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Authorised and notified according
to Article 29 of the Regulation (EU)
No 305/2011 of the European
Parliament and of the Council of
9 March 2011

MEMBER OF EOTA



European Technical Assessment ETA-19/0169 of 2019/04/05

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No. 305/2011: ETA-Danmark A/S

Trade name of the construction product:

fischer Hammerset anchor EA PLUS

Product family to which the above construction product belongs:

Deformation-controlled expansion anchor made of galvanised steel for use in concrete for redundant non-structural systems

Manufacturer:

fischerwerke GmbH & Co. KG
Klaus-Fischer-Straße 1
D-72178 Waldachtal

Manufacturing plant:

Manufacturing plant 8

This European Technical Assessment contains:

15 pages including 10 annexes which form an integral part of the document

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

EAD 330747-00-0601; Fasteners for use in concrete for redundant non-structural systems

This version replaces:

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II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product and intended use

Technical description of the product

fischer Hammerset anchor EA PLUS is a deformation-controlled expansion anchor made of galvanised steel. The anchor is installed in a drilled hole and anchored by deformation-controlled expansion.

An illustration of the product is given in Annex A.

2 Specification of the intended use in accordance with the applicable EAD

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 provisions made in this European Technical Assessment are based on an assumed intended working life of the anchor of 50 years.

The indications given on the working life cannot be interpreted as a guarantee given by the producer or Assessment Body, 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 Characteristics of product

Mechanical resistance and stability (BWR 1):

For basic requirement Safety in use the same criteria are valid for Basic Requirement Safety in use (BWR4).

Safety in case of fire (BWR 2):

The essential characteristics are detailed in the Annex from C3 to C4.

Safety in use (BWR4):

The essential characteristics are detailed in the Annex from C1 to C2.

Other Basic Requirements are not relevant.

3.2 Methods of assessment

The assessment of fitness of the anchor for the intended use in relation to the requirements for mechanical resistance and stability and safety in use in the sense of the Basic Requirement 1, 2 and 4 has been made in accordance with EAD 330747-00-0601; Fasteners for use in concrete for redundant non-structural systems.

4 Assessment and verification of constancy of performance (AVCP)

4.1 AVCP system

According to the decision 97/161/EC of the European Commission, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No. 305/2011) is 2+.

5 Technical details necessary for the implementation of the AVCP system, as foreseen in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking.

Issued in Copenhagen on 2019-04-05 by



Thomas Bruun
Managing Director, ETA-Danmark

Figure A1.1: anchor without flange head

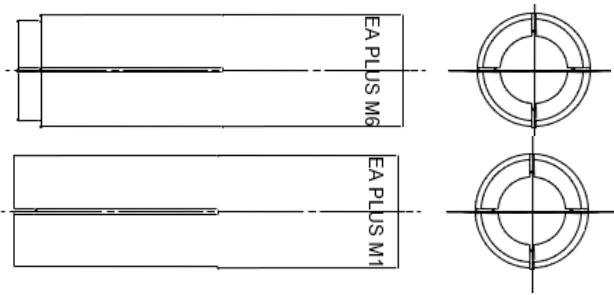


Figure A1.2: anchor with flange head

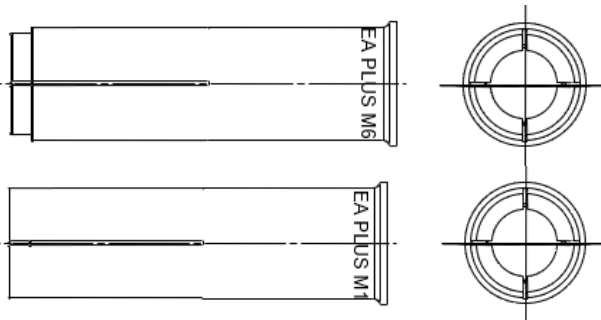
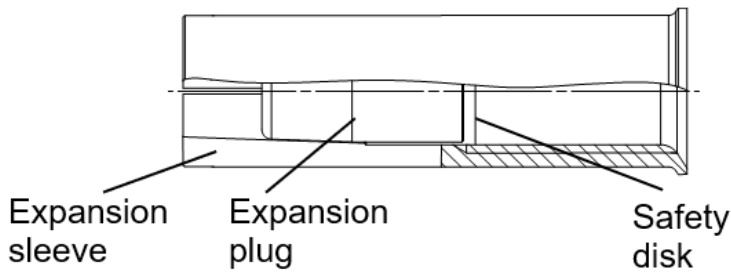


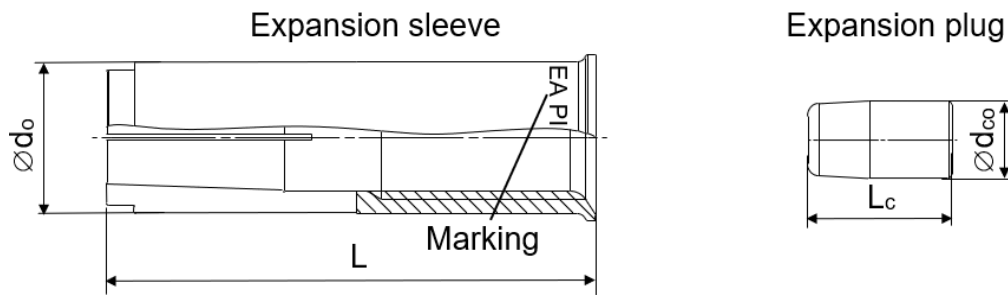
Figure A1.3: assembly



Marking on anchor body

⊕ EA PLUS 'thread size' x 'length of the expansion sleeve'

fischer Hammerset anchor EA PLUS	Annex A1 of European Technical Assessment ETA-19/0169
Product description Anchor types	

Table A2.1: Geometry

EA PLUS			M6x25	M8x25	M8x30	M8x40	M10x25	M10x30	M10x40	M12x25	M12x50	M16x65
Length of the expansion sleeve	L	[mm]	24,90	24,90	29,90	39,60	24,60	29,60	39,60	24,60	50,50	65,00
Diameter outside	d_o	[mm]	7,94	9,94	9,94	9,94	11,94	11,94	11,94	14,94	14,94	19,80
Length of the expansion plug	L_c	[mm]	10,00	8,15	11,90	11,90	8,80	13,60	15,70	10,45	20,70	28,10
Diameter outside expansion plug	d_{co}	[mm]	5,05	6,40	6,25	6,25	8,30	7,85	7,85	9,80	10,05	13,85

Table A2.2: Material

Member	Material
Expansion sleeve	Cold formed steel grade C8C in accordance with table 2 in EN 10263-2 or cold formed steel grade 1008 in accordance with table 3 in ASTM A510. Galvanised.
Expansion plug	Cold formed steel grade C8C in accordance with table 2 in EN 10263-2 or cold formed steel grade 1008 in accordance with table 3 in ASTM A510. Galvanised.

fischer Hammerset anchor EA PLUS

Product description
Geometry and material

Annex A2
of European
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Table A3.1: Setting tools

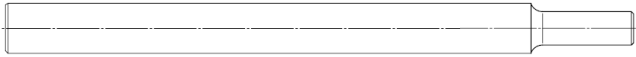
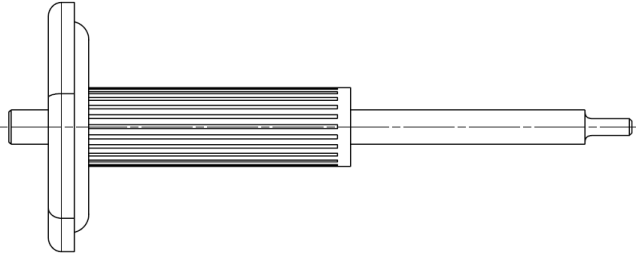
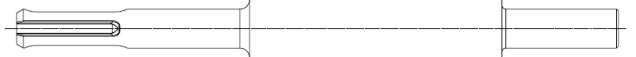
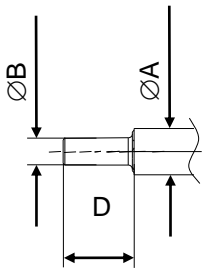
Setting tools	Description
	Hand setting tool No. 1
	Hand setting tool No. 2 with hand guard
	Machine setting tool

Table A3.2: Dimension of setting tools



Setting tool size			M6x25	M8x25	M8x30	M8x40	M10x25	M10x30	M10x40	M12x25	M12x50	M16x65
Diameter shaft	ØA	[mm]	10,00	10,00	10,00	10,00	13,00	13,00	13,00	16,00	16,00	22,00
Diameter impact pin (REF)	ØB	[mm]	4,70	6,35	6,35	6,35	7,90	7,90	7,90	9,80	9,80	13,50
Length impact pin	D	[mm]	15,00	16,75	17,90	27,70	15,80	16,00	23,80	14,15	29,70	36,80

fischer Hammerset anchor EA PLUS

Product description
Setting tools

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Specification of intended use:

Use:

The anchors are intended to be used for anchorages for which requirements for mechanical resistance and stability and safety in use in the sense of the Basic Requirements 1, 2 and 4 of Regulation 305/2011 (EU) shall be fulfilled and failure of anchorages made with these products would compromise the stability of the works, cause risk to human life and/or lead to considerable economic consequences.

Anchors subject to:

- Use for redundant non-structural systems.
- Static and quasi-static loads.

Base materials:

- Compacted reinforced or unreinforced normal weight concrete without fibres (cracked or uncracked) according to EN 206:2013
- Strength classes C20/25 to C50/60 according to EN 206-1:2013

Use conditions (Environmental conditions):

- Internal dry conditions

Installation:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Anchor installation in accordance with the manufacturer's specifications and drawings and using the appropriate tools.
- Check before placing the anchor to ensure that the strength class of the concrete, in which the anchor is to be placed, is identical with the values for which the characteristic loads apply.
- Check of concrete being well compacted, e.g. without significant voids.
- Edge distances and spacings not less than the specified values without minus tolerances.
- Positioning of the drill holes without damaging the reinforcement.
- In case of aborted hole: new drilling at minimum distance away of twice the depth of the aborted hole or smaller distance if the aborted drill hole is filled with high strength mortar and if under shear or oblique tension load it is not the direction of load application.
- Hole shall be cleaned.
- Anchor installation such that the effective anchorage depth is complied, values given in Annex B2.
- Anchor expansion by impact using the setting tools given in Annex A3. The anchor is properly set if the stop of the setting tool reaches the expansion sleeve.

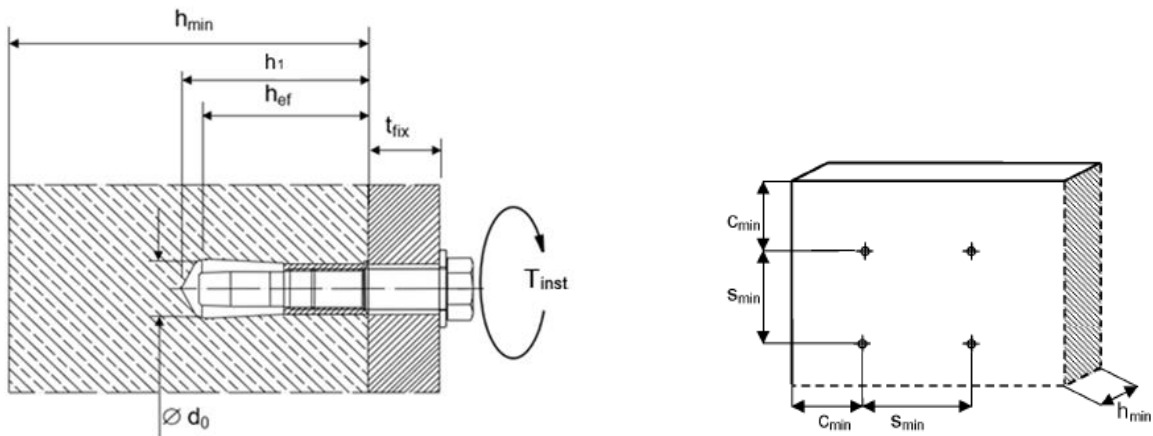
Proposed design methods:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings prepared taking account of the loads to be transmitted. 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 and quasi-static loads are designed according to EN 1992-4:2016 and EOTA Technical Report TR 055.
- The fastening screw or threaded rod has to be designed separately.
- Fasteners are only to be used for redundant non-structural applications acc. to EAD 330747-00-0601.

fischer Hammerset anchor EA PLUS	Annex B1 of European Technical Assessment ETA-19/0169
Intended use Specification	

Table B2.1: Installation parameters for concrete C20/25 to C50/60

EA PLUS				M6x25	M8x25	M8x30	M8x40	M10x25	M10x30	M10x40	M12x25	M12x50	M16x65
Nom. drill hole diameter	d_0	[mm]	=	8	10	10	10	12	12	12	15	15	20
Max. cutting diameter of drill bit	d_{cut}	[mm]	≤	8,45	10,45	10,45	10,45	12,45	12,45	12,45	15,50	15,50	20,50
Depth of drill hole	h_1	[mm]	≥	25	25	30	40	25	30	40	25	50	65
Effective anchorage depth	h_{ef}	[mm]	≥	25	25	30	40	25	30	40	25	50	65
Installation torque	T_{inst}	[Nm]	≤	4	8	8	15	15	15	15	35	35	60
Minimum member thickness	h_{min}	[mm]	=	100	100	100	100	100	100	120	100	140	160
Minimum edge distance	c_{min}	[mm]	=	110	50	140	80	55	60	90	100	140	125
Minimum spacing	s_{min}	[mm]	=	120	100	130	120	110	150	120	200	130	140



fischer Hammer set anchor EA PLUS

Intended use
Installation parameters

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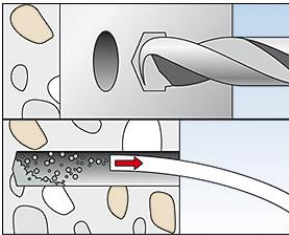
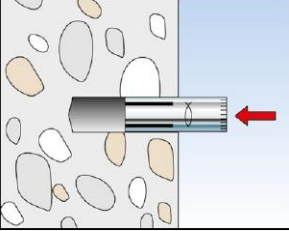
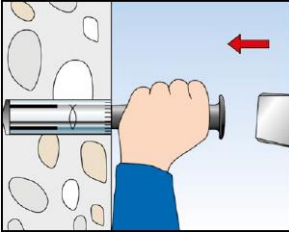
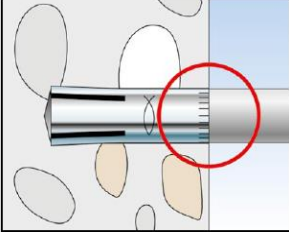
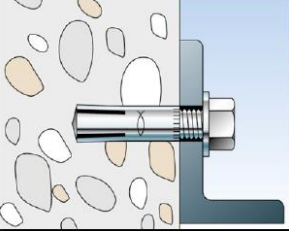
Installation instruction	
	<p>Drill the hole. Drill hole diameter d_0 and drill hole depth h_1 according to table B2.1</p> <p>Clean the drill hole.</p>
	<p>Set anchor until anchor is flush with surface of concrete.</p>
	<p>Expand the sleeve by driving the pin into the sleeve.</p>
	<p>Control the correct setting: a) setting tool is flush with the edge of the sleeve</p>
	<p>Mounting of fixture. Maximum installation torque T_{inst} must not be exceeded.</p>
<p>fischer Hammerset anchor EA PLUS</p>	<p>Annex B3 of European Technical Assessment ETA-19/0169</p>
<p>Intended use Installation instruction</p>	

Table C1.1: Characteristic tension load values

EA PLUS			M6x25	M8x25	M8x30	M8x40	M10x25	M10x30	M10x40	M12x25	M12x50	M16x65
Effective embedment depth	h_{ef}	[mm]	25	25	30	40	25	30	40	25	50	65
Steel failure												
Resistance to steel failure	$N_{Rk,s}$	[kN]	9,92	14,13	14,62	14,13	15,24	15,24	15,24	30,92	30,92	49,90
Partial safety factor	γ_{Ms}	[-]	1,4									
Pull-out failure												
Resistance to pull-out failure in cracked concrete C20/25	$N_{Rk,cr}$	[kN]	2,0	0,9	2,0	1,5	1,5	3,0	4,0	2,0	3,5	6,0
Increasing factors for non-cracked concrete C20/25	ψ_c	[-]	1,35	1,34	1,25	1,39	1,45	1,19	1,47	1,45	1,55	1,55
Concrete cone failure and splitting failure												
Edge distance	$c_{Cr,N}$	[mm]	1,5 x h_{ef}									
Spacing	$s_{Cr,N}$	[mm]	3 x h_{ef}									
Robustness												
Installation safety factor	γ_{inst}	[-]	1,2	1,4	1,2	1,4	1,2	1,4	1,2	1,4	1,4	1,0
Edge distance to prevent splitting under load												
Char. resistance for splitting	$N^0_{Rk,sp}$	[kN]	2,0	0,9	2,0	1,5	1,5	2,0	4,0	2,0	3,5	6,0
Appropriate edge distance	$c_{Cr,sp}$	[mm]	110	60	140	80	75	90	90	100	140	125

fischer Hammerset anchor EA PLUS

Performance for static and quasi-static loads: Resistances and Displacements

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Table C2.1: Characteristic shear load values

EA PLUS			M6x25	M8x25	M8x30	M8x40	M10x25	M10x30	M10x40	M12x25	M12x50	M16x65
Effective embedment depth	h_{ef}	[mm]	25	25	30	40	25	30	40	25	50	65
Resistance to steel failure under shear load												
Resistance to shear load without lever arm	$V_{Rk,s}^0$	[kN]	2,5	4,0	5,0	5,5	7,0	6,5	6,0	5,0	7,5	16,0
Resistance to shear load with lever arm	$M_{Rk,s}^0$	[Nm]	14,5	34,7	33,4	34,72	46,5	46,5	46,5	114,0	114,0	245,0
Factor for group fasteners	k_7	[-]	1,0									
Resistance to pry-out failure												
Factor for pry-out failure	k_8	[-]	1,0									2,0
Resistance to concrete edge failure												
Outside diameter of the fastener relevant for shear loading	d_{nom}	[mm]	8	10	10	10	12	12	12	15	15	20
Effective length of the fastener for transfer of shear load	l_f	[mm]	25	25	30	40	25	30	40	25	50	65

fischer Hammerset anchor EA PLUS

Performance for static and quasi-static loads: Resistances and Displacements

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Table C3.1: Resistance to fire													
EA PLUS			M6x25	M8x25	M8x30	M8x40	M10x25	M10x30	M10x40	M12x25	M12x50	M16x65	
Effective embedment depth	h_{ef}	[mm]	25	25	30	40	25	30	40	25	50	65	
Steel failure for tension load and shear load													
Characteristic resistance	$N_{Rk,s,fi}$	R30	[kN]	0,21	0,27	0,27	0,31	0,50	0,50	0,50	1,24	1,24	2,14
		R60		0,19	0,25	0,25	0,27	0,43	0,43	0,43	0,93	0,93	1,60
		R90		0,15	0,19	0,19	0,21	0,33	0,33	0,33	0,81	0,81	1,39
		R120		0,11	0,14	0,14	0,15	0,27	0,27	0,27	0,62	0,62	1,07
	$V_{Rk,s,fi}$	R30	[kN]	0,21	0,27	0,27	0,31	0,50	0,50	0,50	1,24	1,24	2,14
		R60		0,19	0,25	0,25	0,27	0,43	0,43	0,43	0,93	0,93	1,60
		R90		0,15	0,19	0,19	0,21	0,33	0,33	0,33	0,81	0,81	1,39
		R120		0,11	0,14	0,14	0,15	0,27	0,27	0,27	0,62	0,62	1,07
	$M^0_{Rk,s,fi}$	R30	[Nm]	0,40	0,67	0,67	0,67	1,53	1,53	1,53	4,59	4,59	10,49
		R60		0,36	0,60	0,60	0,60	1,32	1,32	1,32	3,44	3,44	7,87
		R90		0,28	0,47	0,47	0,47	1,02	1,02	1,02	2,98	2,98	6,82
		R120		0,20	0,34	0,34	0,34	0,81	0,81	0,81	2,29	2,29	5,25
Pullout failure													
Characteristic resistance in concrete $\geq C20/25$	$N_{Rk,p,fi}$	R30	[kN]	0,50	0,23	0,50	0,38	0,38	0,75	1,00	0,50	0,88	1,50
		R60											
		R90											
		R120											
Concrete cone failure													
Characteristic resistance in concrete $\geq C20/25$	$N_{Rk,c,fi}$	R30	[kN]	0,56	0,56	0,89	1,82	0,56	0,89	1,82	0,56	3,18	6,13
		R60											
		R90											
		R120											
Pryout failure													
k-factor	k_8	[-]	1,00									2,00	
Characteristic resistance in concrete $\geq C20/25$	$V^0_{Rk,cp,fi}$	R30	[kN]	0,56	0,56	0,89	1,82	0,56	0,89	1,82	0,56	3,18	12,26
		R60											
		R90											
		R120											
Edge distance													
R30 to R120	$C_{cr,fi}$	[mm]	$2 \times h_{ef}$										
	C_{min}		fire attack from one side: $2 \times h_{ef}$; fire attack from more than one side: $\geq 300\text{mm}$										
Spacing													
R30 to R120	$S_{cr,fi}$	[mm]	$4 \times h_{ef}$										
	S_{min}		100	100	130	120	110	150	120	200	130	140	
fischer Hammerset anchor EA PLUS										Annex C3 of European Technical Assessment ETA-19/0169			
Performance for exposure to fire													

Table C4.1: Resistance to fire

EA PLUS	M6x25	M8x25	M8x30	M8x40	M10x25	M10x30	M10x40	M12x25	M12x50	M16x65
Concrete edge failure										
<p>The initial value $V_{Rk,c,fi}^0$ of the characteristic resistance in concrete C20/25 to C50/60 under fire exposure may be determined by: $V_{Rk,c,fi}^0 = 0,25 \times V_{Rk,c}^0 (\leq R90)$; $V_{Rk,c,fi}^0 = 0,20 \times V_{Rk,c}^0 (\leq R120)$.</p>										
<p>With $V_{Rk,c}^0$ initial value of the characteristic resistance in cracked concrete C20/25 under normal temperature.</p>										
fischer Hammerset anchor EA PLUS								Annex C4 of European Technical Assessment ETA-19/0169		
Performance for exposure to fire										