

## Concrete screw with hexagon head and washer ULTRACUT FBS II A4 US

stainless steel

Permissible loads of a single anchor in cracked normal concrete (concrete tension zone) of strength class C20/25 (~B25) <sup>1) 2) 3) 8)</sup>										Minimum spacings while reducing the load	
Type	Material fixing element	Minimum member thickness	Screw-in 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			
		h <sub>min</sub> [mm]	h <sub>nom</sub> [mm]	T <sub>imp,max</sub> <sup>4)</sup> [Nm]	N <sub>perm</sub> <sup>5)</sup> [kN]	V <sub>perm</sub> <sup>5)</sup> [kN]	[mm]	[mm]	[mm]	[mm]	[mm]
<b>FBS II 8x50</b>	A4	100	50	450	1,9	4,3	35	90	120	35	35
<b>FBS II 8x65</b>	A4	120	65	450	4,3	6,4	45	125	160	35	35
<b>FBS II 10x55</b>	A4	100	55	450	2,1	4,8	40	100	130	40	40
<b>FBS II 10x65</b>	A4	120	65	450	2,9	6,2	40	115	155	40	40
<b>FBS II 10x85</b>	A4	140	85	450	7,6	19,2	75	360	205	40	40
<b>FBS II 12x60</b>	A4	110	60	650	2,1	5,5	50	105	145	50	50
<b>FBS II 12x75</b>	A4	130	75	650	5,2	15,9	50	305	180	50	50
<b>FBS II 12x100</b>	A4	150	100	650	12,5	25,0	125	445	245	50	50

For the design the complete assessment ETA-17/0740 has to be considered. <sup>7)</sup>

<sup>1)</sup> The partial safety factors for material resistance as regulated in the ETA-17/0740 as well as a partial safety factor for load actions of  $\gamma_{F} = 1,4$  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-17/0740.

<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 resp. hollow drilling. For further allowable drill methods see ETA-17/0740.

<sup>4)</sup> Maximum allowable torque for installation with any tangential impact screw driver.

<sup>5)</sup> For combinations of tensile loads and shear loads or for shear loads with lever arm (bending moments) as well as reduced edge distances or spacings (anchor groups) we recommend to use our anchor design software C-FIX.

<sup>6)</sup> Minimum possible axial spacings resp. edge distance while reducing the permissible load.

<sup>7)</sup> The given loads refer to the European Technical Assessment ETA-17/0740, issue date 23/10/2018. Design of the loads according TR055/ETAG 001, Annex C, Method A (for static resp. quasi-static loads).

<sup>8)</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

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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	Minimum member thickness	Screw-in 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			
		h <sub>min</sub> [mm]	h <sub>nom</sub> [mm]	T <sub>imp,max</sub> <sup>4)</sup> [Nm]	N <sub>perm</sub> <sup>5)</sup> [kN]	V <sub>perm</sub> <sup>5)</sup> [kN]	c [mm]	c [mm]	s <sub>cr</sub> [mm]	s <sub>min</sub> <sup>6)</sup> [mm]	c <sub>min</sub> <sup>6)</sup> [mm]
<b>FBS II 8x50</b>	A4	100	50	450	3,3	6,1	35	90	120	35	35
<b>FBS II 8x65</b>	A4	120	65	450	6,7	9,0	55	120	160	35	35
<b>FBS II 10x55</b>	A4	100	55	450	4,0	6,8	40	100	130	40	40
<b>FBS II 10x65</b>	A4	120	65	450	6,7	8,8	55	115	155	40	40
<b>FBS II 10x85</b>	A4	140	85	450	13,5	20,9	105	270	205	40	40
<b>FBS II 12x60</b>	A4	110	60	650	4,8	7,7	50	105	145	50	50
<b>FBS II 12x75</b>	A4	130	75	650	5,7	22,4	50	300	180	50	50
<b>FBS II 12x100</b>	A4	150	100	650	17,5	26,2	125	320	245	50	50

For the design the complete assessment ETA-17/0740 has to be considered.<sup>7)</sup>

<sup>1)</sup> The partial safety factors for material resistance as regulated in the ETA-17/0740 as well as a partial safety factor for load actions of  $\gamma_F = 1.4$  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-17/0740.

<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 resp. hollow drilling. For further allowable drill methods see ETA-17/0740.

<sup>4)</sup> Maximum allowable torque for installation with any tangential impact screw driver.

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## LOADS

### Concrete screw with countersunk head ULTRACUT FBS II A4 SK

stainless steel

Permissible loads of a single anchor in cracked normal concrete (concrete tension zone) of strength class C20/25 (~B25) <sup>1)2)3)8)</sup>										Minimum spacings while reducing the load	
Type	Material fixing element	Minimum member thickness	Screw-in 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			
		h <sub>min</sub> [mm]	h <sub>nom</sub> [mm]	T <sub>imp,max</sub> <sup>4)</sup> [Nm]	N <sub>perm</sub> <sup>5)</sup> [kN]	V <sub>perm</sub> <sup>5)</sup> [kN]	c [mm]	c [mm]	s <sub>cr</sub> [mm]	s <sub>min</sub> <sup>6)</sup> [mm]	c <sub>min</sub> <sup>6)</sup> [mm]
<b>FBS II 8x50</b>	A4	100	50	450	1,9	4,3	35	90	120	35	35
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<b>FBS II 10x55</b>	A4	100	55	450	2,1	4,8	40	100	130	40	40
<b>FBS II 10x65</b>	A4	120	65	450	2,9	6,2	40	115	155	40	40
<b>FBS II 10x85</b>	A4	140	85	450	7,6	19,2	75	360	205	40	40

For the design the complete assessment ETA-17/0740 has to be considered.<sup>7)</sup>

<sup>1)</sup> The partial safety factors for material resistance as regulated in the ETA-17/0740 as well as a partial safety factor for load actions of  $\gamma_F = 1.4$  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-17/0740.

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For the design the complete assessment ETA-17/0740 has to be considered. <sup>7)</sup>

<sup>1)</sup> The partial safety factors for material resistance as regulated in the ETA-17/0740 as well as a partial safety factor for load actions of  $\gamma_F = 1,4$  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-17/0740.

<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 drill methods see ETA-17/0740.

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## LOADS

### Concrete screw ULTRACUT FBS II

Highest recommended loads <sup>1)3)</sup> for a single anchor, resp. a fixing point <sup>4)5)6)</sup> in solid brick masonry.

Base material	Compressive strength [N/mm <sup>2</sup> ]	Type	ULTRACUT		
		Size	FBS II 8	FBS II 10	
		Anchoring depth h <sub>nom</sub>	[mm]	65	85
Solid clay brick <sup>9)</sup> (EN771-1)	≥ 12	Frec <sup>2)3)</sup>	[kN]	1,1	1,4
≥ 240x113x115 mm	≥ 20	Frec <sup>2)3)7)</sup>	[kN]	1,6	1,6
Solid sand-lime brick <sup>9)</sup> (EN771-2)	≥ 12	Frec <sup>2)3)7)</sup>	[kN]	1,2	1,2
≥ 240x71x115 mm	≥ 20	Frec <sup>2)3)7)</sup>	[kN]	1,2	1,2
Aerated concrete (EN771-4)	≥ 6	Frec <sup>2)3)</sup>	[kN]	0,7	0,9
Minimum spacing within anchor groups of 2 or 4 anchors		s <sub>min</sub>	[mm]	80	
Minimum spacing between single anchors, resp. anchor groups		s <sub>min</sub>	[mm]	80	
Minimum distance to the horizontal joint		c <sub>min,v</sub> <sup>8)</sup>	[mm]	20	
Minimum distance to the vertical joint		c <sub>min,h</sub> <sup>8)</sup>	[mm]	40	
Minimum distance to the free edge		c <sub>min,free edge</sub> <sup>8)</sup>	[mm]	200	
Tightening torque <sup>10)</sup>	Solid clay brick <sup>9)</sup>	T <sub>tighten</sub>	[Nm]	10	
	Solid sandlime brick <sup>9)</sup>			15	
	Aerated concrete			5	

<sup>1)</sup> An appropriate safety factor is considered.

<sup>2)</sup> The given loads apply to the given brick measures for masonry with superimposed load. Bigger brick sizes are minimum equal in case of the loads.

<sup>3)</sup> The loads only apply to multiple fixings of non-load-bearing systems and are valid for tensile load, shear load and oblique load under any angle.

<sup>4)</sup> On-site screw testing is recommended to validate technical data. If the joints are not visible 100% anchor testing is recommended due to the screws are only working in the bricks and not in the mortar joints.

<sup>5)</sup> A fixing point can be a single anchor, 2 anchors or 4 anchors with a minimum spacing s<sub>min</sub>. Anchor groups of 4 anchors are arranged in rectangular disposition.

<sup>6)</sup> The fixing points have to be arranged in this way that there will be always maximum one fixing point arranged in one brick.

<sup>7)</sup> Brick pull-out is decisive.

<sup>8)</sup> The values c<sub>min,v</sub> and c<sub>min,h</sub> are only valid if the mortar joints are filled proper. Otherwise the joints has to be considered as free edges and c<sub>min,free</sub> is decisive. Minimum mortar strength is M2.5

<sup>9)</sup> The values are valid for unperforated solid bricks.

<sup>10)</sup> The screw is screwed in with a cordless screwdriver, an impact screwdriver or by hand. The screwing process must be finished immediately when the screw head is in contact with the assembled object. The specified tightening torque must then be applied with a torque wrench.