

Declaration of Performance

1343-CPR-M 530-1/01.15

1. Unique identification code of the product-type: Mungo Injection System MIT600RE for concrete

2. Manufacturer: Mungo Befestigungstechnik AG, Bornfeldstrasse 2, CH-4603 Olten/Switzerland

3. System/s of AVCP: System 1

4. Intended use or use/es:

Product	Intended use
Bonded anchor for use in concrete	For fixing and/or supporting to concrete, structural elements (which contributes to the stability of the works) or heavy units.

5. European Assessment Document: ETAG 001 Part 5: "Bonded anchors", April 2013, used as EAD

European Technical Assessment: ETA-09/0340 of 13 December 2016

Technical Assessment Body: DIBt – Deutsches Institut für Bautechnik

Notified body/ies: 1343 – MPA Darmstadt

6. Declared performance:

Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance for design according to TR 029 and TR 045	See appendix, especially Annex C1 to C6
Characteristic resistance for design according to CEN/TS 1992-4:2009 and TR 045	See appendix, especially Annex C7 to C12
Displacements under tension and shear loads	See appendix, especially Annex C13 / C14

Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorages satisfy requirements for Class A1
Resistance to fire	No performance determined (NPD)

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Singed for and on behalf of the manufacturer by:

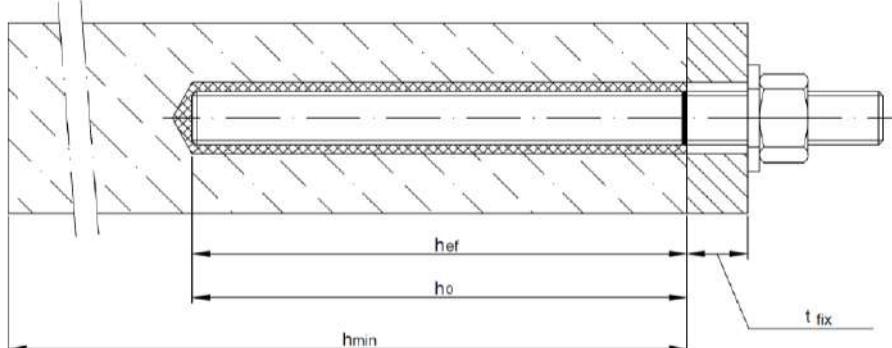
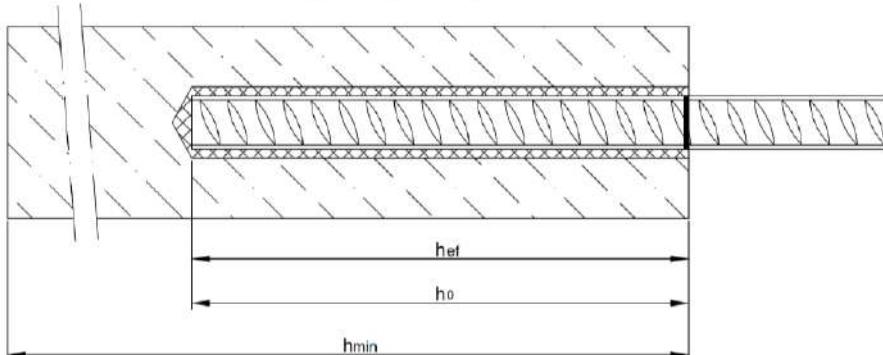
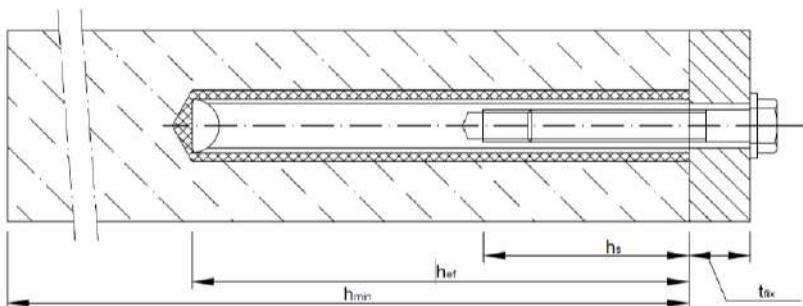
Dipl.-Ing. Massimo Pirozzi
Head of Engineering



Olten, 2017-20-12

This DoP Has been prepared in different languages. In case there is a dispute on the interpretation the English version shall always prevail.

The Appendix includes voluntary and complementary information in English language exceeding the (language as neutrally specified) legal requirements.

Installation threaded rod M8 to M30**Installation reinforcing bar Ø8 to Ø32****Installation internal threaded rod IG-M6 to IG-M20**

d_f = diameter of clearance hole in the fixture

t_{fix} = thickness of fixture

h_{ef} = effective anchorage depth

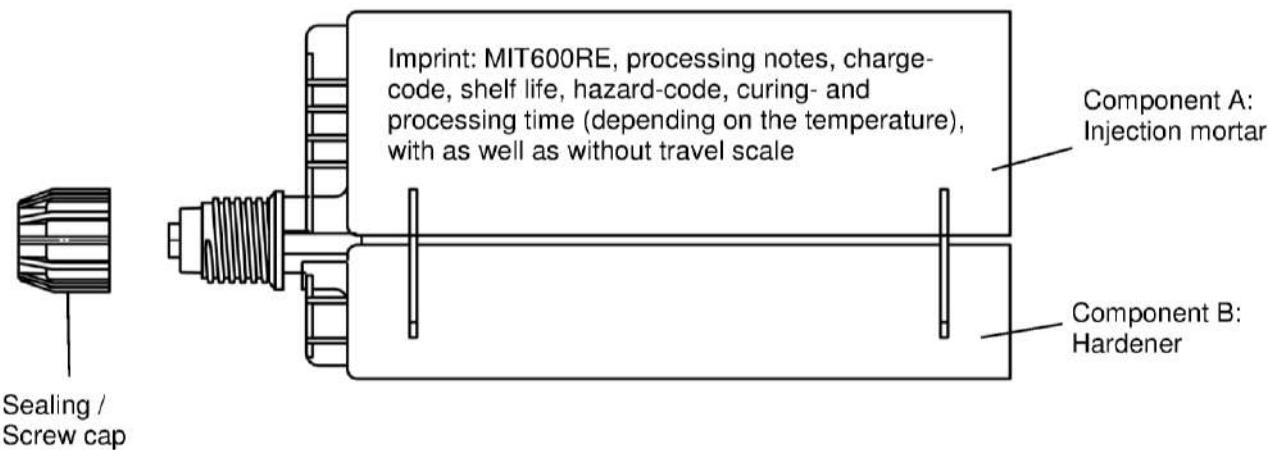
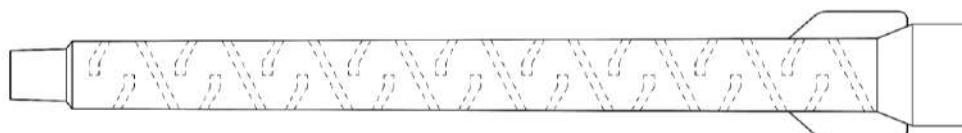
h_0 = depth of drill hole

h_{\min} = minimum thickness of member

Mungo Injection System MIT600RE for concrete

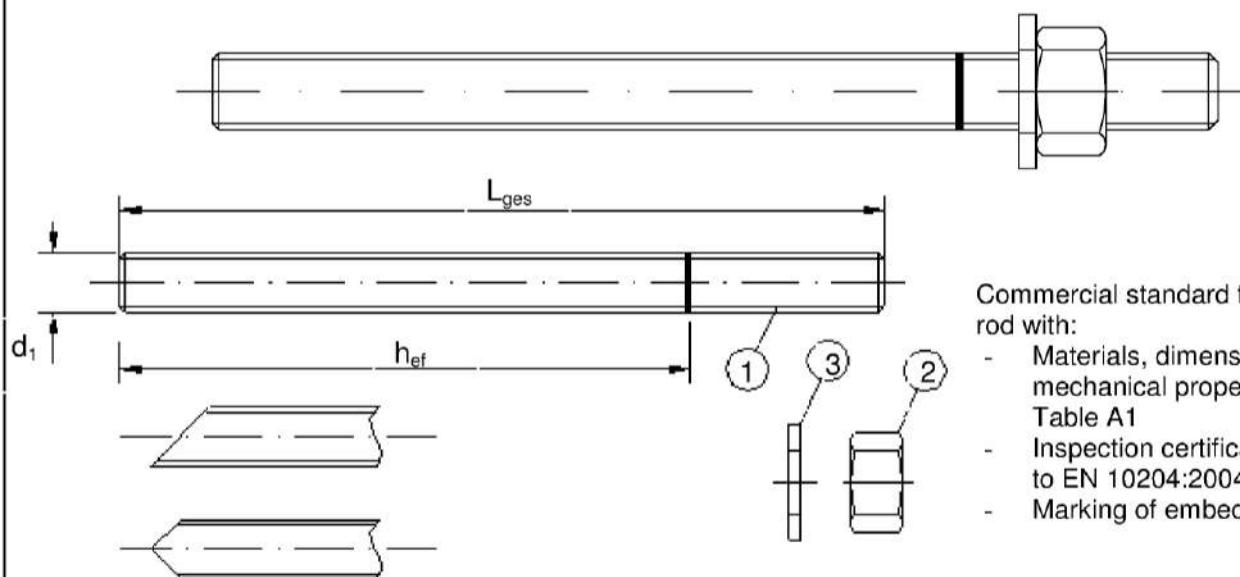
Product description
Installed condition

Annex A 1

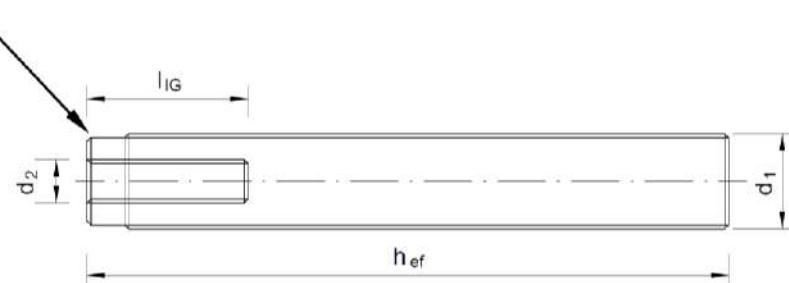
Cartridge: MIT600RE**385ml, 444ml, 585ml, 999ml and 1400ml injection mortar cartridge (Type: "side-by-side")****Static mixer****Mungo Injection System MIT600RE for concrete**

Product description
Injection system

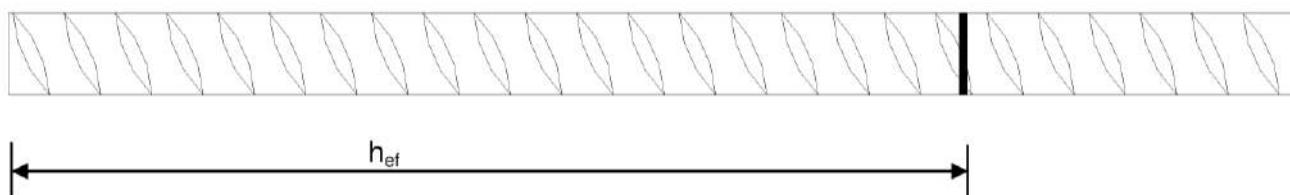
Annex A 2

Threaded rod M8, M10, M12, M16, M20, M24, M27, M30 with washer and hexagon nut**Internal Threaded Sleeve IG-M6, IG-M8, IG-M10, IG-M12, IG-M16, IG-M20**

Mark of the producer



Marking: e.g. M8

Reinforcing bar Ø 8, Ø 10, Ø 12, Ø 14, Ø 16, Ø 20, Ø 25, Ø 28, Ø 32

- 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 $0,05d \leq h \leq 0,07d$
(d: Nominal diameter of the bar; h: Rip height of the bar)

Mungo Injection System MIT600RE for concrete
Product description
 Threaded rod, Internal Threaded Sleeve and reinforcing bar
Annex A 3

Table A1: Materials

Designation	Material
Steel, zinc plated ≥ 5 µm acc. to EN ISO 4042:1999 or Steel, hot-dip galvanised ≥ 40 µm acc. to EN ISO 1461:2009 and EN ISO 10684:2004+AC:2009	
Anchor rod	Steel, EN 10087:1998 or EN 10263:2001 Property class 4.6, 4.8, 5.8, 8.8, EN 1993-1-8:2005+AC:2009 $A_5 > 8\%$ fracture elongation
Hexagon nut, EN ISO 4032:2012	Steel acc. to EN 10087:1998 or EN 10263:2001 Property class 4 (for class 4.6 and 4.8 rod) EN ISO 898-2:2012, Property class 5 (for class 5.8 rod) EN ISO 898-2:2012, Property class 8 (for class 8.8 rod) EN ISO 898-2:2012
Washer, EN ISO 887:2006, EN ISO 7089:2000, EN ISO 7093:2000 or EN ISO 7094:2000	Steel, zinc plated or hot-dip galvanised
Internally threaded sleeve	Steel, zinc plated
Stainless steel	
Anchor rod	Material 1.4401 / 1.4404 / 1.4571, EN 10088-1:2005, > M24: Property class 50 EN ISO 3506-1:2009 \leq M24: Property class 70 EN ISO 3506-1:2009 $A_5 > 8\%$ fracture elongation
Hexagon nut, EN ISO 4032:2012	Material 1.4401 / 1.4404 / 1.4571 EN 10088:2005, > M24: Property class 50 (for class 50 rod) EN ISO 3506-2:2009 \leq M24: Property class 70 (for class 70 rod) EN ISO 3506-2:2009
Washer, EN ISO 887:2006, EN ISO 7089:2000, EN ISO 7093:2000 or EN ISO 7094:2000	Material 1.4401, 1.4404 or 1.4571, EN 10088-1:2005
Internally threaded sleeve	Stainless steel: 1.4401 / 1.4404 / 1.4571, EN 10088-1:2005
High corrosion resistance steel	
Anchor rod	Material 1.4529 / 1.4565, EN 10088-1:2005, > M24: Property class 50 EN ISO 3506-1:2009 \leq M24: Property class 70 EN ISO 3506-1:2009 $A_5 > 8\%$ fracture elongation
Hexagon nut, EN ISO 4032:2012	Material 1.4529 / 1.4565 EN 10088-1:2005, > M24: Property class 50 (for class 50 rod) EN ISO 3506-2:2009 \leq M24: Property class 70 (for class 70 rod) EN ISO 3506-2:2009
Washer, EN ISO 887:2006, EN ISO 7089:2000, EN ISO 7093:2000 or EN ISO 7094:2000	Material 1.4529 / 1.4565, EN 10088-1:2005
Reinforcing bars	
Rebar EN 1992-1-1:2004+AC:2010, Annex C	Bars and de-coiled rods class B or C f_{yk} and k according to NDP or NCL of EN 1992-1-1/NA:2013 $f_{uk} = f_{tk} = k \cdot f_{yk}$
Mungo Injection System MIT600RE for concrete	
Product description Materials	Annex A 4

Specifications of intended use

Anchorage subject to:

- Static and quasi-static loads: M8 to M30, Rebar Ø8 to Ø32, IG-M6 to IG-M20.
- Seismic action for Performance Category C1: M12 to M30, Rebar Ø12 to Ø32.
- Seismic action for Performance Category C2: M12 and M16.

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.
- Non-cracked concrete: M8 to M30, Rebar Ø8 to Ø32, IG-M6 to IG-M20.
- Cracked concrete: M12 to M30, Rebar Ø12 to Ø32, IG-M8 to IG-M20.

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
- Anchorages under seismic actions (cracked concrete) are designed in accordance with:
 - EOTA Technical Report TR 045 "Design of Metal Anchors under Seismic Action", Edition February 2013
 - Anchorages shall be positioned outside of critical regions (e.g. plastic hinges) of the concrete structure.
 - Fastenings in stand-off installation or with a grout layer for seismic loading are not allowed.

Installation:

- Dry or wet concrete: M8 to M30, Rebar Ø8 to Ø32.
- Flooded holes (not sea water): M8 to M30, Rebar Ø8 to Ø32.
- Hole drilling by hammer or compressed air 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.
- Fastening screws or threaded rods (incl. nut and washer) must comply with the appropriate material and property class of the internally threaded sleeve.

Mungo Injection System MIT600RE for concrete
Intended Use
 Specifications

Annex B 1

Table B1: Installation parameters for threaded rod

Anchor size		M 8	M 10	M 12	M 16	M 20	M 24	M 27	M 30
Nominal drill hole diameter	d_0 [mm] =	10	12	14	18	24	28	32	35
Effective anchorage depth	$h_{ef,min}$ [mm] =	60	60	70	80	90	96	108	120
	$h_{ef,max}$ [mm] =	96	120	144	192	240	288	324	360
Diameter of clearance hole in the fixture ¹⁾	d_f [mm] ≤	9	12	14	18	22	26	30	33
Torque moment	T_{inst} [Nm] ≤	10	20	40	80	120	160	180	200
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	80	100	120	135	150
Minimum edge distance	c_{min} [mm]	40	50	60	80	100	120	135	150

¹⁾ For larger clearance hole see TR029 section 1.1**Table B2: Installation parameters for rebar**

Rebar size		Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	Ø 28	Ø 32
Nominal drill hole diameter	d_0 [mm] =	12	14	16	18	20	24	32	35	40
Effective anchorage depth	$h_{ef,min}$ [mm] =	60	60	70	75	80	90	100	112	128
	$h_{ef,max}$ [mm] =	96	120	144	168	192	240	300	336	384
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	80	100	125	140	160
Minimum edge distance	c_{min} [mm]	40	50	60	70	80	100	125	140	160

Table B3: Installation parameters for internally threaded sleeve

Anchor size		IG-M 6	IG-M 8	IG-M 10	IG-M 12	IG-M 16	IG-M 20	
Internal diameter of sleeve	d_2 [mm] =	6	8	10	12	16	20	
Outer diameter of sleeve ²⁾	$d_1 = d_{nom}$ [mm] =	10	12	16	20	24	30	
Nominal drill hole diameter	d_0 [mm] =	12	14	18	24	28	35	
Effective anchorage depth	$h_{ef,min}$ [mm] =	70	70	80	90	96	120	
	$h_{ef,max}$ [mm] =	200	240	320	400	480	600	
Diameter of clearance hole in the fixture ¹⁾	d_f [mm] =	7	9	12	14	18	22	
Installation torque moment	T_{inst} [Nm] ≤	10	10	20	40	60	100	
Thread engagement length Min/max	l_{IG} [mm] =	8/20	8/20	10/20	12/30	16/40	20/50	
Minimum thickness of member	h_{min} [mm]	$h_{ef} + 30$ mm		$h_{ef} + 2d_0$				
Minimum spacing	s_{min} [mm]	50	60	80	100	120	135	
Minimum edge distance	c_{min} [mm]	50	60	80	100	120	135	

¹⁾ For larger clearance hole see TR029 section 1.1²⁾ With metric threads according to EN 1993-1-8:2005+AC:2009**Mungo Injection System MIT600RE for concrete**

Intended Use
Installation parameters

Annex B 2

Steel brush**Table B4: Parameter cleaning and setting tools**

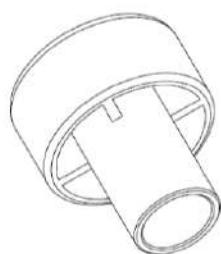
Threaded Rod [mm]	Rebar [mm]	Internal Threaded Sleeve [mm]	d_0 Drill bit - Ø [mm]	d_b Brush - Ø [mm]	$d_{b,min}$ min. Brush - Ø [mm]	Piston plug [No.]
M8			10	12	10,5	No piston plug required
M10	8	IG-M6	12	14	12,5	
M12	10	IG-M8	14	16	14,5	
	12		16	18	16,5	
M16	14	IG-M10	18	20	18,5	
	16		20	22	20,5	
M20	20	IG-M12	24	26	24,5	# 24
M24		IG-M16	28	30	28,5	# 28
M27	25		32	34	32,5	# 32
M30	28	IG-M20	35	37	35,5	# 35
	32		40	41,5	40,5	# 38



MAC: Hand pump (volume 750 ml)
Drill bit diameter (d_0): 10 mm to 20 mm



CAC: Recommended compressed air tool (min 6 bar)
Drill bit diameter (d_0): 10 mm to 40 mm

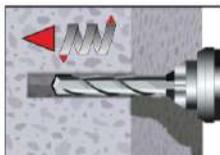


Piston plug for overhead or horizontal installation
Drill bit diameter (d_0): 24 mm to 40 mm

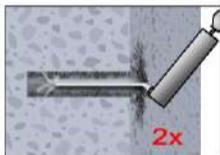
Mungo Injection System MIT600RE for concrete

Intended Use
Cleaning and setting tools

Annex B 3

Installation instructions

- 1.** Drill with hammer drill a hole into the base material to the size and embedment depth required by the selected anchor (Table B1, B2 or B3). In case of aborted drill hole: the drill hole shall be filled with mortar

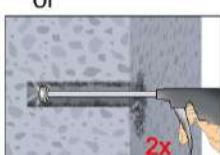


Attention! Standing water in the bore hole must be removed before cleaning.

- 2a.** Starting from the bottom or back of the bore hole, blow the hole clean with compressed air (CAC) (min. 6 bar) or a hand pump (MAC) (Annex B 3) a minimum of two times. If the bore hole ground is not reached an extension shall be used.

MAC: The hand-pump¹⁾ can **only** be used for anchor sizes in uncracked concrete, either up to bore hole diameter 20mm or embedment depth up to 240mm.

CAC: Compressed air (min. 6 bar, oil-free) can be used for all sizes in cracked and uncracked concrete.

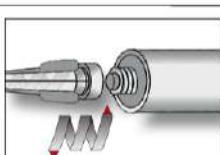
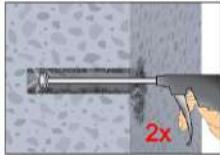


- 2b.** Check brush diameter (Table B4) and attach the brush to a drilling machine or a battery screwdriver. Brush the hole with an appropriate sized wire brush $> d_{b,min}$ (Table B4) a minimum of two times. If the bore hole ground is not reached with the brush, a brush extension shall be used (Table B4).

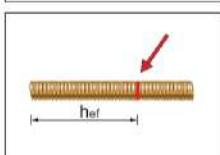
- 2c.** Finally blow the hole clean again with compressed air (CAC) (min. 6 bar) or a hand pump (MAC) (Annex B 3) a minimum of two times. If the bore hole ground is not reached an extension shall be used.
MAC: The hand-pump¹⁾ can **only** be used for anchor sizes in uncracked concrete, either up to bore hole diameter 20mm or embedment depth up to 240mm.
CAC: Compressed air (min. 6 bar, oil-free) can be used for all sizes in cracked and uncracked concrete.

After cleaning, the bore hole has to be protected against re-contamination in an appropriate way, until dispensing the mortar in the bore hole. If necessary, the cleaning repeated has to be directly before dispensing the mortar. In-flowing water must not contaminate the bore hole again.

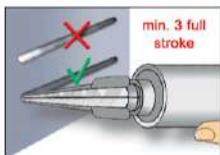
¹⁾ It is permitted to blow bore holes with diameter between 14 mm and 20 mm and an embedment depth up to 240 mm also in cracked concrete with hand-pump.



- 3.** 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 B5) as well as for new cartridges, a new static-mixer shall be used.



- 4.** Prior to inserting the anchor rod into the filled bore hole, the position of the embedment depth shall be marked on the anchor rods.

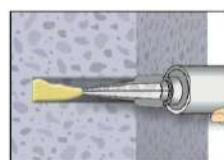


- 5.** Prior to dispensing into the anchor hole, squeeze out separately a minimum of three full strokes and discard non-uniformly mixed adhesive components until the mortar shows a consistent grey or red colour.

Mungo Injection System MIT600RE for concrete

Intended Use
Installation instructions

Annex B 4

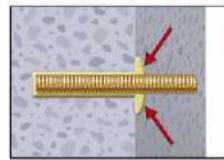
Installation instructions (continuation)

6. 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 piston plug (Annex B 3) and extension nozzle shall be used. Observe the gel-/ working times given in Table B5.

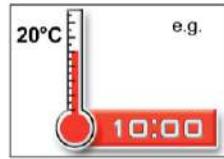


7. Push the threaded rod or reinforcing bar into the anchor hole while turning slightly to ensure positive distribution of the adhesive until the embedment depth is reached.

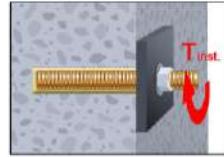
The anchor shall be free of dirt, grease, oil or other foreign material.



8. Be sure that the anchor is fully seated at the bottom of the hole and that excess mortar is visible at the top of the hole. If these requirements are not maintained, the application has to be renewed. For overhead application the anchor rod should be fixed (e.g. wedges).



9. 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 B5).



10. After full curing, the add-on part can be installed with up to the max. torque (Table B1 or B3) by using a calibrated torque wrench.

Table B5: Minimum curing time

Concrete temperature	Gelling-working time	Minimum curing time in dry concrete	Minimum curing time in wet concrete
+ 5 °C to + 9 °C	120 min	50 h	100 h
+ 10 °C to + 19 °C	90 min	30 h	60 h
+ 20 °C to + 29 °C	30 min	10 h	20 h
+ 30 °C to + 39 °C	20 min	6 h	12 h
+ 40 °C	12 min	4 h	8 h
Cartridge temperature		+5°C to +40°C	

Mungo Injection System MIT600RE for concrete**Intended Use**

Installation instructions (continuation)
Curing time

Annex B 5

Table C1: Characteristic values of tension loads under static, quasi-static action and seismic action (performance category C1 and C2)

Anchor size threaded rod			M 8	M 10	M 12	M 16	M 20	M 24	M 27	M 30			
Steel failure													
Characteristic tension resistance													
	$N_{Rk,s} =$ $N_{Rk,s,C1} =$ $N_{Rk,s,C2}$	[kN]											
Combined pull-out and concrete cone failure													
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 ²]	15	15	15	14	13	12	12	12			
	flooded bore hole	$\tau_{Rk,ucr}$ [N/mm ²]	15	14	13	10	9,5	8,5	7,5	7,0			
Temperature range II: 60°C/43°C	dry and wet concrete	$\tau_{Rk,ucr}$ [N/mm ²]	9,5	9,5	9,0	8,5	8,0	7,5	7,5	7,5			
	flooded bore hole	$\tau_{Rk,ucr}$ [N/mm ²]	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	$\tau_{Rk,ucr}$ [N/mm ²]	8,5	8,5	8,0	7,5	7,0	7,0	6,5	6,5			
	flooded bore hole	$\tau_{Rk,ucr}$ [N/mm ²]	8,5	8,5	8,0	7,5	7,0	6,0	5,5	5,5			
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			
		$\tau_{Rk,C1}$ [N/mm ²]				7,1	6,2	5,7	5,5	5,5			
		$\tau_{Rk,C2}$ [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			
		$\tau_{Rk,C1}$ [N/mm ²]				7,1	5,8	4,8	4,5	4,0			
		$\tau_{Rk,C2}$ [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			
		$\tau_{Rk,C1}$ [N/mm ²]				4,3	3,8	3,4	3,5	3,5			
		$\tau_{Rk,C2}$ [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			
		$\tau_{Rk,C1}$ [N/mm ²]				4,3	3,8	3,4	3,5	3,5			
		$\tau_{Rk,C2}$ [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			
		$\tau_{Rk,C1}$ [N/mm ²]				3,9	3,4	3,0	3,0	3,0			
		$\tau_{Rk,C2}$ [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			
		$\tau_{Rk,C1}$ [N/mm ²]				3,9	3,4	3,0	3,0	3,0			
		$\tau_{Rk,C2}$ [N/mm ²]				1,3	1,2	No Performance Determined (NPD)					
Increasing factors for concrete ψ_c			C25/30					1,02					
			C30/37					1,04					
			C35/45					1,07					
			C40/50					1,08					
			C45/55					1,09					
			C50/60					1,10					
Factor according to CEN/TS 1992-4-5 Section 6.2.2.3			k_8	[-]				10,1					
								7,2					
Concrete cone failure													
Factor according to CEN/TS 1992-4-5 Section 6.2.3.1			k_{ucr}	[-]				10,1					
			k_{cr}	[-]				7,2					
Edge distance			$c_{cr,N}$	[mm]				1,5 h_{ef}					
Axial distance			$s_{cr,N}$	[mm]				3,0 h_{ef}					
Splitting failure													
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 $c_{cr,sp}$					
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					
Mungo Injection System MIT600RE for concrete													
Performances Characteristic values of tension loads under static, quasi-static action and seismic action (performance category C1 and C2)										Annex C 1			

Table C2: Characteristic values of shear loads under static, quasi-static action and seismic action (performance category C1 and C2)

Anchor size threaded rod	M 8	M 10	M 12	M 16	M 20	M24	M 27	M 30								
Steel failure without lever arm																
Characteristic shear resistance																
	$V_{Rk,s}$	[kN]	$0,50 \cdot A_s \cdot f_{uk}$													
	$V_{Rk,s,C1}$	[kN]	NPD	$0,44 \cdot A_s \cdot f_{uk}$		$0,40 \cdot A_s \cdot f_{uk}$										
	$V_{Rk,s,C2}$	[kN]		$0,40 \cdot A_s \cdot f_{uk}$		No Performance Determined (NPD)										
Steel failure with lever arm																
Characteristic bending moment																
	$M_{Rk,s}^0$	[Nm]	$1,2 \cdot W_{el} \cdot f_{uk}$													
	$M_{Rk,s,C1}^0$	[Nm]	No Performance Determined (NPD)													
	$M_{Rk,s,C2}^0$	[Nm]														
Concrete pry-out failure																
Factor k_3 in equation (27) of CEN/TS 1992-4-5 Section 6.3.3 Factor k in equation (5.7) of Technical Report TR 029	$k_{(3)}$	[-]	2,0													
Installation safety factor	$\gamma_2 = \gamma_{inst}$	[-]	1,0													
Concrete edge failure																
Effective length of anchor	l_t	[mm]	$l_t = \min(h_{ef}; 8 d_{nom})$													
Outside diameter of anchor	d_{nom}	[mm]	8	10	12	16	20	24	27	30						
Installation safety factor	$\gamma_2 = \gamma_{inst}$	[-]	1,0													
Mungo Injection System MIT600RE for concrete																
Performances Characteristic values of shear loads under static, quasi-static action and seismic action (performance category C1 and C2)						Annex C 2										

Table C3: Characteristic values of tension loads for internal threaded sleeves under static and quasi-static action

Anchor size internally threaded sleeves				IG-M 6	IG-M 8	IG-M 10	IG-M 12	IG-M 16	IG-M 20
Steel failure									
Characteristic tension resistance, Steel, strength class 5.8	N _{Rk,s}	[kN]		10	17	29	42	76	123
Partial safety factor	γ _{Ms,N}	[·]				1,5			
Characteristic tension resistance, Steel, strength class 8.8	N _{Rk,s}	[kN]		16	27	46	67	121	196
Partial safety factor	γ _{Ms,N}	[·]				1,5			
Characteristic tension resistance, Stainless Steel A4 Strength class 70	N _{Rk,s}	[kN]		14	26	41	59	110	172
Partial safety factor	γ _{Ms,N}	[·]				1,87			
Combined pull-out and concrete cone failure									
Characteristic bond resistance in non-cracked concrete C20/25									
Temperature range I: 40°C/24°C	dry and wet concrete			15	15	14	13	12	12
	flooded bore hole	τ _{Rk,ucr}	[N/m ²]	14	13	10	9,5	8,5	7,0
Temperature range II: 60°C/43°C	dry and wet concrete			9,5	9,0	8,5	8,0	7,5	7,5
	flooded bore hole	τ _{Rk,ucr}	[N/m ²]	9,5	9,0	8,5	7,5	7,0	6,0
Temperature range III: 72°C/43°C	dry and wet concrete			8,5	8,0	7,5	7,0	7,0	6,5
	flooded bore hole	τ _{Rk,ucr}	[N/m ²]	8,5	8,0	7,5	7,0	6,0	5,5
Characteristic bond resistance in cracked concrete C20/25									
Temperature range I: 40°C/24°C	dry and wet concrete			7,5	6,5	6,0	5,5	5,5	5,5
	flooded bore hole	τ _{Rk,cr}	[N/m ²]	7,5	6,0	5,0	4,5	4,0	4,0
Temperature range II: 60°C/43°C	dry and wet concrete			4,5	4,0	3,5	3,5	3,5	3,5
	flooded bore hole	τ _{Rk,cr}	[N/m ²]	4,5	4,0	3,5	3,5	3,5	3,5
Temperature range III: 72°C/43°C	dry and wet concrete			4,0	3,5	3,0	3,0	3,0	3,0
	flooded bore hole	τ _{Rk,cr}	[N/m ²]	4,0	3,5	3,0	3,0	3,0	3,0
Increasing factors for concrete Ψ _c				C25/30				1,02	
				C30/37				1,04	
				C35/45				1,07	
				C40/50				1,08	
				C45/55				1,09	
				C50/60				1,10	
Factor according to CEN/TS 1992-4-5 Section 6.2.3	Non-cracked concrete	k _a	[·]					10,1	
	Cracked concrete							7,2	
Concrete cone failure									
Factor according to CEN/TS 1992-4-5 Section 6.2.3.1	Non-cracked concrete	k _{ucr}	[·]					10,1	
	Cracked concrete	k _{cr}	[·]					7,2	
Edge distance	c _{cr,N}	[mm]					1,5 h _{ef}		
Axial distance	s _{cr,N}	[mm]					3,0 h _{ef}		
Splitting failure									
Edge distance	h/h _{ef} ≥ 2,0	c _{cr,sp}	[mm]				1,0 h _{ef}		
	2,0 > h/h _{ef} > 1,3						2 · h _{ef} $\left(2,5 - \frac{h}{h_{ef}} \right)$		
	h/h _{ef} ≤ 1,3						2,4 h _{ef}		
Axial distance	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		
Mungo Injection System MIT600RE for concrete								Annex C 3	
Performances Characteristic values of tension loads for internal threaded sleeves under static and quasi-static action									

Table C4: Characteristic values of shear loads for internal threaded sleeves under static and quasi-static action

Anchor size for internally threaded sleeves			IG-M 6	IG-M 8	IG-M 10	IG-M 12	IG-M 16	IG-M 20
Steel failure without lever arm								
Characteristic shear resistance, Steel, strength class 5.8	V _{Rk,s}	[kN]	5	9	15	21	38	61
Partial safety factor	γ _{Ms,V}	[·]			1,25			
Characteristic shear resistance, Steel, strength class 8.8	V _{Rk,s}	[kN]	8	14	23	34	60	98
Partial safety factor	γ _{Ms,V}	[·]			1,25			
Characteristic shear resistance, Stainless Steel A4 Strength class 70	V _{Rk,s}	[kN]	7	13	20	30	55	86
Partial safety factor	γ _{Ms,V}	[·]			1,56			
Steel failure with lever arm								
Characteristic bending moment, Steel, strength class 5.8	M ⁰ _{Rk,s}	[Nm]	8	19	37	66	167	325
Partial safety factor	γ _{Ms,V}	[·]			1,25			
Characteristic bending moment, Steel, strength class 8.8	M ⁰ _{Rk,s}	[Nm]	12	30	60	105	267	519
Partial safety factor	γ _{Ms,V}	[·]			1,25			
Characteristic bending moment, Stainless Steel A4 Strength class 70	M ⁰ _{Rk,s}	[Nm]	11	26	52	92	233	454
Partial safety factor	γ _{Ms,V}	[·]			1,56			
Concrete pry-out failure								
Factor k ₃ in equation (27) of CEN/TS 1992-4-5 Section 6.3.3 Factor k ₃ in equation (5.7) of Technical Report TR 029	k ₍₃₎	[·]			2,0			
Installation safety factor	γ _{2 = γ_{inst}}	[·]			1,0			
Concrete edge failure								
Effective length of anchor	l _l	[mm]			l _l = min(h _{ef} ; 8 d _{nom})			
Outside diameter of anchor	d _{nom}	[mm]	10	12	16	20	24	30
Installation safety factor	γ _{2 = γ_{inst}}	[·]			1,0			
Mungo Injection System MIT600RE for concrete								
Performances Characteristic values of shear loads for internal threaded sleeves under static and quasi-static action						Annex C 4		

Table C5: Characteristic values of tension loads under static, quasi-static action and seismic action (performance category C1)

Anchor size reinforcing bar	$\varnothing 8$	$\varnothing 10$	$\varnothing 12$	$\varnothing 14$	$\varnothing 16$	$\varnothing 20$	$\varnothing 25$	$\varnothing 28$	$\varnothing 32$					
Steel failure														
Characteristic tension resistance	$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$											
Combined pull-out and concrete cone failure														
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 ²]	14	14	13	13	12	12	11				
	flooded bore hole	$\tau_{Rk,ucr}$	[N/mm ²]	14	13	11	10	9,5	8,5	7,5				
Temperature range II: 60°C/43°C	dry and wet concrete	$\tau_{Rk,ucr}$	[N/mm ²]	8,5	8,5	8,0	8,0	7,5	7,0	7,0				
	flooded bore hole	$\tau_{Rk,ucr}$	[N/mm ²]	8,5	8,5	8,0	8,0	7,5	7,0	6,0				
Temperature range III: 72°C/43°C	dry and wet concrete	$\tau_{Rk,ucr}$	[N/mm ²]	7,5	7,5	7,5	7,0	7,0	6,5	6,0				
	flooded bore hole	$\tau_{Rk,ucr}$	[N/mm ²]	7,5	7,5	7,5	7,0	7,0	6,0	5,5				
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]	No Performance Determined (NPD)	7,5	7,0	6,5	6,0	5,5	5,5				
		$\tau_{Rk,C1}$	[N/mm ²]		7,1	6,4	6,2	5,7	5,5	5,5				
	flooded bore hole	$\tau_{Rk,cr}$	[N/mm ²]		7,5	6,5	6,0	5,0	4,5	4,0				
		$\tau_{Rk,C1}$	[N/mm ²]		7,1	6,0	5,7	4,8	4,5	4,0				
Temperature range II: 60°C/43°C	dry and wet concrete	$\tau_{Rk,cr}$	[N/mm ²]		4,5	4,0	4,0	3,5	3,5	3,5				
		$\tau_{Rk,C1}$	[N/mm ²]		4,3	3,7	3,8	3,3	3,5	3,5				
	flooded bore hole	$\tau_{Rk,cr}$	[N/mm ²]		4,5	4,0	4,0	3,5	3,5	3,0				
		$\tau_{Rk,C1}$	[N/mm ²]		4,3	3,7	3,8	3,3	3,5	3,0				
Temperature range III: 72°C/43°C	dry and wet concrete	$\tau_{Rk,cr}$	[N/mm ²]		4,0	3,5	3,5	3,0	3,0	3,0				
		$\tau_{Rk,C1}$	[N/mm ²]		3,9	3,2	3,3	2,9	3,0	3,0				
	flooded bore hole	$\tau_{Rk,cr}$	[N/mm ²]		4,0	3,5	3,5	3,0	3,0	3,0				
		$\tau_{Rk,C1}$	[N/mm ²]		3,9	3,2	3,3	2,9	3,0	3,0				
Increasing factors for concrete ψ_c				C25/30	1,02									
				C30/37	1,04									
				C35/45	1,07									
				C40/50	1,08									
				C45/55	1,09									
				C50/60	1,10									
Factor according to CEN/TS 1992-4-5 Section 6.2.2.3	Non-cracked concrete	k_8	[-]	10,1										
	Cracked concrete			7,2										
Concrete cone failure														
Factor according to CEN/TS 1992-4-5 Section 6.2.3.1	Non-cracked concrete	k_{ucr}	[-]	10,1										
	Cracked concrete	k_{cr}	[-]	7,2										
Edge distance				$c_{cr,N}$	1,5 h_{ef}									
Axial distance				$s_{cr,N}$	3,0 h_{ef}									
Splitting failure														
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				$s_{cr,sp}$	2 $c_{cr,sp}$									
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									
Mungo Injection System MIT600RE for concrete								Annex C 5						
Performances Characteristic values of tension loads under static, quasi-static action and seismic action (performance category C1)														

Table C6: Characteristic values of shear loads under static, quasi-static action and seismic action (performance category C1)

Anchor size reinforcing bar		$\varnothing 8$	$\varnothing 10$	$\varnothing 12$	$\varnothing 14$	$\varnothing 16$	$\varnothing 20$	$\varnothing 25$	$\varnothing 28$	$\varnothing 32$
Steel failure without lever arm										
Characteristic shear resistance	$V_{Rk,s}$	[kN]								$0,50 \cdot A_s \cdot f_{uk}$
	$V_{Rk,s,C1}$	[kN]	No Performance Determined (NPD)							$0,44 \cdot A_s \cdot f_{uk}$
Steel failure with lever arm										
Characteristic bending moment	$M_{Rk,s}^0$	[Nm]								$1,2 \cdot W_{gl} \cdot f_{uk}$
	$M_{Rk,s,C1}^0$	[Nm]								No Performance Determined (NPD)
Concrete pry-out failure										
Factor k_3 in equation (27) of CEN/TS 1992-4-5 Section 6.3.3 Factor k in equation (5.7) of Technical Report TR 029	$k_{(3)}$	[\cdot]								2,0
Installation safety factor	$\gamma_2 = \gamma_{inst}$	[\cdot]								1,0
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
Installation safety factor	$\gamma_2 = \gamma_{inst}$	[\cdot]								32
Mungo Injection System MIT600RE for concrete										
Performances Characteristic values of shear loads under static, quasi-static action and seismic action (performance category C1)		Annex C 6								

Table C7: Displacements under tension load¹⁾ (threaded rod)

Anchor size threaded rod			M 8	M 10	M 12	M 16	M 20	M24	M 27	M 30
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)]		0,210	0,210	0,210	0,210	0,210	0,210	
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)]		0,240	0,240	0,240	0,240	0,240	0,240	
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)]		0,240	0,240	0,240	0,240	0,240	0,240	
Cracked concrete C20/25 under seismic C2 action										
Temperature range I: 40°C/24°C	$\delta_{N,seis(DLS)}$ -factor	[mm/(N/mm²)]	No Performance Determined (NPD)	0,03	0,05	No Performance Determined (NPD)				
	$\delta_{N,seis(ULS)}$ -factor	[mm/(N/mm²)]		0,06	0,09					
Temperature range II: 60°C/43°C	$\delta_{N,seis(DLS)}$ -factor	[mm/(N/mm²)]		0,03	0,05					
	$\delta_{N,seis(ULS)}$ -factor	[mm/(N/mm²)]		0,06	0,09					
Temperature range III: 72°C/43°C	$\delta_{N,seis(DLS)}$ -factor	[mm/(N/mm²)]		0,03	0,05					
	$\delta_{N,seis(ULS)}$ -factor	[mm/(N/mm²)]		0,06	0,09					

¹⁾ Calculation of the displacement

$$\delta_{N0} = \delta_{N0}\text{-factor} \cdot \tau; \quad \delta_{N,seis(DLS)} = \delta_{N,seis(DLS)}\text{-factor} \cdot \tau; \quad \tau: \text{action bond stress for tension}$$

$$\delta_{N\infty} = \delta_{N\infty}\text{-factor} \cdot \tau; \quad \delta_{N,seis(ULS)} = \delta_{N,seis(ULS)}\text{-factor} \cdot \tau;$$

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

Anchor size threaded rod			M 8	M 10	M 12	M 16	M 20	M24	M 27	M 30						
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	$\delta_{V,seis(DLS)}$ -factor	[mm/kN]	No Performance Determined (NPD)	0,2	0,1	No Performance Determined (NPD)										
	$\delta_{V,seis(ULS)}$ -factor	[mm/kN]		0,2	0,1											
¹⁾ Calculation of the displacement																
$\delta_{V0} = \delta_{V0}\text{-factor} \cdot V; \quad V: \text{action shear load}$																
$\delta_{V\infty} = \delta_{V\infty}\text{-factor} \cdot V;$																
$\delta_{V,seis(DLS)} = \delta_{V,seis(DLS)}\text{-factor} \cdot V;$																
$\delta_{V,seis(ULS)} = \delta_{V,seis(ULS)}\text{-factor} \cdot V;$																
Mungo Injection System MIT600RE for concrete																
Performances Displacements (threaded rods)						Annex C 7										

Table C9: Displacements under tension load¹⁾ (internally threaded sleeve)

Anchor size internally threaded sleeve			IG-M 6	IG-M 8	IG-M 10	IG-M 12	IG-M 16	IG-M 20
Non-cracked concrete C20/25 under static and quasi-static action								
Temperature range I: 40°C/24°C	δ_{N0} -factor	[mm/(N/mm ²)]	0,013	0,015	0,020	0,024	0,029	0,035
	$\delta_{N\infty}$ -factor	[mm/(N/mm ²)]	0,052	0,061	0,079	0,096	0,114	0,140
Temperature range II: 60°C/43°C	δ_{N0} -factor	[mm/(N/mm ²)]	0,015	0,018	0,023	0,028	0,033	0,043
	$\delta_{N\infty}$ -factor	[mm/(N/mm ²)]	0,060	0,070	0,091	0,111	0,131	0,161
Temperature range III: 72°C/43°C	δ_{N0} -factor	[mm/(N/mm ²)]	0,015	0,018	0,023	0,028	0,033	0,043
	$\delta_{N\infty}$ -factor	[mm/(N/mm ²)]	0,060	0,070	0,091	0,111	0,131	0,161
Cracked concrete C20/25 under static and quasi-static action								
Temperature range I: 40°C/24°C	δ_{N0} -factor	[mm/(N/mm ²)]		0,032	0,037	0,042	0,048	0,058
	$\delta_{N\infty}$ -factor	[mm/(N/mm ²)]		0,210	0,210	0,210	0,210	0,210
Temperature range II: 60°C/43°C	δ_{N0} -factor	[mm/(N/mm ²)]	No Performance Determined (NPD)	0,037	0,043	0,049	0,055	0,067
	$\delta_{N\infty}$ -factor	[mm/(N/mm ²)]		0,240	0,240	0,240	0,240	0,240
Temperature range III: 72°C/43°C	δ_{N0} -factor	[mm/(N/mm ²)]		0,037	0,043	0,049	0,055	0,067
	$\delta_{N\infty}$ -factor	[mm/(N/mm ²)]		0,240	0,240	0,240	0,240	0,240

¹⁾ Calculation of the displacement

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

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

Table C10: Displacements under shear load¹⁾ (internally threaded sleeve)

Anchor size internally threaded sleeve			IG-M 6	IG-M 8	IG-M 10	IG-M 12	IG-M 16	IG-M 20
Non-cracked and cracked concrete C20/25 under static and quasi-static action								
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

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

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

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Displacements (internally threaded sleeve)

Annex C 8

Table C11: Displacements under tension load¹⁾ (rebar)

Anchor size reinforcing bar			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
	$\delta_{N\infty}$ -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
	$\delta_{N\infty}$ -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
	$\delta_{N\infty}$ -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)]	No Performance Determined (NPD)	0,032	0,035	0,037	0,042	0,049	0,055	0,061	
	$\delta_{N\infty}$ -factor	[mm/(N/mm²)]		0,210	0,210	0,210	0,210	0,210	0,210	0,210	
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	0,070	
	$\delta_{N\infty}$ -factor	[mm/(N/mm²)]		0,240	0,240	0,240	0,240	0,240	0,240	0,240	
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	0,070	
	$\delta_{N\infty}$ -factor	[mm/(N/mm²)]		0,240	0,240	0,240	0,240	0,240	0,240	0,240	

¹⁾ Calculation of the displacement

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

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

Table C12: Displacement under shear load¹⁾ (rebar)

Anchor size reinforcing bar			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
	$\delta_{V\infty}$ -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

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

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

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Displacements (rebar)**Annex C 9**