

WTB1 SSt Throughbolt Anchor

High performance stainless steel expansion anchor for cracked concrete

Anchor types



WTB1 SSt 8x75
WTB1 SSt 8x115
WTB1 SSt 10x95
WTB1 SSt 10x130
WTB1 SSt 12x125
WTB1 SSt 12x150

- The **WTB1 SSt** throughbolts are torque-controlled stainless steel through-fixings for medium to heavy loads. They are approved for use in cracked and non-cracked concrete.

Features and benefits

- ETA Option 1 approval for cracked and non-cracked concrete
- Made of stainless steel for use in external atmospheric environment
- Two embedment depths provide installation flexibility
- Fire resistance class R30-R120 for design of anchorages under exposure to fire
- High load capacity
- Pre- and through fixing

Approvals and certificates

- European Technical Assessment
- Fire Test Report

ETA-17/0343, 12 April 2017
ETA-17/0343, 12 April 2017



Suitable base materials

- Non-cracked concrete, C20/25 to C50/60
- Cracked concrete, C20/25 to C50/60
- Stone

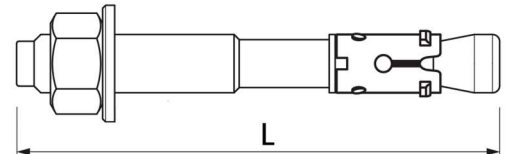
Typical applications

- Structural steel
- Barriers and safety systems
- Heavy plant machinery
- Façade systems
- Cladding

Product details

Article	Description	Size	Length	Max. fixture thickness ¹⁾	Fixture hole clearance
		[-]	L [mm]	t _{fix,max} [mm]	d _f [mm]
609871080	WTB1 SSt 8x75	M8	75	25 / 10	9
609871081	WTB1 SSt 8x115	M8	115	65 / 50	9
609871100	WTB1 SSt 10x95	M10	95	35 / 15	11
609871101	WTB1 SSt 10x130	M10	130	70 / 50	11
609871120	WTB1 SSt 12x125	M12	125	50 / 30	13
609871121	WTB1 SSt 12x150	M12	150	70 / 55	13

1) Max. fixture thickness is indicated at reduced / standard embedment depths



Packaging details

Article	Description	Pack 1		Pack 2	
		[pcs]	EAN13	[pcs]	EAN13
609871080	WTB1 SSt 8x75	100	8712993156931	-	-
609871081	WTB1 SSt 8x115	50	8712993156948	-	-
609871100	WTB1 SSt 10x95	50	8712993156955	-	-
609871101	WTB1 SSt 10x130	50	8712993156962	-	-
609871120	WTB1 SSt 12x125	50	8712993156979	-	-
609871121	WTB1 SSt 12x150	50	8712993156986	-	-

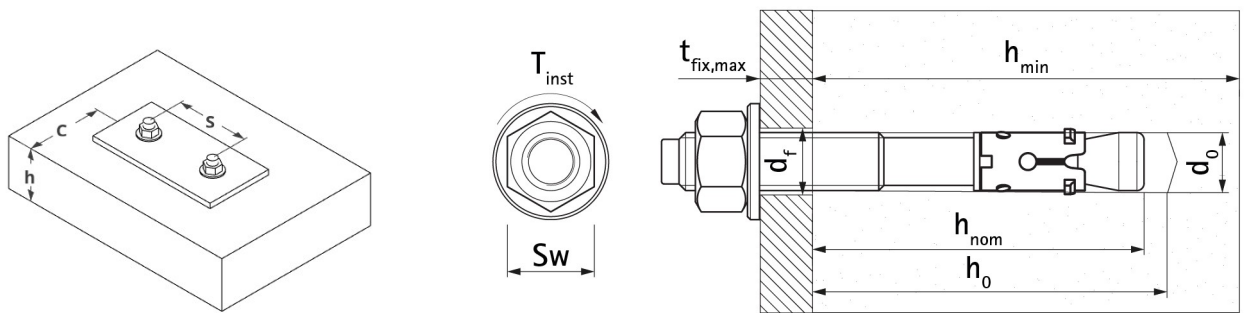
Mechanical properties

Component	Material
Anchor body	Steel rod on coil cold forged bolts. Steel grade 1.4578, according EN 10263-5.
Expansion sleeve	Steel grade 1.4401, according EN 10088-2.
Hexagonal nut	According DIN 934
Washer	According DIN 125A or DIN 9021

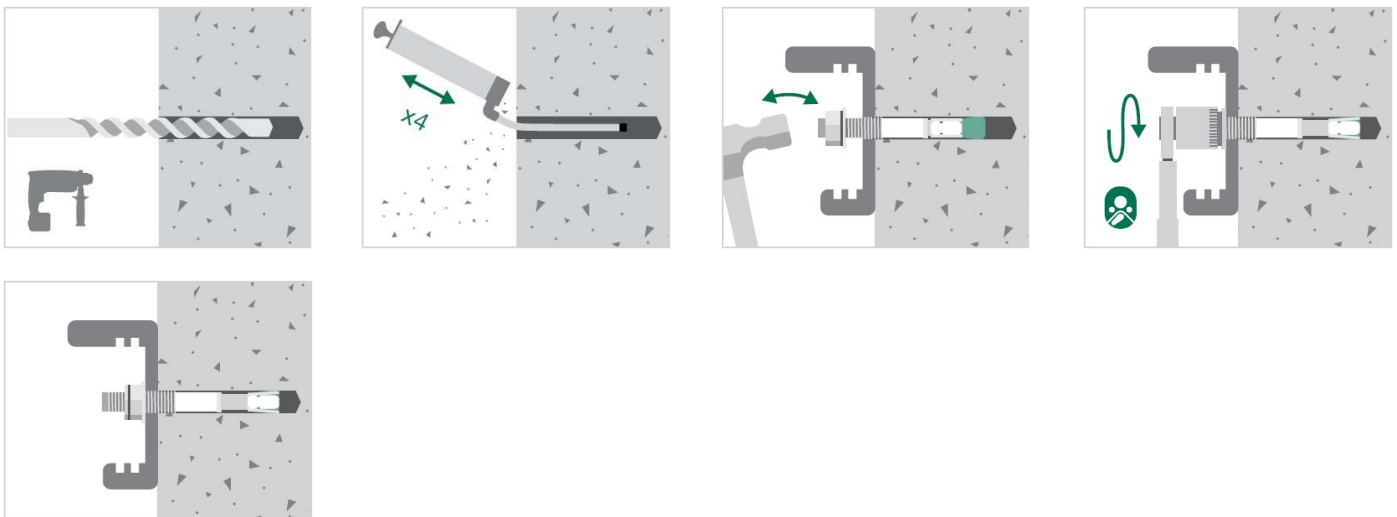
Component	Material properties	
Anchor body	M8 – M10	M12-M16
Ultimate tensile strength [N/mm ²]	600-700	550-650
Expansion sleeve	M8-M16	
Ultimate tensile strength [N/mm ²]	530-680	

Installation parameters

Anchor Type		WTB1 SSt		
Anchor Size		M8	M10	M12
Drill hole diameter	d_0 [mm]	8	10	12
Installation torque	T_{inst} [Nm]	15	30	50
Wrench Size	SW [mm]	13	17	19
Standard embedment depth				
Depth of drill hole	h_0 [mm]	55	69	80
Nominal embedment depth	h_{nom} [mm]	55	69	80
Min. concrete member thickness	h_{min} [mm]	100	120	140
Min. edge distance in cracked concrete	C_{min} [mm]	40	45	55
Min. edge distance in non-cracked concrete	C_{min} [mm]	40	50	55
Min. anchor spacing in cracked concrete	S_{min} [mm]	55	70	90
Min. anchor spacing in non-cracked concrete	S_{min} [mm]	55	70	90
Reduced embedment depth				
Depth of drill hole	h_0 [mm]	40	49	60
Nominal embedment depth	h_{nom} [mm]	40	49	60
Min. concrete member thickness	h_{min} [mm]	100	100	100
Min. edge distance in cracked concrete	C_{min} [mm]	40	50	70
Min. edge distance in non-cracked concrete	C_{min} [mm]	50	70	95
Min. anchor spacing in cracked concrete	S_{min} [mm]	50	70	120
Min. anchor spacing in non-cracked concrete	S_{min} [mm]	50	70	120



Instructions for installation in concrete



Recommended loads in C20/25 concrete for single anchors¹⁾

Anchor Type			WTB1 SSt			
Anchor size			M8	M10	M12	
Standard embedment depth	h_{nom}	[mm]	55	69	80	
Reduced embedment depth	h_{nom}	[mm]	40	49	60	
Tension						
Non-cracked concrete	h_{nom} = standard	N_{Rec}	[kN]	3.57	7.62	11.90
	h_{nom} = reduced	N_{Rec}	[kN]	2.98	4.76	8.00
Cracked concrete	h_{nom} = standard	N_{Rec}	[kN]	2.38	4.29	5.71
	h_{nom} = reduced	N_{Rec}	[kN]	1.19	2.98	4.29
Shear						
Non-cracked concrete	h_{nom} = standard	V_{Rec}	[kN]	6.46	10.57	13.48
	h_{nom} = reduced	V_{Rec}	[kN]	3.63	4.88	8.00
Cracked concrete	h_{nom} = standard	V_{Rec}	[kN]	4.60	7.77	9.61
	h_{nom} = reduced	V_{Rec}	[kN]	2.59	3.48	5.70

1) Single anchors are anchors not affected by concrete edge and anchor spacing influence.

2) Recommended load includes partial safety factor and an overall partial safety factor for action of 1.4. The partial safety factor for action depends on the type of loading and shall be taken from national regulations. All anchor failure modes and the entire relevant product European Technical Assessment must be considered for anchor design.

Characteristic values of resistance to tension load under fire exposure¹⁾

Anchor Type			WTB1 SSt					
Anchor Size			M8		M10		M12	
Nominal embedment depth			40	55	49	69	60	80
R30								
Steel failure	$N_{Rk,s,fi}$	[kN]	0.70	0.70	1.50	1.50	2.50	2.50
Pull-out failure	$N_{Rk,s,fi}$	[kN]	0.80	1.50	1.90	2.30	2.30	3.00
Concrete cone failure	$N_{Rk,c,fi}$	[kN]	1.00	2.70	1.70	4.80	2.90	6.90
R60								
Steel failure	$N_{Rk,s,fi}$	[kN]	0.60	0.60	1.20	1.20	2.10	2.10
Pull-out failure	$N_{Rk,s,fi}$	[kN]	0.80	1.50	1.90	2.30	2.30	3.00
Concrete cone failure	$N_{Rk,c,fi}$	[kN]	1.00	2.70	1.70	4.80	2.90	6.90
R90								
Steel failure	$N_{Rk,s,fi}$	[kN]	0.40	0.40	0.90	0.90	1.70	1.70
Pull-out failure	$N_{Rk,s,fi}$	[kN]	0.80	1.50	1.90	2.30	2.30	3.00
Concrete cone failure	$N_{Rk,c,fi}$	[kN]	1.00	2.70	1.70	4.80	2.90	6.90
R120								
Steel failure	$N_{Rk,s,fi}$	[kN]	0.40	0.40	0.80	0.80	1.30	1.30
Pull-out failure	$N_{Rk,s,fi}$	[kN]	0.60	1.20	1.50	1.80	1.80	2.40
Concrete cone failure	$N_{Rk,c,fi}$	[kN]	0.80	2.20	1.40	3.90	2.30	5.50
Critical anchor spacing distance	$S_{cr,N}$	[mm]	4 x h_{ef}					
Minimum anchor spacing distance	S_{min}	[mm]	50	55	70	70	120	90
Critical edge spacing distance	$C_{cr,N}$	[mm]	2 x h_{ef}					
Minimum edge spacing distance	C_{min}	[mm]	2 x h_{ef} ³⁾					

1) In absence of other national regulations the partial safety factor for resistance under fire exposure $\gamma_{M,fi} = 1,0$ is recommended

2) Use restricted to anchoring statically indeterminate structural components

3) If the fire attack is from more than one side, the edge distance of the anchor has to be ≥ 300 mm and $\geq 2 \times h_{ef}$

Characteristic values of resistance to shear load under fire exposure

Anchor Type			WTB1							
Anchor Size			M8		M10		M12		M16	
Nominal embedment depth	h_{nom}	[mm]	40 ¹⁾	55	49 ¹⁾	69	60	80	80	100
R30										
Steel failure without lever arm	$V_{Rk,s,fi}$	[kN]	0.70	0.70	1.50	1.50	2.25	2.25	4.70	4.70
Steel failure with lever arm	$M_{Rk,s,fi}$	[Nm]	0.70	0.70	1.90	1.90	3.90	3.90	10.00	10.00
R60										
Steel failure without lever arm	$V_{Rk,s,fi}$	[kN]	0.60	0.60	1.20	1.20	2.10	2.10	3.90	3.90
Steel failure with lever arm	$M_{Rk,s,fi}$	[Nm]	0.60	0.60	1.50	1.50	3.30	3.30	8.30	8.30
R90										
Steel failure without lever arm	$V_{Rk,s,fi}$	[kN]	0.40	0.40	0.90	0.90	1.70	1.70	3.10	3.10
Steel failure with lever arm	$M_{Rk,s,fi}$	[Nm]	0.40	0.40	1.20	1.20	2.60	2.60	6.70	7.70
R120										
Steel failure without lever arm	$V_{Rk,s,fi}$	[kN]	0.40	0.40	0.80	0.80	1.30	1.30	2.50	2.50
Steel failure with lever arm	$M_{Rk,s,fi}$	[Nm]	0.40	0.40	1.00	1.00	2.10	2.10	5.30	5.30
Factor ²⁾	k_8	[-]	-	-	1.20	-	-	-	-	-
Concrete edge failure			<p>The characteristic resistance $V_{Rk,c,fi}^0$ in concrete C20/25 to C50/60 is determined by: $V_{Rk,c,fi}^0 = 0,25 \times V_{Rk,c}^0 (\leq 90)$ and $V_{Rk,c,fi}^0 = 0,20 \times V_{Rk,c}^0 (\leq 120)$ with the initial value of the characteristic resistance $V_{Rk,c}^0$ in cracked concrete C20/25 under normal temperature</p>							

1) Use restricted to anchoring statically indeterminate structural components

2) The values of factor k_8 and relevant values of $N_{Rk,c,fi}$ given in the table *Characteristic values of resistance to tension load under fire exposure* have to be considered in the design