DECLARATION OF PERFORMANCE

HECO-DoP_ETA_15/0784_MMS-plus_1606_GB

1. Unique identification code of the product-type:
MULTI-MONTI-plus (MMS-plus)

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:
ETA-15/0784 annex B1

Anchor type	Screw anchor
For use in	Concrete C20/25 - C50/60 (EN 206) - uncracked: Ø6, Ø7.5, Ø10 and Ø12 - cracked: Ø6, Ø7.5, Ø10 and Ø12
Option/Category	Option 1 Seismic: category C1
Stress	static, quasi-static loads, seismic (Ø10 + Ø12), fire exposure
Material/Versions	Galvanized steel: - for structures to dry internal conditions - different head versions

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:
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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: Otto-Graf-Institut Stuttgart, ID number 0672
- European Assessment Document: ETAG 001 part 1, 3 (04.2013)
- Certificate of Conformity: 0672-CPR-0635

9. Declared performance

Essential characteristics	**Design method**	**Performance**	**Harmonized Technical Specification**
Characteristic values for tension	ETAG 001, annex: C, methode A CEN/TS 1992-4:2009, methode A	ETA-15/0784: annex C1	ETAG 001 Part 1, 3 ETAG 001, annex E EOTA TR 020 (fire resistance)
	EOTA TR 045	ETA-15/0784: annex C2	
	EOTA TR 020 (fire resistance) CEN/TS 1992-4: annex D	ETA-15/0784: annex C3	
Characteristic values for shear	ETAG 001, annex: C, methode A CEN/TS 1992-4:2009, methode A	ETA-15/0784: annex C1	
	EOTA TR 045	ETA-15/0784: annex C2	
	EOTA TR 020 (fire resistance) CEN/TS 1992-4: annex D	ETA-15/0784: annex C3	
Installation parameters		ETA-15/0784: annex B2	
Displacement for serviceability limit state	ETAG 001, annex: C, methode A CEN/TS 1992-4:2009, methode A	ETA-15/0784: annex C4	

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, 01.07.2016 i.V.

Andreas Hettich, Head of PM/Marketing

Specifications of intended use

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_{nom2}) and size 12 with the embedment depth $h_{nom\ 1}$ and $h_{nom\ 2}$.
- 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.
- Non-cracked and cracked concrete: all sizes.

Conditions of use (Environmental conditions):
- Structures subject to dry internal conditions.

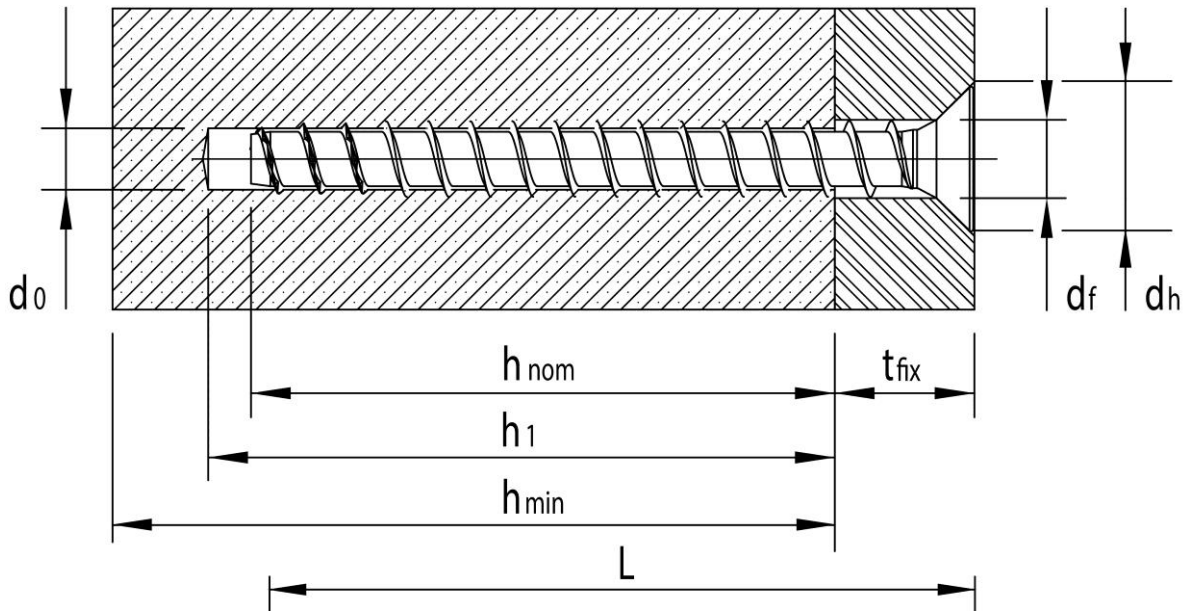
Design:
- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e. g. position of the anchor relative to reinforcement or to supports, etc.).
- Anchorages under static or quasi-static actions are designed for design method A in accordance with:
  - ETAG 001, Annex C, edition august 2010 or
  - CEN/TS 1992-4:2009
- The design of the anchoring under seismic action have to be carried out in accordance with:
  - EOTA Technical Report TR 045, edition February 2013
  - Anchoring's have to be placed outside of critical places like plastic hinges.
  - A distance mounting or mounting with mortar layer is not allowed.
- The design of the anchoring under fire exposure have to be carried in accordance with:
  - EOTA Technical Report 020, edition Mai 2014 or
  - CEN/TS 1992-4:2009, Annex D
  - In case of requirements for resistance of fire exposure it must be ensured that local spalling of the concrete cover does not occur.

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.
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of the aborted hole or smaller distance if the aborted hole is filled with high strength mortar and if under shear or oblique tension load it is not the direction of the load application.
- The anchor may be used only once.
- After installation further turning of the anchor must not be possible.
- The head of the anchor must be supported on the fixture and is not damaged.

Annex B1

Table B1: Installation parameters MMS-plus

Size MMS-plus				6		7,5		10		12	
				h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}
Embedment depth in concrete			[mm]	35	45	35	55	50	65	75	90
Nominal drill diameter		d_0	[mm]	5		6		8		10	
Drill bit cutting diameter		d_{cut} ≤	[mm]	5,40		6,40		8,45		10,45	
Depth of borehole		h_1 ≥	[mm]	40	50	40	65	60	75	85	100
Diameter of clearance hole in the fixture		d_f ≤	[mm]	7		9		12		14	
Diameter Countersunk		d_h	[mm]	11,5		15,5		19,5		24	
Min. thickness of the concrete member		h_{min}	[mm]	100	100	100	100	100	115	125	150
cracked and uncracked concrete	min. spacing	s_{min}	[mm]	30	30	40	40	40	50	60	60
	min. edge distance	c_{min}	[mm]	30	30	40	40	40	50	60	60
Recommended installation tool			[Nm]	Impact screw driver, max. power output T_{max} according manufacturer information							
				75	100	100		200		250	
Torque moment for threaded version (type MMS-plus V)		T_{inst}	[Nm]	-		15		20		30	



Annex B2

Table C1: Characteristic values for static and quasi-static tension MMS-plus

Size MMS-plus				6		7,5		10		12	
				h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}
Embedment depth in concrete		h_{nom}	[mm]	35 [1]	45	35 [1]	55	50	65	75	90
Steel failure for tension- and shear resistance											
Characteristic resistance		$N_{Rk,s}$	[kN]	10,8		17,6		32,1		49,9	
		$V_{Rk,s}$	[kN]	4,1		6,1		13,7		24,1	
		k_2 [2]	-	0,8							
		$M^0_{Rk,s}$	[Nm]	6,7		14,1		34,5		66,8	
Partial safety factor		γ_2	-	1,25							
Pullout											
Characteristic resistance in uncracked concrete C20/25		$N_{Rk,p}$	[kN]	4,0	6,0	4,0	9,0	12,0	16,0	20,0	25,0
Characteristic resistance in cracked concrete C20/25		$N_{Rk,p}$	[kN]	1,0	1,5	2,0	4,0	6,0	9,0	12,0	16,0
Increasing factor for concrete	C30/37	Ψ_c	-	1,22							
	C40/50			1,41							
	C50/60			1,55							
Concrete cone failure and splitting failure											
Effective anchorage depth		h_{ef}	[mm]	26	35	26	43	36	50	57	70
Factor for	cracked	k_{cr} [2]	-	7,2							
	uncracked	k_{unc} [2]	-	10,1							
Concrete cone	edge distance	$c_{cr,N}$	[mm]	1.5 h_{ef}							
	spacing	$s_{cr,N}$	[mm]	3 h_{ef}							
Splitting	edge distance	$c_{cr,sp}$	[mm]	1.8 h_{ef}							
	spacing	$s_{cr,sp}$	[mm]	3.6 h_{ef}							
Installation safety factor		γ_2 [3] = γ_{inst} [2]	-	1,0							
Concrete pryout failure											
k-factor		$k^{3)} = k_3$ [2]	-	1,0							2,0
Concrete edge failure											
Effective length of the anchor under shear loading		$l_f = h_{ef}$	[mm]	26	35	26	43	36	50	57	70
Effective diameter of the anchor		d_{nom}	[mm]	5		6		8		10	

[1] Only for non-structural applications
[2] Parameter only relevant for the design according to CEN/TS 1992-4:2009
[3] Parameter only relevant for the design according to ETAG 001, Annex C

Annex C1

Table C2: Characteristic values for seismic actions C1

Size MMS-plus			**10**	**12**	
Embedment depth in concrete [mm]	h_{nom}		h_{nom2}	h_{nom1}	h_{nom2}
			65	75	90
Steel failure for tension- and shear resistance					
Characteristic resistance	$N_{Rk,s,seis}$	[kN]	24,1	37,4	
	$V_{Rk,s,seis}$	[kN]	9,6	16,9	
Pullout					
Characteristic in cracked concrete	$N_{Rk,p,seis}$	[kN]	6,8	9,0	12,0
Concrete cone failure					
Effective anchorage depth	h_{ef}	[mm]	50	57	70
concrete cone — edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}		
concrete cone — spacing	$s_{cr,N}$	[mm]	3 h_{ef}		
Installation safety factor	γ_2	-	1,0		
Concrete pryout failure					
k-factor	k	-	2,0	1,0	
Concrete edge failure					
Effective length of the anchor under shear loading	$l_{ef} = h_{ef}$	[mm]	50	57	70
Effective diameter of the anchor	d_{nom}	[mm]	8	10	

Annex C2

Table C3: Characteristic values under fire exposure

Size MMS-plus				**6**		**7,5**		**10**		**12**	
				h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}
Embedment depth in concrete		h_{nom}	[mm]	35	45	35	55	50	65	75	90
Steel failure for tension- and shear resistance ($F_{Rk,fi} = N_{Rk,fi} = V_{Rk,fi}$)											
Characteristic resistance	R30	$F_{Rk,fi}$	[kN]	0,25	0,4	0,5	1,0	1,5	2,3	3,0	3,0
	R60	$F_{Rk,fi}$	[kN]	0,25	0,4	0,5	0,8	1,4	1,4	2,1	2,1
	R90	$F_{Rk,fi}$	[kN]	0,25	0,4	0,5	0,5	1,0	1,0	1,5	1,5
	R120	$F_{Rk,fi}$	[kN]	0,2	0,3	0,4	0,4	0,8	0,8	1,2	1,2
	R30	$M^0_{Rk,s,fi}$	[Nm]	0,5		1,1		2,7		5,3	
	R60	$M^0_{Rk,s,fi}$	[Nm]	0,3		0,6		1,5		2,8	
	R90	$M^0_{Rk,s,fi}$	[Nm]	0,2		0,4		1,1		2,0	
	R120	$M^0_{Rk,s,fi}$	[Nm]	0,2		0,3		0,9		1,6	
Edge distance											
	R30 to R120	$c_{cr,fi}$	[mm]	2 h_{ef}							
Spacing											
	R30 to R120	$s_{cr,fi}$	[mm]	2 $c_{cr,fi}$							

Annex C3

Table C4: Displacements under tension loads

Size MMS-plus				6		7,5		10		12	
				h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}
Embedment depth in concrete		h_{nom}	[mm]	35	45	35	55	50	65	75	90
Cracked concrete C20/25 to C50/60	tension	N	[kN]	1,9	3,0	1,9	5,3	5,7	7,9	10,7	12,8
	displacement	δ_{N0}	[mm]	0,11	0,11	0,06	0,12	0,06	0,07	0,05	0,19
		$\delta_{N\infty}$	[mm]	0,30	0,28	0,38	1,03	0,75	0,72	0,74	0,60
Uncracked concrete C20/25 to C50/60	tension	N	[kN]	0,5	0,7	0,9	2,0	2,9	4,3	5,7	6,4
	displacement	δ_{N0}	[mm]	0,01	0,02	0,03	0,04	0,03	0,09	0,05	0,02
		$\delta_{N\infty}$	[mm]	0,14	0,09	0,12	0,11	0,08	0,09	0,07	0,22

Table C5: Displacements under shear loads

Size MMS-plus				6		7,5		10		12	
				h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}
Embedment depth in concrete		h_{nom}	[mm]	35	45	35	55	50	65	75	90
Cracked and uncracked concrete C20/25 to C50/60	shear load	V	[kN]	2	2	4	4	8	8	12	12
	displacement	δ_{N0}	[mm]	0,14	0,13	0,09	0,11	0,18	0,13	0,18	0,18
		$\delta_{N\infty}$	[mm]	0,20	0,19	0,13	0,16	0,27	0,20	0,27	0,27

Annex C4