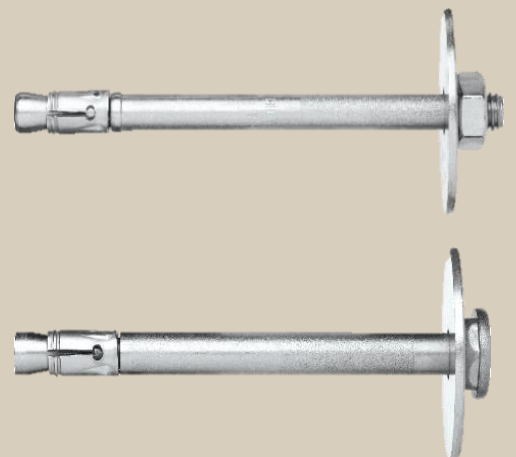




HFB NAIL ANCHOR

Technical Datasheet





Update: Jan-23


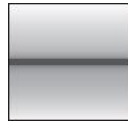


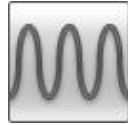







HFB Nail anchor

Premium Fastener for Fire Protection Panels, Light Duty applications and Light Ventilated Facades

Anchor version	Benefits
 <p>HFB (d6)</p>	<ul style="list-style-type: none"> - Verified for ISO 834 (celluloid) curve, HCM curve, ZTV-ING part 5 curve and RWS fire curve. - System tests with several market leading Boards - Keeps its place under static, dynamic and seismic (C1) conditions thereby minimizing economical impact. - Comes with a cordless electric power tool for drilling, setting and removal allowing the fastest (re-) installation time, ensuring that the service interruption is minimized. - The anchor can easily be removed, even the “nail head” geometry” - Pre-assembled washer - Mesh clip for a quick and easy installation support when used with sprayed fire protection mortar - Pre-assembled rubber washer, ideal for installation of light ventilated façade brakckets
 <p>HFB-R (d6) HFB-HCR (d6)</p>	
 <p>HFB-A-R (M6) HFB-A-HCR (M6)</p>	
 <p>HFB-R RW (d6)</p>	

Base material	Load conditions
 <p>Concrete (cracked)</p>	 <p>Static/ quasi-static</p>  <p>Seismic C1</p>  <p>Fire resistance</p>  <p>Fatigue/Dynamic</p>

Installation conditions	Other information
 <p>Hammer drilled holes</p>	 <p>European Technical Assessment</p>  <p>CE conformity</p>

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
European technical assessment ^{a)}	ZAG. Ljubljana	ETA-17/0168, 2021-01-18
Fire test report ^{a)}	ZAG. Ljubljana	ETA-17/0168, 2021-01-18
Fire test report (RWS/HCinc)	EFFECTIS France	EFR-18-J-002325
Seismic report	Fastening-technology	TA-1703, 2018-05-25
Fatigue	Hilti technical data	TA

a) All data given in this section according to ETA-17/0168, issue 2021-01-18.

Static and quasi-static loading (for a single anchor)

All data in this section applies to:

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- Steel failure
- Minimum base material thickness
- Concrete C 20/25, $f_{ck,cube} = 25 \text{ N/mm}^2$

Effective anchorage depth for static

Anchor size		M6 / d6		
Effective anchorage depth	h_{ef} [mm]	25	30	35 ^{a)}

Characteristic resistance

Anchor size		M6 / d6			
Cracked concrete					
Resistance, load in all directions	HFB-R, HFB-R RW, HFB-HCR, HFB-A-HCR	F^0_{Rk} [kN]	3,0	5,0	6,0
	HFB, HFB-A-R;		3,0	4,5	6,0 ^{a)}

Design resistance

Anchor size		M6 / d6			
Cracked concrete					
Resistance, load in all directions	HFB-R, HFB-R RW, HFB-HCR, HFB-A-HCR	F^0_{Rd} [kN]	2,0	3,3	4,0
	HFB, HFB-A-R		2,0	3,0	4,0 ^{a)}

Recommended^{b)} resistance

Anchor size		M6 / d6			
Cracked concrete					
Resistance, load in all directions	HFB-R, HFB-R RW, HFB-HCR, HFB-A-HCR	F^0_{Rec} [kN]	1,4	2,4	2,9
	HFB, HFB-A-R		1,4	2,1	2,9 ^{a)}

a) Not applicable to HFB (CS), since it is not tested for $h_{ef}=35$.

b) With overall partial safety factor for action $\gamma = 1,4$, The partial safety factors for action depend on the type of loading and shall be taken from national regulations.



Seismic loading (for a single anchor)

All data in this section applies to:

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- Steel failure
- Minimum base material thickness
- Concrete C 20/25, $f_{ck,cube} = 25 \text{ N/mm}^2$
- All data given in this section is according to TA-1703, issue 2018-05-25

Effective anchorage depth for seismic C1

Anchor size		M6 / d6		
Effective anchorage depth	h_{ef} [mm]	25	30	35

Characteristic resistance in case of seismic performance C1

Anchor size		M6 / d6			
Cracked concrete					
Tension	HFB-R, HFB-R RW	$N_{Rk,seis}$ [kN]	3,0	4,0	4,0
	HFB-A-R		3,0	4,0	4,0
Shear	HFB-R, HFB-R RW	$V_{Rk,seis}$ [kN]	-	3,5	3,5
	HFB-A-R		-	-	-

Design resistance in case of seismic performance C1

Anchor size		M6 / d6			
Cracked concrete					
Tension	HFB-R, HFB-R RW	$N_{Rd,seis}$ [kN]	2,0	2,6	2,6
	HFB-A-R		2,0	2,6	2,6
Shear	HFB-R, HFB-R RW	$V_{Rd,seis}$ [kN]	-	2,3	2,3
	HFB-A-R		-	-	-

Fire resistance

All data in this section applies to:

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- Steel failure
- Minimum base material thickness
- Concrete C 20/25 to C50/60
- Partial safety factor for resistance under fire exposure $\gamma_{M,fi} = 1,0$ (in absence of other national regulations)

Effective anchorage depth

Anchor size		M6 / d6		
Effective anchorage depth	h_{ef} [mm]	25	30	35 ^{a)}

a) Not applicable to HFB (CS), since it is not tested for $h_{ef}=35$.

Characteristic resistance

Anchor size		M6 / d6			
Fire exposure R30					
Resistance, load in all directions	HFB	$F^{0}_{Rk,fi}$ [kN]	0,5	0,9	- a)
	HFB-R, HFB-HCR, HFB-R RW		0,5	0,9	1,2
	HFB-A-R, HFB-A-HCR		0,5	0,9	1,0
Fire exposure R120					
Resistance, load in all directions	HFB	$F^{0}_{Rk,fi}$ [kN]	0,3	0,3	- a)
	HFB-R, HFB-HCR, HFB-R RW		0,2	0,7	1,0
	HFB-A-R, HFB-A-HCR		0,1	0,1	0,1

Design resistance

Anchor size		M6 / d6			
Fire exposure R30					
Resistance, load in all directions	HFB	$F^{0}_{Rd,fi}$ [kN]	0,5	0,9	- a)
	HFB-R, HFB-HCR, HFB-R RW		0,5	0,9	1,2
	HFB-A-R, HFB-A-HCR		0,5	0,9	1,0
Fire exposure R120					
Resistance, load in all directions	HFB	$F^{0}_{Rd,fi}$ [kN]	0,3	0,3	- a)
	HFB-R, HFB-HCR, HFB-R RW		0,2	0,7	1,0
	HFB-A-R, HFB-A-HCR		0,1	0,1	0,1

For more information about different failure modes and fire resistance times please see the full ETA-17/0168 report.

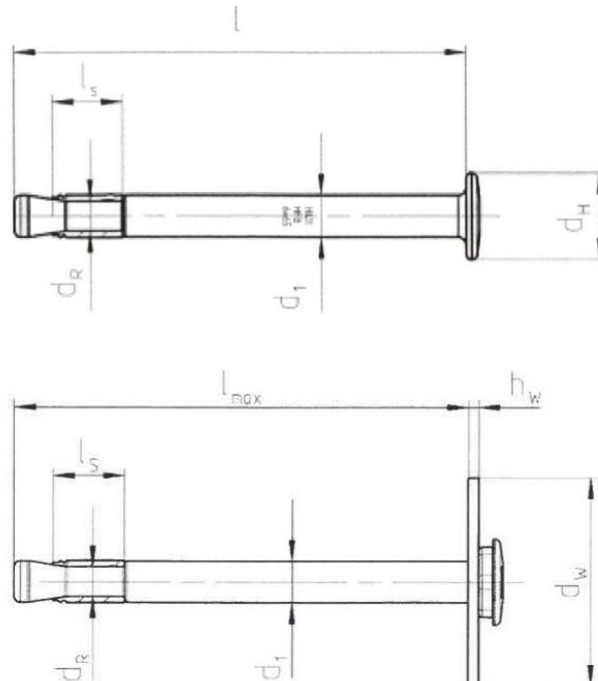
Materials

Material quality

Part		Material
Metal parts made of carbon steel		
Anchor bolt	HFB	Carbon steel, galvanized, coated, rupture elongation ($l_0 = 5d$) > 8%
Expansion sleeve	HFB	Stainless steel A4
Metal parts made of stainless steel		
Anchor bolt	HFB-R, HFB-A-R, HFB-R RW	Stainless steel A4, coated, rupture elongation ($l_0 = 5d$) > 8%
Expansion sleeve	HFB-R, HFB-A-R, HFB-R RW	Stainless steel A4
Washer	HFB-R, HFB-A-R, HFB-R RW	Stainless steel A4
Hexagon/Special nut	HFB-R, HFB-A-R, HFB-R RW	Stainless steel A4
Metal parts made of high corrosion resistant steel		
Anchor bolt	HFB-HCR HFB-A-HCR	High corrosion resistance steel, coated, rupture elongation ($l_0 = 5d$) > 8%
Expansion sleeve	HFB-HCR HFB-A-HCR	High corrosion resistance steel
Washer	HFB-HCR HFB-A-HCR	High corrosion resistance steel
Hexagon/Special nut	HFB-HCR HFB-A-HCR	High corrosion resistance steel
Rubber parts		
Washer	HFB-R RW	Elastomer, black

Anchor dimensions

Anchor		HFB	HFB-R, HFB-R RW, HFB-HCR	HFB-A-R and HFB-A-HCR
Maximum length of anchor	$l_{max} \leq$ [mm]	150		
Anchor diameter	d_1 [mm]	5,9	5,2	
Shaft diameter at the cone	d_R [mm]	4,2		
Diameter of head	$d_H \leq$ [mm]	12,2	-	
Length of expansion sleeve	l_s [mm]	10,1		
Diameter of washer	$d_w \leq$ [mm]	-	30	
Thickness of washer	$h_w \leq$ [mm]	-	1,5	

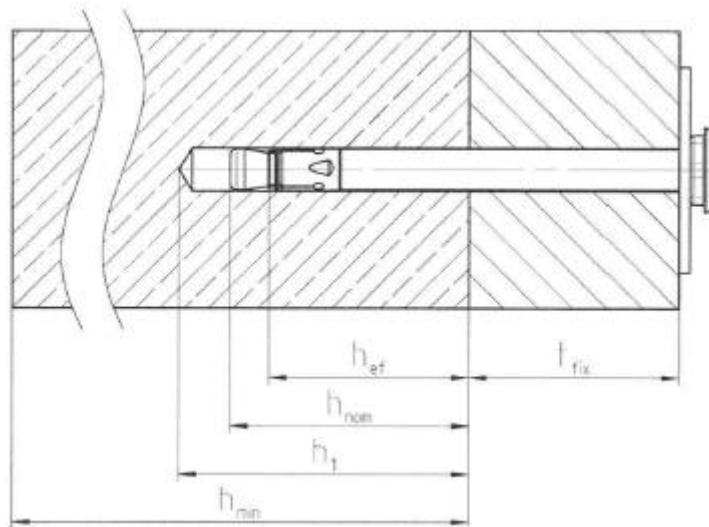


Setting information

Setting details

Anchor		HFB, HFB-R, HFB-R RW HFB-A-R, HFB-HCR and HFB-A-HCR		
Nominal diameter of drill bit	d_o [mm]	6		
Cutting diameter of drill bit	$d_{cut} \leq$ [mm]	6,40		
Maximum diameter of clearance hole in the fixture	d_f [mm]	7		
Nominal embedment depth	h_{nom} [mm]	30	35	40 ^{a)}
Effective embedment depth	h_{ef} [mm]	25	30	35 ^{a)}
Drill hole depth	$h_1 \geq$ [mm]	34	39	44 ^{a)}

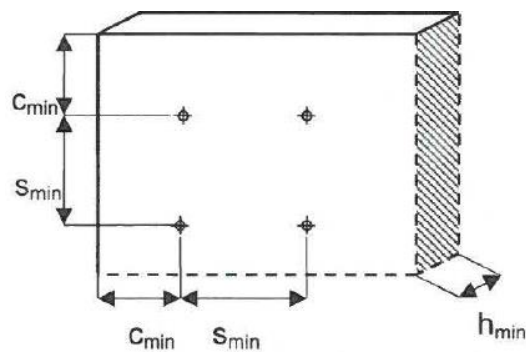
a) Not applicable to HFB (CS), since it is not tested for $h_{ef}=35$.



Setting parameters

Anchor Size		HFB, HFB-R, HFB-R RW, HFB-A-R, HFB-HCR and HFB-A-HCR		
Effective anchorage depth	h_{ef} [mm]	25	30	35 ^{a)}
Minimum base material thickness	h_{min} [mm]	80	80	80 ^{a)}
Minimum spacing	s_{min} [mm]	50	50	50 ^{a)}
	for $c \geq$ [mm]	50	50	50 ^{a)}
Minimum edge distance	c_{min} [mm]	40	40	40 ^{a)}
	for $s \geq$ [mm]	75	80	80 ^{a)}

a) Not applicable to HFB (CS), since it is not tested for $h_{ef}=35$.



Installation equipment

Anchor size	HFB	HFB-R, HFB-R RW	HFB-A-R	HFB-HCR	HFB-A-HCR
Rotary hammer	TE-4 (-A) – TE-6 (-A)				
Setting tool	TE-C-HFB-ST				
Setting tool pneumatic	P-HFB-ST				
Setting tube	D-HFB-ST				
Socket wrench	-	-	SI-HFB-RS	-	SI-HFB-RS
Mesh clip	-	HFB-CM 20	HFB-CM 20	-	-

Applications



Fastening of pre-fabricated fire protection boards



Fastening of light wire mesh reinforcement for fire protection mortar

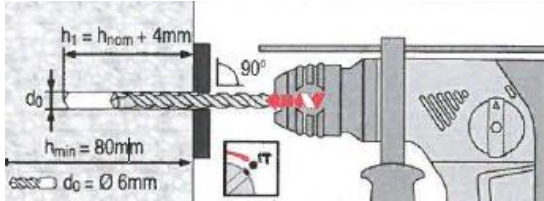
Setting instructions

*For detailed information on installation see instruction for use given with the package of the product

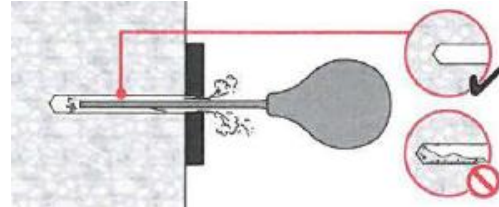
Setting instruction for HFB-R, HFB-R RW* , HFB-A-R, HFB-HCR and HFB-A-HCR

Hammer drilling

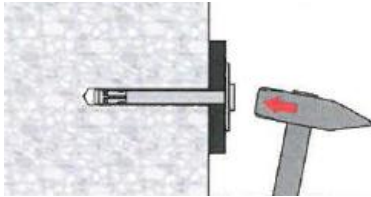
1. Drill the hole



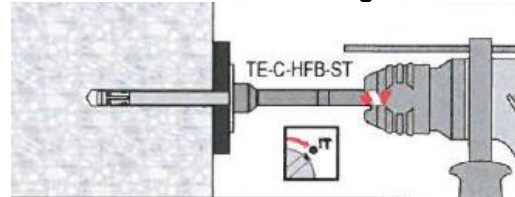
2. Clean the hole



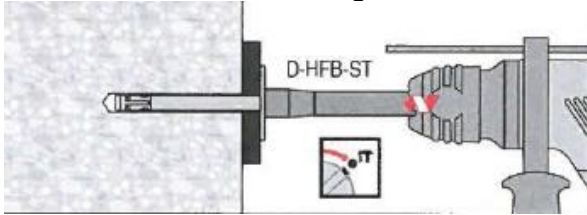
3a. Insert the anchor with hammer



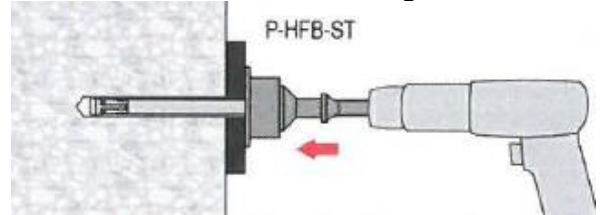
3b. Insert the anchor with setting tool TE-C-HFB-ST



3c. Insert the anchor with setting tool D-HFB-ST



3d. Insert the anchor with setting tool P-HFB-ST



4. Check the anchor

