BUILDING TRUST

Sika AnchorFix®-3040

DICHIARAZIONE DI PRESTAZIONE
N. 54007967

1	**CODICE DI IDENTIFICAZIONE UNICO DEL PRODOTTO-TIPO:**	54007967
2	**USI PREVISTI**	EAD 330499-02-0601-v01 Sistema di ancoraggio chimico per utilizzo in calcestruzzo fessurato e non fessurato per carichi statici, sismici e al fuoco e per una vita di servizio di 50 e/o 100 anni.
3	**FABBRICANTE:**	Sika Services AG Tüffenwies 16-22 8048 Zürich
4	**MANDATARIO:**	
5	**SISTEMI DI VVCP:**	Sistema 1
6b	**DOCUMENTO DI VALUTAZIONE EUROPEA:**	EAD 330499-02-0601-v01
	Valutazione tecnica europea:	ETA 26/0301 of 24/07/2026
	Organismo di valutazione tecnica:	Deutsches Institut für Bautechnik
	Organismi notificati:	2873

7 PRESTAZIONI DICHIARATE

Caratteristiche Essenziali	Prestazioni	AVCP	Norma tecnica Armonizzata
Mechanical resistance and stability (BWR 1)			
Characteristic resistance to tension load (static and quasi-static loading)	Annex C1 to C6, C8 to C11, C13 to C16, B3	System 1	EAD 330499-02-0601-v01
Characteristic resistance to shear load (static and quasi-static loading)	Annex C1,C7, C12, C17	System 1	
Displacements under short-term and long-term loading	Annex C18 to C20	System 1	
Characteristic resistance and displacements for seismic performance categories C1 and C2	Annex C21 to C28	System 1	
Safety in case of fire (BWR 2)			
Reaction to fire	Class A1	System 1	
Resistance to fire	Annex C29 to C31	System 1	

Table C1: Characteristic values for steel tension resistance and steel shear resistance of threaded rods

Threaded rod				M8	M10	M12	M16	M20	M24	M27	M30
Cross section area		A_s	[mm²]	36,6	58	84,3	157	245	353	459	561
Characteristic tension resistance, Steel failure [1]											
Steel, Property class 4.6 and 4.8		$N_{Rk,s}$	[kN]	15 (13)	23 (21)	34	63	98	141	184	224
Steel, Property class 5.6 and 5.8		$N_{Rk,s}$	[kN]	18 (17)	29 (27)	42	78	122	176	230	280
Steel, Property class 8.8		$N_{Rk,s}$	[kN]	29 (27)	46 (43)	67	125	196	282	368	449
Stainless steel A2, A4 and HCR, class 50		$N_{Rk,s}$	[kN]	18	29	42	79	123	177	230	281
Stainless steel A2, A4 and HCR, class 70		$N_{Rk,s}$	[kN]	26	41	59	110	171	247	-[3]	-[3]
Stainless steel A4 and HCR, class 80		$N_{Rk,s}$	[kN]	29	46	67	126	196	282	-[3]	-[3]
Characteristic tension resistance, Partial factor [2]											
Steel, Property class 4.6 and 5.6		$\gamma_{Ms,N}$	[-]	2,0							
Steel, Property class 4.8, 5.8 and 8.8		$\gamma_{Ms,N}$	[-]	1,5							
Stainless steel A2, A4 and HCR, class 50		$\gamma_{Ms,N}$	[-]	2,86							
Stainless steel A2, A4 and HCR, class 70		$\gamma_{Ms,N}$	[-]	1,87							
Stainless steel A4 and HCR, class 80		$\gamma_{Ms,N}$	[-]	1,6							
Characteristic shear resistance, Steel failure [1]											
Without lever arm	Steel, Property class 4.6 and 4.8	$V^0_{Rk,s}$	[kN]	9 (8)	14 (13)	20	38	59	85	110	135
	Steel, Property class 5.6 and 5.8	$V^0_{Rk,s}$	[kN]	11 (10)	17 (16)	25	47	74	106	138	168
	Steel, Property class 8.8	$V^0_{Rk,s}$	[kN]	15 (13)	23 (21)	34	63	98	141	184	224
	Stainless steel A2, A4 and HCR, class 50	$V^0_{Rk,s}$	[kN]	9	15	21	39	61	88	115	140
	Stainless steel A2, A4 and HCR, class 70	$V^0_{Rk,s}$	[kN]	13	20	30	55	86	124	-[3]	-[3]
	Stainless steel A4 and HCR, class 80	$V^0_{Rk,s}$	[kN]	15	23	34	63	98	141	-[3]	-[3]
With lever arm	Steel, Property class 4.6 and 4.8	$M^0_{Rk,s}$	[Nm]	15 (13)	30 (27)	52	133	260	449	666	900
	Steel, Property class 5.6 and 5.8	$M^0_{Rk,s}$	[Nm]	19 (16)	37 (33)	65	166	324	560	833	1123
	Steel, Property class 8.8	$M^0_{Rk,s}$	[Nm]	30 (26)	60 (53)	105	266	519	896	1333	1797
	Stainless steel A2, A4 and HCR, class 50	$M^0_{Rk,s}$	[Nm]	19	37	66	167	325	561	832	1125
	Stainless steel A2, A4 and HCR, class 70	$M^0_{Rk,s}$	[Nm]	26	52	92	232	454	784	-[3]	-[3]
	Stainless steel A4 and HCR, class 80	$M^0_{Rk,s}$	[Nm]	30	59	105	266	519	896	-[3]	-[3]
Characteristic shear resistance, Partial factor [2]											
Steel, Property class 4.6 and 5.6		$\gamma_{Ms,V}$	[-]	1,67							
Steel, Property class 4.8, 5.8 and 8.8		$\gamma_{Ms,V}$	[-]	1,25							
Stainless steel A2, A4 and HCR, class 50		$\gamma_{Ms,V}$	[-]	2,38							
Stainless steel A2, A4 and HCR, class 70		$\gamma_{Ms,V}$	[-]	1,56							
Stainless steel A4 and HCR, class 80		$\gamma_{Ms,V}$	[-]	1,33							

[1] Values are only valid for the given stress area A_s. Values in brackets are valid for undersized threaded rods with smaller stress area A_s for hot-dip galvanised threaded rods according to EN ISO 10684:2004 + AC:2009.

[2] in absence of national regulation

[3] Fastener type not part of the ETA

Sika AnchorFix-3040 for concrete	**Annex C 1**
Performances Characteristic values for steel tension resistance and steel shear resistance of threaded rods	

Table C2: Characteristic values of tension loads under static and quasi-static action for a working life of 50 and 100 years

Fastener				All Fastener type and sizes
Concrete cone failure				
Uncracked concrete		$k_{ucr,N}$	[-]	11,0
Cracked concrete		$k_{cr,N}$	[-]	7,7
Edge distance		$c_{cr,N}$	[mm]	$1,5\ h_{ef}$
Axial distance		$s_{cr,N}$	[mm]	$2\ c_{cr,N}$
Splitting				
Edge distance	$h/h_{ef} \geq 2,0$	$c_{cr,sp}$	[mm]	$1,0\ h_{ef}$
	$2,0 > h/h_{ef} > 1,3$			$2 \cdot h_{ef}\left(2,5 - \frac{h}{h_{ef}}\right)$
	$h/h_{ef} \leq 1,3$			$2,4\ h_{ef}$
Axial distance		$s_{cr,sp}$	[mm]	$2\ c_{cr,sp}$

Sika AnchorFix-3040 for concrete	**Annex C 2**
Performances Characteristic values of tension loads under static and quasi-static action for a working life of 50 and 100 years	

Table C3: Characteristic values of tension loads under static and quasi-static action for a working life of 50 years

Threaded rod					M8	M10	M12	M16	M20	M24	M27	M30
Steel failure												
Characteristic tension resistance			$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$ (or see Table C1)							
Partial factor			$\gamma_{Ms,N}$	[-]	see Table C1							
Combined pull-out and concrete failure												
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled (HD) and compressed air drilled holes (CD)												
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,ucr}$	[N/mm²]	20	20	19	19	18	17	16	16
	II: 50°C/72°C				15	15	15	14	13	13	12	12
	III:60°C/80°C				6,5	6,5	6,5	6,0	6,0	5,5	5,5	5,5
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled holes with hollow drill bit (HDB)												
Temperature range	I: 24°C/40°C	Dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	17	16	16	16	15	14	14	13
	II: 50°C/72°C				14	14	14	13	13	12	12	11
	III:60°C/80°C				6,5	6,5	6,5	6,0	6,0	5,5	5,5	5,5
	I: 24°C/40°C	flooded bore hole			16	16	16	15	15	14	14	13
	II: 50°C/72°C				14	14	14	13	13	12	12	11
	III:60°C/80°C				6,5	6,5	6,5	6,0	6,0	5,5	5,5	5,5
Characteristic bond resistance in cracked concrete C20/25 in hammer drilled holes (HD) , compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)												
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,cr}$	[N/mm²]	7,0	7,0	8,5	8,5	8,5	8,5	8,5	8,5
	II: 50°C/72°C				6,0	6,0	7,0	7,0	7,0	7,0	7,0	7,0
	III:60°C/80°C				5,0	5,0	5,0	4,5	4,5	4,5	4,5	4,5
Reduction factor in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)												
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	ψ^0_{sus}	[-]	0,99							
	II: 50°C/72°C				0,68							
	III:60°C/80°C				0,70							
Increasing factors for concrete	≤ C50/60		ψ_c	[-]	$(f_{ck} / 20)^{0,1}$							
	> C50/60				1,1							
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,ucr}$ =		$\psi_c \cdot \tau_{Rk,ucr,(C20/25)}$							
			$\tau_{Rk,cr}$ =		$\psi_c \cdot \tau_{Rk,cr,(C20/25)}$							
Concrete cone failure or Splitting												
Relevant parameter					see Table C2							
Installation factor												
for dry and wet concrete (HD; HDB, CD)			γ_{inst}	[-]	1,0							
for flooded bore hole (HD; HDB, CD)					1,2							

Sika AnchorFix-3040 for concrete	**Annex C 3**
Performances Characteristic values of tension loads under static and quasi-static action for a working life of 50 years (threaded rod)	

Table C4: Characteristic values of tension loads under static and quasi-static action for a working life of 100 years

Threaded rod					M8	M10	M12	M16	M20	M24	M27	M30
Steel failure												
Characteristic tension resistance			$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$ (or see Table C1)							
Partial factor			$\gamma_{Ms,N}$	[-]	see Table C1							
Combined pull-out and concrete failure												
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled (HD) and compressed air drilled holes (CD)												
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,ucr,100}$	[N/mm²]	20	20	19	19	18	17	16	16
	II: 50°C/72°C				15	15	15	14	13	13	12	12
	III:60°C/80°C				6,5	6,5	6,5	6,0	6,0	5,5	5,5	5,5
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled holes with hollow drill bit (HDB)												
Temperaturerange	I: 24°C/40°C	Dry or wet concrete	$\tau_{Rk,ucr,100}$	[N/mm²]	17	16	16	16	15	14	14	13
	II: 50°C/72°C				14	14	14	13	13	12	12	11
	III:60°C/80°C				6,5	6,5	6,5	6,0	6,0	5,5	5,5	5,5
	I: 24°C/40°C	flooded bore hole			16	16	16	15	15	14	14	13
	II: 50°C/72°C				14	14	14	13	13	12	12	11
	III:60°C/80°C				6,5	6,5	6,5	6,0	6,0	5,5	5,5	5,5
Characteristic bond resistance in cracked concrete C20/25 in hammer drilled holes (HD) , compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)												
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,cr,100}$	[N/mm²]	6,5	6,5	7,5	7,5	7,5	7,5	7,5	7,5
	II: 50°C/72°C				5,5	5,5	6,5	6,5	6,5	6,5	6,5	6,5
	III:60°C/80°C				5,0	5,0	5,0	4,5	4,5	4,5	4,5	4,5
Reduction factor in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)												
Temperatur e range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\psi^0_{sus,100}$	[-]	0,97							
	II: 50°C/72°C				0,68							
	III:60°C/80°C				0,70							
Increasing factors for concrete	≤ C50/60		ψ_c	[-]	$(f_{ck} / 20)^{0,1}$							
	> C50/60				1,1							
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,ucr,100}$ =		$\psi_c \cdot \tau_{Rk,ucr,100,(C20/25)}$							
			$\tau_{Rk,cr,100}$ =		$\psi_c \cdot \tau_{Rk,cr,100,(C20/25)}$							
Concrete cone failure or Splitting												
Relevant parameter					see Table C2							
Installation factor												
for dry and wet concrete (HD; HDB, CD)			γ_{inst}	[-]	1,0							
for flooded bore hole (HD; HDB, CD)					1,2							

Sika AnchorFix-3040 for concrete

Performances
Characteristic values of tension loads under static and quasi-static action for a working life of 100 years (threaded rod)

Annex C 4

Table C5: Characteristic values of tension loads under static and quasi-static action for a working life of 50 years

Threaded rod					M8	M10	M12	M16	M20	M24	M27	M30
Steel failure												
Characteristic tension resistance			$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$ (or see Table C1)							
Partial factor			$\gamma_{Ms,N}$	[-]	see Table C1							
Combined pull-out and concrete failure												
Characteristic bond resistance in uncracked concrete C20/25 in diamond drilled holes (DD)												
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,ucr}$	[N/mm²]	15	14	14	13	12	12	11	11
	II: 50°C/72°C				12	12	11	10	9,5	9,5	9,0	9,0
	III: 60°C/80°C				5,5	5,5	5,0	4,5	4,5	4,5	4,0	4,0
Characteristic bond resistance in cracked concrete C20/25 in diamond drilled holes (DD)												
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,cr}$	[N/mm²]	1)			5,5	5,5	5,5	5,5	5,4
	II: 50°C/72°C							4,6	4,6	4,6	4,6	4,5
	III: 60°C/80°C							2,4	2,3	2,4	2,4	2,3
Reduction factor in uncracked concrete C20/25 in diamond drilled holes (DD)												
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	ψ^0_{sus}	[-]	0,77							
	II: 50°C/72°C				0,72							
	III: 60°C/80°C				0,72							
Increasing factors for concrete	≤ C50/60		$\psi_{c,ucr}$	[-]	$(f_{ck} / 20)^{0,2}$							
	> C50/60				1,2							
	≤ C50/60		$\psi_{c,cr}$	[-]	$(f_{ck} / 20)^{0,4}$							
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,ucr}$ =		$\psi_{c,ucr} \cdot \tau_{Rk,ucr,(C20/25)}$							
			$\tau_{Rk,cr}$ =		$\psi_{c,cr} \cdot \tau_{Rk,cr,(C20/25)}$							
Concrete cone failure or Splitting												
Relevant parameter					see Table C2							
Installation factor												
for dry and wet concrete (DD)			γ_{inst}	[-]	1,0							
for flooded bore hole (DD)					1,2			1,4				

1) no performance assessed

Sika AnchorFix-3040 for concrete

Performances
Characteristic values of tension loads under static and quasi-static action for a working life of 50 years (threaded rod)

Annex C 5

Table C6: Characteristic values of tension loads under static and quasi-static action for a working life of 100 years

Threaded rod					M8	M10	M12	M16	M20	M24	M27	M30
Steel failure												
Characteristic tension resistance			$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$ (or see Table C1)							
Partial factor			$\gamma_{Ms,N}$	[-]	see Table C1							
Combined pull-out and concrete failure												
Characteristic bond resistance in uncracked concrete C20/25 in diamond drilled holes (DD)												
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,ucr,100}$	[N/mm²]	15	14	14	13	12	12	11	11
	II: 50°C/72°C				11	11	10	10	9,5	9,0	8,5	8,5
	III:60°C/80°C				5,5	5,5	5,0	4,5	4,5	4,5	4,0	4,0
Reduction factor in uncracked concrete C20/25 in diamond drilled holes (DD)												
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\psi^0_{sus,100}$	[-]	0,73							
	II: 50°C/72°C				0,70							
	III:60°C/80°C				0,72							
Increasing factors for concrete		≤ C50/60	ψ_c	[-]	$(f_{ck} / 20)^{0,2}$							
		> C50/60			1,2							
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,ucr,100}$ =		$\psi_c \cdot \tau_{Rk,ucr,100,(C20/25)}$							
Concrete cone failure or Splitting												
Relevant parameter					see Table C2							
Installation factor												
for dry and wet concrete (DD)			γ_{inst}	[-]	1,0							
for flooded bore hole (DD)					1,2			1,4				

Sika AnchorFix-3040 for concrete	**Annex C 6**
Performances Characteristic values of tension loads under static and quasi-static action for a working life of 100 years (threaded rod)	

Table C7: Characteristic values of shear loads under static and quasi-static action for a working life of 50 and 100 years

Threaded rod			M8	M10	M12	M16	M20	M24	M27	M30
Steel failure without lever arm										
Characteristic shear resistance Steel, strength class 4.6, 4.8 and 5.6, 5.8	$V^0_{Rk,s}$	[kN]	$0,6 \cdot A_s \cdot f_{uk}$ (or see Table C1)							
Characteristic shear resistance Steel, strength class 8.8 Stainless Steel A2, A4 and HCR, all strength classes	$V^0_{Rk,s}$	[kN]	$0,5 \cdot A_s \cdot f_{uk}$ (or see Table C1)							
Partial factor	$\gamma_{Ms,V}$	[-]	see Table C1							
Ductility factor	k_7	[-]	1,0							
Steel failure with lever arm										
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	$1,2 \cdot W_{el} \cdot f_{uk}$ (or see Table C1)							
Elastic section modulus	W_{el}	[mm³]	31	62	109	277	541	935	1387	1874
Partial factor	$\gamma_{Ms,V}$	[-]	see Table C1							
Concrete pry-out failure										
Factor	k_8	[-]	2,0							
Installation factor	γ_{inst}	[-]	1,0							
Concrete edge failure										
Effective length of fastener	l_f	[mm]	$\min(h_{ef}; 12 \cdot d_{nom})$						$\min(h_{ef}; 300mm)$	
Outside diameter of fastener	d_{nom}	[mm]	8	10	12	16	20	24	27	30
Installation factor	γ_{inst}	[-]	1,0							

Sika AnchorFix-3040 for concrete	**Annex C 7**
Performances Characteristic values of shear loads under static and quasi-static action for a working life of 50 and 100 years (threaded rod)	

Table C8: Characteristic values of tension loads under static and quasi-static action for a working life of 50 years

Internal threaded anchor rods					IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Steel failure[1]										
Characteristic tension resistance, Steel, strength class	5.8		$N_{Rk,s}$	[kN]	10	17	29	42	76	123
	8.8		$N_{Rk,s}$	[kN]	16	27	46	67	121	196
Partial factor, strength class 5.8 and 8.8			$\gamma_{Ms,N}$	[-]	1,5					
Characteristic tension resistance, Stainless Steel A4 and HCR, Strength class 70[2]			$N_{Rk,s}$	[kN]	14	26	41	59	110	124
Partial factor			$\gamma_{Ms,N}$	[-]	1,87					2,86
Combined pull-out and concrete cone failure										
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled (HD) and compressed air drilled holes (CD)										
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,ucr}$	[N/mm²]	20	19	19	18	17	16
	II: 50°C/72°C				15	15	14	13	13	12
	III:60°C/80°C				6,5	6,5	6,0	6,0	5,5	5,5
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled holes with hollow drill bit (HDB)										
Temperature range	I: 24°C/40°C	Dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	16	16	16	15	14	13
	II: 50°C/72°C				14	14	13	13	12	11
	III:60°C/80°C				6,5	6,5	6,0	6,0	5,5	5,5
	I: 24°C/40°C	flooded bore hole			16	16	15	15	14	13
	II: 50°C/72°C				14	14	13	13	12	11
	III:60°C/80°C				6,5	6,5	6,0	6,0	5,5	5,5
Characteristic bond resistance in cracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)										
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,cr}$	[N/mm²]	7,0	8,5	8,5	8,5	8,5	8,5
	II: 50°C/72°C				6,0	7,0	7,0	7,0	7,0	7,0
	III:60°C/80°C				5,0	5,0	4,5	4,5	4,5	4,5
Reduction factor in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)										
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	ψ^0_{sus}	[-]	0,99					
	II: 50°C/72°C				0,68					
	III:60°C/80°C				0,70					
Increasing factors for concrete	≤ C50/60		ψ_c	[-]	$(f_{ck} / 20)^{0,1}$					
	> C50/60				1,1					
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,ucr}$ =		$\psi_c \cdot \tau_{Rk,ucr,(C20/25)}$					
			$\tau_{Rk,cr}$ =		$\psi_c \cdot \tau_{Rk,cr,(C20/25)}$					
Concrete cone failure or Splitting										
Relevant parameter					see Table C2					
Installation factor										
for dry and wet concrete (HD; HDB, CD)			γ_{inst}	[-]	1,0					
for flooded bore hole (HD; HDB, CD)					1,2					

1) Fastenings (incl. nut and washer) must comply with the appropriate material and property class of the internal threaded rod. The characteristic tension resistance for steel failure is valid for the internal threaded rod and the fastening element.

2) For IG-M20 strength class 50 is valid

Sika AnchorFix-3040 for concrete	**Annex C 8**
Performances Characteristic values of tension loads under static and quasi-static action for a working life of 50 years (Internal threaded anchor rod)	

Table C9: Characteristic values of tension loads under static and quasi-static action for a working life of 100 years

Internal threaded anchor rods					IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Steel failure[1]										
Characteristic tension resistance, Steel, strength class	5.8		$N_{Rk,s}$	[kN]	10	17	29	42	76	123
	8.8		$N_{Rk,s}$	[kN]	16	27	46	67	121	196
Partial factor, strength class 5.8 and 8.8			$\gamma_{Ms,N}$	[-]	1,5					
Characteristic tension resistance, Stainless Steel A4 and HCR, Strength class 70[2]			$N_{Rk,s}$	[kN]	14	26	41	59	110	124
Partial factor			$\gamma_{Ms,N}$	[-]	1,87					2,86
Combined pull-out and concrete cone failure										
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled (HD) and compressed air drilled holes (CD)										
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,ucr,100}$	[N/mm²]	20	19	19	18	17	16
	II: 50°C/72°C				15	15	14	13	13	12
	III:60°C/80°C				6,5	6,5	6,0	6,0	5,5	5,5
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled holes with hollow drill bit (HDB)										
Temperature range	I: 24°C/40°C	Dry or wet concrete	$\tau_{Rk,ucr,100}$	[N/mm²]	16	16	16	15	14	13
	II: 50°C/72°C				14	14	13	13	12	11
	III:60°C/80°C				6,5	6,5	6,0	6,0	5,5	5,5
	I: 24°C/40°C	flooded bore hole			16	16	15	15	14	13
	II: 50°C/72°C				14	14	13	13	12	11
	III:60°C/80°C				6,5	6,5	6,0	6,0	5,5	5,5
Characteristic bond resistance in cracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)										
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,cr,100}$	[N/mm²]	6,5	7,5	7,5	7,5	7,5	7,5
	II: 50°C/72°C				5,5	6,5	6,5	6,5	6,5	6,5
	III:60°C/80°C				5,0	5,0	4,5	4,5	4,5	4,5
Reduction factor in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)										
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\psi^0_{sus,100}$	[-]	0,97					
	II: 50°C/72°C				0,68					
	III:60°C/80°C				0,70					
Increasing factors for concrete	≤ C50/60		ψ_c	[-]	$(f_{ck} / 20)^{0,1}$					
	> C50/60				1,1					
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,ucr,100}$ =		$\psi_c \cdot \tau_{Rk,ucr,100,(C20/25)}$					
			$\tau_{Rk,cr,100}$ =		$\psi_c \cdot \tau_{Rk,cr,100,(C20/25)}$					
Concrete cone failure or Splitting										
Relevant parameter					see Table C2					
Installation factor										
for dry and wet concrete (HD; HDB, CD)			γ_{inst}	[-]	1,0					
for flooded bore hole (HD; HDB, CD)					1,2					

1) Fastenings (incl. nut and washer) must comply with the appropriate material and property class of the internal threaded rod. The characteristic tension resistance for steel failure is valid for the internal threaded rod and the fastening element.

2) For IG-M20 strength class 50 is valid

Sika AnchorFix-3040 for concrete	**Annex C 9**
Performances Characteristic values of tension loads under static and quasi-static action for a working life of 100 years (Internal threaded anchor rod)	

Table C10: Characteristic values of tension loads under static and quasi-static action for a working life of 50 years

Internal threaded anchor rods					IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Steel failure[1)]										
Characteristic tension resistance, Steel, strength class	5.8		$N_{Rk,s}$	[kN]	10	17	29	42	76	123
	8.8		$N_{Rk,s}$	[kN]	16	27	46	67	121	196
Partial factor, strength class 5.8 and 8.8			$\gamma_{Ms,N}$	[-]	1,5					
Characteristic tension resistance, Stainless Steel A4 and HCR, Strength class 70[2)]			$N_{Rk,s}$	[kN]	14	26	41	59	110	124
Partial factor			$\gamma_{Ms,N}$	[-]	1,87					2,86
Combined pull-out and concrete cone failure										
Characteristic bond resistance in uncracked concrete C20/25 in diamond drilled holes (DD)										
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,ucr}$	[N/mm²]	14	14	13	12	12	11
	II: 50°C/72°C				12	11	10	9,5	9,5	9,0
	III: 60°C/80°C				5,5	5,0	4,5	4,5	4,5	4,0
Characteristic bond resistance in cracked concrete C20/25 in diamond drilled holes (DD)										
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,cr}$	[N/mm²]	3)		5,5	5,5	5,5	5,4
	II: 50°C/72°C						4,6	4,6	4,6	4,5
	III: 60°C/80°C						2,4	2,3	2,4	2,3
Reduction factor in uncracked concrete C20/25 in diamond drilled holes (DD)										
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	ψ^0_{sus}	[-]	0,77					
	II: 50°C/72°C				0,72					
	III: 60°C/80°C				0,72					
Increasing factors for concrete		≤ C50/60	$\psi_{c,ucr}$	[-]	$(f_{ck} / 20)^{0,2}$					
		> C50/60			1,2					
		≤ C50/60	$\psi_{c,cr}$	[-]	$(f_{ck} / 20)^{0,4}$					
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,ucr}$ =		$\psi_{c,ucr} \cdot \tau_{Rk,ucr,(C20/25)}$					
			$\tau_{Rk,cr}$ =		$\psi_{c,cr} \cdot \tau_{Rk,cr,(C20/25)}$					
Concrete cone failure or Splitting										
Relevant parameter					see Table C2					
Installation factor										
for dry and wet concrete (DD)			γ_{inst}	[-]	1,0					
for flooded bore hole (DD)					1,2		1,4			

1) Fastenings (incl. nut and washer) must comply with the appropriate material and property class of the internal threaded rod. The characteristic tension resistance for steel failure is valid for the internal threaded rod and the fastening element.
2) For IG-M20 strength class 50 is valid
3) no performance assessed

Sika AnchorFix-3040 for concrete	**Annex C 10**
Performances Characteristic values of tension loads under static and quasi-static action for a working life of 50 years (Internal threaded anchor rod)	

Table C11: Characteristic values of tension loads under static and quasi-static action for a working life of 100 years

Internal threaded anchor rods					IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Steel failure[1]										
Characteristic tension resistance, Steel, strength class	5.8	$N_{Rk,s}$	[kN]		10	17	29	42	76	123
	8.8	$N_{Rk,s}$	[kN]		16	27	46	67	121	196
Partial factor, strength class 5.8 and 8.8		$\gamma_{Ms,N}$	[-]		1,5					
Characteristic tension resistance, Stainless Steel A4 and HCR, Strength class 70[2]		$N_{Rk,s}$	[kN]		14	26	41	59	110	124
Partial factor		$\gamma_{Ms,N}$	[-]		1,87					2,86
Combined pull-out and concrete cone failure										
Characteristic bond resistance in uncracked concrete C20/25 in diamond drilled holes (DD)										
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,ucr,100}$	[N/mm²]	14	14	13	12	12	11
	II: 50°C/72°C				11	10	10	9,5	9,0	8,5
	III:60°C/80°C				5,5	5,0	4,5	4,5	4,5	4,0
Reduction factor in uncracked concrete C20/25 in diamond drilled holes (DD)										
Temperature range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\psi^0_{sus,100}$	[-]	0,73					
	II: 50°C/72°C				0,70					
	III:60°C/80°C				0,72					
Increasing factors for concrete	≤ C50/60		ψ_c	[-]	$(f_{ck} / 20)^{0,2}$					
	> C50/60				1,2					
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,ucr,100}$ =		$\psi_c \cdot \tau_{Rk,ucr,100,(C20/25)}$					
Concrete cone failure or Splitting										
Relevant parameter					see Table C2					
Installation factor										
for dry and wet concrete (DD)		γ_{inst}	[-]		1,0					
for flooded bore hole (DD)					1,2		1,4			

1) Fastenings (incl. nut and washer) must comply with the appropriate material and property class of the internal threaded rod. The characteristic tension resistance for steel failure is valid for the internal threaded rod and the fastening element.

2) For IG-M20 strength class 50 is valid

Sika AnchorFix-3040 for concrete	**Annex C 11**
Performances Characteristic values of tension loads under static and quasi-static action for a working life of 100 years (Internal threaded anchor rod)	

Table C12: Characteristic values of shear loads under static and quasi-static action for a working life of 50 and 100 years

Internal threaded anchor rods				IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Steel failure without lever arm[1)]									
Characteristic shear resistance, Steel, strength class	5.8	$V^0_{Rk,s}$	[kN]	5	9	15	21	38	61
	8.8	$V^0_{Rk,s}$	[kN]	8	14	23	34	60	98
Partial factor, strength class 5.8 and 8.8		$\gamma_{Ms,V}$	[-]	1,25					
Characteristic shear resistance, Stainless Steel A4 and HCR, Strength class 70[2)]		$V^0_{Rk,s}$	[kN]	7	13	20	30	55	40
Partial factor		$\gamma_{Ms,V}$	[-]	1,56					2,38
Ductility factor		k_7	[-]	1,0					
Steel failure with lever arm[1)]									
Characteristic bending moment, Steel, strength class	5.8	$M^0_{Rk,s}$	[Nm]	8	19	37	66	167	325
	8.8	$M^0_{Rk,s}$	[Nm]	12	30	60	105	267	519
Partial factor, strength class 5.8 and 8.8		$\gamma_{Ms,V}$	[-]	1,25					
Characteristic bending moment, Stainless Steel A4 and HCR, Strength class 70[2)]		$M^0_{Rk,s}$	[Nm]	11	26	52	92	233	456
Partial factor		$\gamma_{Ms,V}$	[-]	1,56					2,38
Concrete pry-out failure									
Factor		k_8	[-]	2,0					
Installation factor		γ_{inst}	[-]	1,0					
Concrete edge failure									
Effective length of fastener		l_f	[mm]	$\min(h_{ef}; 12 \cdot d_{nom})$					$\min(h_{ef}; 300mm)$
Outside diameter of fastener		d_{nom}	[mm]	10	12	16	20	24	30
Installation factor		γ_{inst}	[-]	1,0					

1) Fastenings (incl. nut and washer) must comply with the appropriate material and property class of the internal threaded rod. The characteristic tension resistance for steel failure is valid for the internal threaded rod and the fastening element.

2) For IG-M20 strength class 50 is valid

Sika AnchorFix-3040 for concrete	**Annex C 12**
Performances Characteristic values of shear loads under static and quasi-static action for a working life of 50 and 100 years (Internal threaded anchor rod)	

Table C13: Characteristic values of tension loads under static and quasi-static action for a working life of 50 years

Reinforcing bar					Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 24	Ø 25	Ø 28	Ø 32	Ø 36	Ø 40
Steel failure																
Characteristic tension resistance			$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$ [1]											
Cross section area			A_s	[mm²]	50	79	113	154	201	314	452	491	616	804	1018	1256
Partial factor			$\gamma_{Ms,N}$	[-]	1,4 [2]											
Combined pull-out and concrete failure																
Characteristic bond resistance in uncracked concrete C20/25 in hammer (HD) and compressed air drilled holes (CD)																
Temp.-range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,ucr}$	[N/mm²]	16	16	16	16	16	16	15	15	15	15	15	15
	II: 50°C/72°C				12	12	12	12	12	12	12	12	11	11	11	11
	III: 60°C/80°C				5,5	5,5	5,5	5,5	5,5	5,5	5,0	5,0	5,0	5,0	4,5	4,5
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled holes with hollow drill bit (HDB)																
Temperature range	I: 24°C/40°C	Dry, wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	14	14	13	13	13	13	13	13	13	13	3)	
	II: 50°C/72°C				12	12	12	11	11	11	11	11	11	11		
	III: 60°C/80°C				5,5	5,5	5,5	5,5	5,5	5,5	5,0	5,0	5,0	5,0		
	I: 24°C/40°C	flooded bore hole			13	13	13	13	13	13	13	13	13	13		
	II: 50°C/72°C				11	11	11	11	11	11	11	11	11	11		
	III: 60°C/80°C				5,5	5,5	5,5	5,5	5,5	5,5	5,0	5,0	5,0	5,0		
Characteristic bond resistance in cracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)																
Temp.-range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,cr}$	[N/mm²]	7,0	7,0	8,5	8,5	8,5	8,5	8,5	8,5	8,5	8,5	3)	
	II: 50°C/72°C				6,0	6,0	7,0	7,0	7,0	7,0	7,0	7,0	7,0	7,0		
	III: 60°C/80°C				4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5		
Reduction factor in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)																
Temp.-range	I: 24°C/40°C	Dry, wet and flooded bore hole	ψ^0_{sus}	[-]	0,99											
	II: 50°C/72°C				0,68											
	III: 60°C/80°C				0,70											
Increasing factors for concrete	≤ C50/60		ψ_c	[-]	$(f_{ck} / 20)^{0,1}$											
	> C50/60				1,1											
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,ucr}$ =		$\psi_c \cdot \tau_{Rk,ucr,(C20/25)}$											
			$\tau_{Rk,cr}$ =		$\psi_c \cdot \tau_{Rk,cr,(C20/25)}$											
Concrete cone failure or Splitting																
Relevant parameter					see Table C2											
Installation factor (HD; HDB, CD)																
for dry and wet concrete			γ_{inst}	[-]	1,0										1,2	
for flooded bore hole					1,2										3)	

[1] f_{uk} shall be taken from the specifications of reinforcing bars
[2] in absence of national regulation
[3] no performance assessed

Sika AnchorFix-3040 for concrete	**Annex C 13**
Performances Characteristic values of tension loads under static and quasi-static action for a working life of 50 years (reinforcing bar)	

Table C14: Characteristic values of tension loads under static and quasi-static action for a working life of 100 years

Reinforcing bar					Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 24	Ø 25	Ø 28	Ø 32	Ø 36	Ø 40
Steel failure																
Characteristic tension resistance			$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$ [1]											
Cross section area			A_s	[mm²]	50	79	113	154	201	314	452	491	616	804	1018	1256
Partial factor			$\gamma_{Ms,N}$	[-]	1,4 [2]											
Combined pull-out and concrete failure																
Characteristic bond resistance in uncracked concrete C20/25 in hammer (HD) and compressed air drilled holes (CD)																
Temp.-range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,ucr,100}$	[N/mm²]	16	16	16	16	16	16	15	15	15	15	15	15
	II: 50°C/72°C				12	12	12	12	12	12	12	12	11	11	11	11
	III: 60°C/80°C				5,5	5,5	5,5	5,5	5,5	5,5	5,0	5,0	5,0	5,0	4,5	4,5
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled holes with hollow drill bit (HDB)																
Temperature range	I: 24°C/40°C	Dry or wet concrete	$\tau_{Rk,ucr,100}$	[N/mm²]	14	14	13	13	13	13	13	13	13	13	3)	
	II: 50°C/72°C				12	12	12	11	11	11	11	11	11	11		
	III: 60°C/80°C				5,5	5,5	5,5	5,5	5,5	5,5	5,0	5,0	5,0	5,0		
	I: 24°C/40°C	flooded bore hole			13	13	13	13	13	13	13	13	13	13		
	II: 50°C/72°C				11	11	11	11	11	11	11	11	11	11		
	III: 60°C/80°C				5,5	5,5	5,5	5,5	5,5	5,5	5,0	5,0	5,0	5,0		
Characteristic bond resistance in cracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)																
Temp.-range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,cr,100}$	[N/mm²]	6,5	6,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	3)	
	II: 50°C/72°C				5,5	5,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5		
	III: 60°C/80°C				4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5		
Reduction factor in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)																
Temp.-range	I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\psi^0_{sus,100}$	[-]	0,97											
	II: 50°C/72°C				0,68											
	III: 60°C/80°C				0,70											
Increasing factors for concrete	≤ C50/60		ψ_c	[-]	$(f_{ck} / 20)^{0,1}$											
	> C50/60				1,1											
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,ucr,100} =$		$\psi_c \cdot \tau_{Rk,ucr,100,(C20/25)}$											
			$\tau_{Rk,cr,100} =$		$\psi_c \cdot \tau_{Rk,cr,100,(C20/25)}$											
Concrete cone failure or Splitting																
Relevant parameter					see Table C2											
Installation factor (HD; HDB, CD)																
for dry and wet concrete			γ_{inst}	[-]	1,0										1,2	
for flooded bore hole					1,2										3)	

1) f_{uk} shall be taken from the specifications of reinforcing bars
2) in absence of national regulation
3) no performance assessed

Sika AnchorFix-3040 for concrete	**Annex C 14**
Performances Characteristic values of tension loads under static and quasi-static action for a working life of 100 years (reinforcing bar)	

Table C15: Characteristic values of tension loads under static and quasi-static action for a working life of 50 years

Reinforcing bar				Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 24	Ø 25	Ø 28	Ø 32	Ø 36	Ø 40
Steel failure															
Characteristic tension resistance	$N_{Rk,s}$	[kN]		$A_s \cdot f_{uk}$ [1]											
Cross section area	A_s	[mm²]		50	79	113	154	201	314	452	491	616	804	1018	1256
Partial factor	$\gamma_{Ms,N}$	[-]		1,4 [2]											
Combined pull-out and concrete failure															
Characteristic bond resistance in uncracked concrete C20/25 in diamond drilled holes (DD)															
Temperature range I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,ucr}$	[N/mm²]	14	13	13	13	12	12	11	11	11	11	11	10
Temperature range II: 50°C/72°C				11	11	10	10	10	9,5	9,5	9,5	9,0	9,0	8,5	8,5
Temperature range III:60°C/80°C				5,0	5,0	5,0	4,5	4,5	4,5	4,0	4,0	4,0	4,0	4,0	4,0
Reduction factor in uncracked concrete C20/25 in diamond drilled holes (DD)															
Temperature range I: 24°C/40°C	Dry, wet concrete or flooded bore hole	ψ^0_{sus}	[-]	0,77											
Temperature range II: 50°C/72°C				0,72											
Temperature range III:60°C/80°C				0,72											
Increasing factors for concrete	≤ C50/60	$\psi_{c,ucr}$	[-]	$(f_{ck} / 20)^{0,2}$											
	> C50/60			1,2											
Characteristic bond resistance depending on the concrete strength class		$\tau_{Rk,ucr} =$		$\psi_{c,ucr} \cdot \tau_{Rk,ucr,(C20/25)}$											
Concrete cone failure or Splitting															
Relevant parameter				see Table C2											
Installation factor (DD)															
for dry and wet concrete		γ_{inst}	[-]	1,0										1,2	
for flooded bore hole				1,2				1,4						3)	

[1] f_{uk} shall be taken from the specifications of reinforcing bars

[2] in absence of national regulation

[3] no performance assessed

Sika AnchorFix-3040 for concrete	**Annex C 15**
Performances Characteristic values of tension loads under static and quasi-static action for a working life of 50 years (reinforcing bar)	

Table C16: Characteristic values of tension loads under static and quasi-static action for a working life of 100 years

Reinforcing bar				Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 24	Ø 25	Ø 28	Ø 32	Ø 36	Ø 40
Steel failure															
Characteristic tension resistance		$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$ [1)]											
Cross section area		A_s	[mm²]	50	79	113	154	201	314	452	491	616	804	1018	1256
Partial factor		$\gamma_{Ms,N}$	[-]	1,4 [2)]											
Combined pull-out and concrete failure															
Characteristic bond resistance in uncracked concrete C20/25 in diamond drilled holes (DD)															
Temperature range I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\tau_{Rk,ucr,100}$	[N/mm²]	14	13	13	13	12	12	11	11	11	11	11	10
Temperature range II: 50°C/72°C				11	10	10	10	9,5	9,0	9,0	9,0	8,5	8,5	8,0	8,0
Temperature range III:60°C/80°C				5,0	5,0	5,0	4,5	4,5	4,5	4,0	4,0	4,0	4,0	4,0	4,0
Reduction factor in uncracked concrete C20/25 in diamond drilled holes (DD)															
Temperature range I: 24°C/40°C	Dry, wet concrete or flooded bore hole	$\psi^0_{sus,100}$	[-]	0,73											
Temperature range II: 50°C/72°C				0,70											
Temperature range III:60°C/80°C				0,72											
Increasing factors for concrete	≤ C50/60	$\psi_{c,ucr}$	[-]	$(f_{ck} / 20)^{0,2}$											
	> C50/60			1,2											
Characteristic bond resistance depending on the concrete strength class		$\tau_{Rk,ucr,100}$ =		$\psi_{c,ucr} \cdot \tau_{Rk,ucr,100,(C20/25)}$											
Concrete cone failure or Splitting															
Relevant parameter				see Table C2											
Installation factor (DD)															
for dry and wet concrete		γ_{inst}	[-]	1,0										1,2	
for flooded bore hole				1,2				1,4						3)	

1) f_{uk} shall be taken from the specifications of reinforcing bars

2) in absence of national regulation

3) no performance assessed

Sika AnchorFix-3040 for concrete	**Annex C 16**
Performances Characteristic values of tension loads under static and quasi-static action for a working life of 100 years (reinforcing bar)	

Table C17: Characteristic values of shear loads under static and quasi-static action for a working life of 50 and 100 years

Reinforcing bar			Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 24	Ø 25	Ø 28	Ø 32	Ø 36	Ø 40
Steel failure without lever arm														
Characteristic shear resistance	$V^0_{Rk,s}$	[kN]	$0,5 \cdot A_s \cdot f_{uk}$ [1)]											
Cross section area	A_s	[mm²]	50	79	113	154	201	314	452	491	616	804	1018	1256
Partial factor	$\gamma_{Ms,V}$	[-]	1,5 [2)]											
Ductility factor	k_7	[-]	1,0											
Steel failure with lever arm														
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	$1,2 \cdot W_{el} \cdot f_{uk}$ [1)]											
Elastic section modulus	W_{el}	[mm³]	50	98	170	269	402	785	1357	1534	2155	3217	4580	6283
Partial factor	$\gamma_{Ms,V}$	[-]	1,5 [2)]											
Concrete pry-out failure														
Factor	k_8	[-]	2,0											
Installation factor	γ_{inst}	[-]	1,0											
Concrete edge failure														
Effective length of fastener	l_f	[mm]	$\min(h_{ef}; 12 \cdot d_{nom})$							$\min(h_{ef}; 300mm)$				
Outside diameter of fastener	d_{nom}	[mm]	8	10	12	14	16	20	24	25	28	32	36	40
Installation factor	γ_{inst}	[-]	1,0											

1) f_{uk} shall be taken from the specifications of reinforcing bars

2) in absence of national regulation

Sika AnchorFix-3040 for concrete	**Annex C 17**
Performances Characteristic values of shear loads under static and quasi-static action for a working life of 50 and 100 years (reinforcing bar)	

Table C18: Displacements under tension load[1] in hammer drilled holes (HD), comp. air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)

Threaded rod			M8	M10	M12	M16	M20	M24	M27	M30
Uncracked concrete under static and quasi-static action for a working life of 50 and 100 years										
Temperature range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,028	0,029	0,030	0,033	0,035	0,038	0,039	0,041
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,028	0,029	0,030	0,033	0,035	0,038	0,039	0,041
Temperature range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,038	0,039	0,040	0,044	0,047	0,051	0,052	0,055
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,047	0,049	0,051	0,055	0,059	0,064	0,067	0,070
Temperature range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,038	0,039	0,040	0,044	0,047	0,051	0,052	0,055
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,047	0,049	0,051	0,055	0,059	0,064	0,067	0,070
Cracked concrete under static and quasi-static action for a working life of 50 and 100 years										
Temperature range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,069	0,071	0,072	0,074	0,076	0,079	0,081	0,082
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,100	0,115	0,122	0,128	0,135	0,142	0,155	0,171
Temperature range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,092	0,095	0,096	0,099	0,102	0,106	0,109	0,110
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,134	0,154	0,163	0,172	0,181	0,189	0,207	0,229
Temperature range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,092	0,095	0,096	0,099	0,102	0,106	0,109	0,110
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,134	0,154	0,163	0,172	0,181	0,189	0,207	0,229

[1] Calculation of the displacement: $\delta_{N0} = \delta_{N0}\text{-factor} \cdot \tau$; $\delta_{N\infty} = \delta_{N\infty}\text{-factor} \cdot \tau$; τ: action bond stress for tension

Table C19: Displacements under tension load[1] in diamond drilled holes (DD)

Threaded rod			M8	M10	M12	M16	M20	M24	M27	M30
Cracked and uncracked concrete under static and quasi-static action for a working life of 50 years										
Temperature range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,011	0,012	0,012	0,013	0,014	0,014	0,015	0,015
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,018	0,019	0,019	0,020	0,022	0,023	0,024	0,025
Temperature range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,013	0,014	0,014	0,015	0,016	0,016	0,018	0,018
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,052	0,053	0,055	0,058	0,062	0,065	0,068	0,070
Temperature range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,013	0,014	0,014	0,015	0,016	0,016	0,018	0,018
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,052	0,053	0,055	0,058	0,062	0,065	0,068	0,070
Uncracked concrete under static and quasi-static action for a working life of 100 years										
Temperature range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,011	0,012	0,012	0,013	0,014	0,014	0,015	0,015
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,020	0,021	0,021	0,023	0,024	0,025	0,026	0,027
Temperature range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,013	0,014	0,014	0,015	0,016	0,016	0,018	0,018
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,038	0,039	0,040	0,043	0,045	0,047	0,049	0,051
Temperature range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,013	0,014	0,014	0,015	0,016	0,016	0,018	0,018
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,038	0,039	0,040	0,043	0,045	0,047	0,049	0,051

[1] Calculation of the displacement: $\delta_{N0} = \delta_{N0}\text{-factor} \cdot \tau$; $\delta_{N\infty} = \delta_{N\infty}\text{-factor} \cdot \tau$; τ: action bond stress for tension

Table C20: Displacements under shear load[1] for all drilling methods

Threaded rod			M8	M10	M12	M16	M20	M24	M27	M30
Uncracked and cracked concrete under static and quasi-static action for a working life of 50 and 100 years										
All temperature ranges	δ_{V0}-factor	[mm/kN]	0,06	0,06	0,05	0,04	0,04	0,03	0,03	0,03
	$\delta_{V\infty}$-factor	[mm/kN]	0,09	0,08	0,08	0,06	0,06	0,05	0,05	0,05

[1] Calculation of the displacement $\delta_{V0} = \delta_{V0}\text{-factor} \cdot V$; $\delta_{V\infty} = \delta_{V\infty}\text{-factor} \cdot V$; V: action shear load

Sika AnchorFix-3040 for concrete	**Annex C 18**
Performances Displacements under static and quasi-static action for a working life of 50 and 100 years (threaded rod)	

Table C21: Displacements under tension load[1] in hammer drilled holes (HD), comp. air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)

Internal threaded anchor rods			IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Uncracked concrete under static and quasi-static action for a working life of 50 and 100 years								
Temperature range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,029	0,030	0,033	0,035	0,038	0,041
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,029	0,030	0,033	0,035	0,038	0,041
Temperature range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,039	0,040	0,044	0,047	0,051	0,055
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,049	0,051	0,055	0,059	0,064	0,070
Temperature range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,039	0,040	0,044	0,047	0,051	0,055
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,049	0,051	0,055	0,059	0,064	0,070
Cracked concrete under static and quasi-static action for a working life of 50 and 100 years								
Temperature range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,071	0,072	0,074	0,076	0,079	0,082
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,115	0,122	0,128	0,135	0,142	0,171
Temperature range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,095	0,096	0,099	0,102	0,106	0,110
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,154	0,163	0,172	0,181	0,189	0,229
Temperature range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,095	0,096	0,099	0,102	0,106	0,110
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,154	0,163	0,172	0,181	0,189	0,229

[1] Calculation of the displacement: $\delta_{N0} = \delta_{N0}\text{-factor} \cdot \tau$; $\delta_{N\infty} = \delta_{N\infty}\text{-factor} \cdot \tau$; τ: action bond stress for tension

Table C22: Displacements under tension load[1] in diamond drilled holes (DD)

Internal threaded anchor rods			IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Cracked and uncracked concrete under static and quasi-static action for a working life of 50 years								
Temperature range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,012	0,012	0,013	0,014	0,014	0,015
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,019	0,019	0,020	0,022	0,023	0,025
Temperature range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,014	0,014	0,015	0,016	0,016	0,018
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,053	0,055	0,058	0,062	0,065	0,070
Temperature range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,014	0,014	0,015	0,016	0,016	0,018
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,053	0,055	0,058	0,062	0,065	0,070
Uncracked concrete under static and quasi-static action for a working life of 100 years								
Temperature range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,012	0,012	0,013	0,014	0,014	0,015
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,021	0,021	0,023	0,024	0,025	0,027
Temperature range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,014	0,014	0,015	0,016	0,016	0,018
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,039	0,040	0,043	0,045	0,047	0,051
Temperature range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,014	0,014	0,015	0,016	0,016	0,018
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,039	0,040	0,043	0,045	0,047	0,051

[1] Calculation of the displacement: $\delta_{N0} = \delta_{N0}\text{-factor} \cdot \tau$; $\delta_{N\infty} = \delta_{N\infty}\text{-factor} \cdot \tau$; τ: action bond stress for tension

Table C23: Displacements under shear load[1] for all drilling methods

Internal threaded anchor rods			IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Uncracked and cracked concrete under static and quasi-static action for a working life of 50 and 100 years								
All temperature ranges	δ_{V0}-factor	[mm/kN]	0,07	0,06	0,06	0,05	0,04	0,04
	$\delta_{V\infty}$-factor	[mm/kN]	0,10	0,09	0,08	0,08	0,06	0,06

[1] Calculation of the displacement $\delta_{V0} = \delta_{V0}\text{-factor} \cdot V$; $\delta_{V\infty} = \delta_{V\infty}\text{-factor} \cdot V$; V: action shear load

Sika AnchorFix-3040 for concrete	**Annex C 19**
Performances Displacements under static and quasi-static action for a working life of 50 and 100 years (Internal threaded anchor rod)	

Table C24: Displacements under tension load[1] in hammer drilled holes (HD), comp. air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)

Reinforcing bar			Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 24	Ø 25	Ø 28	Ø 32	Ø 36	Ø 40
Uncracked concrete under static and quasi-static action for a working life of 50 and 100 years														
Temp.- range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,028	0,029	0,030	0,031	0,033	0,035	0,038	0,038	0,040	0,043	0,045	0,047
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,028	0,029	0,030	0,031	0,033	0,035	0,038	0,038	0,040	0,043	0,045	0,047
Temp.- range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,038	0,039	0,040	0,042	0,044	0,047	0,051	0,051	0,054	0,058	0,060	0,063
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,047	0,049	0,051	0,053	0,055	0,059	0,065	0,065	0,068	0,072	0,074	0,079
Temp.- range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,038	0,039	0,040	0,042	0,044	0,047	0,051	0,051	0,054	0,058	0,060	0,063
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,047	0,049	0,051	0,053	0,055	0,059	0,065	0,065	0,068	0,072	0,074	0,079
Cracked concrete under static and quasi-static action for a working life of 50 and 100 years														
Temp.- range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,069	0,071	0,072	0,073	0,074	0,076	0,079	0,079	0,081	0,084	2)	
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,115	0,122	0,128	0,135	0,142	0,155	0,171	0,171	0,181	0,194		
Temp.- range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,092	0,095	0,096	0,098	0,099	0,102	0,106	0,106	0,109	0,113		
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,154	0,163	0,172	0,181	0,189	0,207	0,229	0,229	0,242	0,260		
Temp.- range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,092	0,095	0,096	0,098	0,099	0,102	0,106	0,106	0,109	0,113		
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,154	0,163	0,172	0,181	0,189	0,207	0,229	0,229	0,242	0,260		

1) Calculation of the displacement: $\delta_{N0} = \delta_{N0}\text{-factor} \cdot \tau$; $\delta_{N\infty} = \delta_{N\infty}\text{-factor} \cdot \tau$; τ: action bond stress for tension
2) No performance assessed

Table C25: Displacements under tension load[1] in diamond drilled holes (DD)

Reinforcing bar			Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 24	Ø 25	Ø 28	Ø 32	Ø 36	Ø 40
Uncracked concrete under static and quasi-static action for a working life of 50 years														
Temp.- range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,008	0,009	0,009	0,01	0,011	0,012	0,013	0,013	0,014	0,015	0,016	0,017
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,018	0,018	0,019	0,020	0,021	0,024	0,027	0,027	0,028	0,031	0,032	0,034
Temp.- range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,009	0,011	0,011	0,012	0,013	0,014	0,015	0,015	0,016	0,018	0,019	0,020
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,048	0,051	0,054	0,058	0,061	0,068	0,076	0,076	0,081	0,088	0,090	0,097
Temp.- range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,009	0,011	0,011	0,012	0,013	0,014	0,015	0,015	0,016	0,018	0,019	0,020
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,048	0,051	0,054	0,058	0,061	0,068	0,076	0,076	0,081	0,088	0,090	0,097
Uncracked concrete under static and quasi-static action for a working life of 100 years														
Temp.- range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,008	0,009	0,009	0,010	0,011	0,012	0,013	0,013	0,014	0,015	0,016	0,017
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,018	0,020	0,021	0,022	0,024	0,026	0,029	0,029	0,031	0,034	0,035	0,037
Temp.- range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,009	0,011	0,011	0,012	0,013	0,014	0,015	0,015	0,016	0,018	0,019	0,020
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,035	0,037	0,040	0,042	0,045	0,049	0,055	0,055	0,059	0,064	0,066	0,070
Temp.- range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,009	0,011	0,011	0,012	0,013	0,014	0,015	0,015	0,016	0,018	0,019	0,020
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,035	0,037	0,040	0,042	0,045	0,049	0,055	0,055	0,059	0,064	0,066	0,070

1) Calculation of the displacement: $\delta_{N0} = \delta_{N0}\text{-factor} \cdot \tau$; $\delta_{N\infty} = \delta_{N\infty}\text{-factor} \cdot \tau$; τ: action bond stress for tension

Table C26: Displacements under shear load[1] for all drilling methods

Reinforcing bar			Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 24	Ø 25	Ø 28	Ø 32	Ø 36	Ø 40
Uncracked and cracked concrete under static and quasi-static action for a working life of 50 and 100 years														
All temperature ranges	δ_{V0}-factor	[mm/kN]	0,06	0,05	0,05	0,04	0,04	0,04	0,03	0,03	0,03	0,03	0,03	0,03
	$\delta_{V\infty}$-factor	[mm/kN]	0,09	0,08	0,08	0,06	0,06	0,05	0,05	0,05	0,04	0,04	0,04	0,04

1) Calculation of the displacement $\delta_{V0} = \delta_{V0}\text{-factor} \cdot V$; $\delta_{V\infty} = \delta_{V\infty}\text{-factor} \cdot V$; V: action shear load

Sika AnchorFix-3040 for concrete	**Annex C 20**
Performances Displacements under static and quasi-static action for a working life of 50 and 100 years (reinforcing bar)	

Table C27: Characteristic values of tension loads under seismic action (performance category C1) for a working life of 50 years

Threaded rod					**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Steel failure												
Characteristic tension resistance		$N_{Rk,s,eq,C1}$	[kN]		$1,0 \cdot N_{Rk,s}$							
Partial factor		$\gamma_{Ms,N}$	[-]		see Table C1							
Combined pull-out and concrete failure												
Characteristic bond resistance in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)												
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,eq,C1}$	[N/mm²]	7,0	7,0	8,5	8,5	8,5	8,5	8,5	8,5
	II: 50°C/72°C		$\tau_{Rk,eq,C1}$	[N/mm²]	6,0	6,0	7,0	7,0	7,0	7,0	7,0	7,0
	III:60°C/80°C		$\tau_{Rk,eq,C1}$	[N/mm²]	5,0	5,0	5,0	4,5	4,5	4,5	4,5	4,5
Increasing factors for concrete			ψ_c	[-]	1,0							
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,eq,C1} =$		$\psi_c \cdot \tau_{Rk,eq,C1,(C20/25)}$							
Installation factor												
for dry and wet concrete (HD; HDB, CD)			γ_{inst}	[-]	1,0							
for flooded bore hole (HD; HDB, CD)					1,2							

Sika AnchorFix-3040 for concrete	**Annex C 21**
Performances Characteristic values of tension loads under seismic action (performance category C1) for a working life of 50 years (threaded rod)	

Table C28: Characteristic values of tension loads under seismic action (performance category C1) for a working life of 100 years

Threaded rod					**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Steel failure												
Characteristic tension resistance		$N_{Rk,s,eq,C1}$	[kN]		$1,0 \cdot N_{Rk,s}$							
Partial factor		$\gamma_{Ms,N}$	[-]		see Table C1							
Combined pull-out and concrete failure												
Characteristic bond resistance in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)												
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,eq,C1}$	[N/mm²]	6,5	6,5	7,5	7,5	7,5	7,5	7,5	7,5
	II: 50°C/72°C		$\tau_{Rk,eq,C1}$	[N/mm²]	5,5	5,5	6,5	6,5	6,5	6,5	6,5	6,5
	III:60°C/80°C		$\tau_{Rk,eq,C1}$	[N/mm²]	5,0	5,0	5,0	4,5	4,5	4,5	4,5	4,5
Increasing factors for concrete			ψ_c	[-]	1,0							
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,eq,C1} =$		$\psi_c \cdot \tau_{Rk,eq,C1,(C20/25)}$							
Installation factor												
for dry and wet concrete (HD; HDB, CD)			γ_{inst}	[-]	1,0							
for flooded bore hole (HD; HDB, CD)					1,2							

Sika AnchorFix-3040 for concrete	**Annex C 22**
Performances Characteristic values of tension loads under seismic action (performance category C1) for a working life of 100 years (threaded rod)	

Table C29: Characteristic values of shear loads under seismic action (performance category C1) for a working life of 50 and 100 years

Threaded rod			M8	M10	M12	M16	M20	M24	M27	M30
Steel failure										
Characteristic shear resistance (Seismic C1)	$V_{Rk,s,eq,C1}$	[kN]	$0,70 \cdot V^0_{Rk,s}$							
Partial factor	$\gamma_{Ms,V}$	[-]	see Table C1							
Factor for annular gap	α_{gap}	[-]	0,5 (1,0)[1)]							

1) Value in brackets valid for filled annular gab between fastener and clearance hole in the fixture. Use of special filling washer Annex A 3 is recommended.

Sika AnchorFix-3040 for concrete	**Annex C 23**
Performances Characteristic values of shear loads under seismic action (performance category C1) for a working life of 50 and 100 years (threaded rod)	

Table C30: Characteristic values of tension loads under seismic action (performance category C1) for a working life of 50 years

Reinforcing bar				Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 24	Ø 25	Ø 28	Ø 32
Steel failure													
Characteristic tension resistance		$N_{Rk,s,eq,C1}$	[kN]	$1,0 \cdot A_s \cdot f_{uk}$ [1]									
Cross section area		A_s	[mm²]	50	79	113	154	201	314	452	491	616	804
Partial factor		$\gamma_{Ms,N}$	[-]	1,4 [2]									
Combined pull-out and concrete failure													
Characteristic bond resistance in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)													
Temperature range I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,eq,C1}$	[N/mm²]	7,0	7,0	8,5	8,5	8,5	8,5	8,5	8,5	8,5	8,5
Temperature range II: 50°C/72°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,eq,C1}$	[N/mm²]	6,0	6,0	7,0	7,0	7,0	7,0	7,0	7,0	7,0	7,0
Temperature range III: 60°C/80°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,eq,C1}$	[N/mm²]	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5
Increasing factors for concrete		Ψ_C	[-]	1,0									
Characteristic bond resistance depending on the concrete strength class		$\tau_{Rk,eq,C1} =$		$\Psi_C \cdot \tau_{Rk,eq,C1,(C20/25)}$									
Installation factor													
for dry and wet concrete (HD; HDB, CD)		γ_{inst}	[-]	1,0									
for flooded bore hole (HD; HDB, CD)		γ_{inst}	[-]	1,2									

1) f_{uk} shall be taken from the specifications of reinforcing bars

2) in absence of national regulation

Sika AnchorFix-3040 for concrete	**Annex C 24**
Performances Characteristic values of tension loads under seismic action (performance category C1) for a working life of 50 years (reinforcing bar)	

Table C31: Characteristic values of tension loads under seismic action (performance category C1) for a working life of 100 years

Reinforcing bar				**Ø 8**	**Ø 10**	**Ø 12**	**Ø 14**	**Ø 16**	**Ø 20**	**Ø 24**	**Ø 25**	**Ø 28**	**Ø 32**
Steel failure													
Characteristic tension resistance		$N_{Rk,s,eq,C1}$	[kN]	$1,0 \cdot A_s \cdot f_{uk}$ [1)]									
Cross section area		A_s	[mm²]	50	79	113	154	201	314	452	491	616	804
Partial factor		$\gamma_{Ms,N}$	[-]	1,4 [2)]									
Combined pull-out and concrete failure													
Characteristic bond resistance in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)													
Temperature range I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,eq,C1}$	[N/mm²]	6,5	6,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5
Temperature range II: 50°C/72°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,eq,C1}$	[N/mm²]	5,5	5,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5
Temperature range III:60°C/80°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,eq,C1}$	[N/mm²]	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5
Increasing factors for concrete		ψ_c	[-]	1,0									
Characteristic bond resistance depending on the concrete strength class		$\tau_{Rk,eq,C1} =$		$\psi_c \cdot \tau_{Rk,eq,C1,(C20/25)}$									
Installation factor													
for dry and wet concrete (HD; HDB, CD)		γ_{inst}	[-]	1,0									
for flooded bore hole (HD; HDB, CD)		γ_{inst}	[-]	1,2									

1) f_{uk} shall be taken from the specifications of reinforcing bars

2) in absence of national regulation

Sika AnchorFix-3040 for concrete	**Annex C 25**
Performances Characteristic values of tension loads under seismic action (performance category C1) for a working life of 100 years (reinforcing bar)	

Table C32: Characteristic values of shear loads under seismic action (performance category C1) for a working life of 50 and 100 years

Reinforcing bar			**Ø 8**	**Ø 10**	**Ø 12**	**Ø 14**	**Ø 16**	**Ø 20**	**Ø 24**	**Ø 25**	**Ø 28**	**Ø 32**
Steel failure												
Characteristic shear resistance	$V_{Rk,s,eq,C1}$	[kN]	$0,35 \cdot A_s \cdot f_{uk}$ [1)]									
Cross section area	A_s	[mm²]	50	79	113	154	201	314	452	491	616	804
Partial factor	$\gamma_{Ms,V}$	[-]	1,5 [2)]									
Factor for annular gap	α_{gap}	[-]	0,5 (1,0) [3)]									

1) f_{uk} shall be taken from the specifications of reinforcing bars

2) in absence of national regulation

3) Value in brackets valid for filled annular gab between fastener and clearance hole in the fixture. Use of special filling washer Annex A 3 is recommended.

Sika AnchorFix-3040 for concrete	**Annex C 26**
Performances Characteristic values of shear loads under seismic action (performance category C1) for a working life of 50 and 100 years (reinforcing bar)	

Table C33: Characteristic values of tension loads under seismic action (performance category C2) for a working life of 50 and 100 years

Threaded rod					M12	M16	M20	M24	M27	M30
Steel failure										
Characteristic tension resistance, Steel, strength class 8.8 Stainless Steel A4 and HCR, Strength class ≥70			$N_{Rk,s,eq,C2}$	[kN]	$1,0 \cdot N_{Rk,s}$					
Partial factor			$\gamma_{Ms,N}$	[-]	see Table C1					
Combined pull-out and concrete failure										
Characteristic bond resistance in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)										
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,eq,C2}$	[N/mm²]	5,8	4,8	5,0	5,1	4,8	5,0
	II: 50°C/72°C		$\tau_{Rk,eq,C2}$	[N/mm²]	5,0	4,1	4,3	4,4	4,1	4,3
	III:60°C/80°C		$\tau_{Rk,eq,C2}$	[N/mm²]	1,9	1,6	1,6	1,7	1,5	1,6
Increasing factors for concrete			ψ_c	[-]	1,0					
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,eq,C2} =$		$\psi_c \cdot \tau_{Rk,eq,C2,(C20/25)}$					
Installation factor										
for dry and wet concrete (HD; HDB, CD)			γ_{inst}	[-]	1,0					
for flooded bore hole (HD; HDB, CD)					1,2					

Table C34: Characteristic values of shear loads under seismic action (performance category C2) for a working life of 50 and 100 years

Threaded rod			M12	M16	M20	M24	M27	M30
Steel failure								
Characteristic shear resistance Steel, strength class 8.8 Stainless Steel A4 and HCR, Strength class ≥70	$V_{Rk,s,eq,C2}$	[kN]	$0,70 \cdot V^0_{Rk,s}$					
Partial factor	$\gamma_{Ms,V}$	[-]	see Table C1					
Factor for annular gap	α_{gap}	[-]	0,5 (1,0)[1)]					

[1)] Value in brackets valid for filled annular gab between fastener and clearance hole in the fixture. Use of special filling washer Annex A 3 is recommended.

Sika AnchorFix-3040 for concrete	**Annex C 27**
Performances Characteristic values of tension and shear loads under seismic action (performance category C2) for a working life of 50 and 100 years (threaded rod)	

Table C35: Displacements under tension load (threaded rod)

Threaded rod			M12	M16	M20	M24	M27	M30
Uncracked and cracked concrete under seismic action (performance category C2) for a working life of 50 and 100 years								
All temperature ranges	$\delta_{N,eq,C2(50\%)} = \delta_{N,eq,C2(DLS)}$	[mm]	0,21	0,24	0,27	0,36	0,92	0,70
	$\delta_{N,eq,C2(100\%)} = \delta_{N,eq,C2(ULS)}$	[mm]	0,54	0,51	0,54	0,63	1,70	0,92

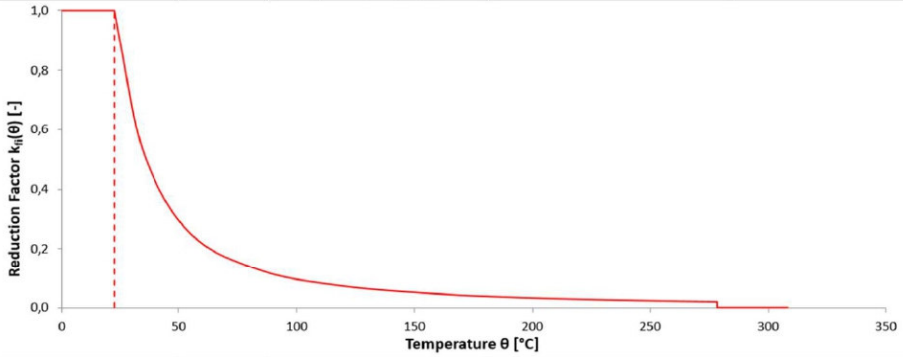
Table C36: Displacements under shear load (threaded rod)

Threaded rod			M12	M16	M20	M24	M27	M30
Uncracked and cracked concrete under seismic action (performance category C2) for a working life of 50 and 100 years								
All temperature ranges	$\delta_{V,eq,C2(50\%)} = \delta_{V,eq,C2(DLS)}$	[mm]	3,1	3,4	3,5	4,2	4,0	3,8
	$\delta_{V,eq,C2(100\%)} = \delta_{V,eq,C2(ULS)}$	[mm]	6,0	7,6	7,3	10,9	11,1	11,2

Sika AnchorFix-3040 for concrete	**Annex C 28**
Performances Displacements under seismic action (performance category C2) for a working life of 50 and 100 years (threaded rod)	

Table C37: Characteristic values of tension and shear loads under fire exposure in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)

Threaded rod					M8	M10	M12	M16	M20	M24	M27	M30
Steel failure												
Characteristic tension resistance; Steel, Stainless Steel A2, A4 and HCR, strength class 5.8 resp. 50 and higher	$N_{Rk,s,fi}$	[kN]	Fire exposure time [min]	30	1,1	1,7	3,0	5,7	8,8	12,7	16,5	20,2
				60	0,9	1,4	2,3	4,2	6,6	9,5	12,4	15,1
				90	0,7	1,0	1,6	3,0	4,7	6,7	8,7	10,7
				120	0,5	0,8	1,2	2,2	3,4	4,9	6,4	7,9
Characteristic bond resistance in cracked and uncracked concrete C20/25 up to C50/60 under fire conditions for a given temperature θ												
Temperature reduction factor	$k_{fi,p}(\theta)$	[-]	$\theta < 23°C$		1,0							
			$23°C \leq \theta \leq 278°C$		$150{,}28 \cdot \theta^{-1{,}598} \leq 1{,}0$							
			$\theta > 278°C$		0,0							



Characteristic bond resistance for a given temperature (θ)	$\tau_{Rk,fi}(\theta)$	[N/mm²]	$k_{fi,p}(\theta) \cdot \tau_{Rk,cr,(C20/25)}$ [1)]

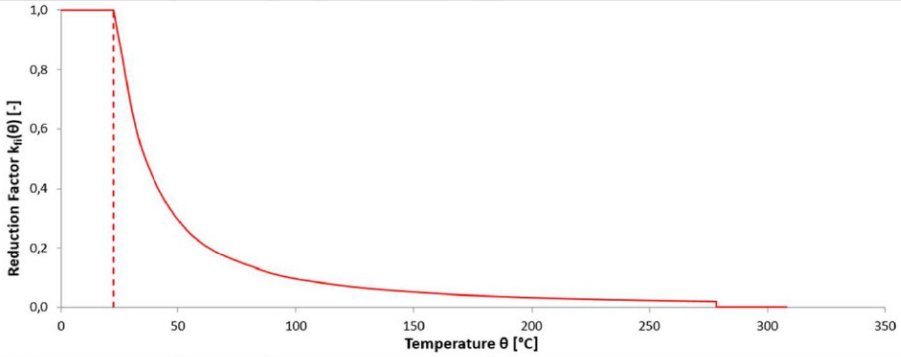
Steel failure without lever arm												
Characteristic shear resistance; Steel, Stainless Steel A2, A4 and HCR, strength class 5.8 resp. 50 and higher	$V_{Rk,s,fi}$	[kN]	Fire exposure time [min]	30	1,1	1,7	3,0	5,7	8,8	12,7	16,5	20,2
				60	0,9	1,4	2,3	4,2	6,6	9,5	12,4	15,1
				90	0,7	1,0	1,6	3,0	4,7	6,7	8,7	10,7
				120	0,5	0,8	1,2	2,2	3,4	4,9	6,4	7,9
Steel failure with lever arm												
Characteristic bending moment; Steel, Stainless Steel A2, A4 and HCR, strength class 5.8 resp. 50 and higher	$M^0_{Rk,s,fi}$	[Nm]	Fire exposure time [min]	30	1,1	2,2	4,7	12,0	23,4	40,4	59,9	81,0
				60	0,9	1,8	3,5	9,0	17,5	30,3	44,9	60,7
				90	0,7	1,3	2,5	6,3	12,3	21,3	31,6	42,7
				120	0,5	1,0	1,8	4,7	9,1	15,7	23,3	31,5

[1)] $\tau_{Rk,cr,(C20/25)}$ characteristic bond resistance for cracked concrete for concrete strength class C20/25 for the relevant temperature range and working life.

Sika AnchorFix-3040 for concrete	**Annex C 29**
Performances Characteristic values of tension and shear loads under fire exposure (threaded rod)	

Table C38: Characteristic values of tension and shear loads under fire exposure in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)

Internal threaded anchor rods					IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Steel failure										
Characteristic tension resistance; Steel, Stainless Steel A4 and HCR, strength class 5.8 and 8.8 resp. 70	$N_{Rk,s,fi}$	[kN]	Fire exposure time [min]	30	0,3	1,1	1,7	3,0	5,7	8,8
				60	0,2	0,9	1,4	2,3	4,2	6,6
				90	0,2	0,7	1,0	1,6	3,0	4,7
				120	0,1	0,5	0,8	1,2	2,2	3,4
Characteristic bond resistance in cracked and uncracked concrete C20/25 up to C50/60 under fire conditions for a given temperature θ										
Temperature reduction factor	$k_{fi,p}(\theta)$	[-]	$\theta < 23°C$		1,0					
			$23°C \leq \theta \leq 278°C$		$150{,}28 \cdot \theta^{-1{,}598} \leq 1{,}0$					
			$\theta > 278°C$		0,0					



Characteristic bond resistance for a given temperature (θ)	$\tau_{Rk,fi}(\theta)$	[N/mm²]	$k_{fi,p}(\theta) \cdot \tau_{Rk,cr,(C20/25)}$ [1)]

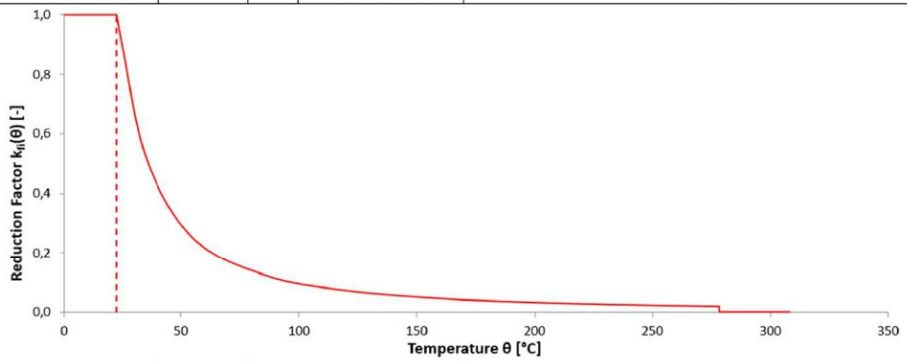
Steel failure without lever arm										
Characteristic shear resistance; Steel, Stainless Steel A4 and HCR, strength class 5.8 and 8.8 resp. 70	$V_{Rk,s,fi}$	[kN]	Fire exposure time [min]	30	0,3	1,1	1,7	3,0	5,7	8,8
				60	0,2	0,9	1,4	2,3	4,2	6,6
				90	0,2	0,7	1,0	1,6	3,0	4,7
				120	0,1	0,5	0,8	1,2	2,2	3,4
Steel failure with lever arm										
Characteristic bending moment; Steel, Stainless Steel A4 and HCR, strength class 5.8 and 8.8 resp. 70	$M^0_{Rk,s,fi}$	[Nm]	Fire exposure time [min]	30	0,2	1,1	2,2	4,7	12,0	23,4
				60	0,2	0,9	1,8	3,5	9,0	17,5
				90	0,1	0,7	1,3	2,5	6,3	12,3
				120	0,1	0,5	1,0	1,8	4,7	9,1

1) $\tau_{Rk,cr,(C20/25)}$ characteristic bond resistance for cracked concrete for concrete strength class C20/25 for the relevant temperature range and working life.

Sika AnchorFix-3040 for concrete	**Annex C 30**
Performances Characteristic values of tension and shear loads under fire exposure (internal threaded anchor rod)	

Table C39: Characteristic values of tension and shear loads under fire exposure in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)

Reinforcing bar					Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 24	Ø 25	Ø 28	Ø 32
Steel failure														
Characteristic tension resistance; BSt 500	$N_{Rk,s,fi}$	[kN]	Fire exposure time [min]	30	0,5	1,2	2,3	3,1	4,0	6,3	9,0	9,8	12,3	16,1
				60	0,5	1,0	1,7	2,3	3,0	4,7	6,8	7,4	9,2	12,1
				90	0,4	0,8	1,5	2,0	2,6	4,1	5,9	6,4	8,0	10,5
				120	0,3	0,6	1,1	1,5	2,0	3,1	4,5	4,9	6,2	8,0
Characteristic bond resistance in cracked and uncracked concrete C20/25 up to C50/60 under fire conditions for a given temperature θ														
Temperature reduction factor	$k_{fi,p}(\theta)$	[-]	$\theta < 25°C$		1,0									
			$25°C \leq \theta \leq 278°C$		$176{,}37 \cdot \theta^{-1{,}598} \leq 1{,}0$									
			$\theta > 278°C$		0,0									



Characteristic bond resistance for a given temperature (θ)	$\tau_{Rk,fi}(\theta)$	[N/mm²]	$k_{fi,p}(\theta) \cdot \tau_{Rk,cr,(C20/25)}$ [1)]

Steel failure without lever arm														
Characteristic shear resistance; BSt 500	$V_{Rk,s,fi}$	[kN]	Fire exposure time [min]	30	0,5	1,2	2,3	3,1	4,0	6,3	9,0	9,8	12,3	16,1
				60	0,5	1,0	1,7	2,3	3,0	4,7	6,8	7,4	9,2	12,1
				90	0,4	0,8	1,5	2,0	2,6	4,1	5,9	6,4	8,0	10,5
				120	0,3	0,6	1,1	1,5	2,0	3,1	4,5	4,9	6,2	8,0
Steel failure with lever arm														
Characteristic bending moment; BSt 500	$M^0_{Rk,s,fi}$	[Nm]	Fire exposure time [min]	30	0,6	1,8	4,1	6,5	9,7	18,8	32,6	36,8	51,7	77,2
				60	0,5	1,5	3,1	4,8	7,2	14,1	24,4	27,6	38,8	57,9
				90	0,4	1,2	2,6	4,2	6,3	12,3	21,2	23,9	33,6	50,2
				120	0,3	0,9	2,0	3,2	4,8	9,4	16,3	18,4	25,9	38,6

[1)] $\tau_{Rk,cr,(C20/25)}$ characteristic bond resistance for cracked concrete for concrete strength class C20/25 for the relevant temperature range and working life.

Sika AnchorFix-3040 for concrete	**Annex C 31**
Performances Characteristic values of tension and shear loads under fire exposure (reinforcing bar)	

8 DOCUMENTAZIONE TECNICA APPROPRIATA E/O DOCUMENTAZIONE TECNICA SPECIFICA

La prestazione del prodotto sopra identificato è conforme all'insieme delle prestazioni dichiarate. La presente dichiarazione di responsabilità viene emessa, in conformità al regolamento (UE) n. 305/2011, sotto la sola responsabilità del fabbricante sopra identificato.

Firmato a nome e per conto del fabbricante da:

Name : Viviana Sala
Function: PE Refurbishment
At Castel D'Azzano
on 09 June 2026

Viviana Sala

Name : Luigi Perrino
Function: Head of R&D Quality Control
At Castel D'Azzano
on 09 June 2026

End of information as required by Regulation (EU) No 305/2011

LABEL CE COMPLETA

CE

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Sika Services AG, Zurich, Switzerland

DoP No. 54007967

EAD 330499-02-0601-v01

Notified Body 2873

Sistema di ancoraggio con barre filettate e d'armatura post istallate mediante Sika AnchorFix®-3040

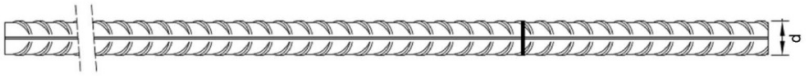
Table A1: Materials

Part	Designation	Material				
Steel, zinc plated (Steel acc. to EN ISO 683-4:2018 or EN 10263:2017) - zinc plated ≥ 5 µm acc. to EN ISO 4042:2022 or - hot-dip galvanised ≥ 40 µm acc. to EN ISO 1461:2022 and EN ISO 10684:2004 + AC:2009 or - sherardized ≥ 45 µm acc. to EN ISO 17668:2016						
1	Threaded rod	Property class		Characteristic steel ultimate tensile strength	Characteristic steel yield strength	Elongation at fracture
		acc. to EN ISO 898-1:2013	4.6	f_{uk} = 400 N/mm²	f_{yk} = 240 N/mm²	A_5 > 8%
			4.8	f_{uk} = 400 N/mm²	f_{yk} = 320 N/mm²	A_5 > 8%
			5.6	f_{uk} = 500 N/mm²	f_{yk} = 300 N/mm²	A_5 > 8%
			5.8	f_{uk} = 500 N/mm²	f_{yk} = 400 N/mm²	A_5 > 8%
			8.8	f_{uk} = 800 N/mm²	f_{yk} = 640 N/mm²	A_5 ≥ 12%3)
2	Hexagon nut	acc. to EN ISO 898-2:2022	4	for anchor rod class 4.6 or 4.8		
			5	for anchor rod class 5.6 or 5.8		
			8	for anchor rod class 8.8		
3a	Washer	Steel, zinc plated, hot-dip galvanised or sherardized (e.g.: EN ISO 887:2006, EN ISO 7089:2000, EN ISO 7093:2000 or EN ISO 7094:2000)				
3b	Filling washer	Steel, zinc plated, hot-dip galvanised or sherardized				
4	Internal threaded anchor rod	Property class		Characteristic steel ultimate tensile strength	Characteristic steel yield strength	Elongation at fracture
		acc. to EN ISO 898-1:2013	5.8	f_{uk} = 500 N/mm²	f_{yk} = 400 N/mm²	A_5 > 8%
			8.8	f_{uk} = 800 N/mm²	f_{yk} = 640 N/mm²	A_5 > 8%
Stainless steel A2 (Material 1.4301 / 1.4307 / 1.4311 / 1.4567 or 1.4541, acc. to EN 10088-1:2023) **Stainless steel A4** (Material 1.4401 / 1.4404 / 1.4571 / 1.4362 or 1.4578, acc. to EN 10088-1:2023) **High corrosion resistance steel** (Material 1.4529 or 1.4565, acc. to EN 10088-1:2023)						
1	Threaded rod1)4)	Property class		Characteristic steel ultimate tensile strength	Characteristic steel yield strength	Elongation at fracture
		acc. to EN ISO 3506-1:2020	50	f_{uk} = 500 N/mm²	f_{yk} = 210 N/mm²	A_5 ≥ 8%
			70	f_{uk} = 700 N/mm²	f_{yk} = 450 N/mm²	A_5 ≥ 12%3)
			80	f_{uk} = 800 N/mm²	f_{yk} = 600 N/mm²	A_5 ≥ 12%3)
2	Hexagon nut1)4)	acc. to EN ISO 3506-1:2020	50	for anchor rod class 50		
			70	for anchor rod class 70		
			80	for anchor rod class 80		
3a	Washer	A2: Material 1.4301 / 1.4307 / 1.4311 / 1.4567 or 1.4541, acc. to EN 10088-1:2023 A4: Material 1.4401 / 1.4404 / 1.4571 / 1.4362 or 1.4578, acc. to EN 10088-1:2023 HCR: Material 1.4529 or 1.4565, acc. to EN 10088-1:2023 (e.g.: EN ISO 887:2006, EN ISO 7089:2000, EN ISO 7093:2000 or EN ISO 7094:2000)				
3b	Filling washer	Stainless steel A4, High corrosion resistance steel				
4	Internal threaded anchor rod 1)2)	Property class		Characteristic steel ultimate tensile strength	Characteristic steel yield strength	Elongation at fracture
		acc. to EN ISO 3506-1:2020	50	f_{uk} = 500 N/mm²	f_{yk} = 210 N/mm²	A_5 > 8%
			70	f_{uk} = 700 N/mm²	f_{yk} = 450 N/mm²	A_5 > 8%

1) Property class 70 or 80 for anchor rods and hexagon nuts up to M24 and Internal threaded anchor rods up to IG-M16
2) for IG-M20 only property class 50
3) A_5 > 8% fracture elongation if no use for seismic performance category C2
4) Property class 80 only for stainless steel A4 and HCR

Sika AnchorFix-3040 for concrete	**Annex A 4**
Product description Materials threaded rod, Internal threaded anchor rod and filling washer	

Reinforcing bar: ø8 up to ø40



Minimum value of related rip area $f_{R,min}$ according to EN 1992-1-1:2004 + AC:2010
Rib height of the bar shall be in the range $0{,}05d \le h_{rib} \le 0{,}07d$
(d: Nominal diameter of the bar; h_{rib}: Rib height of the bar)

Table A2: Materials Reinforcing bar

Part	Designation	Material
Rebar		
1	Reinforcing steel according to EN 1992-1-1:2004 + AC:2010, Annex C	Bars and rebars from ring class B or C f_{yk} and k according to NDP or NCI according to EN 1992-1-1/NA $f_{uk} = f_{tk} = k \cdot f_{yk}$

Specification of the intended use

Fasteners subject to (Static and quasi-static loads):

	Working life 50 years		Working life 100 years	
	in concrete C20/25 to C90/105 without fibers and in concrete C20/25 to C50/60 with fibers[5]			
Base material	uncracked concrete	cracked concrete	uncracked concrete	cracked concrete
HD: Hammer drilling HDB: Hammer drilling with hollow drill bit CD: Compressed air drilling	M8 to M30, Ø8 to Ø32, IG-M6 to IG-M20		M8 to M30, Ø8 to Ø32, IG-M6 to IG-M20	
HD: Hammer drilling CD: Compressed air drilling	Ø36 to Ø40	No performance assessed	Ø36 to Ø40	No performance assessed
DD: Diamond drilling	M8 to M30, Ø8 to Ø40, IG-M6 to IG-M20	M16 to M30[4] IG-M10 to IG-M20[4]	M8 to M30, Ø8 to Ø40, IG-M6 to IG-M20	No performance assessed
Temperature Range:	I: - 40°C to +40°C[1] II: - 40°C to +72°C[2] III: - 40°C to +80°C[3]		I: - 40°C to +40°C[1] II: - 40°C to +72°C[2] III: - 40°C to +80°C[3]	

Fasteners subject to (seismic action):

	Performance Category C1	Performance Category C2
Base material	Cracked and uncracked concrete C20/25 to C50/60 with and without fibers[5]	
HD: Hammer drilling HDB: Hammer drilling with hollow drill bit CD: Compressed air drilling	M8 to M30, Ø8 to Ø32	M12 to M30
DD: Diamond drilling	No performance assessed	No performance assessed
Temperature Range:	I: - 40°C to +40°C[1] II: - 40°C to +72°C[2] III: - 40°C to +80°C[3]	I: - 40°C to +40°C[1] II: - 40°C to +72°C[2] III: - 40°C to +80°C[3]

Fasteners subject to (fire exposure):

Base material	Cracked and uncracked concrete C20/25 to C90/105 without fibers and in cracked and uncracked concrete C20/25 to C50/60 with fibers[5]
HD: Hammer drilling HDB: Hammer drilling with hollow drill bit CD: Compressed air drilling	M8 to M30, Ø8 to Ø32, IG-M6 to IG-M20
DD: Diamond drilling	No performance assessed
Temperature Range:	I: - 40°C to +40°C[1] II: - 40°C to +72°C[2] III: - 40°C to +80°C[3]

[1] (max. long-term temperature +24°C and max. short-term temperature +40°C)
[2] (max. long-term temperature +50°C and max. short-term temperature +72°C)
[3] (max. long-term temperature +60°C and max. short-term temperature +80°C)
[4] only C20/25 to C50/60 and without fibers
[5] with fibers only by hammer (HD), hollow (HDB) or compressed air drilling mode (CD)

Sika AnchorFix-3040 for concrete	**Annex B 1**
Intended use Specifications	

Base materials:
- Compacted, reinforced or unreinforced normal weight concrete with strength classes C20/25 to C90/105 according to EN 206:2013 + A2:2021.
- Steel fiber reinforced concrete according to EN 206:2013 + A2:2021 with steel fibers according to EN 14889-1:2006, section 5, group 1, with a maximum fiber content of 80kg/m³.

Use conditions (Environmental conditions):

For working life for at least 50 and / or 100 years
- Structures subject to dry internal conditions (all materials).
- For all other conditions according to EN 1993-1-4:2006 + A1:2015 corresponding to corrosion resistance class:
  - Stainless steel A2 according to Annex A 4, Table A1: CRC II
  - Stainless steel A4 according to Annex A 4, Table A1: CRC III
  - High corrosion resistance steel HCR according to Annex A 4, Table A1: CRC V

For variable working life
- Structures subject to internal and external conditions: Classification of atmospheric corrosivity, determination and estimation C1-CX according to EN ISO 9223:2012 Table C.1 for a variable working life according to Table B1.
  - Carbon steel, hot dip galvanized according to EN ISO 10684:2004 + AC:2009 with mean thickness ≥ 50 µm

Table B1: Variable working life

Corrosivity category[1)]	Corrosivity	Working life (years)
C1	Very low	50
C2	Low	50
C3	Medium	25
C4	High	12,5
C5	Very High	5
CX	Extreme	2

1) Corrosivity categories according to EN ISO 9223:2012, Table C.1

Design:
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the fastener is indicated on the design drawings (e. g. position of the fastener relative to reinforcement or to supports, etc.).
- Fasteners are designed under the responsibility of an engineer experienced in fasteners and concrete work.
- The fasteners are designed in accordance to EN 1992-4:2018 and Technical Report TR 055, Edition February 2018.
- Fasteners in steel fiber reinforced concrete may be designed in accordance with EN 1992-4:2018. All performance parameters are to be applied as for normal concrete of strength classes C20/25 to C50/60 without fibers.
- The fasteners under fire exposure are designed in accordance to Technical Report TR 082, Edition June 2023.

Installation:
- Dry, wet concrete or flooded bore holes (not sea-water).
- Hole drilling by hammer (HD), hollow (HDB), compressed air (CD) or diamond drill mode (DD).
- Overhead installation allowed.
- Fastener installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.

Sika AnchorFix-3040 for concrete	**Annex B 2**
Intended use Specifications (Continued)	

Table B2: Installation parameters for threaded rod

Threaded rod				M8	M10	M12	M16	M20	M24	M27	M30
Diameter of element		$d = d_{nom}$	[mm]	8	10	12	16	20	24	27	30
Nominal drill hole diameter		d_0	[mm]	10	12	14	18	22	28	30	35
Effective embedment depth		$h_{ef,min}$	[mm]	60	60	70	80	90	96	108	120
		$h_{ef,max}$	[mm]	160	200	240	320	400	480	540	600
Diameter of clearance hole in the fixture	Prepositioned installation	$d_f \leq$	[mm]	9	12	14	18	22	26	30	33
	Push through installation	d_f	[mm]	12	14	16	20	24	30	33	40
Maximum installation torque		max T_{inst}	[Nm]	10	20	40[1]	60	100	170	250	300
Minimum thickness of member		h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 mm			h_{ef} + 2d_0				
Minimum spacing		s_{min}	[mm]	40	50	60	75	95	115	125	140
Minimum edge distance		c_{min}	[mm]	35	40	45	50	60	65	75	80

1) Maximum installation torque for M12 with steel Grade 4.6 is 35 Nm

Table B3: Installation parameters for reinforcing bar

Reinforcing bar			Ø 8[1]	Ø 10[1]	Ø 12[1]	Ø 14	Ø 16	Ø 20	Ø 24[1]	Ø 25[1]	Ø 28	Ø 32	Ø 36	Ø 40
Diameter of element	$d = d_{nom}$	[mm]	8	10	12	14	16	20	24	25	28	32	36	40
Nominal drill hole diameter	d_0	[mm]	10 12	12 14	14 16	18	20	25	30 32	30 32	35	40	45	52/55
Effective embedment depth	$h_{ef,min}$	[mm]	60	60	70	75	80	90	96	100	112	128	144	160
	$h_{ef,max}$	[mm]	160	200	240	280	320	400	480	500	560	640	720	800
Minimum thickness of member	h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 mm			h_{ef} + 2d_0								
Minimum spacing	s_{min}	[mm]	40	50	60	70	75	95	120	120	130	150	180	200
Minimum edge distance	c_{min}	[mm]	35	40	45	50	50	60	70	70	75	85	180	200

1) both nominal drill hole diameter can be used

Table B4: Installation parameters for Internal threaded anchor rod

Internal threaded anchor rod			IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Internal diameter of anchor rod	d_2	[mm]	6	8	10	12	16	20
Outer diameter of anchor rod[1]	$d = d_{nom}$	[mm]	10	12	16	20	24	30
Nominal drill hole diameter	d_0	[mm]	12	14	18	22	28	35
Effective embedment depth	$h_{ef,min}$	[mm]	60	70	80	90	96	120
	$h_{ef,max}$	[mm]	200	240	320	400	480	600
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	7	9	12	14	18	22
Maximum installation torque	max T_{inst}	[Nm]	10	10	20	40	60	100
Thread engagement length min/max	l_{IG}	[mm]	8/20	8/20	10/25	12/30	16/32	20/40
Minimum thickness of member	h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 mm		h_{ef} + 2d_0			
Minimum spacing	s_{min}	[mm]	50	60	75	95	115	140
Minimum edge distance	c_{min}	[mm]	40	45	50	60	65	80

1) With metric threads

Sika AnchorFix-3040 for concrete

Intended use
Installation parameters

Annex B 3

Table B7: Working and curing time

Temperature in base material			Maximum working time	Minimum curing time[1]
T			t_{work}	t_{cure}
+ 0 °C	to	+ 4 °C	80 min	144 h
+ 5 °C	to	+ 9 °C	80 min	48 h
+ 10 °C	to	+ 14 °C	60 min	28 h
+ 15 °C	to	+ 19 °C	40 min	18 h
+ 20 °C	to	+ 24 °C	30 min	12 h
+ 25 °C	to	+ 34 °C	12 min	9 h
+ 35 °C	to	+ 39 °C	8 min	6 h
+ 40 °C			8 min	4 h
Cartridge temperature			+5°C to +40°C	

1) The minimum curing time is only valid for dry base material.
In wet base material the curing time must be doubled.

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