BUILDING TRUST

Sika AnchorFix®- 2+

YTELSESERKLÆRING

Nr. 75735322

1	**PRODUKTYPENS ENTYDIGE IDENTIFIKASJONSKODE:**	75735322
2	**TILSIKTET BRUKSOMRÅDE:**	ETA 14/0346 of 07/10/2016 Bonded injection type anchor for use in cracked and non-cracked concrete
3	**FABRIKANT:**	Sika Services AG Tüffenwies 16-22 8064 Zürich
4	**OPPNEVNT REPRESENTANT:**	
5	**SYSTEM FOR VURDERING OG KONTROLL AV YTEEVNE:**	System 1
6b	EUROPEISK BEDØMMELSES DOKUMENT:	ETAG 001-Part 1 and Part 5, edition 2013
	Europeisk Teknisk Bedømmelse:	ETA 14/0346 of 07/10/2016
	Teknisk bedømmelsesorgan:	TECHNICKY A ZKUSEBNI USTAV S PRAHA s.p.
	Teknisk kontrollorgan (hEN) / vurderingsorgan (ETA):	1020

7 ANGITT YTELSE

Reaction to fire - Anchorages satisfy requirements for Class A1
Resistance to fire - No performance assessed

Anchorages subject to:
- Static and quasi-static load.
- Seismic performance category C1: threaded rod size M10, M12, M16, M20, M24

Base materials
- Non-cracked concrete.
- Cracked and non-cracked concrete for threaded rod size M10, M12, M16, M20, M24
- Reinforced or unreinforced normal weight concrete of strength class C20/25 at minimum and C50/60 at maximum according EN 206-1:2000-12.

Temperature range:
- -40°C to +80°C (max. short. term temperature +80°C and max. long term temperature +50°C)

Use conditions (Environmental conditions)
- Structures subject to dry internal conditions (zinc coated steel, stainless steel, high corrosion resistance steel).
- Structures subject to external atmospheric exposure including industrial and marine environment, if no particular aggressive conditions exist (stainless steel, high corrosion resistance steel).
- Structures subject to permanently damp internal condition, if no particular aggressive conditions exist (stainless steel, high corrosion resistance steel).
- Structures subject to permanently damp internal condition, with particular aggressive conditions exist (high corrosion resistance steel).

Note: Particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used).

Use categories: Category 2 – installation in dry or wet concrete or in flooded hole.

Design:
- The anchorages are designed in accordance with the EOTA Technical Report TR 029 “Design of bonded anchors” under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings.
- Anchorages under seismic actions (cracked concrete) have to be designed in accordance with EOTA Technical Report TR 045 "Design of Metal Anchors under Seismic Action”.

Installation:
- Dry or wet concrete or flooded hole.
- Hole drilling by rotary drill mode.

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- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.

Table B1: Installation parameters of threaded rod

Size			M8	M10	M12	M16	M20	M24	M27	M30
Nominal drill hole diameter	Ød$_0$	[mm]	10	12	14	18	22	26	30	35
Diameter of cleaning brush	d_b	[mm]	14	14	20	20	29	29	40	40
Torque moment	T_{inst}	[Nm]	10	20	40	80	150	200	240	275
$h_{ef,min}$ = 8d										
Depth of drill hole	h^0	[mm]	64	80	96	128	160	192	216	240
Minimum edge distance	c_{min}	[mm]	35	40	50	65	80	96	110	120
Minimum spacing	s_{min}	[mm]	35	40	50	65	80	96	110	120
Minimum thickness of member	h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 mm				h_{ef} + 2d$_0$			
$h_{ef,max}$ = 20d										
Depth of drill hole	h^0	[mm]	160	200	240	320	400	480	540	600
Minimum edge distance	c^{min}	[mm]	80	100	120	160	200	240	270	300
Minimum spacing	s_{min}	[mm]	80	100	120	160	200	240	270	300
Minimum thickness of member	h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 mm				h_{ef} + 2d$_0$			

Table B2: Installation parameters of rebar

Size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Nominal drill hole diameter	Ød$_0$	[mm]	12	14	16	20	25	32	40
Diameter of cleaning brush	d_b	[mm]	14	14	19	22	29	40	42
$h_{ef,min}$ = 8d									
Depth of drill hole	h_0	[mm]	64	80	96	128	160	200	256
Minimum edge distance	c_{min}	[mm]	35	40	50	65	80	100	130
Minimum spacing	s_{min}	[mm]	35	40	50	65	80	100	130
Minimum thickness of member	h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 mm				h_{ef} + 2d$_0$		
$h_{ef,max}$ = 20d									
Depth of drill hole	h_0	[mm]	160	200	240	320	400	500	640
Minimum edge distance	c_{min}	[mm]	80	100	120	160	200	250	320
Minimum spacing	s_{min}	[mm]	80	100	120	160	200	250	320
Minimum thickness of member	h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 mm				h_{ef} + 2d$_0$		

Table B3: Cleaning

All diameters
- 2 x blowing
- 2 x brushing
- 2 x blowing
- 2 x brushing
- 2 x blowing

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Table B4: Minimum curing time

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Application temperature	**Processing time**	**Load time**
+5 to +10°C	10 mins	145 mins
+10 to +15°C	8 mins	85 mins
+15 to +20°C	6 mins	75 mins
+20 to +25°C	5 mins	50 mins
+25 to +30°C	4 mins	40 mins

Processing time refers to the highest temperature in the range.
Load time refers to the lowest temperature in the range.
Cartridge must be conditioned to a minimum +5°C.

Table C1: Design method TR 029

Characteristic values of resistance to tension load of threaded rod

Steel failure – Characteristic resistance										
Size			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Steel grade **4.6**	$N_{Rk,s}$	[kN]	15	23	34	63	98	141	184	224
Partial safety factor	γ_{Ms} [1)]	[-]	2							
Steel grade **5.8**	$N_{Rk,s}$	[kN]	18	29	42	79	123	177	230	281
Partial safety factor	γ_{Ms} [1)]	[-]	1,5							
Steel grade **8.8**	$N_{Rk,s}$	[kN]	29	46	67	126	196	282	367	449
Partial safety factor	γ_{Ms} [1)]	[-]	1,5							
Steel grade **10.9**	$N_{Rk,s}$	[kN]	37	58	84	157	245	353	459	561
Partial safety factor	γ_{Ms} [1)]	[-]	1,4							
Stainless steel grade **A4-70**	$N_{Rk,s}$	[kN]	26	41	59	110	172	247	321	393
Partial safety factor	γ_{Ms} [1)]	[-]	1,9							
Stainless steel grade **A4-80**	$N_{Rk,s}$	[kN]	29	46	67	126	196	282	367	449
Partial safety factor	γ_{Ms} [1)]	[-]	1,6							
Stainless steel grade **1.4529**	$N_{Rk,s}$	[kN]	26	41	59	110	172	247	321	393
Partial safety factor	γ_{Ms} [1)]	[-]	1,5							

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Combined pullout and concrete cone failure in non-cracked concrete C20/25									
Size			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Characteristic bond resistance in non-cracked concrete										
Dry and wet concrete	τ_{Rk}	[N/mm^2]	11	10	9,5	9	8,5	8	6,5	5,5
Partial safety factor	γ_{Mc} [1)]	[-]	1,8 [2)]						2,1 [3)]	
Flooded hole	τ_{Rk}	[N/mm^2]	9	8	7,5	7	7	6		
Partial safety factor	γ_{Mc} [1)]	[-]	2,1 [3)]							
Factor for concrete C50/60	ψ_c	[-]	1							

Combined pullout and concrete cone failure in cracked concrete C20/25							
Size			**M10**	**M12**	**M16**	**M20**	**M24**
Characteristic bond resistance in cracked concrete							
Dry and wet concrete	τ_{Rk}	[N/mm^2]	5	5	5	4,5	4,5
Partial safety factor	γ_{Mc} [1)]	[-]	1,8 [2)]				
Flooded hole	τ_{Rk}	[N/mm^2]	5	5	5	4,5	4,5
Partial safety factor	γ_{Mc} [1)]	[-]	2,1 [3)]				
Factor for cracked concrete C30/37	ψ_c	[-]	1,12				
Factor for cracked concrete C40/50	ψ_c	[-]	1,23				
Factor for cracked concrete C50/60	ψ_c	[-]	1,30				

Splitting failure									
Size			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Edge distance	$c_{cr,sp}$	[mm]	$1,5h_{ef}$							
Spacing	$s_{cr,sp}$	[mm]	$3,0h_{ef}$							
Partial safety factor	γ_{Ms} [1)]	[-]	1,8							

[1)] In absence of national regulations

[2)] The partial safety factor γ_2=1,2 is included

[3)] The partial safety factor γ_2=1,4 is included

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Table C2: Design method TR 029

Characteristic values of resistance to tension load of rebar

Steel failure – Characteristic resistance								
Size			**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
Rebar BSt 500 S	$N_{Rk,s}$	[kN]	28	43	62	111	173	270	442
Partial safety factor	γ_{Ms} [1)]	[-]	1,4						

Combined pullout and concrete cone failure in non-cracked concrete C20/25								
Size			**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
Characteristic bond resistance in non-cracked concrete								
Dry and wet concrete	τ_{Rk}	[N/mm²]	12	10	10	9	9	9	5,5
Partial safety factor	γ_{Mc} [1)]	[-]	1,8 [2)]						
Flooded hole	τ_{Rk}	[N/mm²]	12	10	10	9	9	9	5,5
Partial safety factor	γ_{Mc} [1)]	[-]	2,1 [3)]						
Factor for concrete C50/60	ψ_c	[-]	1						

Splitting failure								
Size			**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
Edge distance	$c_{cr,sp}$	[mm]	$1,5h_{ef}$						
Spacing	$s_{cr,sp}$	[mm]	$3,0h_{ef}$						
Partial safety factor	γ_{Msp} [1)]	[-]	1,8						

[1)] In absence of national regulations

[2)] The partial safety factor γ_2=1,2 is included

[3)] The partial safety factor γ_2=1,4 is included

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Table C3: Design method TR 029
Characteristic values of resistance to shear load of threaded rod

Steel failure without lever arm									
Size			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Steel grade **4.6**	$V_{Rk,s}$	[kN]	7	12	17	31	49	71	92	112
Partial safety factor	γ_{Ms} [1)]	[-]	1,67							
Steel grade **5.8**	$V_{Rk,s}$	[kN]	9	15	21	39	61	88	115	140
Partial safety factor	γ_{Ms} [1)]	[-]	1,25							
Steel grade **8.8**	$V_{Rk,s}$	[kN]	15	23	34	63	98	141	184	224
Partial safety factor	γ_{Ms} [1)]	[-]	1,25							
Steel grade **10.9**	$V_{Rk,s}$	[kN]	18	29	42	79	123	177	230	281
Partial safety factor	γ_{Ms} [1)]	[-]	1,5							
Stainless steel grade **A4-70**	$V_{Rk,s}$	[kN]	13	20	30	55	86	124	161	196
Partial safety factor	γ_{Ms} [1)]	[-]	1,56							
Stainless steel grade **A4-80**	$V_{Rk,s}$	[kN]	15	23	34	63	98	141	184	224
Partial safety factor	γ_{Ms} [1)]	[-]	1,33							
Stainless steel grade **1.4529**	$V_{Rk,s}$	[kN]	13	20	30	55	86	124	161	196
Partial safety factor	γ_{Ms} [1)]	[-]	1,25							

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Steel failure with lever arm									
Size			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Steel grade **4.6**	$M^0_{Rk,s}$	[N.m]	15	30	52	133	260	449	666	900
Partial safety factor	γ_{Ms} [1)]	[-]	1,67							
Steel grade **5.8**	$M^0_{Rk,s}$	[N.m]	19	37	66	166	325	561	832	1125
Partial safety factor	γ_{Ms} [1)]	[-]	1,25							
Steel grade **8.8**	$M^0_{Rk,s}$	[N.m]	30	60	105	266	519	898	1332	1799
Partial safety factor	γ_{Ms} [1)]	[-]	1,25							
Steel grade **10.9**	$M^0_{Rk,s}$	[N.m]	37	75	131	333	649	1123	1664	2249
Partial safety factor	γ_{Ms} [1)]	[-]	1,50							
Stainless steel grade **A4-70**	$M^0_{Rk,s}$	[N.m]	26	52	92	233	454	786	1165	1574
Partial safety factor	γ_{Ms} [1)]	[-]	1,56							
Stainless steel grade **A4-80**	$M^0_{Rk,s}$	[N.m]	30	60	105	266	519	898	1332	1799
Partial safety factor	γ_{Ms} [1)]	[-]	1,33							
Stainless steel grade **1.4529**	$M^0_{Rk,s}$	[N.m]	26	52	92	233	454	786	1165	1574
Partial safety factor	γ_{Ms} [1)]	[-]	1,25							
Concrete pryout failure										
Factor *k* from TR 029 Design of bonded anchors, Part 5.2.3.3			2							
Partial safety factor	γ_{M_p} [1)]	[-]	1,5							

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Concrete edge failure									
Size			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
See section 5.2.3.4 of Technical Report TR 029 for the Design of Bonded Anchors									
Partial safety factor	γ_{Mc} [1)]	[-]	1,5							

[1)] In absence of national regulations

Table C4: Design method TR 029

Characteristic values of resistance to shear load of rebar

Steel failure without lever arm									
Size			**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
Rebar BSt 500 S	$V_{Rk,s}$	[kN]	14	22	31	55	86	135	221
Partial safety factor	γ_{Ms} [1)]	[-]	1,5						

Steel failure with lever arm									
Size			**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
Rebar BSt 500 S	$M^0_{Rk,s}$	[N.m]	33	65	112	265	518	1013	2122
Partial safety factor	γ_{Ms} [1)]	[-]	1,5						
Concrete pryout failure									
Factor *k* from TR 029 Design of bonded anchors, Part 5.2.3.3			2						
Partial safety factor	γ_{Mp} [1)]	[-]	1,5						

Concrete edge failure									
Size			**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
See section 5.2.3.4 of Technical Report TR 029 for the Design of Bonded Anchors									
Partial safety factor	γ_{Mc} [1)]	[-]	1,5						

[1)] In absence of national regulations

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Table C5: Design method CEN/TS 1992-4

Characteristic values of resistance to tension load of threaded rod

Steel failure – Characteristic resistance									
Size			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Steel grade **4.6**	$N_{Rk,s}$	[kN]	15	23	34	63	98	141	184	224
Partial safety factor	γ_{Ms} [1)]	[-]	2							
Steel grade **5.8**	$N_{Rk,s}$	[kN]	18	29	42	79	123	177	230	281
Partial safety factor	γ_{Ms} [1)]	[-]	1,5							
Steel grade **8.8**	$N_{Rk,s}$	[kN]	29	46	67	126	196	282	367	449
Partial safety factor	γ_{Ms} [1)]	[-]	1,5							
Steel grade **10.9**	$N_{Rk,s}$	[kN]	37	58	84	157	245	353	459	561
Partial safety factor	γ_{Ms} [1)]	[-]	1,4							
Stainless steel grade **A4-70**	$N_{Rk,s}$	[kN]	26	41	59	110	172	247	321	393
Partial safety factor	γ_{Ms} [1)]	[-]	1,9							
Stainless steel grade **A4-80**	$N_{Rk,s}$	[kN]	29	46	67	126	196	282	367	449
Partial safety factor	γ_{Ms} [1)]	[-]	1,6							
Stainless steel grade **1.4529**	$N_{Rk,s}$	[kN]	26	41	59	110	172	247	321	393
Partial safety factor	γ_{Ms} [1)]	[-]	1,5							

Combined pullout and concrete cone failure in non-cracked concrete C20/25									
Size			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Characteristic bond resistance in non-cracked concrete										
Dry and wet concrete	τ_{Rk}	[N/mm²]	11	10	9,5	9	8,5	8	6,5	5,5
Partial safety factor	γ_{Mc} [1)]	[-]	1,8 [2)]						2,1 [3)]	
Flooded hole	τ_{Rk}	[N/mm²]	9	8	7,5	7	7	6		
Partial safety factor	γ_{Mc} [1)]	[-]	2,1 [3)]							
Factor for concrete C50/60	ψ_c	[-]	1							
Factor according to CEN/TS 1992-4-5Section 6.2.2		k_8	10,1							

Combined pullout and concrete cone failure in cracked concrete C20/25							
Size			**M10**	**M12**	**M16**	**M20**	**M24**
Characteristic bond resistance in cracked concrete							
Dry and wet concrete	τ_{Rk}	[N/mm²]	5	5	5	4,5	4,5
Partial safety factor	γ_{Mc} [1)]	[-]	1,8 [2)]				
Flooded hole	τ_{Rk}	[N/mm²]	5	5	5	4,5	4,5
Partial safety factor	γ_{Mc} [1)]	[-]	2,1 [3)]				
Factor for cracked concrete C30/37	ψ_c	[-]	1,12				
Factor for cracked concrete C40/50	ψ_c	[-]	1,23				
Factor for cracked concrete C50/60	ψ_c	[-]	1,30				
Factor according to CEN/TS 1992-4-5 Section 6.2.2		k_8	7,2				

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Concrete cone failure									
Size			M8	M10	M12	M16	M20	M24	M27	M30
Factor according to CEN/TS 1992-4-5 Section 6.2.3		k_{ucr}	10,1							
		k_{cr}		7,2						
Edge distance	$c_{cr,N}$	[mm]	$1,5h_{ef}$							
Spacing	$s_{cr,N}$	[mm]	$3,0h_{ef}$							
Splitting failure										
Edge distance	$c_{cr,sp}$	[mm]	$1,5h_{ef}$							
Spacing	$s_{cr,sp}$	[mm]	$3,0h_{ef}$							
Partial safety factor	γ_{Ms} [1)] p	[-]	1,8							

[1)] In absence of national regulations

[2)] The partial safety factor γ_2=1,2 is included

[3)] The partial safety factor γ_2=1,4 is included

Table C6: Design method CEN/TS 1992-4

Characteristic values of resistance to tension load of rebar

Steel failure – Characteristic resistance									
Size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Rebar BSt 500 S	$N_{Rk,s}$	[kN]	28	43	62	111	173	270	442
Partial safety factor	γ_{Ms} [1)]	[-]	1,4						

Combined pullout and concrete cone failure in non-cracked concrete C20/25									
Size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Characteristic bond resistance in non-cracked concrete									
Dry and wet concrete	τ_{Rk}	[N/mm^2]	12	10	10	9	9	9	5,5
Partial safety factor	γ_{Mc} [1)]	[-]	1,8 [2)]						
Flooded hole	τ_{Rk}	[N/mm^2]	12	10	10	9	9	9	5,5
Partial safety factor	γ_{Mc} [1)]	[-]	2,1 [3)]						
Factor for concrete C50/60	ψ_c	[-]	1						
Factor according to CEN/TS 1992-4-5Section 6.2.2	k_8		10,1						

Concrete cone failure								
Size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Factor according to CEN/TS 1992-4-5 Section 6.2.3	k_{ucr}		10,1						
Edge distance	$c_{cr,N}$	[mm]	$1,5h_{ef}$						
Spacing	$s_{cr,N}$	[mm]	$3,0h_{ef}$						
Splitting failure									
Edge distance	$c_{cr,sp}$	[mm]	$1,5h_{ef}$						
Spacing	$s_{cr,sp}$	[mm]	$3,0h_{ef}$						
Partial safety factor	γ_{Ms} [1)]	[-]	1,8						

[1)] In absence of national regulations

[2)] The partial safety factor γ_2=1,2 is included

[3)] The partial safety factor γ_2=1,4 is included

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Table C7: Design method CEN/TS 1992-4
Characteristic values of resistance to shear load of threaded rod

Steel failure without lever arm									
Size			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Steel grade **4.6**	$V_{Rk,s}$	[kN]	7	12	17	31	49	71	92	112
Partial safety factor	γ_{Ms} [1)]	[-]	1,67							
Steel grade **5.8**	$V_{Rk,s}$	[kN]	9	15	21	39	61	88	115	140
Partial safety factor	γ_{Ms} [1)]	[-]	1,25							
Steel grade **8.8**	$V_{Rk,s}$	[kN]	15	23	34	63	98	141	184	224
Partial safety factor	γ_{Ms} [1)]	[-]	1,25							
Steel grade **10.9**	$V_{Rk,s}$	[kN]	18	29	42	79	123	177	230	281
Partial safety factor	γ_{Ms} [1)]	[-]	1,5							
Stainless steel grade **A4-70**	$V_{Rk,s}$	[kN]	13	20	30	55	86	124	161	196
Partial safety factor	γ_{Ms} [1)]	[-]	1,56							
Stainless steel grade **A4-80**	$V_{Rk,s}$	[kN]	15	23	34	63	98	141	184	224
Partial safety factor	γ_{Ms} [1)]	[-]	1,33							
Stainless steel grade **1.4529**	$V_{Rk,s}$	[kN]	13	20	30	55	86	124	161	196
Partial safety factor	γ_{Ms} [1)]	[-]	1,25							
Ductility factor according to CEN/TS 1992-4-5 Section 6.3.2.1		k_2	0,8							

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Steel failure with lever arm									
Size			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Steel grade **4.6**	$M^0_{Rk,s}$	[N.m]	15	30	52	133	260	449	666	900
Partial safety factor	γ_{Ms}	[-]	1,67							
Steel grade **5.8**	$M^0_{Rk,s}$	[N.m]	19	37	66	166	325	561	832	1125
Partial safety factor	γ_{Ms}	[-]	1,25							
Steel grade **8.8**	$M^0_{Rk,s}$	[N.m]	30	60	105	266	519	898	1332	1799
Partial safety factor	γ_{Ms}	[-]	1,25							
Steel grade **10.9**	$M^0_{Rk,s}$	[N.m]	37	75	131	333	649	1123	1664	2249
Partial safety factor	γ_{Ms}	[-]	1,50							
Stainless steel grade **A4-70**	$M^0_{Rk,s}$	[N.m]	26	52	92	233	454	786	1165	1574
Partial safety factor	γ_{Ms}	[-]	1,56							
Stainless steel grade **A4-80**	$M^0_{Rk,s}$	[N.m]	30	60	105	266	519	898	1332	1799
Partial safety factor	γ_{Ms}	[-]	1,33							
Stainless steel grade **1.4529**	M^0	[N.m]	26	52	92	233	454	786	1165	1574
Partial safety factor	γ_{Ms}	[-]	1,25							
Concrete pryout failure									
Factor according to CEN/TS 1992-4-5 Section 6.3.3		k_3	2,0							
Partial safety factor	γ_M	[-]	1,5							

Concrete edge failure									
Size			**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
See section 6.3.4 of CEN/TS 1992-4-5									
Effective length of anchor	l_f	[mm]	$l_f = \min(h_{ef}; 8\ d_{nom})$						
Outside diameter of anchor	d_{nom}	[mm]	8	10	12	16	20	24	30
Partial safety factor	γ_{Mc} [1)]	[-]	1,5						

[1)] In absence of national regulations

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Table C8: Design method CEN/TS 1992-4
Characteristic values of resistance to shear load of rebar

Steel failure without lever arm								
Size			**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
Rebar BSt 500 S	$V_{Rk,s}$	[kN]	14	22	31	55	86	135	221
Partial safety factor	γ_{Ms} [1)]	[-]	1,5						
Ductility factor according to CEN/TS 1992-4-5 Section 6.3.2.1 k2	K_2		0,8						

Steel failure with lever arm								
Size			**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
Rebar BSt 500 S	$M^0_{Rk,s}$	[N.m]	33	65	112	265	518	1013	2122
Partial safety factor	γ_{Ms} [1)]	[-]	1,5						
Concrete pryout failure								
Factor according to CEN/TS 1992-4-5 Section 6.3.3 k3	K_3		2,0						
Partial safety factor	γ_{Mp} [1)]	[-]	1,5						

Concrete edge failure								
Size			**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
See section 6.3.4 of CEN/TS 1992-4-5									
Effective length of anchor	l_f	[mm]	$l_f = \min(h_{ef}; 8\, d_{nom})$						
Outside diameter of anchor	d_{nom}	[mm]	8	10	12	16	20	24	30
Partial safety factor	γ_{Mc} [1)]	[-]	1,5						

1) In absence of national regulations

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Table C9: Displacement of threaded rod under tension and shear load

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Non-cracked concrete										
Tension load	F	[kN]	6,3	7,9	11,9	15,9	23,8	29,8	37,7	45,6
Displacement	δ_{N0}	[mm]	0,3	0,3	0,3	0,3	0,4	0,5	0,5	0,5
	$\delta_{N\infty}$	[mm]	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Shear load	F	[kN]	3,1	5,0	7,2	13,5	21,0	30,3	39,4	48,0
Displacement	δ_{V0}	[mm]	1,5	1,5	1,5	1,5	2,0	2,5	2,5	2,5
	$\delta_{V\infty}$	[mm]	2,3	2,3	2,3	2,3	3,0	3,8	3,8	3,8
Cracked concrete										
Tension load	F	[kN]		5,1	7,4	13,1	20,5	24,6		
Displacement	δ_{N0}	[mm]		0,4	0,7	0,7	0,7	0,6		

Table C10: Displacement of rebar under tension and shear load

Rebar size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Non-cracked concrete									
Tension load	F	[kN]	7,9	9,9	13,9	23,8	29,8	55,6	55,6
Displacement	δ_{N0}	[mm]	0,3	0,3	0,3	0,4	0,4	0,5	0,5
	$\delta_{N\infty}$	[mm]	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Shear load	F	[kN]	5,9	9,3	13,3	23,7	37,0	57,9	94,8
Displacement	δ_{V0}	[mm]	0,3	0,4	0,4	0,4	0,4	0,5	0,9
	$\delta_{V\infty}$	[mm]	0,5	0,6	0,6	0,6	0,6	0,8	1,4

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Table C11: Characteristic values of resistance under seismic action category C1 for threaded rods

Size			M10	M12	M16	M20	M24
Tension load							
Steel failure							
Characteristic resistance grade **4.6**	$N_{Rk,s,seis}$	[kN]	23	34	63	98	141
Partial safety factor	γ_{Ms} [1)]	[-]			2,00		
Characteristic resistance grade **5.8**	$N_{Rk,s,seis}$	[kN]	29	42	79	123	177
Partial safety factor	γ_{Ms} [1)]	[-]			1,50		
Characteristic resistance grade **8.8**	$N_{Rk,s,seis}$	[kN]	46	67	126	196	282
Partial safety factor	γ_{Ms} [1)]	[-]			1,50		
Characteristic resistance grade **10.9**	$N_{Rk,s,seis}$	[kN]	58	84	157	245	353
Partial safety factor	γ_{Ms} [1)]	[-]			1,33		
Characteristic resistance **A2-70, A4-70**	$N_{Rk,s,seis}$	[kN]	41	59	110	172	247
Partial safety factor	γ_{Ms} [1)]	[-]			1,87		
Characteristic resistance **A4-80**	$N_{Rk,s,seis}$	[kN]	46	67	126	196	282
Partial safety factor	γ_{Ms} [1)]	[-]			1,60		
Characteristic resistance **1.4529**	$N_{Rk,s,seis}$	[kN]	41	59	110	172	247
Partial safety factor	γ_{Ms} [1)]	[-]			1,50		
Characteristic resistance **1.4565**	$N_{Rk,s,seis}$	[kN]	41	59	110	172	247
Partial safety factor	γ_{Ms} [1)]	[-]			1,87		
Combined pull-out and concrete cone failure							
Dry and wet concrete	$\tau_{Rk,seis,C1}$	[N/mm²]	3,9	3,9	3,9	3,9	3,9
Partial safety factor	γ_{Mc} [1)]	[-]			1,8 [2)]		
Flooded hole	$\tau_{Rk,seis,C1}$	[N/mm²]	3,9	3,9	3,9	3,9	3,9
Partial safety factor	γ_{Mc} [1)]	[-]			2,1 [3)]		

Shear load							
Steel failure without lever arm							
Characteristic resistance grade **4.6**	$V_{Rk,s,seis}$	[kN]	7	10	23	30	40
Partial safety factor	γ_{Ms} [1)]	[-]			1,67		
Characteristic resistance grade **5.8**	$V_{Rk,s,seis}$	[kN]	9	13	28	38	51
Partial safety factor	γ_{Ms} [1)]	[-]			1,25		
Characteristic resistance grade **8.8**	$V_{Rk,s,seis}$	[kN]	14	21	45	61	81
Partial safety factor	γ_{Ms} [1)]	[-]			1,25		
Characteristic resistance grade **10.9**	$V_{Rk,s,seis}$	[kN]	18	26	56	76	101
Partial safety factor	γ_{Ms} [1)]	[-]			1,50		
Characteristic resistance **A2-70**, **A4-70**	$V_{Rk,s,seis}$	[kN]	12	18	39	53	71
Partial safety factor	γ_{Ms} [1)]	[-]			1,56		
Characteristic resistance **A4-80**	$V_{Rk,s,seis}$	[kN]	14	21	45	61	81
Partial safety factor	γ_{Ms} [1)]	[-]			1,33		
Characteristic resistance **1.4529**	$V_{Rk,s,seis}$	[kN]	12	18	39	53	71
Partial safety factor	γ_{Ms} [1)]	[-]			1,25		
Characteristic resistance **1.4565**	$V_{Rk,s,seis}$	[kN]	12	18	39	53	71
Partial safety factor	γ_{Ms} [1)]	[-]			1,56		

[1)] In absence of national regulations

[2)] The partial safety factor γ_2=1,2 is included

[3)] The partial safety factor γ_2=1,4 is included

Note: Rebars are not qualified for seismic design

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8 RELEVANT TEKNISK DOKUMENTASJON OG/ELLER SPESIFIKK TEKNISK DOKUMENTASJON

Ytelsen for varen som angitt i pkt. 1 og 2, er i samsvar med ytelsen angitt i pkt. 7. Denne ytelseserklæringen er utstedt i samsvar med forskrift (EU) nr. 305/2011 på eget ansvar av produsenten, som angitt i pkt. 3.

Undertegnet for og på vegne av produsenten av:

Navn: Marco Poltera
CPE
At Zurich on 23 October 2017

. . . . . .

Navn : Tomek Gutowski
Corporate Standarization and Approvals
At Warszawa on 23 October 2017

. . . . . .

Ovenstående informasjon i samsvar med krav i EU-forordning nr. 305/2011

RELATERT YTELSESERKLÆRING

Produktnavn	Harmonisert teknisk spesifikasjon	DoP nummer
Sika AnchorFix-2+ for rebar connection	ETA-13/0779	88587701

HELSE, MILJØ OG SIKKERHETS INFORMASJON (REACH)

Brukere skal alltid forholde seg til sist oppdaterte versjon av produktdatablad og HMS-datablad for det aktuelle produktet. Kopier av gjeldende versjoner finnes på Sika Norges internettsider: www.sika.no.

PRODUKTANSVAR

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