

# LOADS

## Bolt anchor FAZ II, FAZ II K and FAZ II GS (HBS)

zinc plated steel / stainless steel / high corrosion resistant steel

Permissible loads of a single anchor in cracked normal concrete (concrete tension zone) of strength class C20/25 (~B25) <sup>1) 2) 3) 9)</sup>										Minimum spacings while reducing the load		
Type	Material fixing element	Min. member thickness	Effective anchorage depth	Installation torque	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
		h <sub>min</sub> [mm]	h <sub>ef</sub> <sup>4)</sup> [mm]	T <sub>inst</sub> [Nm]	N <sub>perm</sub> <sup>6)</sup> [kN]	V <sub>perm</sub> <sup>6)</sup> [kN]	[mm]	[mm]	[mm]	[mm]	[mm]	
FAZ II 6	gvz	80	40	8	0,7	3,4	45	80	120	35	45	
	A4											
	C											
FAZ II 8	gvz	80	35 <sup>5)</sup>	20	2,6	7,8	40	200	105	35	40	
		90	45		3,8		45	185	135			
	A4	80	35 <sup>5)</sup>		2,6	8,9	40	235	105			
		90	45		3,8	9,6	45		135			
	C	80	35 <sup>5)</sup>		2,6	8,9	40		105			
		90	45		3,8	9,6	45		135			
FAZ II 10	gvz	90	40	45	4,3	11,3	60		275	120	40	45
		110	60		6,2	12,2	65		255	180		
	A4	90	40		4,3	11,3	60	275	120			
		110	60		6,2	15,1	65	325	180			
	C	90	40		4,3	11,3	60	275	120			
		110	60		6,2	15,1	65	325	180			
FAZ II 12	gvz	100	50	60	6,1	17,5	75	400	150	50	55	
		120	70		9,5		100	350	210			
	A4	100	50		6,1	18,8	75	435	150			
		120	70		9,5	21,9	100	450	210			
	C	100	50		6,1	18,8	75	435	150			
		120	70		9,5	21,9	100	450	210			
FAZ II 16	gvz	140	65	110	9,0	28,7	100	545	195	65	65	
			85		13,4	31,4	130	585	255			
	A4		65		9,0	28,7	100	545	195			
			85		13,4	39,9	130	760	255			
	C		65		9,0	28,7	100	545	195			
			85		13,4	39,9	130	760	255			
FAZ II 20	gvz	170	100	200	17,1	44,6	150	745	300	95	85	
	A4											
	C											
FAZ II 24	gvz	210	125	270	24,0	57,5	170	840	375	100	100	
	A4											
	C											

For the design the complete assessment ETA-05/0069, issue date 03.07.2017 has to be considered.<sup>9)</sup>

<sup>1)</sup> The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of  $\gamma_L = 1,4$  are considered. As a single anchor under tension load and shear load without edge influence counts e.g. an anchor with a spacing  $s \geq 3 \cdot h_{ef}$  and an edge distance  $c \geq 1,5 \cdot h_{ef}$ . Concerning shear loads under edge influence and accurate data see ETA.

<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, hollow drilling resp. Diamond drilling.

<sup>4)</sup> Eff. anchorage depth: min. anchorage depth, max. anchorage depth.

<sup>5)</sup> The anchorage depths smaller than 40 mm are only allowed for single anchors as part of a multiple fixing of non-structural systems.

<sup>6)</sup> For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see ETA.

<sup>7)</sup> Minimum possible axial spacings resp. edge distance while reducing the permissible load.

<sup>8)</sup> The given loads refer to the European Technical Assessment ETA-05/0069, issue date 03.07.2017. Design of the loads according TR055/ETAG 001, Annex C, Method A (for static resp. quasi-static loads).

<sup>9)</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  $w_k \sim 0,3\text{mm}$ .

# LOADS

## Bolt anchor FAZ II, FAZ II K and FAZ II GS (HBS)

zinc plated steel / stainless steel / high corrosion resistant 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	Material fixing element	Min. member thickness	Effective anchorage depth	Installation torque	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	s <sub>min</sub> <sup>7)</sup> [mm]	c <sub>min</sub> <sup>7)</sup> [mm]		
		h <sub>min</sub> [mm]	h <sub>ef</sub> <sup>4)</sup> [mm]	T <sub>inst</sub> [Nm]	N <sub>perm</sub> <sup>6)</sup> [kN]	V <sub>perm</sub> <sup>6)</sup> [kN]	[mm]	[mm]	[mm]							
FAZ II 6	gvz	80	40	8	3,6	3,4	45	55	120	35	45					
	A4				5,0	5,0	50	85								
	C															
FAZ II 8	gvz	80	35 <sup>5)</sup>	20	5,0	7,8	85	140	105	40	40					
		90	45		6,7		80	125	135							
	A4	80	35 <sup>5)</sup>		5,0	9,6	85	175	105							
		90	45		6,7		80	160	135							
	C	80	35 <sup>5)</sup>		5,0	85	175	105								
		90	45		6,7	80	160	135								
	FAZ II 10	gvz	90		40	45	6,1	12,2	80			205	120	40	45	
			110		60		9,5		75			175	180			
A4		90	40	6,1	15,1		80	260	120							
		110	60	9,5			75	220	180							
C		90	40	6,1	80		260	120								
		110	60	9,5	75		220	180								
FAZ II 12		gvz	100	50	60		8,5	17,5	100	275	150	50	55			
			120	70			10,5		80	240	210					
	A4	100	50	8,5		21,9	100	350	150							
		120	70	10,5			80	305	210							
	C	100	50	8,5		100	350	150								
		120	70	10,5		80	305	210								
	FAZ II 16	gvz	140	65		110	12,6	31,4	130	410	195			65	65	
				85			18,8		170	400	255					
A4		65		12,6	39,9		130	535	195							
		85		18,8			170	520	255							
C		65		12,6	130		535	195								
		85		18,8	170		520	255								
FAZ II 20		gvz		170	100		200	24,0	46,5	230	530	300	95			95
		A4							60,7		515					
	C															
FAZ II 24	gvz	210	125	270	33,6	62,9	265	630	375	100	135					
	A4					80,7		835								
	C															

For the design the complete assessment ETA-05/0069, issue date 03.07.2017 has to be considered.<sup>8)</sup>

<sup>1)</sup> The partial safety factors for material resistance as regulated in the ETA as well as a partial safety factor for load actions of  $\gamma_L = 1,4$  are considered. As an single anchor under tension load and shear load without edge influence counts e.g. an anchor with a spacing  $s \geq 3 \cdot h_{ef}$  and an edge distance  $c \geq 1,5 \cdot h_{ef}$ . Concerning shear loads under edge influence and accurate data see ETA.

<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, hollow drilling resp. Diamond drilling.

<sup>4)</sup> Eff. anchorage depth: min. anchorage depth, max. anchorage depth.

<sup>5)</sup> The anchorage depths smaller than 40 mm are only allowed for single anchors as part of a multiple fixing of non-structural systems.

<sup>6)</sup> For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see ETA.

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