

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

ETA-05/0011  
of 9 October 2020

English translation prepared by DIBt - Original version in German language

### General Part

Technical Assessment Body issuing the  
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

HECO MULTI-MONTI MMS A4

Product family  
to which the construction product belongs

Mechanical fasteners for use in concrete

Manufacturer

HECO-Schrauben GmbH & Co. KG  
Dr.-Kurt-Steim-Straße 28  
78713 Schramberg

Manufacturing plant

HECO-Schrauben GmbH & Co. KG  
Dr.-Kurt-Steim-Straße 28  
78713 Schramberg

This European Technical Assessment  
contains

12 pages including 3 annexes which form an integral part  
of this assessment

This European Technical Assessment is  
issued in accordance with Regulation (EU)  
No 305/2011, on the basis of

EAD 330232-01-0601, Edition 12/2019

This version replaces

ETA-05/0011 issued on 4 September 2018

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## Specific Part

### 1 Technical description of the product

The concrete screw HECO MULTI MONTI MMS A4 is an anchor in sizes 7.5, 10 and 12 mm made of stainless steel. The anchor is screwed into a predrilled cylindrical drill hole. The special thread of the anchor cuts an internal thread into the member while setting. The anchorage is characterised by mechanical interlock in the special thread.

The product description is given in Annex A.

### 2 Specification of the intended use in accordance with the applicable European Assessment Document

The performances given in Section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchor of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

### 3 Performance of the product and references to the methods used for its assessment

#### 3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance to tension load (static and quasi-static loading)	See Annex B 2 and Annex C 1
Characteristic resistance to shear load (static and quasi-static loading)	See Annex C 2
Displacements and Durability	See Annex C 1, C 2 and Annex B 1
Characteristic resistance and displacements for seismic performance categories C1 and C2	No performance assessed

#### 3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C 3

English translation prepared by DIBt

**4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base**

In accordance with the European Assessment Document EAD 330232-01-0601 the applicable European legal act is: [96/582/EC].

The system to be applied is: 1

**5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document**

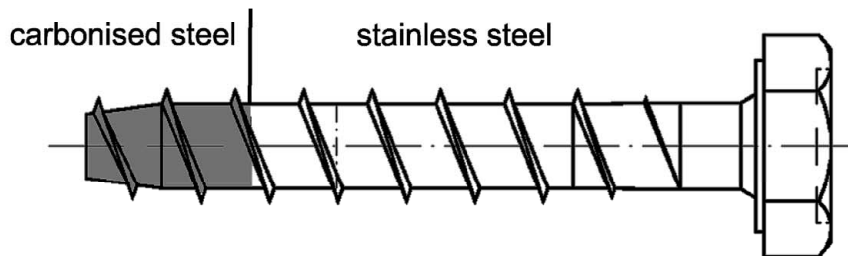
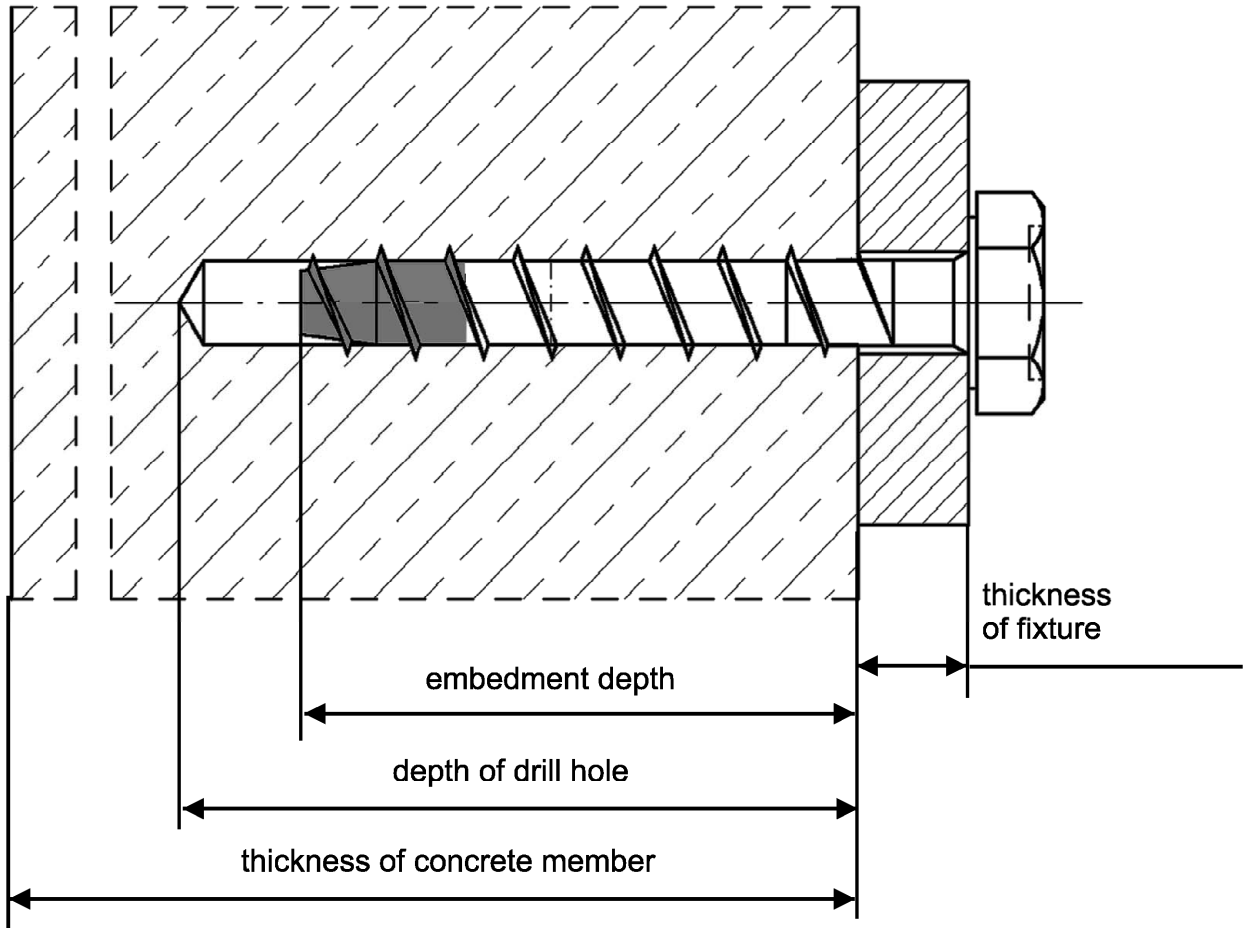
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Deutsches Institut für Bautechnik.

Issued in Berlin on 9 October 2020 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow  
Head of Department

*beglaubigt:*  
Tempel

## Installed condition



### HECO MULTI-MONTI MMS A4

**Product description**  
Product,  
Installed condition

**Annex A 1**

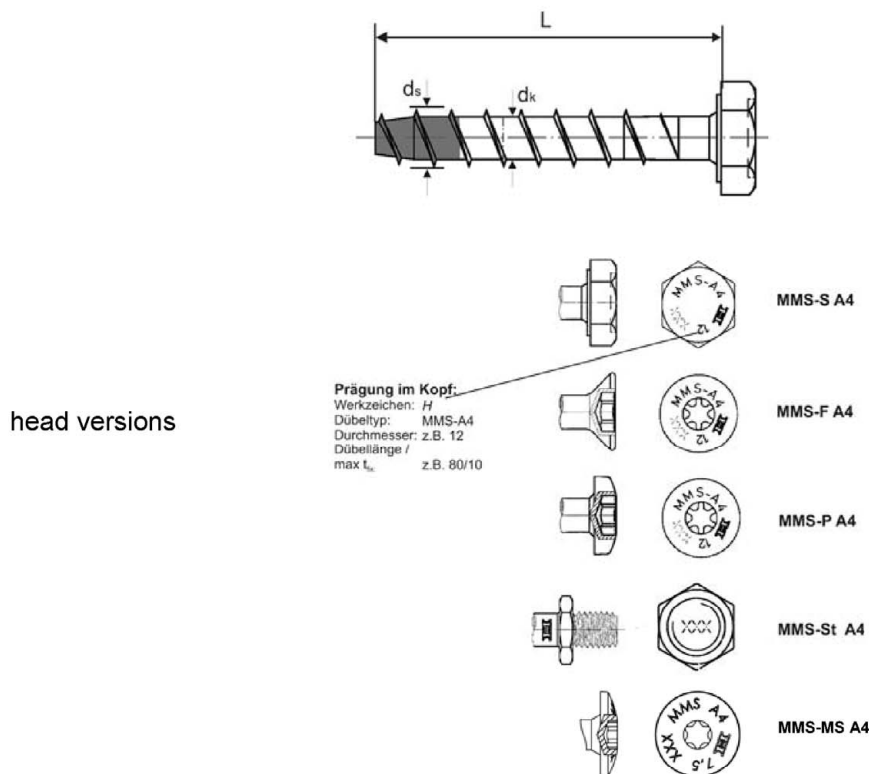


Table A1: Dimensions and Materials

Anchor sizes			MMS-7,5 A4	MMS-10 A4	MMS-12 A4
Length	$L \geq$	[mm]	65	75	90
Length	$L \leq$	[mm]	500	500	500
Bolt diameter	$d_k$	[mm]	5,7	7,6	9,6
Thread diameter	$d_s$	[mm]	7,5	10,1	12,4
Nominal value of the yield strength	$f_{yk}$	[N/mm <sup>2</sup> ]	855		
Nominal value of the tensile strength	$f_{uk}$	[N/mm <sup>2</sup> ]	950		
Elongation at rupture	$A_5$	[%]	$\geq 8$		
Material	stainless steel 1.4401, 1.4462, 1.4529, 1.4578 and 1.4571 acc. to EN 10088-1:2005				
Material of the tip	steel acc. to EN 10263-4:2001				

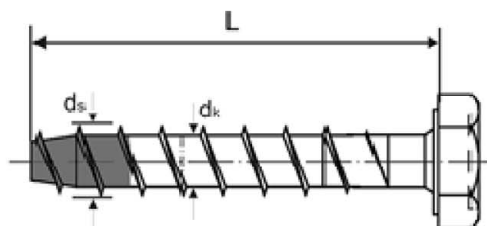
Table A1: Materials and head marking

Material	head-marking
1.4401 / 1.4578	MMS-A4
1.4462	MMS-FA
1.4571	MMS-A5
1.4529	MMS-KK

## HECO MULTI-MONTI MMS A4

Product description  
Head Versions,  
dimensions and materials

## Annex A 2



**Embossing**

Identifying mark of the producer:

H

Anchor typ:

MMS A4\*\*

Diameter:

12

Length:

z.B. 120

f

**Table A3: Dimensions and Materials**

Anchor sizes			MMS-12 A4
Length	$L \geq$	[mm]	90
Length	$L \leq$	[mm]	500
Bolt diameter	$d_k$	[mm]	9,6
Thread diameter	$d_s$	[mm]	12,4
Nominal value of the yield strength	$f_{yk}$	[N/mm <sup>2</sup> ]	675
Nominal value of the tensile strength	$f_{uk}$	[N/mm <sup>2</sup> ]	750
Elongation at rupture		[%]	$\geq 8$
Material	Stainless steel 1.4401, 1.4462, 1.4578, 1.4529 and 1.4571 acc. to EN 10088-1:2005		
Material of the tip	Steel acc to EN 10263-4:2001		

**Table A4: Materials and head marking**

Material	head-marking
1.4401 / 1.4578	MMS-A4
1.4462	MMS-FA
1.4571	MMS-A5
1.4529	MMS-KK

**HECO MULTI-MONTI MMS A4**

**Product description**  
Head Versions,  
dimensions and materials

**Annex A 3**

## Specifications of intended use

### Anchorage subject to:

- Static and quasi-static loads: all sizes.
- Fire exposure: all sizes.

### Base Materials:

- Compacted reinforced or unreinforced normal weight concrete according to EN 206:2013 + A1:2016.
- Strength classes C20/25 to C50/60 according to EN 206:2013 + A1:2016
- Cracked and uncracked concrete: all sizes.

### Use conditions (Environmental conditions):

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

### 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 anchorages under static or quasi-static actions and fire exposure has to be carried out in accordance with EN 1992-4:2018 and EOTA Technical Report TR055
- The design under shear load according to EN 1992-4:2018, section 6.2.2 applies to all in Annex B 2, 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.
- The head of the anchor is attached to the fixture and is not damaged; respectively the required embedment depth  $h_{nom}$  is reached.

**HECO MULTI-MONTI MMS A4**

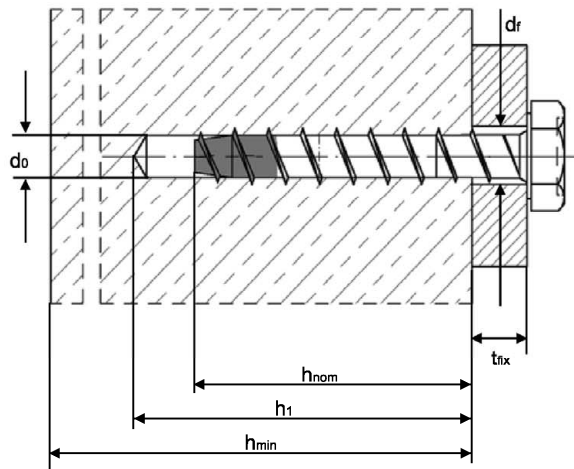
**Intended Use  
Specifications**

**Annex B 1**

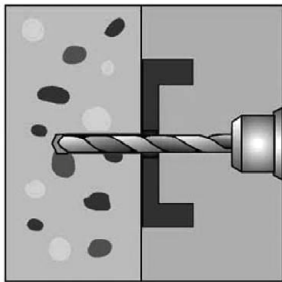


**Table B1: Installation Parameters**

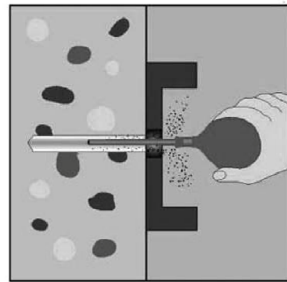
Anchor sizes		MMS-7,5 A4	MMS-10 A4	MMS-12 A4
Nominal drill diameter	$d_0$ [mm]	6,0	8,0	10,0
Cutting diameter of the drill bit	$d_{cut} \leq$ [mm]	6,4	8,45	10,45
Depth of drill hole	$h_1 \geq$ [mm]	75	90	100
Embedment depth	$h_{nom} \geq$ [mm]	65	75	90
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	9,0	12,0	14,0
Recommended installation tool		Impact screw driver, max. power output $T_{max}$ according to manufacturer information		
		100 Nm	250 Nm	250 Nm



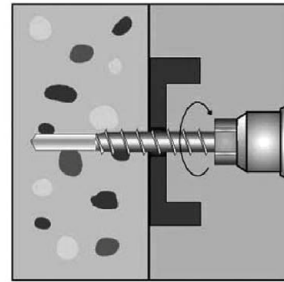
**Installation Instruction**



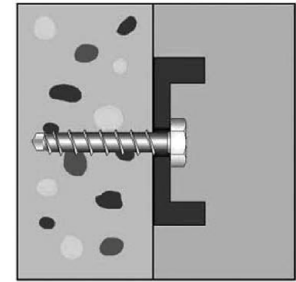
**Drilling**  
Drill diameter  $d_0$  and drilling depth  $h_1$  have to be met



**Removal of drill dust**  
e.g. blowing



**Installation**  
e.g. by hand or with impact screw driver



**Complete verification:** head supported to fixture and embedment depth  $h_{nom}$

**Table B2: Minimum thickness of concrete member, minimum spacing and minimum edge distances of anchor**

Anchor sizes		MMS-7,5 A4	MMS-10 A4	MMS-12 A4
min. thickness of concrete member	$h_{min}$ [mm]	105	130	140
<b>cracked and uncracked concrete</b>				
min. spacing	$s_{min}$ [mm]	40	50	60
min. edge distance	$c_{min}$ [mm]	40	50	60

**HECO MULTI-MONTI MMS A4**

**Intended Use**

Installation Parameters, installation instruction, minimum thickness of concrete member, minimum spacing and minimum edge distance

**Annex B 2**

**Table C1: Performance under tension loads**

Anchor sizes			MMS-7,5 A4	MMS-10 A4	MMS-12 A4
<b>Steel failure</b>					
Characteristic resistance	$N_{Rk,s}$	[kN]	23	16	25
Partial safety factor	$\gamma_{Ms}$	[-]	1,4		
<b>Pullout</b>					
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p}$	[kN]	5	9	12
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	7,5	12	16
Increasing factor for $N_{Rk,p}$ in cracked and uncracked concrete	$\psi_c$	C30/37	1,22		
		C40/50	1,41		
		C50/60	1,58		
Installation factor	$\gamma_{inst}$	[-]	1,4	1,2	
<b>Concrete cone failure, splitting failure</b>					
Effective anchorage depth	$h_{ef}$	[mm]	40	47,5	54,5
Factor for	cracked concrete	$k_{cr,N}$	7,7		
	uncracked concrete	$k_{urc,N}$	11,0		
Charact. resistance for splitting	$N^0_{Rk,sp}$	[kN]	$\min(N_{Rk,p}; N^0_{Rk,c}{}^1)$		
Spacing	$s_{cr,N} = s_{cr}$	[mm]	$3 \times h_{ef}$		
Edge distance	$c_{cr,N} = c_{cr}$	[mm]	$1,5 \times h_{ef}$		
Installation factor	$\gamma_{inst}$	[-]	1,4	1,2	

<sup>1)</sup>  $N^0_{Rk,c}$  according to EN 1992-4:2018

**Table C2: Displacements under tension loads**

Anchor sizes			MMS-7,5 A4	MMS-10 A4	MMS-12 A4
Tension load in cracked concrete	N	[kN]	1,7	3,0	4,0
Displacements	$\delta_{N0}$	[mm]	0,1	0,1	0,2
	$\delta_{N\infty}$	[mm]	0,2	0,2	0,6
Tension load in uncracked concrete	N	[kN]	2,6	4,0	5,3
Displacements	$\delta_{N0}$	[mm]	0,1	0,1	0,2
	$\delta_{N\infty}$	[mm]	0,2	0,2	0,6

**HECO MULTI-MONTI MMS A4**

**Performance**  
Characteristic values under tension loads  
Displacements under tension loads

**Annex C 1**

**Table C3: Performance under shear loads**

Anchor sizes			MMS-7,5 A4	MMS-10 A4	MMS-12 A4
<b>Steel failure without lever arm</b>					
Characteristic resistance	$V^0_{Rk,s}$	[kN]	12,3	20	33
Factor	$k_7$		0,8 (1,0 <sup>1)</sup> )		
Partial safety factor	$\gamma_{Ms}$	[-]	1,5		
<b>Steel failure with lever arm</b>					
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	22	45	93 (65 <sup>1)</sup> )
Partial safety factor	$\gamma_{Ms}$	[-]	1,5		
<b>Concrete pryout failure</b>					
k-factor	$k_8$	[-]	1,0	2,0	
Installation factor	$\gamma_{inst}$	[-]	1,0		
<b>Concrete edge failure</b>					
Effective length of the anchor	$l_f$	[mm]	40	47,5	54,5
Effective diameter of the anchor	$d_{nom}$	[mm]	6	8	10
Installation factor	$\gamma_{inst}$	[-]	1,0		

<sup>1)</sup> for  $f_{uk} = 750 \text{ N/mm}^2$

**Table C4: Displacements under shear loads**

Anchor sizes			MMS-7,5 A4	MMS-10 A4	MMS-12 A4
Shear load in cracked and uncracked concrete	$V$	[kN]	5,9	9,7	15,7
Displacements	$\delta_{V0}$	[mm]	1,7	3,0	3,2
	$\delta_{V\infty}$	[mm]	2,6	4,5	4,8

**HECO MULTI-MONTI MMS A4**

Performance  
Characteristic values under shear loads  
Displacements under shear loads

**Annex C 2**

**Table C5: Performance under tension loads under fire exposure**

Anchor sizes			MMS-7,5 A4				MMS-10 A4				MMS-12 A4			
Fire resistance duration	R	[min]	30	60	90	120	30	60	90	120	30	60	90	120
<b>Steel failure</b>														
Characteristic resistance	$N_{Rk,s,fi}$	[kN]	1,7	1,2	0,8	0,6	3,4	2,5	1,7	1,2	5,9	4,4	3,0	2,2
Characteristic resistance for MMS-St with metric stud	$N_{Rk,s,fi}$	[kN]	1,7	1,2	0,8	0,6	1,8	1,5	1,1	1,0	-	-	-	-
<b>Pullout</b>														
Characteristic resistance in concrete C20/25 to C50/60	$N_{Rk,p,fi}$	[kN]	1,3		1,0		2,3		1,8		3,0		2,4	
<b>Concrete cone failure</b>														
Characteristic resistance in concrete C20/25 to C50/60	$N_{Rk,c,fi}$	[kN]	1,8		1,5		2,8		2,2		3,9		3,2	
Spacing	$s_{cr,fi}$	[mm]	4 x $h_{ef}$											
Edge distance	$c_{cr,fi}$	[mm]	2 x $h_{ef}$											

**Table C6: Performance under shear loads under fire exposure**

Anchor sizes			MMS-7,5 A4				MMS-10 A4				MMS-12 A4			
Fire resistance duration	R	[min]	30	60	90	120	30	60	90	120	30	60	90	120
<b>Steel failure without lever arm</b>														
Characteristic resistance	$V_{Rk,s,fi}$	[kN]	1,7	1,2	0,8	0,6	3,4	2,5	1,7	1,2	5,9	4,4	3,0	2,2
<b>Steel failure with lever arm</b>														
Characteristic resistance	$M^0_{Rk,s,fi}$	[Nm]	1,5	1,1	0,7	0,5	4,0	3,0	2,0	1,5	8,8	6,6	4,4	3,3

**HECO MULTI-MONTI MMS A4**

**Performance**  
Characteristic values of tension and shear load resistance under fire exposure

**Annex C 3**