

DÉCLARATION DES PERFORMANCES

DoP 0192

pour goujon d'ancrage fischer FBN II, FBN II R (fixation mécanique pour utilisation dans le béton)

FR

1. <u>Code d'identification unique du type de produit:</u>	DoP 0192		
2. <u>Usage(s) prévu(s):</u>	Fixation dans du béton non fissuré. Voir annexes, en particulier les annexes B1- B3		
3. <u>Fabricant:</u>	fischerwerke GmbH & Co. KG, Klaus-Fischer-Str. 1, 72178 Waldachtal, Allemagne		
4. <u>Mandataire:</u>	-		
5. <u>Système(s) d'évaluation et de vérification de la constance des performances:</u>	1		
6. <u>Document d'évaluation européen:</u>	EAD 330232-01-0601, (Edition 12/ 2019)		
Evaluation Technique Européenne:	ETA-07/0211; 2020-07-13		
Organisme d'évaluation technique:	DIBt- Deutsches Institut für Bautechnik		
Organisme(s) notifié(s):	1343 MPA Darmstadt / 2873 TU Darmstadt		
7. <u>Performance(s) déclarée(s):</u>			
Résistance mécanique et stabilité (BWR 1)			
Résistance caractéristique à la charge de traction (charge statique et quasi-statique):	Résistance à la rupture de l'acier: Résistance à l'extraction glissement:	Annexe C1 Annexe C1	$E_s = 210\ 000\ \text{MPa}$
	Résistance à la rupture du cône béton: Robustesse:	Annexe C1 Annexe C1	$k_{cr,N} = \text{NPD}$
	Distance au bord et entraxe mini.:	Annexe C3	
	Distance au bord pour éviter la rupture par fendage sous charge:	Annexe C1	
Résistance caractéristique à la charge de cisaillement (charge statique et quasi-statique), Méthode A:	Résistance à la rupture de l'acier (charge de cisailier) Résistance à la rupture par effet de levier :	Annexe C2 Annexe C2	
Résistance caractéristique et déplacements pour les catégories de performance sismique C1 et C2:	Résistance à la charge de traction, déplacements, catégorie C1: Résistance à la charge de traction, déplacements, catégorie C2: Résistance à la charge de cisaillement, déplacements, catégorie C1: Résistance à la charge de cisaillement, déplacements, catégorie C2: Facteur espace annulaire :	NPD NPD NPD NPD NPD	
Résistance caractéristique pour un dimensionnement simplifié:	Méthode B: Méthode C:	NPD NPD	
Déplacements et Durabilité:	Déplacements sous charge statique et quasi-statique Durabilité:	Annexe C3 Annexes A4, B1	
Sécurité en cas d'incendie (BWR 2)			
Réaction au feu:	Classe (A1)		
Résistance au feu:	Résistance en cas d'incendie, rupture de l'acier Résistance en cas d'incendie, extraction glissement Résistance en cas d'incendie, rupture de l'acier	NPD NPD NPD	



8. Documentation technique appropriée et/ou
documentation technique spécifique:

Les performances du produit identifié ci-dessus sont conformes aux performances déclarées. Conformément au règlement (UE) no 305/2011, la présente déclaration des performances est établie sous la seule responsabilité du fabricant mentionné ci-dessus.

Signé pour le fabricant et en son nom par:

Thilo Pregartner, Dr.-Ing.
Tumlingen, 2020-07-27

Peter Schillinger, Dipl.-Ing.

Cette DoP a été préparée en plusieurs langues. En cas de différend relatif à l'interprétation, la version anglaise prévaudra.

L'annexe comprend des informations volontaires et complémentaires en langue anglaise dépassant les exigences légales (spécifiées de manière neutre).

Specific Part

1 Technical description of the product

The Fischer Bolt anchor FBN II and FBN II R is an anchor made of zinc plated, hot-dip galvanised or stainless steel which is placed into a drilled hole and anchored by torque-controlled expansion.

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 fastener 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 fastener 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 loading)	See Annex C 3, C 1
Characteristic resistance to shear load (static and quasi-static loading)	See Annex C 2
Displacements (static and quasi-static loading)	See Annex C 3
Characteristic resistance and displacements for seismic performance categories C1 and C2	No performance assessed
Durability	See Annex B 1

3.2 Safety in case of fire (BWR 2)

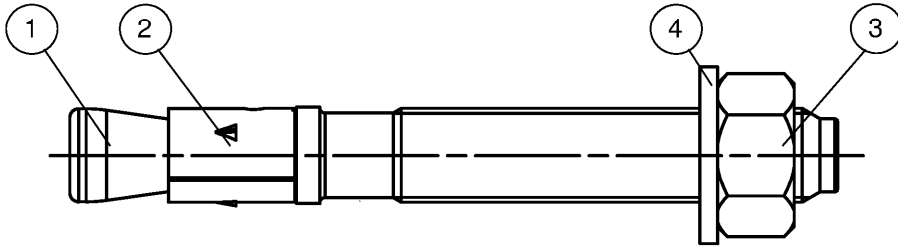
Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	No performance assessed

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

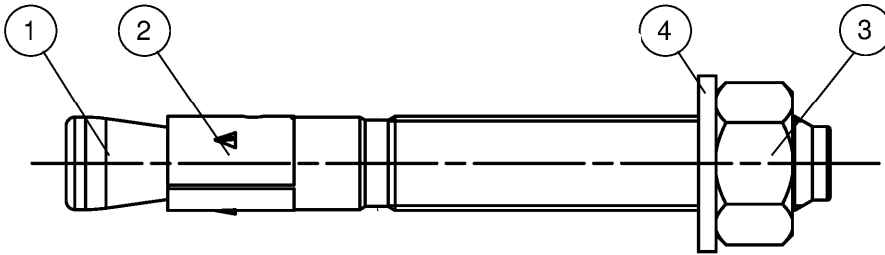
In accordance with the European Assessment Document EAD 330232-01-0601 the applicable European legal act is: [96/582/EC].

The system to be applied is: 1

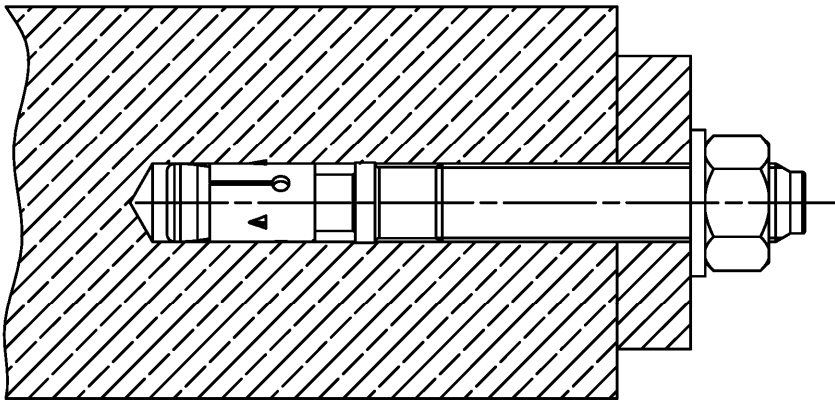
Cone bolt manufactured by cold - forming:



Cone bolt manufactured by turning:



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



(Fig. not to scale)

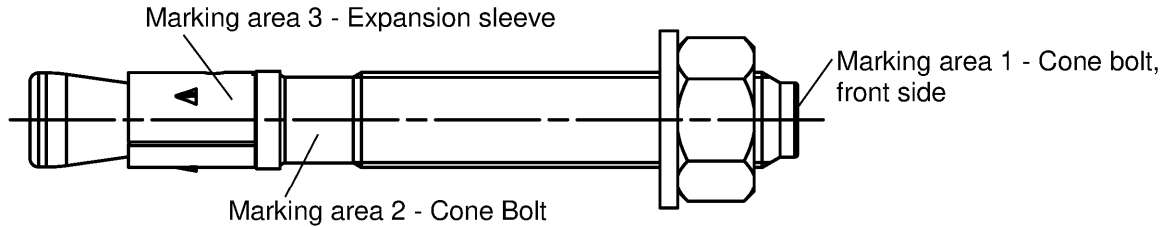
fischer Bolt Anchor FBN II, FBN II R

Product description
Installed condition

Annex A 1

Appendix 2/ 11

FBN II for use with standard and reduced anchorage depth ($h_{ef, sta}$ and $h_{ef, red}$)



Product label, example:

FBN II 12/10 R

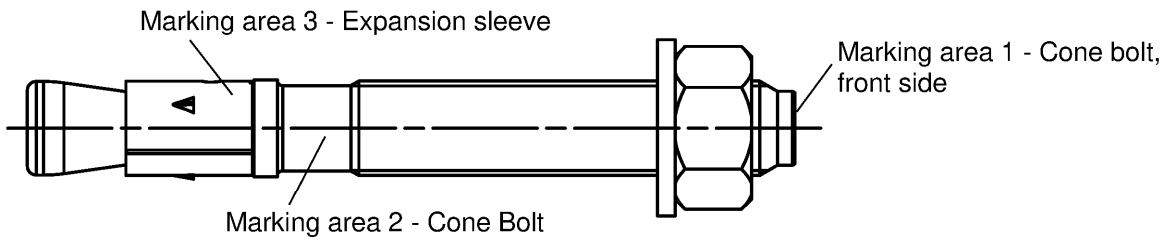
Brand | type of fastener
placed at marking area 2 or 3

Thread size / max. thickness of the fixture (t_{fix}) for $h_{ef, sta}$
identification R or HDG placed at marking area 2

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

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} for $h_{ef, sta}$	M6-M20	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	120	140	160	180	200	250	300	350	400
max. t_{fix} for $h_{ef, red}$	M8, M10	15	20	25	30	35	40	45	50	55	60	70	80	90	100	110	130	150	170	190	210	260	310	360	410
	M12, M16	20	25	30	35	40	45	50	55	60	65	75	85	95	105	115	135	155	175	195	215	265	315	365	415
	M20	30	35	40	45	50	55	60	65	70	75	85	95	105	115	125	145	165	185	205	225	275	325	375	425

FBN II K for use with reduced anchorage depth only ($h_{ef, red}$):



Product label, example:

FBN II 12/10 K R

Brand | type of fastener
placed at marking area 2 or 3

Thread size / max. thickness of the fixture (t_{fix})
identification K for $h_{ef, red}$
identification R or HDG placed on marking area 2

Table A2.2: Letter-code on marking area 1 and maximum thickness of fixture t_{fix} [mm]:

Markierung		-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} for $h_{ef, red}$	M8-M20	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	120	140	160	180	200	250	300	350	400

Identification for $h_{ef, red}$ is the letter-code between 2 hyphen

(Fig. not to scale)

fischer Bolt Anchor FBN II, FBN II R

Product description
Product label and letter code

Annex A 2

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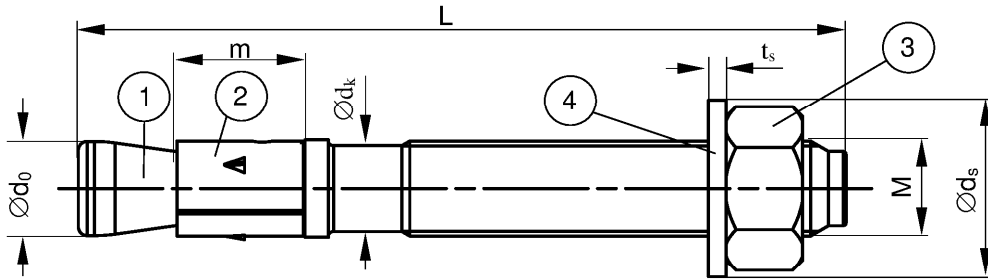


Table A3.1: Anchor dimensions [mm]

Part	Designation		FBN II, FBN II R					
			M6	M8	M10	M12	M16	M20
1	Cone bolt	M	M6	M8	M10	M12	M16	M20
		$\varnothing d_0$	5,9	7,9	9,9	11,9	15,9	19,6
		$\varnothing d_k$	5,2	7,1	8,9	10,8	14,5	18,2
2	Expansion sleeve	m	10	11,5	13,5	16,5	21,5	33,5
3	Hexagon nut	SW	10	13	17	19	24	30
4	Washer	t_s	1,0	1,4	1,8	2,3	2,7	2,7
		$\varnothing d_s$	11,5	15	19	23	29	36
Thickness of fixture		t_{fix}	0	0	0	0	0	0
			200	200	250	300	400	500
Length of fastener		L_{min}	45	56	71	86	120	139
		L_{max}	245	261	316	396	520	654

(Fig. not to scale)

fischer Bolt Anchor FBN II, FBN II R

Product description
Dimensions

Annex A 3

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Table A4.1: Materials FBN II (zinc plated $\geq 5\mu\text{m}$, ISO 4042:2018)

Part	Designation	Material
1	Cone bolt	Cold form steel or free cutting steel
2	Expansion sleeve	Cold strip, EN 10139:2016 ¹⁾
3	Hexagon nut	Steel, property class min. 8, EN ISO 898-2:2012
4	Washer	Cold strip, EN 10139:2013

¹⁾ Optional stainless steel EN 10088:2014

Table A4.2: Materials FBN II HDG (hot-dip galvanised $\geq 50\mu\text{m}$, ISO 10684: 2004 ²⁾)

Part	Designation	Material
1	Cone bolt	Cold form steel or free cutting steel
2	Expansion sleeve	Stainless steel EN 10088:2014
3	Hexagon nut	Steel, property class min. 8, EN ISO 898-2:2012
4	Washer	Cold strip, EN 10139:2016

¹⁾ Alternative method sherardized $\geq 50\mu\text{m}$, EN 13811:2003

Table A4.3: Materials FBN II R

Part	Designation	Material
1	Cone bolt	Stainless steel EN 10088:2014
2	Expansion sleeve	Stainless steel EN 10088:2014
3	Hexagon nut	Stainless steel EN 10088:2014 ISO 3506-2: 2009; property class min. 70
4	Washer	Stainless steel EN 10088:2014

fischer Bolt Anchor FBN II, FBN II R

Product description
Materials

Annex A 4

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Specifications of intended use

Anchorage subject to:

fischer Bolt Anchor FBN II, FBN II R		M6 ¹⁾	M8 ¹⁾	M10	M12	M16	M20
Material	Steel	Zinc plated			✓		
		Hot-dip galvanized HDG	-2)		✓		
	Stainless steel	R			✓		
Static and quasi-static loads					✓		
Reduced anchorage depth			-2)			✓	
Uncracked concrete					✓		

¹⁾ Use of FBN II 6 (gvz/R) and FBN II 8 (gvz/HDG/R) with $h_{ef} = 30\text{mm}$ restricted to anchoring of structural components which are statically indeterminate

²⁾ Anchor type not part of the assessment

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:
- For all other conditions according to EN 1993-1-4:2015-10 corresponding to corrosion resistance class CRC III

FBN II, FBN II HDG

FBN II R

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 TR 055

fischer Bolt Anchor FBN II, FBN II R

Intended Use
Specifications

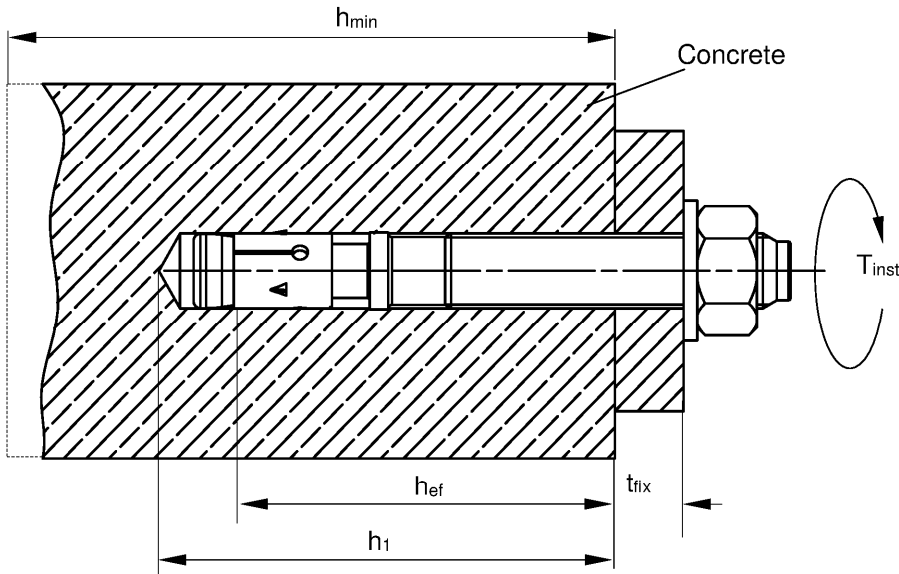
Annex B 1

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Table B2.1: Installation parameters

Type of anchor / size FBN II, FBN II R	M6	M8	M10	M12	M16	M20
Nominal drill hole diameter $d_0 =$	6	8	10	12	16	20
Cutting diameter of drill bit $d_{cut} \leq$	6,45	8,45	10,45	12,50	16,50	20,55
Standard anchorage depth $h_{ef,sta} =$	30 ¹⁾	40	50	65	80	105
Reduced anchorage depth $h_{ef,red} =$ [mm]	- ²⁾	30 ¹⁾	40	50	65	80
Standard drill hole depth $h_{1,sta} \geq$	40	56	68	85	104	135
Reduced drill hole depth $h_{1,red} \geq$	- ²⁾	46 ¹⁾	58	70	89	110
Diameter of clearance hole in the fixture $d_f \leq$	7	9	12	14	18	22
Required torque moment FBN II (zinc plated)	4	15	30	50	100	200
Required torque moment FBN II (hot-dip galvanized) $T_{inst} =$ [Nm]	- ³⁾	15	30	40	70	200
Required torque moment FBN II R	4	10	20	35	80	150

- 1) Use restricted to anchoring of structural components which are statically indeterminate
- 2) No performance assessed
- 3) Anchor type not part of the assessment



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 FBN II, FBN II R

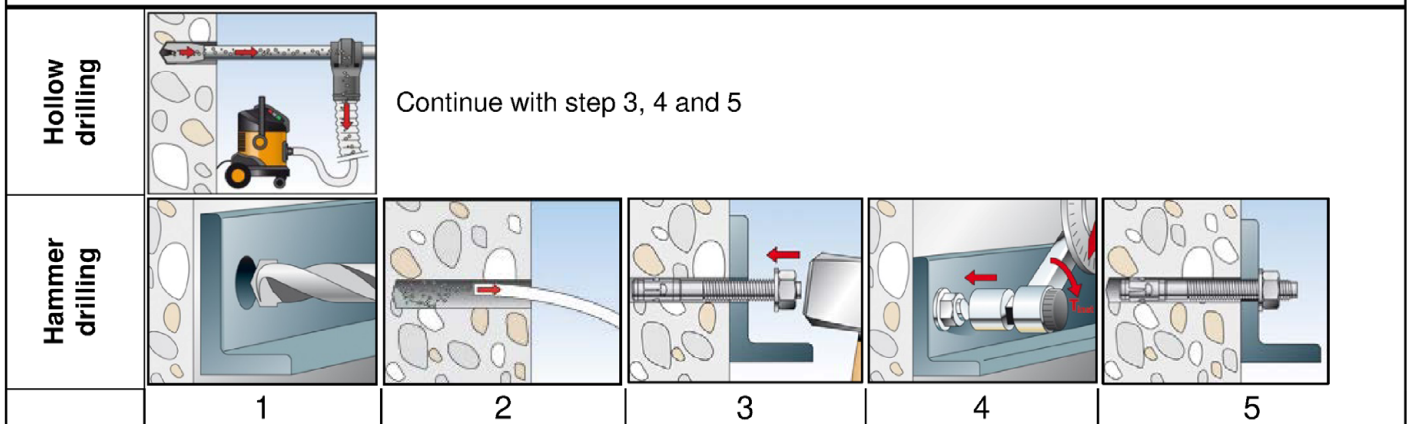
Intended Use
Installation parameters

Annex B 2

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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
- Checking before placing the fastener to ensure that the strength class of the concrete in which the fastener is to be placed is in the range given and is not lower than that of the concrete to which the characteristic loads apply
- Check of concrete being well compacted, e.g. without significant voids
- Hammer or hollow 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 oblique tension load it is not in the direction of load application



No.	Description	
1	Create drill hole with hammer drill	Create drill hole with hollow drill and vacuum cleaner
2	Clean drill hole	-
3	Set anchor	
4	Expand anchor with prescribed installation torque T_{inst}	
5	Finished installation	

Types of drills

Hammer drill



Hollow drill



fischer Bolt Anchor FBN II, FBN II R

Intended Use
Installation instructions

Annex B 3

Appendix 8/ 11

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

Type of anchor / size			M6	M8	M10	M12	M16	M20
Steel failure for standard and reduced anchorage depth FBN II								
Characteristic resistance FBN II	$N_{Rk,s}$	[kN]	8,3	16,5	27,2	41,6	77,9	107
Partial factor	γ_{Ms}^1	[-]	1,5	1,4	1,4	1,4	1,5	1,5
Steel failure for standard and reduced anchorage depth FBN II R								
Characteristic resistance FBN II R	$N_{Rk,s}$	[kN]	10,6	16,5	27,2	41,6	78	111
Partial factor	γ_{Ms}^1	[-]	1,5	1,4	1,4	1,4	1,4	1,5
Pullout failure for standard anchorage depth FBN II, FBN II R								
Characteristic resistance C20/25	$N_{Rk,p}$	[kN]	6 ⁴⁾	12,5	17,4	25,8	35,2	52,9
Pullout failure for reduced anchorage depth FBN II, FBN II R								
Characteristic resistance C20/25	$N_{Rk,p}$	[kN]	-. ⁵⁾	6 ⁴⁾	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 for standard anchorage depth FBN II, FBN II R								
Effective anchorage depth	$h_{ef, sta}$	[mm]	30 ⁴⁾	40	50	65	80	105
Factor for uncracked concrete	$k_{Ucr,N}$	[-]	11,0 ²⁾					
Spacing	$s_{cr,N}$	[mm]	3 $h_{ef, sta}$					
Edge distance	$c_{cr,N}$		1,5 $h_{ef, sta}$					
Spacing (splitting failure)	$s_{cr,sp}$		130 ⁴⁾	190	200	290	350	370
Edge distance (splitting failure)	$c_{cr,sp}$		65 ⁴⁾	95	100	145	175	185
Characteristic resistance to splitting	$N^0_{Rk,sp}$	[kN]	min { $N^0_{Rk,c}$, $N_{Rk,p}$ } ³⁾					
Concrete cone and splitting failure for reduced anchorage depth FBN II, FBN II R								
Effective anchorage depth	$h_{ef, red}$	[mm]	-. ⁵⁾	30 ⁴⁾	40	50	65	80
Factor for uncracked concrete	$k_{Ucr,N}$	[-]	11,0 ²⁾					
Spacing	$s_{cr,N}$	[mm]	3 $h_{ef, red}$					
Edge distance	$c_{cr,N}$		1,5 $h_{ef, red}$					
Spacing (splitting failure)	$s_{cr,sp}$		-. ⁵⁾	190 ⁴⁾	200	290	350	370
Edge distance (splitting failure)	$c_{cr,sp}$		-. ⁵⁾	95 ⁴⁾	100	145	175	185

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

⁴⁾ Use restricted to anchoring of structural components which are statically indeterminate

⁵⁾ No performance assessed

fischer Bolt Anchor FBN II, FBN II R

Performances
Characteristic values of **tension** resistance

Annex C 1

Appendix 9/ 11

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

Type of anchor / size		M6	M8	M10	M12	M16	M20
Installation Factor	γ_{inst} [-]	1,0					
Steel failure without lever arm for standard and reduced anchorage depth							
Characteristic resistance	$\frac{F_{B,N II}}{F_{B,N II R}} V_{Rk,s}^0$ [kN]	6,0 ²⁾	13,3	21,0	31,3	55,1	67
		5,3 ²⁾	12,8	20,3	27,4	51	86
Steel failure with lever arm for standard anchorage depth							
Characteristic bending moment	$\frac{F_{B,N II}}{F_{B,N II R}} M_{Rk,s}^0$ [Nm]	9,4 ²⁾	26,2	52,3	91,6	232,2	422
		8 ²⁾	26	52	85	216	454
Steel failure with lever arm for reduced anchorage depth							
Characteristic bending moment	$\frac{F_{B,N II}}{F_{B,N II R}} M_{Rk,s}^0$ [Nm]	- ³⁾	19,9 ²⁾	45,9	90,0	226,9	349
		- ³⁾	21 ²⁾	47	85	216	353
Partial factor steel failure	$\gamma_{Ms}^{1)}$ [-]	1,25					
Factor for ductility	k_7 [-]	1,0					
Concrete pryout failure for standard anchorage depth FBN II, FBN II R							
Factor for pryout failure	k_8 [-]	1,4	1,8	2,1	2,3	2,3	2,3
Concrete pryout failure for reduced anchorage depth FBN II, FBN II R							
Factor for pryout failure	k_8 [-]	- ³⁾	1,8	2,1	2,3	2,3	2,3
Concrete edge failure for standard anchorage depth FBN II, FBN II R							
Effective length of anchor	$l_{f,sta}$ [mm]	30 ²⁾	40	50	65	80	105
Effective diameter of anchor	d_{nom}	6	8	10	12	16	20
Concrete edge failure for reduced anchorage depth FBN II, FBN II R							
Effective length of anchor	$l_{f,red}$ [mm]	- ³⁾	30 ²⁾	40	50	65	80
Effective diameter of anchor	d_{nom}	- ³⁾	8	10	12	16	20

¹⁾ In absence of other national regulations

²⁾ Use restricted to anchoring of structural components which are statically indeterminate

³⁾ No performance assessed

fischer Bolt Anchor FBN II, FBN II R

Performances
Characteristic values of **shear** resistance

Annex C 2

Appendix 10/ 11

Table C3.1: Minimum thickness of concrete members, minimum spacing and minimum edge distance

Type of anchor / size FBN II, FBN II R			M6	M8	M10	M12	M16	M20
Standard anchorage depth	Effective anchorage depth	$h_{ef, sta}$	30 ²⁾	40	50	65	80	105
	Minimum thickness of member	h_{min}	100	100	100	120	160	200
	Minimum spacing	s_{min} [mm]	40	40	50 (70 ¹⁾)	70	90 (120 ¹⁾)	120
	Minimum edge distance	c_{min}	40	40 (45 ¹⁾)	50 (55 ¹⁾)	70	90 (80 ¹⁾)	120
Reduced anchorage depth	Effective anchorage depth	$h_{ef, red}$	- ³⁾	30 ²⁾	40	50	65	80
	Minimum thickness of member	h_{min}	- ³⁾	100	100	100	120	160
	Minimum spacing	s_{min} [mm]	- ³⁾	40 (50 ¹⁾)	50	70	90	120 (140 ¹⁾)
	Minimum edge distance	c_{min}	- ³⁾	40 (45 ¹⁾)	80	100	120	120

¹⁾ Values for FBN II R

²⁾ Use restricted to anchoring of structural components which are statically indeterminate

³⁾ No performance assessed

Table C3.2: Displacements under static and quasi static **tension** loads

Type of anchor / size FBN II, FBN II R			M6	M8	M10	M12	M16	M20
Standard anchorage depth	$h_{ef, sta}$	[mm]	30	40	50	65	80	105
Tension load C20/25	N	[kN]	2,8	6,1	8,5	12,6	17,2	25,8
Displacements	δ_{N0}	[mm]	1,9	0,6	0,9	1,5 (1,9 ¹⁾)	1,8	1,8 (2,0 ¹⁾)
	$\delta_{N\infty}$		3,1 (2,7 ¹⁾)					
Reduced anchorage depth	$h_{ef, red}$		- ²⁾	30	40	50	65	80
Tension load C20/25	N	[kN]	- ²⁾	2,8	6,1	8,5	12,6	17,2
Displacements	δ_{N0}	[mm]		0,4	0,7	0,7	0,9	1,0
	$\delta_{N\infty}$		1,6 (1,7 ¹⁾)					

¹⁾ Values for FBN II R

²⁾ No performance assessed

Table C3.3: Displacements under static and quasi static **shear** loads

Type of anchor / size FBN II, FBN II R			M6	M8	M10	M12	M16	M20
Shear load FBN II	V	[kN]	3,4	7,6	12,0	17,9	31,5	38,2
Displacements FBN II	δ_{v0}	[mm]	0,7	1,5	1,6	2,0	3,0	2,6
	$\delta_{v\infty}$		1,1	2,3	2,4	3,0	4,5	3,9
Shear load FBN II R	V	[kN]	3,0	7,3	11,6	15,7	29,1	49,0
Displacements FBN II R	δ_{v0}	[mm]	1,5	1,4	2,1	2,6	2,7	4,6
	$\delta_{v\infty}$		2,3	2,2	3,2	3,9	4,1	7,0

fischer Bolt Anchor FBN II, FBN II R

Performances

Minimum thickness of concrete members, minimum spacing and minimum edge distance
Displacements due to tension and shear loads

Annex C 3

Appendix 11/ 11



DÉCLARATION DES PERFORMANCES



No 0015 – FR

1. Code d'identification unique du produit type: **goujon d'ancrage fischer FBN II, FBN II A4**

2. Usage(s) prévu(s):

Produit	Usage(s) prévu(s)
Cheville à expansion par vissage à couple contrôlé	Cheville de fixation dans du béton non fissuré, voir annexe, en particulier annexes B 1 - B 3

3. Fabricant: **fischerwerke GmbH & Co. KG, Klaus-Fischer-Straße 1, 72178 Waldachtal, Allemagne**

4. Mandataire: --

5. Système(s) d'évaluation et de vérification de la constance des performances: **1**

6a. Norme harmonisée: ---

Organisme(s) notifié(s): ---

6b. Document d'évaluation européen: **ETAG 001; 2013-04**

Évaluation technique européenne: **ETA-07/0211; 2016-05-19**

Organisme d'évaluation technique: **DIBt**

Organisme(s) notifié(s): **1343 – MPA Darmstadt**

7. Performance(s) déclarée(s):

Résistance mécanique et stabilité (BWR 1)

Caractéristique essentielle	Performance
Valeurs caractéristiques pour des sollicitations en traction et cisaillement	Voir annexe, en particulier annexes C 1 et C 2
Distances au bord et entraxes	Voir annexe, en particulier annexes C 1 et C 2
Déplacements sous charges de traction et cisaillement	Voir annexe, en particulier annexe C 3

Protection contre le feu (BWR 2)

Caractéristique essentielle	Performance
Réaction au feu	La cheville remplit les exigences de la classe A 1
Résistance au feu	NPD

8. Documentation technique appropriée et/ou documentation technique spécifique: ---

Les performances du produit identifié ci-dessus sont conformes aux performances déclarées. Conformément au règlement (UE) no 305/2011, la présente déclaration des performances est établie sous la seule responsabilité du fabricant mentionné ci-dessus.

Signé pour le fabricant et en son nom par:

Andreas Bucher, Dipl.-Ing.

Wolfgang Hengesbach, Dipl.-Ing., Dipl.-Wirtsch.-Ing.

Tumlingen, 2016-05-25

- Cette déclaration des performances a été émise en différentes langues. En cas de divergences d'interprétation, la version anglaise prévaut toujours.

- L'annexe contient des informations volontaires et complémentaires en langue anglaise dépassant les exigences légales (spécifiées en langage neutre).

Specific Part

1 Technical description of the product

The Fischer Bolt anchor FBN II and FBN II A4 is an anchor made of zinc plated, hot-dip galvanised or stainless steel which is placed into a drilled hole and anchored by torque-controlled expansion.

Product and 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 for tension and shear loads in concrete	See Annex C 1 and C 2
Edge distances and spacing	See Annex C 1 and C 2
Displacements under tension and shear loads	See Annex C 3

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorage satisfy requirements for Class A1
Resistance to fire	No performance determined (NPD)

3.3 Safety in use (BWR 4)

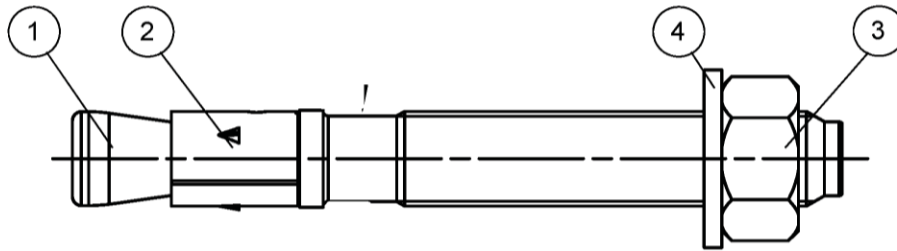
The essential characteristics regarding Safety in use are included under the Basic Works Requirement Mechanical resistance and stability.

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

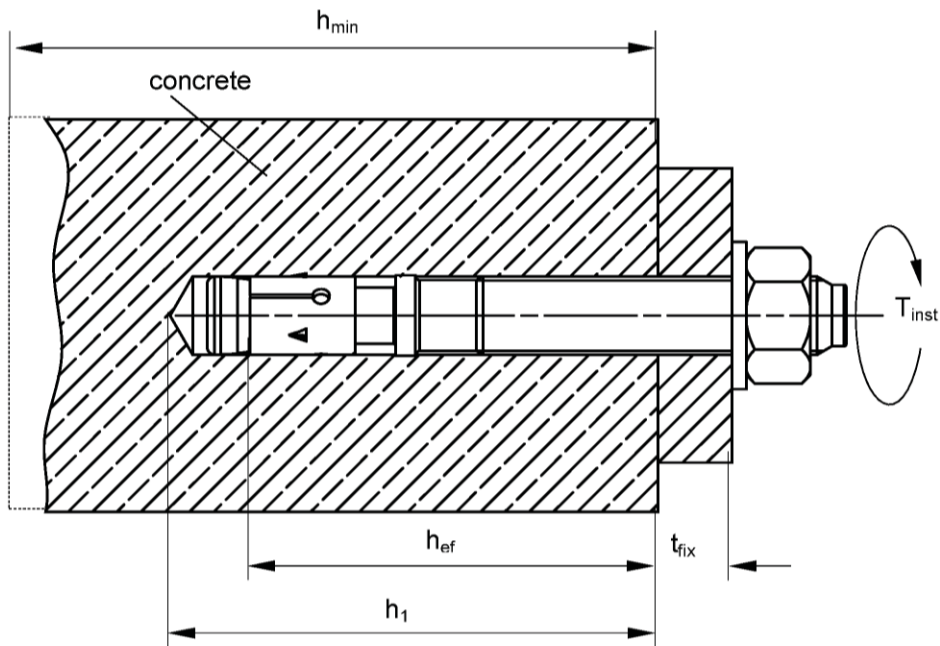
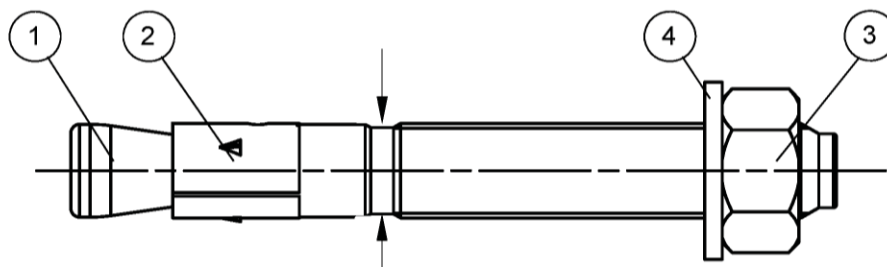
In accordance with guideline for European technical approval ETAG 001, April 2013 used as European Assessment Document (EAD) according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011 the applicable European legal act is: [96/582/EC].

The system to be applied is: 1

Cone bolt manufactured by cold - forming:



Cone bolt manufactured by turning:



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

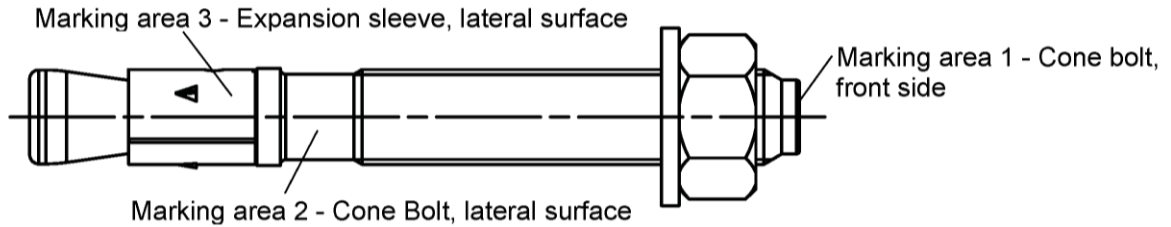
- h_{ef} = Effective anchorage depth
- t_{fix} = Thickness of fixture
- h_1 = Drill hole depth
- h_{min} = Thickness of concrete member
- T_{inst} = Required torque moment

fischer Bolt Anchor FBN II, FBN II A4

Product description
Installed condition

Annex A 1

FBN II for use with standard and reduced anchorage depth ($h_{ef, sta}$ and $h_{ef, red}$)



Product marking, example:



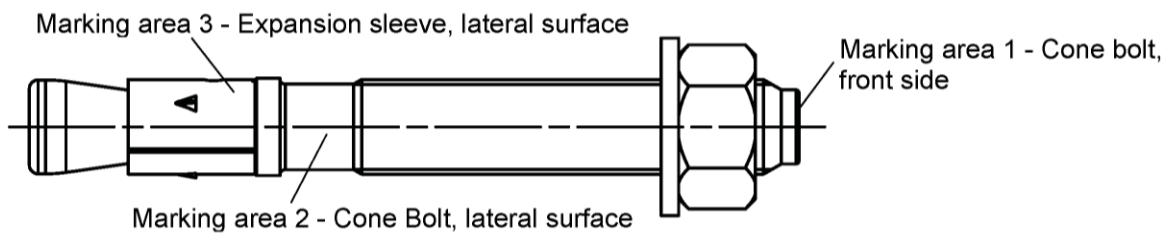
works symbol | type of anchor placed on marking area 2 or marking area 3

thread size / thickness of fixture (t_{fix}) for $h_{ef, sta}$ identification A4 placed on marking area 2

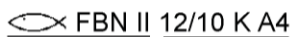
Table A1: Letter-code on marking area 1 and maximum thickness of fixture t_{fix} :

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} for $h_{ef, sta}$	M6-M20	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	120	140	160	180	200	250	300	350	400
max. t_{fix} for $h_{ef, red}$	M8, M10	15	20	25	30	35	40	45	50	55	60	70	80	90	100	110	130	150	170	190	210	260	310	360	410
	M12, 16	20	25	30	35	40	45	50	55	60	65	75	85	95	105	115	135	155	175	195	215	265	315	365	415
	M20	30	35	40	45	50	55	60	65	70	75	85	95	105	115	125	145	165	185	205	225	275	325	375	425

FBN II K for use with reduced anchorage depth only ($h_{ef, red}$):



Product marking, example:



works symbol | type of anchor placed on marking area 2 or marking area 3

thread size / thickness of fixture (t_{fix}) identification K for $h_{ef, red}$ | identification A4 placed on marking area 2

Table A2: 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} for $h_{ef, red}$	M8-M20	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	120	140	160	180	200	250	300	350	400

Identification for $h_{ef, red}$ is the letter-code between 2 hyphen

fischer Bolt Anchor FBN II, FBN II A4

Product description
Anchor Types

Annex A 2

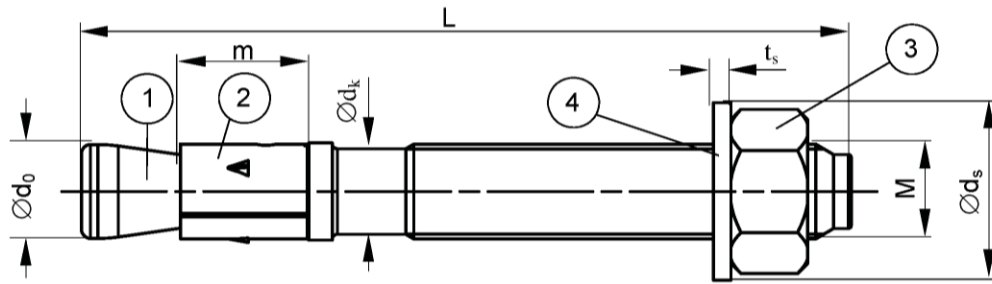


Table A3: Anchor dimensions [mm]

Part	Designation		FBN II, FBN II A4						
			M6	M8	M10	M12	M16	M20	
1	Cone bolt	M	=	M6	M8	M10	M12	M16	M20
		Ø d ₀	=	5,9	7,9	9,9	11,9	15,9	19,6
		Ø d _k	=	5,2	7,1	8,9	10,8	14,5	18,2
2	Expansion sleeve	m	=	10	11,5	13,5	16,5	21,5	33,5
3	Hexagon nut	SW	=	10	13	17	19	24	30
4	Washer	t _s	≥	1,0	1,4	1,8	2,3	2,7	2,7
		Ø d _s	≥	11,5	15	19	23	29	36
Thickness of fixture		t _{fix}	≥	0	0	0	0	0	0
			≤	200	200	250	300	400	500
Length of anchor		L _{min}	-	45	56	71	86	120	139
		L _{max}	-	245	261	316	396	520	654

fischer Bolt Anchor FBN II, FBN II A4

Product description
Anchor dimensions

Annex A 3

Table A4: Materials FBN II (zinc plated $\geq 5\mu\text{m}$, DIN EN ISO 4042: 2001-01)

Part	Designation	Material
1	Cone bolt	Cold form steel or free cutting steel Nominal steel tensile strength $f_{uk} \leq 1000 \text{ N/mm}^2$ Nominal yield strength FBN II 8 - 16 $f_{yk} \geq 560 \text{ N/mm}^2$ ¹⁾
2	Expansion sleeve	Cold strip, EN 10139:2013 ²⁾
3	Hexagon nut	Steel, property class min. 8, EN ISO 898-2:2012
4	Washer	Cold strip, EN 10139:2013

¹⁾ FBN II 6 $f_{yk} \geq 480 \text{ N/mm}^2$, FBN II 20 $f_{yk} \geq 520 \text{ N/mm}^2$

²⁾ Optional stainless steel EN 10088:2014

Table A5: Materials FBN II (hot-dip galvanized $\geq 50\mu\text{m}$, ISO 10684: 2004 ²⁾)

Part	Designation	Material
1	Cone bolt	Cold form steel or free cutting steel Nominal steel tensile strength $f_{uk} \leq 1000 \text{ N/mm}^2$ Nominal yield strength FBN II 8 - 16 $f_{yk} \geq 560 \text{ N/mm}^2$ ¹⁾
2	Expansion sleeve	Stainless steel EN 10088:2014
3	Hexagon nut	Steel, property class min. 8, EN ISO 898-2:2012
4	Washer	Cold strip, EN 10139:2013

¹⁾ FBN II 6 $f_{yk} \geq 480 \text{ N/mm}^2$, FBN II 20 $f_{yk} \geq 520 \text{ N/mm}^2$

²⁾ Alternative method sherardized $\geq 50 \mu\text{m}$, EN 13811:2003

Table A6: Materials FBN II A4

Part	Designation	Material
1	Cone bolt	Stainless steel EN 10088:2014 Nominal steel tensile strength $f_{uk} \leq 1000 \text{ N/mm}^2$ Nominal yield strength FBN II 8 - 20 $f_{yk} \geq 560 \text{ N/mm}^2$ ¹⁾
2	Expansion sleeve	Stainless steel EN 10088:2014
3	Hexagon nut	Stainless steel EN 10088:2014 ISO 3506-2: 2009; property class min. 70
4	Washer	Stainless steel EN 10088:2014

¹⁾ FBN II 6 $f_{yk} \geq 480 \text{ N/mm}^2$

fischer Bolt Anchor FBN II, FBN II A4

Product description
Materials

Annex A 4

Specifications of intended use

fischer Bolt Anchor FBN II, FBN II A4		M6	M8	M10	M12	M16	M20
Material	Steel	Zinc plated		✓			
		Hot-dip galvanized		-	✓		
	Stainless steel	A4		✓			
Static and quasi-static loads				✓			
Reduced anchorage depth		-			✓		
Uncracked concrete				✓			

Base materials:

- Reinforced and unreinforced normal weight concrete according to EN 206-1:2000
- Strength classes C20/25 to C50/60 according to EN 206-1:2000

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions (FBN II (zinc plated / hot-dip galvanized), FBN II A4)
- Structures subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal condition, if no particular aggressive conditions exist (FBN II A4). Such particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used)

Design:

- Anchorages 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.)
- Anchorages under static or quasi-static actions are to be designed in accordance with:
 - ETAG 001, Annex C, design method A, Edition August 2010 or
 - CEN/TS 1992-4:2009, design method A

Installation:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site
- Hammer or hollow drilling according to Annex B3
- 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 and only if the hole is not in the direction of the oblique tensile or shear load

fischer Bolt Anchor FBN II, FBN II A4

Intended Use
Specifications

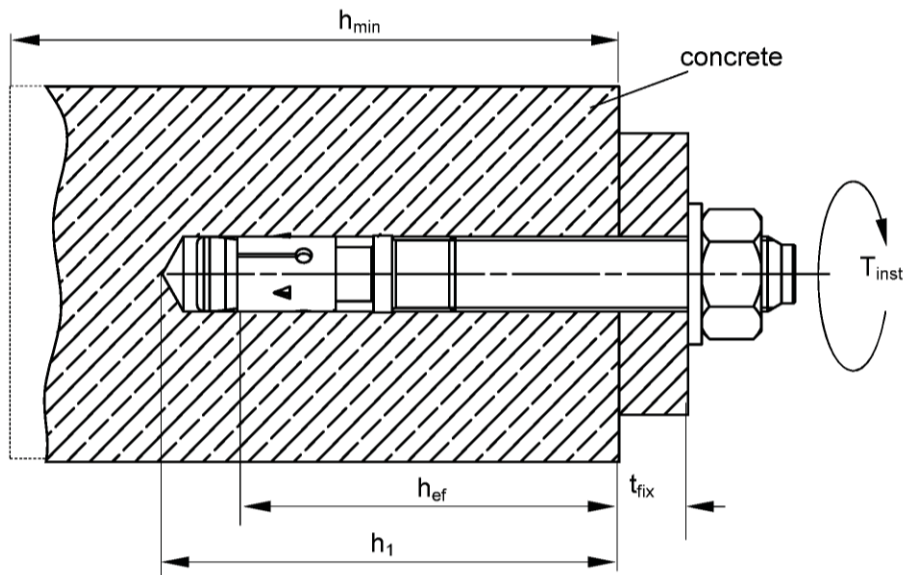
Annex B 1

Table B1: Installation parameters

Type of anchor / size FBN II, FBN II A4		M6	M8	M10	M12	M16	M20
Nominal drill hole diameter	$d_0 =$ [mm]	6	8	10	12	16	20
Cutting diameter of drill bit	$d_{cut} \leq$ [mm]	6,45	8,45	10,45	12,5	16,5	20,55
Effective anchorage depth	$h_{ef} =$ [mm]	30 ²⁾	40 (30 ¹⁾²⁾	50 (40 ¹⁾)	65 (50 ¹⁾)	80 (65 ¹⁾)	105 (80 ¹⁾)
Depth of drill hole in concrete	$h_1 \geq$ [mm]	40	56 (46 ¹⁾²⁾)	68 (58 ¹⁾)	85 (70 ¹⁾)	104 (89 ¹⁾)	135 (110 ¹⁾)
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	7	9	12	14	18	22
Required torque moment FBN II (zinc plated)	$T_{inst} =$ [Nm]	4	15	30	50	100	200
Required torque moment FBN II (hot-dip galvanized)	$T_{inst} =$ [Nm]	-	15	30	40	70	200
Required torque moment FBN II A4	$T_{inst} =$ [Nm]	4	10	20	35	80	150

¹⁾ Values for reduced anchorage depth

²⁾ Use restricted to anchoring of structural components which are statically indeterminate



- h_{ef} = Effective anchorage depth
- t_{fix} = Thickness of fixture
- h_1 = Drill hole depth
- h_{min} = Thickness of concrete member
- T_{inst} = Required torque moment

fischer Bolt Anchor FBN II, FBN II A4

Intended Use
Installation instructions

Annex B 2

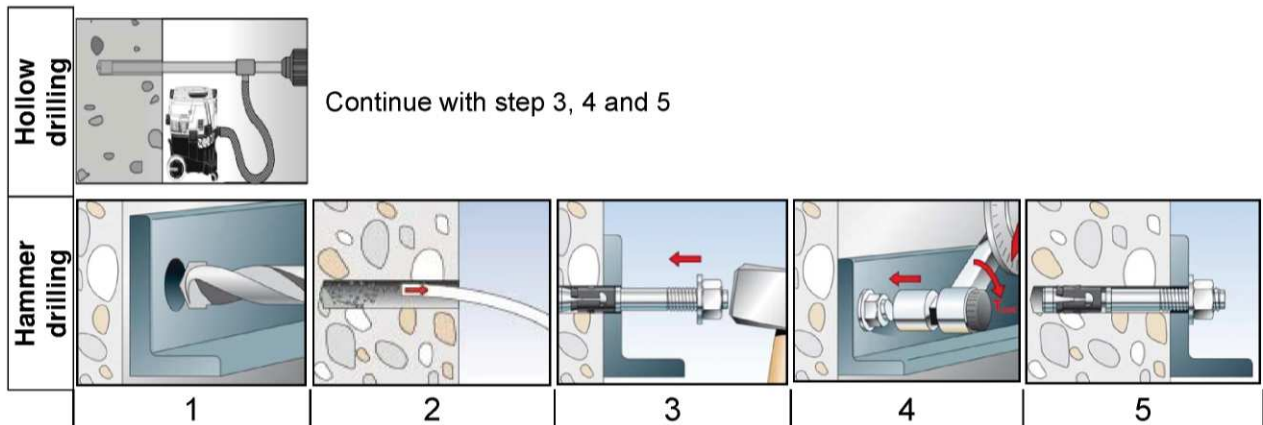
Table B2: Minimum thickness of concrete members, minimum spacing and minimum edge distance

Type of anchor / size FBN II, FBN II A4			M6	M8	M10	M12	M16	M20
Standard anchorage depth	Effective anchorage depth	$h_{ef, sta}$ [mm]	30 ²⁾	40	50	65	80	105
	Minimum thickness of member	h_{min} [mm]	100	100	100	120	160	200
	Minimum spacing	s_{min} [mm]	40	40	50 (70 ¹⁾)	70	90 (120 ¹⁾)	120
	Minimum edge distance	c_{min} [mm]	40	40 (45 ¹⁾)	50 (55 ¹⁾)	70	90 (80 ¹⁾)	120
Reduced anchorage depth	Effective anchorage depth	$h_{ef, red}$ [mm]	-	30 ²⁾	40	50	65	80
	Minimum thickness of member	h_{min} [mm]	-	100	100	100	120	160
	Minimum spacing	s_{min} [mm]	-	40 (50 ¹⁾)	50	70	90	120 (140 ¹⁾)
	Minimum edge distance	c_{min} [mm]	-	40 (45 ¹⁾)	80	100	120	120

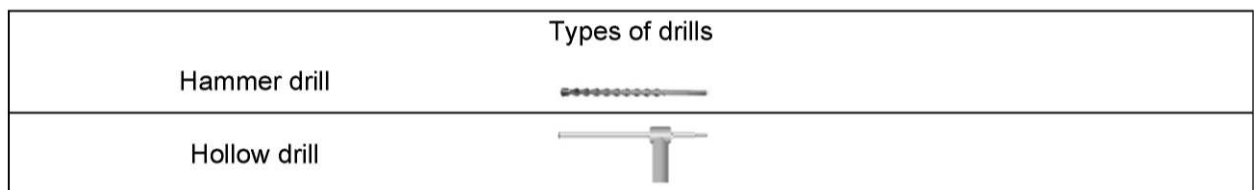
¹⁾ Values for FBN II A4

²⁾ Use restricted to anchoring of structural components which are statically indeterminate

Installation instructions



No.	Description	
1	Create drill hole with hammer drill	Create drill hole with hollow drill and vacuum cleaner
2	Clean bore hole	-
3	Set anchor	
4	Expand anchor with prescribed installation torque T_{inst}	
5	Finished installation	



fischer Bolt Anchor FBN II, FBN II A4

Intended Use
Minimum spacing and edge distance
Installation instructions

Annex B 3

Table C1: Characteristic values of **tension** resistance for **standard and reduced anchorage depth** under static and quasi-static action (Design method A, according to **ETAG 001, Annex C** or **CEN/TS 1992-4:2009**)

Type of anchor / size			M6	M8	M10	M12	M16	M20
Steel failure for standard and reduced anchorage depth FBN II								
Characteristic resistance FBN II	$N_{Rk,s}$	[kN]	8,3	16,5	27,2	41,6	77,9	107
Partial safety factor	γ_{Ms}	[-]	1,5	1,4	1,4	1,4	1,5	1,5
Steel failure for standard and reduced anchorage depth FBN II A4								
Characteristic resistance FBN II A4	$N_{Rk,s}$	[kN]	10,6	16,5	27,2	41,6	78	111
Partial safety factor	γ_{Ms}	[-]	1,5	1,4	1,4	1,4	1,4	1,5
Pullout failure for standard anchorage depth FBN II, FBN II A4								
Characteristic resistance C20/25	$N_{Rk,p}$	[kN]	6 ⁴⁾	- ³⁾				
Pullout failure for reduced anchorage depth FBN II, FBN II A4								
Characteristic resistance C20/25	$N_{Rk,p}$	[kN]	-	6 ⁴⁾	- ³⁾			
Increasing factors for $N_{Rk,p}$	ψ_c	C25/30	1,10					
		C30/37	1,22					
		C35/45	1,34					
		C40/50	1,41					
		C45/55	1,48					
		C50/60	1,55					
Installation safety factor	$\gamma_2^{1)} = \gamma_{inst}^{2)}$	[-]	1,0					
Concrete cone and splitting failure for standard anchorage depth FBN II, FBN II A4								
Effective anchorage depth	$h_{ef, sta}$	[mm]	30 ⁴⁾	40	50	65	80	105
Factor for uncracked concrete	$k_{ucr}^{2)}$	[-]	10,1					
Spacing	$s_{cr,N}$	[mm]	3 $h_{ef, sta}$					
Edge distance	$c_{cr,N}$	[mm]	1,5 $h_{ef, sta}$					
Spacing (splitting failure)	$s_{cr,sp}$	[mm]	130 ⁴⁾	190	200	290	350	370
Edge distance (splitting failure)	$c_{cr,sp}$	[mm]	65 ⁴⁾	95	100	145	175	185
Concrete cone and splitting failure for reduced anchorage depth FBN II, FBN II A4								
Effective anchorage depth	$h_{ef, red}$	[mm]	-	30 ⁴⁾	40	50	65	80
Factor for uncracked concrete	$k_{ucr}^{2)}$	[-]	10,1					
Spacing	$s_{cr,N}$	[mm]	3 $h_{ef, red}$					
Edge distance	$c_{cr,N}$	[mm]	1,5 $h_{ef, red}$					
Spacing (splitting failure)	$s_{cr,sp}$	[mm]	-	190 ⁴⁾	200	290	350	370
Edge distance (splitting failure)	$c_{cr,sp}$	[mm]	-	95 ⁴⁾	100	145	175	185

¹⁾ Parameter relevant for design according to ETAG 001, Annex C

²⁾ Parameter relevant for design according to CEN/TS 1992-4:2009

³⁾ Pullout failure not relevant

⁴⁾ Use restricted to anchoring of structural components which are statically indeterminate

fischer Bolt Anchor FBN II, FBN II A4

Performances

Characteristic values of tension resistance for standard and reduced anchorage depth

Annex C 1

Table C2: Characteristic values of **shear resistance** for **standard and reduced anchorage depth** under static and quasi-static action (Design method A, according to **ETAG 001, Annex C** or **CEN/TS 1992-4:2009**)

Type of anchor / size			M6	M8	M10	M12	M16	M20
Steel failure without lever arm for standard and reduced anchorage depth								
Charact. resistance FBN II	$V_{Rk,s}$	[kN]	6,0	13,3	21,0	31,3	55,1	67
Steel failure without lever arm for standard and reduced anchorage depth								
Charact. resistance FBN II A4	$V_{Rk,s}$	[kN]	5,3	12,8	20,3	27,4	51	86
Steel failure with lever arm for standard anchorage depth								
Charact. bending moment FBN II	$M^0_{Rk,s}$	[Nm]	9,4 ³⁾	26,2	52,3	91,6	232,2	422
Steel failure with lever arm for standard anchorage depth								
Charact. bending moment FBN II A4	$M^0_{Rk,s}$	[Nm]	8 ³⁾	26	52	85	216	454
Steel failure with lever arm for reduced anchorage depth								
Charact. bending moment FBN II	$M^0_{Rk,s}$	[Nm]	-	19,9 ³⁾	45,9	90,0	226,9	349
Steel failure with lever arm for reduced anchorage depth								
Charact. bending moment FBN II A4	$M^0_{Rk,s}$	[Nm]	-	21 ³⁾	47	85	216	353
Partial safety factor steel failure	γ_{Ms}	[-]	1,25					
Factor for ductility	$k_2^{2)}$	[-]	1,0					
Concrete pryout failure for standard anchorage depth FBN II, FBN II A4								
Factor k according to ETAG 001, Annex C or k_3 according to CEN/TS 1992-4	$k^1=k_{(3)}^{2)}$	[-]	1,4 ³⁾	1,8	2,1	2,3	2,3	2,3
Installation safety factor	$\gamma_2^1 = \gamma_{inst}^{2)}$	[-]	1,0					
Concrete pryout failure for reduced anchorage depth FBN II, FBN II A4								
Factor k according to ETAG 001, Annex C or k_3 according to CEN/TS 1992-4	$k^1=k_{(3)}^{2)}$	[-]	-	1,8 ³⁾	2,1	2,3	2,3	2,3
Installation safety factor	$\gamma_2^1 = \gamma_{inst}^{2)}$	[-]	1,0					
Concrete edge failure for standard anchorage depth FBN II, FBN II A4								
Effective length of anchor	$l_{f,sta}$	[mm]	30 ³⁾	40	50	65	80	105
Effective diameter of anchor	d_{nom}	[mm]	6	8	10	12	16	20
Installation safety factor	$\gamma_2^1 = \gamma_{inst}^{2)}$	[-]	1,0					
Concrete edge failure for reduced anchorage depth FBN II, FBN II A4								
Effective length of anchor	$l_{f,red}$	[mm]	-	30 ³⁾	40	50	65	80
Effective diameter of anchor	d_{nom}	[mm]	-	8	10	12	16	20
Installation safety factor	$\gamma_2^1 = \gamma_{inst}^{2)}$	[-]	1,0					

¹⁾ Parameter relevant for design according to ETAG 001, Annex C

²⁾ Parameter relevant for design according to CEN/TS 1992-4:2009

³⁾ Use restricted to anchoring of structural components which are statically indeterminate

fischer Bolt Anchor FBN II, FBN II A4

Performances

Characteristic values of shear resistance for standard and reduced anchorage depth

Annex C 2

Table C3: Displacements due to tension loads

Type of anchor / size FBN II, FBN II A4			M6	M8	M10	M12	M16	M20
Standard anchorage depth	$h_{ef, sta}$	[mm]	30	40	50	65	80	105
Tension load C20/25	N	[kN]	2,8	6,1	8,5	12,6	17,2	25,8
Displacements	δ_{N0}	[mm]	1,9	0,6	0,9	1,5 (1,9 ¹⁾)	1,8	1,8 (2,0 ¹⁾)
	$\delta_{N\infty}$	[mm]	3,1 (2,7 ¹⁾)					
Reduced anchorage depth	$h_{ef, red}$	[mm]	-	30	40	50	65	80
Tension load C20/25	N	[kN]		2,8	6,1	8,5	12,6	17,2
Displacements	δ_{N0}	[mm]		0,4	0,7	0,7	0,9	1,0
	$\delta_{N\infty}$	[mm]		1,6 (1,7 ¹⁾)				

¹⁾ Values for FBN II A4

Table C4: Displacements due to shear loads

Type of anchor / size FBN II, FBN II A4			M6	M8	M10	M12	M16	M20
Shear load FBN II	V	[kN]	3,4	7,6	12,0	17,9	31,5	38,2
Displacements FBN II	δ_{V0}	[mm]	0,7	1,5	1,6	2,0	3,0	2,6
	$\delta_{V\infty}$	[mm]	1,1	2,3	2,4	3,0	4,5	3,9
Shear load FBN II A4	V	[kN]	3,0	7,3	11,6	15,7	29,1	49,0
Displacements FBN II A4	δ_{V0}	[mm]	1,5	1,4	2,1	2,6	2,7	4,6
	$\delta_{V\infty}$	[mm]	2,3	2,2	3,2	3,9	4,1	7,0

fischer Bolt Anchor FBN II, FBN II A4

Performances
Displacement under tension and shear loads

Annex C 3



DÉCLARATION DES PERFORMANCES



DoP: 0098

pour goujon d'ancrage fischer FBN II HDG (Chevilles métalliques pour utilisation dans le béton à durée de vie variable (capacité de charge élevée)) – FR

1. Code d'identification unique du produit type: **DoP: 0098**
2. Usage(s) prévu(s): **Cheville de fixation dans du béton non fissuré, voir annexe, en particulier annexes B 1 - B 5**
3. Fabricant: **fischerwerke GmbH & Co. KG, Klaus-Fischer-Straße 1, 72178 Waldachtal, Allemagne**
4. Mandataire: --
5. Système(s) d'évaluation et de vérification de la constance des performances: **1**
6. Document d'évaluation européen: **EAD 331612-00-0601**

Évaluation technique européenne: **ETA-18/0101; 2018-07-16**

Organisme d'évaluation technique: **ETA-Danmark A/S**

Organisme(s) notifié(s): **1343 – MPA Darmstadt**

7. Performance(s) déclarée(s):

Résistance mécanique et stabilité (BWR 1), Sécurité pendant l'utilisation (BWR 4)

- **Caractéristiques essentielles: Voir annexe, en particulier annexes C 1 - C 2**

Protection contre le feu (BWR 2)

- **Caractéristiques essentielles: NP**

Hygiène, santé et protection de l'environnement (BWR 3)

- **Contenu, émission et / ou libération de substances dangereuses: Le DEE n'ayant pas de critères d'évaluation, aucune évaluation n'est possible.**

Utilisation durable de ressources naturelles (BWR 7)

- **Caractéristiques essentielles: Le DEE n'ayant pas de critères d'évaluation, aucune évaluation n'est possible.**

8. Documentation technique appropriée et/ou documentation technique spécifique: ---

Les performances du produit identifié ci-dessus sont conformes aux performances déclarées. Conformément au règlement (UE) no 305/2011, la présente déclaration des performances est établie sous la seule responsabilité du fabricant mentionné ci-dessus.

Signé pour le fabricant et en son nom par:

Andreas Bucher, Dipl.-Ing.

Wolfgang Hengesbach, Dipl.-Ing., Dipl.-Wirtsch.-Ing.

Tumlingen, 2018-07-23

- Cette déclaration des performances a été émise en différentes langues. En cas de divergences d'interprétation, la version anglaise prévaut toujours.
- L'annexe contient des informations volontaires et complémentaires en langue anglaise dépassant les exigences légales (spécifiées en langage neutre).

II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product and intended use

Technical description of the product

The Fischer Bolt anchor FBN II HDG is an anchor made of zinc plated, hot-dip galvanised steel which is placed into a drilled hole and anchored by torque controlled expansion. The thickness of the corrosion protection layer is minimum 40 µm with a batch average of minimum 50 µm

Product and product description is given in Annex A.

The characteristic material values, dimensions and tolerances of the anchors not indicated in Annexes shall correspond to the respective values laid down in the technical documentation of this European Technical Assessment.

The anchors are intended to be used with embedment depth given in Annex B, Table B1. The intended use specifications of the product are detailed in the Annex B1.

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 as given in Annex B depending on the corrosion protection.

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):

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

Safety in case of fire (BWR 2):

No Performance assessed.

Hygiene, health and the environment (BWR3):

Regarding the dangerous substances contained in this European Technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

Safety in use (BWR4):

For basic requirement Safety in use the same criteria are valid for Basic Requirement Mechanical resistance and stability (BWR1).

Sustainable use of natural resources (BWR7)

No performance determined

Other Basic Requirements are not relevant.

3.2 Methods of assessment

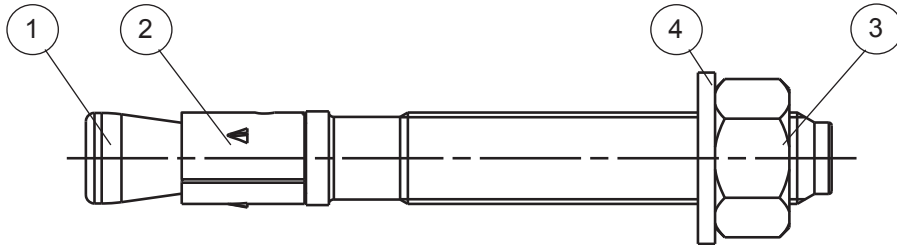
The assessment of fitness of the anchor for the intended use in relation to the requirements for mechanical resistance and stability and safety in use in the sense of the Basic Works Requirements 1 and 4 has been made in accordance with EAD 330232-00-0601; Mechanical fasteners for use in concrete and EAD 331612-00-0601 Torque controlled mechanical wedge anchor with variable working life.

4 Assessment and verification of constancy of performance (AVCP)

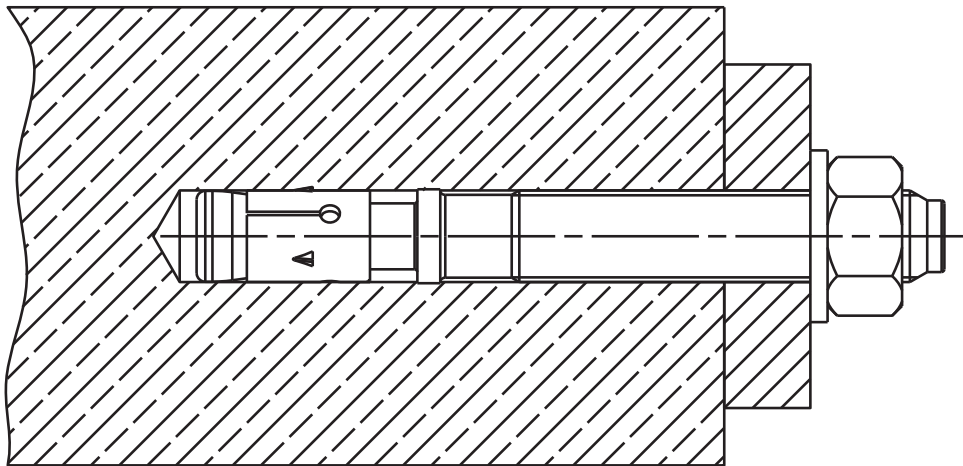
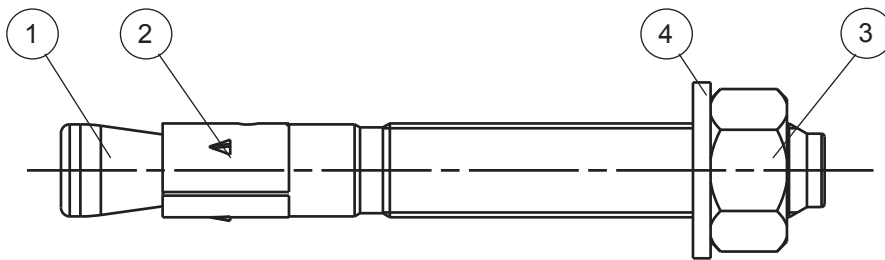
4.1 AVCP system

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:



Cone bolt manufactured by turning:



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

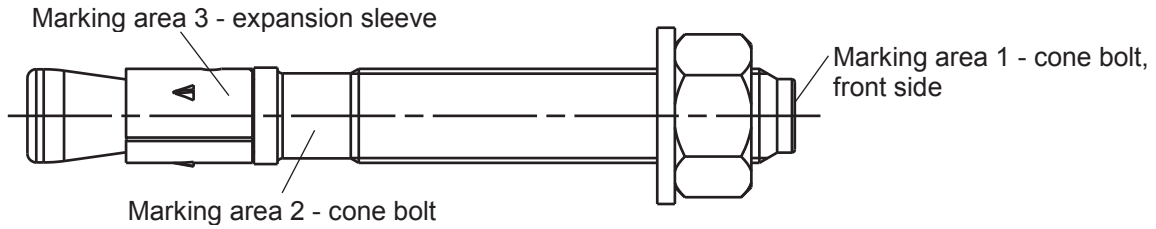
(Fig. not to scale)

fischer Bolt Anchor hot-dip galvanised FBN II HDG

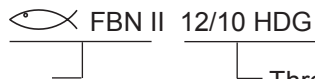
Product description
Installed condition

Annex A1
of European
Technical Assessment
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FBN II HDG for use with standard and reduced embedment depth ($h_{ef, sta}$ and $h_{ef, red}$)



Product label, example:



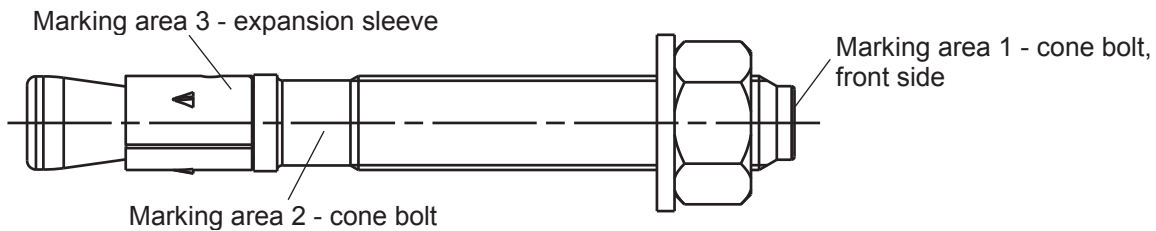
Brand | type of fastener placed at marking area 2 or marking area 3

Thread Size / max. thickness of fixture (t_{fix}) for $h_{ef, sta}$ placed at marking area 2

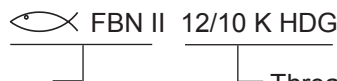
Table A2.1: Letter-code on marking area 1 and maximum thickness of fixture t_{fix} :

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} for $h_{ef, sta}$	M8-M20	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	120	140	160	180	200	250	300	350	400
Max. t_{fix} for $h_{ef, red}$	M8, M10	15	20	25	30	35	40	45	50	55	60	70	80	90	100	110	130	150	170	190	210	260	310	360	410
	M12, M16	20	25	30	35	40	45	50	55	60	65	75	85	95	105	115	135	155	175	195	215	265	315	365	415
	M20	30	35	40	45	50	55	60	65	70	75	85	95	105	115	125	145	165	185	205	225	275	325	375	425

FBN II K HDG for use with reduced embedment depth only ($h_{ef, red}$):



Product label, example:



Brand | type of fastener placed at marking area 2 or marking area 3

Thread Size / max. thickness of fixture (t_{fix}) identification K for $h_{ef, red}$ placed at marking area 2

Table A2.2: 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} for $h_{ef, red}$	M8-M20	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	120	140	160	180	200	250	300	350	400

(Fig. not to scale)

fischer Bolt Anchor hot-dip galvanised FBN II HDG	Annex A2 of European Technical Assessment ETA-18/0101
Product description Anchor types	

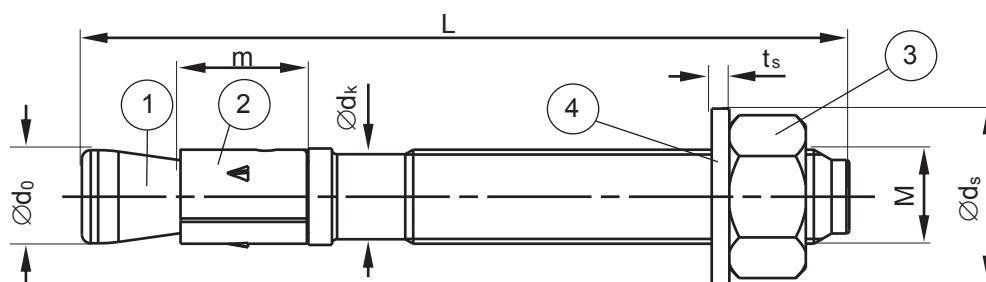


Table A3.1: Anchor dimensions [mm]

Part	Designation	M8	M10	M12	M16	M20	
1	Cone bolt	$\varnothing d_0$	7,9	9,9	11,9	15,9	19,6
		$\varnothing d_k$	7,1	8,9	10,8	14,5	18,2
		$L_{min} \geq$	56	71	86	120	139
		$L_{max} \leq$	261	316	396	520	654
2	Expansion sleeve	m	11,5	13,5	16,5	21,5	33,5
3	Hexagon nut	Wrench Size	13	17	19	24	30
4	Washer	$t_s \geq$	1,4	1,8	2,3	2,7	2,7
		$\varnothing d_s \geq$	15	19	23	29	36

Table A3.2: Materials

Part	Designation	Material
1	Cone bolt	Cold form steel or free cutting steel ¹⁾
2	Expansion sleeve	Stainless steel acc. to EN 10088
3	Hexagon nut	Steel, property class 8 ¹⁾
4	Washer	Cold strip ^{1) 2)}

¹⁾ Hot-dip galvanised $\geq 50 \mu\text{m}$, according to EN ISO 10684: 2011

²⁾ Alternative mechanical plated $\geq 53 \mu\text{m}$, according to EN ISO 12683: 2005

(Fig. not to scale)

fischer Bolt Anchor hot-dip galvanised FBN II HDG

Product description
Anchor dimensions
Materials

Annex A3
of European
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Specifications of intended use

fischer Bolt Anchor hot-dip galvanised FBN II HDG	M8	M10	M12	M16	M20
Static and quasi-static loads			✓		
Standard embedment depth			✓		
Reduced embedment depth			✓		
Uncracked concrete			✓		

Base materials:

- Normal weight concrete (uncracked) according to EN 206-1: 2000
- Strength classes C20/25 to C50/60 according to EN 206-1: 2000

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions and to external atmospheric Classification of atmospheric corrosivity, determination and estimation C1 – CX according to EAD 331612-00-0601

Design:

- Anchorages 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 FprEN 1992-4: 2016 and EOTA Technical Report TR 055

Installation:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site
- Hammer or hollow drilling according to Annex B5

Durability:

- Variable working life according to EAD 331612-00-0601

Table B1.1: Durability of hot dip galvanised **coatings** according to EN ISO 10684: 2011-09 for coatings with mean thickness of minimum 50 µm

Corrosivity category	Corrosivity	Durability
		Thickness according to EN ISO 10684: 2011 chapter 8.3 ≥ 50µm in average Durability [years]
C1	Very low	50 ¹⁾
C2	Low	50 ¹⁾
C3	Medium	25
C4	High	12,5
C5	Very high	5
CX	Extreme	2

¹⁾ Durability of coating thickness. Working life of fastener according to EAD 330232-00-0601 section 1.2.2 (limited to 50 years)

fischer Bolt Anchor hot-dip galvanised FBN II HDG	Annex B1 of European Technical Assessment ETA-18/0101
Intended use Specification	

Table B2.1 Description of typical atmospheric environments **indoor** related to the estimation of corrosivity categories according to ISO 9223-2012-02 Table C.1 and the corresponding durability categories according to EAD-330232-00-0601 chapter 2.2.12 a (1) – (3)

Corrosivity category	Corrosivity	Typical environments – Examples	
		Indoor	EAD-330232 chapter 2.2.12 a
C1	Very low	Heated spaces with low relative humidity and insignificant pollution, e.g. offices, schools, museums	(1)
C2	Low	Unheated spaces with varying temperature and relative humidity. Low frequency of condensation and low pollution, e.g. storage, sport halls	(1)
C3	Medium	Spaces with moderate frequency of condensation and moderate pollution from production process, e.g. food-processing plants, laundries, breweries, dairies	(2)
C4	High	Spaces with high frequency of condensation and high pollution from production process, e.g. industrial processing plants, swimming pools	(2)
C5	Very high	Spaces with very high frequency of condensation and/or high pollution from production process, e.g. mines, caverns for industrial purposes, unventilated sheds in subtropical and tropical zones	(3)
CX	Extreme	Spaces with almost permanent condensation or extensive periods of exposure to extreme humidity effects and/or high pollution from production process, e.g. unventilated sheds in humid tropical zones with penetration of outdoor pollution including airborne chlorides and corrosion-stimulating particulate matter	(3)

fischer Bolt Anchor hot-dip galvanised FBN II HDG

Intended use
Specification

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Table B3.1 Description of typical atmospheric environments **outdoor** related to the estimation of corrosivity categories according to ISO9223-2012-02 Table C.1 and the corresponding durability categories according to EAD-330232-00-0601 chapter 2.2.12 a (1) – (3)

Corrosivity category	Corrosivity	Typical environments – Examples	
		Outdoor	EAD-330232 chapter 2.2.12 a
C1	Very low	Dry or cold zone, atmospheric environment with very low pollution and time of wetness, e.g. certain deserts, Central Arctic/Antarctica	(2)
C2	Low	Temperate zone, atmospheric environment with low pollution (SO ₂ < 5 µg/m ³), e.g. rural areas, small towns Dry or cold zone, atmospheric environment with short time of wetness, e.g. deserts, subarctic areas	(2)
C3	Medium	Temperate zone, atmospheric environment with medium pollution (SO ₂ : 5 µg/m ³ to 30 µg/m ³) or some effect of chlorides, e.g. urban areas, coastal areas with low deposition of chlorides Subtropical and tropical zone, atmosphere with low pollution	(2)
C4	High	Temperate zone, atmospheric environment with high pollution (SO ₂ : 30 µg/m ³ to 90 µg/m ³) or substantial effect of chlorides, e.g. polluted urban areas, industrial areas, coastal areas without spray of salt water or, exposure to strong effect of de-icing salts Subtropical and tropical zone, atmosphere with medium pollution	(2)
C5	Very high	Temperate and subtropical zone, atmospheric environment with very high pollution (SO ₂ : 90 µg/m ³ to 250 µg/m ³) and/or significant effect of chlorides, e.g. industrial areas, coastal areas, sheltered positions on coastline	(3)
CX	Extreme	Subtropical and tropical zone (very high time of wetness), atmospheric environment with very high SO ₂ pollution (higher than 250 µg/m ³) including accompanying and production factors and/or strong effect of chlorides, e.g. extreme industrial areas, coastal and offshore areas, occasional contact with salt spray	(3)

fischer Bolt Anchor hot-dip galvanised FBN II HDG

Intended use
Specification

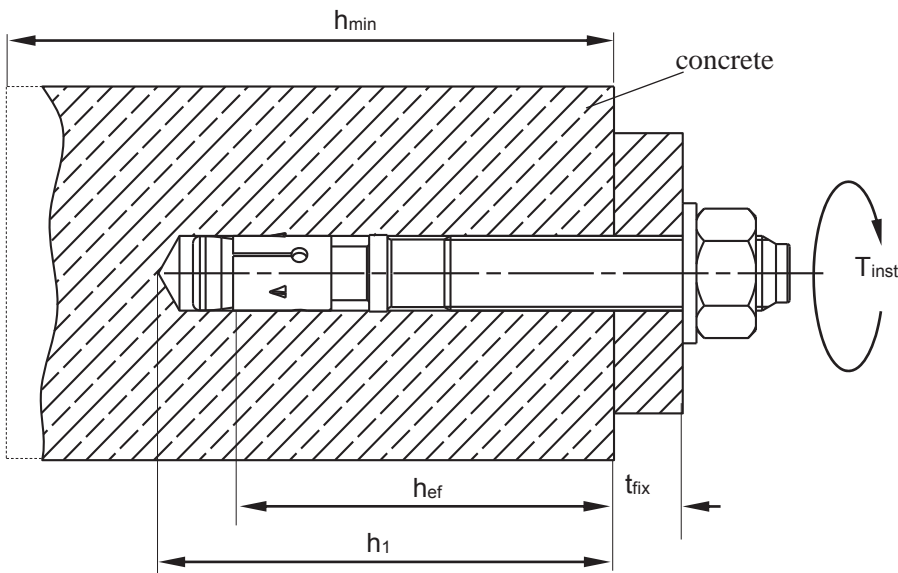
Annex B3
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ETA-18/0101

Table B5.1: Installation parameters

Size	M8	M10	M12	M16	M20
Nominal drill hole diameter d_0	8	10	12	16	20
Maximum diameter of drill bit $d_{cut} \leq$	8,45	10,45	12,5	16,5	20,55
Effective embedment depth $h_{ef} \geq$ [mm]	40 (30 ^{1) 2)}	50 (40 ¹⁾)	65 (50 ¹⁾)	80 (65 ¹⁾)	105 (80 ¹⁾)
Depth of drill hole to deepest point $h_1 \geq$	56 (46 ^{1) 2)}	68 (58 ¹⁾)	85 (70 ¹⁾)	104 (89 ¹⁾)	135 (110 ¹⁾)
Diameter of clearance hole in the fixture $d_f \leq$	9	12	14	18	22
Required setting torque T_{inst} [Nm]	15	30	40	70	200

¹⁾ Only for reduced embedment depth

²⁾ Use restricted to anchoring of structural components which are statically indeterminate



- h_{ef} = Effective embedment depth
- t_{fix} = Thickness of 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)

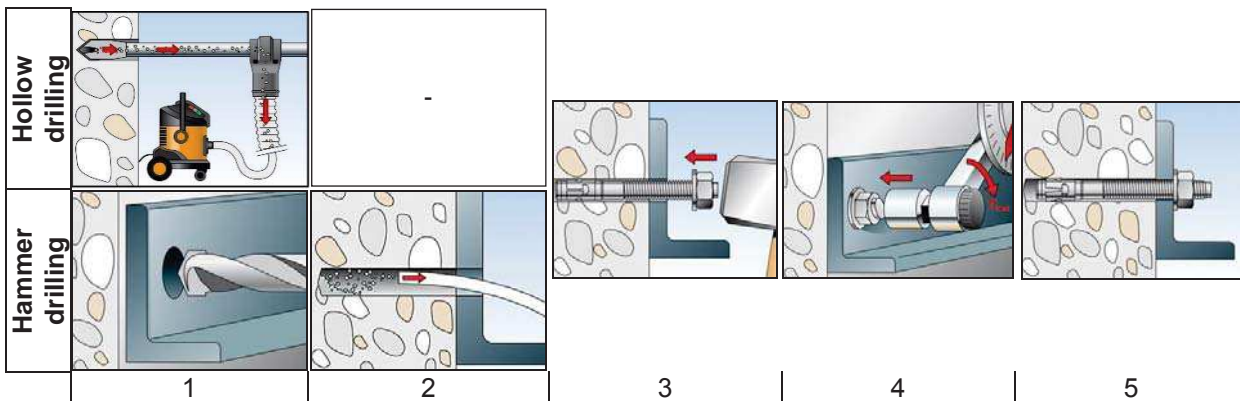
fischer Bolt Anchor hot-dip galvanised FBN II HDG	Annex B4 of European Technical Assessment ETA-18/0101
Intended use Installation parameters	

Table B6.1: Minimum thickness of concrete members, minimum spacing and minimum edge distance

Size		M8	M10	M12	M16	M20
Standard embedment depth	Effective embedment depth $h_{ef, sta}$	40	50	65	80	105
	Minimum thickness of member h_{min}	100	100	120	160	200
	Minimum spacing s_{min}	40	50	70	90	120
	Minimum edge distance c_{min}	40	50	70	90	120
Reduced embedment depth	Effective embedment depth $h_{ef, red}$	30 ¹⁾	40	50	65	80
	Minimum thickness of member h_{min}	100	100	100	120	160
	Minimum spacing s_{min}	40	50	70	90	120
	Minimum edge distance c_{min}	40	80	100	120	120

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

Installation instructions



No.	Description	
1	Create drill hole with hammer drill	Create drill hole with hollow drill and vacuum cleaner
2	Clean bore hole	-
3	Set anchor	
4	Expand anchor with prescribed installation torque T_{inst}	
5	Finished installation	

Types of drills	
Hammer drill	
Hollow drill	

(Fig. not to scale)

fischer Bolt Anchor hot-dip galvanised FBN II HDG	<p>Annex B5 of European Technical Assessment ETA-18/0101</p>
<p>Intended use Minimum thickness of member, minimum spacing and edge distance Installation instructions</p>	

Table C1.1: Characteristic values of **tension** resistance for **standard and reduced embedment depth** under static and quasi-static loads

Size			M8	M10	M12	M16	M20
Steel failure for standard and reduced embedment depth							
Characteristic resistance	$N_{Rk,s}$	[kN]	16,5	27,2	41,6	77,9	107
Partial safety factor	γ_{Ms}	[-]	1,4	1,4	1,4	1,5	1,5
Pullout failure for standard embedment depth							
Characteristic resistance C20/25	$N_{Rk,p}$	[kN]	- ¹⁾				
Pullout failure for reduced embedment depth							
Characteristic resistance C20/25	$N_{Rk,p}$	[kN]	6 ²⁾	- ¹⁾			
Increasing factors for $N_{Rk,p}$	ψ_c	C25/30	1,12				
		C30/37	1,23				
		C35/45	1,32				
		C40/50	1,41				
		C45/55	1,50				
		C50/60	1,58				
Installation safety factor	γ_{inst}	[-]	1,0				
Concrete cone and splitting failure for standard and reduced embedment depth							
Effective embedment depth	$\frac{h_{ef, sta}}{h_{ef, red}}$	[mm]	40	50	65	80	105
			30 ²⁾	40	50	65	80
Factor k_1 for uncracked concrete	$k_{ucr,N}$	[-]	11,0				
Spacing	$s_{cr,N}$	[mm]	3 h_{ef}				
Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}				
Spacing (splitting failure)	$s_{cr,sp}$	[mm]	190	200	290	350	370
Edge distance (splitting failure)	$c_{cr,sp}$	[mm]	95	100	145	175	185

¹⁾ Pullout failure is not relevant

²⁾ Use restricted to anchoring of structural components which are statically indeterminate

fischer Bolt Anchor hot-dip galvanised FBN II HDG

Performances
Characteristic values of tension resistance for standard and reduced embedment

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Table C2.1: Characteristic values of **shear** resistance for **standard and reduced embedment depth** under static and quasi-static loads

Size		M8	M10	M12	M16	M20
Steel failure without lever arm for standard and reduced embedment depth						
Characteristic resistance	$V_{Rk,s}$ [kN]	13,3	21,0	31,3	55,1	67
Steel failure with lever arm for standard embedment depth						
Characteristic bending moment	$M^0_{Rk,s}$ [Nm]	26,2	52,3	91,6	232,2	422
Steel failure with lever arm for reduced embedment depth						
Characteristic bending moment	$M^0_{Rk,s}$ [Nm]	19,9 ¹⁾	45,9	90,0	226,9	349
Concrete pryout failure for standard and reduced embedment depth						
Factor for pryout	k_8	1,8	2,1	2,3	2,3	2,3
Installation safety factor	γ_{inst} [-]	1,0				
Concrete edge failure for standard and reduced embedment depth						
Effective length of anchor	$l_{f,sta}$	40	50	65	80	105
	$l_{f,red}$ [mm]	30 ¹⁾	40	50	65	80
Effective diameter of anchor	d_{nom}	8	10	12	16	20
Installation safety factor	γ_{inst} [-]	1,0				

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

Table C2.2: Displacements due to tension loads

Size		M8	M10	M12	M16	M20
Standard embedment depth	$h_{ef, sta}$ [mm]	40	50	65	80	105
Tension load C20/25	N [kN]	6,1	8,5	12,6	17,2	25,8
Displacements	$\frac{\delta_{N0}}{\delta_{N\infty}}$ [mm]	0,6	0,9	1,5	1,8	1,8
		3,1				
Reduced embedment depth	$h_{ef, red}$ [mm]	30	40	50	65	80
Tension load C20/25	N [kN]	2,8	6,1	8,5	12,6	17,2
Displacements	$\frac{\delta_{N0}}{\delta_{N\infty}}$ [mm]	0,4	0,7	0,7	0,9	1,0
		1,6				

Table C2.3: Displacements due to shear loads

Size		M8	M10	M12	M16	M20
Shear load	V [kN]	7,6	12,0	17,9	31,5	38,2
Displacements	$\frac{\delta_{V0}}{\delta_{V\infty}}$ [mm]	1,5	1,6	2,0	3,0	2,6
		2,3	2,4	3,0	4,5	3,9

fischer Bolt Anchor hot-dip galvanised FBN II HDG

Performances
 Characteristic values of shear resistance for standard and reduced embedment depth
 Displacements

Annex C2
 of European
 Technical Assessment
 ETA-18/0101