

IZJAVA O LASTNOSTIH
DoP Nr. MKT-331 – sl

1. Enotna identifikacijska oznaka tipa proizvoda: **MKT Injektionssystem VME**
2. Tip, serijska ali zaporedna številka ali kateri koli drug element, na podlagi katerega je mogoče prepoznati gradbene proizvode, v skladu s členom 11(4):

ETA-09/0350, dodatek A1, A3
Serijska številka je odtisnjena na nalepki ali embalaži

3. Predvidena uporaba ali predvidene vrste uporabe gradbenega proizvoda v skladu z veljavno harmonizirano tehnično specifikacijo, kot jih predvideva proizvajalec:

generični tip	Povezovalno sidro
za uporabo v	Beton z razpokami in brez razpok C20/25 - C50/60 (EN 206)
opcija / kategorija	1
obremenitev	Statično in skoraj statično, potres kategorija C1 (M12–M30 in Ø12–Ø32) in C2 (M12, M16)
material	<u>armaturna palice (B 500 B):</u> velikosti: beton brez razpok: Ø8, Ø10, Ø12, Ø14, Ø16, Ø20, Ø25, Ø28, Ø32 beton z razpokami: Ø12, Ø14, Ø16, Ø20, Ø25, Ø28, Ø32 <u>pocinkano jeklo:</u> samo pod pogoji suhe notranjosti velikosti: beton brez razpok: M8, M10, M12, M16, M20, M24, M27, M30 beton z razpokami: M12, M16, M20, M24, M27, M30 <u>nerjaveče jeklo (oznaka A4):</u> notranja in zunanja uporaba brez posebnih agresivnih pogojev velikosti: beton brez razpok: M8, M10, M12, M16, M20, M24, M27, M30 beton z razpokami: M12, M16, M20, M24, M27, M30 <u>zelo korozijsko odporno jeklo (oznaka HCR)</u> notranja in zunanja uporaba pod agresivnimi pogoji velikosti: beton brez razpok: M8, M10, M12, M16, M20, M24, M27, M30 beton z razpokami: M12, M16, M20, M24, M27, M30
temperaturno območje	območje I: -40 °C - +40 °C območje II: -40 °C - +60 °C območje III: -40 °C - +72 °C

4. Ime, registrirano trgovsko ime ali registrirana blagovna znamka in naslov proizvajalca v skladu s členom 11(5):

MKT Metall-Kunststoff-Technik GmbH & Co. KG
Auf dem Immel 2
D - 67685 Weilerbach

5. Po potrebi ime ali naslov pooblaščenega zastopnika, katerega pooblastilo zajema naloge, opredeljene v členu 12(2): --
6. Sistem ali sistemi ocenjevanja in preverjanja nespremenljivosti lastnosti gradbenega proizvoda, kot je določeno v Prilogi V: **sistem 1**

7. Za izjavo o lastnostih glede gradbenega proizvoda, za katerega velja harmoniziran standard:

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8. Za izjavo o lastnostih glede gradbenega proizvoda, za katerega je bila izdana evropska tehnična ocena:

Deutsches Institut für Bautechnik, Berlin

izdal:

ETA-09/0350

na podlagi

ETAG 001-5

Prijavljeni proizvod certifikacijski organ 1343-CPR je treba uvesti v sistem 1:

- i) določitve tipa proizvoda na podlagi preskušanja tipa (vključno z vzorčenjem), izračuna tipa, vrednosti iz preglednice ali opisne dokumentacije proizvoda;
- ii) začetnega pregleda proizvodnega obrata in tovarniške kontrole proizvodnje;
- iii) stalnega nadzora, ocenjevanja in vrednotenja tovarniške kontrole proizvodnje.

in izdal: Potrdilo o nespremenljivosti lastnosti 1343-CPR-M 550-5

9. Navedena lastnost:

Bistvene značilnosti	Metoda ocenjevanja	Lastnost		Harmonizirane tehnične specifikacije
		Gewindestange	Betonstahl	
charakteristická únosnosť v ťahu	TR 029, CEN/TS 1992-4 TR 045	dodatek C1, C2	dodatek C4, C5	ETAG 001
charakteristická únosnosť v šmyku	TR 029, CEN/TS 1992-4 TR 045	dodatek C3	dodatek C6	
odstopanja v dovoljenih mejah uporabnosti	TR 029, CEN/TS 1992-4	dodatek C7	dodatek C8	

Zahteve, ki jih izpolnjuje produkt, kadar se je v skladu s členoma 37 in 38 uporabila specifična tehnična dokumentacija: --

10. Lastnosti proizvoda, navedenega v točki 1 in 2, so v skladu z navedenimi lastnostmi iz točke 9.

Za izdajo te izjave o lastnostih je odgovoren izključno proizvajalec, naveden v točki 4:

Podpisal za in v imenu proizvajalca:


Lore Weustenhagen
(Vodja)
Weilerbach, 29.01.15

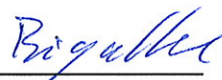
i.V. 
Dipl.-Ing. Detlef Bigalke
(Vodja razvoja izdelkov)



Table C1: Characteristic values for **threaded rods** under **tension loads** in **non-cracked concrete** (Design according to TR 029 or CEN/TS 1992-4)

Anchor size threaded rod				M8	M10	M12	M16	M20	M24	M27	M30
Steel failure											
Characteristic tension resistance, Steel, property class 4.6	N _{Rk,s}	[kN]	15	23	34	63	98	141	184	224	
Characteristic tension resistance, Steel, property class 5.8	N _{Rk,s}	[kN]	18	29	42	78	122	176	230	280	
Characteristic tension resistance, Steel, property class 8.8	N _{Rk,s}	[kN]	29	46	67	125	196	282	368	449	
Characteristic tension resistance, Stainless steel A4 and HCR, property class 50 (>M24) and 70 (≤ M24)	N _{Rk,s}	[kN]	26	41	59	110	171	247	230	281	
Combined pullout and concrete cone failure											
Characteristic bond resistance in non-cracked C20/25											
Temperature range I: 40°C/24°C	dry and wet concrete	τ _{Rk,ucr}	[N/mm²]	15	15	15	14	13	12	12	12
	flooded bore hole	τ _{Rk,ucr}	[N/mm²]	15	14	13	10	9,5	8,5	7,5	7,0
Temperature range II: 60°C/43°C	dry and wet concrete	τ _{Rk,ucr}	[N/mm²]	9,5	9,5	9,0	8,5	8,0	7,5	7,5	7,5
	flooded bore hole	τ _{Rk,ucr}	[N/mm²]	9,5	9,5	9,0	8,5	7,5	7,0	6,5	6,0
Temperature range III: 72°C/43°C	dry and wet concrete	τ _{Rk,ucr}	[N/mm²]	8,5	8,5	8,0	7,5	7,0	7,0	6,5	6,5
	flooded bore hole	τ _{Rk,ucr}	[N/mm²]	8,5	8,5	8,0	7,5	7,0	6,0	5,5	5,5
Increasing factors for concrete	ψ _c	C30/37	1,04								
		C40/50	1,08								
		C50/60	1,10								
Factor according to CEN/TS 1992-4-5 Section 6.2.2.3	k ₈	[-]	10,1								
Concrete cone failure											
Factor according to CEN/TS 1992-4-5 Section 6.2.3.1	k _{ucr}	[-]	10,1								
Edge distance	c _{cr,N}	[mm]	1,5 h _{ef}								
Spacing	s _{cr,N}	[mm]	3,0 h _{ef}								
Splitting failure											
Edge distance	c _{cr,sp}	[mm]	$1,0 \cdot h_{ef} \leq 2 \cdot h_{ef} \left(2,5 - \frac{h}{h_{ef}} \right) \leq 2,4 \cdot h_{ef}$								
Spacing	s _{cr,sp}	[mm]	2 c _{cr,sp}								
Installation safety factor (dry and wet concrete)	γ ₂ = γ _{inst}	[-]	1,2					1,4			
Installation safety factor (flooded bore hole)	γ ₂ = γ _{inst}	[-]	1,4								
Injection System VME for concrete									Annex C1		
Performances											
Characteristic values for threaded rods under tension loads in non-cracked concrete (Design according to TR 029 or CEN/TS 1992-4)											

Table C2: Characteristic values for **threaded rods** under **tension loads** in **cracked concrete**
(Design according to TR 029 or CEN/TS 1992-4 or TR 045)

Anchor size threaded rod				M12	M16	M20	M24	M27	M30
Steel failure									
Characteristic tension resistance, Steel, property class 4.6	$N_{Rk,s} = N_{Rk,s,seis}$	[kN]	34	63	98	141	184	224	
Characteristic tension resistance, Steel, property class 5.8	$N_{Rk,s} = N_{Rk,s,seis}$	[kN]	42	78	122	176	230	280	
Characteristic tension resistance, Steel, property class 8.8	$N_{Rk,s} = N_{Rk,s,seis}$	[kN]	67	125	196	282	368	449	
Characteristic tension resistance, Stainless steel A4 and HCR, property class 50 (>M24) and 70 (≤ M24)	$N_{Rk,s} = N_{Rk,s,seis}$	[kN]	59	110	171	247	230	281	
Combined pullout and concrete cone failure									
Characteristic bond resistance in cracked concrete C20/25									
Temperature range I: 40°C/24°C	dry and wet concrete	$\tau_{Rk,cr}$	[N/mm ²]	7,5	6,5	6,0	5,5	5,5	5,5
		$\tau_{Rk,seis,C1}$	[N/mm ²]	7,1	6,2	5,7	5,5	5,5	5,5
		$\tau_{Rk,seis,C2}$	[N/mm ²]	2,4	2,2	No Performance Determined (NPD)			
	flooded bore hole	$\tau_{Rk,cr}$	[N/mm ²]	7,5	6,0	5,0	4,5	4,0	4,0
		$\tau_{Rk,seis,C1}$	[N/mm ²]	7,1	5,8	4,8	4,5	4,0	4,0
		$\tau_{Rk,seis,C2}$	[N/mm ²]	2,4	2,1	No Performance Determined (NPD)			
Temperature range II: 60°C/43°C	dry and wet concrete	$\tau_{Rk,cr}$	[N/mm ²]	4,5	4,0	3,5	3,5	3,5	3,5
		$\tau_{Rk,seis,C1}$	[N/mm ²]	4,3	3,8	3,4	3,5	3,5	3,5
		$\tau_{Rk,seis,C2}$	[N/mm ²]	1,4	1,4	No Performance Determined (NPD)			
	flooded bore hole	$\tau_{Rk,cr}$	[N/mm ²]	4,5	4,0	3,5	3,5	3,5	3,5
		$\tau_{Rk,seis,C1}$	[N/mm ²]	4,3	3,8	3,4	3,5	3,5	3,5
		$\tau_{Rk,seis,C2}$	[N/mm ²]	1,4	1,4	No Performance Determined (NPD)			
Temperature range III: 72°C/43°C	dry and wet concrete	$\tau_{Rk,cr}$	[N/mm ²]	4,0	3,5	3,0	3,0	3,0	3,0
		$\tau_{Rk,seis,C1}$	[N/mm ²]	3,9	3,4	3,0	3,0	3,0	3,0
		$\tau_{Rk,seis,C2}$	[N/mm ²]	1,3	1,2	No Performance Determined (NPD)			
	flooded bore hole	$\tau_{Rk,cr}$	[N/mm ²]	4,0	3,5	3,0	3,0	3,0	3,0
		$\tau_{Rk,seis,C1}$	[N/mm ²]	3,9	3,4	3,0	3,0	3,0	3,0
		$\tau_{Rk,seis,C2}$	[N/mm ²]	1,3	1,2	No Performance Determined (NPD)			
Increasing factors for concrete (only static or quasi-static actions)	ψ_c	C30/37	[-]	1,04					
		C40/50	[-]	1,08					
		C50/60	[-]	1,10					
Factor according to CEN/TS 1992-4-5 Section 6.2.2.3	k_8	[-]	7,2						
Concrete cone failure									
Factor according to CEN/TS 1992-4-5 Section 6.2.3.1	k_{cr}	[-]	7,2						
Edge distance	$C_{cr,N}$	[mm]	1,5 h_{ef}						
Spacing	$S_{cr,N}$	[mm]	3,0 h_{ef}						
Installation safety factor (dry and wet concrete)	$\gamma_2 = \gamma_{inst}$	[-]	1,2			1,4			
Installation safety factor (flooded bore hole)	$\gamma_2 = \gamma_{inst}$	[-]	1,4						

Injection System VME for concrete

Performances

Characteristic values for **threaded rods** under tension loads in cracked concrete
(Design according to TR 029 or CEN/TS 1992-4 or TR 045)

Annex C2

Table C3: Characteristic values for **threaded rods** under **shear loads** in cracked and non-cracked concrete (Design according to TR 029 or CEN/TS 1992-4 or TR 045)

Anchor size threaded rod			M8	M10	M12	M16	M20	M24	M27	M30
Steel failure without lever arm										
Characteristic shear resistance, Steel, property class 4.6	$V_{Rk,s}$	[kN]	7	12	17	31	49	71	92	112
	$V_{Rk,s,seis,C1}$	[kN]	No Performance Determined (NPD)		14	27	42	56	72	88
	$V_{Rk,s,seis,C2}$	[kN]			13	25	No Performance Determined (NPD)			
Characteristic shear resistance, Steel, property class 5.8	$V_{Rk,s}$	[kN]	9	15	21	39	61	88	115	140
	$V_{Rk,s,seis,C1}$	[kN]	No Performance Determined (NPD)		18	34	53	70	91	111
	$V_{Rk,s,seis,C2}$	[kN]			17	31	No Performance Determined (NPD)			
Characteristic shear resistance, Steel, property class 8.8	$V_{Rk,s}$	[kN]	15	23	34	63	98	141	184	224
	$V_{Rk,s,seis,C1}$	[kN]	No Performance Determined (NPD)		30	55	85	111	145	177
	$V_{Rk,s,seis,C2}$	[kN]			27	50	No Performance Determined (NPD)			
Characteristic shear resistance, Stainless steel A4 and HCR, property class 50 (>M24) and 70 (≤ M24)	$V_{Rk,s}$	[kN]	13	20	30	55	86	124	115	140
	$V_{Rk,s,seis,C1}$	[kN]	No Performance Determined (NPD)		26	48	75	98	91	111
	$V_{Rk,s,seis,C2}$	[kN]			24	44	No Performance Determined (NPD)			
Ductility factor according to CEN/TS 1992-4-5 Section 6.3.2.1	k_2	[-]	0,8							
Steel failure with lever arm										
Characteristic bending moment, Steel, property class 4.6	$M^0_{Rk,s}$	[Nm]	15	30	52	133	260	449	666	900
	$M^0_{Rk,s,seis,C1}$	[Nm]	No Performance Determined (NPD)							
	$M^0_{Rk,s,seis,C2}$	[Nm]								
Characteristic bending moment, Steel, property class 5.8	$M^0_{Rk,s}$	[Nm]	19	37	65	166	324	560	833	1123
	$M^0_{Rk,s,seis,C1}$	[Nm]	No Performance Determined (NPD)							
	$M^0_{Rk,s,seis,C2}$	[Nm]								
Characteristic bending moment, Steel, property class 8.8	$M^0_{Rk,s}$	[Nm]	30	60	105	266	519	896	1333	1797
	$M^0_{Rk,s,seis,C1}$	[Nm]	No Performance Determined (NPD)							
	$M^0_{Rk,s,seis,C2}$	[Nm]								
Characteristic bending moment, Stainless steel A4 and HCR, property class 50 (>M24) and 70 (≤ M24)	$M^0_{Rk,s}$	[Nm]	26	52	92	232	454	784	832	1125
	$M^0_{Rk,s,seis,C1}$	[Nm]	No Performance Determined (NPD)							
	$M^0_{Rk,s,seis,C2}$	[Nm]								
Concrete pryout failure										
Factor k acc. to TR 029 and k ₃ acc. to CEN/TS 1992-4 Section 6.3.3	k ₍₃₎	[-]	2,0							
Concrete edge failure										
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	27	30
Installation safety factor	γ ₂ = γ _{inst}	[-]	1,0							

Injection System VME for concrete

Performances

Characteristic values for **threaded rods** under shear loads in cracked and non-cracked concrete (Design according to TR 029 or CEN/TS 1992-4 or TR 045)

Annex C3

Table C4: Characteristic values for **rebar** under **tension loads** in **non-cracked concrete**
(Design according to TR 029 or CEN/TS 1992-4)

Rebar size				Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Steel failure												
Characteristic tension resistance		N _{Rk,s}	[kN]	A _s • f _{uk}								
Combined pullout and concrete cone failure												
Characteristic bond resistance in non-cracked concrete C20/25												
Temperature range I: 40°C/24°C	dry and wet concrete	τ _{Rk,ucr}	[N/mm²]	14	14	13	13	12	12	11	11	11
	flooded bore hole	τ _{Rk,ucr}	[N/mm²]	14	13	11	10	9,5	8,5	7,5	7,0	6,0
Temperature range II: 60°C/43°C	dry and wet concrete	τ _{Rk,ucr}	[N/mm²]	8,5	8,5	8,0	8,0	7,5	7,0	7,0	6,5	6,5
	flooded bore hole	τ _{Rk,ucr}	[N/mm²]	8,5	8,5	8,0	8,0	7,5	7,0	6,0	5,5	5,0
Temperature range III: 72°C/43°C	dry and wet concrete	τ _{Rk,ucr}	[N/mm²]	7,5	7,5	7,5	7,0	7,0	6,5	6,0	6,0	6,0
	flooded bore hole	τ _{Rk,ucr}	[N/mm²]	7,5	7,5	7,5	7,0	7,0	6,0	5,5	5,0	4,5
Increasing factors for non-cracked concrete	ψ _c	C30/37	[-]	1,04								
		C40/50	[-]	1,08								
		C50/60	[-]	1,10								
Factor according to CEN/TS 1992-4-5 Section 6.2.2.3		k ₈	[-]	10,1								
Concrete cone failure												
Factor according to CEN/TS 1992-4-5 Section 6.2.3.1		k _{ucr}	[-]	10,1								
Edge distance		C _{cr,N}	[mm]	1,5 h _{ef}								
Spacing		S _{cr,N}	[mm]	3,0 h _{ef}								
Splitting failure												
Edge distance		C _{cr,sp}	[mm]	$1,0 \cdot h_{ef} \leq 2 \cdot h_{ef} \left(2,5 - \frac{h}{h_{ef}} \right) \leq 2,4 \cdot h_{ef}$								
Spacing		S _{cr,sp}	[mm]	2 C _{cr,sp}								
Installation safety factor (dry and wet concrete)		γ ₂ = γ _{inst}	[-]	1,2					1,4			
Installation safety factor (flooded bore hole)		γ ₂ = γ _{inst}	[-]	1,4								

Injection System VME for concrete

Performances

Characteristic values of resistance for **rebar** under tension loads in non-cracked concrete
(Design according to TR 029 or CEN/TS 1992-4)

Annex C4

Table C5: Characteristic values for **rebar** under **tension loads** in **cracked concrete**
(Design according to TR 029 or CEN/TS 1992-4 or TR 045)

Rebar size				Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	Ø 28	Ø 32
Steel failure										
Characteristic tension resistance			$N_{Rk,s}=N_{Rk,s,seis,C1}$	[kN]	$A_s \cdot f_{uk}$					
Combined pullout and concrete cone failure										
Characteristic bond resistance in cracked concrete C20/25										
Temperature range I: 40°C/24°C	dry and wet concrete	$\tau_{Rk,cr}$	[N/mm²]	7,5	7,0	6,5	6,0	5,5	5,5	5,5
		$\tau_{Rk,seis,C1}$	[N/mm²]	6,9	6,4	6,2	5,7	5,5	5,5	5,5
	flooded bore hole	$\tau_{Rk,cr}$	[N/mm²]	7,5	6,5	6,0	5,0	4,5	4,0	4,0
		$\tau_{Rk,seis,C1}$	[N/mm²]	6,9	6,0	5,7	4,8	4,5	4,0	4,0
Temperature range II: 60°C/43°C	dry and wet concrete	$\tau_{Rk,cr}$	[N/mm²]	4,5	4,0	4,0	3,5	3,5	3,5	3,5
		$\tau_{Rk,seis,C1}$	[N/mm²]	4,1	3,7	3,8	3,3	3,5	3,5	3,5
	flooded bore hole	$\tau_{Rk,cr}$	[N/mm²]	4,5	4,0	4,0	3,5	3,5	3,5	3,0
		$\tau_{Rk,seis,C1}$	[N/mm²]	4,1	3,7	3,8	3,3	3,5	3,5	3,0
Temperature range III: 72°C/43°C	dry and wet concrete	$\tau_{Rk,cr}$	[N/mm²]	4,0	3,5	3,5	3,0	3,0	3,0	3,0
		$\tau_{Rk,seis,C1}$	[N/mm²]	3,7	3,2	3,3	2,9	3,0	3,0	3,0
	flooded bore hole	$\tau_{Rk,cr}$	[N/mm²]	4,0	3,5	3,5	3,0	3,0	3,0	3,0
		$\tau_{Rk,seis,C1}$	[N/mm²]	3,7	3,2	3,3	2,9	3,0	3,0	3,0
Increasing factors for cracked concrete (only static or quasi-static actions)		ψ_c	C30/37	[-]	1,04					
		C40/50	[-]	1,08						
		C50/60	[-]	1,10						
Factor according to CEN/TS 1992-4-5 Section 6.2.2.3		k_8	[-]	7,2						
Concrete cone failure										
Factor according to CEN/TS 1992-4-5 Section 6.2.3.1		k_{cr}	[-]	7,2						
Edge distance		$c_{cr,N}$	[mm]	1,5 h_{ef}						
Spacing		$s_{cr,N}$	[mm]	3,0 h_{ef}						
Installation safety factor (dry and wet concrete)		$\gamma_2 = \gamma_{inst}$	[-]	1,2			1,4			
Installation safety factor (flooded bore hole)		$\gamma_2 = \gamma_{inst}$	[-]	1,4						

Injection System VME for concrete

Performances

Characteristic values of resistance for **rebar** under tension loads in cracked concrete
(Design according to TR 029 or CEN/TS 1992-4 or TR 045)

Annex C5

Table C6: Characteristic values of resistance for **rebar** under **shear loads** in cracked and non-cracked concrete
(Design according to TR 029 or CEN/TS 1992-4 or TR 045)

Rebar size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Steel failure without lever arm											
Characteristic shear resistance	$V_{Rk,s}$	[kN]	$0,50 \cdot A_s \cdot f_{uk}$								
	$V_{Rk,s,seis,C1}$	[kN]	No Performance Determined (NPD)	$0,44 \cdot A_s \cdot f_{uk}$							
Ductility factor according to CEN/TS 1992-4-5 Section 6.3.2.1	k_2	[-]	0,8								
Steel failure with lever arm											
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	$1.2 \cdot W_{el} \cdot f_{uk}$								
	$M^0_{Rk,s,seis,C1}$	[Nm]	No Performance Determined (NPD)								
Concrete pryout failure											
Factor k acc. to TR 029 and k ₃ acc. to CEN/TS 1992-4 Section 6.3.3	$k_{(3)}$	[-]	2,0								
Concrete edge failure											
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	14	16	20	25	28	32
Installation safety factor	$\gamma_2 = \gamma_{inst}$	[-]	1,0								

Injection System VME for concrete

Performances

Characteristic values of resistance for **rebar** under shear loads in cracked and non-cracked concrete
(Design according to TR 029 or CEN/TS 1992-4 or TR 045)

Annex C6

Table C7: Displacements under tension loads¹⁾ (threaded rod)

Anchor size threaded rod			M8	M10	M12	M16	M20	M24	M27	M30
Non-cracked concrete C20/25 under static and quasi-static action										
Temperature range I: 40°C/24°C	δ_{N0} -factor	[mm/(N/mm²)]	0,011	0,013	0,015	0,020	0,024	0,029	0,032	0,035
	$\delta_{N\infty}$ -factor	[mm/(N/mm²)]	0,044	0,052	0,061	0,079	0,096	0,114	0,127	0,140
Temperature range II: 60°C/43°C	δ_{N0} -factor	[mm/(N/mm²)]	0,013	0,015	0,018	0,023	0,028	0,033	0,037	0,043
	$\delta_{N\infty}$ -factor	[mm/(N/mm²)]	0,050	0,060	0,070	0,091	0,111	0,131	0,146	0,161
Temperature range III: 72°C/43°C	δ_{N0} -factor	[mm/(N/mm²)]	0,013	0,015	0,018	0,023	0,028	0,033	0,037	0,043
	$\delta_{N\infty}$ -factor	[mm/(N/mm²)]	0,050	0,060	0,070	0,091	0,111	0,131	0,146	0,161
Cracked concrete C20/25 under static, quasi-static and seismic C1 action										
Temperature range I: 40°C/24°C	δ_{N0} -factor	[mm/(N/mm²)]	No Performance Determined (NPD)	0,032	0,037	0,042	0,048	0,053	0,058	
	$\delta_{N\infty}$ -factor	[mm/(N/mm²)]		0,21	0,21	0,21	0,21	0,21	0,21	
Temperature range II: 60°C/43°C	δ_{N0} -factor	[mm/(N/mm²)]		0,037	0,043	0,049	0,055	0,061	0,067	
	$\delta_{N\infty}$ -factor	[mm/(N/mm²)]		0,24	0,24	0,24	0,24	0,24	0,24	
Temperature range III: 72°C/43°C	δ_{N0} -factor	[mm/(N/mm²)]		0,037	0,043	0,049	0,055	0,061	0,067	
	$\delta_{N\infty}$ -factor	[mm/(N/mm²)]		0,24	0,24	0,24	0,24	0,24	0,24	
Cracked concrete C20/25 under seismic C2 action										
Temperature range I: 40°C/24°C	$\delta_{N,seis}(DLS)$	[mm/(N/mm²)]	No Performance Determined (NPD)	0,03	0,05	No Performance Determined (NPD)				
	$\delta_{N,seis}(ULS)$	[mm/(N/mm²)]		0,06	0,09					
Temperature range II: 60°C/43°C	$\delta_{N,seis}(DLS)$	[mm/(N/mm²)]		0,03	0,05					
	$\delta_{N,seis}(ULS)$	[mm/(N/mm²)]		0,06	0,09					
Temperature range III: 72°C/43°C	$\delta_{N,seis}(DLS)$	[mm/(N/mm²)]		0,03	0,05					
	$\delta_{N,seis}(ULS)$	[mm/(N/mm²)]		0,06	0,09					

¹⁾ Calculation of the displacement

$$\delta_{N0} = \delta_{N0}\text{-factor} \cdot \tau;$$

$$\delta_{N\infty} = \delta_{N\infty}\text{-factor} \cdot \tau;$$

Table C8: Displacement under shear load¹⁾ (threaded rod)

Anchor size threaded rod			M8	M10	M12	M16	M20	M24	M27	M30
Non-cracked and cracked concrete C20/25 under static, quasi-static and seismic C1 action										
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
Cracked concrete C20/25 under seismic C2 action										
All temperature ranges	$\delta_{V,seis}(DLS)$	[mm/kN]	No Performance Determined (NPD)		0,2	0,1	No Performance Determined (NPD)			
	$\delta_{V,seis}(ULS)$	[mm/kN]			0,2	0,1				

¹⁾ Calculation of the displacement

$$\delta_{V0} = \delta_{V0}\text{-factor} \cdot V;$$

$$\delta_{V\infty} = \delta_{V\infty}\text{-factor} \cdot V;$$

Injection System VME for concrete

Performances
Displacements (threaded rod)

Annex C7

Table C9: Displacements under tension load ¹⁾ (rebar)

Rebar size			Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	Ø 28	Ø 32
Non-cracked concrete C20/25 under static and quasi-static action											
Temperature range I: 40°C/24°C	δ _{N0} -factor	[mm/(N/mm²)]	0,011	0,013	0,015	0,018	0,020	0,024	0,030	0,033	0,037
	δ _{N∞} -factor	[mm/(N/mm²)]	0,044	0,052	0,061	0,070	0,079	0,096	0,118	0,132	0,149
Temperature range II: 60°C/43°C	δ _{N0} -factor	[mm/(N/mm²)]	0,013	0,015	0,018	0,020	0,023	0,028	0,034	0,038	0,043
	δ _{N∞} -factor	[mm/(N/mm²)]	0,050	0,060	0,070	0,081	0,091	0,111	0,136	0,151	0,172
Temperature range III: 72°C/43°C	δ _{N0} -factor	[mm/(N/mm²)]	0,013	0,015	0,018	0,020	0,023	0,028	0,034	0,038	0,043
	δ _{N∞} -factor	[mm/(N/mm²)]	0,050	0,060	0,070	0,081	0,091	0,111	0,136	0,151	0,172
Cracked concrete C20/25 under static, quasi-static and seismic C1 action											
Temperature range I: 40°C/24°C	δ _{N0} -factor	[mm/(N/mm²)]	-			0,032	0,035	0,037	0,042	0,049	0,055
	δ _{N∞} -factor	[mm/(N/mm²)]				0,21	0,21	0,21	0,21	0,21	0,21
Temperature range II: 60°C/43°C	δ _{N0} -factor	[mm/(N/mm²)]	-			0,037	0,040	0,043	0,049	0,056	0,063
	δ _{N∞} -factor	[mm/(N/mm²)]				0,24	0,24	0,24	0,24	0,24	0,24
Temperature range III: 72°C/43°C	δ _{N0} -factor	[mm/(N/mm²)]	-			0,037	0,040	0,043	0,049	0,056	0,063
	δ _{N∞} -factor	[mm/(N/mm²)]				0,24	0,24	0,24	0,24	0,24	0,24

¹⁾ Calculation of the displacement

$$\delta_{N0} = \delta_{N0\text{-factor}} \cdot \tau;$$

$$\delta_{N\infty} = \delta_{N\infty\text{-factor}} \cdot \tau;$$

Table C10: Displacement under shear load¹⁾ (rebar)

Rebar size			Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	Ø 28	Ø 32
For concrete C20/25 under static, quasi-static and seismic C1 action											
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
	δ _{V∞} -factor	[mm/(kN)]	0,09	0,08	0,08	0,06	0,06	0,05	0,05	0,04	0,04

¹⁾ Calculation of the displacement

$$\delta_{V0} = \delta_{V0\text{-factor}} \cdot V;$$

$$\delta_{V\infty} = \delta_{V\infty\text{-factor}} \cdot V;$$

Injection System VME for concrete

Performances
Displacements (rebar)

Annex C8