

DECLARATION OF PERFORMANCE

DoP 0291

for fischer Drop-in anchor EA II (Mechanical fastener for use in concrete)

EN

1. Unique identification code of the product-type: DoP 0291
2. Intended use/es: Post-installed fastening for use in non-cracked concrete, see appendix, especially annexes B1-B3.
3. Manufacturer: fischerwerke GmbH & Co. KG, Klaus-Fischer-Str. 1, 72178 Waldachtal, Germany
4. Authorised representative: -
5. System/s of AVCP: 1
6. European Assessment Document: EAD 330232-01-0601
European Technical Assessment: ETA-07/0135; 2021-10-20
Technical Assessment Body: DIBt- Deutsches Institut für Bautechnik
Notified body/ies: 2873 TU Darmstadt
7. Declared performance/s:
Mechanical resistance and stability (BWR 1)
Characteristic resistance to tension load (static and quasi-static loading) Method A:
Resistance to steel failure: Annex C1
Resistance to pull- out failure: Annex C1
Resistance to concrete cone failure: Annex C1
Robustness: Annex C1
Minimum edge distance and spacing: Annex B2
Edge distance to prevent splitting under load: Annex C1

Characteristic resistance to shear load (static and quasi-static loading), Method A:
Resistance to steel failure (shear load): Annex C2
Resistance to pry-out failure: Annex C2

Characteristic Resistance for simplified design:
Method B: NPD
Method C: NPD

Displacements:
Displacements under static and quasi-static loading: Annex C3

Characteristic resistance and displacements for seismic performance categories C1 and C2:
Resistance to tension load, displacements, category C1: NPD
Resistance to tension load, displacements, category C2: NPD
Resistance to shear load, displacements, category C1: NPD
Resistance to shear load, displacements, category C2: NPD
Factor for annular gap: NPD

Safety in case of fire (BWR 2)
Reaction to fire: Class (A1)

Resistance to fire:
Fire resistance to steel failure (tension load): NPD
Fire resistance to pull-out failure (tension load): NPD
Fire resistance to steel failure (shear load): NPD

Durability:
Durability: Annexes A3, B1
8. Appropriate Technical Documentation and/or Specific Technical Documentation: -



The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:



Dr.-Ing. Oliver Geibig, Managing Director Business Units & Engineering
Tumlingen, 2021-10-27



Jürgen Grün, Managing Director Chemistry & Quality

This DoP has been prepared in different languages. In case there is a dispute on the interpretation the English version shall always prevail.

The Appendix includes voluntary and complementary information in English language exceeding the (language-neutrally specified) legal requirements.

Specific Part

1 Technical description of the product

The Fischer drop-in anchor EA II is an anchor made of galvanized or stainless steel which is placed into a drilled hole and anchored by deformation-controlled expansion.

The fixture shall be anchored with a fastening screw or threaded rod.

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 action) Method A	See Annex B2 and C1
Characteristic resistance to shear load (static and quasi static action)	See Annex C2
Displacements and Durability	See Annex C3 and B1
Characteristic resistance and displacements for seismic performance categories C1 and C2	No performance assessed

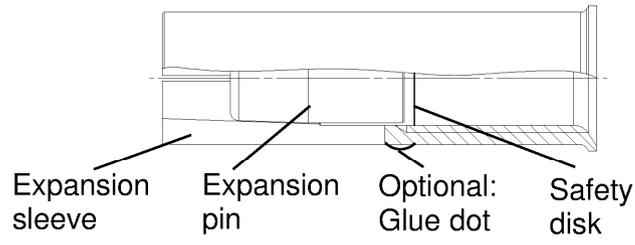
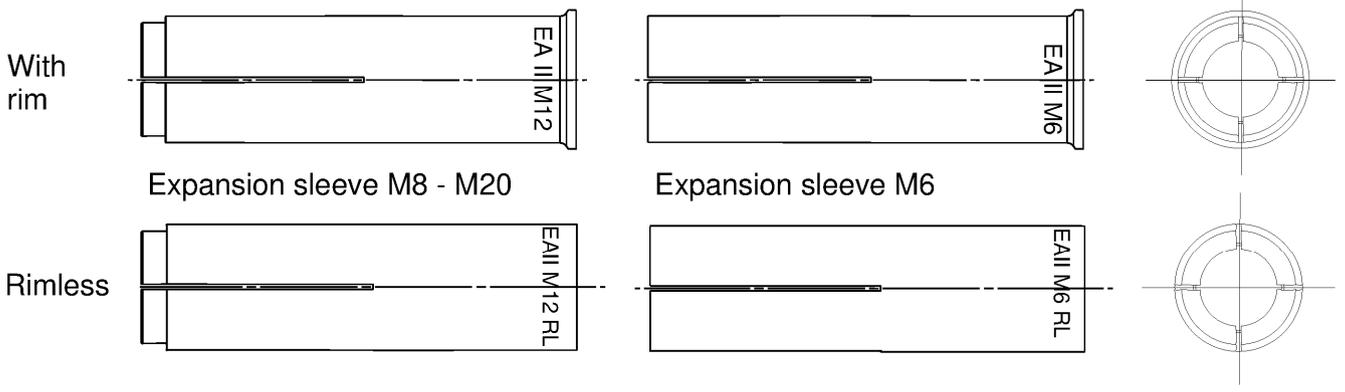
3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	No performance assessed

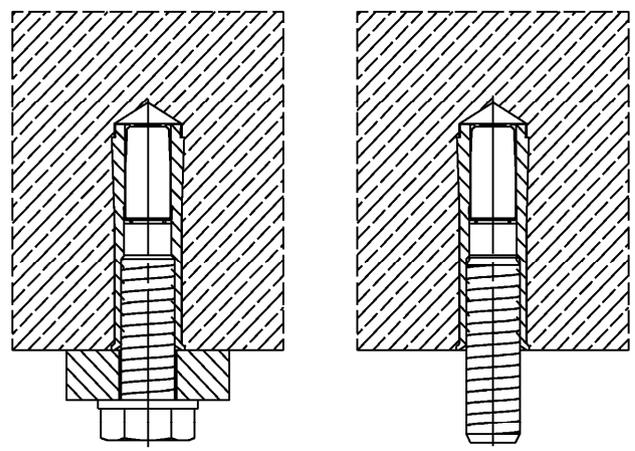
4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

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



Intended use in concrete



(Fig. not to scale)

fischer drop-in anchor EA II

Product description
Anchor types
Installed condition

Annex A 1

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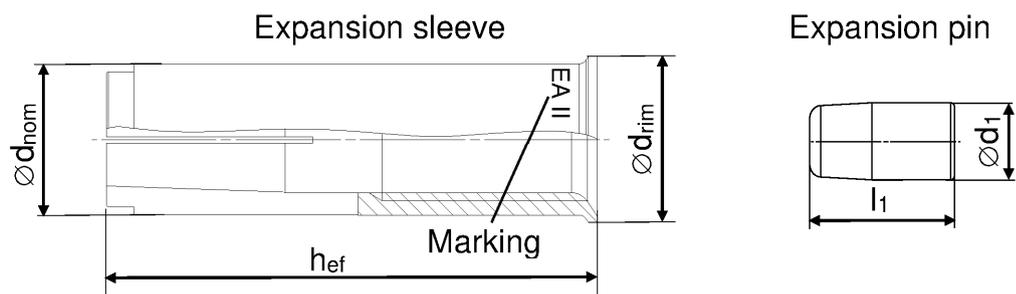


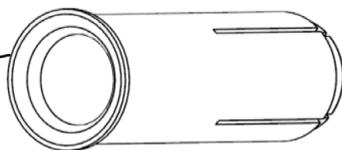
Table A2.1: Anchor size

Anchor size EA II [mm]	M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M12x50 D	M16x65	M20x80
h_{ef}	30	30	40	30	40	50		65	80
$\varnothing d_{nom}$	8	10		12		15	16	20	25
$\varnothing d_{rim}$ (not applicable for EA II RL)	9,5	11,5		13,5		16,5	17,5	21,5	27,0
$\varnothing d_1$	5	6,5		8		10		13,5	17,5
l_1	14	13,5		13	18	18		25	26

Distinctive feature

No groove for:

- EA II M6x30..
- EA II M8x30..
- EA II M10x40..
- EA II M12x50..
- EA II M16x65..
- EA II M20x80..



2 grooves for:

- EA II M8x40..
- EA II M10x30..

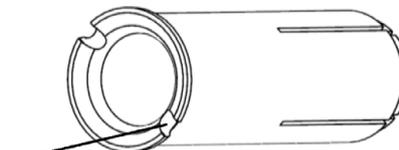


Table A2.2: Marking on anchor body

galvanised steel (gvz)		stainless steel (R)	
with rim	rimless	with rim	rimless
EA II M6x30	EA II M6x30 RL	EA II M6x30 R	EA II M6x30 RL R
EA II M8x30	EA II M8x30 RL	EA II M8x30 R	EA II M8x30 RL R
EA II M8x40	EA II M8x40 RL	EA II M8x40 R	EA II M8x40 RL R
EA II M10x30	EA II M10x30 RL	EA II M10x30 R	EA II M10x30 RL R
EA II M10x40	EA II M10x40 RL	EA II M10x40 R	EA II M10x40 RL R
EA II M12x50	EA II M12x50 RL	EA II M12x50 R	EA II M12x50 RL R
EA II M12x50 D	EA II M12x50 RL D	EA II M12x50 D R	EA II M12x50 RL D R
EA II M16x65	EA II M16x65 RL	EA II M16x65 R	EA II M16x65 RL R
EA II M20x80	EA II M20x80 RL	EA II M20x80 R	EA II M20x80 RL R

(Fig. not to scale)

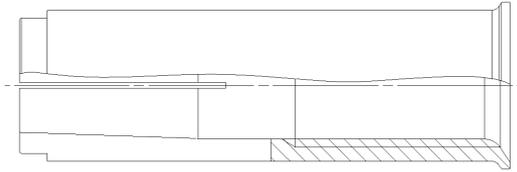
fischer drop-in anchor EA II

Product description
Anchor types

Annex A 2

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Expansion sleeve



Expansion pin

**Table A3.1: Materials**

Designation	Material	
	galvanised steel ($\geq 5 \mu\text{m}$)	stainless steel (R)
Expansion sleeve	EN 10277:2018 or EN 10084:2008 or EN 10111:2008 or EN 10263:2018 or EN 10087:1999 or ASTM A29/A29M	EN 10088:2014
Expansion pin		
Fastening screw or threaded rod	steel, property class 4.6, 5.6, 5.8 or 8.8 according to EN ISO 898-1:2013	property class 50, 70 or 80 according to EN ISO 3506:2020

(Fig. not to scale)

fischer drop-in anchor EA II

Product description
Material

Annex A 3

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Setting & drilling tools

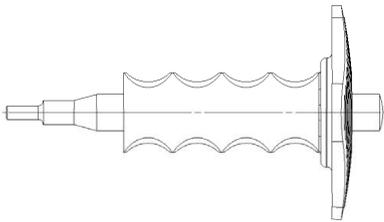
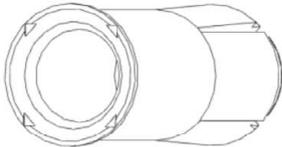
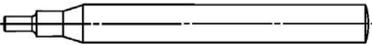
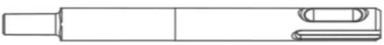
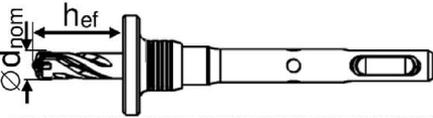
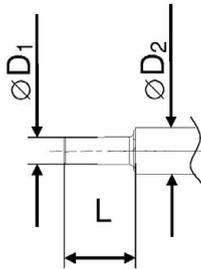
Setting tools	Marking	Description	Marking on EA II with rim and rimless
	EHS Plus M..x hef	Manual setting tool with hand guard	
	EHS M..x hef	Manual setting tool basic format	
	EMS M..x hef	Machine setting tool with SDS Plus	No marking
Drilling tools			
	EBB $\varnothing d_{nom} \times hef$	Stop drill	
Or other usual drillers			

Table A4.1: Corresponding drill bits and parameters of setting tools

Manual setting tool	Machine setting tool	Stop drill	For anchor size EA II	$\varnothing D1$ [mm]	$\varnothing D2$ [mm]	L [mm]
EHS (Plus) M6x25/30	EMS M6x25/30	EBB 8x30	EA II M6x30	4,8	9,0	17,0
EHS (Plus) M8x25/30	EMS M8x25/30	EBB 10x30	EA II M8x30	6,4	11,0	18,0
EHS (Plus) M8x40	EMS M8x40	EBB 10x40	EA II M8x40			28,0
EHS (Plus) M10x25/30	EMS M10x25/30	EBB 12x30	EA II M10x30	7,9	13,0	18,0
EHS (Plus) M10x40	EMS M10x40	EBB 12x40	EA II M10x40			24,0
EHS (Plus) M12x50	EMS M12x50	EBB 15x50	EA II M12x50	10,2	16,5	30,0
EHS (Plus) M12x50	EMS M12x50	EBB 16x50	EA II M12x50 D			
EHS (Plus) M16x65	EMS M16x65	EBB 20x65	EA II M16x65	13,5	22	36,0
EHS (Plus) M20x80	EMS M20x80	EBB 25x80	EA II M20x80	16,4	27	50,0

(Fig. not to scale)

fischer drop-in anchor EA II

Intended Use
Setting & Drilling tools

Annex A 4

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Specifications of intended use

Anchorage subject to:

fischer drop-in anchor EA II (all versions)	M6	M8	M10	M12	M16	M20
Hammer drilling with standard drill bit 	All types					
Hammer drilling with hollow drill bit with automatic cleaning 						
Material	Steel	Zinc plated	✓			
	Stainless	R				
Static and quasi-static loads			✓			
Uncracked concrete			✓			

Base materials:

- Reinforced or unreinforced normal concrete without fibres of strength classes C20/25 to C50/60 according to EN 206:2013+A1:2016

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions: **EA II, EA II R**
- For all other conditions according to EN 1993-1-4:2006 + A1:2015 corresponding to corrosion resistance class CRC III **EA II R**
Anchor types M6x30 R, M8x30 R and M10x30 R only for dry internal exposure

Design:

- Anchorage are to be designed under the responsibility of an engineer experienced in anchorages and concrete work
- Verifiable calculation notes and drawings are to be 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.)
- Design of fastenings according to EN 1992-4:2018 and Technical Report TR 055, Edition February 2018
- Anchor sizes M6x30, M8x30 and M10x30 for statically indeterminate structural components only, when in case of failure, the load can be distributed to other fasteners.

Installation:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site
- Create drill hole with hammer drill or with hollow drill and vacuum cleaner
- The anchor may only be used once
- In case of aborted hole: New hole must be drilled at a minimum distance of twice the depth of the aborted hole or closer, if the hole is filled with a high strength mortar (e.g. FIS EM Plus, FIS SB or FIS V Plus) and only if the hole is not in the direction of the oblique tensile or shear load
- Anchor expansion by impact using the setting tools given in Annex A 4. The anchor is properly set if the stop of the setting tool reaches the expansion sleeve. The manual setting tool with installation control leaves a visible mark on the sleeve, as illustrated in Annex A 4 and B 3

fischer drop-in anchor EA II

Intended Use
Specifications

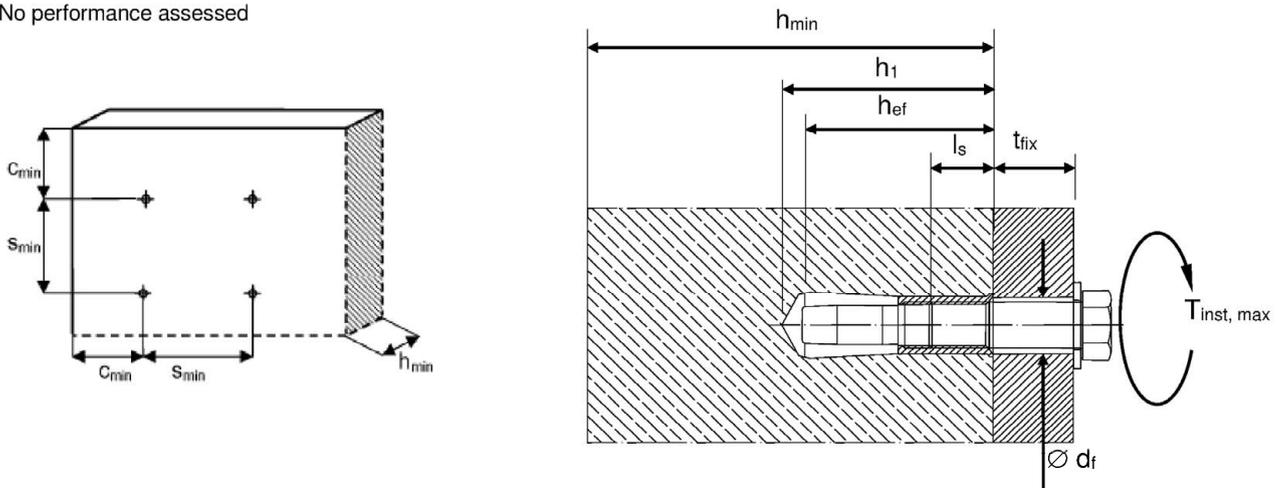
Annex B 1

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

Anchor size (all versions)			M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M12x50 D	M16x65	M20x80
Nominal drill hole diameter	d_0	[mm]	8	10		12		15	16	20	25
Cutting diameter of drill bit	d_{cut}		8,45	10,45		12,50		15,50	16,50	20,55	25,55
Effective anchorage depth	h_{ef}		30	30	40	30	40	50		65	80
Maximum installation torque	$T_{inst,max}$	[Nm]	4	8		15		35	60	120	
Minimum drill hole depth	h_1	[mm]	32	33	43	33	43	54	70	85	
Minimum screw-in depth	$l_{s,min}$		6	8		10		12	16	20	
Maximum screw-in depth	$l_{s,max}$		14	14		15	17	22	28	34	
Clearance of hole diameter	$\varnothing d_f \leq$		7	9		12		14	18	22	
$h_{min} = 80$ mm											
Minimum spacing	S_{min}	[mm]	70	110	200	200		-1)			
Minimum edge distance	C_{min}		150	150		150					
$h_{min} = 100$ mm											
Minimum spacing	S_{min}	[mm]	65	70	90	150	200		-1)		
Minimum edge distance	C_{min}		115	115		160	180				
$h_{min} = 120$ mm											
Minimum spacing	S_{min}	[mm]	65	70	85	95	145	-1)			
Minimum edge distance	C_{min}		115	115		140	150				
$h_{min} = 160$ mm											
Minimum spacing	S_{min}	[mm]	65	70	85	95	145	180	-1)		
Minimum edge distance	C_{min}		115	115		140	150	200			
$h_{min} = 200$ mm											
Minimum spacing	S_{min}	[mm]	65	70	85	95	145	180	190	-1)	
Minimum edge distance	C_{min}		115	115		140	150	200	240		

1) No performance assessed



Fastening screw or threaded rod:

- Minimum property class and materials according to table A3.1
- The length of the fastening screw or threaded rod shall be determined depending on thickness of fixture t_{fix} , admissible tolerances and maximum screw-in depth $l_{s,max}$ as well as minimum screw-in depth $l_{s,min}$

(Fig. not to scale)

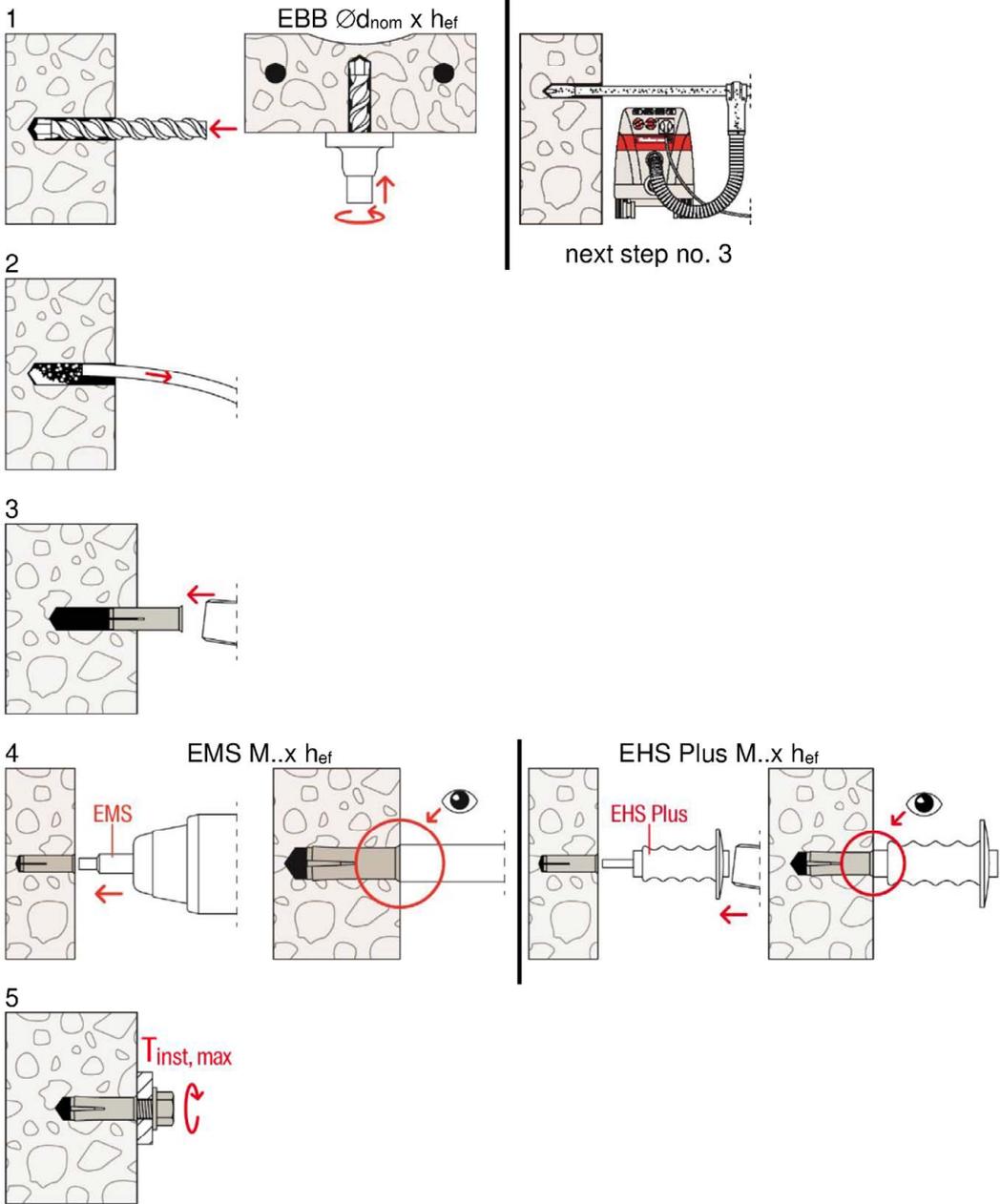
fischer drop-in anchor EA II

Intended Use
Installation parameters

Annex B 2

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Installation instructions



next step no. 3

No.	Description
1	Create drill hole with hammer drill or stop drill or with hollow drill and vacuum cleaner (e.g. fischer FVC)
2	Clean from drill-dust
3	Set anchor till anchor is flush with surface of concrete
4	Expand the sleeve by driving the pin with the corresponding setting tool into the sleeve and control the correct setting
5	Fixation of fixture. Maximum installation torque $T_{inst,max}$ must not be exceeded

fischer drop-in anchor EA II

Intended Use
Installation instructions

Annex B 3

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Table C1.1: Characteristic values for tension loads under static and quasi-static action

EA II	property class of the fastening screw or threaded rod		M6x30 ¹⁾	M8x30 ¹⁾	M8x40	M10x30 ¹⁾	M10x40	M12x50	M12x50 D	M16x65	M20x80
			Steel failure								
Installation factor	γ_{inst}	[-]	1,0								
Characteristic resistance	$N_{Rk,s}$	[kN]	A4-50	10,1	18,3	29,0	42,1	78,3	122,4		
Partial factor	$\gamma_{Ms}^{4)}$	[-]	2,86								
Characteristic resistance	$N_{Rk,s}$	[kN]	A4-70	14,1	19,6	24,9	45,1	59,0	73,8	117,2	
Partial factor	$\gamma_{Ms}^{4)}$	[-]	1,87	1,5				1,87	1,5		
Characteristic resistance	$N_{Rk,s}$	[kN]	A4-80	16,1	19,6	24,9	45,1	59,0	73,8	117,2	
Partial factor	$\gamma_{Ms}^{4)}$	[-]	1,6	1,5							
Characteristic resistance	$N_{Rk,s}$	[kN]	steel 4.6	8,0	14,6	23,2	33,7	62,7	97,9		
Partial factor	$\gamma_{Ms}^{4)}$	[-]	2,0								
Characteristic resistance	$N_{Rk,s}$	[kN]	steel 5.6	10,1	18,3	29,0	42,1	78,3	122,4		
Partial factor	$\gamma_{Ms}^{4)}$	[-]	2,0								
Characteristic resistance	$N_{Rk,s}$	[kN]	steel 5.8	10,1	17,2	21,8	39,6	42,1	64,7	102,8	
Partial factor	$\gamma_{Ms}^{4)}$	[-]	1,5								
Characteristic resistance	$N_{Rk,s}$	[kN]	steel 8.8	13,5	17,2	21,8	39,6	53,3	64,7	102,8	
Partial factor	$\gamma_{Ms}^{4)}$	[-]	1,5								
Pullout failure											
Characteristic resistance C20/25	$N_{Rk,p}$	[kN]	8,1	12,5	8,1	12,5	17,4	25,8	35,2		
Increasing Factors for $N_{Rk,p}$	ψ_c	C25/30	1,12								
		C30/37	1,22								
		C35/45	1,32								
		C40/50	1,41								
		C45/55	1,50								
		C50/60	1,58								
Installation factor	γ_{inst}	[-]	1,0								
Concrete cone and splitting failure											
Effective anchorage depth	h_{ef}	[mm]	30	40	30	40	50	65	80		
Factor for uncracked concrete	$k_{ucr,N}$	[-]	11,0 ²⁾								
Factor for cracked concrete	$k_{cr,N}$	[-]	No performance assessed								
Spacing	$s_{cr,N}$	[mm]	90	120	90	120	150	195	240		
Edge distance	$c_{cr,N}$	[mm]	45	60	45	60	75	97	120		
Spacing (splitting failure)	$s_{cr,sp}$	[mm]	210	280	210	320	350	455	560		
Edge distance (splitting failure)	$c_{cr,sp}$	[mm]	105	140	105	160	175	227	280		
Characteristic resistance to splitting	$N_{Rk,sp}^0$	[kN]	$\min \{N_{Rk,c}^0, N_{Rk,p}\}^{3)}$								

¹⁾ Use restricted to anchoring of structural components which are statically indeterminate

²⁾ Based on concrete strength as cylinder strength

³⁾ $N_{Rk,c}^0$ according to EN 1992-4:2018

⁴⁾ In absence of other national regulations

fischer drop-in anchor EA II

Performances

Characteristic resistance to tension loads under static and quasi-static action

Annex C 1

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Table C2.1: Characteristic values for shear loads under static and quasi-static action

EA II	property class of the fastening screw or threaded rod		M6x30 ¹⁾	M8x30 ¹⁾	M8x40	M10x30 ¹⁾	M10x40	M12x50	M12x50 D	M16x65	M20x80
			Factor for ductility	k ₇ [-]		1,0					
Installation factor	γ _{inst} [-]		1,0								
Steel failure without lever arm											
Characteristic resistance	V ⁰ _{Rk,s} [kN]	A4-50	5,0	9,2	14,5	21,1	39,2	61,2			
Partial factor	γ _{Ms} ²⁾ [-]		2,38								
Characteristic resistance	V ⁰ _{Rk,s} [kN]	A4-70	7,0	9,8	12,4	22,6	29,5	37	59		
Partial factor	γ _{Ms} ²⁾ [-]		1,56	1,25				1,56	1,25		
Characteristic resistance	V ⁰ _{Rk,s} [kN]	A4-80	8,0	9,8	12,4	22,6	30,4	36,9	58,6		
Partial factor	γ _{Ms} ²⁾ [-]		1,33	1,25							
Characteristic resistance	V ⁰ _{Rk,s} [kN]	steel 4.6	4,0	7,3	11,6	16,9	31	49			
Partial factor	γ _{Ms} ²⁾ [-]		1,67								
Characteristic resistance	V ⁰ _{Rk,s} [kN]	steel 5.6	5,0	9,2	14,5	21,1	39	61			
Partial factor	γ _{Ms} ²⁾ [-]		1,67								
Characteristic resistance	V ⁰ _{Rk,s} [kN]	steel 5.8	5,0	8,6	10,9	19,8	21,1	32	51		
Partial factor	γ _{Ms} ²⁾ [-]		1,25								
Characteristic resistance	V ⁰ _{Rk,s} [kN]	steel 8.8	6,8	8,6	10,9	19,8	27	32	51		
Partial factor	γ _{Ms} ²⁾ [-]		1,25								
Steel failure with lever arm											
Characteristic resistance	M ⁰ _{Rk,s} [Nm]	A4-50	8	19	37	66	166	324			
Partial factor	γ _{Ms} ²⁾ [-]		2,38								
Characteristic resistance	M ⁰ _{Rk,s} [Nm]	A4-70	11	26	52	92	232	454			
Partial factor	γ _{Ms} ²⁾ [-]		1,56								
Characteristic resistance	M ⁰ _{Rk,s} [Nm]	A4-80	12	30	60	105	266	519			
Partial factor	γ _{Ms} ²⁾ [-]		1,33								
Characteristic resistance	M ⁰ _{Rk,s} [Nm]	steel 4.6	6,1	15	30	52	133	259			
Partial factor	γ _{Ms} ²⁾ [-]		1,67								
Characteristic resistance	M ⁰ _{Rk,s} [Nm]	steel 5.6	7,6	19	37	66	166	324			
Partial factor	γ _{Ms} ²⁾ [-]		1,67								
Characteristic resistance	M ⁰ _{Rk,s} [Nm]	steel 5.8	7,6	19	37	66	166	324			
Partial factor	γ _{Ms} ²⁾ [-]		1,25								
Characteristic resistance	M ⁰ _{Rk,s} [Nm]	steel 8.8	12	30	60	105	266	517			
Partial factor	γ _{Ms} ²⁾ [-]		1,25								
Concrete pryout failure											
Factor for pryout failure	k ₈ [-]		1,74	1,9	1,74	1,9	2,0				
Concrete edge failure											
Effective length of anchor	l _f [mm]		30	40	30	40	50	65	80		
Effective diameter of anchor	d _{nom} [mm]		8	10	12	15	16	20	25		

¹⁾ Use restricted to anchoring of structural components which are statically indeterminate

²⁾ In absence of other national regulations

fischer drop-in anchor EA II

Performances

Characteristic resistance to shear loads under static and quasi-static action

Annex C 2

Appendix 10 / 11

Table C3.1: Displacements under tension and shear loads for EA II in galvanised steel

EA II											
		M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M12x50 D	M16x65	M20x80	
Tension load in C20/25 to C50/60	N [kN]	4,0		6,1	4,0	6,1	8,5		12,6	17,2	
Displacement	δ_{N_0} [mm]	0,1									
	δ_{N_∞} [mm]	0,2									
Shear load in C20/25 to C50/60	V [kN]	3,9	4,9	6,2		11,3	15,2	18,5	29,4		
Displacement	δ_{V_0} [mm]	0,95	1,00	1,05		1,10	1,40	1,80			
	δ_{V_∞} [mm]	1,40	1,50	1,60		1,70	2,10	2,70			

Table C3.2: Displacements under tension and shear loads for EA II in stainless steel

EA II R											
		M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M12x50 D	M16x65	M20x80	
Tension load in C20/25 to C50/60	N [kN]	4,0		6,1	4,0	6,1	8,5		12,6	17,2	
Displacement	δ_{N_0} [mm]	0,1									
	δ_{N_∞} [mm]	0,2									
Shear load in C20/25 to C50/60	V [kN]	3,2	5,6	7,1		12,9	13,5	21,1	33,5		
Displacement	δ_{V_0} [mm]	0,95	1,00	1,05		1,10	1,40	1,80			
	δ_{V_∞} [mm]	1,40	1,50	1,60		1,70	2,10	2,70			

fischer drop-in anchor EA II

Performances
 Displacements
Annex C 3

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