DECLARATION OF PERFORMANCE

DoP_15-0784_01 (GB)

1. Unique identification code of the product-type:

MULTI-MONTI-plus (MMS-plus), MULTI-MONTI-plus A4 (MMS-plus A4)

2. Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4):

Identification acc. ETA-15/0784 annex A2, A3
Batch number: see packaging of product

3. Intended use or uses of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer:

Use of the anchoring:

- Static and quasi static loads: all sizes
- Seismic category C1:
- MMS-plus all Versions, size 10 with maximum embedment depth (h_{nom}), size 12 with both embedment depth (h_{nom}) and size 16 and 20 with maximum embedment depth (h_{nom})
- Seismic category C2:
- MMS-plus all Versions, size 16 and 20 with maximum embedment depth (h_{nom})
- Fire exposure: all sizes

Base Materials:

- Reinforced or non-reinforced normal weight concrete according to EN 206-1:2000
- Strength classes C20/25 to C50/60 according to EN 206-1:2000
- Cracked and uncracked concrete

Conditions of use (Environmental conditions):

- Structures subject to dry internal conditions
- For all other conditions according to EN 1993-1-4:2015, Table A.1 corresponding to corrosion resistance classes:
  - CRC III: srews with head marking MMS+A4, MMS+A5
  - CRC IV: srews with head marking MMS+FA
  - CRC V: srews with head marking MMS+KK

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Sitz Schramberg, Amtsgericht Stuttgart HRB 480374
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Kreissparkasse Rottweil	642 500 40	556509	SOLADES1RWL	DE90642500400000556509
Volksbank Schwarzwald-Donau-Neckar	643 199 30	621998001	GENODES1TUT	DE23643901300621998001
Deutsche Postbank	600 100 70	13570700	PBNKDEFF600	DE07600100700013570700
Commerzbank VS-Villingen	694 400 07	1571629	COBADEFF694	DE75694400070157162900

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 design of the anchoring under static or quasi-static actions and fire exposure have to be carried out in accordance with FprEN 1992-4:2017 and EOTA Technical Report TR055
- The design under shear load according to FprEN 1992-4:2017, section 6.2.2 applies to all in appendix B2, table B1 specified diameter d_f the diameter of clearance hole in the fixture

Installation:

- Hole drilling by hammer-drilling only
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site
- After installation further turning of the anchor must not be possible
- The head of the anchor is attached to the fixture and is not damaged, respectively the required embedment depth is reached.

4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required pursuant to Article 11(5):

HECO-Schrauben GmbH & Co. KG
Dr.-Kurt-Steim-Str. 28
78713 Schramberg (Germany)

5. Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2):

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6. System or systems of assessment and verification of constancy of performance of the construction product as set out in Annex V:

System 1

7. In case of the declaration of performance concerning a construction product covered by a harmonised standard:

8. In case of the declaration of performance concerning a construction product for which a European Technical Assessment has been issued:

- Technical Assessment Body: Deutsches Institut für Bautechnik (DIBt)
- Notified Body: Materialprüfungsanstalt Universität Stuttgart, ID number 0672
- European Assessment Document: EAD 330232-00-0601
- Certificate of Conformity: 0672-CPR-0635

9. Declared performance

Characteristic values for static and quasi-static loading MMS-plus carbon steel																		
Size MMS-plus				**6**		**7,5**		**10**		**12**		**16**		**20**	
Embedment depth		h_{nom}	[mm]	35[1)]	45	35[1)]	55	50	65	75	90	100	115	140	
Min. thickness of the concrete member		h_{min}	[mm]	100		100		100	115	125	150	150		180	
cracked and uncracked concrete	min. spacing	s_{min}	[mm]	30		35		35		40		60		80	
	min. edge distance	c_{min}	[mm]	30		30		35		40		60		80	
Steel failure for tension- and shear load															
Characteristic resistance		$N_{Rk,s}$	[kN]	10,8		17,6		32,1		49,9		111,1		190,2	
		E_S	[mm²]	210000											
Characteristic resistance		$V^0_{Rk,s}$	[kN]	4,1		6,1		13,7		24,1		50,2		85,3	
		k_7	-	0,8											
Characteristic resistance		$M^0_{Rk,s}$	[Nm]	6,7		14,1		34,5		66,8		207,6		464,3	
Pullout															
Characteristic resistance in uncracked concrete C20/25		$N_{Rk,p}$	[kN]	5,5	8	4	-[2)]	-[2)]		-[2)]		-[2)]		-[2)]	
Characteristic resistance in cracked concrete C20/25		$N_{Rk,p}$	[kN]	1	1,5	2	4	6	9	12	16	20	30	44	
Increasing factor for concrete	C30/37	Ψ_c	-	1,22											
	C40/50			1,41											
	C50/60			1,58											
Concrete cone failure and splitting failure															
Effective anchorage depth		h_{ef}	[mm]	26	35	26	43	36	50	57	70	77	90	114	
Factor for	cracked	$k_{cr,N}$	-	7,7											
	uncracked	$k_{urc,N}$	-	11,0											
Concrete cone	edge distance	$c_{cr,N}$	[mm]	1.5 h_{ef}											
Splitting	edge distance	$c_{cr,sp}$	[mm]	1.5 h_{ef}											
Installation factor		γ_{inst}	-	1,0											
Concrete pryout failure															
k-Faktor		k_8	-	1,0							2,0				
[1)] Only for non-structural applications															
[2)] Pullout is not decisive															

Characteristic values for seismic actions C1/C2 MMS-plus carbon steel							
Size MMS-plus			**10**	**12**		**16**	**20**
Embedment depth	h_{nom}	[mm]	65	75	90	115	140
Steel failure for tension- and shear load / seismic actions C1							
Characteristic resistance	$N_{Rk,s,eq}$	[kN]	24,1	37,4		100,0	142,7
	$V_{Rk,s,eq}$	[kN]	9,6	16,9		45,2	91,0
Steel failure for tension- and shear load / seismic actions C2							
Characteristic resistance	$N_{Rk,s,eq}$	[kN]	-	-	-	100,0	142,7
	$V_{Rk,s,eq}$	[kN]	-	-	-	26,1	57,7
Pullout / seismic actions C1							
Characteristic resistance in cracked concrete	$N_{Rk,p,eq}$	[kN]	6,8	9,0	12,0	21,0	33,0
Pullout / seismic actions C2							
Characteristic resistance in cracked concrete	$N_{Rk,p,eq}$	[kN]	-	-	-	14,0	18,1

Characteristic values under fire exposure MMS-plus carbon steel														
Size MMS-plus				**6**		**7,5**		**10**		**12**		**16**		**20**
Embedment depth		h_{nom}	[mm]	35	45	35	55	50	65	75	90	100	115	140
Characteristic resistance for tension and shear														
Characteristic resistance	R30	$F_{Rk,fi}$	[kN]	0,3	0,4	0,5	1,1	1,4	2,3	3,0	3,9	5,0	7,5	11,0
	R60	$F_{Rk,fi}$	[kN]	0,3	0,4	0,5	0,8	1,4	1,4	2,1	2,1	4,5	4,5	7,7
	R90	$F_{Rk,fi}$	[kN]	0,3	0,4	0,5	0,5	1,0	1,0	1,5	1,5	3,3	3,3	5,6
	R120	$F_{Rk,fi}$	[kN]	0,2	0,3	0,4	0,4	0,8	0,8	1,2	1,2	2,6	2,6	4,5
	R30	$M^0_{Rk,s,fi}$	[Nm]	0,5		1,1		2,7		5,3		16,4		36,6
	R60	$M^0_{Rk,s,fi}$	[Nm]	0,3		0,6		1,5		2,8		8,9		19,8
	R90	$M^0_{Rk,s,fi}$	[Nm]	0,2		0,4		1,1		2,0		6,4		14,2
	R120	$M^0_{Rk,s,fi}$	[Nm]	0,2		0,3		0,9		1,6		5,1		11,4

Displacements under tension loads MMS-plus carbon steel													
Size MMS-plus			**6**		**7,5**		**10**		**12**		**16**		**20**
Embedment depth	h_{nom}	[mm]	35	45	35	55	50	65	75	90	100	115	140
Tension load uncracked concrete	N	[kN]	1,9	3,0	1,9	5,3	5,7	7,9	10,7	12,8	16,2	20,1	29,3
Displacement	δ_{N0}	[mm]	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,2	0,1	0,1	0,1
	$\delta_{N\infty}$	[mm]	0,3	0,3	0,4	1,1	0,8	0,7	0,7	0,6	0,1	0,1	0,1
Tension load cracked concrete	N	[kN]	0,5	0,7	0,9	2,0	2,9	4,3	5,7	6,4	9,5	14,2	20,95
Displacement	δ_{N0}	[mm]	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1
	$\delta_{N\infty}$	[mm]	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,2	1,4	1,4	0,7
Displacements under tension loads MMS-plus stainless steel													
Tension load uncracked concrete	V	[kN]	2,0		4,0		8,0		12,0		22,6		42,8
Displacement	δ_{V0}	[mm]	0,14	0,13	0,09	0,11	0,18	0,13	0,18		2,9		3,4
	$\delta_{V\infty}$	[mm]	0,20	0,19	0,13	0,16	0,27	0,20	0,27		4,4		5,1

Characteristic values for static and quasi-static loading MMS-plus stainless steel										
Size MMS-plus A4				**7,5**			**10**		**12**	
Embedmend depth $h_{nom.standard}$	h_{nom}	[mm]	40	55	75	70	85	100	115
Min. thickness of the concrete member	h_{min}	[mm]	100			115	125	150	
cracked and uncracked concrete — min. spacing	s_{min}	[mm]	35			35		40	
cracked and uncracked concrete — min. edge distance	c_{min}	[mm]	30			35		40	
Steel failure for tension- and shear load										
Characteristic resistance	$N_{Rk,s}$	[kN]	16			29		45	
	E_S	[mm²]	210000						
Characteristic resistance	$V^0_{Rk,s}$	[kN]	2	11	14	18	28	23	27
Partial safety factor	γ_{Ms}	-	1,4						
	k_7	-	1,0						
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	13,3			32,1		61,1	
Pullout										
Embedmend $h_{nom,standard}$	h_{nom}	[mm]	40	55	75	70	85	100	115
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	5,5	4,5	13	12	20	20	32
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p}$	[kN]	3,5	2	4	6	9	12	16
Embedmend $h_{nom,reduced}$	h_{nom}	[mm]	35[1)]	50	65	60	75	90	105
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	4	4	10	10	17	16	26
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p}$	[kN]	2,5	1,5	3	5	7	9,5	13
Increase factors for $N_{Rk,P}$										
Increasing factor for concrete — C30/37	Ψ_c	-	1,22						
Increasing factor for concrete — C40/50	Ψ_c	-	1,41						
Increasing factor for concrete — C50/60	Ψ_c	-	1,58						
Concrete cone failure and splitting failure										
Effective anchorage depth	$h_{ef,standard}$	[mm]	23	36	49	44	56	65	77
Effective anchorage depth	$h_{ef,reduced}$	[mm]	19	32	40	35	48	56	69
Factor fo — cracked	$k_{cr,N}$	-	7,7						
Factor fo — uncracked	$k_{urc,N}$	-	11,0						
Concrete cone — edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}						
Splitting — edge distance	$c_{cr,sp}$	[mm]	1,5 h_{ef}						
Installation factor	γ_{inst}	-	1,2				1,0		
Concrete pryout failure										
k-Faktor for $h_{ef,standard}$	k_8	-	1,0					2,0	
k-Faktor for $h_{ef,reduced}$	k_8	-	1,0						2,0

[1)] Only for non-structural applications and in dry interiors

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Characteristic values under fire exposure MMS-plus stainless steel										
Size MMS-plus A4				**7,5**			**10**		**12**	
Embedment depth $h_{nom,standard}$			[mm]	40	55	75	70	85	100	115
Embedment depth $h_{nom,reduced}$			[mm]	35	50	65	60	75	90	105
Characteristic resistance for tension and shear										
Characteristic resistance	R30	$F_{Rk,fi}$	[kN]	0,5	1,1		1,4	2,3	3,0	3,9
	R60	$F_{Rk,fi}$	[kN]	0,5	0,8		1,4	1,4	2,1	2,1
	R90	$F_{Rk,fi}$	[kN]	0,5	0,5		1,0	1,0	1,5	1,5
	R120	$F_{Rk,fi}$	[kN]	0,4	0,4		0,8	0,8	1,2	1,2
	R30	$M^0_{Rk,s,fi}$	[Nm]	1,1			2,7		5,3	
	R60	$M^0_{Rk,s,fi}$	[Nm]	0,6			1,5		2,8	
	R90	$M^0_{Rk,s,fi}$	[Nm]	0,4			1,1		2,0	
	R120	$M^0_{Rk,s,fi}$	[Nm]	0,3			0,9		1,6	

Displacements under tension loads MMS-plus stainless steel									
Size MMS-plus A4			**7,5**			**10**		**12**	
Embedment depth $h_{nom,standard}$		[mm]	40	55	75	70	85	100	115
Embedment depth $h_{nom,reduced}$		[mm]	35	50	65	60	75	90	105
Tension load uncracked concrete	N	[kN]	2,4	2,1	6,2	5,7	9,5	9,5	14,3
Displacement	δ_{N0}	[mm]	1,4	1,3	2,5	2,3	2,7	10,3	3,7
	$\delta_{N\infty}$	[mm]	2,1	1,9	3,8	3,5	4,0	15,9	5,5
Tension load cracked concrete	N	[kN]	1,4	0,7	1,9	2,9	4,3	5,7	7,6
Displacement	δ_{N0}	[mm]	1,3	0,2	0,3	0,6	0,5	1,3	1,4
	$\delta_{N\infty}$	[mm]	1,9	0,3	0,5	0,9	0,8	1,9	2,2
Displacements under shear loads MMS-plus carbon steel									
Shear load uncracked concrete	V	[kN]	3,9	4,8	6,2	8,1	12,9	10,5	12,4
Displacement	δ_{V0}	[mm]	2,7	3,5	3,1	2,7	3,3	3,2	3,3
	$\delta_{V\infty}$	[mm]	4,0	5,3	4,6	4,1	4,9	4,8	5,0

10. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

Schramberg, 28.08.2018

ppa.

Andreas Hettich, Head of Business Development