

LOADS

Injection system FIS EM 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 - 10/0012 has to be considered.

					Cracked concrete				Non-cracked concrete			
Typ	Minimum effective anchorage depth	Maximum effective anchorage depth	Minimum member thickness	Maximum torque moment	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
	$h_{ef,min}$ [mm]	$h_{ef,max}$ [mm]	h_{min} [mm]	$T_{inst,max}$ [Nm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FIS A M8 (8.8)	60		100	10,0	5,0	8,6	40	40	10,8	8,6	40	40
		160	190	10,0	13,4	8,6	40	40	14,3	8,6	40	40
FIS A M10 (8.8)	60		100	20,0	6,3	12,6	45	45	11,2	13,1	45	45
		200	230	20,0	20,9	13,1	45	45	22,4	13,1	45	45
FIS A M12 (8.8)	70		100	40,0	8,8	17,6	55	55	14,1	19,4	55	55
		240	270	40,0	30,2	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	34,4	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	71,8	56,0	85	85	93,3	56,0	85	85
FIS A M24 (8.8)	96		152	150,0	13,4	32,2	105	105	18,8	45,2	105	105
		480	536	150,0	100,5	80,6	105	105	134,3	80,6	105	105
FIS A M27 (8.8)	108		168	200,0	16,0	38,5	120	120	22,5	54,0	120	120
		540	600	200,0	127,2	105,1	120	120	175,2	105,1	120	120
FIS A M30 (8.8)	120		190	300,0	18,8	45,1	140	140	26,3	63,2	140	140
		600	670	300,0	157,1	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 72°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 EM with threaded rod FIS A A4 (property class A4-70)

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

For the design the complete approval ETA - 10/0012 has to be considered.

					Cracked concrete				Non-cracked concrete			
Type	Minimum effective anchorage depth	Maximum effective anchorage depth	Minimum member thickness	Max. torque moment	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
	$h_{ef,min}$ [mm]	$h_{ef,max}$ [mm]	h_{min} [mm]	$T_{inst,max}$ [Nm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FIS A M8 (A4-70)	60		100	10,0	5,0	6,0	40	40	9,9	6,0	40	40
		160	190	10,0	9,9	6,0	40	40	9,9	6,0	40	40
FIS A M10 (A4-70)	60		100	20,0	6,3	9,2	45	45	11,2	9,2	45	45
		200	230	20,0	15,7	9,2	45	45	15,7	9,2	45	45
FIS A M12 (A4-70)	70		100	40,0	8,8	13,7	55	55	14,1	13,7	55	55
		240	270	40,0	22,5	13,7	55	55	22,5	13,7	55	55
FIS A M16 (A4-70)	80		116	60,0	11,5	23,0	65	65	17,2	25,2	65	65
		320	356	60,0	42,0	25,2	65	65	42,0	25,2	65	65
FIS A M20 (A4-70)	90		138	120,0	14,6	29,3	85	85	20,5	39,4	85	85
		400	448	120,0	65,7	39,4	85	85	65,7	39,4	85	85
FIS A M24 (A4-70)	96		152	150,0	13,4	32,2	105	105	18,8	45,2	105	105
		480	536	150,0	94,3	56,8	105	105	94,3	56,8	105	105
FIS A M27 (A4-70)	108		168	200,0	16,0	38,5	120	120	22,5	54,0	120	120
		540	600	200,0	123,0	73,7	120	120	123,0	73,7	120	120
FIS A M30 (A4-70)	120		190	300,0	18,8	45,1	140	140	26,3	63,2	140	140
		600	670	300,0	150,1	90,2	140	140	150,1	90,2	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 72°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.

Injection system FIS EM 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 - 10/0012 has to be considered.

					Cracked concrete				Non-cracked concrete			
Type	Minimum effective anchorage depth	Maximum effective anchorage depth	Minimum member thickness	Maximum torque moment	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
	$h_{ef,min}$ [mm]	$h_{ef,max}$ [mm]	h_{min} [mm]	$T_{inst,max}$ [Nm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FIS A M8 (C-70)	60		100	10,0	5,0	7,4	40	40	10,8	7,4	40	40
		160	190	10,0	12,4	7,4	40	40	12,4	7,4	40	40
FIS A M10 (C-70)	60		100	20,0	6,3	11,4	45	45	11,2	11,4	45	45
		200	230	20,0	19,5	11,4	45	45	19,5	11,4	45	45
FIS A M12 (C-70)	70		100	40,0	8,8	17,1	55	55	14,1	17,1	55	55
		240	270	40,0	28,1	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	71,8	49,1	85	85	81,9	49,1	85	85
FIS A M24 (C-70)	96		152	150,0	13,4	32,2	105	105	18,8	45,2	105	105
		480	536	150,0	100,5	70,9	105	105	117,6	70,9	105	105
FIS A M27 (C-70)	108		168	200,0	16,0	38,5	120	120	22,5	54,0	120	120
		540	600	200,0	127,2	92,0	120	120	153,3	92,0	120	120
FIS A M30 (C-70)	120		190	300,0	18,8	45,1	140	140	26,3	63,2	140	140
		600	670	300,0	157,1	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 72°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 EM with internal threaded anchor RG MI (screw property class 8.8)

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

For the design the complete approval ETA - 10/0012 has to be considered.

				Cracked concrete				Non-cracked concrete			
Type	Effective anchorage depth	Minimum member thickness	Maximum torque moment	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
	h_{ef}	h_{min}	$T_{inst,max}$	$N_{perm}^{3)}$	$V_{perm}^{3)}$	$s_{min}^{2)}$	$c_{min}^{2)}$	$N_{perm}^{3)}$	$V_{perm}^{3)}$	$s_{min}^{2)}$	$c_{min}^{2)}$
	[mm]	[mm]	[Nm]	[kN]	[kN]	[mm]	[mm]	[kN]	[kN]	[mm]	[mm]
RG M 8 I	90	120	10,0	11,3	8,3	55	55	13,8	8,3	55	55
RG M 10 I	90	125	20,0	12,9	13,3	65	65	20,5	13,3	65	65
RG M 12 I	125	165	40,0	20,2	19,3	75	75	32,4	19,3	75	75
RG M 16 I	160	208	80,0	28,9	30,9	95	95	40,6	30,9	95	95
RG M 20 I	200	264	120,0	40,4	51,4	125	125	56,7	51,4	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 temperatures in the substrate up to +50°C (resp. short term up to 72°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 EM 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 - 10/0012 has to be considered.

				Cracked concrete				Non-cracked concrete			
Type	Effective anchorage depth	Minimum member thickness	Maximum torque moment	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
	h_{ef}	h_{min}	$T_{inst,max}$	$N_{perm}^{3)}$	$V_{perm}^{3)}$	$s_{min}^{2)}$	$c_{min}^{2)}$	$N_{perm}^{3)}$	$V_{perm}^{3)}$	$s_{min}^{2)}$	$c_{min}^{2)}$
	[mm]	[mm]	[Nm]	[kN]	[kN]	[mm]	[mm]	[kN]	[kN]	[mm]	[mm]
RG M 8 I A4	90	120	10,0	9,9	5,9	55	55	9,9	5,9	55	55
RG M 10 I A4	90	125	20,0	12,9	9,3	65	65	15,7	9,3	65	65
RG M 12 I A4	125	165	40,0	20,2	13,5	75	75	22,5	13,5	75	75
RG M 16 I A4	160	208	80,0	28,9	25,1	95	95	40,6	25,1	95	95
RG M 20 I A4	200	264	120,0	40,4	39,4	125	125	56,7	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 temperatures in the substrate up to +50°C (resp. short term up to 72°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.