... eine starke Verbindung

ДЕКЛАРАЦИЯ ЗА ЕКСПЛОАТАЦИОННИ ПОКАЗАТЕЛИ

DoP № **MKT-2.1-500_bg**

- **Уникален идентификационен код на типа продукт:** **инжекционна система VM-EA**
- **Предвидена употреба/употреби:** Инжекционна система за закрепване в бетон, който не е напукан, виж Приложение Б/Annex B
- **Производител:** MKT Metall-Kunststoff-Technik GmbH & Co.KG
Auf dem Immel 2
67685 Weilerbach
- **Система или системи за оценяване и проверка на постоянството на експлоатационните показатели:** 1
- **Европейски документ за оценяване:** **EAD 330499-01-0601**
Европейска техническа оценка: **ETA-16/0898, 25.04.2020**
Орган за техническа оценка: TZÚS, Prag
отифициран орган/органи: NB 2873 – Technische Universität Darmstadt
- **Декларирани експлоатационни показатели:**

Съществени характеристики	Експлоатационни показатели
Механично съпротивление и устойчивост (BWR 1)	
характерна якост на опън (статична и квази-статична)	виж приложение / Annex C1, C2, C4
характерна напречна товароносимост (статична и квази-статична)	виж приложение / Annex C1, C3, C5
Изместване	виж приложение / Annex C6
трайност	виж приложение / Annex B1
Хигиена, здраве и околна среда (BWR 3)	
Съдържание, емисии и / или отделяне на опасни вещества	Производителността не е оценена

ксплоатационните показатели на продукта, посочени по-горе, са в съответствие с декларираните експлоатационни показатели. Настоящата декларация за експлоатационни показатели се издава в съответствие с Регламент (EU) № 305/2011, като отговорността за нея се носи изцяло от посочения по-горе производител.

Подписано за и от името на производителя от:

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(Продуктов мениджър)

Оригиналът на тази декларация за експлоатационни показатели е на немски език. В случай на отклонения в превода, немската версия е валидна.

Specifications of intended use

Injection System VM-EA		Anchor rod	Internally threaded anchor rod
Static or quasi-static action		**VMU-A, V-A, VM-A,** commercial standard threaded rod M8 – M24 zinc plated, A2, A4, HCR	**VMU-IG** M6 - M16 electroplated or sherardized, A4, HCR
Base materials		reinforced or unreinforced normal weight concrete acc. to EN 206:2013+A1:2016	
		strength classes acc. to EN 206:2013+A1:2016: C20/25 to C50/60	
		uncracked concrete	
Temperature Range I:	24°C / 40°C	Temperature range from -40°C to +40°C with max. long term temperature +24°C and max. short term temperature +40 °C	
Temperature Range II:	50°C / 80°C	Temperature range from -40°C to +80°C with max. long term temperature +50°C and max. short term temperature +80 °C	

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions (all materials).
- For all other conditions according to EN 1993-1-4:2006+A1:2015 corresponding to corrosion resistance classes:
  - Stainless steel A2 according to Annex A, Table A3: CRC II
  - Stainless steel A4 according to Annex A, Table A3: CRC III
  - High corrosion resistant steel HCR according to Annex A, Table A3: CRC V

  Steel grades of a higher corrosion resistance class may be 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 EN 1992-4:2018 or TR 055.

Concrete condition:

- I1 = installation in dry or wet (water saturated) concrete and use in service in dry or wet concrete
- I2 = installation in water-filled drill holes (not sea water) and use in service in dry or wet concrete

Installation:

- Hole drilling by hammer or compressed air drill mode
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site

Installation direction:

- D3 = downward and horizontal and upwards (e.g. overhead) installation

Table B1: Installation parameters for threaded rod

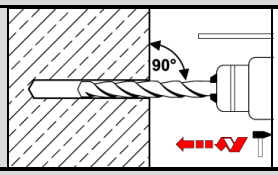
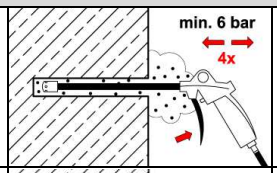
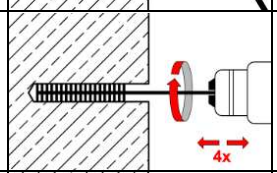
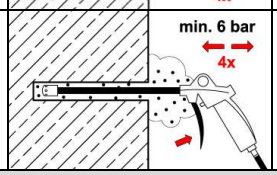
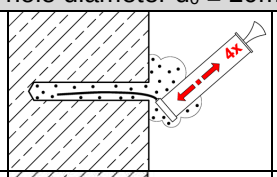
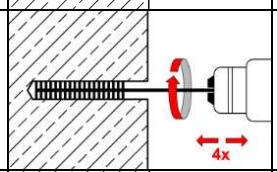
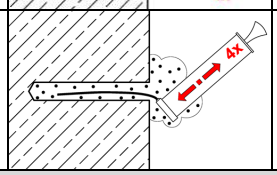
Threaded rod			M 8	M 10	M 12	M 16	M 20	M 24
Diameter of threaded rod	$d=d_{nom}$	[mm]	8	10	12	16	20	24
Nominal drill hole diameter	d_0	[mm]	10	12	14	18	24	28
Effective anchorage depth	$h_{ef,min}$	[mm]	60	60	70	80	90	96
	$h_{ef,max}$	[mm]	160	200	240	320	400	480
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	9	12	14	18	22	26
Installation torque	$T_{inst} \leq$	[Nm]	10	20	40	80	120	160
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
Minimum edge distance	c_{min}	[mm]	40	50	60	80	100	120

Table B2: Installation parameters for internally threaded anchor rod

Internally threaded anchor rod			VMU-IG M 6	VMU-IG M 8	VMU-IG M 10	VMU-IG M 12	VMU-IG M 16
Inner diameter of threaded rod	d_2	[mm]	6	8	10	12	16
Outer diameter of threaded rod[1)]	$d=d_{nom}$	[mm]	10	12	16	20	24
Nominal drill hole diameter	d_0	[mm]	12	14	18	24	28
Effective anchorage 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[1)]	$d_f \leq$	[mm]	7	9	12	14	18
Installation torque	$T_{inst} \leq$	[Nm]	10	10	20	40	60
Minimum screw-in depth	l_{IG}	[mm]	8	8	10	12	16
Minimum thickness of member	h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 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

[1)] With metric thread acc. to EN 1993-1-8:2005+AC:2009

Installation instructions

Drilling of the hole		
1.		Drill with hammer drill a hole into the base material to the size required by the selected anchor (Table B1 or B2). In case of aborted drill hole, the drill hole shall be filled with mortar.
Cleaning		
2.	**Attention! Standing water in the drill hole must be removed before cleaning!**	
	<u>Cleaning with compressed air</u> (all diameters)	
	2a. 	Starting from the bottom or back of the drill hole, blow out the hole with compressed air (min. 6 bar) a minimum of **four** times. If the drill hole ground is not reached, an extension must be used.
	2b. 	Attach the brush to a drilling machine or a battery screwdriver. Brush the hole with an appropriate sized wire brush > $d_{b,min}$ (Table B3) a minimum of **four** times. If the drill hole ground is not reached, a brush extension shall be used.
	2c. 	Finally blow the hole clean again with compressed air (min. 6 bar) a minimum of **four** times. If the drill hole ground is not reached an extension shall be used.
	<u>Manual cleaning</u> Drill hole diameter $d_0 \leq 20$mm or drill hole depth $h_0 \leq 240$mm	
	2a. 	Starting from the bottom or back of the drill hole, blow the hole clean with the blow-out pump minimum of **four** times. If the drill hole ground is not reached an extension shall be used.
	2b. 	Attach the brush to a drilling machine or a battery screwdriver. Brush the hole with an appropriate sized wire brush > $d_{b,min}$ (Table B3) a minimum of **four** times. If the drill hole ground is not reached, a brush extension shall be used.
	2c. 	Finally blow the hole clean again with the blow-out pump a minimum of **four** times. If the drill hole ground is not reached an extension shall be used.
	After cleaning, the drill hole has to be protected against re-contamination in an appropriate way, until dispensing the mortar in the drill hole. If necessary, the cleaning repeated has to be directly before dispensing the mortar. In-flowing water must not contaminate the drill hole again.	

Injection System VM-EA for concrete	**Annex B3**
Intended use Installation instructions	

Installation instructions (continuation)

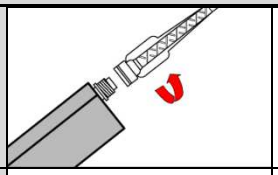
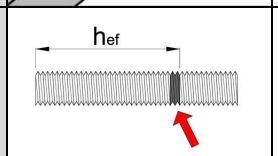
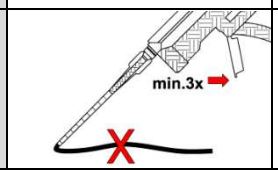
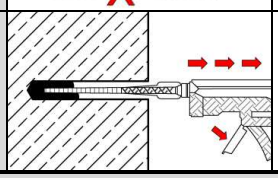
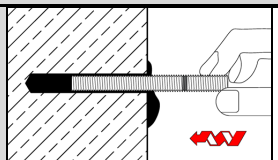
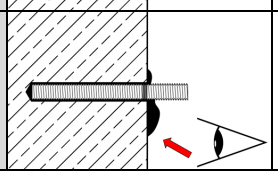
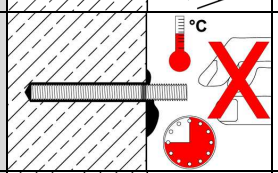
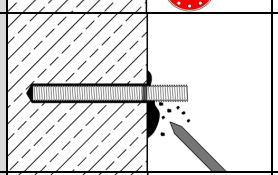
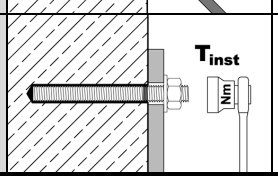
Injection		
3.		Attach a supplied static-mixing nozzle to the cartridge and load the cartridge into the correct dispensing tool. For foil tube cartridges: cut off the foil tube clip before use. For every working interruption longer than the recommended working time (Table B4) as well as for new cartridges, a new static-mixer shall be used.
4.		Prior to inserting the anchor rod into the filled drill hole, the position of the embedment depth shall be marked on the anchor rod.
5.		Prior to dispensing into the drill 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 blue (VM-EA blue) color. For foil tube cartridges discard a minimum of six full strokes.
6a.		Starting from the bottom or back of the cleaned drill hole fill the hole up to approximately two-thirds with adhesive. Slowly withdraw the static mixing nozzle as the hole fills to avoid air pockets. For embedment larger than 190mm an extension nozzle shall be used. Observe the gel-/ working times given in Table B4.
Inserting the anchor		
7.		Push the threaded rod into the hole while turning slightly to ensure proper distribution of the adhesive until the embedment depth is reached. The anchor shall be free of dirt, grease, oil or other foreign material.
8.		Make sure that the anchor is fully seated up to the full embedment depth 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 installation, the anchor should be fixed (e.g. by 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 B4).
10.		Remove excess mortar.
11.		The fixture can be mounted after curing time. Apply installation torque T_{inst} according to Table B1 or B2.

Table B3: Parameter cleaning tools

Threaded rod	Internally threaded anchor rod	Drill bit - ∅	Brush - ∅	min. Brush - ∅
[-]	[-]	d_0 [mm]	d_b [mm]	$d_{b,min}$ [mm]
M8	-	10	12	10,5
M10	VMU-IG M6	12	14	12,5
M12	VMU-IG M8	14	16	14,5
M16	VMU-IG M10	18	20	18,5
M20	VMU-IG M12	24	26	24,5
M24	VMU-IG M16	28	30	28,5

Recommended compressed air tool (min 6 bar)
all applications

Blow-out pump (volume 750ml)
Drill bit diameter (d_0): 10 mm to 20 mm
Drill hole depth (h_0): ≤ 240 mm

Cleaning brush RB

Table B4: Working time and curing time

Concrete temperature	VM-EA low speed		VM-EA, VM-EA blue [1)]		VM-EA express	
	working time	minimum curing time	working time	minimum curing time	working time	minimum curing time
-10 to -6°C	-	-	-	-	60 min	4 h
-5 to -1°C	-	-	90 min	6 h	45 min	2 h
0 to +4°C	-	-	45 min	3 h	25 min	80 min
+5 to +9°C	-	-	25 min	2 h	10 min	45 min
+10 to +14°C	30 min	5 h	20 min	100 min	4 min	25 min
+15 to +19°C	20 min	210 min	15 min	80 min	3 min	20 min
+20 to +29°C	15 min	145 min	6 min	45 min	2 min	15 min
+30 to +34°C	10 min	80 min	4 min	25 min	-	-
+35 to +39°C	6 min	45 min	2 min	20 min	-	-
+40 to +44°C	4 min	25 min	-	-	-	-
+45 °C	2 min	20 min	-	-	-	-
Cartridge temperature	**+5°C to +45°C**		**+5°C to +40°C**		**0°C to +30°C**	

[1)] The VM-EA blue injection mortar has a curing time proof by changing the color from blue to grey after minimum curing time. The curing time proof is only valid for the standard version of the mortar

Injection System VM-EA for concrete

Intended Use
Parameter cleaning tools, working time and curing time

Annex B5