

IZJAVA O SVOJSTVIMA

DoP 0370

za fischer vijak za beton ULTRACUT FBS II R (Mehaničko sidro za uporabu u betonu)

HR

- | | |
|---|--|
| 1. <u>Jedinstveni identifikator tipa proizvoda:</u> | DoP 0370 |
| 2. <u>Namjena korištenja:</u> | Naknadno učvršćivanje u napuknutom i ne-napuknutom betonu, vidi dodatak, posebno priloge B1 - B5. |
| 3. <u>Proizvođač:</u> | fischerwerke GmbH & Co. KG, Klaus-Fischer-Str. 1, 72178 Waldachtal, Njemačka |
| 4. <u>Ovlašteni zastupnik:</u> | – |
| 5. <u>Sistem/i od AVCP:</u> | 1 |
| 6. <u>Europski dokument za ocjenjivanje:</u> | EAD 330232-01-0601 |
| Europska tehnička ocjena: | ETA-17/0740; 2025-01-08 |
| Tijelo za tehničko ocjenjivanje: | DIBt- Deutsches Institut für Bautechnik |
| Prijavljeno tijelo/prijavljena tijela: | 2873 TU Darmstadt |

7. Objavljena svojstva:

Mehanička otpornost i stabilnost (BWR 1)

Karakteristični otpor na opterećenje (statičko i kvazi-statičko opterećenje) Metoda A:

Otpornost na lom čelika: Priloge C1
Otpornost na čupanje: Priloge C1
Otpornost na lom betona: Priloge C1
Robusnost: Priloge C1
Minimalna udaljenost od ruba i razmak: Priloge C4
Udaljenost ruba kako bi se spriječilo cijepanje pod opterećenjem: Priloge C1

Karakteristični otpor na smicanje (statičko i kvazi-statičko opterećenje):

Otpornost na lom čelika (posmično opterećenje): Priloge C1
Otpornost na otkazivanje: Priloge C1

Karakteristična otpornost za pojednostavljeni návrh:

Metoda B: NPD
Metoda C: NPD

Istisnine:

Pomaci pri statičkom i kvazi-statičkom opterećenju: Priloge C4

Karakteristični otpor i pomaci za kategorije seizmičke učinkovitosti C1 i C2:

Otpornost na vlačno opterećenje (napetost), pomaci, kategorija C1: Prilog C2
Otpornost na vlačno opterećenje (napetost), pomaci, kategorija C2: Prilog C2
Otpornost na posmično opterećenje, pomaci, kategorije C1: Prilog C2
Otpornost na posmično opterećenje, pomaci, kategorije C2: Prilog C2
Faktor prstenaste pukotine: Prilog C2

Sigurnost u slučaju požara (BWR 2)

Reakcija na vatru: Klasa (A1)

Otpornost na vatru:

Vatrootpornost na lom čelika (vlačna sila): Prilog C3
Vatrootpornost na čupanje (vlačna sila): Prilog C3
Vatrootpornost na lom čelika (posmik): Prilog C3

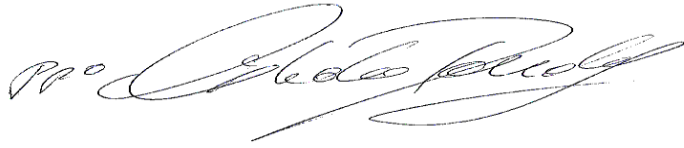
Trajnost:

Trajnost: Priloge B1

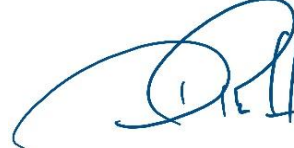
8. Odgovarajuća tehnička dokumentacija i/ili specifična –
tehnička dokumentacija:

Svojstva gore navedenog proizvoda su u skladu sa skupom izjava o svojstvima. Ova izjava o svojstvima se izdaje, u skladu sa Europskom regulativom (EU) Br. 305/2011, pod punom odgovornošću gore navedenog proizvođača.

Za proizvođača i u njegovo ime potpisao:



Dr. Ronald Mihala, Voditelj razvoja i upravljanja proizvodima
Tumlingen, 2025-02-03



Dieter Pfaff, Voditelj Međunarodne federacije za proizvodnju i upravljanje kvalitetom

Ovaj DoP je pripremljen u različitim jezicima. U slučaju da postoji spor u tumačenju, engleska verzija će uvijek prevladati.

U aneksu se nalaze dodatni podaci na engleskom jeziku, koji ne podliježu zakonskoj regulativi.

Translation guidance Essential Characteristics and Performance Parameters for Annexes

Smjernice za prijevod. Bitne karakteristike i parametri izvedbe za dodatke

Mechanical resistance and stability (BWR 1)		
Mehanička otpornost i stabilnost (BWR 1)		
Characteristic resistance under static and quasi-static loading, Method A		
Karakteristični otpor na opterećenje (statičko i kvazi-statičko opterećenje) Metoda A:		
1	Resistance to steel failure: Otpornost na lom čelika:	$N_{Rk,s}$ [kN], E_s [N/mm ²]
2	Resistance to pull- out failure: Otpornost na čupanje:	$N_{Rk,p}$ [kN], ψ_c
3	Resistance to concrete cone failure: Otpornost na lom betona:	$k_{cr,N}$, $k_{ucr,N}$ [-], h_{ef} , $c_{cr,N}$ [mm]
4	Robustness: Robusnost:	γ_{inst} [-]
5	Minimum edge distance and spacing: Minimalna udaljenost od ruba i razmak:	c_{min} , s_{min} , h_{min} [mm]
6	Edge distance to prevent splitting under load: Udaljenost ruba kako bi se spriječilo cijepanje pod opterećenjem:	$N^0_{Rk,sp}$ [kN], $c_{cr,sp}$ [mm]
Characteristic resistance to shear load (static and quasi-static loading), Method A		
Karakteristični otpor na smicanje (statičko i kvazi-statičko opterećenje):		
7	Resistance to steel failure under shear load: Otpornost na lom čelika (posmično opterećenje):	$V^0_{Rk,s}$ [kN], $M^0_{Rk,s}$ [Nm], k_7 [-]
8	Resistance to pry-out failure: Otpornost na otkazivanje:	k_8 [-]
Characteristic Resistance for simplified design		
Karakteristična otpornost za pojednostavljeni návrh:		
9	Method B: Metoda B:	F^0_{Rk} [kN], c_{cr} , s_{cr} [mm]
10	Method C: Metoda C:	F_{Rk} [kN]
Displacements		
Istisnine:		
11	Displacements under static and quasi-static loading: Pomaci pri statičkom i kvazi-statičkom opterećenju:	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		
Karakteristični otpor i pomaci za kategorije seizmičke učinkovitosti C1 i C2:		
13	Resistance to tension load, displacements, category C1: Otpornost na vlačno opterećenje (napetost), pomaci, kategorija C1:	$N_{Rk,s,C1}$ [kN], $N_{Rk,p,C1}$ [kN]
	Resistance to tension load, displacements, category C2: Otpornost na vlačno opterećenje (napetost), pomaci, kategorija C2:	$N_{Rk,s,C2}$ [kN], $N_{Rk,p,C2}$ [kN], $\delta_{N,C2}$ [mm]
14	Resistance to shear load, displacements, category C1: Otpornost na posmično opterećenje, pomaci, kategorije C1:	$V_{Rk,s,C1}$ [kN]
	Resistance to shear load, displacements, category C2: Otpornost na posmično opterećenje, pomaci, kategorije C2:	$V_{Rk,s,C2}$ [kN], $\delta_{V,C2}$ [mm]
15	Factor for annular gap Faktor prstenaste pukotine:	α_{gap} [-]
Safety in case of fire (BWR 2)		
Sigurnost u slučaju požara (BWR 2)		
16	Reaction to fire: Reakcija na vatru:	Class
Resistance to fire:		
Otpornost na vatru:		
17	Fire resistance to steel failure (tension load): Vatrootpornost na lom čelika (vlačna sila):	$N_{Rk,s,fi}$ [kN]
18	Fire resistance to pull-out failure (tension load): Vatrootpornost na čupanje (vlačna sila):	$N_{Rk,p,fi}$ [kN]
19	Fire resistance to steel failure (shear load): Vatrootpornost na lom čelika (posmik):	$V_{Rk,s,fi}$ [kN], $M^0_{Rk,s,fi}$ [Nm]
Aspects of durability		
Trajnost:		
20	Durability: Trajnost:	Class

II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product and intended use

Technical description of the product

fischer concrete screw UltraCut FBS II R is a concrete screw made of stainless steel. The anchor is installed in a drilled hole and anchored by mechanical interlock.

An illustration of the product 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 B2.1. The intended use specifications of the product are detailed in the Annex B1.

2 Specification of the intended use 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

3.1 Characteristics of product

Mechanical resistance and stability (BWR 1):

The essential characteristics are detailed in the Annex C1, C2 and C4.

Safety in case of fire (BWR 2):

The essential characteristics are detailed in the Annex C3.

Durability:

See annex B1.

Other Basic Requirements are not relevant.

3.2 Methods of assessment

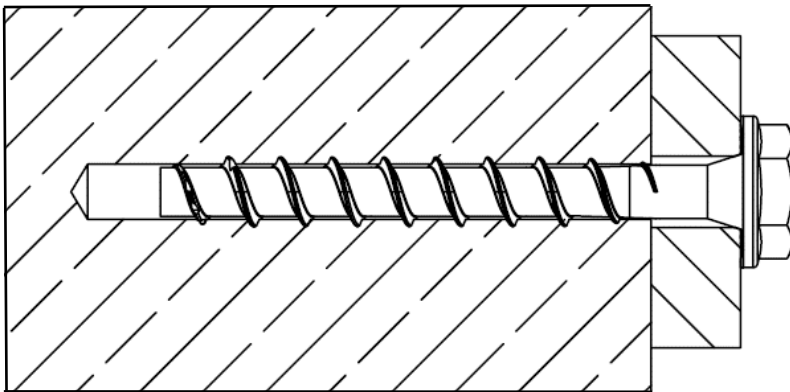
The assessment of fitness of the anchor for the intended use in relation to the requirements for mechanical resistance and stability and safety in use in the sense of the Basic Works Requirement 1 has been made in accordance with EAD 330232-01-0601; Mechanical fasteners for use in concrete.

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

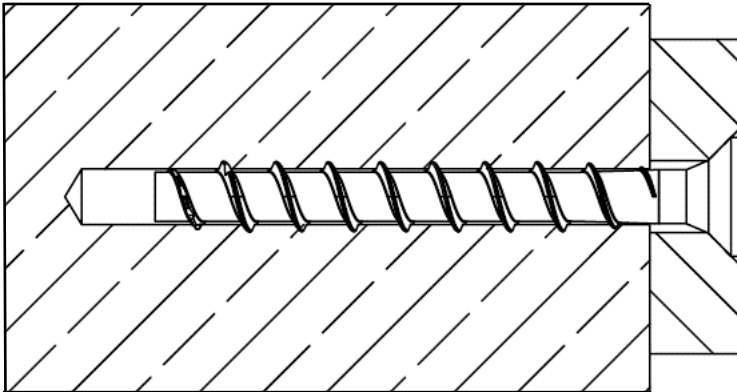
4.1 AVCP system

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.

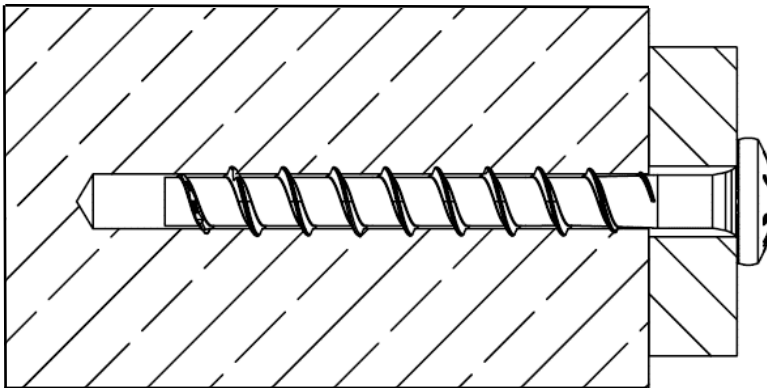
Product in the installed condition



FBS II US R/
FBS II US TX R



FBS II SK R



FBS II P R

(Figure not to scale)

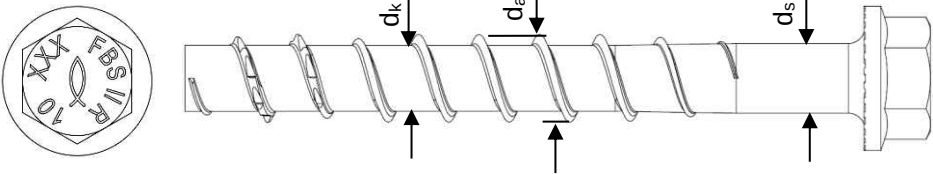
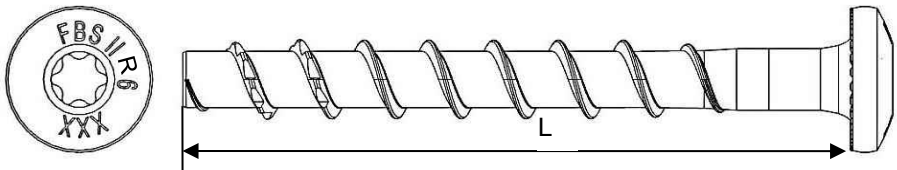
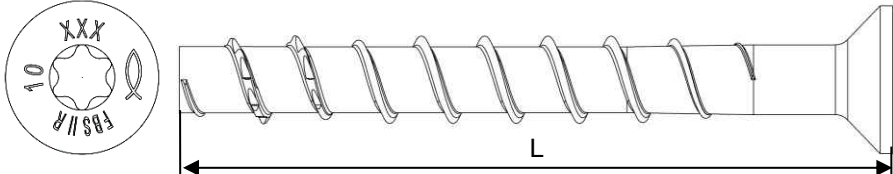
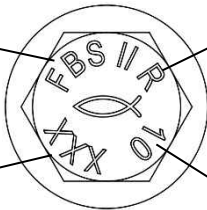
fischer concrete screw UltraCut FBS II R

Product description

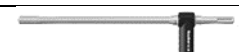
Product in the installed condition

Annex A 1

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Table A2.1: Geometry and material						
Type of screw / size			FBS II US R / FBS II SK R / FBS II P R			
			6	8	10	12
Thread outer diameter	d _a	[mm]	7,8	10,3	12,5	14,6
Core diameter	d _k		5,6	7,5	9,4	11,1
Shaft diameter	d _s		6,0	8,0	9,9	11,7
Material			Tip: hardened steel; Shaft and head: stainless steel EN 10088-1:2023			
Coating			Tip: red colour			
Hexagon head with formed washer (US/US TX)						
Pan head (P)						
Countersunk Head (SK)						
Head Marking (example) 						
(Figure not to scale)						
fischer concrete screw UltraCut FBS II R						Annex A 2 Appendix 5 / 14
Product description Geometry and material						

Specification of intended use:

Size	FBS II R								
	6	8		10			12		
Nominal embedment depth [mm]	60	50	65	55	65	85	60	75	100
Hammer drilling 	✓								
Hollow drilling 	- 1)	✓							
Diamond drilling 									
Static and quasi-static loads	✓								
Cracked and uncracked concrete									
Fire exposure									
Seismic performance category C1	✓	- 1)	✓	- 1)	✓	- 1)	✓	- 1)	✓
Seismic performance category C2	- 1)								

¹⁾ No performance assessed

Base materials:

- Compacted reinforced or unreinforced normal weight concrete without fibres (cracked or uncracked) according to EN 206:2013+A2:2021
- Strength classes C20/25 to C50/60 according to EN 206:2013+A2:2021

Use conditions (Environmental conditions):

- Structures subjected to dry internal conditions (FBS II R)
- For all other conditions according to EN 1993-1-4:2006 + A1:2015, corresponding to corrosion resistance class
- CRC III: for FBS II R

Design:

- The structural design according to EN 1992-4:2018 are conducted under responsibility of a designer experienced in the field of anchorages 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 screw relative to reinforcement or to supports, etc.).
- Design of fastenings according to EN 1992-4:2018 and EOTA Technical Report TR 055:2018

fischer concrete screw UltraCut FBS II R

Intended use

Specification of intended use

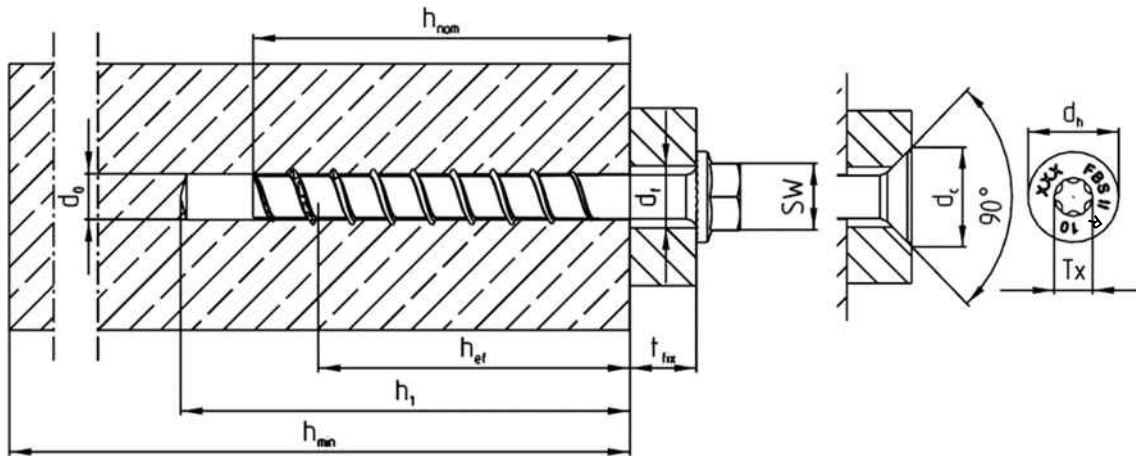
Annex B 1

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Table B2.1: Installation parameters

FBS II R			6	8		10			12		
Nominal embedment depth	h_{nom}	[mm]	60	50	65	55	65	85	60	75	100
Nominal drill hole diameter	d_0		6	8		10			12		
Cutting diameter of drill bits	$d_{cut} \leq$		6,40	8,45		10,45			12,50		
Cutting diameter for diamond drillers			- 1)	8,10		10,30			12,30		
Clearance hole diameter			d_f	8,0	10,6 – 12,0		12,8 – 14,0			14,8 – 16,0	
Wrench size (US)	SW		10 / 13	13		15			17		
TX-size (SK / P / US TX))	TX	[-]	30	40		50			-		
Countersunk head diameter	d_h	[mm]	13,3	18		21					
Countersunk diameter in fixture	d_c		15,2	20		23					
Drill hole depth	$h_1 \geq$		70	60	75	65	75	95	70	85	110
Drill hole depth (with adjustable setting)			- 1)	70	85	75	85	105	80	95	120
Thickness of fixture			$t_{fix} \leq$	L - h_{nom}							
Length of screw	$L_{min} =$		65	50	65	55	65	85	60	75	100
	$L_{max} =$	400	400	415	405	415	435	410	425	450	
Torque impact screw driver	$T_{imp,max}$	[Nm]	240	450					650		
Torque impact screw driver (with adjustable setting process)	$T_{imp,max}$		- 1)	300					450		

¹⁾ No performance assessed



(Figure not to scale)

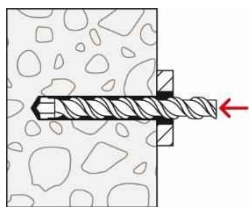
fischer concrete screw UltraCut FBS II R

Intended use
Installation parameters

Annex B 2

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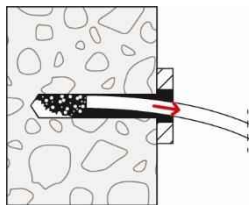
Installation instruction part 1 FBS II 8/10/12 R



Step 1: Drilling of the hole:

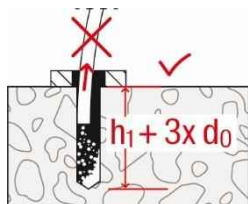
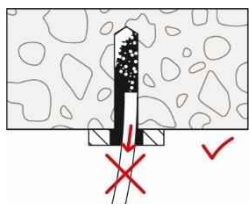
Drill the hole using hammer drill, hollow drill or diamond core drill

Drill hole diameter d_0 and drill hole depth h_1 according to table B2.1



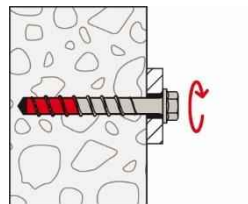
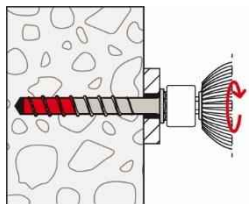
Step 2: Cleaning of the drill hole - horizontal:

Clean the drill hole. This step can be omitted in the preparation of the hole by using a hollow drill bit or diamond core drill. (recommendation: use the fischer FHD hollow drill bit)



Step 2: Cleaning of the drill hole - vertical:

Cleaning of the drill hole can be omitted, if drilling vertically upwards or if drilling vertically downwards and the hole depth has been increased. It is recommended to increase the drill hole depth by an additional $3 \times \text{drilling } \varnothing$ when drilling vertically downwards.

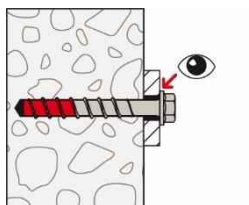


Step 3: Installation:

Turn in until the head is in contact with the fixture.

Installation with any torque impact screw driver up to the maximum mentioned torque moment ($T_{\text{imp,max}}$ according to table B2.1).

Alternatively, all other tools without an indicated torque moment are allowed (e.g. ratchet spanner). The indicated torque moments $T_{\text{imp,max}}$ for impact screw driver are not decisive for manual installation.



Step 4: Checking of the correct installation:

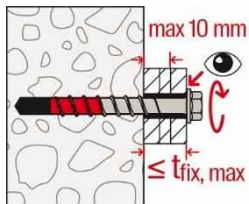
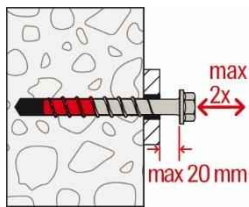
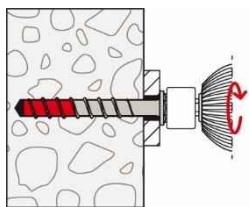
After installation a further turning of the screw must not be possible. The head of the screw must be in contact with the fixture and is not damaged

fischer concrete screw UltraCut FBS II R

Intended use
Installation Instructions

Annex B 3

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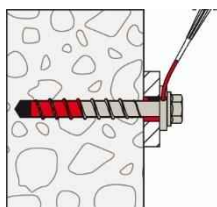


Adjustment

Optional:

It is permissible to adjust the screw twice.
Therefore, the screw may be untightened to a maximum of $L_{adj} = 20 \text{ mm}$ off the surface of the initial fixture. The total permissible thickness of shims added during the adjustment process is $t_{adj} = 10 \text{ mm}$.

The required nominal anchoring depth h_{nom} must be kept after the adjustment process. (see also annex B 3)



Filling of the annular gap

For seismic performance category C2 applications:

The gap between screw shaft and fixture must be filled with mortar; mortar compressive strength $\geq 50 \text{ N/mm}^2$

(e. g. FIS V Plus, FIS HB, FIS SB or FIS EM Plus). As an aid for filling the gap, the filling disc FFD is recommended.

fischer concrete screw UltraCut FBS II R

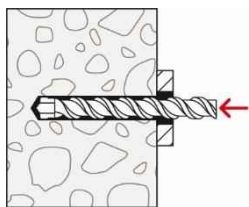
Intended use

Installation Instructions

Annex B 4

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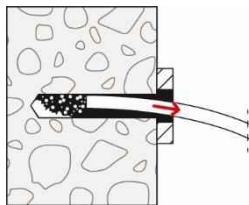
Installation instruction FBS II 6 R



Step 1: Drilling of the hole:

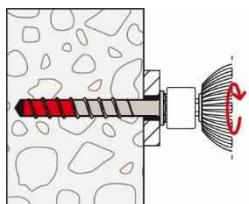
Drill the hole using hammer drill

Drill hole diameter d_0 and
drill hole depth h_1 according to table B2.1



Step 2: Cleaning of the drill hole:

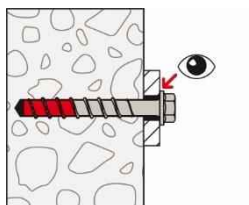
Clean the drill hole.



Step 3: Installation:

Turn in until the head is in contact with the fixture.

Installation with any torque impact screw driver up to the
maximum mentioned torque moment ($T_{imp,max}$ according to
table B2.1).



Step 4: Checking of the correct installation:

After installation a further turning of the screw must not be
possible. The head of the screw must be in contact with the
fixture and is not damaged

fischer concrete screw UltraCut FBS II R

Intended use
Installation Instructions

Annex B 5

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

FBS II R				6	8		10			12		
Nominal embedment depth		h_{nom}	[mm]	60	50	65	55	65	85	60	75	100
Steel failure for tension load and shear load												
Characteristic resistance		$N_{Rk,s}$	[kN]	19,3	27,8		43,8			67,7		
Partial factor		$\gamma_{Ms,N}$	-	1,5								
Characteristic resistance		$V_{Rk,s}^0$	[kN]	12,6	18,0	27,8	13,2	19,3	36,6	20,4	40,1	45,8
Partial factor		$\gamma_{Ms,V}$	[-]	1,25								
Factor for ductility		k_7		0,75								
Characteristic bending resistance		$M_{Rk,s}^0$	[Nm]	16,1	31,3		68,5			112,8		
Pullout failure												
Characteristic resistance in concrete C20/25	uncracked	$N_{Rk,p}$	[kN]	10,0	7,0	14,0	8,5	14,0	$\geq N_{Rk,c}^0$	10,0	12,0	$\geq N_{Rk,c}^0$
	cracked	$N_{Rk,p}$	[kN]	4,0	4,0	9,0	4,5	6,0	16,0	4,5	11,0	$\geq N_{Rk,c}^0$
Increasing factors concrete	C25/30	ψ_c	[-]	1,07	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}	[-]	1,4	1,0							
Concrete cone failure and splitting failure; concrete pryout failure												
Effective embedment depth		h_{ef}	[mm]	37	40	52	43	51	68	47	60	81
Factor for uncracked concrete		$k_{ucr,N}$	[-]	11,0								
Factor for cracked concrete		$k_{cr,N}$		7,7								
Characteristic edge distance		$c_{cr,N}$	[mm]	$1,5 \cdot h_{ef}$								
Characteristic spacing		$s_{cr,N}$		$3 \cdot h_{ef}$								
Characteristic resistance for splitting		$N_{Rk,sp}^0$	[kN]	$\min\{N_{Rk,c}^0, N_{Rk,p}\}$	12,0	18,4	13,0	17,9	$\geq N_{Rk,c}^0$	15,8	22,9	$\geq N_{Rk,c}^0$
Characteristic edge distance for splitting		$c_{cr,sp}$	[mm]	$1,78 \cdot h_{ef}$	$1,5 \cdot h_{ef}$							
Characteristic spacing for splitting		$s_{cr,sp}$		$3 \cdot h_{ef}$								
Factor for pryout failure		k_8	[-]	2,6	1,0			2,0	1,0	2,0		
Installation factor		γ_{inst}		1,4 ²⁾	1,0							
Concrete edge failure												
Effective length in concrete		l_f	[mm]	46	50	65	55	65	85	60	75	100
Nominal diameter of screw		d_{nom}		6	8		10			12		
Adjustment												
Maximum thickness of shims		t_{adj}	[mm]	- ³⁾	10							
Maximum number of adjustments		n_a	[-]	- ³⁾	2							

1) $N^0_{Rk,c}$ according to EN 1992-4:2018

²⁾ Only for concrete cone failure and splitting failure; concrete pryout failure according to EN 1992-4:2018, Table 4.1

3) No performance assessed

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Performances Characteristic values for static and quasi-static action	

Table C2.1: Characteristic values for Seismic Performance Category C1							
FBS II R			6	8	10	12	
Nominal embedment depth		h_{nom}	[mm]	60	65	85	100
Steel failure for tension load and shear load C1							
Characteristic resistance		$N_{Rk,s,C1}$	[kN]	19,3	27,8	43,8	67,7
		$V_{Rk,s,C1}$		7,5	18,1	29,3	36,6
Without filling of the annular gap		α_{gap}	[-]	0,5			
With filling of the annular gap ¹⁾				1,0			
Pullout failure							
Characteristic resistance in cracked concrete		$N_{Rk,p,C1}$	[kN]	3,5	9,0	16,0	$\geq N^0_{Rk,c}$ ²⁾
Concrete cone failure							
Effective embedment depth		h_{ef}	[mm]	37	52	68	81
Concrete cone failure	Edge distance	$c_{cr,N}$		$1,5 \cdot h_{ef}$			
	Spacing	$s_{cr,N}$		$3 \cdot h_{ef}$			
Installation factor		γ_{inst}	[-]	1,4	1,0		
Concrete pryout failure							
Factor for pryout failure		k_8	[-]	2,6	1,0	2,0	
Concrete edge failure							
Effective length in concrete		l_f	[mm]	46	65	85	100
Nominal diameter of screw		d_{nom}		6	8	10	12
¹⁾ Filling of the annular gap according to annex B 4							
²⁾ $N^0_{Rk,c}$ according to EN 1992-4:2018							

Table C2.2: Characteristic values for Seismic Performance Category C2							
FBS II R			6	8	10	12	
Nominal embedment depth		h_{nom}	[mm]	- ²⁾	65	85	100
Steel failure for tension load and shear load C2							
Characteristic resistance		$N_{Rk,s,C2}$	[kN]	- ²⁾	27,8	43,8	67,7
		$V_{Rk,s,C2}$			9,7	8,8	19,7
With filling of the annular gap ¹⁾		α_{gap}	[-]	1,0			
Pullout failure							
Characteristic resistance in cracked concrete		$N_{Rk,p,C2}$	[kN]	- ²⁾	2,8	5,0	7,3
Concrete cone failure							
Effective embedment depth		h_{ef}	[mm]	- ²⁾	52	68	81
Concrete cone failure	Edge distance	$c_{cr,N}$		- ²⁾	$1,5 \cdot h_{ef}$		
	Spacing	$s_{cr,N}$			$3 \cdot h_{ef}$		
Installation factor		γ_{inst}	[-]	1,0			
Concrete pryout failure							
Factor for pryout failure		k_8	[-]	- ²⁾	1,0	2,0	
Concrete edge failure							
Effective length in concrete		$l_f = h_{nom}$	[mm]	- ²⁾	65	85	100
Nominal diameter of screw		d_{nom}			8	10	12
¹⁾ Filling of the annular gap according to annex B 4. Application without filling of the annular gap not allowed.							
²⁾ No performance assessed							

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Performances		
Characteristic values for Seismic Performance Category C1 and C2		

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Table C3.1: Characteristic values for resistance to fire

FBS II R				6	8		10			12			
Nominal embedment depth		h_{nom}	[mm]	60	50	65	55	65	85	60	75	100	
Steel failure for tension load and shear load ($F_{Rk,s,fi} = N_{Rk,s,fi} = V_{Rk,s,fi}$)													
Characteristic resistance for the head shapes	US US TX ≥SW13	$F_{Rk,s,fi}$	R30	[kN]	2,1	2,3	6,4	3,5		11,0	4,6	15,2	
			R60		1,7	1,8	4,7	2,7		8,1	3,7	11,2	
			R90		1,2	1,3	2,9	2,0		5,2	2,7	7,3	
			R120		1,0	1,0	2,0	1,6		3,8	2,2	5,3	
	SK/P ¹⁾ US SW10 ¹⁾	$F_{Rk,s,fi}$	R30	[kN]	1,8	2,1		3,0			No performance assessed		
			R60		1,4	1,7		2,3					
			R90		1,1	1,2		1,6					
			R120		0,9	1,0		1,2					
	US US TX ≥SW13	$M^0_{Rk,s,fi}$	R30	[Nm]	1,7	2,6	7,2	7,6		15,4	16,8	25,3	
			R60		1,4	2,0	5,2	6,0		11,4	13,3	18,7	
			R90		1,0	1,5	3,3	4,4		7,3	9,8	12,1	
			R120		0,8	1,2	2,3	3,6		5,3	8,0	8,8	
	SK/P ¹⁾ US SW10 ¹⁾	$M^0_{Rk,s,fi}$	R30	[Nm]	1,5	2,4		4,2			No performance assessed		
			R60		1,2	1,9		3,2					
			R90		0,9	1,4		2,2					
			R120		0,7	1,1		1,7					
	Pullout failure												
	Characteristic resistance	$N_{Rk,p,fi}$	R30	[kN]	1,0	1,7	2,4	2,1	3,5	4,3	2,5	3,0	6,3
			R60										
			R90										
R120			0,8										
Concrete cone failure													
Characteristic resistance	$N_{Rk,c,fi}$	R30	[kN]	1,4	1,6	3,4	2,1	3,2	6,6	2,6	4,8	10,2	
		R60											
		R90											
		R120											1,1
Edge distance													
R30 to R120		$C_{cr,fi}$	[mm]	$2 \cdot h_{ef}$									
In case of fire attack from more than one side, the minimum edge distance shall be ≥ 300 mm													
Spacing													
R30 to R120		$S_{cr,fi}$	[mm]	$2 \cdot C_{cr,fi}$									
Concrete pryout failure													
R30 to R120		k_8	[-]	2,6	1,0			2,0	1,0	2,0			
The anchorage depth has to be increased for wet concrete by at least 30 mm compared to the given value.													
¹⁾ Only FBS II 6 R													
fischer concrete screw UltraCut FBS II R								Annex C 3					
Performances Characteristic values for resistance to fire													
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Table C4.1: Displacements due to tension loads (static and quasi-static)											
FBS II R			6	8		10			12		
Nominal embedment depth	h_{nom}	[mm]	60	50	65	55	65	85	60	75	100
Tension load in uncracked concrete	N	[kN]	5,0	3,5	7,1	4,2	7,0	11,9	5,0	6,0	17,1
Displacement in uncracked concrete	δ_{N0}	[mm]	0,1	0,5	0,7	0,4	0,6	0,8	1,0	0,9	1,25
	$\delta_{N\infty}$		0,4	0,7	0,7	0,8	0,8	0,8	1,25	1,25	1,25
Tension load in cracked concrete	N	[kN]	2,8	3,5	4,5	4,2	7,0	8,1	5,0	6,0	12,0
Displacement in cracked concrete	δ_{N0}	[mm]	0,1	0,6	0,4	0,4	0,6	0,7	0,9	0,9	1,4
	$\delta_{N\infty}$		0,5	1,5	1,1	1,0	1,8	1,8	1,4	1,7	1,9

Table C4.2: Displacements due to shear loads (static and quasi-static)											
FBS II R			6	8		10			12		
Nominal embedment depth	h_{nom}	[mm]	60	50	65	55	65	85	60	75	100
Shear load in cracked and uncracked concrete	V	[kN]	7,8	11,0	15,9	10,4	11,9	20,9	12,7	24,9	26,2
Displacement (the gap between fastener and fixture is subtracted)	δ_{V0}	[mm]	2,2	4,1	2,7	1,2	1,2	3,5	1,1	2,5	2,9
	$\delta_{V\infty}$		3,4	6,2	4,1	1,8	1,8	5,3	1,7	3,8	4,4

Table C4.3: Displacements due to tension loads (Seismic Performance Category C2)											
FBS II R			6	8		10			12		
Nominal embedment depth	h_{nom}	[mm]	- ¹⁾	65		85			100		
Displacement DLS	$\delta_{N,C2} \text{ (DLS)}$			0,9		0,9			1,1		
Displacement ULS	$\delta_{N,C2} \text{ (ULS)}$			2,5		2,7			3,2		

Table C4.4: Displacements due to shear loads (Seismic Performance Category C2)											
FBS II R			6	8		10			12		
Nominal embedment depth	h_{nom}	[mm]	- ¹⁾	65		85			100		
Displacement DLS	$\delta_{V,C2} \text{ (DLS)}$			1,6		1,7			2,6		
Displacement ULS	$\delta_{V,C2} \text{ (ULS)}$			5,0		3,8			6,6		

¹⁾ No performance assessed

Table C4.5: Minimum thickness of concrete members, minimum spacing and edge distance											
FBS II R			6	8		10			12		
Nominal embedment depth	h_{nom}	[mm]	60	50	65	55	65	85	60	75	100
Minimum thickness of concrete member	h_{min}		100	100	120	100	120	140	110	130	150
Minimum spacing	s_{min}		35			40			50		
Minimum edge distance	c_{min}		35			40			50		

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