

# YDEEVNEDEKLARATION

HECO-DoP\_ETA\_15/0784\_MMS-plus\_1606\_DA

1. Varetypens unikke identifikationskode:

**MULTI-MONTI-plus (MMS-plus)**

2. Type-, parti- eller serienummer eller en anden form for angivelse, ved hjælp af hvilken byggevaren kan identificeres som krævet i henhold til artikel 11, stk. 4:

**Identifikation ifølge ETA-15/0784 annex A2, A3**

**Chargenummer: se produktemballagen**

3. Byggevarens tilsigtede anvendelse eller anvendelser i overensstemmelse med den gældende harmoniserede tekniske specifikation som påtænkt af fabrikanten:

**ETA-15/0784 tillæg B1**

<b>Dyveltype</b>	Skrueanker
<b>Til anvendelse i</b>	<u>Beton C20/25 til C50/60 (EN 206)</u> - ikke revnet: Ø6, Ø7.5, Ø10 og Ø12 - revnet: Ø6, Ø7.5, Ø10 og Ø12
<b>Option/kategori</b>	<u>Option 1</u> Seismisk: Ydelseskategori C1
<b>Belastning</b>	statisk, quasi-statisk, seismisk (Ø10 + Ø12), brandmodstand
<b>Materiale/udførelse</b>	<u>Galvaniseret stål:</u> - til anvendelse under betingelser som tørre indvendige rum - forskellige hovedformer

4. Fabrikantens navn, registrerede firmabetegnelse eller registrerede varemærke og kontaktadresse som krævet i henhold til artikel 11, stk. 5:

**HECO-Schrauben GmbH & Co. KG**

**Dr.-Kurt-Steim-Str. 28**

**78713 Schramberg (Tyskland)**

5. I givet fald navn og kontaktadresse på den bemyndigede repræsentant, hvis mandat omfatter opgaverne i artikel 12, stk. 2:

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6. Systemet eller systemerne til vurdering og kontrol af konstansen af byggevarens ydeevne, jf. bilag 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. Hvis ydeevnedeklarationen vedrører en byggevare, for hvilken der er udstedt en europæisk teknisk vurdering:

- Evalueringsenhed: Deutsches Institut für Bautechnik (DIBt)
- Bemyndiget organ: Otto-Graf-Institut Stuttgart, identifikationsnummer 0672
- Evalueringsrapport ETAG 001 del 1, 3 (04.2013)
- Konformitetserklæring: 0672-CPR-0635

9. Deklareret ydeevne

Essential characteristics	Vurderingsmetode	Ydelse	Harmoniserede tekniske specifikationer
<b>Karakteristiske værdier for trækbelastningsevne</b>	ETAG 001, tillæg: C, metode A CEN/TS 1992-4:2009, metode A	ETA-15/0784: tillæg C1	ETAG 001 Part 1, 3 ETAG 001, tillæg E EOTA TR 020 (Brandmodstand)
	EOTA TR 045	ETA-15/0784: tillæg C2	
	EOTA TR 020 (Brandmodstand) CEN/TS 1992-4: tillæg D	ETA-15/0784: tillæg C3	
<b>Karakteristiske værdier for tværbæreevne</b>	ETAG 001, tillæg: C, metode A CEN/TS 1992-4:2009, metode A	ETA-15/0784: tillæg C1	
	EOTA TR 045	ETA-15/0784: tillæg C2	
	EOTA TR 020 (Brandmodstand) CEN/TS 1992-4: tillæg D	ETA-15/0784: tillæg C3	
<b>Montageidentifikationsværdier</b>		ETA-15/0784: tillæg B2	
<b>Forskydninger i brugsegnehedens grænseværdi</b>	ETAG 001, tillæg: C, metode A CEN/TS 1992-4:2009, metode A	ETA-15/0784: tillæg C4	

10. Ydeevnen for den byggevare, der er anført i punkt 1 og 2, er i overensstemmelse med den deklarerede ydeevne i punkt 9. Denne ydeevnedeklaration udstedes på eneansvar af den fabrikant, der er anført i punkt 4.

Underskrevet for fabrikanten og på dennes vegne af:

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  $h_{nom1}$  and  $h_{nom2}$ .
- 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:

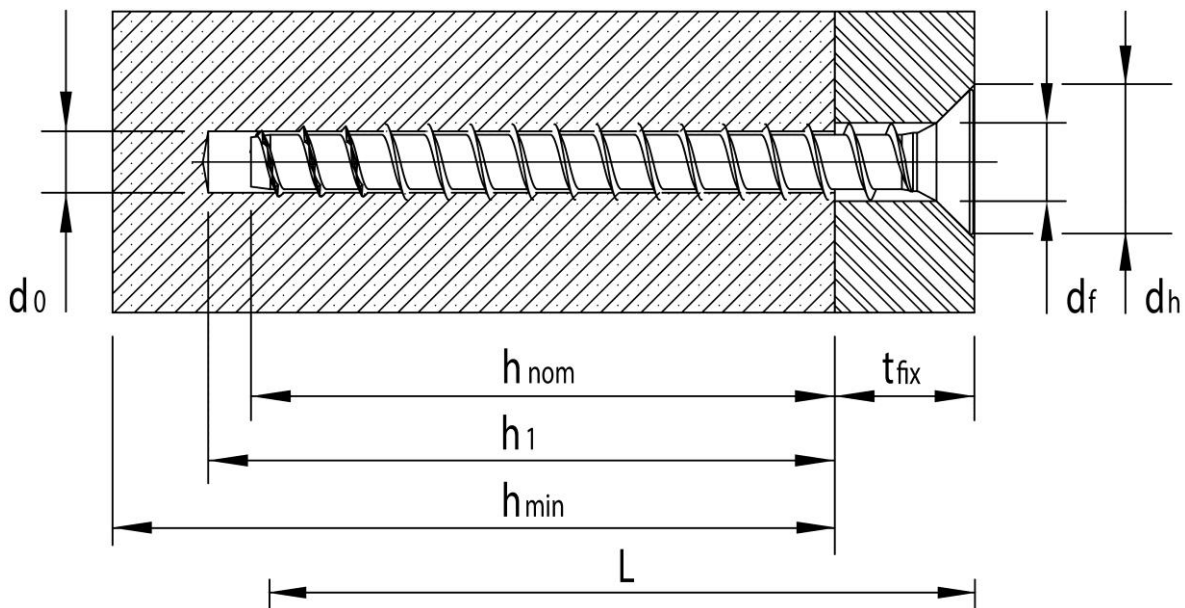
- Hole drilling by hammer-drilling only.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of the aborted hole 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.

Tillæg 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	$d_{cut}$ $\leq$	[mm]	5,40		6,40		8,45		10,45		
Depth of borehole	$h_1$ $\geq$	[mm]	40	50	40	65	60	75	85	100	
Diameter of clearance hole in the fixture	$d_f \leq$	[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		



Tillæg B2

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

Size MMS-plus			6		7,5		10		12		
Embedment depth in concrete $h_{nom}$ [mm]			$h_{nom1}$	$h_{nom2}$	$h_{nom1}$	$h_{nom2}$	$h_{nom1}$	$h_{nom2}$	$h_{nom1}$	$h_{nom2}$	
			35 <sup>1)</sup>	45	35 <sup>1)</sup>	55	50	65	75	90	
<b>Steel failure for tension- and shear resistance</b>											
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		
	$k_2$ <sup>2)</sup>	-	0,8								
	$M^0_{Rk,s}$	[Nm]	6,7		14,1		34,5		66,8		
<b>Partial safety factor</b>		$\gamma_2$	1,25								
<b>Pullout</b>											
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	$\Psi_c$	-	1,22							
	C40/50			1,41							
	C50/60			1,55							
<b>Concrete cone failure and splitting failure</b>											
Effective anchorage depth		$h_{ef}$	[mm]	26	35	26	43	36	50	57	70
Factor for	cracked	$k_{cr}$ <sup>2)</sup>	-	7,2							
	uncracked	$k_{unc}$ <sup>2)</sup>	-	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		$\gamma_2$ <sup>3)</sup> = $\gamma_{inst}$ <sup>2)</sup>	-	1,0							
<b>Concrete pryout failure</b>											
k-factor		$k^{(3)} = k_3^{(2)}$	-	1,0							2,0
<b>Concrete edge failure</b>											
Effective length of the anchor under shear loading		$l_{ef} = h_{ef}$	[mm]	26	35	26	43	36	50	57	70
Effective diameter of the anchor		$d_{nom}$	[mm]	5		6		8		10	

<sup>1)</sup> Only for non-structural applications

<sup>2)</sup> Parameter only relevant for the design according to CEN/TS 1992-4:2009

<sup>3)</sup> Parameter only relevant for the design according to ETAG 001, Annex C

Tillæg 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
<b>Steel failure for tension- and shear resistance</b>					
Characteristic resistance	$N_{Rk,s,seis}$	[kN]	24,1	37,4	
	$V_{Rk,s,seis}$	[kN]	9,6	16,9	
<b>Pullout</b>					
Characteristic in cracked concrete	$N_{Rk,p,seis}$	[kN]	6,8	9,0	12,0
<b>Concrete cone failure</b>					
Effective anchorage depth	$h_{ef}$	[mm]	50	57	70
concrete edge distance	$c_{cr,N}$	[mm]	1,5 $h_{ef}$		
cone spacing	$s_{cr,N}$	[mm]	3 $h_{ef}$		
Installation safety factor	$\gamma_2$	-	1,0		
<b>Concrete pryout failure</b>					
k-factor	k	-	2,0	1,0	
<b>Concrete edge failure</b>					
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	

Tillæg C2

**Table C3: Characteristic values under fire exposure**

Size MMS-plus				6		7,5		10		12	
Embedment depth in concrete $h_{nom}$ [mm]				$h_{nom1}$	$h_{nom2}$	$h_{nom1}$	$h_{nom2}$	$h_{nom1}$	$h_{nom2}$	$h_{nom1}$	$h_{nom2}$
				35	45	35	55	50	65	75	90
<b>Steel failure for tension- and shear resistance (<math>F_{Rk,fi} = N_{Rk,fi} = V_{Rk,fi}</math>)</b>											
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 $C_{cr,fi}$							

Tillæg C3

**Table C4: Displacements under tension loads**

Size MMS-plus				6		7,5		10		12	
Embedment depth in concrete		$h_{nom}$	[mm]	$h_{nom1}$	$h_{nom2}$	$h_{nom1}$	$h_{nom2}$	$h_{nom1}$	$h_{nom2}$	$h_{nom1}$	$h_{nom2}$
				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	$\bar{\delta}_{N0}$	[mm]	0,11	0,11	0,06	0,12	0,06	0,07	0,05	0,19
		$\bar{\delta}_{N\infty}$	[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	$\bar{\delta}_{N0}$	[mm]	0,01	0,02	0,03	0,04	0,03	0,09	0,05	0,02
		$\bar{\delta}_{N\infty}$	[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	
Embedment depth in concrete		$h_{nom}$	[mm]	$h_{nom1}$	$h_{nom2}$	$h_{nom1}$	$h_{nom2}$	$h_{nom1}$	$h_{nom2}$	$h_{nom1}$	$h_{nom2}$
				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	$\bar{\delta}_{N0}$	[mm]	0,14	0,13	0,09	0,11	0,18	0,13	0,18	0,18
		$\bar{\delta}_{N\infty}$	[mm]	0,20	0,19	0,13	0,16	0,27	0,20	0,27	0,27

Tillæg C4