... eine starke Verbindung

DECLARAŢIA DE PERFORMANŢĂ
DoP Nr. MKT-121 - ro

1. Cod unic de identificare al produsului-tip: **Ancora de fixare sarcini grele MKT SZ**

2. Tipul, lotul sau numărul de serie sau orice alt element care permite identificarea produsului pentru construcţii astfel cum este solicitat la articolul 11 alineatul (4):

ETA-02/0030, Annex A2
Număr lot: a se vedea ambalajul

3. Utilizarea sau utilizările preconizate ale produsului pentru construcţii, în conformitate cu specificaţia tehnică armonizată aplicabilă, astfel cum este prevăzut de fabricant:

Tip produs	ancora expandabila cu control al momentului de răsucire (tip manşon)
Pentru utilizarea în	beton fisurat şi nefisurat C20/25 - C50/60 (EN 206)
Opţiune	1
Solicitare	Statică sau cvazistatică; seismică, categorie C1 + C2: dimensiuni disponibile: SZ-B & SZ-S (M8, M10, M12, M16, M16L, M20)
Material	oţel galvanizat: Numai în spatii interioare uscate dimensiuni disponibile: SZ-B (M6, M8, M10, M12, M16, M16L, M20); SZ-S (M6, M8, M10, M12, M16, M16L, M20); SZ-SK (M6, M8, M10, M12) oţel inoxidabil (ştanţare A4): În spatiile interioare şi exterioare fără condiţii deosebit de agresive dimensiuni disponibile: SZ-B (M8, M10, M12, M16); SZ-S (M8, M10, M12, M16); SZ-SK (M8, M10, M12)
Interval detemperatură (dacă este cazul)	--

4. Numele, denumirea socială sau marca înregistrată şi adresa de contact a fabricantului, astfel cum se solicită în temeiul articolului 11 alineatul (5):

MKT Metall-Kunststoff-Technik GmbH & Co. KG
Auf dem Immel 2
D - 67685 Weilerbach

5. După caz, numele şi adresa de contact a reprezentantului autorizat al cărui mandat acoperă atribuţiile specifice la articolul 12 alineatul (2): --

6. Sistemul sau sistemele de evaluare şi verificare a constanţei performanţei produsului pentru construcţii, astfel cum este prevăzut în anexa V:: **Sistemul 1**

7. În cazul declaraţiei de performanţă privind un produs pentru construcţii acoperit de un standard armonizat:
--

28.10.2015

8. În cazul unei declaraţii de performanţă privind un produs pentru construcţii, pentru care s-a emis o evaluare tehnică europeană:

Deutsches Institut für Bautechnik, Berlin

a emis:

ETA-02/0030

pe baza

ETAG 001-2

Organismul notificat de certificare a produsului 1343-CPR a procedat în conformitate cu sistemul 1:

i) determinarea produsului-tip pe baza încercării de tip (inclusiv eşantionarea), a calculării de tip, pe baza valorilor tabelare sau a documentaţiei descriptive a produsului;
ii) inspectarea iniţială a fabricii şi a controlului producţiei în fabrică;
iii) supravegherea şi evaluarea continue ale controlului producţiei în fabrică

şi a emis: certificatul de constanță a performanței 1343-CPR-M 550-9

9. Performanţa declarată:

Caracteristici esenţiale	**Metodă de măsurare**	**Performanţă**		**Specificaţie tehnică armonizată**
		Oţel, galvanizat	**Oţel inoxidabil A4**	
Rezistenţă caracteristică la tracţiune	ETAG 001, Annex C CEN/TS 1992-4	Annex C1, C2	Annex C1, C3	ETAG 001
Rezistenţă caracteristică la forfecare	ETAG 001, Annex C CEN/TS 1992-4	Annex C4	Annex C5	
Rezistenţă caracteristică la efecte seismice	TR 045	Annex C6	Annex C7	
Starea limită de serviciu	ETAG 001, Annex C CEN/TS 1992-4	Annex C9, C10	Annex C9, C10	
Rezistenţă caracteristică în temeiul expunerea la un foc	ETAG 001, Annex C CEN/TS 1992-4	Annex C8	Annex C8	

Atunci când s-a utilizat documentaţia tehnică specifică în temeiul articolului 37 sau al articolului 38, cerinţele pe care le respectă produsul: --

10. Performanţa produsului identificat la punctele 1 și 2 este în conformitate cu performanţa declarată de la punctul 9.

Această declaraţie de performanţă este emisă pe răspunderea exclusivă a fabricantului identificat la punctul 4.

Semnat pentru şi în numele fabricantului de către:

Stefan Weustenhagen
(General Manager)
Weilerbach, 28.10.2015

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

Table C1: Characteristic values for **tension load, cracked concrete** under static or quasi-static action**, steel zinc plated**

Anchor size			**10/M6**	**12/M8**	**15/M10**	**18/M12**	**24/M16**	**24/M16L**	**28/M20**
Installation safety factor	$\gamma_2 = \gamma_{inst}$	[-]	1,0						
Steel failure									
Characteristic resistance	$N_{Rk,s}$	[kN]	16	29	46	67	126	126	196
Partial safety factor	γ_{Ms}	[-]	1,5						
Pull-out failure									
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p}$	[kN]	5	12	16	1)	1)	1)	1)
Increasing factor for $N_{Rk,p}$	ψ_C	[-]	$\left(\frac{f_{ck,cube}}{25}\right)^{0,5}$						
Concrete cone failure									
Effective anchorage depth	h_{ef}	[mm]	50	60	71	80	100	115	125
Factor acc. to CEN/TS 1992-4	k_{cr}	[-]	7,2						

1) Pull-out is not decisive.

Table C2: Characteristic values for **tension load**, **cracked concrete** under static or quasi-static action**, stainless steel A4**

Anchor size			**12/M8**	**15/M10**	**18/M12**	**24/M16**
Installation safety factor	$\gamma_2 = \gamma_{inst}$	[-]	1,0			
Steel failure						
SZ-B						
Characteristic resistance	$N_{Rk,s}$	[kN]	26	41	60	110
Partial safety factor	γ_{Ms}	[-]	1,5			
SZ-S and SZ-SK						
Characteristic resistance	$N_{Rk,s}$	[kN]	26	41	60	110
Partial safety factor	γ_{Ms}	[-]	1,87			
Pull-out failure						
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p}$	[kN]	9	16	1)	1)
Increasing factor for $N_{Rk,p}$	ψ_C	[-]	$\left(\frac{f_{ck,cube}}{25}\right)^{0,5}$			
Concrete cone failure						
Effective anchorage depth	h_{ef}	[mm]	60	71	80	100
Factor acc. to CEN/TS 1992-4	k_{cr}	[-]	7,2			

1) Pull-out is not decisive.

Highload Anchor SZ

Performance
Characteristic values for **tension load** in **cracked concrete** under static or quasi-static action

Annex C1

Table C3: Characteristic values for **tension load in non-cracked concrete**, under static or quasi-static action, **steel zinc plated**

Anchor size			**10/M6**	**12/M8**	**15/M10**	**18/M12**	**24/M16**	**24/M16L**	**28/M20**
Installation safety factor	$\gamma_2 = \gamma_{inst}$	[-]	1,0						
Steel failure									
Characteristic resistance	$N_{Rk,s}$	[kN]	16	29	46	67	126	126	196
Partial safety factor	γ_{Ms}	[-]	1,5						
Pull-out failure									
Characteristic resistance in non-cracked concrete C20/25	$N_{Rk,p}$	[kN]	1)	20	30	1)	1)	1)	1)
Splitting failure (The higher resistance of Case 1 and Case 2 may be applied.)									
Case 1									
Characteristic resistance in concrete C20/25	$N^0_{Rk,sp}$	[kN]	12 2)	16 2)	25 2)	30 2)	40 2)	70	50 2)
Spacing	$s_{cr,sp}$	[mm]	$3\ h_{ef}$						
Edge distance	$c_{cr,sp}$	[mm]	$1{,}5\ h_{ef}$						
Case 2 (acc. to ETAG 001, Annex C, equation (5.3))									
Spacing	$s_{cr,sp}$	[mm]	$5\ h_{ef}$					$3\ h_{ef}$	$5\ h_{ef}$
Edge distance	$c_{cr,sp}$	[mm]	$2{,}5\ h_{ef}$					$1{,}5\ h_{ef}$	$2{,}5\ h_{ef}$
Increasing factor for $N_{Rk,p}$ and $N^0_{Rk,sp}$	ψ_c	[-]	$\left(\frac{f_{ck,cube}}{25}\right)^{0,5}$						
Concrete cone failure									
Effective Anchorage depth	h_{ef}	[mm]	50	60	71	80	100	115	125
Factor acc. to CEN/TS 1992-4	k_{ucr}	[-]	10,1						

1) Pull-out is not decisive.

2) For the proof against splitting failure, $N^0_{Rk,c}$ has to be has to be replaced by $N^0_{Rk,sp}$.

Table C4: Characteristic values for **tension load** in **non-cracked concrete** under static or quasi-static action, **stainless steel A4**

Anchor size			**12/M8**	**15/M10**	**18/M12**	**24/M16**
Installation safety factor	$\gamma_2 = \gamma_{inst}$	[-]	1,0			
Steel failure						
SZ-B						
Characteristic resistance	$N_{Rk,s}$	[kN]	26	41	60	110
Partial safety factor	γ_{Ms}	[-]	1,5			
SZ-S and SZ-SK						
Characteristic resistance	$N_{Rk,s}$	[kN]	26	41	60	110
Partial safety factor	γ_{Ms}	[-]	1,87			
Pull-out failure						
Characteristic resistance in non-cracked concrete C20/25	$N_{Rk,p}$	[kN]	16	25	35	[1)]
Increasing factor for $N_{Rk,p}$	ψ_C	[-]	$\left(\frac{f_{ck,cube}}{25}\right)^{0,5}$			
Splitting failure						
Spacing	$s_{cr,sp}$	[mm]	360	470	530	600
Edge distance	$c_{cr,sp}$	[mm]	180	235	265	300
Concrete cone failure						
Effective anchorage depth	h_{ef}	[mm]	60	71	80	100
Factor acc. to CEN/TS 1992-4	k_{ucr}	[-]	10,1			

[1)] Pull-out is not decisive.

Table C5: Characteristic values of **shear load** under static or quasi-static action, **steel zinc plated**

Anchor size			**10/M6**	**12/M8**	**15/M10**	**18/M12**	**24/M16**	**24/M16L**	**28/M20**
Steel failure without lever arm									
SZ-B									
Characteristic resistance	$V_{Rk,s}$	[kN]	16	25	36	63	91	91	122
Ductility factor	k_2	[-]	1,0						
Partial safety factor	γ_{Ms}	[-]	1,25						
SZ-S and SZ-SK									
Characteristic resistance	$V_{Rk,s}$	[kN]	18	30	48	73	126	126	150
Ductility factor	k_2	[-]	0,8						
Partial safety factor	γ_{Ms}	[-]	1,25						
Steel failure with lever arm									
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	12	30	60	105	266	266	519
Partial safety factor	γ_{Ms}	[-]	1,25						
Concrete pry-out failure									
Factor k acc. to ETAG 001, Annex C or k_3 acc. to CEN/TS 1992-4	$k_{(3)}$	[-]	1,8	2,0					
Concrete edge failure									
Effective length of anchor in shear loading	l_f	[mm]	50	60	71	80	100	115	125
Outside diameter of anchor	d_{nom}	[mm]	10	12	15	18	24	24	28

Highload Anchor SZ

Performance
Characteristic values for **shear load** under static or quasi-static action, **steel zinc plated**

Annex C4

Table C6: Characteristic values for **shear load** under static or quasi-static action, **stainless steel A4**

Anchor size			**12/M8**	**15/M10**	**18/M12**	**24/M16**
Steel failure without lever arm						
SZ-B						
Characteristic resistance	$V_{Rk,s}$	[kN]	24	37	62	92
Ductility factor	k_2	[-]	1,0			
Partial safety factor	γ_{Ms}	[-]	1,25			
SZ-S and SZ-SK						
Characteristic resistance	$V_{Rk,s}$	[kN]	24	37	62	92
Ductility factor	k_2	[-]	0,8			
Partial safety factor	γ_{Ms}	[-]	1,36			
Steel failure with lever arm						
SZ-B						
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	26	52	92	232
Ductility factor	k_2	[-]	1,0			
Partial safety factor	γ_{Ms}	[-]	1,25			
SZ-S and SZ-SK						
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	26	52	92	232
Ductility factor	k_2	[-]	0,8			
Partial safety factor	γ_{Ms}	[-]	1,56			
Concrete pry-out failure						
Factor k acc. to ETAG 001, Annex C or k_3 acc. to CEN/TS 1992-4	$k_{(3)}$	[-]	2,0			
Concrete edge failure						
Effective length of anchor in shear loading	l_f	[mm]	60	71	80	100
Outside diameter of anchor	d_{nom}	[mm]	12	15	18	24

Table C7: Characteristic values for **seismic action, Category C1 and C2, steel zinc plated**

Anchor size			**12/M8**	**15/M10**	**18/M12**	**24/M16**	**24/M16L**	**28/M20**
Tension load								
Installation safety factor	$\gamma_2 = \gamma_{inst}$	[-]	1,0					
Steel failure								
Characteristic tension resistance category **C1**	$N_{Rk,s,seis,C1}$	[kN]	29	46	67	126	126	196
Characteristic tension resistance category **C2**	$N_{Rk,s,seis,C2}$	[kN]	29	46	67	126	126	196
Partial safety factor	$\gamma_{Ms,seis}$	[-]	1,5					
Pull-out failure								
Characteristic tension resistance category **C1**	$N_{Rk,p,seis,C1}$	[kN]	12	16	25	36	44,4	50,3
Characteristic tension resistance category **C2**	$N_{Rk,p,seis,C2}$	[kN]	5,4	16,4	22,6	29,0	41,2	43,6
Increasing factor for $N_{Rk,p,seis}$	ψ_c	[-]	1,0					
Shear load								
Steel failure without lever arm								
SZ-B								
Characteristic shear resistance category **C1**	$V_{Rk,s,seis,C1}$	[kN]	18,0	27,1	43,4	51,9	51,9	96,4
Characteristic shear resistance category **C2**	$V_{Rk,s,seis,C2}$	[kN]	12,7	20,5	31,5	50,1	50,1	67,1
SZ-S								
Characteristic shear resistance category **C1**	$V_{Rk,s,seis,C1}$	[kN]	18,0	27,1	43,4	51,9	51,9	96,4
Characteristic shear resistance category **C2**	$V_{Rk,s,seis,C2}$	[kN]	12,7	20,5	31,5	69,3	69,3	67,1
Partial safety factor	$\gamma_{Ms,seis}$	[-]	1,25					
Steel failure with lever arm								
Characteristic resistance	$M^0_{Rk,s,seis}$	[Nm]	no performance determined					

Table C8: Characteristic values for **seismic action, Category C1 and C2, stainless steel A4**

Anchor size			**12/M8**	**15/M10**	**18/M12**	**24/M16**
Tension load						
Installation safety factor	$\gamma_2 = \gamma_{inst}$	[-]	1,0			
Steel failure						
Characteristic tension resistance, category **C1**	$N_{Rk,s,seis,C1}$	[kN]	26	41	60	110
Characteristic tension resistance, category **C2**	$N_{Rk,s,seis,C2}$	[kN]	26	41	60	110
Partial safety factor **SZ-B**	$\gamma_{Ms,seis}$	[-]	1,5			
Partial safety factor **SZ-S**	$\gamma_{Ms,seis}$	[-]	1,87			
Pull-out failure						
Characteristic tension resistance, category **C1**	$N_{Rk,p,seis,C1}$	[kN]	9	16	26	36
Characteristic tension resistance, category **C2**	$N_{Rk,p,seis,C2}$	[kN]	4,8	16,5	24,8	44,5
Increasing factor for $N_{Rk,p,seis}$	ψ_c	[-]	1,0			
Shear load						
Steel failure without lever arm						
Characteristic shear resistance, category **C1**	$V_{Rk,s,seis,C1}$	[kN]	9,6	13,3	25,4	75,4
Characteristic shear resistance, category **C2**	$V_{Rk,s,seis,C2}$	[kN]	9,7	14,0	18,0	32,2
Partial safety factor **SZ-B**	$\gamma_{Ms,seis}$	[-]	1,25			
Partial safety factor **SZ-S**	$\gamma_{Ms,seis}$	[-]	1,36			
Steel failure with lever arm						
Characteristic resistance	$M^0_{Rk,s,seis}$	[Nm]	no performance determined			

Table C9: Characteristic values for **tension and shear load** under **fire exposure** in cracked and non-cracked concrete C20/25 to C50/60

Anchor size				**10/M6**	**12/M8**	**15/M10**	**18/M12**	**24/M16**	**24/M16L**	**28/M20**
Tension load										
Steel failure										
Steel zinc plated										
Characteristic resistance	R30	$N_{Rk,s,fi}$	[kN]	1,0	1,9	4,3	6,3	11,6		18,3
	R60			0,8	1,5	3,2	4,6	8,6		13,5
	R90			0,6	1,0	2,1	3,0	5,0		7,7
	R120			0,4	0,8	1,5	2,0	3,1		4,9
Stainless steel A4										
Characteristic resistance	R30	$N_{Rk,s,fi}$	[kN]	-	6,1	10,2	15,7	29,2	-	-
	R60			-	4,4	7,3	11,1	20,6	-	-
	R90			-	2,6	4,3	6,4	12,0	-	-
	R120			-	1,8	2,8	4,1	7,7	-	-
Shear load										
Steel failure without lever arm										
Steel zinc plated										
Characteristic resistance	R30	$V_{Rk,s,fi}$	[kN]	1,0	1,9	4,3	6,3	11,6		18,3
	R60			0,8	1,5	3,2	4,6	8,6		13,5
	R90			0,6	1,0	2,1	3,0	5,0		7,7
	R120			0,4	0,8	1,5	2,0	3,1		4,9
Stainless steel A4										
Characteristic resistance	R30	$V_{Rk,s,fi}$	[kN]	-	14,3	22,7	32,8	61,0	-	-
	R60			-	11,1	17,6	25,5	47,5	-	-
	R90			-	7,9	12,6	18,3	34,0	-	-
	R120			-	6,3	10,0	14,6	27,2	-	-
Steel failure with lever arm										
Steel zinc plated										
Characteristic resistance	R30	$M^0_{Rk,s,fi}$	[Nm]	0,8	2,0	5,6	9,7	24,8		42,4
	R60			0,6	1,5	4,1	7,2	18,3		29,8
	R90			0,4	1,0	2,7	4,7	11,9		17,1
	R120			0,3	0,8	1,9	3,1	6,6		10,7
Stainless steel A4										
Characteristic resistance	R30	$M^0_{Rk,s,fi}$	[Nm]	-	6,2	13,2	24,4	61,8	-	-
	R60			-	4,5	9,4	17,2	43,6	-	-
	R90			-	2,7	5,6	10,0	25,3	-	-
	R120			-	1,8	3,6	6,4	16,2	-	-

The characteristic resistances for pull-out failure, concrete cone failure, concrete pry-out and concrete edge failure can be calculated according to TR020 / CEN/TS 1992-4.

Table C10: Displacements under **tension load**

Anchor size			**10/M6**	**12/M8**	**15/M10**	**18/M12**	**24/M16**	**24/M16L**	**28/M20**
Steel, zinc plated									
Tension load in cracked concrete	N	[kN]	2,4	5,7	7,6	12,3	17,1	21,1	24
Displacement	δ_{N0}	[mm]	0,5	0,5	0,5	0,7	0,8	0,7	0,9
	$\delta_{N\infty}$	[mm]	2,0	2,0	1,3	1,3	1,3	1,3	1,4
Tension load in non-cracked concrete	N	[kN]	8,5	9,5	14,3	17,2	24	29,6	34
Displacement	δ_{N0}	[mm]	0,8	1,0	1,1			1,3	0,3
	$\delta_{N\infty}$	[mm]	3,4		1,7			2,3	1,4
Seismic action C2									
Displacement for DLS	$\delta_{N,seis,C2(DLS)}$	[mm]	-	3,3	3,0	5,0	3,0	3,0	4,0
Displacement for ULS	$\delta_{N,seis,C2(ULS)}$	[mm]	-	12,2	11,3	16,0	9,2	9,2	13,8
Stainless steel A4									
Tension load in cracked concrete	N	[kN]	-	4,3	7,6	12,1	17,0	-	-
Displacement	δ_{N0}	[mm]	-	0,5	0,5	1,3	0,5	-	-
	$\delta_{N\infty}$	[mm]	-	1,2	1,6	1,8	1,6	-	-
Tension load in non-cracked concrete	N	[kN]	-	7,6	11,9	16,7	24,1	-	-
Displacement	δ_{N0}	[mm]	-	0,2	0,3	1,2	1,5	-	-
	$\delta_{N\infty}$	[mm]	-	1,1				-	-
Seismic action C2									
Displacement for DLS	$\delta_{N,seis,C2(DLS)}$	[mm]	-	4,7	4,5	4,3	4,9	-	-
Displacement for ULS	$\delta_{N,seis,C2(ULS)}$	[mm]	-	13,3	12,7	9,7	10,1	-	-

Table C11: Displacements under **shear load**

Anchor size			**10/M6**	**12/M8**	**15/M10**	**18/M12**	**24/M16**	**24/M16L**	**28/M20**
Steel, zinc plated									
SZ-B									
Shear load in cracked and non-cracked concrete	V	[kN]	9,1	14	20,7	35,1	52,1	52,1	77
Displacement	δ_{V0}	[mm]	2,5	2,1	2,7	3,0	5,1	5,1	4,3
	$\delta_{V\infty}$	[mm]	3,8	3,1	4,1	4,5	7,6	7,6	6,5
Seismic action C2									
Displacement for DLS	$\delta_{V,seis,C2(DLS)}$	[mm]	-	2,3	3,1	3,0	2,6	2,6	1,6
Displacement for ULS	$\delta_{V,seis,C2(ULS)}$	[mm]	-	4,8	6,4	6,1	6,6	6,6	4,8
SZ-S and SZ-SK									
Shear load in cracked and non-cracked concrete	V	[kN]	10,1	17,1	27,5	41,5	72	72	77
Displacement	δ_{V0}	[mm]	2,9	2,5	3,6	3,5	7,0	7,0	4,3
	$\delta_{V\infty}$	[mm]	4,4	3,8	5,4	5,3	10,5	10,5	6,5
Seismic action C2 (SZ-S)									
Displacement for DLS	$\delta_{V,seis,C2(DLS)}$	[mm]	-	2,3	3,1	3,0	3,3	3,3	1,6
Displacement for ULS	$\delta_{V,seis,C2(ULS)}$	[mm]	-	4,8	6,4	6,1	8,2	8,2	4,8
Stainless steel A4									
Shear load in cracked and non-cracked concrete	V	[kN]	-	13,9	21,1	34,7	50,8	-	-
Displacement	δ_{V0}	[mm]	-	3,4	4,9	4,8	6,7	-	-
	$\delta_{V\infty}$	[mm]	-	5,1	7,4	7,1	10,1	-	-
Seismic action C2									
Displacement for DLS	$\delta_{V,seis,C2(DLS)}$	[mm]	-	2,8	3,1	2,6	3,3	-	-
Displacement for ULS	$\delta_{V,seis,C2(ULS)}$	[mm]	-	5,6	5,8	5,0	6,9	-	-