

YDEEVNEDEKLARATION

DoP 0291

til fischer slaganker EA II (Metalanker til brug i beton)

DA

- | | |
|--|---|
| 1. <u>Varetypens unikke identifikationskode:</u> | DoP 0291 |
| 2. <u>Anvendelsesformål:</u> | Eftermonteret befæstelse i ikke-revnet beton, se appendiks, specifikt Bilage B1-B3. |
| 3. <u>Fabrikant:</u> | fischerwerke GmbH & Co. KG, Klaus-Fischer-Str. 1, 72178 Waldachtal, Tyskland |
| 4. <u>Bemyndiget repræsentant:</u> | – |
| 5. <u>System(er) til vurdering og kontrol af konstansen af ydeevnen:</u> | 1 |
| 6. <u>Europæisk vurderingsdokument:</u> | EAD 330232-01-0601 |
| Europæisk Teknisk Vurdering | ETA-07/0135; 2021-10-20 |
| Teknisk vurderingsorgan: | DIBt- Deutsches Institut für Bautechnik |
| Notificeret organ(er) | 2873 TU Darmstadt |

7. Deklareret ydeevne(r):

Mekanisk modstand og stabilitet (BWR 1)

Karakteristisk modstand for træklast (statisk og quasi-statisk belastning) Metode A:

Modstand overfor stålsvig: Bilag C1
Modstand overfor svigt ved udtrækning: Bilag C1
Modstand overfor svigt af beton-kegle: Bilag C1
Robusthed: Bilag C1
Min. kant og indbyrdes afstand: Bilag B2
Kantafstand til forhindring af flækning under belastning: Bilag C1

Karakteristisk modstand for tværlast (statisk og quasi-statisk belastning), Methode A:

Modstand overfor stålsvig (tværlast): Bilag C2
Modstand overfor svigt ved udtrækning: Bilag C2

Karakteristisk modstand for forenklet design:

Metode B: NPD
Metode C: NPD

Forskydninger:

Forskydninger under statisk og quasi-statisk belastning: Bilag C3

Karakteristisk modstand og Forskydninger for seismiske ydelseskategorier C1 og C2:

Modstand overfor spændingslast, forskydninger, kategori C1: NPD
Modstand overfor spændingslast, forskydninger, kategori C2: NPD
Modstand overfor tværlast, forskydninger, kategori C1: NPD
Modstand overfor tværlast, forskydninger, kategori C2: NPD
Faktor ringhul: NPD

Brandbeskyttelse (BWR 2)

Brandegenskaber: Klasse (A1)

Brandbeskyttelse:

Brandbeskyttelse overfor stålsvig (spændingslast): NPD
Brandbeskyttelse overfor svigt ved udtrækning (spændingslast): NPD
Brandbeskyttelse overfor stålsvig (tværlast): NPD

Holdbarhed:

Holdbarhed: Bilag A3, B1

- | | |
|---|---|
| 8. <u>Relevant teknisk dokumentation og/eller specifik teknisk dokumentation:</u> | – |
|---|---|



Ydeevnen for den vare, der er anført ovenfor, er i overensstemmelse med den deklarerede ydeevne. Denne ydeevnedeklaration er udarbejdet i overensstemmelse med forordning (EU) nr. 305/2011 på eneansvar af den fabrikant, der er anført ovenfor.

Underskrevet for fabrikanten og på dennes vegne af:



Dr.-Ing. Oliver Geibig, Administrerende direktør Forretningsenheder og ingeniørarbejde
Tumlingen, 2021-10-27



Jürgen Grün, Administrerende direktør Kemi & Kvalitet

Denne DoP er tilgængelig i forskellige sprogversioner. I tilfælde af fortolkningsmæssig uoverensstemmelse, henvises der til den engelske version, som altid er gældende.

Appendikset indeholder frivillige og udvidede informationer på engelsk. Disse overgår de lokale (sprogneutrale) retslige krav.

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

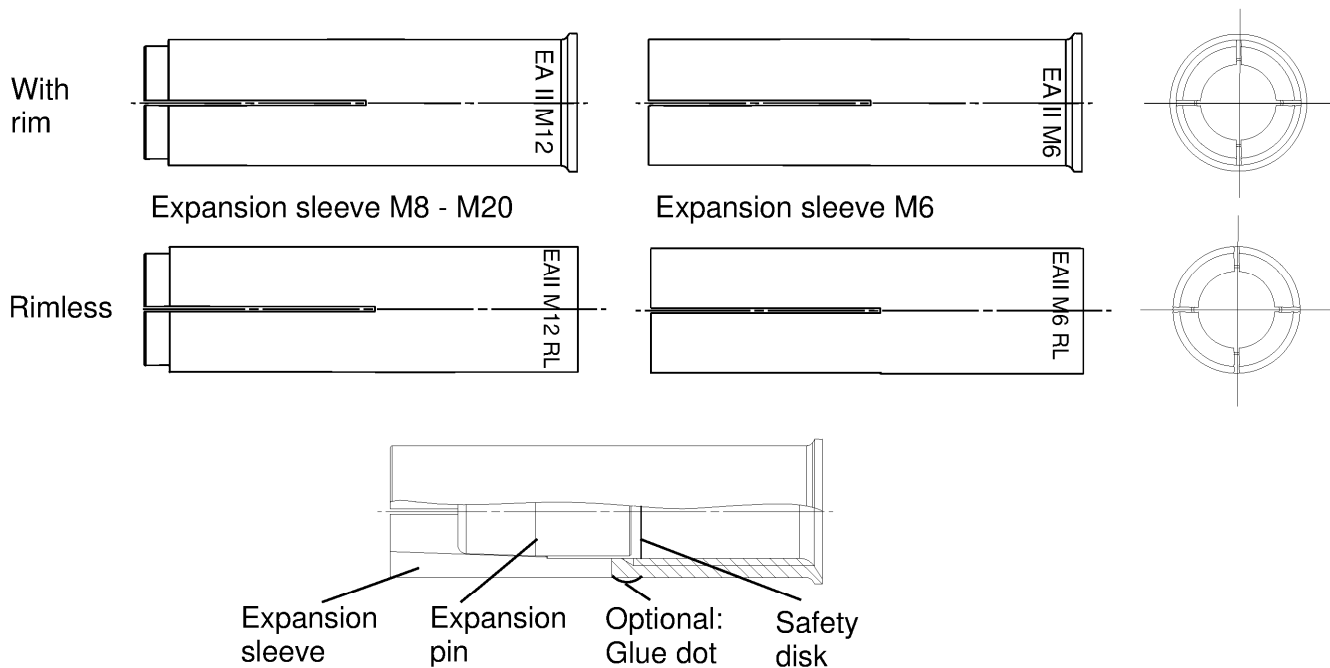
3.2 Safety in case of fire (BWR 2)

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

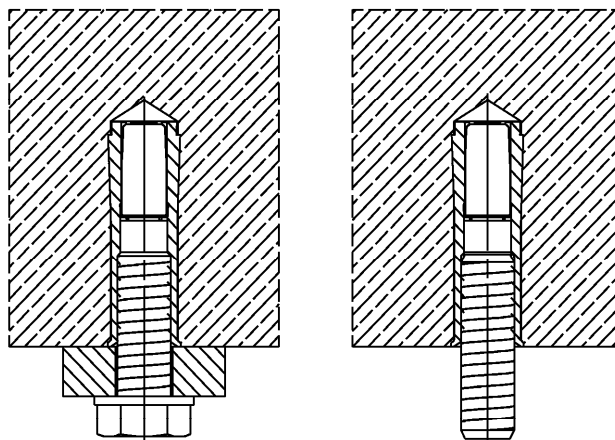
4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

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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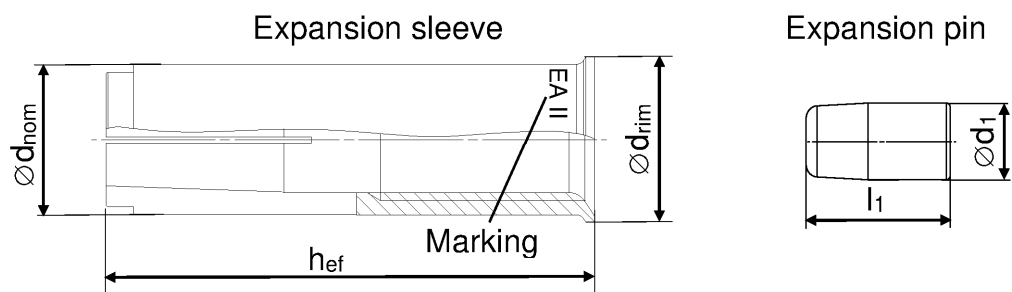


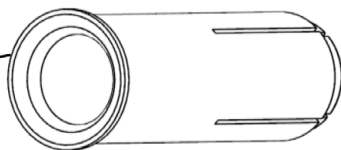
Table A2.1: Anchor size

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..

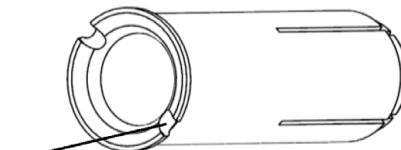


Table A2.2: Marking on anchor body

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)

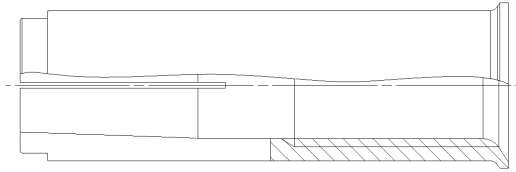
fischer drop-in anchor EA II

Product description
Anchor types

Annex A 2

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Expansion sleeve



Expansion pin

**Table A3.1: Materials**

	Material	
Designation	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)

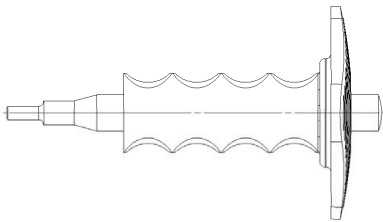
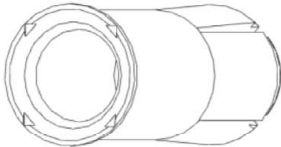
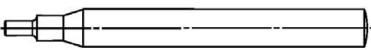
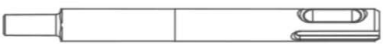
fischer drop-in anchor EA II

Product description
Material

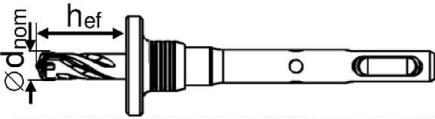
Annex A 3

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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 $\varnothing d_{nom} \times h_{ef}$	Stop drill
Or other usual drill		

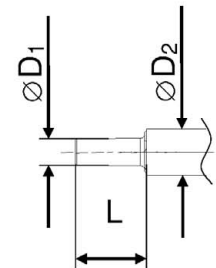


Table A4.1: Corresponding drill bits and parameters of setting tools

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

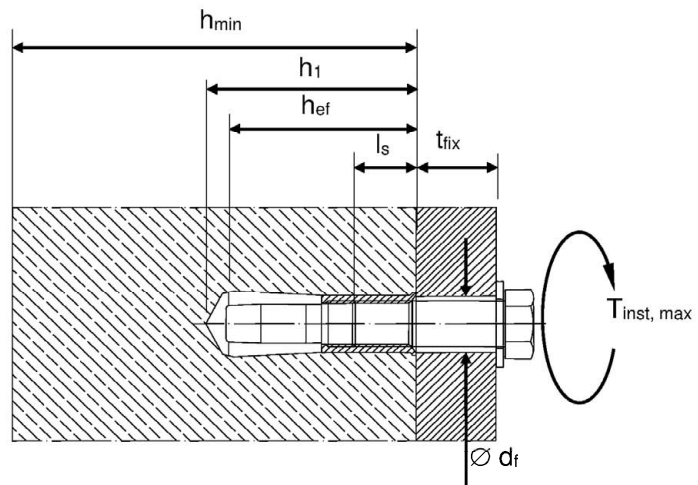
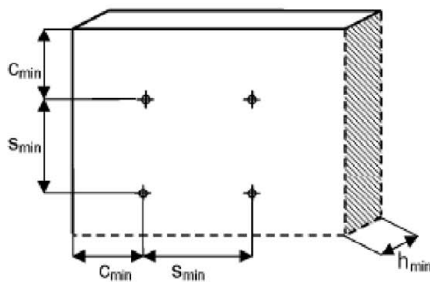
Annex B 1

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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	Ø d _f ≤		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	200			
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		240	
h _{min} = 200 mm											
Minimum spacing	S _{min}	[mm]	65	70		85	95	145		180	190
Minimum edge distance	C _{min}		115	115		140	150	200		240	280

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

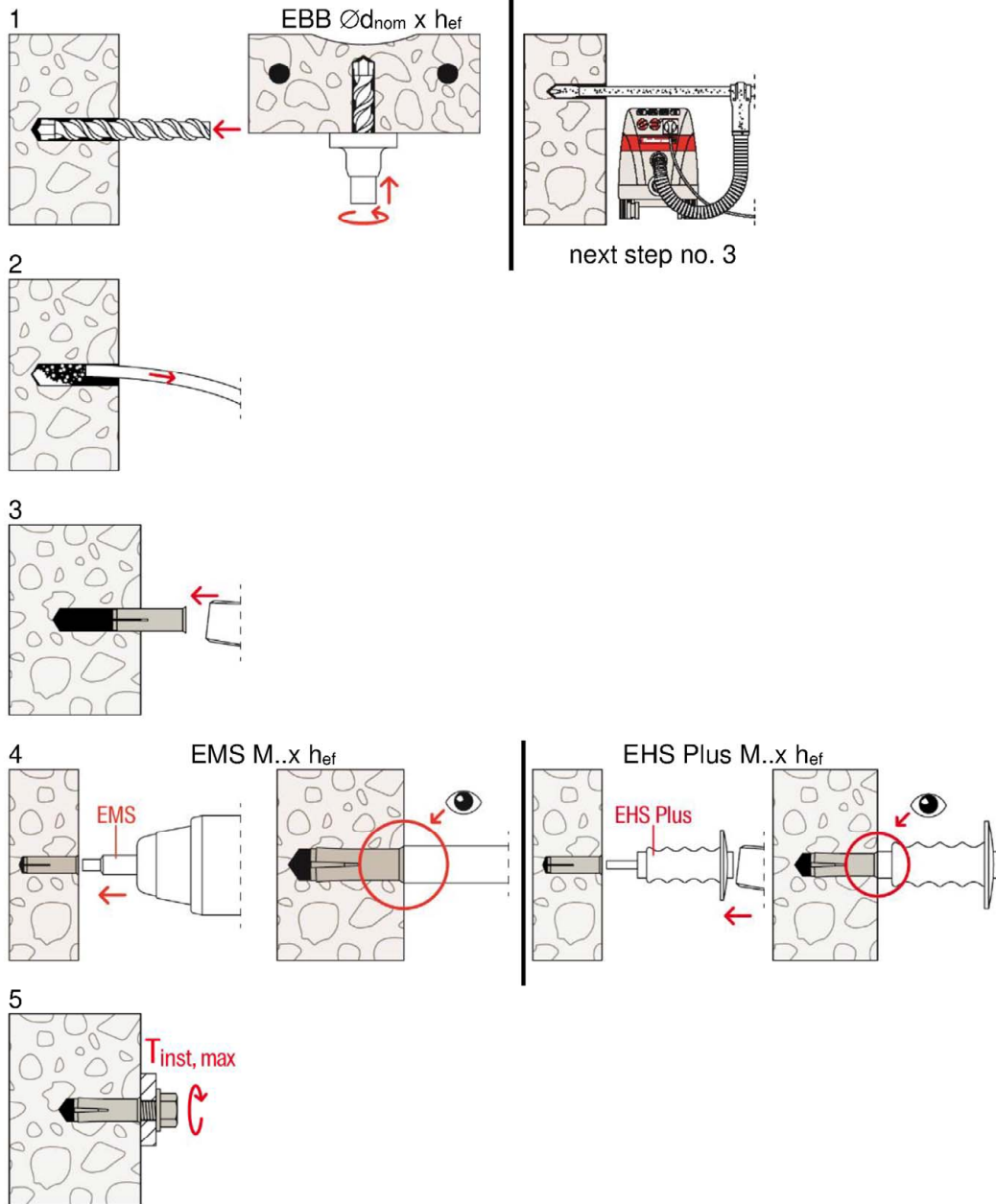
Intended Use

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	$N^0_{Rk,sp}$	[kN]	$\min \{N^0_{Rk,c}, N_{Rk,p}\}^{3)}$								

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

²⁾ Based on concrete strength as cylinder strength

³⁾ $N^0_{Rk,c}$ 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

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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_{N0}	[mm]	0,1								
	$\delta_{N\infty}$	[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_{V0}	[mm]	0,95		1,00		1,05		1,10	1,40	1,80
	$\delta_{V\infty}$	[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_{N0}	[mm]	0,1								
	$\delta_{N\infty}$	[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_{V0}	[mm]	0,95		1,00		1,05		1,10	1,40	1,80
	$\delta_{V\infty}$	[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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