Highload Anchor SZ

Steel, zinc plated

Highload Anchor SZ-S

Highload Anchor SZ-B

Highload Anchor SZ-SK

ETA-02/0030 SEISMIC C1+C2 R30-R120 ESR - 3137 M8 - M24 ZIVILSCHUTZ M8-M24

Range of loading: **2,4 kN–114,3 kN**

Range of concrete quality: **C20/25–C50/60**

Description

The ETA (Option 1) approved Highload Anchor SZ is a high-performance through fastening Anchor System with plastic compression ring and with three part expansion sleeve. This allows for smaller spacings and edge distances with high loads. Through deeper setting, the variable anchorage depth of Highload Anchor SZ allows higher permissable shear loads in many cases, extending its range of possible uses.

Three different models of the Highload Anchor SZ are available: Screw/washer SZ-S, Bolthead SZ-B and for flush surface mounting SZ-SK. All models have been shock-tested by the federal office for population protection in Bern/Switzerland, the models from M8 are also approved for use under seismic actions C1 and C2.

The use of the hollow drill bit SB allows mounting the Highload Anchor SZ without additional blowing out of the drill-hole.

Advantages

- High tension and shear loads
- Variable anchoring depths for even higher shear loads
- Screw/washer (SZ-B) model and flat head (SZ-SK) model for finished surfaces
- Can be dismantled with a flush surface result (only the cone and expansion sleeve remain in the drill-hole)
- Smaller spacings and edge distances
- ICC Evalution Service listing, USA
- Fire protection approved
- Approved to use under seismic action according to the performance category C1+C2 (M8-M24)
- Expert technical assessment for fastenings in steel fiber reinforced concrete

Applications

Medium to highload anchoring in cracked and uncracked concrete, e.g. trusses, railings, machines, scaffolding and consoles.

Highload Anchor SZ

SZ-B SZ-S

- Steel, zinc plated
- ETA assessment for cracked and uncracked concrete
- Variable anchorage depths

Description	Ref. No.		Max. Fixture thickness[1]	Drill hole-ø	Drill hole depth[2]	Drill hole depth through	Setting depth[2]	min. anchorage depth - Max. effective anchorage depth	Anchor length l		Seismic C1 / C2	Thread	Pkg. cont.	Weight per pkg.
	Type SZ-S	Type SZ-B	$t_{fix,max}$	d_0	h_1	h_f	h_{nom}	$h_{ef,min}$ - $h_{ef,max}$	Type SZ-S	Type SZ-B				
			mm	mm	mm	mm	mm	mm	mm	mm			pcs.	kg
SZ 10-0	14005301	16005301	0	10	65	65	60	50	65	67	- / -	M 6	100	3,25
SZ 10-10	14010301	16010301	10	10	65 - 75	75	60-70	50 - 60	75	77	- / -	M 6	50	1,94
SZ 10-30	14025301	16025301	30	10	65 - 91	95	60-86	50 - 76	95	97	- / -	M 6	50	2,47
SZ 10-50	14030301	16030301	50	10	65 - 91	115	60-86	50 - 76	115	117	- / -	M 6	50	2,94
SZ 10-100	-	16045301	100	10	65 - 91	165	60-86	50 - 76	-	167	- / -	M 6	25	2,05
SZ 12-0	14105301	16105301	0	12	80	80	70	60	75	80	✓ / ✓	M 8	50	2,93
SZ 12-10	14110301	16110301	10	12	80 - 90	90	70 - 80	60 - 70	85	90	✓ / ✓	M 8	50	3,31
SZ 12-20	14118301	-	20	12	80 - 100	100	70 - 90	60 - 80	95	-	✓ / ✓	M 8	50	3,70
SZ 12-30	14125301	16125301	30	12	80 - 110	110	70 - 100	60 - 90	105	110	✓ / ✓	M 8	50	4,10
SZ 12-50	14130301	16130301	50	12	80 - 120	130	70 - 110	60 - 100	125	130	✓ / ✓	M 8	25	2,47
SZ 12-100	-	16145301	100	12	80 - 120	180	70 - 110	60 - 100	-	180	✓ / ✓	M 8	25	3,22
SZ 15-0	14205301	16205301	0	15	95	95	85	71	91	96	✓ / ✓	M 10	25	2,85
SZ 15-15	14215301	16215301	15	15	95 - 110	110	85 - 100	71 - 86	106	111	✓ / ✓	M 10	25	3,31
SZ 15-25	14220301	16220301	25	15	95 - 120	120	85 - 110	71 - 96	116	121	✓ / ✓	M 10	25	3,59
SZ 15-45	14225301	16225301	45	15	95 - 134	140	85 - 124	71 - 110	136	141	✓ / ✓	M 10	25	4,20
SZ 15-95	14240301	16240301	95	15	95 - 134	190	85 - 124	71 - 110	186	191	✓ / ✓	M 10	25	5,60
SZ 18-0	14305301	16305301	0	18	105	105	95	80	107	112	✓ / ✓	M 12	20	3,84
SZ 18-10	14310301	16310301	10	18	105 - 115	115	95 - 105	80 - 90	117	122	✓ / ✓	M 12	20	4,18
SZ 18-20	14315301	16315301	20	18	105 - 125	125	95 - 115	80 - 100	127	132	✓ / ✓	M 12	20	4,53
SZ 18-40	14325301	16325301	40	18	105 - 145	145	95 - 135	80 - 120	147	152	✓ / ✓	M 12	20	5,21
SZ 18-70	14335301	16335301	70	18	105 - 155	175	95 - 145	80 - 130	177	182	✓ / ✓	M 12	20	6,26
SZ 18-100	-	16340301	100	18	105 - 155	205	95 - 145	80 - 130	-	212	✓ / ✓	M 12	10	3,55
SZ 24-0	14505301	16505301	0	24	130	130	120	100	130	137	✓ / ✓	M 16	10	4,11
SZ 24-20	14515301	16515301	20	24	130 - 144	150	120 - 134	100 - 114	150	157	✓ / ✓	M 16	10	4,71
SZ 24-50	14525301	16525301	50	24	130 - 144	180	120 - 134	100 - 114	180	187	✓ / ✓	M 16	10	5,58
SZ 24-100	-	16530301	100	24	130 - 144	230	120 - 134	100 - 114	-	237	✓ / ✓	M 16	5	3,49
SZ 24-0 L	14555301	16555301	0	24	145	145	135	115	150	152	✓ / ✓	M 16	10	4,70
SZ 24-30 L	14565301	16565301	30	24	145 - 175	175	135 - 165	115 - 145	180	182	✓ / ✓	M 16	10	5,57
SZ 24-50 L	14575301	16575301	50	24	145 - 180	195	135 - 170	115 - 150	200	202	✓ / ✓	M 16	10	6,20
SZ 28-10	14610301	16610301	10	28	160 - 170	170	150 - 160	125 - 135	172	181	✓ / ✓	M 20	10	7,76
SZ 28-30	14615301	16615301	30	28	160 - 190	190	150 - 180	125 - 155	192	201	✓ / ✓	M 20	5	4,35
SZ 28-60	14625301	16625301	60	28	160 - 220	220	150 - 210	125 - 185	222	231	✓ / ✓	M 20	5	5,02
SZ 28-100	14630301	16630301	100	28	160 - 220	260	150 - 210	125 - 185	262	271	✓ / ✓	M 20	5	5,88
SZ 32-10	14710301	16710301	10	32	180 - 190	190	170 - 180	150 - 160	212	217	✓ / ✓	M 24	5	5,93
SZ 32-30	14715301	16715301	30	32	180 - 210	210	170 - 200	150 - 180	232	237	✓ / ✓	M 24	5	6,41
SZ 32-60	14725301	16725301	60	32	180 - 240	240	170 - 230	150 -210	262	267	✓ / ✓	M 24	5	7,21

[1]At minimum anchorage depth [2]For minimum anchorage depth - for maximum effective anchorage depth

Highload Anchor SZ-SK

- Steel, zinc plated; with countersunk head
- ETA assessment for cracked and uncracked concrete
- Variable anchorage depths

Description	Ref. No.	Max. Fixture thickness[1]	Drill hole-ø	Drill hole depth[2]	Drill hole depth through fixture	Setting depth[2]	min. anchorage depth - Max. effective anchorage depth	Anchor length l	Seismic C1 / C2	Thread	Pkg. cont.	Weight per pkg.
		$t_{fix,max}$	d_0	h_1	h_f	h_{nom}	$h_{ef,min}$ - $h_{ef,max}$					
		mm	mm	mm	mm	mm	mm	mm			pcs	kg
SZ-SK 10-10	14011801	10	10	65 - 67	75	60 - 62	50 - 52	70	- / -	M 6	50	1,69
SZ-SK 10-25	14021801	25	10	65 - 91	90	60 - 86	50 - 76	85	- / -	M 6	50	2,30
SZ-SK 10-40	14031801	40	10	65 - 91	105	60 - 86	50 - 76	100	- / -	M 6	50	2,58
SZ-SK 12-10	14111801	10	12	80	90	70	60	80	✓ / ✓	M 8	50	3,01
SZ-SK 12-25	14121801	25	12	80 - 85	105	70 - 85	60 - 75	95	✓ / ✓	M 8	50	3,65
SZ-SK 12-50	14131801	50	12	80 - 120	130	70 - 110	60 - 100	120	✓ / ✓	M 8	25	2,33
SZ-SK 15-10	14211801	10	15	95	105	84	71	95	✓ / ✓	M 10	25	2,95
SZ-SK 15-25	14221801	25	15	95 - 106	120	85 - 96	71 - 82	110	✓ / ✓	M 10	25	3,29
SZ-SK 15-35	14226801	35	15	95 - 116	130	85 - 106	71 - 92	120	✓ / ✓	M 10	25	3,55
SZ-SK 15-50	14231801	50	15	95 - 131	145	85 - 121	71 - 107	135	✓ / ✓	M 10	25	3,96
SZ-SK 18-20	14316801	20	18	105 - 107	125	95 - 97	80 - 82	115	✓ / ✓	M 12	20	3,99
SZ-SK 18-40	14326801	40	18	105 - 127	145	95 - 117	80 - 102	135	✓ / ✓	M 12	20	4,62

[1]At minimum anchorage depth [2]For minimum anchorage depth - for maximum effective anchorage depth

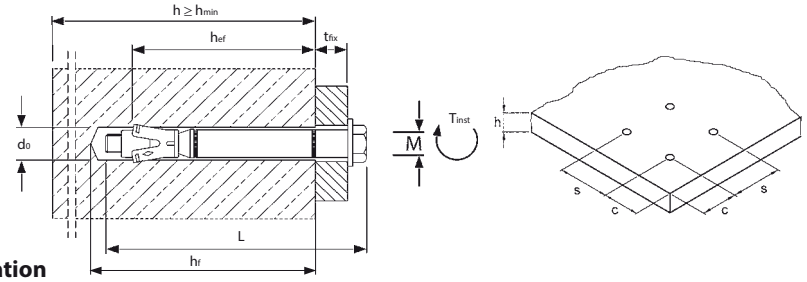
Other lengths and special assemblies on demand.

Extract from Permissible Service Conditions of European Technical Assessment ETA-02/0030 for use in cracked and uncracked concrete (Option 1)

Approved loads according to EN 1992-4 for single anchors without the influence of spacing and edge distances. The total safety factor (γ_M und γ_F) is included. Load capacities under fire exposure see page 192.

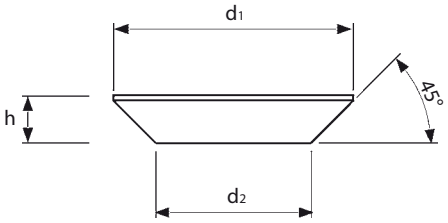
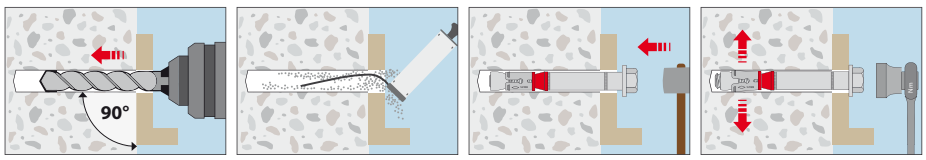
Loads and performance data				Highload Anchor SZ							
				SZ 10 M 6	SZ 12 M 8	SZ 15 M 10	SZ 18 M 12	SZ 24 M 16	SZ 24L M 16	SZ 28 M 20	SZ 32 M 24
Mean ultimate loads, tension	C25/30	N_{um}	[kN]	16,1	21,1	32,8	42,5	60,8	79,8	80,0	134,4
Mean ultimate loads, shear	C25/30	V_{um}	[kN]	18,0/19,0[1)]	28,3/33,4[1)]	42,0/58,6[1)]	71,3/83,7[1)]	106,0/143,7[1)]	106,0/143,7[1)]	151,4/198,5[1)]	213,9/213,9[1)]
Range of anchorage depths $h_{ef,min}$ - $h_{ef,max}$			[mm]	50 - 76	60 - 100	71 - 110	80 - 130	100 - 114	115 - 150	125 - 185	150 - 210
Approved loads, tension for $h_{ef,min}$ - $h_{ef,max}$				cracked concrete							
	C20/25	appr. N	[kN]	2,4	5,7	7,6	11,7	16,4	20,2	22,9	30,1
	C25/30	appr. N	[kN]	2,7	6,4	8,5	13,1	18,3	22,6	25,6	33,7
	C30/37	appr. N	[kN]	2,9	7,0	9,3	14,4	20,1	24,8	28,1	36,9
	C40/50	appr. N	[kN]	3,4	8,1	10,8	16,6	23,2	28,6	32,4	42,6
	C50/60	appr. N	[kN]	3,8	9,0	12,0	18,6	25,9	32,0	36,2	47,6
Approved loads, tension for $h_{ef,min}$ - $h_{ef,max}$				uncracked concrete							
	C20/25	appr. N	[kN]	7,6	9,5	14,0	16,8	23,4	28,9	32,7	43,0
	C25/30	appr. N	[kN]	7,6	10,6	15,7	18,7	26,2	32,3	36,6	48,1
	C30/37	appr. N	[kN]	7,6	11,7	17,2	20,5	28,7	35,4	40,1	52,7
	C40/50	appr. N	[kN]	7,6	13,5	19,8	23,7	33,1	40,9	46,3	60,9
	C50/60	appr. N	[kN]	7,6	13,8	21,9	26,5	37,0	45,7	51,8	68,0
Approved loads, shear for $h_{ef,min}$ - $h_{ef,max}$				cracked concrete							
SZ-S and SZ-SK	C20/25	appr. V	[kN]	10,3	15,2-17,1	19,6-27,4	23,5-41,7	32,8-39,9	40,4-60,2	45,8-82,5	60,2-99,8
	≥ C25/30	appr. V	[kN]	10,3	17,0-17,1	21,9-27,4	26,2-41,7	36,7-44,6	45,2-67,4	51,2-85,7	67,4-111,6
SZ-B	C20/25	appr. V	[kN]	9,1	14,3	19,6-20,6	23,5-36,0	32,8-39,9	40,4-52,0	45,8-69,7	60,2-99,8
	≥ C25/30	appr. V	[kN]	9,1	14,3	20,6	26,2-36,0	36,7-44,6	45,2-52,0	51,2-69,7	67,4-111,6
Approved loads, shear for $h_{ef,min}$ - $h_{ef,max}$				uncracked concrete							
SZ-S and SZ-SK	C20/25	appr. V	[kN]	10,3	17,1	27,4	33,5-41,7	46,9-57,0	57,8-72,0	65,5-85,7	86,1-114,3
	≥ C25/30	appr. V	[kN]	10,3	17,1	27,4	37,5-41,7	52,4-63,8	64,6-72,0	73,2-85,7	96,2-114,3
SZ-B	C20/25	appr. V	[kN]	9,1	14,3	20,6	33,5-36,0	46,9-52,0	52,0	65,5-69,7	86,1-114,3
	≥ C25/30	appr. V	[kN]	9,1	14,3	20,6	36,0	52,0	52,0	69,7	96,2-114,3
Approved bending moments $h_{ef,min}$ - $h_{ef,max}$				cracked / uncracked concrete							
Approved bending moments		appr. M	[Nm]	6,9	17,1	34,3	60,0	152,0	152,0	296,6	513,1
Spacing and edge distance											
Range of anchorage depths $h_{ef,min}$ - $h_{ef,max}$			[mm]	50 – 76	60 – 100	71 – 110	80 – 130	100 – 114	115 – 150	125 – 185	150 – 210
Minimum thickness of concrete slab for $h_{ef,min}$ - $h_{ef,max}$		h_{min}	[mm]	100 – 126	120 – 160	140 – 179	160 – 210	200 – 214	230 – 265	250 – 310	300 – 360
Characteristic spacing		$s_{cr,N}$	[mm]	150 – 228	180 – 300	213 – 330	240 – 390	300 – 342	345 – 450	375 – 555	450 – 630
Characteristic edge distance		$c_{cr,N}$	[mm]	75 – 114	90 – 150	106,5 – 165	120 – 195	150 – 171	172,5 – 225	187,5 – 277,5	225 – 315
				cracked concrete							
Minimum spacing / for edge distance c		s_{min} /c	[mm]	50/50	50/80	60/120	70/140	100/180	100/180	125/300	150/300
Minimum edge distance / for spacing s		c_{min} /s	[mm]	50/50	55/100	60/120	70/160	100/220	100/220	200/350	150/300
				uncracked concrete							
Minimum spacing / for edge distance c		s_{min} /c	[mm]	50/80	60/100	60/120	70/140	100/180	100/180	125/300	150/300
Minimum edge distance / for spacing s		c_{min} /s	[mm]	50/100	60/120	60/120	70/160	100/220	100/220	200/350	150/300
Installation parameters											
Drill hole diameter		d_o	[mm]	10	12	15	18	24	24	28	32
Diameter of clearance hole in the fixture		$d_f \leq$	[mm]	12	14	17	20	26	26	31	35
Range of drill hole depth for $h_{ef,min}$ - $h_{ef,max}$		h_o	[mm]	65 – 91	80 – 120	95 – 134	105 – 155	130 – 144	145 – 180	160 – 220	180 - 240
Installation parameters SZ-S and SZ-B											
Installation torque		T_{inst}	[Nm]	15	30	50	80	160	160	280	280
Width across nut			SW	10	13	17	19	24	24	30	36
Outer diameter of washer			[mm]	18	20	25	30	40	40	50	50
Installation parameters SZ-SK											
Installation torque		T_{inst}	[Nm]	10	25	55	70	-	-	-	-
Internal hexagon size SZ-SK			SW	4	5	6	8	-	-	-	-
Thickness of countersunk washer			[mm]	4	5	6	7	-	-	-	-
Outer diameter of countersunk washer			[mm]	16,5	20,5	24,5	29,5	-	-	-	-
Minimum thickness of fixture for maximum lateral force /without lateral force			[mm]	8 / 4	10 / 5	14 / 6	18 / 7	-	-	-	-

[1)] SZ-B / SZ-S, SZ-SK



Dimensions countersunk head SZ-SK [mm]			
	d1	d2	h
SZ-SK 10 M 6	16,5	9,5	3,9
SZ-SK 12 M 8	20,5	11,5	5,0
SZ-SK 15 M 10	24,5	14,5	5,7
SZ-SK 18 M 12	29,5	17,5	6,7

Countersunk head (type SZ-SK).



Installation