VYHLÁSENIE O PARAMETROCH

DoP 0361

pre oceľovú kotvu fischer FWA Plus (mechanická kotva do betónu) SK

1. Jedinečný identifikačný kód typu výrobku: **DoP 0361**

2. Zamýšľané použitie/použitia: **Dodatočné upevnenie v betóne bez trhlín., pozri prílohu, najmä prílohy B1 - B3.**

3. Výrobca: **fischerwerke GmbH & Co. KG, Klaus-Fischer-Str. 1, 72178 Waldachtal, Nemecko**

4. Splnomocnený zástupca: **–**

5. Systém(-y) posudzovania a overovania nemennosti parametrov: **1**

6. Európsky hodnotiaci dokument: **EAD 330232-01-0601**
   Európske technické posúdenie: **ETA-24/0714; 2024-10-15**
   Orgán technického posudzovania: **DIBt- Deutsches Institut für Bautechnik**
   Notifikovaný(-é) subjekt(-y): **2873 TU Darmstadt**

7. Deklarované parametre:

Mechanická odolnosť a stabilita (BWR 1)

Charakteristická odolnosť v ťahu (statické a kvázistatické zaťaženie) Metóda A:

1 Odolnosť voči porušeniu ocele: Prílohy C1
2 Odolnosť voči porušeniu vytiahnutím: Prílohy C1
3 Odolnosť voči porušeniu betónového kužeľa: Prílohy C1
4 Robustnosť: Prílohy C1
5 Minimálna vzdialenosť od okraj a osová vzdialenosť: Prílohy C2
6 Vzdialenosť od okraja voči rozštiepniu pri zaťažení: Prílohy C1

Charakteristická odolnosť v šmyku (statické a kvázistatické zaťaženie):

7 Odolnosť voči porušeniu ocele: (Zaťaženie šmykom) Prílohy C2
8 Odolnosť voči vylomeniu: Prílohy C2

Charakteristická odolnosť pre zjednodušený návrh:

9 Metóda B: NPD
10 Metóda C: NPD

Posuny:

11 Posuny pri statickom a kvázistatickom zaťažení: Prílohy C2

Charakteristická odolnosť a posuny pre seizmické výkonnostné kategórie C1 a C2:

12 Odolnosť pri zaťažení ťahom, posuny, kategória C1: NPD
   Odolnosť pri zaťažení ťahom, posuny, kategória C2: NPD
13 Odolnosť pri zaťažení šmykom, posuny, kategória C1: NPD
   Odolnosť pri zaťažení šmykom, posuny, kategória C2: NPD
14 Faktor prstencovej medzery: NPD

Bezpečnosť v prípade požiaru (BWR 2)

15 Reakcia na oheň: Trieda (A1)

Odolnosť proti ohňu:

16 Požiarna odolnosť voči porušeniu ocele (Zaťaženie ťahom) NPD
17 Požiarna odolnosť voči vytiahnutiu (Zťaženie tahom) NPD
18 Požiarna odolnosť voči porušeniu ocele (Zaťaženie šmykom) NPD

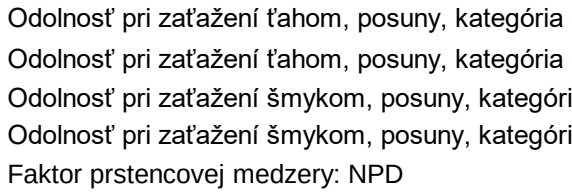
životnosť:

19 životnosť: Prílohy A3, B1

8. Vhodná technická dokumentácia a/alebo špecifická technická dokumentácia: **–**

Uvedené parametre výrobku sú v zhode so súborom deklarovaných parametrov. Toto vyhlásenie o parametroch sa v súlade s nariadením (EÚ) č. 305/2011 vydáva na výhradnú zodpovednosť uvedeného výrobcu.

Podpísal(-a) za a v mene výrobcu:



Dr. Ronald Mihala, Vedúci oddelenia vývoja a riadenia výroby

Jürgen Grün, konateľ oddelenia Chemická výroba & kvalita

Tumlingen, 2024-10-29

Toto vyhlásenie o vlastnostiach bolo vyhotovené v rôznych jazykoch. V prípade, že dôjde k rozdielnemu výkladu má anglická verzia vždy prednosť.

Príloha obsahuje dobrovoľné a doplňujúce informácie v anglickom jazyku. Tieto vychádzajú zo zákonom stanovených požiadaviek (jazykovo neutrálnych) .

Translation guidance Essential Characteristics and Performance Parameters for Annexes

Základné charakteristiky a parametre výkonu – pokyny na preklad pre prílohy

Mechanical resistance and stability (BWR 1) **Mechanická odolnosť a stabilita (BWR 1)**		
Characteristic resistance to tension load (static and quasi-static loading) Method A: **Charakteristická odolnosť v ťahu (statické a kvázistatické zaťaženie) Metóda A:**		
1	Resistance to steel failure: **Odolnosť voči porušeniu ocele:**	$N_{Rk,s}$ [kN]
2	Resistance to pull-out failure: **Odolnosť voči porušeniu vytiahnutím:**	$N_{Rk,p}$ [kN], ψ_c [-]
3	Resistance to concrete cone failure: **Odolnosť voči porušeniu betónového kužeľa:**	$k_{cr,N}$, $k_{ucr,N}$ [-], h_{ef}, $c_{cr,N}$ [mm]
4	Robustness: **Robustnosť:**	γ_{inst} [-]
5	Minimum edge distance and spacing: **Minimálna vzdialenosť od okraj a osová vzdialenosť:**	c_{min}, s_{min}, h_{min} [mm]
6	Edge distance to prevent splitting under load: **Vzdialenosť od okraja voči rozštiepniu pri zaťažení:**	$N^0_{Rk,sp}$ [kN], $c_{cr,sp}$ [mm]
Characteristic resistance to shear load (static and quasi-static loading): **Charakteristická odolnosť v šmyku (statické a kvázistatické zaťaženie):**		
7	Resistance to steel failure (shear load): **Odolnosť voči porušeniu ocele: (Zaťaženie šmykom)**	$V^0_{Rk,s}$ [kN], $M^0_{Rk,s}$ [Nm], k_7 [-]
8	Resistance to pry-out failure: **Odolnosť voči vylomeniu:**	k_8 [-]
Characteristic resistance for simplified design: **Charakteristická odolnosť pre zjednodušený návrh:**		
9	Method B: **Metóda B:**	F^0_{Rk} [kN], $M^0_{Rk,s}$ [Nm], ψ_c [-], c_{cr}, s_{cr}, s_{min}, c_{min}, h_{min} [mm]
10	Method C: **Metóda C:**	F_{Rk} [kN], $M^0_{Rk,s}$ [Nm], c_{cr}, s_{cr}, s_{min}, h_{min} [mm]
Displacements: **Posuny:**		
9	Displacements under static and quasi-static loading: **Posuny pri statickom a kvázistatickom zaťažení:**	δ_{N0}, $\delta_{N\infty}$, δ_{V0}, $\delta_{V\infty}$ [mm]
Characteristic resistance and displacements for seismic performance categories C1 and C2: **Charakteristická odolnosť a posuny pre seizmické výkonnostné kategórie C1 a C2:**		
12	Resistance to tension load, displacements, category C1: **Odolnosť pri zaťažení ťahom, posuny, kategória C1:**	$N_{Rk,s,C1}$, $N_{Rk,p,C1}$ [kN]
	Resistance to tension load, displacements, category C2: **Odolnosť pri zaťažení ťahom, posuny, kategória C2:**	$N_{Rk,s,C2}$, $N_{Rk,p,C2}$ [kN], $\delta_{N,C2}$ [mm]
13	Resistance to shear load, displacements, category C1: **Odolnosť pri zaťažení šmykom, posuny, kategória C1:**	$V_{Rk,s,C1}$ [kN]
	Resistance to shear load, displacements, category C2: **Odolnosť pri zaťažení šmykom, posuny, kategória C2:**	$V_{Rk,s,C2}$ [kN], $\delta_{V,C2}$ [mm]
14	Factor for annular gap: **Faktor prstencovej medzery:**	α_{gap} [-]
Safety in case of fire (BWR 2) **Bezpečnosť v prípade požiaru (BWR 2)**		
15	Reaction to fire: **Reakcia na oheň:**	Class
Resistance to fire: **Odolnosť proti ohňu:**		
16	Fire resistance to steel failure (tension load): **Požiarna odolnosť voči porušeniu ocele (Zaťaženie ťahom)**	$N_{Rk,s,fi}$ [kN]
17	Fire resistance to pull-out failure (tension load): **Požiarna odolnosť voči vytiahnutiu (Zťaženie tahom)**	$N_{Rk,p,fi}$ [kN]
18	Fire resistance to steel failure (shear load): **Požiarna odolnosť voči porušeniu ocele (Zaťaženie šmykom)**	$V_{Rk,s,fi}$ [kN], $M^0_{Rk,s,fi}$ [Nm]
Durability: **životnosť:**		
19	Durability: **životnosť:**	Description/Level

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
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**
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.

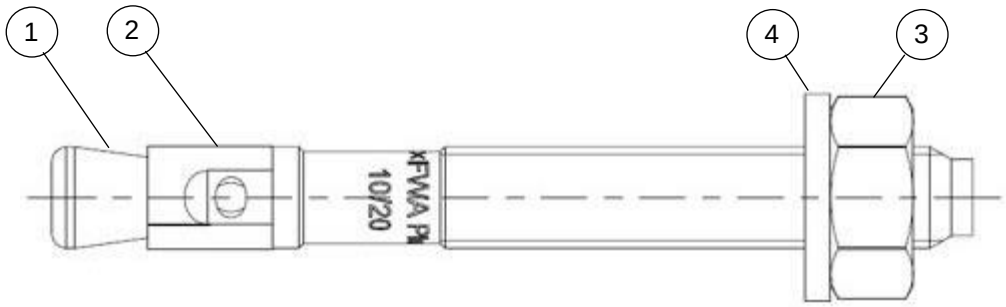
4.1 AVCP system

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.

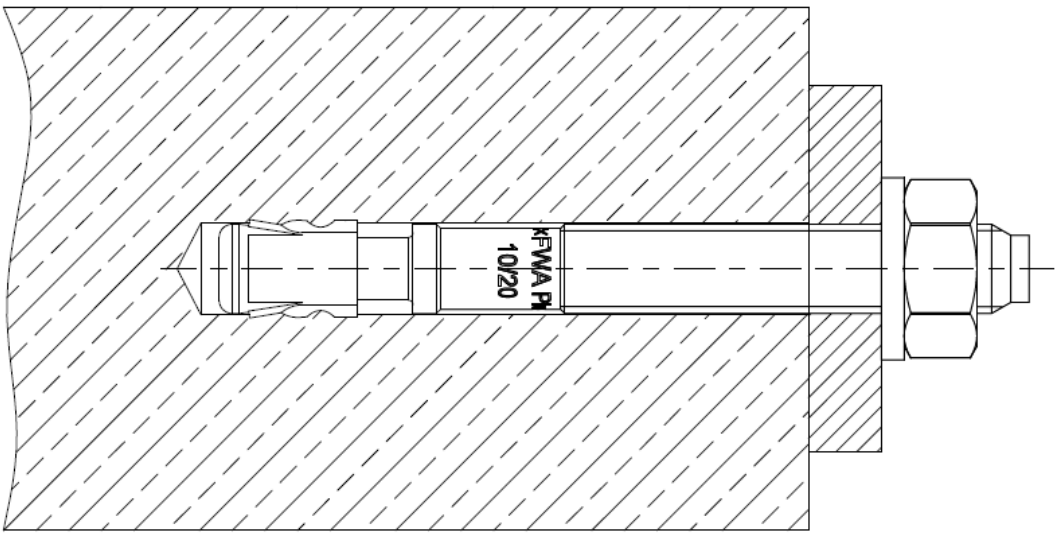
5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

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

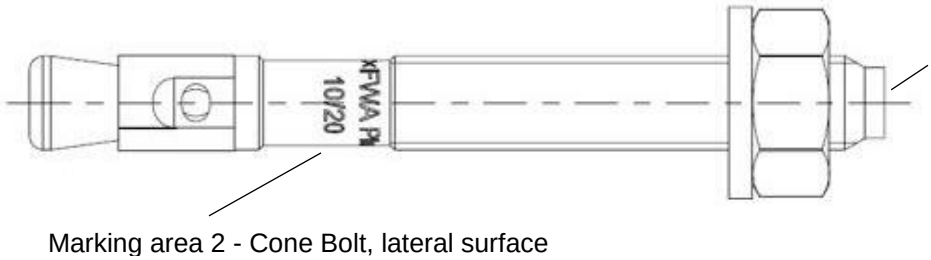
Cone bolt manufactured by cold - forming:



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



(Fig. not to scale)



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

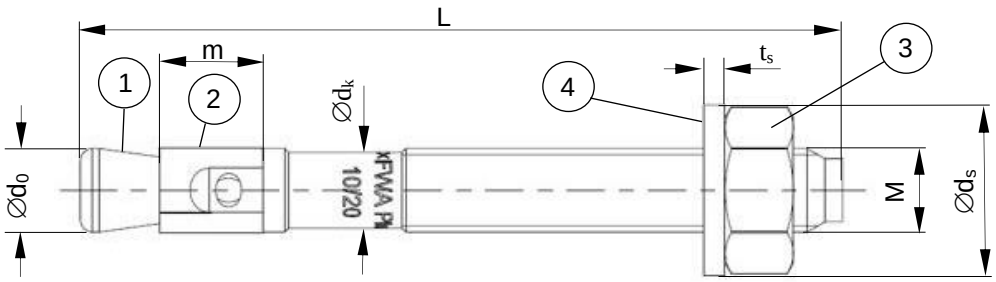


Table A2.2: Fastener dimensions [mm]

Part	Designation			FWA Plus M8	FWA Plus M10	FWA Plus M12	FWA Plus M16
1	Cone bolt	M	=	8	10	12	16
		$\varnothing d_0$	=	7,8	9,8	11,8	15
		$\varnothing d_k$	=	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
		$\varnothing d_s$	≥	16	20	24	30
Thickness of fixture		t_{fix}	≥	0			
			≤	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
Appendix 6 / 12

Table A3.1: Materials FWA Plus (zinc plated ≥ 5µm, 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

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):

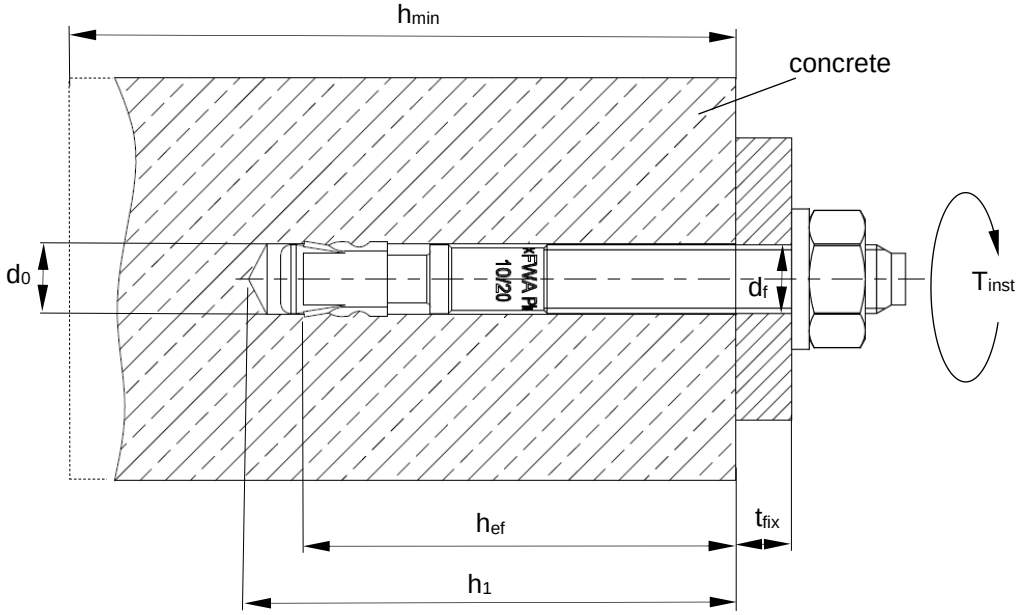
- Structures subject to dry internal conditions.

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.

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

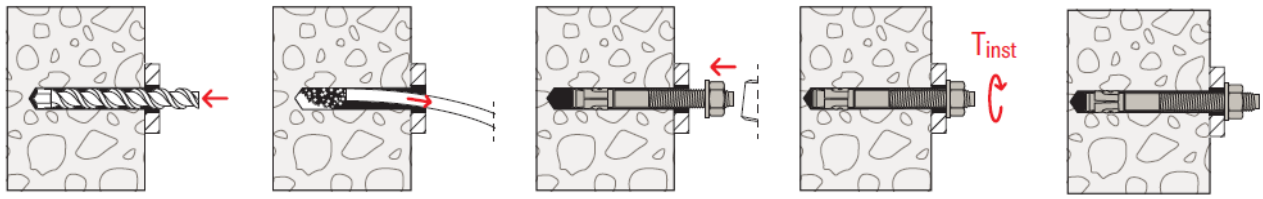


h_{ef} = Effective embedment depth
t_{fix} = Thickness of the fixture
h_1 = Depth of drill hole to deepest point
h_{min} = Minimum thickness of concrete member
T_{inst} = Required setting torque

(Fig. not to scale)

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 +/- 5° 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 oblique 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)

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

Type of fastener / size			FWA Plus M8	FWA Plus M10	FWA Plus M12	FWA Plus M16
Steel failure						
Characteristic resistance	$N_{Rk,s}$	[kN]	15,5	24,3	35,2	67,5
Partial factor	γ_{Ms} [1)]	[-]	1,50			
Pullout failure						
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	12,4	16,5	28,2	34,9
Increasing factors ψ_c for $N_{Rk,p}$ $N_{Rk,p} = \psi_c \cdot N_{Rk,p}$ (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			
Installation sensitivity 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)] $N^0_{Rk,c}$ according to EN 1992-4:2018

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	17,4	25,3	40
Partial factor for steel failure	γ_{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
Partial factor for steel failure	γ_{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}	[mm]	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}	[mm]	100	120	140	170
Minimum spacing	s_{min}	[mm]	65	95	100	115
Minimum edge distance	c_{min}	[mm]	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]	5,7	7,6	18,3	16,2
Displacements	δ_{N0}	[mm]	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	9,9	14,5	22,9
Displacements	δ_{V0}	[mm]	1,9	2,7	3,5	3,5
	$\delta_{V\infty}$	[mm]	2,9	4,1	5,3	3,5