

LOADS

Injection system FIS P Plus 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-11/0419 has to be considered.

Type of anchor sleeve with anchor rod	Compressive-brick-strength	Brick raw density	Minimum brick dimensions ⁶⁾	Min. effective anchorage depth ⁴⁾	Min. member thickness	Maximum torque	Permissible tensile load ³⁾	Permissible shear load ³⁾	Characteristic spacing parallel to bed joint	Characteristic spacing perpendicular to bed joint	Min. spacing ²⁾	Characteristic resp. min. edge distance ²⁾
	f_b	ρ	(L x W x H)	h_{ef}	h_{min}	$T_{inst,max}$	N_{perm}	V_{perm}	$s_{scr \parallel}$	$s_{scr \perp}$	$s_{min \parallel} / s_{min \perp}$	$c_{cr} = c_{min}$
	[N/mm ²]	[kg/dm ³]	[mm]	[mm]	[mm]	[Nm]	[kN]	[kN]	[mm]	[mm]	[mm]	[mm]

Solid sand-lime brick KS acc. to EN 771

12x85 M8	≥ 10	≥ 1,8	240x115x113	85	115	2	1,71	0,86	240	115	240 / 115	100
16x85 M10							1,00	1,00				
20x85 M12							2,43	1,00				
12x85 M8	≥ 20			85	115		2,43	1,29				
16x85 M10							1,57	1,57				
20x85 M12							2,43	1,57				

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.

Injection system FIS P Plus with threaded rod FIS A⁴⁾

Highest permissible loads^{1) 5)} 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-11/04 19 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																				
M8	≥10	≥1,8	240x115x71	50	115	10	1,14	0,71	150	75	150 / 75	100								
M10				50			1,00	1,14	150		150 / 75	100								
M10				80			1,43	1,14	240		240 / 75	100								
M10				200			2,43	3,40	240		240 / 75	150								
M12				50			0,86	1,14	150		150 / 75	100								
M12				80			1,51	1,14	240		240 / 75	100								
M12				200			3,20	2,43	240		240 / 75	150								
M8				≥20			≥1,8	240x115x71	50		115	10	1,57	1,14	150	75	150 / 75	100		
M10									50				1,43	1,71	150		150 / 75	100		
M10									80				2,00	1,71	240		240 / 75	100		
M10									200				2,43	2,43	240		240 / 75	150		
M12									50				1,29	1,57	150		150 / 75	100		
M12	80	2,29	1,57		240	240 / 75			100											
M12	200	2,43	2,43	240	240 / 75	150														
Solid sand-lime brick KS acc. to EN 771																				
M8	≥10	≥1,8	240x115x71	50	115	10	0,71	1,14	240	75	240 / 75	100								
M10				50			0,71	1,14				100								
M10				80			0,71	1,14				100								
M10				200			2,43	1,14				150								
M12				50			0,71	1,43				100								
M12				80			0,71	1,43				100								
M12				200			2,43	1,43				150								
M8				≥20			≥1,8	240x115x71				50	115	10	1,00	1,57	240	75	240 / 75	100
M10												50			1,00	1,57				100
M10												80			1,00	1,57				100
M10												200			2,43	1,57				150
M12												50			1,00	2,00				100
M12	80	1,00	2,00		100															
M12	200	2,43	2,00	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 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.

Injection system FIS P Plus 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-11/0419 has to be considered.

Type of anchor sleeve with anchor 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 Hlz, acc. to EN 771-1												
12x85 M8	≥ 10	≥ 0,9	240x175x113	85	175	2,0	1,14	1,14	240	115	240 / 115	100
16x85 M10							1,00	1,57				
20x85 M12							1,43	1,71				
Perforated sand-lime brick KSL acc. to EN 771-2												
12x85 M8	≥ 12	≥ 1,4	240x175x113	85	175	2,0	0,71	0,71	240	115	100 / 115	100
16x85 M8/M10							0,86	1,29				
20x85 M12							1,00	1,29				
12x85 M8	≥ 20	≥ 1,4	240x175x113	85	175	2,0	1,29	1,29	240	115	100 / 115	100
16x85 M8/M10							1,43	2,14				
20x85 M12							1,71	2,14				
Lightweight concrete hollow block Hbl acc. to EN 771-3												
12x85 M8	≥ 4	≥ 1,0	362x240x240	85	240	2,0	0,86	0,57	365	240	365 / 240	80
16x85 M10												
20x85 M12												

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 P Plus with threaded rod FIS A⁴⁾

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

For the design the complete assessment ETA-11/0419 has to be considered.

Type anchor 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]
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Aerated concrete acc. to EN 771-4

M8	≥ 2	≥ 0,35	-	100	130	1	0,54	0,43	250	250	250	100
M10						2	0,54	0,43				
M12						2	0,54	0,54				
M8	≥ 4	≥ 0,50				1	0,71	0,89				
M10						2	0,89	0,71				
M12						2	0,89	0,89				
M8	≥ 6	≥ 0,65				1	1,25	1,07				
M10						2	1,79	1,07				
M12						2	1,79	1,25				

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.