

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

**ETA-20/0228**  
**of 28 July 2020**

English translation prepared by DIBt - Original version in German language

### General Part

Technical Assessment Body issuing the  
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

Fixanchor W-FB

Product family  
to which the construction product belongs

Mechanical fastener for use in concrete

Manufacturer

Adolf Würth GmbH & Co. KG  
Reinhold-Würth-Straße 12-17  
74653 Künzelsau  
DEUTSCHLAND

Manufacturing plant

Werk W1

This European Technical Assessment  
contains

12 pages including 3 annexes which form an integral part  
of this assessment

This European Technical Assessment is  
issued in accordance with Regulation (EU)  
No 305/2011, on the basis of

EAD 330232-00-0601, Edition 10/2016

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## Specific Part

### 1 Technical description of the product

The Fixanchor W-FB is an anchor made of galvanised 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 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 to tension load (static and quasi-static loading)	See Annex B3 and C1
Characteristic resistance to shear load (static and quasi-static loading)	See Annex C2
Displacements (static and quasi-static loading)	See Annex C3
Characteristic resistance and displacements for seismic performance categories C1 and C2	No performance assessed
Durability	See Annex B1

#### 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 330232-00-0601 the applicable European legal act is: [96/582/EC].  
The system to be applied is: 1

**5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document**

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 28 July 2020 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow  
Head of Department

*beglaubigt:*  
Baderschneider

## Wedge Anchor Fixanchor W-FB

### Installation condition

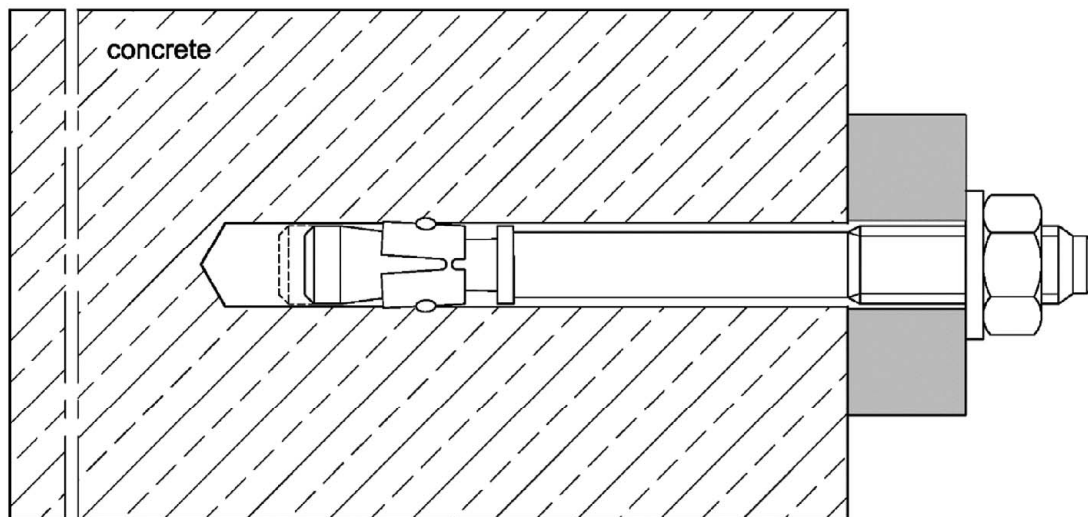
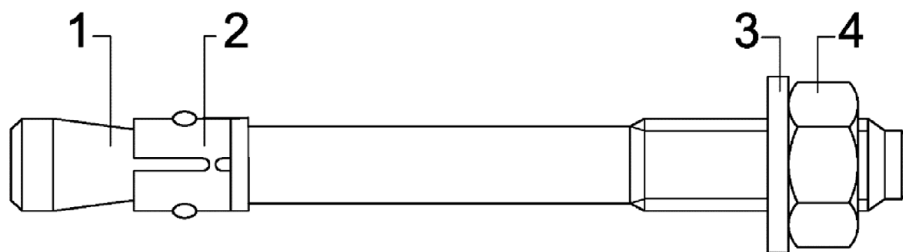


Table A1: Designation and materials

Part	Designation	Material electroplated $\geq 5 \mu\text{m}$ , acc. to EN ISO 4042:1999
1	Conical bolt	Cold formed steel
2	Expansion sleeve	Steel
3	Washer	Steel
4	Hexagon nut	Steel, property class 8

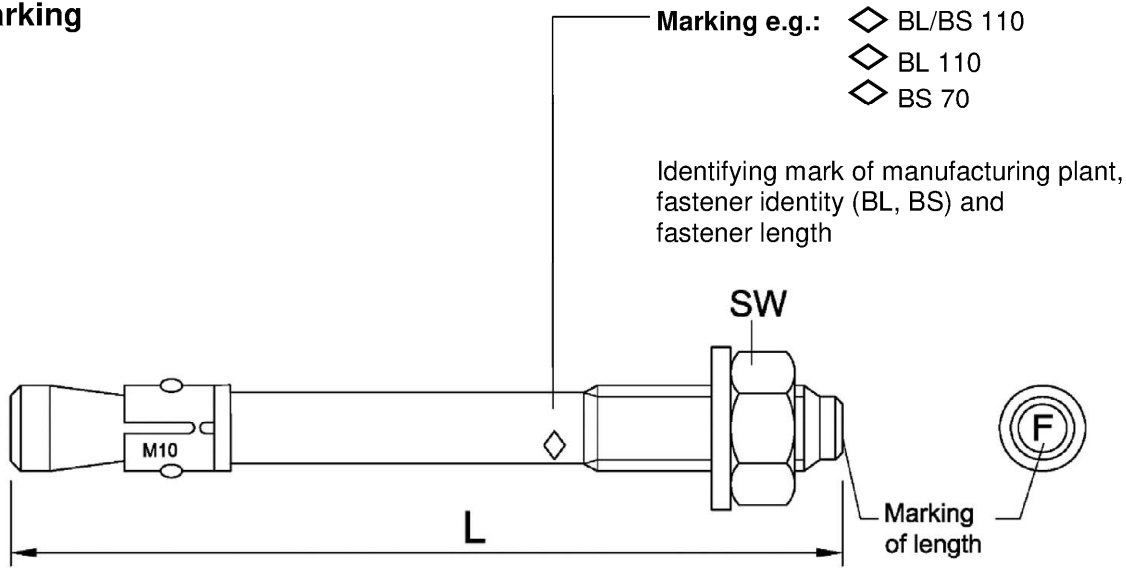


### Wedge Anchor Fixanchor W-FB

**Product description**  
Installation situation and materials

**Annex A1**

### Marking



Marking of length	A	B	C	D	E	F	G	H	I	J	K	L	M
Length of fastener min $\geq$	38,1	50,8	63,5	76,2	88,9	101,6	114,3	127,0	139,7	152,4	165,1	177,8	190,5
Length of fastener max $<$	50,8	63,5	76,2	88,9	101,6	114,3	127,0	139,7	152,4	165,1	177,8	190,5	203,2

Marking of length	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Length of fastener min $\geq$	203,2	215,9	228,6	241,3	254,0	279,4	304,8	330,2	355,6	381,0	406,4	431,8	457,2
Length of fastener max $<$	215,9	228,6	241,3	254,0	279,4	304,8	330,2	355,6	381,0	406,4	431,8	457,2	483,0

Dimensions in mm

**Table A2: Dimensions**

Fastener size	Fastener length L		Wrench size [SW]
	Standard anchorage depth	Reduced anchorage depth	
M8	$t_{\text{fix}} + 66,5$	$t_{\text{fix hef,red}} + 52,5$	13
M10	$t_{\text{fix}} + 74,0$	$t_{\text{fix hef,red}} + 66,0$	17
M12	$t_{\text{fix}} + 97,5$	$t_{\text{fix hef,red}} + 82,5$	19
M16	$t_{\text{fix}} + 121,0$	$t_{\text{fix hef,red}} + 104,0$	24

### Wedge Anchor Fixanchor W-FB

**Product description**  
Marking, dimensions and materials

**Annex A2**

## Specifications of intended use

Wedge anchor	W-FB				W-FB-S			
	M8	M10	M12	M16	M8	M10	M12	M16
Static or quasi-static action		✓				✓		
Uncracked concrete		✓				✓		
Standard anchorage depth		✓				-		
Reduced anchorage depth		✓				✓		

### Base materials:

- Compacted, reinforced or unreinforced normal weight concrete (without fibers) according to EN 206:2013 + A1:2016
- Strength classes C20/25 to C50/60 according to EN 206:2013 + A1:2016

### Use conditions (Environmental conditions):

- Structures subject to dry internal conditions

### Design:

- Fastenings are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are 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 according to EN 1992-4:2018 and Technical Report TR 055

### Installation:

- Drilling by hammer drill bit or vacuum drill bit
- Use of the fastener only as supplied by the manufacturer without exchanging the components of the fastener
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- For anchorages with embedment depth  $h_{ef} < 40\text{mm}$ , the use is restricted to anchorages of statically indeterminate non-structural systems

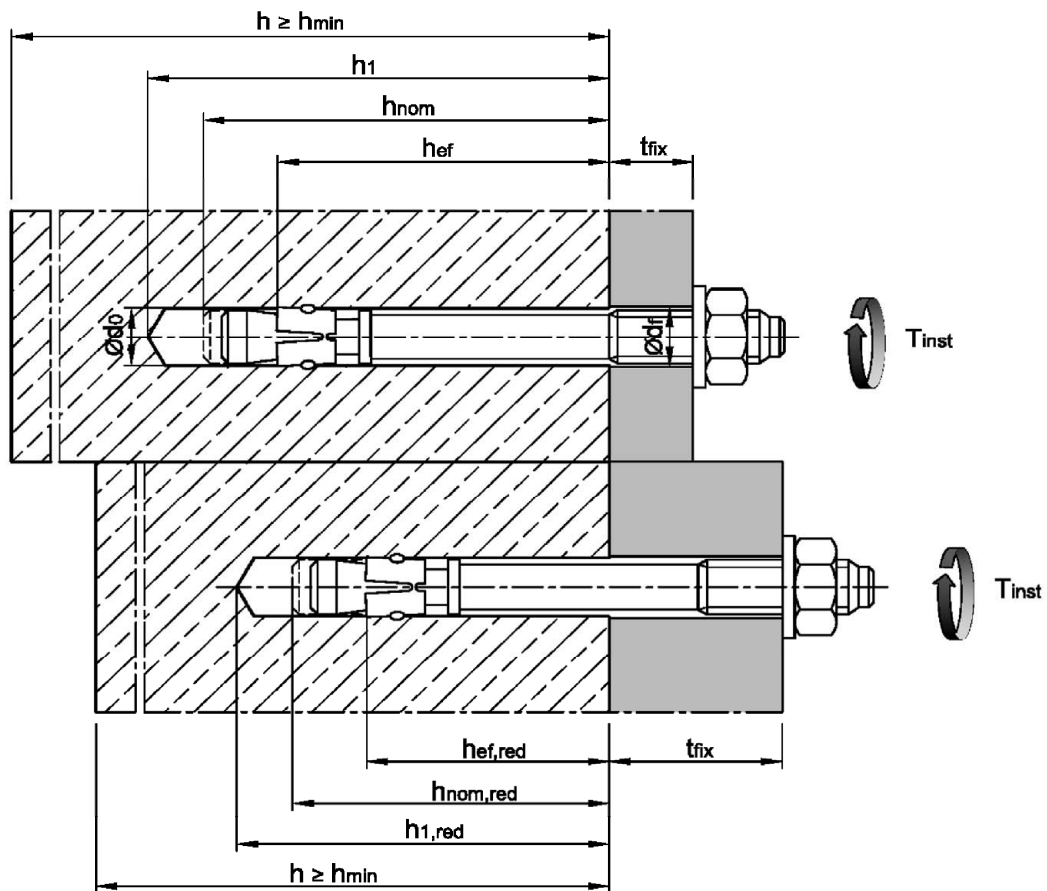
## Wedge Anchor Fixanchor W-FB

Intended use  
Specifications

Annex B1

**Table B1: Installation parameters**

Fastener size		M8	M10	M12	M16
Nominal drill hole diameter	$d_0 =$ [mm]	8	10	12	16
Cutting diameter of drill bit	$d_{cut} \leq$ [mm]	8,45	10,45	12,50	16,50
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	9	12	14	18
Installation torque	$T_{inst} =$ [Nm]	15	30	50	100
<b>Standard anchorage depth</b>					
Effective anchorage depth	$h_{ef} \geq$ [mm]	44	48	65	82
Depth of drill hole	$h_1 \geq$ [mm]	65	70	90	110
Embedment depth	$h_{nom} \geq$ [mm]	56	62	82	102
<b>Reduced anchorage depth</b>					
Effective anchorage depth	$h_{ef,red} \geq$ [mm]	30	40	50	65
Depth of drill hole	$h_{1,red} \geq$ [mm]	50	60	75	95
Embedment depth	$h_{nom,red} \geq$ [mm]	42	54	67	85



**Wedge Anchor Fixanchor W-FB**

Intended use  
Installation data

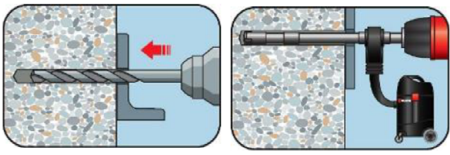
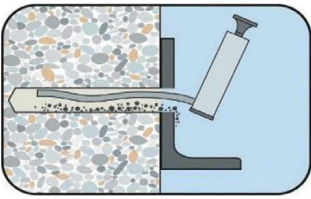
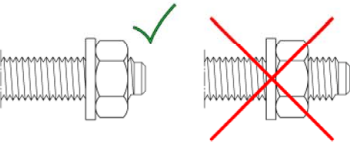
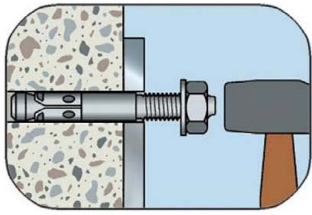
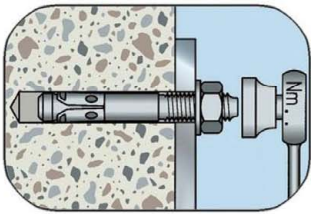
**Annex B2**



**Table B2: Minimum spacing and edge distances**

Fastener size			M8	M10	M12	M16
Minimum member thickness	$h_{min}$	[mm]	100	100	130	170
Minimum spacing	$s_{min}$	[mm]	40	55	75	90
Minimum edge distance	$c_{min}$	[mm]	45	65	90	105

**Installation instructions**

<b>1</b>		Drill hole perpendicular to concrete surface by hammer drill bit or vacuum drill bit. If using a vacuum drill bit, proceed with step 3.
<b>2</b>		Blow out dust. Alternatively vacuum clean down to the bottom of the hole.
<b>3</b>		Check position of nut.
<b>4</b>		Drive in anchor, such that $h_{ef}$ or $h_{ef,red}$ is met.
<b>5</b>		Apply installation torque $T_{inst}$ as specified in Table B1.

**Wedge Anchor Fixanchor W-FB**

**Intended use**  
Minimum spacing and edge distances, Installation instructions

**Annex B3**

**Table C1: Characteristic values for tension loads**

Fastener size			M8	M10	M12	M16
Installation factor	$\gamma_{inst}$	[-]	1,0			
<b>Steel failure</b>						
Characteristic resistance	$N_{Rk,s}$	[kN]	18,1	30,4	41,6	84,0
Partial factor	$\gamma_{Ms}$	[-]	1,5			
<b>Pull-out</b>						
Characteristic resistance in uncracked concrete C20/25 ( <b>Standard</b> anchorage depth)	$N_{Rk,p}$	[kN]	12	14	32	38
Characteristic resistance in uncracked concrete C20/25 ( <b>Reduced</b> anchorage depth)	$N_{Rk,p}$	[kN]	7,5	10	19	26
Increasing factor for $N_{Rk,p}$	$\psi_C$	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$			
<b>Splitting</b>						
Characteristic resistance in uncracked concrete C20/25	$N^0_{Rk,sp}$	[kN]	min [ $N_{Rk,p}$ ; $N^0_{Rk,c}$ ]			
Spacing	$s_{cr,sp}$	[mm]	3 $h_{ef}$			
Edge distance	$c_{cr,sp}$	[mm]	1,5 $h_{ef}$			
<b>Concrete cone failure</b>						
Effective anchorage depth ( <b>Standard</b> anchorage depth)	$h_{ef} \geq$	[mm]	44	48	65	82
Effective anchorage depth ( <b>Reduced</b> anchorage depth)	$h_{ef,red} \geq$	[mm]	30 <sup>1)</sup>	40	50	65
Spacing	$s_{cr,N}$	[mm]	3 $h_{ef}$			
Edge distance	$c_{cr,N}$	[mm]	1,5 $h_{ef}$			
Factor	$k_{ucr,N}$	[-]	11,0			
Factor	$k_{cr,N}$	[-]	No performance assessed			

<sup>1)</sup> Use restricted to dry internal exposure and statically indeterminate structural components, when in case of failure the load may be distributed to other fasteners.

**Wedge Anchor Fixanchor W-FB**

**Performance**  
Characteristic values for **tension loads**

**Annex C1**

**Table C2:** Characteristic values for **shear loads**

Fastener size			M8	M10	M12	M16
Installation factor	$\gamma_{inst}$	[-]	1,0			
<b>Steel failure without lever arm</b>						
Characteristic shear resistance	$V_{Rk,s}^0$	[kN]	10,3	16,2	23,6	44,0
Partial factor	$\gamma_{Ms}$	[-]	1,25			
Ductility factor	$k_7$	[-]	1,0			
<b>Steel failure with lever arm</b>						
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	21	42	73	186
Partial factor	$\gamma_{Ms}$	[-]	1,25			
<b>Concrete pry-out failure</b>						
Pry-out factor for $h_{ef}$ ( <b>Standard</b> anchorage depth)	$k_8$	[-]	1,0	1,0	2,0	2,0
Pry-out factor for $h_{ef,red}$ ( <b>Reduced</b> anchorage depth)	$k_8$	[-]	1,0	1,0	1,0	2,0
<b>Concrete edge failure</b>						
Effective length of fastener in shear loading for $h_{ef}$ ( <b>Standard</b> anchorage depth)	$l_f$	[mm]	44	48	65	82
Effective length of fastener in shear loading for $h_{ef,red}$ ( <b>Reduced</b> anchorage depth)	$l_{f,red}$	[mm]	30 <sup>1)</sup>	40	50	65
Outside diameter of fastener	$d_{nom}$	[mm]	8	10	12	16

<sup>1)</sup> Use restricted to dry internal exposure and statically indeterminate structural components, when in case of failure the load may be distributed to other fasteners.

**Wedge Anchor Fixanchor W-FB**

**Performance**  
Characteristic values for **shear loads**

**Annex C2**

**Table C3:** Displacements under **tension load**

Fastener size		M8	M10	M12	M16
Tension load	N [kN]	5,71	6,67	12,29	17,38
Displacement	$\delta_{N0}$ [mm]	0,32	0,18	0,64	1,81
	$\delta_{N\infty}$ [mm]	3,65			

**Table C4:** Displacements under **shear load**

Fastener size		M8	M10	M12	M16
Shear load	V [kN]	5,86	9,28	13,49	25,12
Displacement	$\delta_{V0}$ [mm]	1,70	1,02	1,75	1,93
	$\delta_{V\infty}$ [mm]	2,55	1,53	2,63	2,90

**Wedge Anchor Fixanchor W-FB**

**Performance**  
Displacements

**Annex C3**