

## The versatile with multiple anchorage depth



Timber substructures



Wall consoles

5 Frame fixings / Stand-off installation

### VERSIONS

- Zinc-plated steel
- Stainless steel

### BUILDING MATERIALS

#### Approved for:

- Vertically perforated brick
- Aerated concrete
- Hollow blocks made from lightweight concrete
- Perforated sand-lime brick
- Thermal insulation blocks
- Solid block made from lightweight and normal weight concrete
- Solid brick
- Solid sand-lime brick
- Concrete  $\geq$  C12/15

#### Also suitable for:

- Natural stone with dense structure
- Solid panel made from gypsum

### CERTIFICATES



### ADVANTAGES

- The long expansion element with multiple anchorage depths of 50, 70 or 90 mm for SXRL 8 and SXRL 10 and 70 or 90 mm for SXRL 14 makes the SXRL a versatile applicable product.
- Through the special geometry of the plug, the loads are evenly distributed in the drill hole.
- When the plug is to be set below the plaster, the longer ribs prevent plug rotation during installation.
- The approval for single-point fixing in cracked concrete makes the SXRL the designated specialist in concrete particularly for tasks such as the installation of awning roofs and outdoor railings compared to steel anchors.
- SXRL 14 is approved for the application under compression load and is thus for example useable for facade substructures that are mounted at a distance without wall brackets.
- Complete range available with diameters of 8, 10 and 14 mm and usable lengths up to 290 mm.

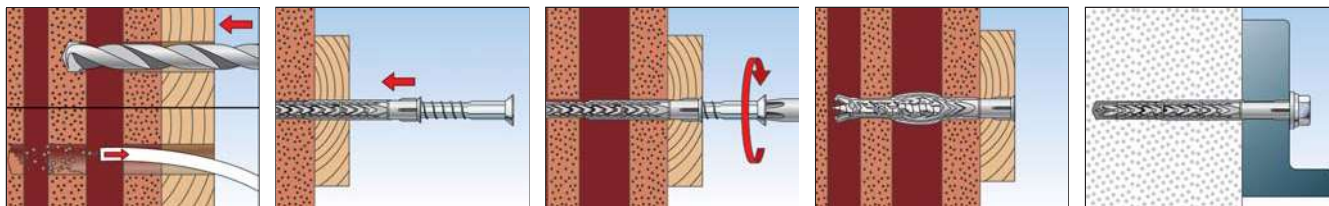
### APPLICATIONS

- Façade, ceiling and roof substructures made of wood and metal
- Facade substructures under compression load (e.g. distance installation without a wall bracket)
- Windows
- Gates and doors
- Wardrobes
- Kitchen hanging cabinets
- Squared timbers
- Beams
- TV consoles
- Wall covering
- Metal brackets
- Metal supports
- Cable ducts
- Cable trays

### FUNCTIONING

- In hollow building materials, the two expansion zones ensure that the introduction of force is gentle on the substrate. The porous block fillets are not crushed by the second expansion zone and therefore serve to transmit the force
- In aircrete and solid building material, the two expansion zones combine to form one long expansion element, thus providing for a uniform and flat distribution of the load into substrate.
- SXRL-T with countersunk head screw is recommended for the installation of timber constructions; in the case of metal constructions, use SXRL-FUS with a wide sleeve rim and a moulded washer on the screw, which also features an integrated hexagon socket.

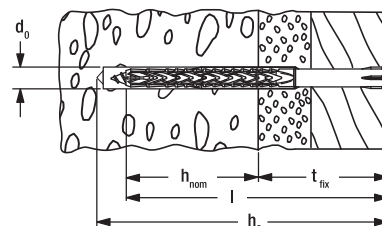
## INSTALLATION



## TECHNICAL DATA



**SXRL-T** - with fischer countersunk head safety screw



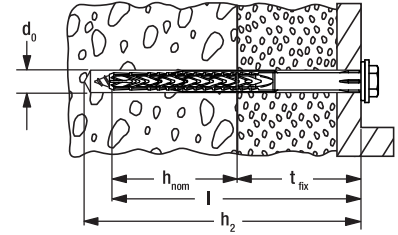
Item	Zinc-plated steel	Stainless steel	Approval		Drill diameter	Min. drill hole depth for through fixings	Usable length at anchorage depth 50mm	Usable length at anchorage depth 70mm	Usable length at anchorage depth 90mm	Anchor length	Drive	Sales unit
	Art.-No.	Art.-No.	ETA	DIBt	$d_0$ [mm]	$h_2$ [mm]	$t_{fix}$ [mm]	$t_{fix}$ [mm]	$t_{fix}$ [mm]	$l$ [mm]		[pcs]
	gvz	A4										
SXRL 8 x 60 T	540113	540119	■	—	8	70	10	—	—	60	T30	50
SXRL 8 x 80 T	540114	540121	■	—	8	90	30	10	—	80	T30	50
SXRL 8 x 100 T	540115	540123	■	—	8	110	50	30	10	100	T30	50
SXRL 8 x 120 T	540116	540124	■	—	8	130	70	50	30	120	T30	50
SXRL 8 x 140 T	540117	540125	■	—	8	150	90	70	50	140	T30	50
SXRL 8 x 160 T	540118	540126	■	—	8	170	110	90	70	160	T30	50
SXRL 10 x 60 T	546477	546505	■	●	10	70	10	—	—	60	T40	50
SXRL 10 x 80 T	522698	522709	■	●	10	90	30	10	—	80	T40	50
SXRL 10 x 100 T	522699	522710	■	●	10	110	50	30	10	100	T40	50
SXRL 10 x 120 T	522700	522711	■	●	10	130	70	50	30	120	T40	50
SXRL 10 x 140 T	522701	522712	■	●	10	150	90	70	50	140	T40	50
SXRL 10 x 160 T	522703	522713	■	●	10	170	110	90	70	160	T40	50
SXRL 10 x 180 T	522704	522714	■	●	10	190	130	110	90	180	T40	50
SXRL 10 x 200 T	522705	522715	■	●	10	210	150	130	110	200	T40	50
SXRL 10 x 230 T	522706	522716	■	●	10	240	180	160	140	230	T40	50
SXRL 10 x 260 T	522707 <sup>1)</sup>	522717 <sup>1)</sup>	■	●	10	270	210	190	170	260	T40	50
SXRL 10 x 290 T	522708 <sup>1)</sup>	522718 <sup>1)</sup>	■	●	10	300	240	220	200	290	T40	50
SXRL 14 x 80 T	530920	530932	■	●	14	95	—	10	—	80	T50	50
SXRL 14 x 100 T	530921	530933	■	●	14	115	—	30	10	100	T50	50
SXRL 14 x 120 T	530922	530934	■	●	14	135	—	50	30	120	T50	50
SXRL 14 x 140 T	530923	530935	■	●	14	155	—	70	50	140	T50	50
SXRL 14 x 160 T	530924	530936	■	●	14	175	—	90	70	160	T50	50
SXRL 14 x 180 T	530925	530937	■	●	14	195	—	110	90	180	T50	50
SXRL 14 x 200 T	530926	530938	■	●	14	215	—	130	110	200	T50	50
SXRL 14 x 230 T	530927	530939	■	●	14	245	—	160	140	230	T50	50
SXRL 14 x 260 T	530928	530940	■	●	14	275	—	190	170	260	T50	50
SXRL 14 x 300 T	530929 <sup>1)</sup>	530941 <sup>1)</sup>	■	●	14	315	—	230	210	300	T50	20
SXRL 14 x 330 T	530930 <sup>1)</sup>	530942 <sup>1)</sup>	■	●	14	345	—	260	240	330	T50	20
SXRL 14 x 360 T	530931 <sup>1)</sup>	530943 <sup>1)</sup>	■	●	14	375	—	290	270	360	T50	20

1) not pre-assembled

## TECHNICAL DATA



**SXRL-FUS** - with fischer hexagon head safety screw, moulded washer and integrated bit recess



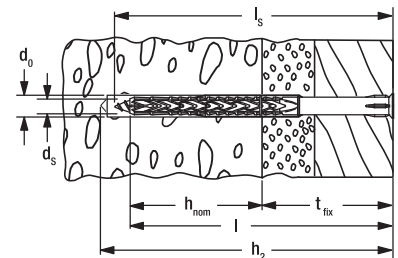
Item	Zinc-plated steel	Stainless steel	Approval		Drill diameter	Min. drill hole depth for through fixings	Usable length at anchorage depth 50mm	Usable length at anchorage depth 70mm	Usable length at anchorage depth 90mm	Anchor length	Drive	Sales unit
	Art.-No.	Art.-No.	ETA	DIBt	$d_0$ [mm]	$h_2$ [mm]	$t_{fix}$ [mm]	$t_{fix}$ [mm]	$t_{fix}$ [mm]	$l$ [mm]		[pcs]
	gvs	A4										
<b>SXRL 8 x 60 FUS</b>	<b>540127</b>	<b>540135</b>	■	—	8	70	10	—	—	60	T30/SW10	50
<b>SXRL 8 x 80 FUS</b>	<b>540129</b>	<b>540136</b>	■	—	8	90	30	10	—	80	T30/SW10	50
<b>SXRL 8 x 100 FUS</b>	<b>540130</b>	<b>540137</b>	■	—	8	110	50	30	10	100	T30/SW10	50
<b>SXRL 8 x 120 FUS</b>	<b>540131</b>	—	■	—	8	130	70	50	30	120	T30/SW10	50
<b>SXRL 8 x 140 FUS</b>	<b>540133</b>	—	■	—	8	150	90	70	50	140	T30/SW10	50
<b>SXRL 8 x 160 FUS</b>	<b>540134</b>	—	■	—	8	170	110	90	70	160	T30/SW10	50
<b>SXRL 10 x 60 FUS</b>	<b>546506</b>	<b>546507</b>	■	●	10	70	10	—	—	60	T40/SW13	50
<b>SXRL 10 x 80 FUS</b>	<b>522719</b>	<b>522730</b>	■	●	10	90	30	10	—	80	T40/SW13	50
<b>SXRL 10 x 100 FUS</b>	<b>522720</b>	<b>522731</b>	■	●	10	110	50	30	10	100	T40/SW13	50
<b>SXRL 10 x 120 FUS</b>	<b>522721</b>	<b>522732</b>	■	●	10	130	70	50	30	120	T40/SW13	50
<b>SXRL 10 x 140 FUS</b>	<b>522723</b>	<b>522733</b>	■	●	10	150	90	70	50	140	T40/SW13	50
<b>SXRL 10 x 160 FUS</b>	<b>522724</b>	<b>522734</b>	■	●	10	170	110	90	70	160	T40/SW13	50
<b>SXRL 10 x 180 FUS</b>	<b>522725</b>	<b>522735</b>	■	●	10	190	130	110	90	180	T40/SW13	50
<b>SXRL 10 x 200 FUS</b>	<b>522726</b>	<b>522736</b>	■	●	10	210	150	130	110	200	T40/SW13	50
<b>SXRL 10 x 230 FUS</b>	<b>522727</b>	<b>522737</b>	■	●	10	240	180	160	140	230	T40/SW13	50
<b>SXRL 10 x 260 FUS</b>	<b>522728</b> <sup>1)</sup>	<b>522738</b> <sup>1)</sup>	■	●	10	270	210	190	170	260	T40/SW13	50
<b>SXRL 10 x 290 FUS</b>	<b>522729</b> <sup>1)</sup>	<b>522739</b> <sup>1)</sup>	■	●	10	300	240	220	200	290	T40/SW13	50
<b>SXRL 14 x 80 FUS</b>	<b>530946</b>	<b>530955</b>	■	●	14	95	—	10	—	80	T50/SW17	50
<b>SXRL 14 x 100 FUS</b>	<b>530947</b>	<b>530956</b>	■	●	14	115	—	30	10	100	T50/SW17	50
<b>SXRL 14 x 120 FUS</b>	<b>530948</b>	<b>530957</b>	■	●	14	135	—	50	30	120	T50/SW17	50
<b>SXRL 14 x 140 FUS</b>	<b>530949</b>	<b>530958</b>	■	●	14	155	—	70	50	140	T50/SW17	50
<b>SXRL 14 x 160 FUS</b>	<b>530950</b>	<b>530959</b>	■	●	14	175	—	90	70	160	T50/SW17	50
<b>SXRL 14 x 180 FUS</b>	<b>530951</b>	<b>530960</b>	■	●	14	195	—	110	90	180	T50/SW17	50
<b>SXRL 14 x 200 FUS</b>	<b>530952</b>	<b>530961</b>	■	●	14	215	—	130	110	200	T50/SW17	50
<b>SXRL 14 x 230 FUS</b>	<b>530953</b>	<b>530962</b>	■	●	14	245	—	160	140	230	T50/SW17	50
<b>SXRL 14 x 260 FUS</b>	<b>530954</b>	<b>530963</b>	■	●	14	275	—	190	170	260	T50/SW17	50

1) not pre-assembled

## ACCESSORIES



**SXRL** - without screw



Item	Art.-No.	Drill diameter	Min. drill hole depth for through fixings	Usable length at anchorage depth 50mm	Usable length at anchorage depth 70mm	Usable length at anchorage depth 90mm	Anchor length	Screw diameter	Min. screw length	Sales unit
		$d_0$ [mm]	$h_2$ [mm]	$t_{fix}$ [mm]	$t_{fix}$ [mm]	$t_{fix}$ [mm]	$l$ [mm]	$d_s$ [mm]	$l_s$ [mm]	[pcs]
<b>SXRL 8 x 60</b>	<b>540879</b>	8	70	10	—	—	60	5,5 - 6,0	65	100
<b>SXRL 8 x 80</b>	<b>540880</b>	8	90	30	10	—	80	5,5 - 6,0	85	100
<b>SXRL 8 x 100</b>	<b>540881</b>	8	110	50	30	10	100	5,5 - 6,0	105	100
<b>SXRL 8 x 120</b>	<b>540882</b>	8	130	70	50	30	120	5,5 - 6,0	125	100

## ACCESSORIES



Cover cap ADT

Item	Art.-No.	Colour	Cap [Ø mm]	Match	Sales unit [pcs]
ADT 15 W	060326	white	15	Safety screw with integrated bit recess T40	100
ADT 15 DB	060329	dark brown	15	Safety screw with integrated bit recess T40	100
ADT 18 W	060334	white	18	Safety screw with integrated bit recess T40	100
ADT 18 DB	060337	dark brown	18	Safety screw with integrated bit recess T40	100

## ACCESSORIES



Washer U

Item	Art.-No.	External-Ø d [mm]	Hole-Ø D [mm]	Thickness S [mm]	Matching anchor type	Sales unit [pcs]
U 11,5 x 21 x 1,5 DIN 522 A2	010026	21	11.5	1.5	SXR 10, SXRL 10, FUR 10	500

## 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	Ø	[mm]	6,0	6,0	6,0
Min. edge distance concrete	$a_r$	[mm]	60	80	100
<b>Recommended loads in the respective base material <math>F_{rec}</math><sup>2)</sup></b>					
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	$\geq Hlz 12 (\rho \geq 1,0 \text{ kg/dm}^3)$	[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.

## LOADS

### 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-07/0121 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	0,71	
Permissible load <sup>3)</sup> in perforated sand-lime brick	$\geq$ KSL 6 [kN]	-			-	0,21	-		0,26	0,34	
	$\geq$ KSL 12 [kN]	0,34	0,43		-	0,71	-		0,43	0,71	
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	0,21	
	$\geq$ 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>6)</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>.

## LOADS

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

Highest permissible compression loads<sup>1)2)</sup> of a single anchor as part of a multiple fixing of non-structural systems.

For the design the complete approval Z-2 1.2-2037 has to be considered.

Product		SXRL	
Anchor diameter	[mm]	Ø 14	
Anchorage depth	$h_{nom}$ [mm]	70	90
<b>Anchorage in concrete <math>\geq</math> C12/15</b>			
Permissible compression load	[kN]	3,37	
Minimum member thickness	$h_{min}$ [mm]	110	130
Characteristic edge distance	$c_{cr,N}$ [mm]	140	
Characteristic spacing	$a$ resp. $s_{cr,N}$ [mm]	135	
Minimum spacing	$s_{min}$ [mm]	85	
with an edge distance	$c \geq$ [mm]	140	
Minimum edge distance	$c_{min}$ [mm]	85	
with a spacing	$s \geq$ [mm]	175	
<b>Anchorage in masonry</b>			
Permissible compression load in solid brick	$\geq$ Mz 12 a. $\geq$ NF	[kN]	0,86
	$\geq$ Mz 20 a. $\geq$ NF	[kN]	1,14
Permissible compression load in solid sand-lime brick	$\geq$ KS 10 a. $\geq$ NF	[kN]	0,86
	$\geq$ KS 20 a. $\geq$ NF	[kN]	1,29
Permissible compression load in lightweight concrete block	$\geq$ V 2; $\rho \geq 1,2 \text{ kg/dm}^3$	[kN]	0,26
	$\geq$ V 6; $\rho \geq 1,6 \text{ kg/dm}^3$	[kN]	0,57
Permissible compression load <sup>4)</sup> in vertically perforated brick (e.g. Poroton)	$\geq$ HLz 10; $\rho \geq 1,0 \text{ kg/dm}^3$	[kN]	0,34
Permissible compression load in perforated sand-lime brick	$\geq$ KSL 6	[kN]	0,21
	$\geq$ KSL 12	[kN]	0,43
Permissible compression load <sup>4)</sup> in hollow lightweight concrete blocks	$\geq$ HBL 2	[kN]	0,26
Minimum member thickness	$h_{min}$ [mm]	115	
Minimum spacing (single anchor)	$a_{min}$ [mm]	250	
Minimum spacing (anchor group)	$s_{min}$ [mm]	100	
Minimum edge distance (anchor group)	$c_{min}$ [mm]	100	
<b>Anchorage in aerated concrete</b>			
Permissible compression load in aerated concrete	2 N/mm <sup>2</sup>	[kN]	0,32
	4 N/mm <sup>2</sup>	[kN]	0,89
	6 N/mm <sup>2</sup>	[kN]	1,43
Minimum member thickness	$h_{min}$ [mm]	175 <sup>5)</sup> /300 <sup>6)</sup>	
Minimum spacing (single anchor)	$a_{min}$ [mm]	250	
Minimum spacing (anchor group)	$s_{min}$ [mm]	80	100 <sup>5)</sup> /125 <sup>6)</sup>
Minimum edge distance (anchor group)	$c_{min}$ [mm]	120	120 <sup>5)</sup> /150 <sup>6)</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 according to tables B3.1, B4.1 resp. B4.2 of the ETA-07/0121.

<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 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>4)</sup> Rotary drilling.

<sup>5)</sup> Only valid for AAC with compression strength  $\geq 2$  to  $< 4 \text{ N/mm}^2$ .

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