Bolt anchor FAZ II

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

For the design the complete approval ETA - 05/0069 has to be considered.

			Cracked concrete							Non-cracked concrete					
Туре	minimum effective anchorage depth	maximum effective anchorage depth	minimum member thickness ⁵⁾	torque moment	permissible tensile load	permissible		min. edge distance	permissible tensile load	permissible	min. spacing	min. edge distance			
	h _{ef,min}	h _{ef,max}	h _{min}	T _{inst}	N _{perm} ³⁾	V _{perm} 3)	S _{min} ²⁾	C _{min} ²⁾	N _{perm} 3)	V 3)	S _{min} ²⁾	C _{min} ²⁾			
	[mm]	[mm]	[mm]	[Nm]	[kN]	[kN]	[mm]	[mm]	[kN]	[kN]	[mm]	[mm]			
FAZ II 8		45	100	20,0	2,4	6,9	35	40	4,3	6,9	40	40			
FAZ II 10	40		80	45,0	4,3	8,7	40	45	6,1	11,4	40	45			
FAZ II IU		60	120	45,0	4,3	11,4	40	45	7,6	11,4	40	45			
FA7 II 12	50		100	60,0	6,1	13,9	45	55	8,5	16,9	50	55			
FAZ II 12		70	140	60,0	7,6	16,9	45	55	11,9	16,9	50	55			
FA7 II 16	65		140	110,0	9,0	20,7	60	65	12,6	29,0	60	65			
FAZ II 16		85	170	110,0	13,4	31,4	60	65	18,8	31,4	60	65			
FAZ II 20		100	200	200,0	17,1	40,0	95	85	24,0	40,0	95	95			
FAZ II 24		125	250	270,0	24,0	49,1	100	100	33,6	49,1	100	135			
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conditions.

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

Minimum possible axial spacings resp. edge distance while reducing the permissible load for the minimum member thickness ($h_{min} \ge 2 \times h_{el}$). The combination of the given min. spacing and min. edge distance is not possible. One of them has to be increased according approval.

³⁾ For combination 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.

For ingrief concrete strength classes up to 6307 to higher permissione loads may be possible.

5) According approval the minimum member thickness $\{h_{\min} \ge 2 \times h_n\}$ can be reduced under specific

Bolt anchor FAZ II A4

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

For the design the complete approval ETA - 05/0069 has to be considered

			gerissen	er Beton		ungerissener Beton						
Туре	minimum effective anchorage depth	maximum effective anchorage depth	minimum member thickness ⁵⁾	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}	h _{ef,max}	h _{min}	T _{inst}	N _{perm} 3)	V 3) perm	S _{min} ²⁾	C _{min} ²⁾	N _{perm} 3)	V _{perm} 3)	S _{min} ²⁾	C _{min} ²⁾
	[mm]	[mm]	[mm]	[Nm]	[kN]	[kN]	[mm]	[mm]	[kN]	[kN]	[mm]	[mm]
FAZ II 8 A4		45	100	20,0	2,4	6,9	35	40	4,3	6,9	40	40
	40		80	45,0	4,3	8,7	40	45	6,1	11,4	40	45
FAZ II 10 A4		60	120	45,0	4,3	11,4	40	45	7,6	11,4	40	45
FAZ II 12 A4	50		100	60,0	6,1	13,9	45	55	8,5	16,9	50	55
FAZ II 12 A4		70	140	60,0	7,6	16,9	45	55	11,9	16,9	50	55
FA7 II 40 A4	65		140	110,0	9,0	20,7	60	65	12,6	29,0	60	65
FAZ II 16 A4		85	170	110,0	13,4	31,4	60	65	18,8	31,4	60	65
FAZ II 20 A4		100	200	200,0	17,1	40,0	95	85	24,0	40,0	95	95
FAZ II 24 A4		125	250	270,0	24,0	49,1	100	100	33,6	49,1	100	135

¹⁰ The partial safety factors for material resistance as regulated in the approval as well as a partial safety factor for load actions of γ_L = 1,4 are considered. As an single anchor counts e.g. an anchor with a spacing s ≥ 3 x h_{el} and an edge distance c ≥ 1,5 x h_{el}. Accurate data see approval.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load for the minimum member thickness (h_{min} ≥ 2 x h_{et}). The combination of the given min. spacing and min. edge distance is not possible. One of them has to be increased according approval.

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

 $^{^{\}mbox{\tiny 4)}}$ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

⁶⁾ According approval the minimum member thickness (h_{min} ≥ 2 x h_{el}) can be reduced under specific conditions

Bolt anchor FAZ II C

Highest permissible loads for a single anchor¹⁾ in concrete C2O/25⁴⁾

For the design the complete approval ETA - 05/0069 has to be considered.

				Cracked o	concrete		Non-cracked concrete					
Туре	minimum effective anchorage depth	maximum effective anchorage depth	minimum member thickness ⁵⁾	torque moment	permissible tensile load	permissible shear load	min. spacing	min. edge distance	permissible tensile load		min. spacing	min. edge distance
	h _{ef,min} [mm]	h _{ef,max} [mm]	h _{min} [mm]	T _{inst}	N _{perm} ³⁾ [kN]	V 3) [kN]	S _{min} ²⁾ [mm]	C _{min} ²⁾ [mm]	N 3) [kN]	V _{perm} 3) [kN]	S _{min} ²⁾ [mm]	C _{min} ²⁾ [mm]
FAZ II 8 C	Linni	45	100	20,0	2,4	6,9	35	40	4,3	6,9	40	40
	40		80	45,0	4,3	8,7	40	45	6,1	11,4	40	45
FAZ II 10 C		60	120	45,0	4,3	11,4	40	45	7,6	11,4	40	45
FAZ II 12 C	50		100	60,0	6,1	13,9	45	55	8,5	16,9	50	55
FAZ II 12 G		70	140	60,0	7,6	16,9	45	55	11,9	16,9	50	55
FA7 II 40 0	65		140	110,0	9,0	20,7	60	65	12,6	29,0	60	65
FAZ II 16 C		85	170	110,0	13,4	31,4	60	65	18,8	31,4	60	65
FAZ II 20 C		100	200	200,0	17,1	40,0	95	85	24,0	40,0	95	95
FAZ II 24 C		125	250	270,0	24,0	49,1	100	100	33,6	49,1	100	135

The partial safety factors for material resistance as regulated in the approval as well as a partial safety factor for load actions of γ_L = 1,4 are considered. As an single anchor counts e.g. an anchor with a spacing s ≥ 3 x h_{ef} and an edge distance c ≥ 1,5 x h_{ef}. Accurate data see approval.

²¹ Minimum possible axial spacings resp. edge distance while reducing the permissible load for the minimum member thickness $(h_{min} \ge 2 \times h_{el})$. The combination of the given min. spacing and min. edge distance is not possible. One of them has to be increased according approval.

For combination 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.

⁵⁾ According approval the minimum member thickness $\{h_{min} \ge 2 \times h_{el}\}$ can be reduced under specific conditions.

Bolt anchor FAZ II GS

Highest permissible loads for a single anchor¹⁾ in concrete C2O/25⁴⁾

For the design the complete approval ETA - 05/0069 has to be considered.

						Cracked	concrete		Non-cracked concrete				
Туре	minimum effective anchorage	maximum effective anchorage	minimum member thickness ⁵⁾	torque moment	permissible tensile load	permissible shear load	min. spacing	min. edge distance	permissible tensile load		min. spacing	min. edge distance	
	depth h _{ef,min}	depth h _{ef,max}	h _{min}	T _{inst}	N 3)	V 3) perm	S _{min} ²⁾	C _{min} ²⁾	N 3)	V 3)	S _{min} ²⁾	C _{min} ²⁾	
	[mm]	[mm]	[mm]	[Nm]	[kN]	[kN]	[mm]	[mm]	[kN]	[kN]	[mm]	[mm]	
FAZ II 8 GS		45	100	20,0	2,4	6,9	35	40	4,3	6,9	40	40	
FAZ II 10 GS	40		80	45,0	4,3	8,7	40	45	6,1	11,4	40	45	
FAZ II 10 GS		60	120	45,0	4,3	11,4	40	45	7,6	11,4	40	45	
FA7 II 12 CC	50		100	60,0	6,1	13,9	45	55	8,5	16,9	50	55	
FAZ II 12 GS		70	140	60,0	7,6	16,9	45	55	11,9	16,9	50	55	
EA7 II 16 CC	65		140	110,0	9,0	20,7	60	65	12,6	29,0	60	65	
FAZ II 16 GS		85	170	110,0	13,4	31,4	60	65	18,8	31,4	60	65	

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 $s \ge 3 \times h_{el}$ and an edge distance $c \ge 1.5 \times h_{el}$. Accurate data see approval.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load for the minimum member thickness $(h_{min} \ge 2 \times h_{el})$. The combination of the given min. spacing and min. edge distance is not possible. One of them has to be increased according approval.

³⁾ For combination 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.

⁵⁾ According approval the minimum member thickness ($h_{min} \ge 2 \times h_{el}$) can be reduced under specific conditions

Bolt anchor FAZ II GS A4

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

For the design the complete approval ETA - 05/0069 has to be considered.

						Cracked	concrete		Non-cracked concrete					
Туре	minimum effective anchorage depth	maximum effective anchorage depth	minimum member thickness ⁵⁾	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}	h _{ef,max}	h _{min}	T_{inst}	N _{perm} 3)	V 3) perm	S _{min} ²⁾	C _{min} ²⁾	N _{perm} 3)	V 3) perm	S _{min} ²⁾	C _{min} ²⁾		
	[mm]	[mm]	[mm]	[Nm]	[kN]	[kN]	[mm]	[mm]	[kN]	[kN]	[mm]	[mm]		
FAZ II 8 GS A4		45	100	20,0	2,4	6,9	35	40	4,3	6,9	40	40		
FAZ II 10 GS A4	40		80	45,0	4,3	8,7	40	45	6,1	11,4	40	45		
FAZ II IU US A4		60	120	45,0	4,3	11,4	40	45	7,6	11,4	40	45		
FAZ II 12 GS A4	50		100	60,0	6,1	13,9	45	55	8,5	16,9	50	55		
FAZ II 1Z US A4		70	140	60,0	7,6	16,9	45	55	11,9	16,9	50	55		
FAZ II 16 GS A4	65		140	110,0	9,0	20,7	60	65	12,6	29,0	60	65		
FAZ II 10 US A4		85	170	110,0	13,4	31,4	60	65	18,8	31,4	60	65		

¹⁾ The partial safety factors for material resistance as regulated in the approval as well as a partial safety factor for load actions of $\gamma_t = 1.4$ are considered. As an single anchor counts e.g. an anchor with a spacing $s \ge 3 \times h_{el}$ and an edge distance $c \ge 1.5 \times h_{el}$. Accurate data see approval.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load for the minimum member thickness $(h_{min} \ge 2 \times h_{el})$. The combination of the given min. spacing and min. edge distance is not possible. One of them has to be increased according approval.

³⁾ For combination 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.

⁵⁾ According approval the minimum member thickness (h_{min} ≥ 2 x h_{el}) can be reduced under specific conditions.