

# LOADS

## Frame fixing SXRL<sup>3)</sup>

Highest recommended loads<sup>1)</sup> for a single anchor as part of a multiple fixing of non-structural systems.

The given loads are valid for wood screws with the specified diameter.

Type			SXRL 8		
Anchorage depth	$h_{nom}$	[mm]	50	70	90
Screw diameter	$\emptyset$	[mm]	6,0	6,0	6,0
Min. edge distance concrete	$a_r$	[mm]	60	80	100
Recommended loads in the respective base material $F_{rec}$ <sup>2)</sup>					
Concrete	$\geq C20/25$	[kN]	0,60	1,00	1,00
Solid brick	$\geq Mz 12$	[kN]	0,45	0,60	0,60
Solid sand-lime brick	$\geq KS 12$	[kN]	0,40	0,50	0,50
Vertically perforated brick	$\geq Hz 12$ ( $\rho \geq 1,0 \text{ kg/dm}^3$ )	[kN]	0,15	0,15	0,15
Perforated sand-lime brick	$\geq KSL 12$	[kN]	0,10	0,40	0,40
Aerated concrete	AAC 2	[kN]	-	0,10	0,10
Aerated concrete	AAC 4	[kN]	-	0,15	0,20

<sup>1)</sup> Required safety factors are considered.

<sup>2)</sup> Valid for tensile load, shear load and oblique load under any angle.

<sup>3)</sup> Valid for zinc coated screws and for screws made of stainless steel. For exterior use of the zinc coated screws measures against incoming humidity have to be taken.

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## Frame fixing SXRL<sup>4)</sup>

Highest permissible loads<sup>1)2)</sup> of a single anchor as part of a multiple fixing of non-structural systems.  
For the design the complete assessment ETA-07/O121 has to be considered.

Product		SXRL								
Anchor diameter	[mm]	Ø 8			Ø 10			Ø 14		
Anchorage depth	$h_{nom}$ [mm]	50	70	90	50	70	90	70	90	
<b>Anchorage in concrete <math>\geq</math> C12/15</b>										
Permissible tensile load	[kN]	1,59	1,98		1,98	2,58		3,37		
Permissible shear load	Zinc-plated steel [kN]	4,23			5,98			12,40		
	Stainless steel A4 [kN]	3,93			5,98			11,63		
Minimum member thickness	$h_{min}$ [mm]	80	100	120	100		120	110	130	
Characteristic edge distance	$c_{cr,N}$ [mm]	85			140			140		
Characteristic spacing	$a$ resp. $s_{cr,N}$ [mm]	90	105		120			135		
Minimum spacing with an edge distance	$s_{min}$ [mm]	85			70			85		
	$c \geq$ [mm]	85			140			140		
Minimum edge distance with a spacing	$c_{min}$ [mm]	85			70			85		
	$s \geq$ [mm]	85			175			175		
<b>Anchorage in narrow concrete members (<math>h \geq 40</math> mm) made of concrete <math>\geq</math> C12/15, e.g. weather shells of triple-skin outer wall panels</b>										
Permissible tensile load	[kN]	-			0,99	-		-		
Permissible shear load	[kN]	-			5,98	-		-		
<b>Anchorage in pre-stressed hollow-core concrete slabs (mirror thickness <math>d_b \geq 30</math> mm) made of concrete <math>\geq</math> C45/55</b>										
Permissible tensile load	[kN]	-			1,39	-		-		
Permissible shear load	[kN]	-			5,98	-		-		
<b>Anchorage in masonry</b>										
Permissible load <sup>3)</sup> in solid brick	$\geq Mz 12$ a. $\geq NF$ [kN]	0,57	0,71		0,57	1,14	-		0,86	
	$\geq Mz 20$ a. $\geq NF$ [kN]	0,86	1,14		1,00	1,14	-		1,14	
Permissible load <sup>3)</sup> in solid sand-lime brick	$\geq KS 10$ a. $\geq NF$ [kN]	0,57			0,57	0,71	-		0,86	
	$\geq KS 20$ a. $\geq NF$ [kN]	0,71	0,86		1,00		-		1,29	
Permissible load <sup>3)</sup> in lightweight concrete block	$\geq V 2; \rho \geq 1,2$ kg/dm <sup>3</sup> [kN]	0,11	0,26		0,11		-		0,26	
	$\geq V 6; \rho \geq 1,6$ kg/dm <sup>3</sup> [kN]	0,34	0,57		0,57	1,29	-		0,57	
Permissible load <sup>3)5)</sup> in vertically perforated brick (e.g. Poroton)	$\geq HLz 10; \rho \geq 1,0$ kg/dm <sup>3</sup> [kN]	0,17			-	0,21	-		0,57	
Permissible load <sup>3)</sup> in perforated sand-lime brick	$\geq KSL 6$ [kN]	-			-	0,21	-		0,26	
	$\geq KSL 12$ [kN]	0,34	0,43		-	0,71	-		0,43	
Permissible load in <sup>3)5)</sup> hollow lightweight concrete blocks	$\geq HBL 2$ [kN]	0,43	0,57	0,43	0,57	0,71	-		0,34	
	$\geq HBL 6$ [kN]	0,43	0,71	0,43	0,71	0,43	-		0,57	
Permissible load <sup>3)5)</sup> in ceilings made of vertically perforated bricks	$f_b \geq 10$ N/mm <sup>2</sup> ; $\rho \geq 0,7$ kg/dm <sup>3</sup> [kN]	-			-	0,57	-		-	
Minimum member thickness	$h_{min}$ [mm]	115			110			115		
Minimum spacing (single anchor)	$a_{min}$ [mm]	250			250			250		
Minimum spacing (anchor group)	$s_{min}$ [mm]	100			100			100		
Minimum edge distance (anchor group)	$c_{min}$ [mm]	100			100			100		
<b>Anchorage in aerated concrete</b>										
Permissible load <sup>3)</sup> in aerated concrete	$2$ N/mm <sup>2</sup> [kN]	-	0,14	0,21	-	0,18	0,21	0,32	0,43	
	$4$ N/mm <sup>2</sup> [kN]	-	0,32	0,43	-	0,43	0,54	0,89	1,07	
	$6$ N/mm <sup>2</sup> [kN]	-	0,54	0,71	-	0,71	0,89	1,43	1,79	
Minimum member thickness	$h_{min}$ [mm]	-	175		-	100	120	175 <sup>6)</sup> /300 <sup>7)</sup>		
Minimum spacing (single anchor)	$a_{min}$ [mm]	-	250		-	250		250		
Minimum spacing (anchor group)	$s_{min}$ [mm]	-	80 <sup>6)</sup> /110 <sup>8)</sup>		-	100 <sup>6)</sup> /120 <sup>8)</sup>		80	100 <sup>6)</sup> /125 <sup>7)</sup>	
Minimum edge distance (anchor group)	$c_{min}$ [mm]	-	90 <sup>6)</sup> /110 <sup>8)</sup>		-	120		120	120 <sup>6)</sup> /150 <sup>7)</sup>	

<sup>1)</sup> The required partial safety factors for material resistance as well as a partial safety factor for load actions  $\gamma_L = 1,4$  are considered.

As a single anchor counts e.g. an anchor with a minimum spacing  $a$  according to table B4.1 resp. table B4.2 of the assessment.

<sup>2)</sup> Valid for temperatures in the substrate up to +50 °C (resp. short term up to +80 °C). For long term temperatures up to +30 °C higher permissible loads may be possible.

<sup>3)</sup> Valid for tensile load, shear load and oblique load under any angle. For combinations of tensile loads, shear loads and bending moments see assessment.

<sup>4)</sup> Valid for zinc coated screws and for screws made of stainless steel. For exterior use of the zinc coated screws measures against incoming humidity according to assessment have to be taken.

<sup>5)</sup> Rotary drilling.

<sup>6)</sup> Only valid for AAC with compression strength  $\geq 2$  to  $< 4$  N/mm<sup>2</sup>.

<sup>7)</sup> Only valid for AAC with compression strength  $\geq 4$  N/mm<sup>2</sup>.

<sup>8)</sup> Only valid for AAC with compression strength  $\geq 6$  N/mm<sup>2</sup>.

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## Frame fixing SXRL 10

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>1) 5)</sup>									Minimum spacings while reducing the load	
Type	Screw material resp. screw surface	Min. member thickness  $h_{min}$ [mm]	Nominal anchorage depth  $h_{nom}$ [mm]	Permissible tensile load  $N_{perm}^{2)}$ [kN]	Permissible shear load  $V_{perm}^{2)}$ [kN]	Required edge distance (with one edge) for		Required spacing for  Max. load  $s$ [mm]	Min. spacing  $s_{min}^{3)}$ [mm]	Min. edge distance  $c_{min}^{3)}$ [mm]
						Max. tension load $c$ [mm]	Max. shear load $c$ [mm]			
<b>SXRL 10</b>	gvz	100	70	1,5	3,6	50	80	50	50	50
	A4									

For the design the complete approval Z-21.2-2092 has to be considered. <sup>4)</sup>

<sup>1)</sup> The partial safety factors for material resistance as regulated in the Z-21.2-2092 as well as a partial safety factor for load actions of  $\gamma_L = 1,4$  are considered. As a single anchor counts e.g. a anchor with a spacing  $s \geq 3 \cdot h_{ef}$  and an edge distance  $c \geq 1,5 \cdot h_{ef}$ . Accurate data see Z-21.2-2092.

<sup>2)</sup> For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see Z-21.2-2092.

<sup>3)</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. to Z-21.2-2092.

<sup>4)</sup> The given loads refer to the approval Z-21.2-2092, issue date 19/11/2018 and are valid for temperature range II. Design of the loads according to ETAG 001, Annex C, Method A (for static resp. quasi-static loads).

<sup>5)</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.

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## Frame fixing SXRL 10

zinc plated steel / stainless steel

Permissible loads of a single anchor in non-cracked concrete (concrete compression zone) of strength class C20/25 (~B25) <sup>1)5)</sup>									Minimum spacings while reducing the load	
Type	Screw material resp. screw surface	Min. member thickness	Nominal anchorage depth	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]	N <sub>perm</sub> <sup>2)</sup> [kN]	V <sub>perm</sub> <sup>2)</sup> [kN]	c [mm]	c [mm]	s [mm]	s <sub>min</sub> <sup>3)</sup> [mm]	c <sub>min</sub> <sup>3)</sup> [mm]
SXRL 10	gvz	110	70	2,6	6,0	80	90	80	80	80
	A4									

For the design the complete approval Z-21.2-2092 has to be considered. <sup>4)</sup>

<sup>1)</sup> The partial safety factors for material resistance as regulated in the Z-21.2-2092 as well as a partial safety factor for load actions of  $\gamma_L = 1,4$  are considered. As a single anchor counts e.g. a anchor with a spacing  $s \geq 3 \cdot h_{ef}$  and an edge distance  $c \geq 1,5 \cdot h_{ef}$ . Accurate data see Z-21.2-2092.

<sup>2)</sup> For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see Z-21.2-2092.

<sup>3)</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. to Z-21.2-2092.

<sup>4)</sup> The given loads refer to the approval Z-21.2-2092, issue date 19/11/2018 and are valid for temperature range II. Design of the loads according to ETAG 001, Annex C, Method A (for static resp. quasi-static loads).