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DECLARATION OF PERFORMANCE

DoP Nr.: MKT-2.5-100_en


- ✧ **Unique identification code of product-type:** Chemical Anchor V
- ✧ **Intended use/es:** Bonded fastener for use in concrete, see Annex B
- ✧ **Manufacturer:** MKT Metall-Kunststoff-Technik GmbH & Co.KG
Auf dem Immel 2
67685 Weilerbach
- ✧ **System/s of AVCP:** 1
- ✧ **European Assessment Document:** EAD 330499-00-0601
European Technical Assessment: ETA-05/0231, 29.05.2018
Technical Assessment Body: DIBt, Berlin
Notified body/ies: NB 2873 – Technische Universität Darmstadt

✧ **Declared performance/s:**

Essential characteristics	Performance
Mechanical resistance and stability (BWR 1)	
Characteristic resistance to tension load (static and quasi-static loading)	Annex C1
Characteristic resistance to shear load (static and quasi-static loading)	Annex C2
Displacements (static and quasi-static loading)	Annex C1 + C2

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.

Signed for and on behalf of the manufacturer by:


Stefan Weustenhagen
 (General manager)
 Weilerbach, 01.01.2021

p.p. 
Dipl.-Ing. Detlef Bigalke
 (Head of product development)



The original of this declaration of performance was written in German. In the event of deviations in the translation, the German version shall be valid.

Specifications of intended use

Chemical Anchor V	Anchor rod V-A					
	M8	M10	M12	M16	M20	M24
Static or quasi-static action	✓					
Base materials	reinforced or unreinforced normal weight concrete without fibres acc. to EN 206:2013					
	strength classes C20/25 to C50/60, acc. to EN 206:2013					
	uncracked concrete					
Temperature Range I	-40°C to +40°C	max long term temperature +24°C and max short term temperature +40°C				
Temperature Range II	-40°C to +80°C	max long term temperature +50°C and max short term temperature +80°C				

Use conditions (environmental conditions):

- Structures subject to dry internal conditions (zinc plated 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 are designed in accordance with FprEN 1992-4:2016 and TR 055

Chemical Anchor V

Intended use
Specifications

Annex B1

Table B1: Installation parameters

Anchor size			M8	M10	M12	M16	M20	M24
Nominal diameter of drill hole	d_0	[mm]	10	12	14	18	25	28
Cutting diameter of drill hole	$d_{cut} \leq$	[mm]	10,5	12,5	14,5	18,5	25,5	28,5
Depth of drill hole	h_0	[mm]	80	90	110	125	170	210
Effective anchorage depth	h_{ef}	[mm]	80	90	110	125	170	210
Diameter of clearance hole in the fixture	d_f	[mm]	9	12	14	18	22	26
Diameter of steel brush	d_b	[mm]	11	13	16	20	27	30
Maximum installation torque	T_{inst}	[Nm]	10	20	40	80	120	180

Steelbrush d_b 

Table B2: Minimum member thickness, edge distance and spacing

Anchor size			M8	M10	M12	M16	M20	M24
Minimum member thickness	h_{min}	[mm]	110	120	140	160	220	260
Minimum edge distance	c_{min}	[mm]	40	45	55	65	85	105
Minimum spacing	s_{min}	[mm]	40	45	55	65	85	105

Table B3: Minimum curing time

Temperature in the drill hole	Minimum curing time	
	dry concrete	wet concrete
$\geq 0^\circ\text{C}$	5 h	10 h
$\geq + 5^\circ\text{C}$	1 h	2 h
$\geq +20^\circ\text{C}$	20 min	40 min
$\geq +30^\circ\text{C}$	10 min	20 min

Chemical Anchor V

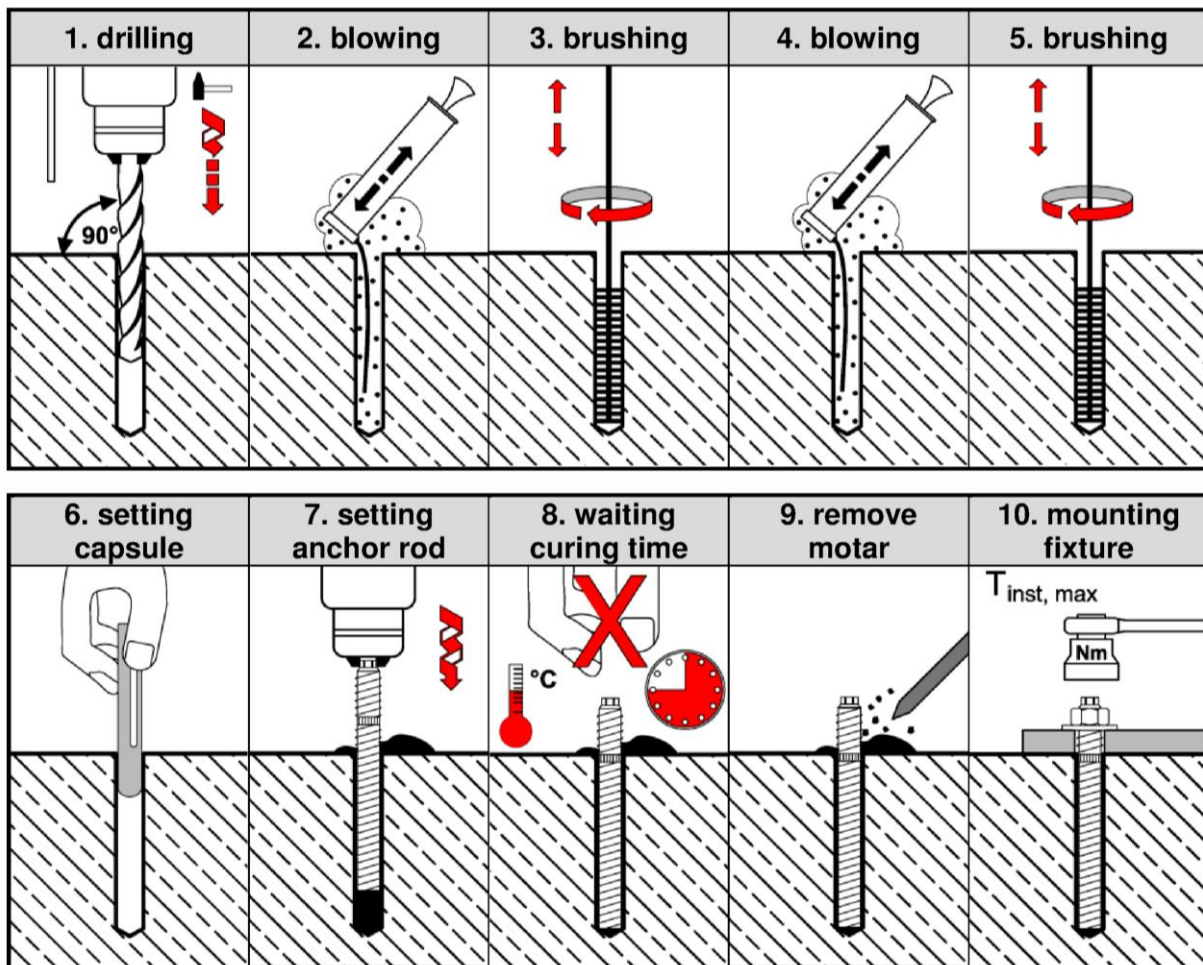
Intended use
Installation parameters / Curing Time

Annex B2

Installation

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site
- Dry or wet concrete, all sizes
- Hole drilling by hammer drilling
- Cleaning the drill hole:

Removing possibly existing water in the drill hole completely and cleaning the drill hole by at least one blowing operation, by at least 1 x blowing / 1 x brushing / 1 x blowing / 1 x brushing operation by using the steel brush supplied by the manufacturer; before brushing cleaning the brush and checking whether the brush diameter according to Annex B2, Table B1 is still sufficient. The steel brush shall produce natural resistance as it enters the anchor hole. If this is not the case a new brush or a brush with a larger diameter must be used.
- Curing time must be observed prior to loading the anchor.
- Observe expiration date



Chemical Anchor V

Intended use
Installation

Annex B3

Table C1: Characteristic values for tension loads

Anchor size			M8	M10	M12	M16	M20	M24	
Steel failure									
Characteristic resistance	Steel, zinc plated property class 5.8	$N_{Rk,s}$	[kN]	18	29	42	78	123	177
	Steel, zinc plated property class 8.8	$N_{Rk,s}$	[kN]	29	46	67	126	196	282
	Stainless steel A4 property class 70	$N_{Rk,s}$	[kN]	26	40	59	110	172	247
	Stainless steel A4 property class 80	$N_{Rk,s}$	[kN]	29	46	67	126	196	282
	High corrosion resistant steel HCR	$N_{Rk,s}$	[kN]	26	40	59	110	172	247
Combined pull-out and concrete failure									
Characteristic resistance in uncracked concrete C20/25 to C50/60									
Temperature range I	τ_{Rk}	[N/mm ²]	10	11	9,5	9,5	8,5	7,5	
Temperature range II	τ_{Rk}	[N/mm ²]	10	11	9,5	8,0	7,0	5,5	
Concrete cone failure									
Factor for k_1	$k_{Ucr,N}$	[-]	11,0						
Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}						
Spacing	$s_{cr,N}$	[mm]	3 h_{ef}						
Splitting									
Characteristic resistance	$N^0_{Rk,sp}$	[kN]	min [$N^0_{Rk,p}$; $N^0_{Rk,c}$]						
Edge distance	$c_{cr,sp}$	[mm]	1,5 h_{ef}	1 h_{ef}					
Spacing	$s_{cr,sp}$	[mm]	3 h_{ef}	2 h_{ef}					
Installation factor	γ_{inst}	[-]	1,2						

Table C2: Displacements under tension load

Anchor size			M8	M10	M12	M16	M20	M24
Tension load	N	[kN]	8	12	16	20	30	38
Displacement	δ_{N0}	[mm]	0,1	0,2	0,2	0,2	0,5	0,4
	$\delta_{N\infty}$	[mm]	0,5					

Chemical Anchor V**Performance**Characteristic values and displacements under **tension load****Annex C1**

Table C3: Characteristic values for shear loads

Anchor size				M8	M10	M12	M16	M20	M24
Steel failure without lever arm									
Characteristic shear resistance	Steel, zinc plated property class 5.8	$V_{Rk,s}^0$	[kN]	9	14	21	39	61	88
	Steel, zinc plated property class 8.8	$V_{Rk,s}^0$	[kN]	15	23	33	63	98	141
	Stainless steel A4 property class 70	$V_{Rk,s}^0$	[kN]	13	20	29	55	86	124
	Stainless steel A4 property class 80	$V_{Rk,s}^0$	[kN]	15	23	33	62	98	141
	High corrosion resistant steel HCR	$V_{Rk,s}^0$	[kN]	13	20	29	55	86	124
Ductility factor	k_7	[-]	0,8						
Steel failure with lever arm									
Characteristic bending moment	Steel, zinc plated property class 5.8	$M_{Rk,s}^0$	[Nm]	19	37	65	166	325	561
	Steel, zinc plated property class 8.8	$M_{Rk,s}^0$	[Nm]	30	60	105	266	519	898
	Stainless steel A4 property class 70	$M_{Rk,s}^0$	[Nm]	26	52	92	233	454	785
	Stainless steel A4 property class 80	$M_{Rk,s}^0$	[Nm]	30	60	105	266	519	898
	High corrosion resistant steel HCR	$M_{Rk,s}^0$	[Nm]	26	52	92	233	454	785
Pry-out failure									
Factor	k_8	[-]	2,0						
Concrete edge failure									
Effective length of anchor	l_f	[mm]	80	90	110	125	170	210	
Effective diameter of anchor	d_{nom}	[mm]	10	12	14	18	25	28	
Installation factor	γ_{inst}	[-]	1,0						

Table C4: Displacements under shear load

Anchor size				M8	M10	M12	M16	M20	M24
Shear load	V	[kN]	5	8	12	22	35	50	
Displacement	δ_{V0}	[mm]	2	3	3	4	5	5	
	$\delta_{V\infty}$	[mm]	4	5	5	6	7	7	

Chemical Anchor V

Performance
 Characteristic values and displacements under **shear load**

Annex C2