

## DEKLARACJA WŁAŚCIWOŚCI UŻYTKOWYCH

DoP Nr: MKT-1.1-301\_pl

- ❖ **Niepowtarzalny kod identyfikacyjny typu wyrobu:** **Kotwa udarowa E / ES**
- ❖ **Zamierzone zastosowanie lub zastosowania:** Kotek mechaniczny do kotwienia w betonie, patrz załącznik /Annex B
- ❖ **Producent:** MKT Metall-Kunststoff-Technik GmbH & Co.KG  
Auf dem Immel 2  
67685 Weilerbach
- ❖ **System(-y) oceny i weryfikacji stałości właściwości użytkowych:** 1
- ❖ **Europejski dokument oceny:** **EAD 330232-01-0601**

Europejska ocena techniczna: **ETA-02/0020, 01.06.2021**

Jednostka ds. oceny technicznej: DIBt, Berlin

Jednostka lub jednostki notyfikowane: NB 2873 – Technische Universität Darmstadt

❖ **Deklarowane właściwości użytkowe:**

Zasadnicze charakterystyki	Właściwości użytkowe
<b>Nośność i stateczność (BWR 1)</b>	
Charakterystyczna wytrzymałość na rozciąganie (obciążenia statyczne i quasi-statyczne) Metoda A	Załącznik/Annex B2, C1 – C2
Nośności charakterystyczne przy obciążeniu poprzecznym (obciążenia statyczne i quasi-statyczne)	Załącznik/Annex C3 – C4
Przesunięcia	Załącznik/Annex C5
Trwałość	Załącznik/Annex B1
Nośności charakterystyczne i przemieszczenia dla kategorii sejsmicznych C1 + C2	Wydajność nie oceniono
<b>Bezpieczeństwo pożarowe (BWR 2)</b>	
Zachowanie ogień	Klasa A1
Odporność ogniowa	Wydajność nie oceniono

Właściwości użytkowe określonego powyżej wyrobu są zgodne z zestawem deklarowanych właściwości użytkowych. Niniejsza deklaracja właściwości użytkowych wydana zostaje zgodnie z rozporządzeniem (UE) nr 305/2011 na wyłączną odpowiedzialność producenta określonego powyżej.

W imieniu producenta podpisał(-a):



**Stefan Weustenhagen**

(Kierownik)

**Weilerbach, 01.06.2021**

p.p.



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(Kierownik Rozwoju Produktu)



Oryginał tej deklaracji właściwości użytkowych został sporządzony w języku niemieckim. W przypadku odchyień w tłumaczeniu obowiązuje wersja niemiecka.

## Specifications of intended use

### Anchorage subject to:

- Static and quasi-static loads

### Base materials:

- Compacted, reinforced or unreinforced normal weight concrete, without fibres according to EN 206:2013 + A1:2016
- Uncracked concrete
- Strength classes C20/25 to C50/60 according to EN 206:2013 + A1:2016

### Use conditions (Environmental conditions):

- Structures subject to dry internal conditions (all materials)
- For all other conditions applies:  
Use according to EN 1993-1-4:2015 corresponding to corrosion resistance class CRC according to Annex A2, Table A1:
  - Stainless steel A4: CRC III
  - High corrosion resistant steel HCR: CRC V
- Anchor types M6x30 A4 and M8x30 A4 only for dry internal exposure

### Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- 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.).
- The strength class and the length of the fastening screw or threaded rod shall be defined by the designing engineer
- Design of fastenings according EN 1992-4:2018 (and TR 055, if necessary)
- Anchor sizes M6x30, M8x30 and M10x30 for statically indeterminate structural components only, when in case of failure, the load can be distributed to other fasteners.

### Installation:

- Anchor installation in accordance with the manufacturer's specifications and drawings and using the appropriate tools
- Drill hole by hammer drilling or vacuum drilling

## Drop-in Anchor E / ES

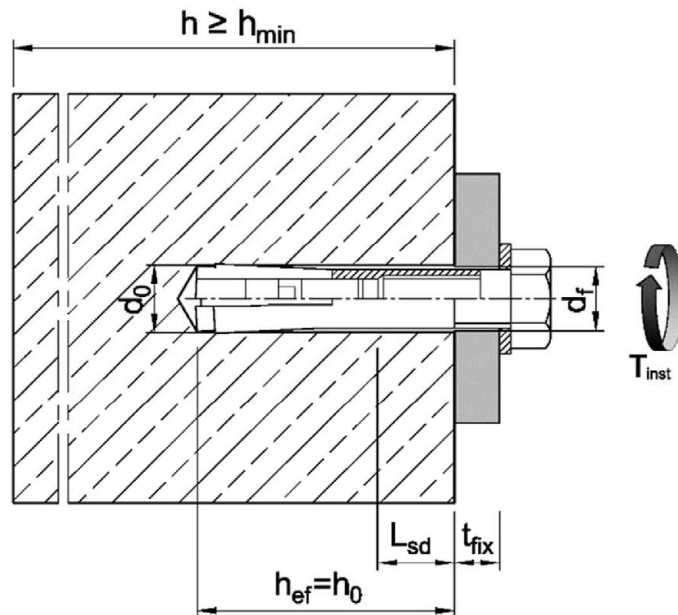
Intended use  
Specifications

Annex B1

**Table B1: Installation parameters**

Anchor size		M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M12x80	M16x65	M16x80	M20x80
Depth of drill hole	$h_0 =$ [mm]	30	30	40	30	40	50	80	65	80	80
Drill hole diameter	$d_0 =$ [mm]	8	10	10	12	12	15	15	20	20	25
Cutting diameter of drill bit	$d_{cut} \leq$ [mm]	8,45	10,45	10,45	12,5	12,5	15,5	15,5	20,55	20,55	25,55
Max. installation torque <sup>1)</sup>	$T_{inst} \leq$ [Nm]	4	8	8	15	15	35	35	60	60	120
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	7	9	9	12	12	14	14	18	18	22
Thread length	$L_{th}$ [mm]	13	13	20	12	15	18	45	23	38	34
Minimum screw-in depth	$L_{sdmin}$ [mm]	7	9	9	10	11	13	13	18	18	22
<b>Steel, zinc plated</b>											
Minimum thickness of member	$h_{min}$ [mm]	100	100	100	120	120	130	130	160	160	200
Minimum spacing	$s_{min}$ [mm]	55	60	80	100	100	120	120	150	150	160
Minimum edge distance	$c_{min}$ [mm]	95	95	95	115	135	165	165	200	200	260
<b>Stainless steel A4, HCR</b>											
Minimum thickness of member	$h_{min}$ [mm]	100	100	100	-	130	140	140	160	160	250
Minimum spacing	$s_{min}$ [mm]	50	60	80	-	100	120	120	150	150	160
Minimum edge distance	$c_{min}$ [mm]	80	95	95	-	135	165	165	200	200	260

<sup>1)</sup> If the screw or threaded rod is otherwise secured against unscrewing, the torque can be omitted



**Drop-in Anchor E / ES**

**Intended use**  
Installation parameters

**Annex B2**

# Installation instructions

1		<p>Drill hole perpendicular to concrete surface. Using vacuum drill bit proceed with step 3.</p>
2		<p>Blow out dust. Alternatively, vacuum clean down to the bottom of the hole.</p>
3		<p>Drive in anchor.</p>
4		<p>Drive in cone by using setting tool.</p>
5		<p>Shoulder of setting tool must fit on anchor rim.</p>
6		<p>Turn in screw or threaded rod with nut, observe minimum screw-in depth (see Annex B2). Apply installation torque <math>T_{inst}</math>.</p>

## Drop-in Anchor E / ES

Intended use  
Installation instructions

Annex B3

**Table C1: Characteristic values for tension loads, zinc plated steel**

Anchor size			M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M12x80	M16x65 M16x80	M20x80				
Installation factor	$\gamma_{inst}$	[-]	1,2												
<b>Steel failure</b>															
Characteristic resistance	property class	4.6	$N_{Rk,s}$	[kN]	8,0	14,6		23,2		33,7		62,8	98,0		
		4.8			8,0	14,6		18,0	20,2	33,7		62,8	98,0		
		5.6			10,0	18,3		18,0	20,2	42,1		78,3	122,4		
		5.8			10,0	17,6	18,3	18,0	20,2	40,2	42,1	67,1	106,4		
		8.8			15,0	17,6	19,9	18,0	20,2	40,2	43,0	67,1	106,4		
Partial factor	property class	4.6	$\gamma_{Ms}^1)$	[-]	2,0										
		5.6			2,0		1,5		2,0						
		4.8			1,5							1,6			
		5.8													
		8.8													
<b>Pull-out failure</b>															
Characteristic resistance in concrete C20/25	$N_{Rk,p}$	[kN]	8,1	8,1	9,0	8,1	12,4	17,4	17,4	25,8	35,2				
Increasing factor	$\psi_C$	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$		$\left(\frac{f_{ck}}{20}\right)^{0,3}$	$\left(\frac{f_{ck}}{20}\right)^{0,5}$									
<b>Splitting</b>															
Characteristic resistance in concrete C20/25	$N^0_{Rk,sp}$	[kN]	$\min ( N_{Rk,p} ; N^0_{Rk,c} )$												
Characteristic edge distance	$c_{cr,sp}$	[mm]	95	95	95	115	135	165		200	260				
Characteristic spacing	$s_{cr,sp}$	[mm]	$2 \cdot c_{cr,sp}$												
<b>Concrete cone failure</b>															
Effective anchorage depth	$h_{ef}$	[mm]	30	30	40	30	40	50	80	65 80 <sup>2)</sup>	80				
Characteristic edge distance	$c_{cr,N}$	[mm]	$1,5 h_{ef}$												
Characteristic spacing	$s_{cr,N}$	[mm]	$2 \cdot c_{cr,N}$												
Factor	uncracked concrete	$k_{ucr,N}$	[-]												
	cracked concrete	$k_{cr,N}$	[-]												
			11,0												
			No performance assessed												

<sup>1)</sup> in absence of other national regulations

<sup>2)</sup> for M16x80

**Drop-in Anchor E / ES**

**Performance**  
Characteristic values for **tension loads, zinc plated steel**

**Annex C1**

**Table C2: Characteristic values for tension loads, stainless steel A4, HCR**

Anchor size			M6x30	M8x30	M8x40	M10x40	M12x50 M12x80	M16x65 M16x80	M20x80
Installation factor	$\gamma_{inst}$	[-]	1,0						
<b>Steel failure</b>									
Characteristic resistance (property class 70)	$N_{Rk,s}$	[kN]	14,1	23,3		29,4	50,2	83,8	133,0
Characteristic resistance (property class 80)	$N_{Rk,s}$	[kN]	17,5	23,3		29,4	50,2	83,8	133,0
Partial factor	$\gamma_{Ms}^{1)}$	[-]	1,87						
<b>Pull-out failure</b>									
Characteristic resistance in concrete C20/25	$N_{Rk,p}$	[kN]	8,1	8,1	11,0	12,4	17,4	25,8	35,2
Increasing factor	$\psi_C$	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$		$\left(\frac{f_{ck}}{20}\right)^{0,3}$	$\left(\frac{f_{ck}}{20}\right)^{0,5}$			
<b>Splitting failure</b>									
Characteristic resistance in concrete C20/25	$N^0_{Rk,sp}$	[kN]	min ( $N_{Rk,p}$ ; $N^0_{Rk,c}$ )						
Edge distance	$c_{cr,sp}$	[mm]	80	95	95	135	165	200	260
Spacing	$s_{cr,sp}$	[mm]	$2 \cdot c_{cr,sp}$						
<b>Concrete cone failure</b>									
Effective anchorage depth	$h_{ef}$	[mm]	30	30	40	40	50 80 <sup>2)</sup>	65 80 <sup>2)</sup>	80
Edge distance	$c_{cr,N}$	[mm]	$1,5 h_{ef}$						
Spacing	$s_{cr,N}$	[mm]	$2 \cdot c_{cr,N}$						
Factor	uncracked concrete	$k_{ucr,N}$	11,0						
	cracked concrete	$k_{cr,N}$	No performance assessed						

1) in absence of other national regulations

2) for M12x80 and M16x80

**Drop-in Anchor E / ES**
**Performance**

 Characteristic values for **tension loads, stainless steel A4, HCR**
**Annex C2**

**Table C3: Characteristic values for shear loads, zinc plated steel**

Anchor size			M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M12x80	M16x65 M16x80	M20x80		
<b>Steel failure without lever arm</b>													
Characteristic resistance	property class	4.6	$V_{Rk,s}^0$	[kN]	4,0	7,3	11,6	9,6	16,8		31,3	49,0	
		4.8			4,0	7,3	10,1	10,1	16,9		31,3	49,0	
		5.6			5,0	9,1	10,1	9,6	21,1		39,2	61,2	
		5.8			5,0	6,9	10,1	7,2	19,4	21,1	33,5	53,2	
		8.8			5,0	6,9	10,1	7,2	19,4	21,5	33,5	53,2	
Partial factor	property class	4.6	$\gamma_{Ms}^{1)}$	[-]	1,67								
		5.6			1,67		1,25	1,67					
		4.8			1,25								1,33
		5.8			1,25								1,33
		8.8			1,25								1,33
Duktilitätsfaktor			$k_7$	[-]	1,0								
<b>Steel failure with lever arm</b>													
Characteristic bending resistance	property class	4.6	$M_{Rk,s}^0$	[Nm]	6,1	15	30		52		133	259	
		4.8			7,6	19	37		65		166	324	
		5.6			12	30	59	60	105		266	519	
		5.8			12	30	59	60	105		266	519	
Partial factor	property class	4.6	$\gamma_{Ms}^{1)}$	[-]	1,67								
		5.6			1,67								
		4.8			1,25								
		5.8			1,25								
8.8	1,25												
Factor of ductility			$k_7$	[-]	1,0								
<b>Concrete pry-out failure</b>													
Pry-out factor			$k_8$	[-]	1,0			1,5	2,0				
<b>Concrete edge failure</b>													
Effective length of fastener in shear loading			$l_f$	[mm]	30	30	40	30	40	50	80	$\frac{65}{80}^{2)}$	80
Outside diameter of fastener			$d_{nom}$	[mm]	8	10		12		15		20	25

<sup>1)</sup> in absence of other national regulations

<sup>2)</sup> for M16x80

**Drop-in Anchor E / ES**

**Performance**  
Characteristic values for **shear loads, zinc plated steel**

**Annex C3**

**Table C4: Characteristic values for shear loads, stainless steel A4, HCR**

Anchor size			M6x30	M8x30	M8x40	M10x40	M12x50	M12x80	M16x65	M16x80	M20x80
<b>Steel failure without lever arm</b>											
Characteristic resistance (property class 70)	$V_{Rk,s}^0$	[kN]	7,0	10,6	13,4	25,1	41,9	66,5			
Characteristic resistance (property class 80)	$V_{Rk,s}^0$	[kN]	8,7	10,6	13,4	25,1	41,9	66,5			
Partial factor	$\gamma_{Ms}^{1)}$	[-]	1,56								
Factor of ductility	$k_7$	[-]	1,0								
<b>Steel failure with lever arm</b>											
Characteristic bending resistance (property class 70)	$M_{Rk,s}^0$	[Nm]	11	26	52	92	233	454			
Partial factor	$\gamma_{Ms}^{1)}$	[-]	1,56								
Characteristic bending resistance (property class 80)	$M_{Rk,s}^0$	[Nm]	12	30	60	105	266	519			
Partial factor	$\gamma_{Ms}^{1)}$	[-]	1,33								
Factor of ductility	$k_7$	[-]	1,0								
<b>Concrete pry-out failure</b>											
Pry-out factor	$k_8$	[-]	1,0	1,7					2,0		
<b>Concrete edge failure</b>											
Effective length of fastener in shear loading	$l_f$	[mm]	30	30	40	40	50	80	65	80	80
Outside diameter of fastener	$d_{nom}$	[mm]	8	10	12	15	20	25			

<sup>1)</sup> in absence of other national regulations

**Drop-in Anchor E / ES**

**Performance**  
Characteristic values for shear loads, stainless steel A4, HCR

**Annex C4**



**Table C5: Displacements under tension loads**

Anchor size			M6x30	M8x30	M8x40	M10x30	M10x40	M12x50 M12x80	M16x65 M16x80	M20x80
<b>Steel, zinc plated</b>										
Tension load in uncracked concrete	N	[kN]	3	3	3,6	3,3	4,8	6,4	10	14,8
Displacements	$\delta_{N0}$	[mm]	0,24							
	$\delta_{N\infty}$	[mm]	0,36							
<b>Stainless steel A4 / HCR</b>										
Tension load in uncracked concrete	N	[kN]	4	4	4,3	- <sup>1)</sup>	6,1	8,5	12,6	17,2
Displacements	$\delta_{N0}$	[mm]	0,12							
	$\delta_{N\infty}$	[mm]	0,24							

<sup>1)</sup> Anchor version is not part of the ETA

**Table C6: Displacements under shear loads**

Anchor size			M6x30	M8x30	M8x40	M10x30	M10x40	M12x50 M12x80	M16x65 M16x80	M20x80
<b>Steel, zinc plated</b>										
Shear load in uncracked concrete	V	[kN]	2	4	4	5,7	4,0	11,3	18,8	32,2
Displacements	$\delta_{V0}$	[mm]	0,9	0,9	1,0	1,5	0,6	1,2	1,2	1,6
	$\delta_{V\infty}$	[mm]	1,3	1,3	1,5	2,3	0,9	1,9	1,9	2,4
<b>Stainless steel A4 / HCR</b>										
Shear load in uncracked concrete	V	[kN]	3,5	5,2	5,2	- <sup>1)</sup>	6,5	11,5	19,2	30,4
Displacements	$\delta_{V0}$	[mm]	1,9	1,1	0,7	- <sup>1)</sup>	1,0	1,7	2,4	2,6
	$\delta_{V\infty}$	[mm]	2,8	1,6	1,0	- <sup>1)</sup>	1,5	2,6	3,6	3,8

<sup>1)</sup> Anchor version is not part of the ETA

**Drop-in Anchor E / ES**

**Performance**  
Displacements

**Annex C5**