SUORITUSTASOILMOITUS

DoP 0371

fischer betoniruuville ULTRACUT FBS II R (mekaaninen kiinnike käytettäväksi betonissa) FI

1. Tuotetyypin yksilöllinen tunniste: **DoP 0371**
2. Aiottu käyttötarkoitus (aiotut käyttötarkoitukset): **Jälkiasennettu kiinnitin käytettäväksi betonissa tarpeettomille ei-rakenteellisille järjestelmille, katso lisäys, erityisesti liitteet B1- B3.**
3. Valmistaja: **fischerwerke GmbH & Co. KG, Klaus-Fischer-Str. 1, 72178 Waldachtal, Saksa**
4. Valtuutettu edustaja: **–**
5. Suoritustason pysyvyyden arvioinnissa ja varmentamisessa käytetty järjestelmä/käytetyt järjestelmät: **2+**
6. Eurooppalainen arviointiasiakirja: **EAD 330747-00-0601**
   Eurooppalainen tekninen arviointi: **ETA-24/0973; 2025-01-08**
   Teknisestä arvioinnista vastaava laitos: **DIBt- Deutsches Institut für Bautechnik**
   Ilmoitettu laitos/ilmoitetut laitokset: **2873 TU Darmstadt**
7. Ilmoitettu suoritustaso/ilmoitetut suoritustasot:

Käyttöturvallisuus (BWR 4)

Tyypillinen kestävyys kuormitukselle (staattinen ja lähes staattinen kuormitus):

Teräksen murtokuorma: katso lisäys, erityisesti liitte C1 E_S= 210 000 MPa
Ulosvetoarvon murtokuorma: katso lisäys, erityisesti liitte C1
Betonimassan murtokuorma: katso lisäys, erityisesti liitte C1
Kestävyys: katso lisäys, erityisesti liitte C1
Pienin reuna- ja keskinäis etäisyys: katso lisäys, erityisesti liitte C2
Reunaetäisyys halkeamien estämiseksi kuormituksessa: katso lisäys, erityisesti liitte C1

Tyypillinen kestävyys leikkauskuormalle (staattinen ja näennäisstaattinen kuormitus):

Teräksen murtokuorma (leikkauskuorma): katso lisäys, erityisesti liitte C1
Taivutusvoiman murtokuorma: katso lisäys, erityisesti liitte C1
Betonireunan murtokuorma: katso lisäys, erityisesti liitte C1

Ominaisvastus kaikille kuorman suunnille ja vikatiloille yksinkertaistettua suunnittelua varten:

Ominaisarvo: NPD

Kestävyys:

Kestävyys: katso lisäys, erityisesti liitteet A2, B1

Turvallisuus tulipalon sattuessa (BWR 2)

Reaktio paloon:Luokka (A1)

Tulenkestävyys:

Teräksen murtokuorma tulipalossa (vetokuorma): katso lisäys, erityisesti liitte C2
Ulosvedon murtokuorma tulipalossa (vetokuorma): katso lisäys, erityisesti liitte C2
Teräksen murtokuorma tulipalossa (leikkauskuorma): katso lisäys, erityisesti liitte C2

8. Asianmukainen tekninen asiakirja ja/tai tekninen erityisasiakirja: **–**

Edellä yksilöidyn tuotteen suoritustaso on ilmoitettujen suoritustasojen joukon mukainen. Tämä suoritustasoilmoitus on asetuksen (EU) N:o 305/2011 mukaisesti annettu edellä ilmoitetun valmistajan yksinomaisella vastuulla.

Valmistajan puolesta allekirjoittanut:

Dr. Ronald Mihala, Kehitys- ja tuotantojohtaja

Dieter Pfaff, Kansainvälisen tuotantoliiton ja laadunhallinnan johtaja

Tumlingen, 2025-01-22

Tämä suoritustasoilmoitus on laadittu useilla kielillä. Jos tulkinnasta syntyy erimielisyyttä, englanninkielinen versio on aina katsottava ensisijaiseksi.

Lisäys sisältää vapaaehtoisesti ilmoitettua ja täydentävää englanninkielistä tietoa, joka ylittää (kielestä riippumatta määritellyt) lakisääteiset vaatimukset.

Translation guidance Essential Characteristics and Performance Parameters for Annexes

Käännösopas oleellisten piirteiden ja suorituskyvyn parametrien liitteille

Safety in case of fire (BWR 2) **Turvallisuus tulipalon sattuessa (BWR 2)**		
1	Reaction to fire: **Reaktio paloon:**	Class Luokka (A1)
Resistance to fire: **Tulenkestävyys:**		
2	Fire resistance to steel failure (tension load): **Teräksen murtokuorma tulipalossa (vetokuorma):**	$N_{Rk,s,fi}$ [kN]
3	Fire resistance to pull-out failure (tension load): **Ulosvedon murtokuorma tulipalossa (vetokuorma):**	$N_{Rk,p,fi}$ [kN]
4	Fire resistance to steel failure (shear load): **Teräksen murtokuorma tulipalossa (leikkauskuorma):**	$V_{Rk,s,fi}$ [kN], $M^0_{Rk,s,fi}$ [Nm]
Safety and accessibility in use (BWR 4) **Käyttöturvallisuus (BWR 4)**		
Characteristic resistance to tension load (static and quasi-static loading): **Tyypillinen kestävyys kuormitukselle (staattinen ja lähes staattinen kuormitus):**		
6	Resistance to steel failure: **Teräksen murtokuorma:**	$N_{Rk,s}$ [kN], E_s [N/mm^2]
7	Resistance to pull- out failure: **Ulosvetoarvon murtokuorma:**	$N_{Rk,p}$ [kN], ψ_c, $\tau_{Rk,p}$ [N/mm^2]
8	Resistance to concrete cone failure: **Betonimassan murtokuorma:**	$k_{cr,N}$, $k_{ucr,N}$ [-], h_{ef}, $c_{cr,N}$ [mm]
9	Robustness: **Kestävyys:**	γ_{inst} [-]
10	Minimum edge distance and spacing: **Pienin reuna- ja keskinäis etäisyys:**	c_{min}, s_{min}, h_{min} [mm]
11	Edge distance to prevent splitting under load: **Reunaetäisyys halkeamien estämiseksi kuormituksessa:**	$N^0_{Rk,sp}$ [kN], $c_{cr,sp}$ [mm]
Characteristic resistance to shear load (static and quasi-static loading): **Tyypillinen kestävyys leikkauskuormalle (staattinen ja näennäisstaattinen kuormitus):**		
12	Resistance to steel failure (shear load): **Teräksen murtokuorma (leikkauskuorma):**	$V_{Rk,s}$ [kN], $M^0_{Rk,s}$ [Nm], k_7 [-]
13	Resistance to pry-out failure: **Taivutusvoiman murtokuorma:**	k_8 [-]
14	Resistance to concrete edge failure: **Betonireunan murtokuorma:**	d_{nom}, l_f [mm]
Characteristic resistance for all load directions and modes of failure for simplified design: **Ominaisvastus kaikille kuorman suunnille ja vikatiloille yksinkertaistettua suunnittelua varten:**		
15	Characteristic resistance: **Ominaisarvo:**	F^0_{Rk} [kN], s_{cr}, c_{cr} [mm]
Durability: **Kestävyys:**		
16	Durability: **Kestävyys:**	Description

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

Safety in case of fire (BWR 2):
The essential characteristics are detailed in the Annex C2.

Hygiene, health and the environment (BWR3)
No performance assessed

Safety and accessibility in use (BWR4)
The essential characteristics are detailed in the Annex C1 and C2.

Durability:
See annex B1.

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 2, 3 and 4 has been made in accordance with EAD 330747-00-0601 - Fasteners for use in concrete in redundant for non-structural systems.

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 97/161/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 2+.

Product in the installed condition

Installed condition in normal weight concrete

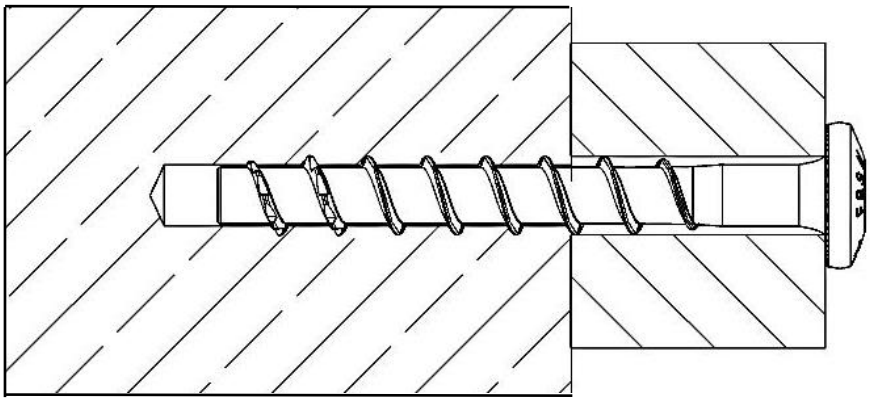
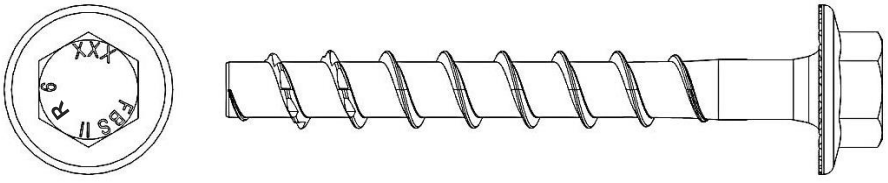
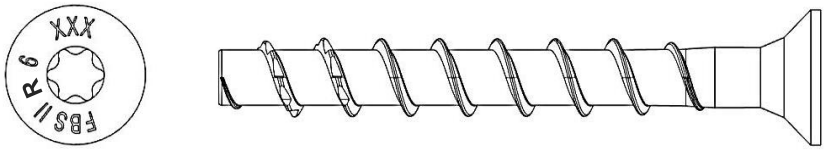
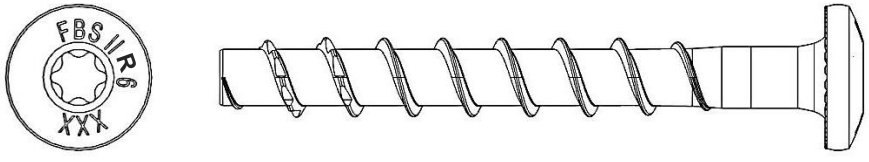


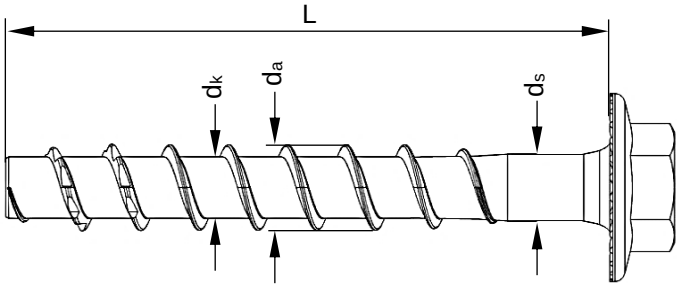
Table A1.1: Screw types FBS II 6 R

FBS II 6 R	
Hexagon head with formed washer (**US**)	
Countersunk head (**SK**)	
Pan head (**P**)	

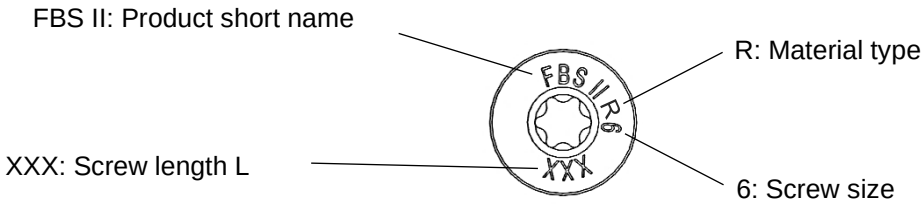
(Figure not to scale)

Table A2.1: Geometry and material

FBS II 6 R			**All head shapes**
Thread outer diameter	d_a	[mm]	7,8
Core diameter	d_k		5,6
Shaft diameter	d_s		6,0
Material		[-]	Tip: hardened steel; Shaft and head: stainless steel EN 10088-1:2023
Coating			Tip: red colour



Head marking (example) at US, SK, P



(Figure not to scale)

Specification of intended use:

Size	FBS II 6 R
Hammer drilling 	✓
Static and quasi-static loads	
Cracked and uncracked concrete	
Fire exposure	

Base materials:

- Compacted reinforced and 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 6 R)
- For all other conditions according to EN 1993-1-4:2006 +A1:2015 corresponding to corrosion resistance class
  - CRC III: for FBS II 6 R

Design:

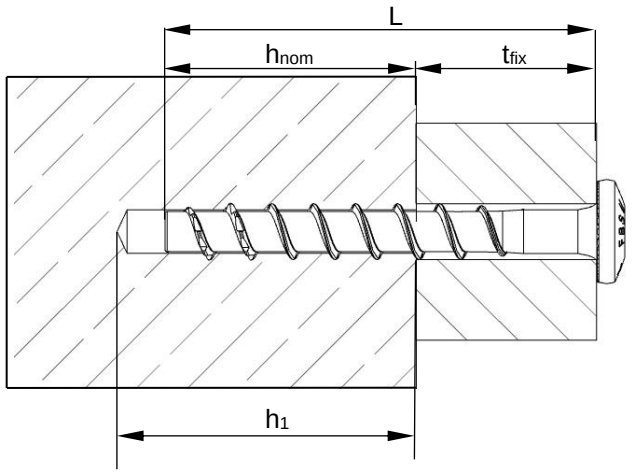
- The structural design according to EN 1992-4:2018 are conducted under responsibility of a designer experienced in the field of anchorages and concrete works.
- Verifiable calculation notes and drawings are to be prepared taking account of the loads to be anchored. The position of the fastener is indicated on the design drawings (e.g. position of the fastener relative to reinforcement or to supports, etc.)
- Design of fastenings according to EN 1992-4: 2018 and EOTA Technical Report TR 055:2018

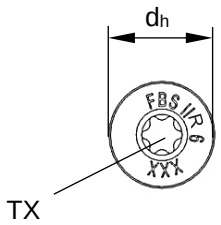
Table B2.1: Installation parameters – drilling bore hole and setting tools

FBS II 6 R			**All head shapes**	
Nominal embedment depth	h_{nom}	[mm]	45	60
Nominal drill hole diameter	d_0 =		6	
Cutting diameter of drill bits	d_{cut} ≤		6,4	
Diameter of clearance hole in the fixture	d_f ≤		8	
Drill hole depth	h_1 ≥		55	70
Drill hole depth (with adjustable setting)			65	80
Torque impact screw driver	$T_{imp,max}$	[Nm]	240	

Table B2.2: Installation parameters – drive and fixture

FBS II 6 R			**US**	**SK**	**P**
Wrench size	SW	[mm]	10 / 13	-	
TX size	TX	[-]	-	30	
Head diameter	d_h	[mm]	15 / 17	13,3	14,4
Thickness of fixture	t_{fix} ≤		$L - h_{nom}$		
Length of screw	L_{min} =		50		
	L_{max} =		400		





(Figure not to scale)

fischer concrete screw UltraCut FBS II 6 R

Intended use
Installation parameters

Annex B 2

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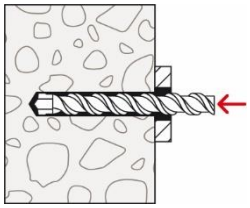
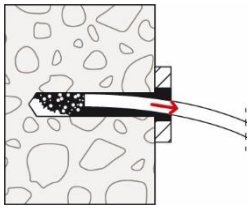
Installation instruction part 1



Step 1: Drilling of the drill hole:

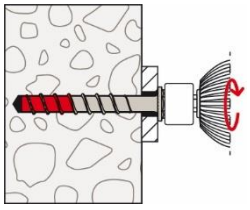
Drill the hole using hammer drill

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



Step 2: Cleaning of the drill hole:

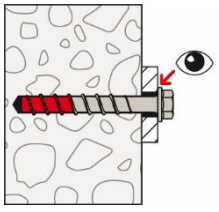
Clean the drill hole.



Step 3: Installation:

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

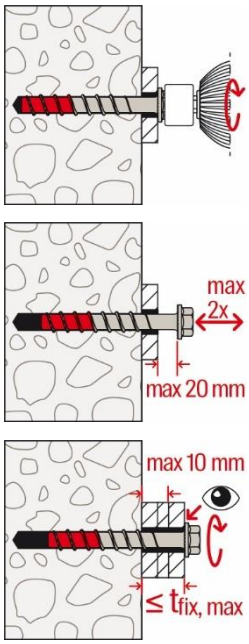
Installation with any torque impact screw driver up to the maximum mentioned torque moment ($T_{imp,max}$ according to table B2.1).



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

Installation instruction part 2



Adjustment

Optional:
It is permissible to adjust the screw twice. Therefore, the screw may be untightened to a maximum of L_{adj} = 20 mm off the surface of the initial fixture. The total permissible thickness of shims added during the adjustment process is t_{adj} = 10 mm.
The required nominal anchoring depth h_{nom} must be kept after the adjustment process. (see also annex B 3)

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

FBS II 6 R					
Nominal embedment depth		h_{nom}	[mm]	45	60
Steel failure for tension load and shear load					
Characteristic resistance		$N_{Rk,s}$	[kN]	19,3	
Partial factor		$\gamma_{Ms,N}$ 2)	[-]	1,5	
Characteristic resistance		$V^0_{Rk,s}$	[kN]	5,2	12,6
Partial factor		$\gamma_{Ms,V}$ 2)	[-]	1,5	
Factor for ductility		k_7		0,75	
Characteristic bending resistance		$M^0_{Rk,s}$	[Nm]	16,1	
Pullout failure					
Characteristic resistance in concrete C20/25	uncracked	$N_{Rk,p}$	[kN]	5,0	10,0
	cracked			2,5	6,0
Increasing factors concrete	C25/30	ψ_c	[-]	1,07	
	C30/37			1,13	
	C35/45			1,18	
	C40/50			1,23	
	C45/55			1,28	
	C50/60			1,32	
Installation sensitivity factor		γ_{inst}		1,4	
Concrete cone failure and splitting failure; concrete pryout failure					
Effective embedment depth		h_{ef}	[mm]	24	37
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		$N^0_{Rk,sp}$	[kN]	min ($N^0_{Rk,c}$ 1); $N_{Rk,p}$)	
Characteristic edge distance for splitting		$c_{cr,sp}$	[mm]	66	42
Characteristic spacing for splitting		$s_{cr,sp}$		$2 \cdot c_{cr,sp}$	$2 \cdot c_{cr,sp}$
Factor for pryout failure		k_8	[-]	2,1	2,6
Installation factor		γ_{inst}		1,4 3)	
Concrete edge failure					
Effective length in concrete		l_f	[mm]	31	46
Nominal diameter of screw		d_{nom}		6	
Adjustment					
Maximum thickness of shims		t_{adj}	[mm]	10	
Max. number of adjustments		n_a	[-]	2	

1) $N^0_{Rk,c}$ according EN 1992-4:2018
2) In absence of other national regulations
3) Only for concrete cone failure and splitting failure; concrete pryout failure according to EN 1992-4:2018,Table 4.1

Table C2.1: Minimum thickness of concrete members, minimum spacing and edge distance

FBS II 6 R

Minimum thickness of concrete member	h_{min}	[mm]	100
Minimum spacing	s_{min}		35
Minimum edge distance	c_{min}		

1) Drill hole depth according to table B2.1

Table C2.2: Characteristic values for resistance to fire

FBS II 6 R

Nominal embedment depth			h_{nom}	[mm]	45	60
Steel failure for tension load and shear load						
Characteristic resistance for the head shapes	US ≥SW13	$F_{Rk,s,fi}$	R30	[kN]	-[1)]	2,1
			R60		-[1)]	1,7
			R90		-[1)]	1,2
			R120		-[1)]	1,0
	SK/P US SW10	$F_{Rk,s,fi}$	R30	[kN]	-[1)]	1,8
			R60		-[1)]	1,4
			R90		-[1)]	1,1
			R120		-[1)]	0,9
Characteristic bending resistance for the head shapes	US ≥SW13	$M^0_{Rk,s,fi}$	R30	[Nm]	-[1)]	1,7
			R60		-[1)]	1,4
			R90		-[1)]	1,0
			R120		-[1)]	0,8
	SK/P US SW10	$M^0_{Rk,s,fi}$	R30	[Nm]	-[1)]	1,5
			R60		-[1)]	1,2
			R90		-[1)]	0,9
			R120		-[1)]	0,7
Pullout failure						
Characteristic resistance	$N_{Rk,p,fi}$		R30	[kN]	-[1)]	1,0
			R60			
			R90			
			R120		-[1)]	0,8
Concrete cone failure failure						
Characteristic resistance	$N_{Rk,c,fi}$		R30	[kN]	-[1)]	1,4
			R60			
			R90			
			R120		-[1)]	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]	$2 \cdot c_{cr,fi}$	

[1)] No performance assessed

fischer concrete screw UltraCut FBS II 6 R

Performances
Minimum thickness of concrete members, minimum spacing and edge distance;
Characteristic values for resistance to fire

Annex C 2