



...eine starke Verbindung

## IZJAVA O SVOJSTVIMA

DoP Br. MKT-2.1-400\_hr

- ✧ **Jedinstvena identifikacijska oznaka vrste proizvoda:** Injekcijski sustav VME
- ✧ **Namjena/namjene:** Injekcijski sustav za sidrenje Beton koji nije ispucan, vidi Prilog/Annex B
- ✧ **Proizvođač:** MKT Metall-Kunststoff-Technik GmbH & Co.KG  
Auf dem Immel 2  
67685 Weilerbach
- ✧ **Sustav/sustavi za ocjenu i provjeru stalnosti svojstava (AVCP):** 1
- ✧ **Europski dokument za ocjenjivanje:** ETAG 001-5  
Europska tehnička ocjena: ETA-13/0773, 01.03.2017  
Tijelo za tehničko ocjenjivanje: DIBt, Berlin  
Prijavljeno tijelo/prijavljena tijela: NB 2873 – Technische Universität Darmstadt
- ✧ **Objavljena svojstva:**

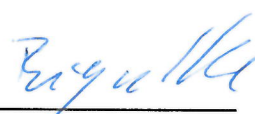
Bitnih značajka	Svojstva
<b>Temeljni zahtjevi za građevine (BWR 1)</b>	
Karakteristične vrijednosti	Prilog/Annex C1 – C4
Pomaci	Prilog/Annex C5 – C6
<b>Sigurnost u slučaju požara (BWR 2)</b>	
Ponašanje požara	Klasa A1
Otpornost na vatru	NPD (No Performance Determined) bez utvrđenog svojstva

Prije utvrđeno svojstvo proizvoda u skladu je s objavljenim svojstvima. Ova izjava o svojstvima izdaje se, u skladu s Uredbom (EU) br. 305/2011, pod isključivom odgovornošću prethodno utvrđenog proizvođača.

Za proizvođača i u njegovo ime potpisao:

  
Stefan Weustenhagen  
(generalni direktor)

Weilerbach, 01.01.2021

p.p.   
Dipl.-Ing. Detlef Bigalke  
(Voditelj razvoja proizvoda)



Izvornik ove izjave o izvedbi pisan je na njemačkom jeziku. U slučaju odstupanja u prijevodu vrijedi njemačka verzija.

## Specifications of intended use

### Anchorage subject to:

- Static and quasi static loads: M10 to M24, rebar Ø10 to Ø25

### Base materials:

- Reinforced or unreinforced normal weight concrete according to EN 206-1:2000
- Strength classes C20/25 to C50/60 according to EN 206-1:2000
- Uncracked concrete: M10 to M24, rebar Ø10 to Ø25

### Temperature Range:

- I: - 40 °C to +40 °C (max long term temperature +24 °C and max short term temperature +40 °C)
- II: - 40 °C to +60 °C (max long term temperature +43 °C and max short term temperature +60 °C)
- III: - 40 °C to +72 °C (max long term temperature +43 °C and max short term temperature +72 °C)

### Use conditions (Environmental conditions):

- Structures subject to dry internal conditions (zinc coated steel, stainless steel or high corrosion resistant steel).
- Structures subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal condition, if no particular aggressive conditions exist (stainless steel or high corrosion resistant steel).
- Structures subject to external atmospheric exposure and to permanently damp internal condition, if other particular aggressive conditions exist (high corrosion resistant steel).  
Note: Particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used).

### Design:

- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to reinforcement or to supports, etc.).
- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Anchorages under static or quasi-static actions are designed in accordance with:
  - EOTA Technical Report TR 029 "Design of bonded anchors", Edition September 2010 or
  - CEN/TS 1992-4:2009

### Installation:

- Dry or wet concrete: M10 to M24, Rebar Ø10 to Ø25.
- Flooded holes (not sea water): M10 to M24, Rebar Ø10 to Ø25.
- Hole drilling by diamond drill mode.
- Overhead installation allowed.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.

## Injection System VME for concrete

Intended use  
Specifications

Annex B1

**Table B1: Installation parameters for threaded rod**

Anchor size			M10	M12	M16	M20	M24
Nominal drill hole diameter	$d_0 =$	[mm]	12	14	18	24	28
Embedment depth and bore hole depth	$h_{ef,min} =$	[mm]	60	70	80	90	96
	$h_{ef,max} =$	[mm]	200	240	320	400	480
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	12	14	18	22	26
Diameter of steel brush	$d_b \geq$	[mm]	14	16	20	26	30
Installation torque	$T_{inst}$	[Nm]	20	40	80	120	160
Thickness of fixture	$t_{fix,min} >$	[mm]	0				
	$t_{fix,max} <$	[mm]	1500				
Minimum thickness of member	$h_{min}$	[mm]	$h_{ef} + 30 \text{ mm}$ $\geq 100 \text{ mm}$			$h_{ef} + 2d_0$	
Minimum spacing	$s_{min}$	[mm]	50	60	80	100	120
Minimum edge distance	$c_{min}$	[mm]	50	60	80	100	120

**Table B2: Installation parameters for rebar**

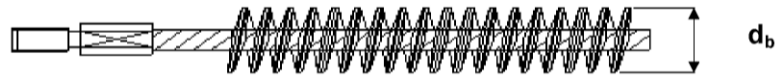
Rebar size			Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25
Nominal drill hole diameter	$d_0 =$	[mm]	14	16	18	20	24	32
Embedment depth and bore hole depth	$h_{ef,min} =$	[mm]	60	70	75	80	90	100
	$h_{ef,max} =$	[mm]	200	240	280	320	400	500
Diameter of steel brush	$d_b \geq$	[mm]	16	18	20	22	26	34
Minimum thickness of member	$h_{min}$	[mm]	$h_{ef} + 30 \text{ mm}$ $\geq 100 \text{ mm}$	$h_{ef} + 2d_0$				
Minimum spacing	$s_{min}$	[mm]	50	60	70	80	100	125
Minimum edge distance	$c_{min}$	[mm]	50	60	70	80	100	125

**Injection System VME for concrete**

**Intended use**  
Installation parameters

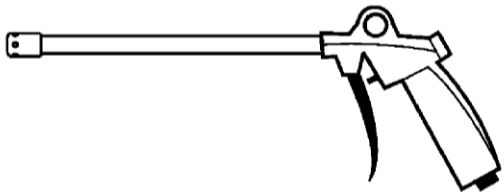
**Annex B2**

## Steel brush



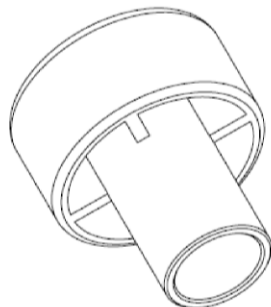
**Table B3: Parameter cleaning and setting tools**

Threaded rod	Rebar	$d_0$ Drill bit - $\emptyset$	$d_b$ Brush - $\emptyset$	$d_{b,min}$ min. Brush - $\emptyset$	Retaining washer
[mm]	[mm]	[mm]	[mm]	[mm]	[-]
M10		12	14	12,5	No retaining washer required
M12	10	14	16	14,5	
	12	16	18	16,5	
M16	14	18	20	18,5	
	16	20	22	20,5	
M20	20	24	26	24,5	VM-IA 24
M24		28	30	28,5	VM-IA 28
	25	32	34	32,5	VM-IA 32



**Rec. compressed air tool (min 6 bar)**

All drill bit diameters ( $d_0$ )



**Retaining washer for overhead or horizontal installation**

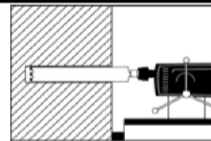
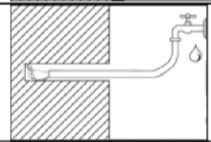
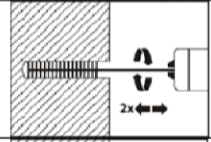
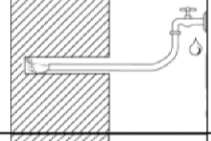
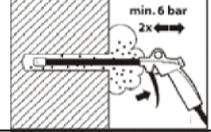
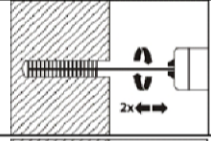
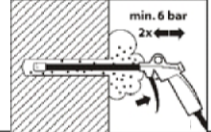
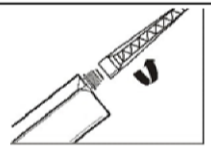
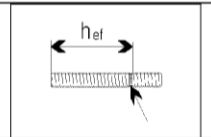
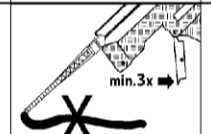
Drill bit diameter ( $d_0$ ): 24 mm to 32 mm

**Injection System VME for concrete**

**Intended use**  
Cleaning and setting tools

**Annex B3**

## Installation instructions

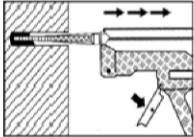
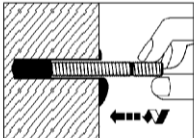
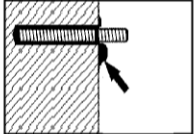

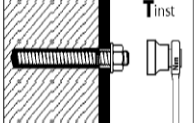
1		<p>Drill with diamond drill a hole into the base material to the size and embedment depth required by the selected anchor (Table B1 or Table B2).</p>
2a		<p>Rinsing with water until clear water comes out.</p>
2b		<p>Check brush diameter acc. Table B3 and attach the brush to a drilling machine or a battery screwdriver. Brush the hole with an appropriate sized wire brush <math>&gt; d_{b,min}</math> (Table B3) a minimum of two times. If the bore hole ground is not reached with the brush, a brush extension shall be used.</p>
2c		<p>Rinsing again with water until clear water comes out.</p>
2d		<p><b>Attention! Standing water in the bore hole must be removed before cleaning.</b> Starting from the bottom or back of the bore hole, blow the hole clean with compressed air (min. 6 bar) acc. to Annex B3, a minimum of two times. If the bore hole ground is not reached an extension shall be used.</p>
2e		<p>Check brush diameter acc. Table B3 and attach the brush to a drilling machine or a battery screwdriver. Brush the hole with an appropriate sized wire brush <math>&gt; d_{b,min}</math> a minimum of two times. If the bore hole ground is not reached with the brush, a brush extension shall be used.</p>
2f		<p>Finally blow the hole clean again with compressed air acc. to Annex B3 (min. 6 bar) a minimum of two times. If the bore hole ground is not reached an extension shall be used.</p>
<p><b>After cleaning, the bore hole has to be protected against re-contamination in an appropriate way, until dispensing the adhesive in the bore hole. If necessary, the cleaning has to be repeated directly before dispensing the adhesive. In-flowing water must not contaminate the bore hole again.</b></p>		
3		<p>Attach a supplied static-mixing nozzle to the cartridge and load the cartridge into the correct dispensing tool. For every working interruption longer than the recommended working time (Table B4) as well as for new cartridges, a new static-mixer shall be used.</p>
4		<p>Prior to inserting the anchor rod into the filled bore hole, the position of the embedment depth shall be marked on the anchor rods.</p>
5		<p>Prior to dispensing into the anchor hole, squeeze out separately a minimum of three full strokes and discard non-uniformly mixed adhesive components until the adhesive shows a consistent colour.</p>

### Injection System VME for concrete

Intended use  
Installation instruction

Annex B4

## Installation instructions (continuation)

6		<p>Starting from the bottom or back of the cleaned anchor hole fill the hole up to approximately two-thirds with adhesive. Slowly withdraw the static mixing nozzle as the hole fills to avoid creating air pockets. For embedment larger than 190 mm an extension nozzle shall be used. For overhead and horizontal installation a retaining washer and extension nozzle (Annex B3) shall be used. Observe the working times given in Table B4.</p>
7		<p>Push the threaded rod or reinforcing bar into the hole while turning slightly to ensure positive distribution of the adhesive until the embedment depth is reached.</p> <p>The anchor should be free of dirt, grease, oil or other foreign material.</p>
8		<p>Be sure that the anchor is fully seated at the bottom of the hole and that excess adhesive is visible at the top of the hole. If these requirements are not maintained, the application has to be renewed. For overhead installation fix embedded part (e.g. wedges).</p>
9		<p>Allow the adhesive to cure to the specified time prior to applying any load or torque. Do not move or load the anchor until it is fully cured (attend Table B4).</p>
10		<p>After full curing, the add-on part can be installed with the maximum torque (Table B1) by using a calibrated torque wrench.</p>

**Table B4: Working and curing time**

Bore hole temperature	Maximum working time	Minimum curing time	
		dry concrete	wet concrete
≥ + 5 °C	120 min	50 h	100 h
≥ + 10 °C	90 min	30 h	60 h
≥ + 20 °C	30 min	10 h	20 h
≥ + 30 °C	20 min	6 h	12 h
≥ + 40 °C	12 min	4 h	8 h

### Injection System VME for concrete

**Intended use**  
 Installation instruction (continuation)  
 Working and curing time

**Annex B5**

**Table C1: Characteristic values for threaded rods under tension loads in uncracked concrete**

Anchor size threaded rod			M 10	M 12	M 16	M 20	M 24	
<b>Steel failure</b>								
Characteristic tension resistance, Steel, property class 4.6	$N_{Rk,s}$	[kN]	23	34	63	98	141	
Characteristic tension resistance, Steel, property class 5.8	$N_{Rk,s}$	[kN]	29	42	78	122	176	
Characteristic tension resistance, Steel, property class 8.8	$N_{Rk,s}$	[kN]	46	67	125	196	282	
Characteristic tension resistance, Stainless steel A4 and HCR, property class 70	$N_{Rk,s}$	[kN]	41	59	110	171	247	
<b>Combined pull-out and concrete cone failure</b>								
Characteristic bond resistance in non-cracked concrete C20/25								
Temperature range I: 40°C/24°C	dry and wet concrete	$\tau_{Rk,ucr}$	[N/mm <sup>2</sup> ]	11	10	10	9,5	9,0
	flooded bore hole	$\tau_{Rk,ucr}$	[N/mm <sup>2</sup> ]	9,0	10	9,5	9,5	8,5
Temperature range II: 60°C/43°C	dry and wet concrete	$\tau_{Rk,ucr}$	[N/mm <sup>2</sup> ]	7,0	6,5	6,0	6,0	5,5
	flooded bore hole	$\tau_{Rk,ucr}$	[N/mm <sup>2</sup> ]	5,5	6,5	6,0	6,0	5,5
Temperature range III: 72°C/43°C	dry and wet concrete	$\tau_{Rk,ucr}$	[N/mm <sup>2</sup> ]	6,0	6,0	5,5	5,0	5,0
	flooded bore hole	$\tau_{Rk,ucr}$	[N/mm <sup>2</sup> ]	5,0	6,0	5,0	5,0	5,0
Increasing factor for concrete	$\psi_c$	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					
<b>Concrete cone failure</b>								
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 $h_{ef}$					
<b>Splitting failure</b>								
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	$\gamma_2 = \gamma_{inst}$	[-]	1,0	1,2				

**Injection System VME for concrete**

**Performances**

Characteristic values of resistance for threaded rods under tension loads in uncracked concrete

**Annex C1**

**Table C2: Characteristic values for threaded rods under shear loads in uncracked concrete**

Anchor size threaded rod			M 10	M 12	M 16	M 20	M24
<b>Steel failure without lever arm</b>							
Characteristic shear resistance, Steel, property class 4.6	$V_{Rk,s}$	[kN]	12	17	31	49	71
Characteristic shear resistance, Steel, property class 5.8	$V_{Rk,s}$	[kN]	15	21	39	61	88
Characteristic shear resistance, Steel, property class 8.8	$V_{Rk,s}$	[kN]	23	34	63	98	141
Characteristic shear resistance, Stainless steel A4 and HCR, property class 70	$V_{Rk,s}$	[kN]	20	30	55	86	124
Ductility factor according to CEN/TS 1992-4-5 Section 6.3.2.1	$k_2$	[-]	0,8				
<b>Steel failure with lever arm</b>							
Characteristic bending moment, Steel, property class 4.6	$M^0_{Rk,s}$	[Nm]	30	52	133	260	449
Characteristic bending moment, Steel, property class 5.8	$M^0_{Rk,s}$	[Nm]	37	65	166	324	560
Characteristic bending moment, Steel, property class 8.8	$M^0_{Rk,s}$	[Nm]	60	105	266	519	896
Characteristic bending moment, Stainless steel A4 and HCR, property class 70	$M^0_{Rk,s}$	[Nm]	52	92	232	454	784
<b>Concrete pry-out failure</b>							
Factor k acc. to TR029 und $k_3$ acc. to CEN/TS 1992-4-5 Section 6.3.3	$k_{(3)}$	[-]	2,0				
<b>Concrete edge failure</b>							
Effective length of anchor	$l_f$	[mm]	$l_f = \min(h_{ef}; 8 d_{nom})$				
Outside diameter of anchor	$d_{nom}$	[mm]	10	12	16	20	24
Installation safety factor[-]	$\gamma_2 = \gamma_{inst}$	[-]	1,0				

**Injection System VME for concrete**

**Performances**

Characteristic values of resistance for threaded rods under shear loads in uncracked concrete

**Annex C2**



**Table C3: Characteristic values for rebar under tension loads in uncracked concrete**

Anchor size reinforcing bar			Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	
<b>Steel failure</b>									
Characteristic tension resistance	$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$						
<b>Combined pull-out and concrete cone failure</b>									
Characteristic bond resistance in non-cracked concrete C20/25									
Temperature range I: 40°C/24°C	dry and wet concrete	$\tau_{Rk,ucr}$	[N/mm <sup>2</sup> ]	11	10	10	10	9,5	9,0
	flooded bore hole	$\tau_{Rk,ucr}$	[N/mm <sup>2</sup> ]	9,0	10	10	9,5	9,5	8,5
Temperature range II: 60°C/43°C	dry and wet concrete	$\tau_{Rk,ucr}$	[N/mm <sup>2</sup> ]	7,0	6,5	6,5	6,0	6,0	5,5
	flooded bore hole	$\tau_{Rk,ucr}$	[N/mm <sup>2</sup> ]	5,5	6,5	6,5	6,0	6,0	5,5
Temperature range III: 72°C/43°C	dry and wet concrete	$\tau_{Rk,ucr}$	[N/mm <sup>2</sup> ]	6,0	6,0	6,0	5,5	5,0	5,0
	flooded bore hole	$\tau_{Rk,ucr}$	[N/mm <sup>2</sup> ]	5,0	6,0	5,5	5,5	5,0	5,0
Increasing factor for concrete	$\psi_c$	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						
<b>Concrete cone failure</b>									
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 $h_{ef}$						
<b>Splitting failure</b>									
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	$\gamma_2 = \gamma_{inst}$	[-]	1,0	1,2					

**Injection System VME for concrete**

**Performances**

Characteristic values of resistance for rebar under tension loads in uncracked concrete

**Annex C3**

**Table C4:** Characteristic values for **rebar** under **shear loads** in uncracked concrete

Anchor size reinforcing bar		Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	
<b>Steel failure without lever arm</b>								
Characteristic shear resistance	$V_{Rk,s}$	[kN]	$0,50 \cdot A_s \cdot f_{uk}$					
Ductility factor according to CEN/TS 1992-4-5 Section 6.3.2.1	$k_2$	[-]	0,8					
<b>Steel failure with lever arm</b>								
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	$1,2 \cdot W_{el} \cdot f_{uk}$					
<b>Concrete pry-out failure</b>								
Factor k acc. to TR029 und $k_3$ acc. to CEN/TS 1992-4-5 Section 6.3.3	$k_{(3)}$	[-]	2,0					
<b>Concrete edge failure</b>								
Effective length of anchor	$l_f$	[mm]	$l_f = \min(h_{ef}; 8 d_{nom})$					
Outside diameter of anchor	$d_{nom}$	[mm]	10	12	14	16	20	25
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 uncracked concrete

**Annex C4**

**Table C5: Displacements under tension loads <sup>1)</sup> (threaded rod)**

Anchor size threaded rod			M 10	M 12	M 16	M 20	M24
<b>Temperature range 40°C/24°C for non-cracked concrete C20/25</b>							
Displacement	$\delta_{N0}$ -factor	[mm/(N/mm <sup>2</sup> )]	0,013	0,015	0,020	0,024	0,029
Displacement	$\delta_{N\infty}$ -factor	[mm/(N/mm <sup>2</sup> )]	0,052	0,061	0,079	0,096	0,114
<b>Temperature range 72°C/43°C and 60°C/43°C for non-cracked concrete C20/25</b>							
Displacement	$\delta_{N0}$ -factor	[mm/(N/mm <sup>2</sup> )]	0,015	0,018	0,023	0,028	0,033
Displacement	$\delta_{N\infty}$ -factor	[mm/(N/mm <sup>2</sup> )]	0,060	0,070	0,091	0,111	0,131

<sup>1)</sup> Calculation of the displacement

$$\delta_{N0} = \delta_{N0}\text{-factor} \cdot \tau; \quad \tau: \text{action bond strength}$$

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

**Table C6: Displacement under shear load <sup>1)</sup> (threaded rod)**

Anchor size threaded rod			M10	M12	M16	M20	M24
Displacement	$\delta_{V0}$ -factor	[mm/(kN)]	0,06	0,05	0,04	0,04	0,03
Displacement	$\delta_{V\infty}$ -factor	[mm/(kN)]	0,08	0,08	0,06	0,06	0,05

<sup>1)</sup> Calculation of the displacement

$$\delta_{V0} = \delta_{V0}\text{-factor} \cdot V; \quad V: \text{action shear load}$$

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

**Injection System VME for concrete**

**Performances**  
Displacements (threaded rods)

**Annex C5**

**Table C7: Displacements under tension loads <sup>1)</sup> (rebar)**

Anchor size reinforcing bar			Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25
<b>Temperature range 40°C/24°C for non-cracked concrete C20/25</b>								
Displacement	$\delta_{N0}$ -factor	[mm/(N/mm <sup>2</sup> )]	0,013	0,015	0,018	0,020	0,024	0,030
Displacement	$\delta_{N\infty}$ -factor	[mm/(N/mm <sup>2</sup> )]	0,052	0,061	0,070	0,079	0,096	0,118
<b>Temperature range 72°C/43°C and 60°C/43°C for non-cracked concrete C20/25</b>								
Displacement	$\delta_{N0}$ -factor	[mm/(N/mm <sup>2</sup> )]	0,015	0,018	0,020	0,023	0,028	0,034
Displacement	$\delta_{N\infty}$ -factor	[mm/(N/mm <sup>2</sup> )]	0,060	0,070	0,081	0,091	0,111	0,136

<sup>1)</sup> Calculation of the displacement

$$\delta_{N0} = \delta_{N0}\text{-factor} \cdot \tau; \quad \tau: \text{action bond strength}$$

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

**Table C8: Displacement under shear load <sup>1)</sup> (rebar)**

Anchor size reinforcing bar			Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25
Displacement	$\delta_{V0}$ -factor	[mm/(kN)]	0,05	0,05	0,04	0,04	0,04	0,03
Displacement	$\delta_{V\infty}$ -factor	[mm/(kN)]	0,08	0,07	0,06	0,06	0,05	0,05

<sup>1)</sup> Calculation of the displacement

$$\delta_{V0} = \delta_{V0}\text{-factor} \cdot V; \quad V: \text{action shear load}$$

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

**Injection System VME for concrete**

**Performances**  
Displacements (rebar)

**Annex C6**