

TOIMIVUSDEKLARATSIOON

DoP 0379

fischer poltpistik FWA Plus (mehaaniline ankur kasutamiseks betoonis)

ET

1. Tootetüübi kordumatu identifitseerimiskood: **DoP 0379**
2. Kavandatud kasutusala(d): **Hiljem paigaldatav mehaaniline ankur pragunemata betooni jaoks , Vt lisa, eelkõige lisad B1 - B3.**
3. Tootja: **fischerwerke GmbH & Co. KG, Klaus-Fischer-Str. 1, 72178 Waldachtal, Saksamaa**
4. Volitatud esindaja: **–**
5. Toimivuse püsivuse hindamise ja kontrolli süsteem: **1**
6. Euroopa hindamisdokument: **EAD 330232-01-0601**
Euroopa tehniline hinnang: **ETA-24/0714; 2025-04-22**
Tehnilise hindamise asutus: **ETA-Danmark A/S**
Teavitatud asutus(ed): **2873 TU Darmstadt**

7. Deklareeritud toimivus:

Mehaaniline vastupidavus ja stabiilsus (BWR 1)

Iseloomulik tõmbekoormuse vastupidavus (staatiline ja kvasi-staatiline koormus) meetod A:

Vastupidavus terase purunemisele: Lisa C1
Vastupidavus väljatõmbamise rikkele: Lisa C1
Vastupidavus betoonikoonuse purunemisele: Lisa C1
Töökindlus: Lisa C1
Minimaalne servakaugus ja vahekaugus: Lisa C2
Servakaugus pragunemise vältimiseks koormuse all: Lisa C1

Iseloomulik nihkekoormuse vastupidavus (staatiline ja kvasi-staatiline koormus):

Vastupidavus terase purunemisele (nihkejõud): Lisa C2
Vastupidavus lahtirebimise rikkele: Lisa C2

Iseloomulik vastupidavus lihtsustatud projekteerimiseks:

Meetod B: NPd
Meetod C: NPd

Nihked:

Nihked staatilise ja kvasi-staatilise koormuse all: Lisa C2

Iseloomulik vastupidavus ja nihked seismilise jõudluse kategooriatele C1 ja C2:

Tõmbekoormuse vastupidavus ja nihked, kategooria C1: NPd
Tõmbekoormuse vastupidavus ja nihked, kategooria C2: NPd
Nihkekoormuse vastupidavus ja nihked, kategooria C1: NPd
Nihkekoormuse vastupidavus ja nihked, kategooria C2: NPd
Rõngaskiu tegur: NPd

Ohutus tulekahju korral (BWR 2)

Reaktsioon tulele: Klass (A1)

Tulekindlus:

Tulekindlus terase purunemisele (tõmbekoormus): NPd
Tulekindlus väljatõmbamise rikkele (tõmbekoormus): NPd
Tulekindlus terase purunemisele (nihkejõud): NPd

Vastupidavus:

Vastupidavus: Liited A3, B1

8. Asjakohane tehniline dokumentatsioon ja/või tehniline eridokumentatsioon: –

Eespool kirjeldatud toote toimivus vastab deklareeritud toimivusele. Käesolev toimivusdeklaratsioon on välja antud kooskõlas määrusega (EL) nr 305/2011 eespool nimetatud tootja ainuvastutusel.

Tootja poolt ja nimel allkirjastanud:



Dr. Ronald Mihala, Arenduse ja tootmise juhtimise juht
Tumlingen, 2025-05-02



Dieter Pfaff, Rahvusvahelise tootmisföderatsiooni ja kvaliteedijuhtimise juht

Toimivusdeklaratsioon on koostatud mitmes keeles. Kui tõlked on omavahel vastuolus, tuleb lähtuda ingliskeelsest versioonist.

Lisa sisaldab (keeleneutraalselt määratletud) juriidilisi nõudeid ületavat vabatahtlikku ja täiendavat teavet inglise keeles.

Translation guidance Essential Characteristics and Performance Parameters for Annexes

Tõlkimisjuhised Lisade olulised omadused ja tulemuslikkuse parameetrid

Mechanical resistance and stability (BWR 1)		
Mehaaniline vastupidavus ja stabiilsus (BWR 1)		
Characteristic resistance under static and quasi-static loading, Method A		
Iseloomulik tõmbekoormuse vastupidavus (staatiline ja kvasi-staatiline koormus) meetod A:		
1	Resistance to steel failure: Vastupidavus terase purunemisele:	$N_{Rk,s}$ [kN], E_s [N/mm ²]
2	Resistance to pull-out failure: Vastupidavus väljatõmbamise rikkele:	$N_{Rk,p}$ [kN], ψ_c
3	Resistance to concrete cone failure: Vastupidavus betoonikoonuse purunemisele:	$k_{cr,N}$, $k_{ucr,N}$ [-], h_{ef} , $c_{cr,N}$ [mm]
4	Robustness: Töökindlus:	γ_{inst} [-]
5	Minimum edge distance and spacing: Minimaalne servakaugus ja vahekaugus:	c_{min} , s_{min} , h_{min} [mm]
6	Edge distance to prevent splitting under load: Servakaugus pragunemise vältimiseks koormuse all:	$N^0_{Rk,sp}$ [kN], $c_{cr,sp}$ [mm]
Characteristic resistance to shear load (static and quasi-static loading), Method A		
Iseloomulik nihkekoormuse vastupidavus (staatiline ja kvasi-staatiline koormus):		
7	Resistance to steel failure under shear load: Vastupidavus terase purunemisele (nihkejõud):	$V^0_{Rk,s}$ [kN], $M^0_{Rk,s}$ [Nm], k_7 [-]
8	Resistance to pry-out failure: Vastupidavus lahtirebimise rikkele:	k_9 [-]
Characteristic Resistance for simplified design		
Iseloomulik vastupidavus lihtsustatud projekteerimiseks:		
9	Method B: Meetod B:	F^0_{Rk} [kN], c_{cr} , s_{cr} [mm]
10	Method C: Meetod C:	F_{Rk} [kN]
Displacements		
Nihked:		
11	Displacements under static and quasi-static loading: Nihked staatilise ja kvasi-staatilise koormuse all:	δ_{N0} , $\delta_{N\infty}$, δ_{V0} , $\delta_{V\infty}$ [mm]
12	Stiffness characteristics for tension loading for non-linear spring models:	$k_{1,ucr}$, $k_{2,ucr}$, $k_{3,ucr}$, $k_{4,ucr}$, $k_{1,cr}$, $k_{2,cr}$, $k_{3,cr}$, $k_{4,cr}$ [kN/mm]
Characteristic resistance and displacements for seismic performance categories C1 and C2		
Iseloomulik vastupidavus ja nihked seismilise jõudluse kategooriatele C1 ja C2:		
13	Resistance to tension load, displacements, category C1: Tõmbekoormuse vastupidavus ja nihked, kategooria C1:	$N_{Rk,s,C1}$ [kN], $N_{Rk,p,C1}$ [kN]
	Resistance to tension load, displacements, category C2: Tõmbekoormuse vastupidavus ja nihked, kategooria C2:	$N_{Rk,s,C2}$ [kN], $N_{Rk,p,C2}$ [kN], $\delta_{N,C2}$ [mm]
14	Resistance to shear load, displacements, category C1: Nihkekoormuse vastupidavus ja nihked, kategooria C1:	$V_{Rk,s,C1}$ [kN]
	Resistance to shear load, displacements, category C2: Nihkekoormuse vastupidavus ja nihked, kategooria C2:	$V_{Rk,s,C2}$ [kN], $\delta_{V,C2}$ [mm]
15	Factor for annular gap Rõngaskiu tegur:	α_{gap} [-]
Safety in case of fire (BWR 2)		
Ohutus tulekahju korral (BWR 2)		
16	Reaction to fire: Reaktsioon tulele:	Class
Resistance to fire:		
Tulekindlus:		
17	Fire resistance to steel failure (tension load): Tulekindlus terase purunemisele (tõmbekoormus):	$N_{Rk,s,fi}$ [kN]
18	Fire resistance to pull-out failure (tension load): Tulekindlus väljatõmbamise rikkele (tõmbekoormus):	$N_{Rk,p,fi}$ [kN]
19	Fire resistance to steel failure (shear load): Tulekindlus terase purunemisele (nihkejõud):	$V_{Rk,s,fi}$ [kN], $M^0_{Rk,s,fi}$ [Nm]
Aspects of durability		
Vastupidavus:		
20	Durability: Vastupidavus:	Class

II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product

The FWA Plus is a torque-controlled expansion anchor made of galvanised steel. It is available in the sizes M8, M10, M12 and M16. The expansion is achieved by torque acting on the bolt. As the anchor is prestressed, the cone is pulled into the expansion sleeve and the load applied to the anchor is transferred to the concrete mainly by friction. The anchor body of sizes M8 to M16 is cold-formed. The FWA Plus is suitable for use in uncracked concrete of strength classes C20/25 to C50/60

The product description is given in Annex A and the intended use specifications of the product are detailed in Annex B.

2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter 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

Characteristic	Assessment of characteristic
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3.1 Mechanical resistance and stability (BWR1)

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 B
Minimum edge distance and spacing	Annex C2
Edge distance to prevent splitting under load	Annex C1

Characteristic resistance to shear load (static and quasi-static loading)

Resistance to steel failure under shear load	Annex C2
Resistance to pry-out failure	Annex C2

Characteristic resistance for simplified design

Method B	Not relevant
Method C	Not relevant

Displacements

Displacements under static and quasi-static loading	Annex C2
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Characteristic resistance and displacements for seismic performance categories C1 and C2

Resistance to tension load, displacements	No performance assessed
Resistance to shear load, displacements	No performance assessed
Factor for annual gap	No performance assessed

Characteristic**Assessment of characteristic****3.2 Safety in case of fire (BWR2)**

Reaction to fire

The anchors are made from steel classified as performance **class A1** of the characteristic reaction to fire, in accordance with the provisions of EC decision 96/603/EC, amended by EC Decision 2000/605/EC.

Resistance to fire

Fire resistance to steel failure (tension load)

No performance assessed

Fire resistance to pull-out failure (tension load)

No performance assessed

Fire resistance to steel failure (shear load)

No performance assessed**3.3 Aspects of durability**

Durability

Annex B

See additional information in section 3.9

3.9 General aspects related to the performance of the product

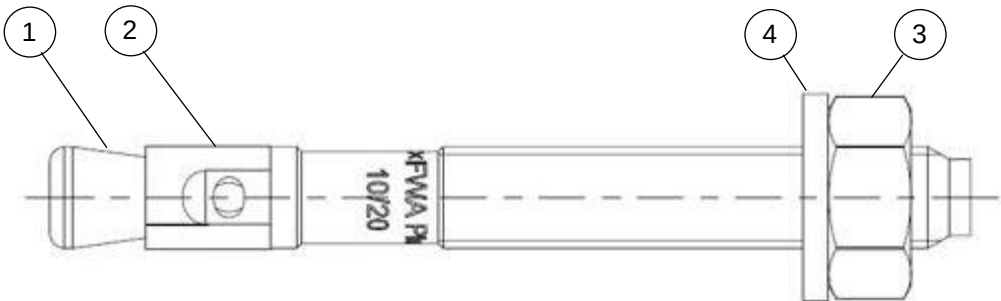
The European Technical Assessment is issued for the product on the basis of agreed data/information, deposited with ETA-Danmark, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to ETA-Danmark before the changes are introduced. ETA-Danmark will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA, shall be necessary.

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

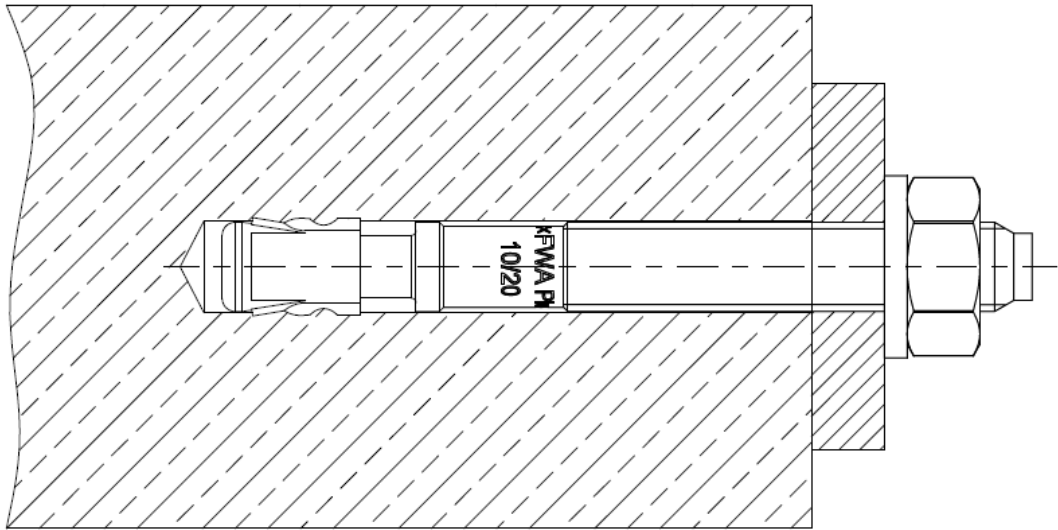
4.1 AVCP system

According to the decision 1996/582/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 1.

Cone bolt manufactured by cold - forming:



- ① Cone bolt (cold formed)
- ② Expansion sleeve
- ③ Hexagon nut
- ④ Washer

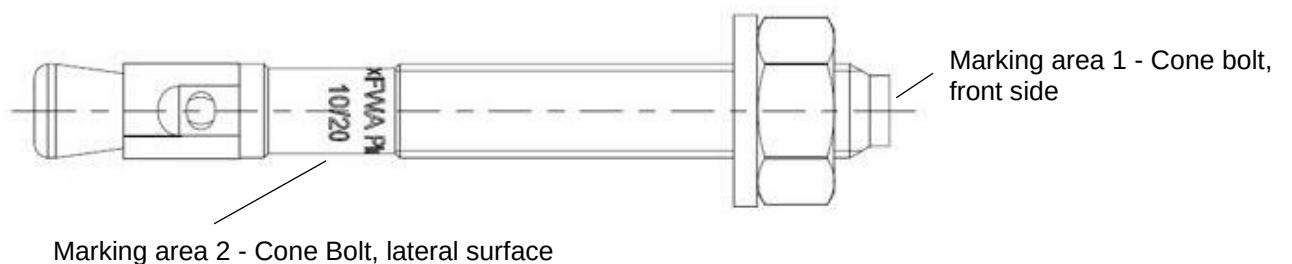


(Fig. not to scale)

fischer Bolt Anchor FWA Plus

Product description
Installed condition

Annex A1



Product marking, example: FWA Plus 10/20x94

Brand | type of fastener placed at marking area 2 Thread size / max. thickness of fixture (t_{fix}) x fastener length (L) placed at marking area 2

Table A2.1: Letter-code on marking area 1 and maximum thickness of fixture t_{fix} :

Marking	A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	R	S	T	U	V	W	X	Y	Z
Max. t_{fix}	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	120	140	160	180	200	250	300	350	400

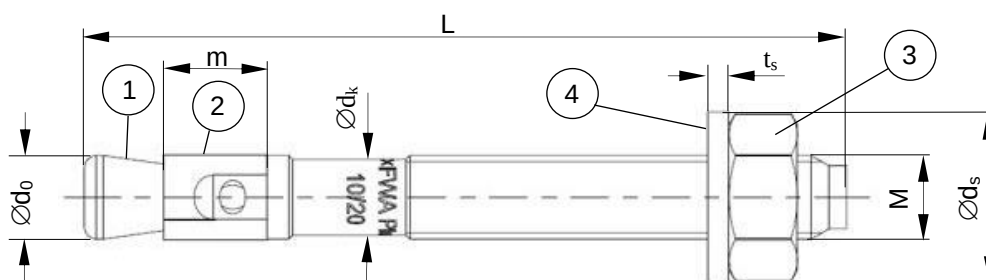


Table A2.2: Fastener dimensions [mm]

Part	Designation		FWA Plus			
			M8	M10	M12	M16
1	Cone bolt	M	8	10	12	16
		Ø d ₀ =	7,8	9,8	11,8	15
		Ø d _k	7,1	8,9	10,7	14,6
2	Expansion sleeve	m =	10,0	12,0	14,0	20,0
3	Hexagon nut	SW =	13	17	19	24
4	Washer	t _s ≥	1,6	2,0	2,5	3,0
		Ø d _s	16	20	24	30
Thickness of fixture		t _{fix} ≥	0			
		t _{fix} ≤	100	200	200	300
Length of fastener		L _{min} =	71	84	108	144
		L _{max}	166	274	202	421

(Fig. not to scale)

fischer Bolt Anchor FWA Plus

Product description
Product marking, letter code and fastener dimensions

Annex A2

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Table A3.1: Materials FWA Plus (zinc plated $\geq 5\mu\text{m}$, ISO 4042:2022)

Part	Designation	Material
1	Cone bolt	Cold form steel
2	Expansion sleeve	Cold strip
3	Hexagon nut	Steel, property class min. 8
4	Washer	Cold strip

fischer Bolt Anchor FWA Plus

Product description
Materials

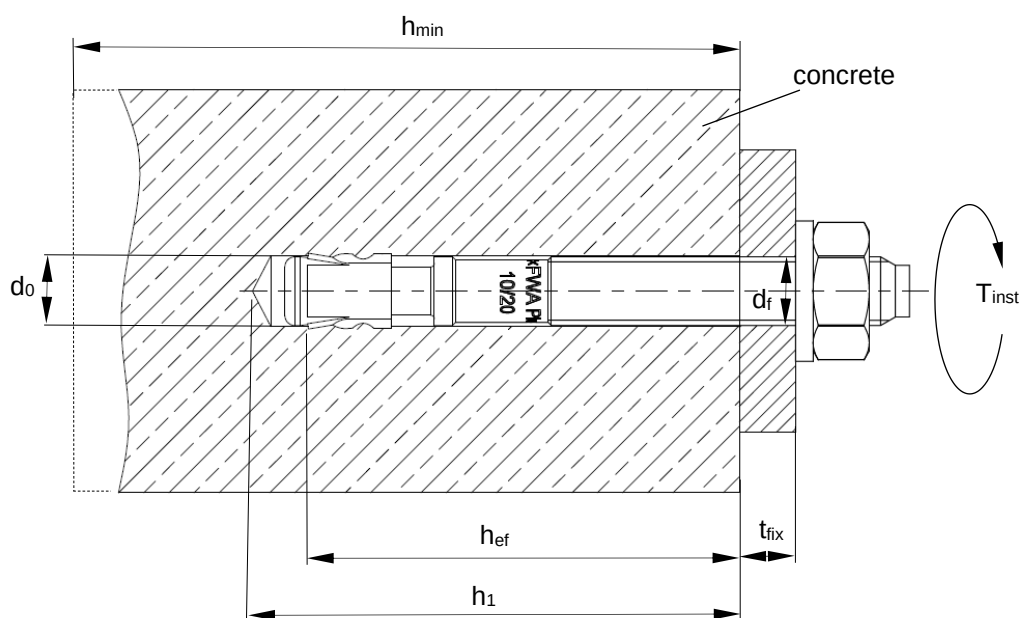
Annex A3

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Specifications of intended use				
fischer Bolt Anchor FWA Plus	M8	M10	M12	M16
Material: steel, zinc plated	✓			
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+A2:2021 Use conditions (Environmental conditions): - Structures subject to dry internal conditions. Design: - The structural design is conducted under responsibility of a designer experienced in the field of fastenings and concrete works. - Verifiable calculation notes and drawings are to be prepared taking account of the loads to be anchored. The position of the fastener is indicated on the design drawings (e.g. position of the fastener relative to reinforcement or to supports, etc.) - Design of fastenings according to EN 1992-4:2018 and TR 055:2018.				
fischer Bolt Anchor FWA Plus				Annex B1 Appendix 8 / 12
Intended Use Specifications				

Table B2.1: Installation parameters

Type of fastener / size		FWA Plus			
		M8	M10	M12	M16
Nominal drill hole diameter	$d_0 =$	8	10	12	16
Cutting diameter of drill bit	$d_{cut} \leq$	8,45	10,45	12,5	16,5
Effective embedment depth	$h_{ef} \geq$ [mm]	48	50	70	84
Depth of drill hole in concrete	$h_1 \geq$	65	75	100	120
Diameter of clearance hole in the fixture	$d_f \leq$	9	12	14	18
Required setting torque	$T_{inst} =$ [Nm]	10	15	35	110



- h_{ef} = Effective embedment depth
 t_{fix} = Thickness of the fixture
 h_1 = Depth of drill hole to deepest point
 h_{min} = Minimum thickness of concrete member
 T_{inst} = Required setting torque

(Fig. not to scale)

fischer Bolt Anchor FWA Plus

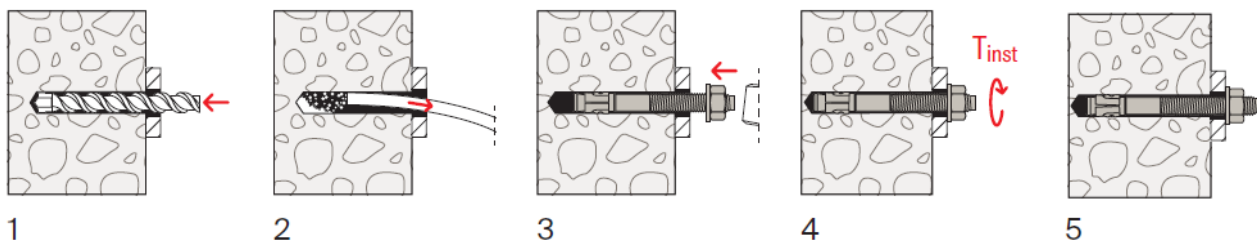
Intended Use
Installation parameters

Annex B2

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Installation instructions

- Fastener installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site
- Use of the fastener only as supplied by the manufacturer without exchanging the components of the fastener
- Hammer drilling
- Drill hole created perpendicular $\pm 5^\circ$ to concrete surface, positioning without damaging the reinforcement
- In case of aborted hole: new drilling at a minimum distance twice the depth of the aborted drill hole or smaller distance if the aborted drill hole is filled with high strength mortar and if under shear or combined shear/tension load it is not in the direction of load application



No.	Description
1	Drill the hole by hammer drilling.
2	Clean the hole.
3	Set the fastener.
4	Apply required setting torque T_{inst}
5	Installed fastener

(Fig. not to scale)

fischer Bolt Anchor FWA Plus

Intended Use
Installation instructions

Annex B3

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Table C1.1: Characteristic values of **tension** resistance under static and quasi-static action

Type of fastener / size			FWA Plus			
			M8	M10	M12	M16
Steel failure						
Characteristic resistance	N _{Rk,s}	[kN]	15,5	22,0	35,0	46,0
Partial factor	γ _{Ms} ¹⁾	[-]	1,50			
Pullout failure						
Characteristic resistance in uncracked concrete C20/25	N _{Rk,p}	[kN]	10,4	13,8	22,8	29,0
Increasing factors ψ _c for N _{Rk,p} N _{Rk,p} = ψ _c · N _{Rk,p} (C20/25)	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			
Partial installation factor	γ _{inst}	[-]	1,0			
Concrete cone and splitting failure						
Effective embedment depth	h _{ef}	[mm]	48	50	70	84
Factor for uncracked concrete	k _{ucr,N}	[-]	11,0 ²⁾			
Characteristic spacing	s _{cr,N}	[mm]	3 h _{ef}			
Characteristic edge distance	c _{cr,N}		1,5 h _{ef}			
Characteristic spacing for splitting failure	s _{cr,sp}		192	250	350	504
Characteristic distance for splitting failure	c _{cr,sp}		96	125	175	252
Characteristic resistance to splitting	N ⁰ _{Rk,sp}		[kN]	min {N ⁰ _{Rk,c} , N _{Rk,p} } ³⁾		
¹⁾ In absence of other national regulations ²⁾ Based on concrete strength as cylinder strength ³⁾ N⁰_{Rk,c} according to EN 1992-4:2018						
fischer Bolt Anchor FWA Plus					Annex C1	
Performance Characteristic values of tension resistance under static and quasi-static action						
					Appendix 11 / 12	

Table C2.1: Characteristic values of **shear** resistance under static and quasi-static action

Type of fastener / size			FWA Plus			
			M8	M10	M12	M16
Installation factor γ_{inst} [-]			1,0			
Steel failure without lever arm						
Characteristic resistance $V^0_{Rk,s}$ [kN]			11,0	17,0	25,3	30,0
Partial factor for steel failure $\gamma_{Ms}^{1)}$ [-]			1,25			
Steel failure with lever arm and concrete pryout failure						
Characteristic bending moment $M^0_{Rk,s}$ [Nm]			22,5	44,8	78,6	199,0
Partial factor for steel failure $\gamma_{Ms}^{1)}$			1,25			
Factor for ductility k_7 [-]			0,8			
Factor for pryout k_8			1		2	
Concrete edge failure						
Effective length of fastener l_f [mm]			48	50	70	84
Effective diameter of fastener d_{nom}			8	10	12	16

¹⁾ In absence of other national regulations

Table C2.2: Minimum thickness of concrete members, minimum spacing and minimum edge distances

Type of fastener / size		FWA Plus			
		M8	M10	M12	M16
Minimum thickness of member	h_{min}	100	120	140	170
Minimum spacing	s_{min} [mm]	65	95	100	115
Minimum edge distance	c_{min}	65	95	100	115

Table C2.3: Displacements under static and quasi static **tension** action

Type of fastener / size		FWA Plus			
		M8	M10	M12	M16
Tension load	N [kN]	4,9	6,5	10,8	13,8
Displacements	δ_{N0}	0,8	1,0	1,2	1,3
	$\delta_{N\infty}$ [mm]	1,2	1,5	1,8	2,0

Table C2.4: Displacements under static and quasi static **shear** action

Type of fastener / size		FWA Plus			
		M8	M10	M12	M16
Shear load	V [kN]	6,3	9,7	14,5	17,1
Displacements	δ_{V0}	1,9	2,7	3,5	3,5
	$\delta_{V\infty}$ [mm]	2,9	4,1	5,3	3,5

fischer Bolt Anchor FWA Plus

Performance

Characteristic values of shear resistance, minimum thickness of concrete members, minimum spacing and edge distances, displacements due to tension and shear action

Annex C2

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