loads for a single anchor^{1) 6)} in concrete C20/25⁴⁾

For the design the complete approval ETA - 02/0024 has to be considered.

Type	Min. effective anchorage depth $h_{ef,min}$ [mm]	Max. effective anchorage depth $h_{ef,max}$ [mm]	Min. member thickness h_{min} [mm]	Max. torque moment $T_{inst,max}$ [Nm]	Cracked concrete				Non-cracked concrete			
					Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]	Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]
FIS A M6 (C-70)	50		100	5,0					4,0	4,0	40	40
		72	102	5,0					5,8	4,0	40	40
FIS A M8 (C-70)	60		100	10,0					7,9	7,4	40	40
		160	190	10,0					12,4	7,4	40	40
FIS A M10 (C-70)	60		100	20,0	5,4	10,8	45	45	9,9	11,4	45	45
		200	230	20,0	18,0	11,4	45	45	19,5	11,4	45	45
FIS A M12 (C-70)	70		100	40,0	7,5	15,1	55	55	13,8	17,1	55	55
		240	270	40,0	25,9	17,1	55	55	28,1	17,1	55	55
FIS A M16 (C-70)	80		116	60,0	11,5	23,0	65	65	17,2	31,4	65	65
		320	356	60,0	46,0	31,4	65	65	52,4	31,4	65	65
FIS A M20 (C-70)	90		138	120,0	14,6	29,3	85	85	20,5	41,1	85	85
		400	448	120,0	65,8	49,1	85	85	81,9	49,1	85	85
FIS A M24 (C-70)	96		152	150,0	15,5	31,0	105	105	22,6	45,2	105	105
		480	536	150,0	77,6	70,9	105	105	117,6	70,9	105	105
FIS A M27 (C-70)	108		168	200,0	17,4	34,9	125	125	27,0	54,0	125	125
		540	600	200,0	87,2	92,0	125	125	153,3	92,0	125	125
FIS A M30 (C-70)	120		190	300,0	21,5	43,1	140	140	31,6	63,2	140	140
		600	670	300,0	107,7	112,6	140	140	187,1	112,6	140	140

¹⁾ The partial safety factors for material resistance as regulated in the approval 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 $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1,5 \times h_{ef}$.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

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

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

⁶⁾ The given loads are valid for temperatures in the substrate up to +50 °C (resp. short term up to 80 °C). Erection of the drill hole by hammer drilling with best possible drill hole cleaning according approval. The anchor may be installed in dry or wet concrete.

LOADS

Injection system FIS V, FIS VW HIGH SPEED and FIS VS LOW SPEED with internal threaded anchor RG MI (screw prop class 8.8)

Highest permissible loads for a single anchor^{1) 6)} in concrete C20/25⁴⁾

For the design the complete approval ETA - 02/0024 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Max. torque moment $T_{inst,max}$ [Nm]	Non-cracked concrete			
				Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]
RG M 8 I	90	120	10,0	13,8	8,3	40	40
RG M 10 I	90	125	20,0	19,0	13,3	45	45
RG M 12 I	125	165	40,0	23,8	19,3	60	60
RG M 16 I	160	208	80,0	35,7	35,8	80	80
RG M 20 I	200	264	120,0	54,8	42,9	125	125

¹⁾ The partial safety factors for material resistance as regulated in the approval 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 $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1,5 \times h_{ef}$.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

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

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

⁶⁾ The given loads are valid for fixations in dry and humid concrete for temperatures in the range up to +50°C (resp. short term up to 80°C) and best possible drillhole cleaning according to the approval.

LOADS

Injection system FIS V, FIS VW HIGH SPEED and FIS VS LOW SPEED with internal threaded anchor RG MI A4 (screw property class A4-70)

Highest permissible loads for a single anchor^{1) 6)} in concrete C20/25⁴⁾

For the design the complete approval ETA - 02/0024 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Max. torque moment $T_{inst,max}$ [Nm]	Non-cracked concrete			
				Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]
RG M 8 I A4	90	120	10,0	9,9	5,9	40	40
RG M 10 I A4	90	125	20,0	15,7	9,3	45	45
RG M 12 I A4	125	165	40,0	22,5	13,5	60	60
RG M 16 I A4	160	208	80,0	35,7	25,1	80	80
RG M 20 I A4	200	264	120,0	54,8	39,4	125	125

¹⁾ The partial safety factors for material resistance as regulated in the approval 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 $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1,5 \times h_{ef}$.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

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

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

⁶⁾ The given loads are valid for fixations in dry and humid concrete for temperatures in the substrate up to +50°C (resp. short term up to 80°C) and best possible drillhole cleaning according approval.

LOADS

Injection system FIS V, FIS VW HIGH SPEED and FIS VS LOW SPEED with threaded rod FIS A⁵⁾

Highest permissible loads^{1) 6)} for a single anchor in solid brick masonry for pre-positioned or push-through installation. For the design the complete assessment ETA-10/O383 has to be considered.

Type	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 h_{ef} [mm]	Min. member thickness h_{min} [mm]	Maximum torque $T_{inst,max}$ [Nm]	Solid brick masonry			
							Permissible tensile load ³⁾ N_{perm} [kN]	Permissible shear load ³⁾ V_{perm} [kN]	Min. spacing ²⁾ s_{min} [mm]	Min. edge distance ²⁾ c_{min} [mm]
Solid brick Mz, 2DF acc. EN 771-1										
M8	≥ 10	≥ 1,8	240x115x113	50	115	10	0,86	0,86	115	6
M10	≥ 10			50			0,86	1,00	115	6
M12	≥ 10			100			1,57	1,00	115	6
M8	≥ 16			50			1,29	1,43	115	6
M10	≥ 16			50			1,29	1,57	115	6
M12	≥ 16			100			2,29	1,57	115	6
Solid sand-lime brick KS acc. EN 771										
M8	≥ 10	≥ 2,0	250x240x240	50	240	10	2,00	1,29	80	6
M10	≥ 10			50			2,00	1,29	80	6
M12	≥ 10			50			2,00	1,29	80	6
M16	≥ 10			50			1,57	1,29	80	6
M8	≥ 20			50			2,57	1,86	80	6
M10	≥ 20			50			2,57	1,86	80	6
M12	≥ 20			50			2,57	1,86	80	6
M16	≥ 20			50			2,14	1,86	80	6
M8	≥ 28			50			2,57	2,57	80	6
M10	≥ 28			50			2,57	2,57	80	6
M12	≥ 28			50			2,57	2,57	80	6
M16	≥ 28			50			2,57	2,57	80	6

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 possible axial spacings resp. edge distance. Details concerning 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.

⁵⁾ gvz, A4 and C.

⁶⁾ The given loads are valid for installation and use of fixations in dry masonry for temperatures of the substrate up to +50°C (resp. short term up to 80°C) and drillhole cleaning according to the assessment. The given brick types in combination with the permissible loads are only a small excerpt of the assessment.

⁷⁾ Hole patterns see assessment.

LOADS

Injection system FIS V, FIS VW HIGH SPEED and FIS VS LOW SPEED with threaded rod FIS A⁵⁾ and anchor sleeve FIS H..K
Highest permissible loads^{1) 6)} for a single anchor in solid brick masonry for pre-positioned 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 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]	Solid brick masonry			
							Permissible tensile load ³⁾ N_{perm} [kN]	Permissible shear load ³⁾ V_{perm} [kN]	Min. spacing ²⁾ s_{min} [mm]	Min. edge distance c_{min} [mm]
Solid brick Mz, 2DF acc. EN 771-1										
M8	≥ 10	≥ 1,8	240x115x113	85	115	10	0,86	0,86	115	60
M10	≥ 10						0,86	1,00	115	60
M8	≥ 16						1,29	1,43	115	60
M10	≥ 16						1,29	1,57	115	60
Solid sand-lime brick KS acc. EN 771										
M8/M10	≥ 10	≥ 2,0	250x240x240	85	240	10	2,29	1,29	80	60
M8/M10	≥ 20						2,57	1,86	80	60
M8/M10	≥ 28						2,57	2,57	80	60
Solid brick of lightweight aggregate concrete Vbl acc. EN 771-3										
M8	≥ 4	≥ 1,6	250x240x239	50	240	4	0,57	0,86	250	130
M8	≥ 4			85			1,00	1,00	250	130
M10	≥ 4			85			1,14	1,00	250	130
M8	≥ 6			50			0,86	1,29	250	130
M8	≥ 6			85			1,43	1,29	250	130
M10	≥ 6			85			1,86	1,57	250	130
M8	≥ 8			50			1,14	1,71	250	130
M8/M10	≥ 8			85			2,43	2,00	250	130
M12/M16	≥ 8			85			2,57	2,43	250	130

- 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 possible axial spacings resp. edge distance. Details concerning 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 max. anchorage depth is corresponding with the relevant anchor sleeves FIS H..K (see technical data).

- ⁵⁾ gvz, A4 and C.
⁶⁾ The given loads are valid for installation and use of fixations in dry masonry for temperatures the substrate up to +50°C (resp. short term up to 80°C) and drillhole cleaning according assessment. The given brick types in combination with the permissible loads are only a small extract the assessment.
⁷⁾ Hole patterns see assessment.

LOADS

Injection system FIS V, FIS VW HIGH SPEED and FIS VS LOW SPEED with threaded rod FIS A⁵⁾ and anchor sleeve FIS H..K
Highest permissible loads^{1) 6)} for a single anchor in perforated brick masonry for pre-positioned 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 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]	Perforated brick masonry			
							Permissible tensile load ³⁾ N_{perm} [kN]	Permissible shear load ³⁾ V_{perm} [kN]	Min. spacing ²⁾ s_{min} [mm]	Min. edge distance c_{min} [mm]
Vertically perforated brick Hlz, shape B acc. EN 771-1										
M6 / M8	≥ 6	≥ 1,0	370x240x237	50	240	2,0	0,17	0,21	100	100
M8 - M16	≥ 6			85			0,43	0,21	100	100
M6 / M8	≥ 8			50			0,21	0,26	100	100
M8 - M16	≥ 8			85			0,57	0,26	100	100
M6 / M8	≥ 16			50			0,86	0,43	100	100
M8 - M16	≥ 16			85			0,86	0,43	100	100
Perforated sand-lime brick KSL acc. EN 771-2										
M6 / M8	≥ 12	≥ 1,4	240x175x113	50	175	2,0	0,71	0,71	100	60
M12 / M16	≥ 12			85			1,00	1,29	100	80
M8 / M10	≥ 20			85			1,43	2,14	100	80
M12 / M16	≥ 20			85			1,71	2,14	100	80
Hollow block of lightweight aggregate concrete Hbl acc. EN 771-3										
M6 / M8	≥ 4	≥ 1,0	362x240x240	50	240	2,0	0,71	0,57	100	60
M12 / M16	≥ 4			85			0,86	0,57	100	60

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 possible axial spacings resp. edge distance. Details concerning 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 max. anchorage depth is corresponding with the relevant anchor sleeves FIS H..K (see technical data).

⁵⁾ gvz, A4 and C.

⁶⁾ The given loads are valid for installation and use of fixations in dry masonry for temperatures the substrate up to +50°C (resp. short term up to 80°C) and drillhole cleaning according assessment. The given brick types in combination with the permissible loads are only a small extract the assessment.

⁷⁾ Hole patterns see assessment.

LOADS

Injection system FIS V, FIS VW HIGH SPEED and FIS VS LOW SPEED with threaded rod FIS A⁵⁾ and push-through anchor sleeve FIS H
Highest permissible loads^{1) 6)} for a single anchor in perforated brick masonry for 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 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]	Perforated brick masonry			
							Permissible tensile load ³⁾ N_{perm} [kN]	Permissible shear load ³⁾ V_{perm} [kN]	Min. spacing ²⁾ s_{min} [mm]	Min. edge distance c_{min} [mm]
Vertically perforated brick shape B, Hz acc. EN 771-1										
M10 / M12	≥ 6	≥ 0,7	500x200x300	130	200	2,0	0,57	0,26	100	80
M16	≥ 6						0,71	0,26	100	80
M10 / M12	≥ 8						0,71	0,34	100	80
M16	≥ 8						0,86	0,34	100	80
M10 / M12	≥ 10						0,86	0,43	100	80
M16	≥ 10						1,14	0,43	80	120
Perforated sand-lime brick KSL acc. EN 771-2										
M10 / M12	≥ 12	≥ 1,4	240x175x113	130	175	2,0	1,00	1,29	100	80
M16	≥ 12						1,00	1,14	100	80
M10 / M12	≥ 20						1,71	2,14	100	80
M16	≥ 20						1,71	1,86	100	80
Hollow block of lightweight aggregate concrete Hbl acc. EN 771-3										
M10 - M16	≥ 2	≥ 1,0	362x240x240	130	240	2,0	0,43	0,26	100	60
M16	≥ 4						0,86	0,57	100	60

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 possible axial spacings resp. edge distance. Details concerning 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 push-through anchor sleeves FIS H 18 K and FIS H 22 K (see technical data).

⁵⁾ gvz, A4 and C.

⁶⁾ The given loads are valid for installation and use of fixations in dry masonry for temperatures the substrate up to +50°C (resp. short term up to 80°C) and drillhole cleaning according assessment. The given brick types in combination with the permissible loads are only a small extract the assessment.

⁷⁾ Hole patterns see assessment.

LOADS

Injection system FIS V, FIS VW HIGH SPEED and FIS VS LOW SPEED with threaded rod FIS A⁵⁾

Highest permissible loads^{1) 6)} for a single anchor in aerated concrete.

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 (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]	Aerated concrete			
							Permissible tensile load ³⁾ N_{perm} [kN]	Permissible shear load ³⁾ V_{perm} [kN]	Min. spacing ²⁾ s_{min} [mm]	Min. edge distance c_{min} [mm]
Aerated concrete acc. EN 771-4										
M8 ⁸⁾	≥ 4	≥ 0,50	130	100		1,0	0,71	0,71	250	100
M10 ⁸⁾	≥ 4	≥ 0,50		100		2,0	1,07	0,89	250	100
M12 ⁸⁾	≥ 4	≥ 0,50		100		2,0	0,89	0,89	250	100
M8 ⁷⁾	≥ 4	≥ 0,50	125	95		2,0	1,25	1,07	250	150
M10 ⁷⁾	≥ 6	≥ 0,65		95		2,0	1,43	2,14	250	150
M12 ⁷⁾	≥ 6	≥ 0,65		95		2,0	1,43	2,14	250	150

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 possible axial spacings resp. edge distance. Details concerning 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.

⁵⁾ gvz, A4 and C.

⁶⁾ The given loads are valid for installation and use of fixations in dry masonry for temperatures the substrate up to +50°C (resp. short term up to 80°C) and drillhole cleaning according assessment. The given brick types in combination with the permissible loads are only a small extract the assessment.

⁷⁾ Drilling with cone drill PBB. Only pre-positioned installation possible.

⁸⁾ Cylindrical drill hole. Pre-positioned and push-through installation possible.