

WT1 Throughbolt Anchors

Ultimate-performance throughbolt anchors for cracked and non-cracked concrete and for seismic performance categories C1 and C2

Anchor types



WT1
(M8 – M16)

- **WT1** is the ultimate-performance zinc-plated throughbolt anchor for use in cracked and non-cracked concrete under normal and seismic C1 or C2 conditions.

Features and benefits

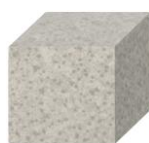
- ETA according to EAD 330232-01-0601 for use in cracked and non-cracked concrete (option 1)
- WT1 is approved for seismic C1 and C2 loads
- Simple and quick installation procedure
- For medium to heavy loads
- Can be installed as pre-fixing (before application of a fixing plate) or as through-fixing (through hole of the fixing plate)
- Compliance with VdS CEA 4001:2024-01 (08) for applications with sprinkler systems in concrete elements
- Fire resistance class R30-R120 for design of anchorages under exposure to fire

Suitable base materials

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



Concrete
(cracked and
non-cracked)



Stone

Typical applications

- Structural steel
- Barriers and safety systems
- Heavy plant machinery
- Facade systems

Approvals and certificates

- European Technical Assessment
- Fire Test Report

ETA-21/0365, 8 February 2024
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1. Product details

Article	Description	Size	Length	Max. fixture thickness	Fixture hole clearance
		[-]	L [mm]	t _{fix,max} [mm]	d _f [mm]
608408080	WT1 M8x80	M8	80	14	9
608408095	WT1 M8x95	M8	95	29	9
608408115	WT1 M8x115	M8	115	49	9
608410090	WT1 M10x90	M10	90	10	12
608410115	WT1 M10x115	M10	115	35	12
608410135	WT1 M10x135	M10	135	55	12
608412110	WT1 M12x110	M12	110	14	14
608412120	WT1 M12x120	M12	120	24	14
608412150	WT1 M12x150	M12	150	54	14
608416145	WT1 M16x145	M16	145	28	18



2. Packaging details

Article	Description	Pack 1		Pack 2	
		[pcs]	EAN13	[pcs]	EAN13
608408080	WT1 M8x80	100	8719942170291	600	8719942170307
608408095	WT1 M8x95	100	8719942170321	600	8719942170338
608408115	WT1 M8x115	100	8719942170352	400	8719942170369
608410090	WT1 M10x90	100	8719942170383	400	8719942170390
608410115	WT1 M10x115	50	8719942170413	200	8719942170420
608410135	WT1 M10x135	50	8719942170444	200	8719942170451
608412110	WT1 M12x110	50	8719942170475	200	8719942170482
608412120	WT1 M12x120	50	8719942170505	200	8719942170512
608412150	WT1 M12x150	50	8719942170536	100	8719942170543
608416145	WT1 M16x145	25	8719942170567	100	8719942170574

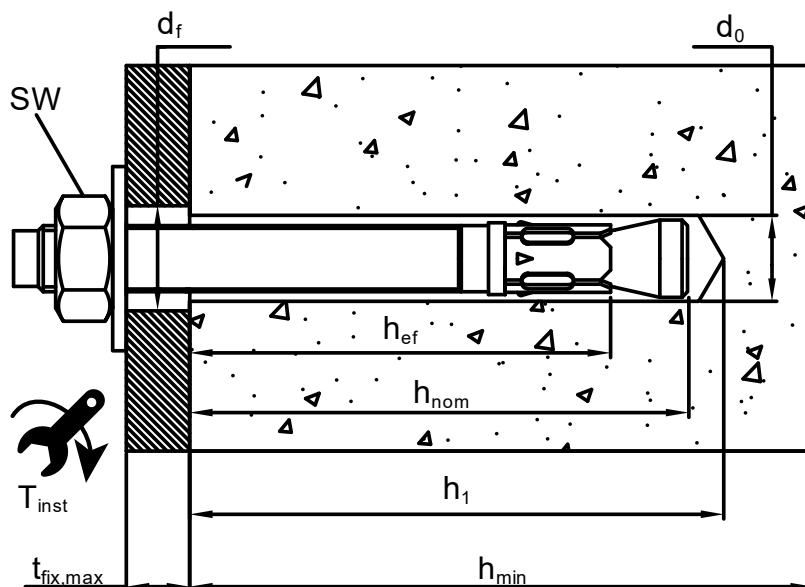
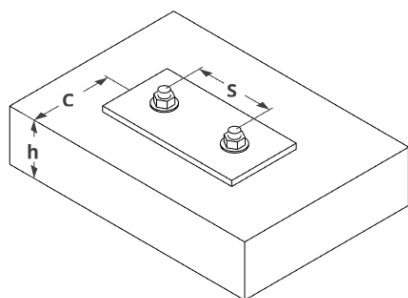
3. Mechanical properties

Component	Material
Anchor Shaft	Carbon steel wire rod, galvanized $\geq 5 \mu\text{m}$ ISO 4042 Zn5/An/T0 with antifriction coating
Washer	DIN 125, DIN 9021, DIN 440 galvanized $\geq 5 \mu\text{m}$ ISO 4042 Zn5/An/T0
Nut	DIN 934 class 6 galvanized $\geq 5 \mu\text{m}$ ISO 4042 Zn5/An/T0
Expansion clip	Carbon steel strip, sherardized $\geq 15 \mu\text{m}$ EN 13811

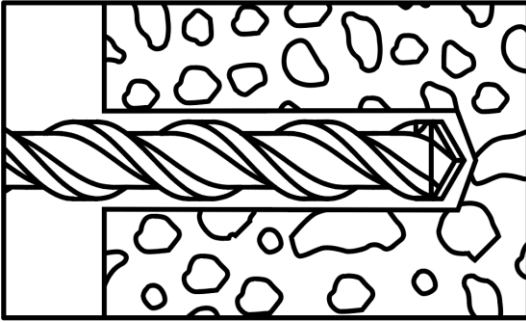
4. Installation data

4.1 Installation parameters

Anchor Type			WT1			
Anchor Size			M8	M10	M12	M16
Nominal embedment depth	h_{nom}	[mm]	55	68	80	97
Effective embedment depth	h_{ef}	[mm]	48	60	70	85
Drill hole diameter	d_0	[mm]	8	10	12	16
Depth of drill hole	$h_1 \geq$	[mm]	60	75	85	105
Diameter of clearing hole in the fixture	d_f	[mm]	9	12	14	18
Max fixture thickness	$t_{fix,max}$	[mm]	L – 66	L – 80	L – 96	L – 117
Minimum concrete member thickness	h_{min}	[mm]	80	90	105	130
Minimum edge distance	c_{min}	[mm]	45	45	55	70
for spacing $s \geq$		[mm]	55	90	110	115
Minimum anchor spacing	s_{min}	[mm]	40	40	60	65
For edge distance $c \geq$		[mm]	55	70	75	95
Characteristic spacing	$S_{cr,N}$	[mm]	144	180	210	255
Characteristic edge distance	$C_{cr,N}$	[mm]	72	90	105	128
Characteristic spacing (splitting)	$S_{cr,sp}$	[mm]	288	300	350	510
Characteristic edge distance (splitting)	$C_{cr,sp}$	[mm]	144	150	175	255
Tightening torque	T_{inst}	[Nm]	15	40	60	100
Installation wrench	SW	[mm]	13	17	19	24

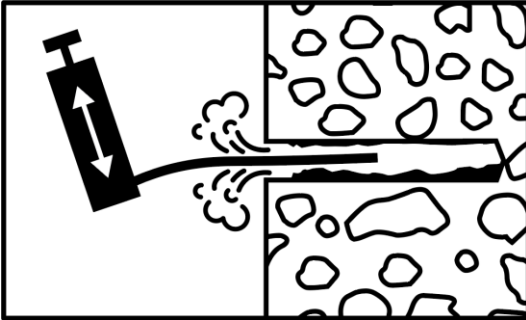


4.2 Installation procedure for concrete

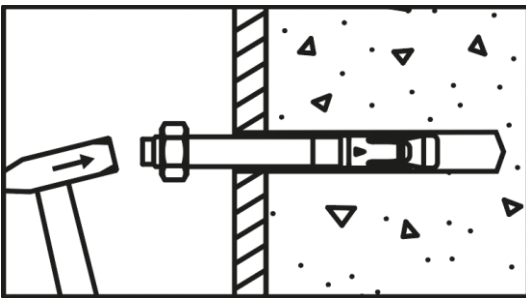


Drill the hole with rotary hammer drilling machine.

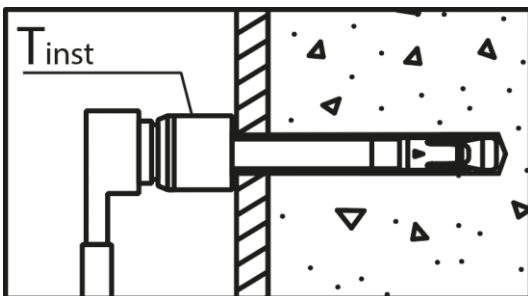
Drill to a required depth.



Clean the drill hole with a hand pump.



Hammer the anchor into the hole.



Tighten the nut to the specified tightening torque T_{inst} .

5. Performance information

5.1 Loading information for WT1 in cracked and non-cracked C20/25 concrete¹⁾

Anchor Type			WT1 – Non-cracked Concrete				WT1 – Cracked Concrete			
Anchor Size			M8	M10	M12	M16	M8	M10	M12	M16
Nominal embedment depth	h_{nom}	[mm]	55.0	68.0	80.0	97.0	55.0	68.0	80.0	97.0
Tension load										
Characteristic resistance	N_{Rk}	[kN]	10.0	18.0	28.0	34.0	7.0	11.0	15.0	27.0
Design resistance	N_{Rd}	[kN]	5.5	12.0	18.6	22.6	3.9	7.3	10.0	18.0
Recommended resistance ²⁾	N_{Rec}	[kN]	3.9	8.5	13.3	16.1	2.7	5.2	7.1	12.9
Shear load										
Characteristic resistance	V_{Rk}	[kN]	<u>11.0</u>	<u>17.4</u>	<u>25.3</u>	<u>47.1</u>	11.5	<u>17.4</u>	<u>25.3</u>	53.9
Design resistance	V_{Rd}	[kN]	<u>8.8</u>	<u>13.9</u>	<u>20.2</u>	<u>37.7</u>	7.6	<u>13.9</u>	<u>20.2</u>	35.9
Recommended resistance ²⁾	V_{Rec}	[kN]	<u>6.3</u>	<u>9.9</u>	<u>14.5</u>	<u>26.9</u>	5.4	<u>9.9</u>	<u>14.5</u>	25.7

1) Presented loading information is only applicable for 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.

3) Underlined and italic values indicate steel failure, **bold** values indicate concrete failure, and all others represent pullout failure.

5.2 Loading information for WT1 in C20/25 concrete under Seismic action, category C1¹⁾

Anchor Type			WT1			
Anchor Size			M8	M10	M12	M16
Nominal embedment depth	h_{nom}	[mm]	55.0	68.0	80.0	97.0
Tension Load						
Design resistance	$N_{Rd,p,C1}$	[kN]	3.2	5.9	10.6	16.6
Shear Load						
Design resistance unfilled annular gap	$V_{Rd,p,C1}$	[kN]	3.0	4.8	7.1	13.2

1) Presented loading information is only applicable for anchors not affected by concrete edge and anchor spacing influence.

5.3 Loading information for WT1 in C20/25 concrete under Seismic action, category C2¹⁾

Anchor Type			WT1			
Anchor Size			M8	M10	M12	M16
Nominal embedment depth	h_{nom}	[mm]	55.0	68.0	80.0	97.0
Tension Load						
Design resistance	$N_{Rd,p,C2}$	[kN]	-	2.6	6.0	-
Shear Load						
Design resistance unfilled annular gap	$V_{Rd,p,C2}$	[kN]	-	4.8	7.1	-

1) Presented loading information is only applicable for anchors not affected by concrete edge and anchor spacing influence.

5.4 Loading information for WT1 under fire exposure¹⁾

Anchor Type			WT1			
Anchor Size			M8	M10	M12	M16
Nominal embedment depth	h_{nom}	[mm]	55.0	68.0	80.0	97.0
Tension and shear load						
Characteristic resistance	R30	$N_{Rk,fi} = V_{Rk,fi}$ [kN]	0.4	0.9	1.7	3.1
	R60	$N_{Rk,fi} = V_{Rk,fi}$ [kN]	0.3	0.8	1.3	2.4
	R90	$N_{Rk,fi} = V_{Rk,fi}$ [kN]	0.3	0.6	1.1	2.0
	R120	$N_{Rk,fi} = V_{Rk,fi}$ [kN]	0.2	0.5	0.8	1.6

1) Presented loading information is only applicable for anchors not affected by concrete edge and anchor spacing influence.