

Injection system FIS VL: Injection mortar FIS VL with Threaded rod FIS A <sup>1)</sup>

zinc plated steel / stainless steel

Permissible loads of a single anchor in cracked normal concrete (concrete tension zone) of strength class C20/25 (~B25) <sup>2) 3) 4) 5) 11)</sup>										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				
							Max. tension load c	Max. shear load c				Max. Load s <sub>cr</sub>	s <sub>min</sub> <sup>8) 9)</sup>	c <sub>min</sub> <sup>8) 9)</sup>	
		h <sub>min</sub> [mm]	h <sub>ef</sub> <sup>6)</sup> [mm]	T <sub>max</sub> [Nm]	N <sub>perm</sub> <sup>7)</sup> [kN]	V <sub>perm</sub> <sup>7)</sup> [kN]	[mm]	[mm]	[mm]	[mm]	[mm]				
M10	5.8	100	60	20	4,5	8,6	90	185	180	45	45				
		120	90		6,7		125	160	270						
		230	200		13,8		110	125	600						
	8.8	100	60		4,5	10,8	90	235	180						
		120	90		6,7	13,3	125	260	270						
		230	200		15,0		180	600							
	A4-70	100	60		4,5		9,3	90	200			180			
		120	90		6,7	125		175	270						
		230	200		15,0	130		600							
	M12	5.8	100		70	40	6,3	12,0	105			255	210	55	55
			140		110		9,9		145			200	330		
			270		240		20,5		140			150	720		
8.8		100	70	6,3	15,1		105	330	210						
		140	110	9,9	19,3		145	345	330						
		270	240	21,5			235	720							
A4-70		100	70	6,3			13,5	105	290	210					
		140	110	9,9	145			230	330						
		270	240	21,5	165			720							
M16		5.8	120	80	60		9,6	22,3	120	445	240	65	65		
			170	125			15,0		185	350	375				
			360	320			37,6		225	960					
	8.8	120	80	9,6		23,0	120	460	240						
		170	125	15,0		35,9	185	600	375						
		360	320	38,3			380	960							
	A4-70	120	80	9,6			23,0	120	460	240					
		170	125	15,0		25,2	185	400	375						
		360	320	38,3			250	960							
	M20	5.8	140	90			120	12,2	29,3	135	530			270	85
			220	170		23,3		225		460	510				
			450	400		54,9		300		1200					
8.8		140	90	12,2	29,3	135		530	270						
		220	170	23,3	56,0	225		785	510						
		450	400	54,9		520		1200							
A4-70		140	90	12,2		29,3		135	530	270					
		220	170	23,3	39,3	225		525	510						
		450	400	54,9		345		1200							

For the design the complete assessment ETA-10/0352 has to be considered. <sup>10)</sup>

<sup>1)</sup> Also valid for anchor rod RGM in the same property class.

<sup>2)</sup> The partial safety factors for material resistance as regulated in the ETA-10/0352 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-10/0352.

<sup>3)</sup> The given loads are valid for injection mortar FIS VL 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-10/0352.

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

<sup>5)</sup> Drill method hammer drilling. For further allowable application conditions see ETA-10/0352.

<sup>6)</sup> For the sizes M10 - M20 the min. anchorage depth and the max. anchorage depth are given. The anchorage depth can be chosen freely between these borders.

<sup>7)</sup> For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see ETA-10/0352.

<sup>8)</sup> Minimum possible axial spacings resp. edge distance while reducing the permissible load.

<sup>9)</sup> 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-10/0352.

<sup>10)</sup> The given loads refer to the European Technical Assessment ETA-10/0352, issue date 10/08/2017. Design of the loads according ETAG 001, Technical Report TR 029 (for static resp. quasi-static loads).

<sup>11)</sup> 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 VL: Injection mortar FIS VL with Threaded rod FIS A <sup>1)</sup>

zinc plated steel / stainless steel

Permissible loads of a single anchor in non-cracked normal concrete (concrete compression zone) of strength class C20/25 (~B25) <sup>2) 3) 4) 5)</sup>										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	
							Max. tension load c	Max. shear load c				Max. Load s <sub>cr</sub>
		h <sub>min</sub> [mm]	h <sub>ef</sub> <sup>6)</sup> [mm]	T <sub>max</sub> [Nm]	N <sub>perm</sub> <sup>6)</sup> [kN]	V <sub>perm</sub> <sup>6)</sup> [kN]						
M6	5.8	100	50	5	3,4	2,9	65	50	150	40	40	
			60		4,0				180			
		110	4,8		220							
	8.8	100	50		3,4	4,6		4,6	70			150
			60		4,0							180
		110	4,8		220							
	A4-70	100	50		3,4	3,2		3,2	55			150
			60		4,0							180
		110	4,8		220							
M8	5.8	100	60	10	6,6	5,1	90	180	40	40		
			110		8,8		100	240				
		190	9,0		40		480					
	8.8	100	60		6,6	8,4	8,4	90			180	
			110		8,8			100			240	
		190	13,9		75			480				
	A4-70	100	60		6,6	5,9	5,9	90			180	
			110		8,8			100			240	
		190	9,8		40			480				
M10	5.8	100	60	20	8,2	8,6	90	180	45	45		
			120		12,3		125	270				
		230	13,8		45		600					
	8.8	100	60		8,2	13,3	13,3	90			180	
			120		12,3			125			270	
		230	22,1		90			600				
	A4-70	100	60		8,2	9,3	9,3	90			180	
			120		12,3			125			270	
		230	15,5		50			600				
M12	5.8	100	70	40	11,5	12,0	140	210	55	55		
			140		18,1		180	330				
		270	20,5		55		720					
	8.8	100	70		11,5	19,3	19,3	140			210	
			140		18,1			180			330	
		270	32,1		110			720				
	A4-70	100	70		11,5	13,5	13,5	140			210	
			140		18,1			180			330	
		270	22,5		60			720				
M16	5.8	120	80	60	14,3	22,3	160	240	65	65		
			170		24,9		245	375				
		360	37,6		80		960					
	8.8	120	80		14,3	34,4	34,4	160			240	
			170		24,9			245			375	
		360	59,8		230			960				
	A4-70	120	80		14,3	25,2	25,2	160			240	
			170		24,9			245			375	
		360	42,0		100			960				

Injection system FIS VL: Injection mortar FIS VL with Threaded rod FIS A <sup>1)</sup>

zinc plated steel / stainless steel

Permissible loads of a single anchor in non-cracked normal concrete (concrete compression zone) of strength class C20/25 (~B25) <sup>2) 3) 4) 5)</sup>										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				
							Max. tension load c	Max. shear load c				Max. Load $s_{cr}$	$s_{min}^{8) 9)}$	$c_{min}^{8) 9)}$	
		$h_{min}$ [mm]	$h_{ef}^{6)}$ [mm]	$T_{max}$ [Nm]	$N_{perm}^{6)}$ [kN]	$V_{perm}^{6)}$ [kN]	[mm]	[mm]	[mm]	[mm]	[mm]				
M20	5.8	140	90	120	17,1	34,9	170	435	270	85	85				
		220	170		40,3		340	305	510						
		450	400		58,6		110	230	1200						
	8.8	140	90		17,1	41,1	170	525	270			56,0	340	530	510
		220	170		40,3	375	350	1200							
		450	400		93,3	170	500	270							
	A4-70	140	90		17,1	39,3	170	500	270			135	255	1200	
		220	170		40,3		340	350	510						
		450	400		65,5		135	255	1200						
	M24	5.8	160		96	150	18,8	45,2	170			540	290	105	105
			270		210		56,5		435			400	630		
			540		480		84,3		140			295	1440		
8.8		160	96	18,8	45,2		170	540	290	80,7	435	685	630		
		270	210	56,5	505		455	1440							
		540	480	129,3	170		540	290							
A4-70		160	96	18,8	45,2		170	540	290	56,6	435	455	630		
		270	210	56,5			435	455	630						
		540	480	94,4			205	320	1440						
M27		5.8	170	108	200		22,5	54,0	195	605	325	125	125		
			310	250			71,5		495	475	750				
			600	540			109,5		200	345	1620				
	8.8	170	108	22,5		54,0	195	605	325	104,9	495			825	750
		310	250	71,5		570	560	1620							
		600	540	154,5		195	605	325							
	A4-70	170	108	22,5		54,0	195	605	325	73,6	495			545	750
		310	250	71,5			315	380	1620						
		600	540	122,7			195	605	325						
	M30	5.8	190	120		300	26,3	63,2	210	660	360			140	140
			350	280			89,0		595	545	840				
			670	600			133,8		270	395	1800				
8.8		190	120	26,3	63,2		210	660	360	128,2	595	940	840		
		350	280	89,0	700		645	1800							
		670	600	190,7	210		660	360							
A4-70		190	120	26,3	63,2		210	660	360	89,9	595	620	840		
		350	280	89,0			400	430	1800						
		670	600	150,0			210	660	360						

For the design the complete assessment ETA-10/0352 has to be considered. <sup>10)</sup><sup>1)</sup> Also valid for anchor rod RGM in the same property class.<sup>2)</sup> The partial safety factors for material resistance as regulated in the ETA-10/0352 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  $s \geq 3 \cdot h_{ef}$  and an edge distance  $c \geq 1,5 \cdot h_{ef}$ . Accurate data see ETA-10/0352.<sup>3)</sup> The given loads are valid for injection mortar FIS VL 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-10/0352.<sup>4)</sup> For higher concrete strength classes up to C50/60 higher permissible loads may be possible.<sup>5)</sup> Drill method hammer drilling. For further allowable application conditions see ETA-10/0352.<sup>6)</sup> 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.<sup>7)</sup> For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see ETA-10/0352.<sup>8)</sup> Minimum possible axial spacings resp. edge distance while reducing the permissible load.<sup>9)</sup> 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-10/0352.<sup>10)</sup> The given loads refer to the European Technical Assessment ETA-10/0352, issue date 10/08/2017. Design of the loads according ETAG 001, Technical Report TR 029 (for static resp. quasi-static loads).

# LOADS

## Injection system FIS VL: Injection mortar FIS VL with Internal threaded anchor RG M I

zinc plated steel / stainless steel

Permissible loads of a single anchor in non-cracked normal concrete (concrete compression zone) of strength class C20/25 (~B25) <sup>1) 2) 3)</sup>										Minimum spacings while reducing the load	
Type	Screw material resp. screw surface	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
							Max. tension load c	Max. shear load c			
		$h_{min}$ [mm]	$h_{ef}$ [mm]	$T_{max}$ [Nm]	$N_{perm}^{4)}$ [kN]	$V_{perm}^{4)}$ [kN]	[mm]	[mm]	[mm]	[mm]	[mm]
RG M8 I	5.8	120	90	10	9,0	5,3	95	65	270	55	55
	8.8				11,9	8,3	135	95			
	A4-70				9,9	5,9	110	70			
RG M10 I	5.8	130	90	20	13,8	8,3	140	90	270	65	65
	8.8				15,9	13,3	170	155			
	A4-70				15,7	9,3		100			
RG M 12 I	5.8	170	125	40	19,8	12,1	190	110	375	75	75
	8.8					19,3		190			
	A4-70					13,5		125			
RG M 16 I	5.8	210	160	80	29,8	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	45,6	35,4	330	245	600	125	125
	8.8					42,9		315			
	A4-70					39,4		280			

For the design the complete assessment ETA-10/0352 has to be considered. <sup>7)</sup>

<sup>1)</sup> The partial safety factors for material resistance as regulated in the ETA-10/0352 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-10/0352.

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

<sup>3)</sup> Drill method hammer drilling. For further allowable application conditions see ETA-10/0352.

<sup>4)</sup> For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see ETA-10/0352.

<sup>5)</sup> Minimum possible axial spacings resp. edge distance while reducing the permissible load.

<sup>6)</sup> 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-10/0352.

<sup>7)</sup> The given loads refer to the European Technical Assessment ETA-10/0352, issue date 10/08/2017. Design of the loads according ETAG 001, Technical Report TR 029 (for static resp. quasi-static loads).

# LOADS

## Injection system FIS VL with threaded rod FIS A<sup>4)</sup>

Highest permissible loads <sup>1) 5)</sup> 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-15/O263 has to be considered.

Type	Compressive brick strength $f_b$ [N/mm <sup>2</sup> ]	Brick raw density $\rho$ [kg/dm <sup>3</sup> ]	Minimum brick dimensions <sup>6)</sup> (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 <sup>3)</sup> $N_{perm}$ [kN]	Permissible shear load <sup>3)</sup> $V_{perm}$ [kN]	Characteristic spacing parallel to bed joint $s_{cr \parallel}$ [mm]	Characteristic spacing perpendicular to bed joint $s_{cr \perp}$ [mm]	Min. spacing <sup>2)</sup> $s_{min \parallel} / s_{min \perp}$ [mm]	Characteristic resp. min. edge distance <sup>2)</sup> $c_{cr} = c_{min}$ [mm]								
<b>Solid brick Mz, NF acc. to EN 771-1</b>																				
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														
<b>Solid sand-lime brick KS acc. to EN 771</b>																				
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																

<sup>1)</sup> 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.

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

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

<sup>4)</sup> Zinc-plated, stainless steel A4 and high corrosion-resistant steel C.

<sup>5)</sup> 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.

<sup>6)</sup> Hole patterns see assessment.

# LOADS

## Injection system FIS VL with threaded rod FIS A<sup>5)</sup> and anchor sleeve FIS H..K

Highest permissible loads<sup>1) 6)</sup> for a single anchor in solid brick masonry (with injection anchor sleeve) for pre-positioned installation.

For the design the complete assessment ETA-15/0263 has to be considered.

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

<sup>1)</sup> 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.

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

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

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

<sup>5)</sup> Zinc-plated, stainless steel A4 and high corrosion-resistant steel C.

<sup>6)</sup> 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.

<sup>7)</sup> Hole patterns see assessment.

# LOADS

## Injection system FIS VL with threaded rod FIS A<sup>5)</sup> and anchor sleeve FIS H...K

Highest permissible loads<sup>1)6)</sup> for a single anchor in perforated brick masonry (with injection anchor sleeve) for pre-positioned installation. For the design the complete assessment ETA-15/0263 has to be considered.

Type of anchor sleeve with anchor rod	Compressive-brick-strength $f_b$ [N/mm <sup>2</sup> ]	Brick raw density $\rho$ [kg/dm <sup>3</sup> ]	Minimum brick-dimensions <sup>7)</sup> (L x W x H) [mm]	Min. effective anchorage depth <sup>4)</sup> $h_{ef}$ [mm]	Min. member thickness $h_{min}$ [mm]	Maximum torque $T_{inst,max}$ [Nm]	Permissible tensile load <sup>3)</sup> $N_{perm}$ [kN]	Permissible shear load <sup>3)</sup> $V_{perm}$ [kN]	Characteristic spacing parallel to bed joint $s_{cr \parallel}$ [mm]	Characteristic spacing perpendicular to bed joint $s_{cr \perp}$ [mm]	Min. spacing <sup>2)</sup> $s_{min \parallel} / s_{min \perp}$ [mm]	Characteristic resp. min. edge distance <sup>2)</sup> $c_{cr} = c_{min}$ [mm]
<b>Vertically perforated brick Hlz, acc. to EN 771-1</b>												
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				
<b>Perforated sand-lime brick KSL acc. to EN 771-2</b>												
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				
<b>Lightweight concrete hollow block Hbl acc. to EN 771-3</b>												
12x85 M8	≥ 4	≥ 1,0	362x240x240	85	240	2,0	0,86	0,57	365	240	365 / 240	80
16x85 M10												
20x85 M12												

<sup>1)</sup> 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.

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

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

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

<sup>5)</sup> Zinc-plated, stainless steel A4 and high corrosion-resistant steel C.

<sup>6)</sup> 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.

<sup>7)</sup> Hole patterns see assessment.

# LOADS

## Injection system FIS VL with threaded rod FIS A<sup>4)</sup>

Highest permissible loads<sup>1) 5)</sup> for a single anchor in aerated concrete.

For the design the complete assessment ETA-15/0263 has to be considered.

Type anchor rod	Compressive-brick-strength $f_b$ [N/mm <sup>2</sup> ]	Brick raw density $\rho$ [kg/dm <sup>3</sup> ]	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 <sup>3)</sup> $N_{perm}$ [kN]	Permissible shear load <sup>3)</sup> $V_{perm}$ [kN]	Characteristic spacing parallel to bed joint $s_{cr \parallel}$ [mm]	Characteristic spacing perpendicular to bed joint $s_{cr \perp}$ [mm]	Min. spacing <sup>2)</sup> $s_{min \parallel} / s_{min \perp}$ [mm]	Characteristic resp. min. edge distance <sup>2)</sup> $c_{cr} = c_{min}$ [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				

<sup>1)</sup> 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.

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

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

<sup>4)</sup> Zinc-plated, stainless steel A4 and high corrosion-resistant steel C.

<sup>5)</sup> 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.