Universal long shaft anchor SXS-T

Usage

Approved for:

- Concrete
- Solid brick
- Solis sand-lime brick
- Hollow block made from lightweight concrete
- Multilayer composite concrete wall

Also suitable for:

- Natural stone with dense structure
- Solid block made from lightweight concrete
- Solid panel made from gypsum

For fixing of:

- Railings
- Handrails
- Gates
- Door frames
- Facade and roof substructures made of wood and metal
- Fire protection doors
- Windows
- Kitchen cabinets
- Squared timbers
- Facings
- Cable conduits

Description

- First nylon frame fixing approved for cracked concrete.
- Fixing sets with A4 stainless steel CO-NA screws for external applications and in damp conditions.

Examples of use

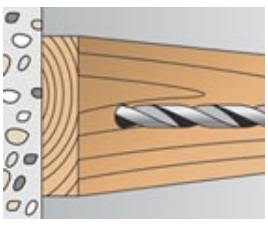
Installation

Type of installation

- Push-through installation

Installation tips

- We advise countersunk screws for fixing wooden structures, and fixings with a flat collar and hexagon-head bolts for metal structures.
- The hexagon-head with integrated washer also has an integral Torx-socket.



Mean ultimate loads, design resistant and recommended loads for single anchors of fischer Long-shaft fixing SXS with large axial spacing and edge distance

Anchor size				Non-cracked concrete SXS 10		cracked concrete SXS 10	
Temperature range: short-term / long-term	°C			30 / 50	50 / 80	30 / 50	50 / 80
Effective anchorage depth [1]	h_{eff}	[mm]		35		35	
Nominate anchorage depth	h_{nom}	[mm]		50		50	
Drill hole depth	$h_1 >$	[mm]		60		60	
Drill hole diameter	d_0	[mm]		10		10	
Mean ultimate loads N_u [kN]							
Tensile	N_u	[kN]	gvz	12.8	8.3	10.4	6.7
	N_u	[kN]	fvz	6.4	4.2	-	-
	N_u	[kN]	A4	12.8	8.3	10.4	6.7
Shear	V_u	[kN]	gvz	13.8	11.7	13.8	11.7
	V_u	[kN]	fvz	6.9	5.9	-	-
	V_u	[kN]	A4	13.8	11.7	13.8	11.7
Design resistant loads N_{Rd} [kN]							
Tensile	N_{Rd}	[kN]	gvz	3.3	2.2	2.8	1.7
	N_{Rd}	[kN]	fvz	1.7	1.1	-	-
	N_{Rd}	[kN]	A4	3.3	2.2	2.8	1.7
Shear	V_{Rd}	[kN]	gvz	5.0	4.2	5.0	4.2
	V_{Rd}	[kN]	fvz	2.5	2.1	-	-
	V_{Rd}	[kN]	A4	5.0	4.2	5.0	4.2
Recommended loads N_{rec} [kN] [1]							
Tensile	N_{rec}	[kN]	gvz	2.4	1.6	2.0	1.2
	N_{rec}	[kN]	fvz	1.2	0.8	-	-
	N_{rec}	[kN]	A4	2.4	1.6	2.0	1.2
Shear	V_{rec}	[kN]	gvz	3.6	3.0	3.6	3.0
	V_{rec}	[kN]	fvz	1.8	1.5	-	-
	V_{rec}	[kN]	A4	3.6	3.0	3.6	3.0
Recommended bending moment M_{rec} [Nm]							
	M_{rec}	[Nm]	gvz	16.3		16.3	
	M_{rec}	[Nm]	fvy	10.1		-	
	M_{rec}	[Nm]	A4	15.8		15.8	
Component dimensions, minimum axial spacings and edge distances [2]							
Min. structural component thickness [2]	h_{min}	[mm]		100	140	100	140
Min. axial spacing [2]	s_{min}	[mm]		55	50	55	50
	for c ≥	[mm]		100	100	100	90
Min. edge distance [2]	c_{min}	[mm]		60	60	50	50
	for s ≥	[mm]		250	200	250	200

* steel failure decisive

[1] For hot-dip galvanized safety screws the values have to be reduced by 50%.

[2] For min. axial spacing and min. edge distance the above described loads have to be reduced!

All load values apply for concrete C20/25 without edge or spacing influence.

Design resistant loads: material safety factor γ_M is included. Material safety factor γ_M depends on type of anchor.

Recommended loads: material safety factor γ_M and safety factor for load γ_L = 1.4 are included.

For detailed design method please contact the fischer technical service department.

Recommended loads N_{rec} [kN] and mean ultimate loads N_u [kN] with large axial spacing and edge distance

Fixing type	SXS 6			
	chipboard screw size 4.5 mm		wood screw size 4.5 mm	
Substrate	N_{rec} [kN]	N_u [kN]	N_{rec} [kN]	N_u [kN]
Concrete ≥ C12/15	0.3	1.8	0.5	3.5
Solid brick ≥ Mz12 (DIN 105)	0.15	1.00	0.2	2.0
Sand lime solid brick ≥ KS12 (DIN 106)	0.3	1.8	0.5	3.5
Hollow block ≥ Hbl2 (lightweight concrete, DIN 18151)	-	-	0.1	0.8

Recommended loads N_{rec} [kN] and mean ultimate loads N_u [kN] with large axial spacing and edge distance

Fixing type	SXS 8			
	chipboard screw size 6.0 mm		wood screw size 6.0 mm	
Substrate	N_{rec} [kN]	N_u [kN]	N_{rec} [kN]	N_u [kN]
Concrete ≥ C12/15	0.5	3.5	0.6	4.2
Solid brick ≥ Mz12 (DIN 105)	0.3	2.6	0.4	3.2
Sand lime solid brick ≥ KS12 (DIN 106)	0.5	3.5	0.6	4.2
Hollow block ≥ Hbl2 (lightweight concrete, DIN 18151)	0.3	2.6	0.4	3.2
Solid block ≥ V2 (lightweight concrete, DIN 18152)	-	-	0.1	1.3

Long-shaft fixings

Mean ultimate loads and recommended loads of fischer Long-shaft fixings

Fixing type				FUR 8	FUR 10	FUR 14	S 8 R	S 10 R	S 12 R	S 14 R	S 10 H-R	S 14 H-R	SXS 10
Anchorage depth	$h_v \geqq$		[mm]	70	70/90[4]	70/90[4]	50	50	60	70	70/90[4]	90	50
Drill-hole depth	$t \geqq$		[mm]	80	80/100[4]	85/105[4]	60	60	70	80	80/100[4]	100	60
Drill ∅			[mm]	8	10	14	8	10	12	14	10[5]	14	10
Concrete	≧ C12/15	$N_{u,m}$	[kN]	8.1	10.0	21.9	4.5	5.7	8.1	12.5	–	–	12.3[6]
		N_{rec}	[kN]	1.2	2.1	3.1	0.9	1.1	1.6	1.8	–	–	1.6[6]
Solid brick (DIN 105)	≧ Mz12	$N_{u,m}$	[kN]	5.0	10.0	12.5	4.5	5.3	7.0	7.0	–	–	6.5[6]
		N_{rec}	[kN]	0.7	1.4	1.8	0.9	1.0	1.4	1.4	–	–	1.0[6]
Solid sand-lime brick (DIN 105)	≧ KS12	$N_{u,m}$	[kN]	7.8	12.8	19.7	4.2	5.3	7.0	7.0	–	–	12.3[6]
		N_{rec}	[kN]	1.1	1.6	2.8	0.8	1.0	1.4	1.4	–	–	2.0[6]
Vertical perforated brick (DIN 105)	≧ HLz12[1]	$N_{u,m}$	[kN]	0.9	2.6	–[8]	–	–	–	–	3.2[6]	3.5	–
		N_{rec}	[kN]	0.13	0.37	0.5	–	–	–	–	0.46[6]	0.5	–
Perforated sand-lime brick (DIN 106)	≧ KSL6	$N_{u,m}$	[kN]	4.4	3.3	–[8]	–	–	–	–	2.0[7]	2.4	–
		N_{rec}	[kN]	0.63	0.48	0.6	–	–	–	–	0.3[7]	0.34	–
Hollow block (lightweight concrete, DIN 18151)[2]	≧ Hbl2	$N_{u,m}$	[kN]	1.2	3.2	2.2	–	–	–	–	–[8]	–[8]	–[8]
		N_{rec}	[kN]	0.17	0.46	0.31	–	–	–	–	0.25	0.3	0.25
Solid block (lightweight concrete, DIN 18152)	≧ KSL6	$N_{u,m}$	[kN]	3.9	5.0	–[8]	–	–	–	–	2.6[6]	3.0	–
		N_{rec}	[kN]	0.56	0.71	0.5	–	–	–	–	0.37	0.43	–
No-fines lightweight concrete		N_{rec}	[kN]	–	0.3	0.7	–	–	–	–	0.4	0.7	–
Aerated concrete (DIN 4165/4166)	Pb2; P3,3	N_{rec}	[kN]	–	–	–	–	–	–	–	0.3	–	–
	Pb4; P4,4	N_{rec}	[kN]	–	–	–	–	–	–	–	0.6	–	–
Recommended bending moments[3]	zinc plated		[Nm]	5.0	10.1	27.8[15]	4.5	10.1	20.7	22.2	10.1	32.6	16.3
	A4 (316)		[Nm]	4.2	8.5	26.1	3.8	8.5	17.5	18.8	8.5	27.5	15.8

Spacings and component dimensions

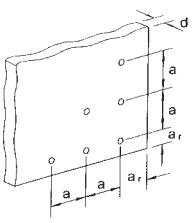
Fixing type				FUR 8		FUR 10		FUR 14		S 8 R	S 10 R	S 12 R	S 14 R	S 10 H-R	S 14 H-R	SXS 10		
Concrete	Single plug[9]	Axial spacing	a ≧	10	10	10	15	10	15	10	10	10	10	–	–	10	10	15
		Edge distance	$a_r \geqq$	5	6	5	10	6	10	5	5	6	6	–	–	5	8	10
	Pair of plugs[9]	Axial spacing	$a_i \geqq$	5	5	5	5	8	5	5	5	8	8	–	–	5	5	5
			$a_g \geqq$	15	24	15	30	18	30	15	15	18	18	–	–	15	24	30
		Edge distance	$a_r \geqq$	5	6	5	10	6	10	5	5	6	6	–	–	5	8	10
	Min. component thickness		d =	10		12		12		10	10	10	12	–	–	10		
Masonry	Axial spacing		a ≧	10		10/25[10]		25		10	10/25[10]	25	25	10/25[10]	25	10		
	Edge distance	for loaded masonry[11]	$a_r \geqq$	10/3[12]		10/3[12]		10/3[12]		10	10	10	10	10	10	10		
		for-non loaded masonry[11]	$a_r \geqq$	25		25		40		25	25	40	40	25	40	25/3[12]		
	Min. component thickness		d =	11.5		11.5		11.5		11.5	11.5	11.5	11.5	11.5	17.5	11.5		
No-fines lightweight concrete	Single plug	Axial spacing	a ≧	–		10		10		–	–	–	–	10	10	–		
		Edge distance	$a_r \geqq$	–		10		10		–	–	–	–	10	10	–		
	Pair of plugs	Axial spacing	a ≧	–		–		–		–	–	–	–	10	20	–		
		Edge distance	$a_r \geqq$	–		–		–		–	–	–	–	10	10	–		
	Min. component thickness		d =	–		20		17.5		–	–	–	–	20	20	–		
Aerated concrete	Axial spacing		a ≧	–		–		–		–	–	–	–	10	–	–		
	Edge distance of loaded masonry[11]		$a_r \geqq$	–		–		–		–	–	–	–	10	–	–		
	Edge distance of non-loaded masonry[11]		$a_r \geqq$	–		–		–		–	–	–	–	25	–	–		
	Min. component thickness		d =	–		–		–		–	–	–	–	11.5	–	–		

1) Assumed density ≧ 1.0 kg/dm³; for other strength classes of brick, the maximum load should always be determined by tests on the structure.
2) The expanding part of the fixing must anchor in the wall of the brick (see approval Z-21.2-9, appendix 7).
3) With simultaneous tensile load, the bending moment must be reduced.
4) For lightweight no-fines concrete only.
5) In aerated concrete, the hole should be made using the special punch provided.
6) For hot-dip galvanized safety screws the value has to be reduced by 50%.
7) Hot-dip galvanized screws: the failure of the substrate varies so much, that no reproducible values can be stated.
8) The failure of the substrate varies so much, that no reproducible values can be stated.
9) See illustration of object dimensions.
10) When anchoring in vertically perforated brick, sand-lime brick (h > 11.3 cm, cavity proportion > 15%) and hollow blocks, the axial spacing must be 25 cm. The axial spacing must be reduced to 10 cm when the maximum load is reduced by half and the distance to other fixings is at least 25 cm. For other values, linear interpolation should be used.
11) And edge distance to non-mortared joints.
12) Edge distance to mortared joints only.
13) If no proof regarding tilting is provided.
14) Higher value applies only to strength class ≧ Pb 4 or P 4.4.
15) For sizes FUR 14x300, FUR 14x330, FUR 14x360: 24 Nm

For evaluating load values of country specific masonry type bricks, we recommend pull-out tests.
Please contact fischer technical service department.

Component dimensions

a) with single plugs



b) with pair of plugs