



MULTI-MONTI®

European Technical Assessment ETA-05/0011

HECO MULTI-MONTI® MMS A4

Mechanical fasteners for use in concrete



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:

Trade name of the construction product

Product family
to which the construction product belongs

Manufacturer

Manufacturing plant

This European Technical Assessment
contains

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

This version replaces

Deutsches Institut für Bautechnik

HECO MULTI-MONTI MMS A4

Mechanical fasteners for use in concrete

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

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

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

EAD 330232-01-0601, Edition 12/2019

ETA-05/0011 issued on 4 September 2018

European Technical Assessment

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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

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

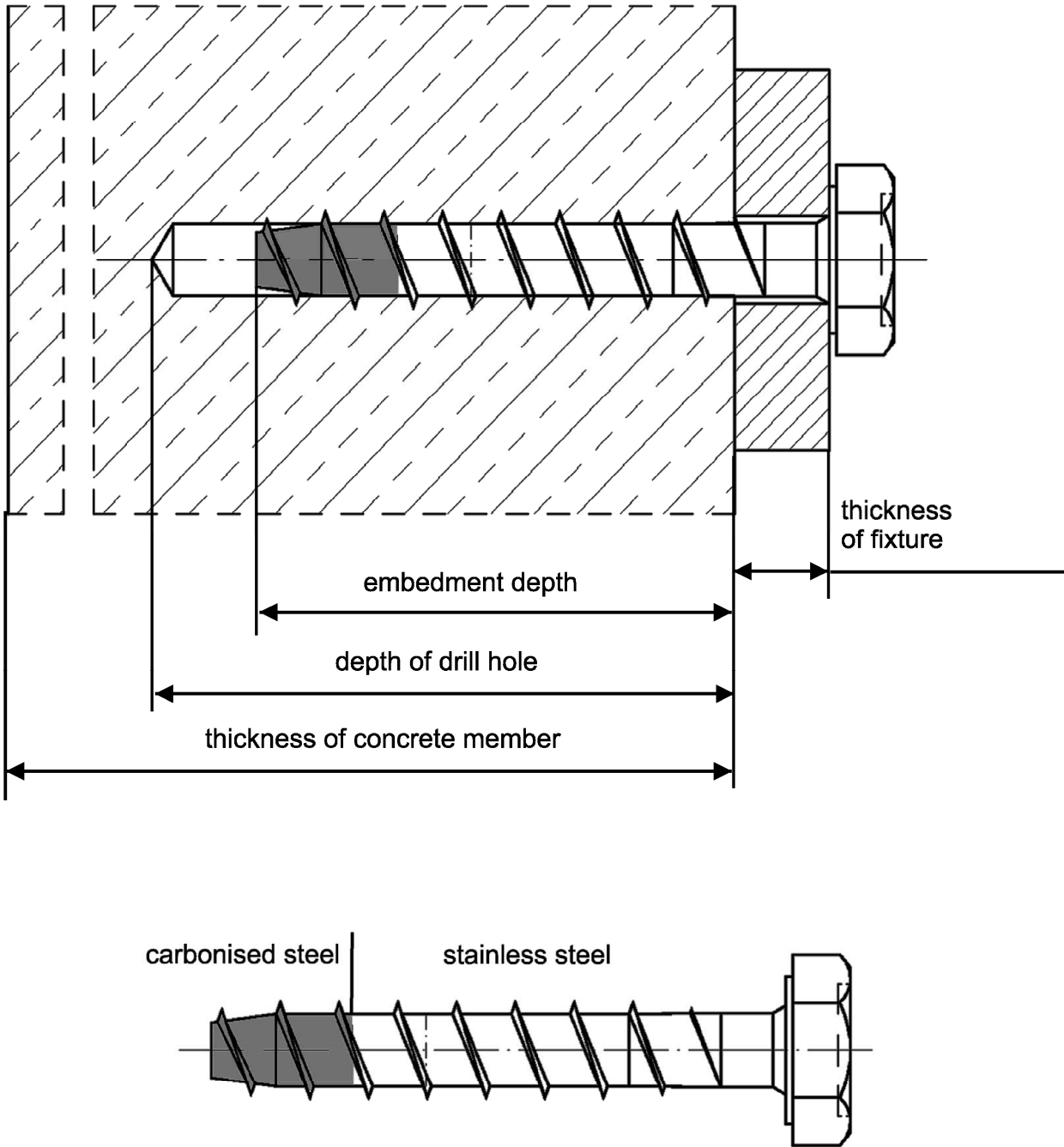
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Deutsches Institut für Bautechnik.

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

BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Tempel

Installed condition



Electronic copy of the ETA by DIBt: ETA-05/0011

HECO MULTI-MONTI MMS A4

Product description
Product,
Installed condition

Annex A 1

head versions

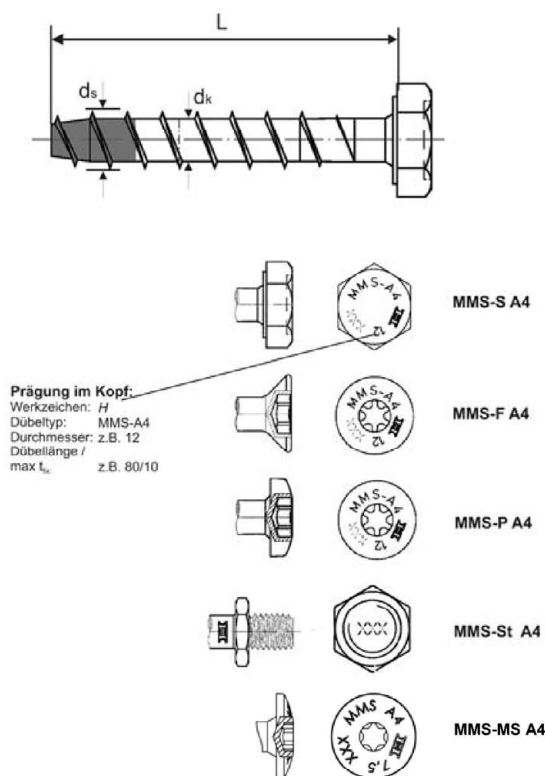


Table A1: Dimensions and Materials

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 ²]	855		
Nominal value of the tensile strength	f_{uk}	[N/mm ²]	950		
Elongation at rupture	A_5	[%]	≥ 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		

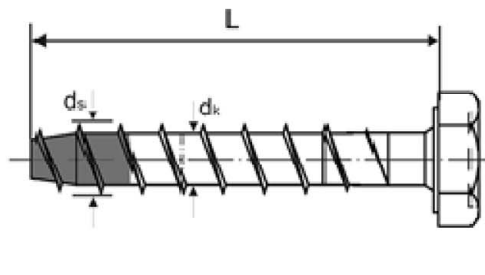
Table A1: Materials and head marking

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



f

Embossing

Identifying mark of
the producer:

H

Anchor typ:

MMS A4**

Diameter:

12

Length:

z.B. 120

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 ²]	675
Nominal value of the tensile strength	f_{uk}	[N/mm ²]	750
Elongation at rupture		[%]	≥ 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.

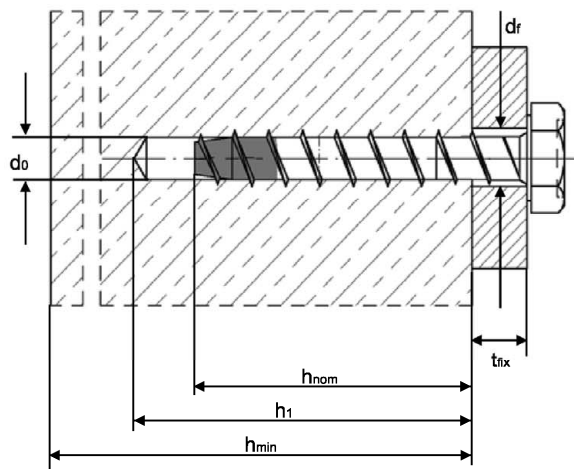
HECO MULTI-MONTI MMS A4

**Intended Use
Specifications**

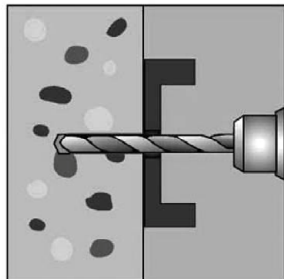
Annex B 1

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

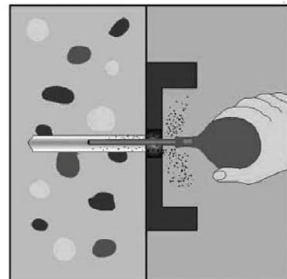


Installation Instruction



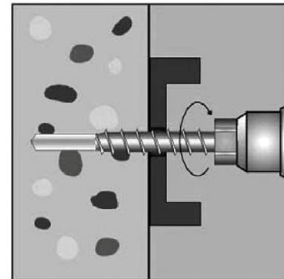
Drilling

Drill diameter d_0 and drilling depth h_1 have to be met



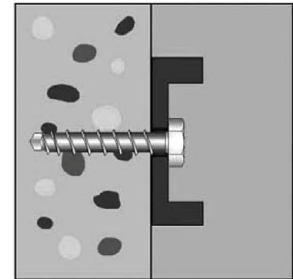
Removal of drill dust

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
cracked and uncracked concrete				
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
Steel failure					
Characteristic resistance	$N_{Rk,s}$	[kN]	23	16	25
Partial safety factor	γ_{Ms}	[-]	1,4		
Pullout					
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	ψ_c	C30/37	1,22		
		C40/50	1,41		
		C50/60	1,58		
Installation factor	γ_{inst}	[-]	1,4	1,2	
Concrete cone failure, splitting failure					
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	γ_{inst}	[-]	1,4	1,2	

¹⁾ $N^0_{Rk,c}$ 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	δ_{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	δ_{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
Steel failure without lever arm					
Characteristic resistance	$V^0_{Rk,s}$	[kN]	12,3	20	33
Factor	k_7		0,8 (1,0 ¹⁾)		
Partial safety factor	γ_{Ms}	[-]	1,5		
Steel failure with lever arm					
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	22	45	93 (65 ¹⁾)
Partial safety factor	γ_{Ms}	[-]	1,5		
Concrete pryout failure					
k-factor	k_8	[-]	1,0	2,0	
Installation factor	γ_{inst}	[-]	1,0		
Concrete edge failure					
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	γ_{inst}	[-]	1,0		

¹⁾ 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	δ_{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
Steel failure														
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	-	-	-	-
Pullout														
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
Concrete cone failure														
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
Steel failure without lever arm														
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
Steel failure with lever arm														
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



HECO-Schrauben GmbH & Co.KG

Dr.-Kurt-Stein-Straße 28 · D-78713 Schramberg

Tel.: +49 (0) 74 22 / 9 89-0 · Fax: +49 (0) 74 22 / 9 89-200

Mail: info@heco-schrauben.de · www.heco-schrauben.de