

WHA1 Highload Anchors

Ultimate performance anchor for cracked concrete and seismic conditions

Anchor types



WHA1H 12x85
WHA1H 12x125
WHA1H 15x110
WHA1H 15x136
WHA1H 18x117

- The **WHA1** highload anchors are the ultimate torque-controlled anchors for heavy to very heavy loads. They are approved for use in cracked and non-cracked concrete under normal and seismic conditions. The **WHA1H** anchors have a hexagon bolt head.

Features and benefits

- ETA Option 1 approval for cracked and non-cracked concrete
- Seismic performance categories C1 and C2 for design of anchorages under seismic action
- Fire resistance class R30-R120 for design of anchorages under exposure to fire
- Very high load capacity

Approvals and certificates

- European Technical Assessment
- Fire Test Report

ETA-16/0562, 15 July 2016
ETA-16/0562, 15 April 2016



Suitable base materials

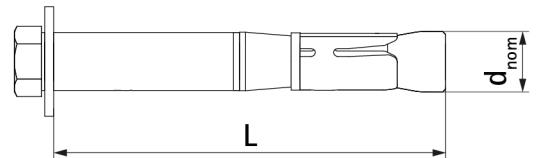
- Non-cracked concrete, C20/25 to C50/60
- Cracked concrete, C20/25 to C50/60
- Fire-exposed concrete, C20/25 to C50/60
- Concrete under seismic C1/C2 action, C20/25 to C50/60

Typical applications

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

Product details

Article	Description	Size	Length	External diameter	Max fixture thickness	Fixture hole clearance
		[-]	L [mm]	d_{nom} [mm]	$t_{fix,max}$ [mm]	d_f [mm]
609832120	WHA1H 12x85	M8	85	12	10	14
609832121	WHA1H 12x125	M8	125	12	50	14
609832150	WHA1H 15x110	M10	110	15	15	17
609832151	WHA1H 15x136	M10	136	15	45	17
609832180	WHA1H 18x117	M12	117	18	10	20



Packaging details

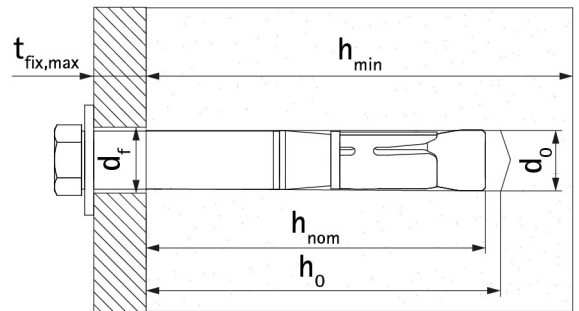
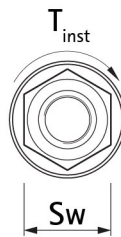
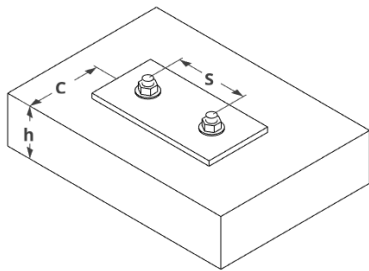
Article	Description	Pack 1	
		[pcs]	EAN13
609832120	WHA1H 12x85	50	8712993157020
609832121	WHA1H 12x125	25	8712993157037
609832150	WHA1H 15x110	25	8712993144174
609832151	WHA1H 15x136	25	8712993144181
609832180	WHA1H 18x117	20	8712993144198

Mechanical properties

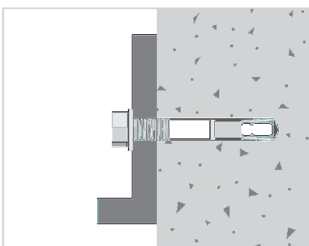
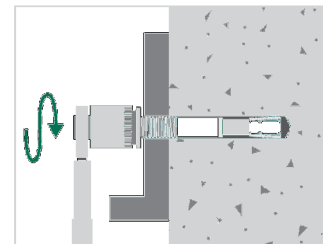
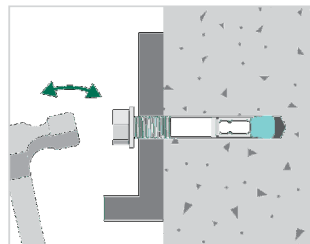
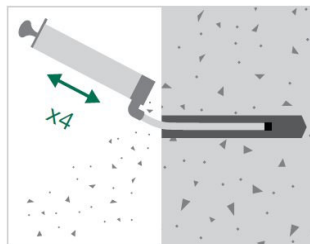
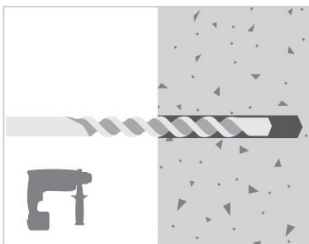
Component	Material
Washer	Steel, strength class 8.8, EN ISO 898-1:2013
Distance sleeve	Precision steel tube, DIN 2394/2393
Plastic ring	Polyethylene
Expansion sleeve	Steel, EN 10139: 1997
Threaded code	Steel, Strength class 8, EN ISO 898-2:2012
Hexagon head screw	Steel, strength class 8.8, EN ISO 898-1:2013

Installation parameters

Anchor Type		WHA1		
Anchor Size		M8	M10	M12
Drill hole diameter	d_0 [mm]	12	15	18
Nominal embedment depth	h_{nom} [mm]	70	85	95
Effective embedment depth	h_{ef} [mm]	60	71	80
Depth of drill hole	h_0 [mm]	80	95	105
Tightening torque	T_{inst} [Nm]	30	50	80
Min. concrete member thickness	h_{min} [mm]	120	140	160
Minimum anchor spacing	S_{min} [mm]	60	70	80
	for $C \geq$ [mm]	100	120	160
Minimum edge distance	C_{min} [mm]	60	70	80
	for $S \geq$ [mm]	120	175	200



Instructions for installation in concrete



Recommended loads in C20/25 concrete for single anchors¹⁾

Anchor Type		WHA1		
Anchor size		M8	M10	M12
Tension				
Non-cracked concrete	N_{rec} [kN]	9.52	14.29	17.20
Cracked concrete	N_{rec} [kN]	5.71	7.62	12.26
Shear				
Non-cracked concrete	V_{rec} [kN]	15.90	20.50	24.50
Cracked concrete	V_{rec} [kN]	17.10	27.40	34.40
Bending moment	M_{rec} [Nm]	17.10	34.30	60.00

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.

Recommended values of resistance for seismic action, categories C1 and C2 in C20/25 to C50/60 concrete for single anchors¹⁾

Anchor Type		WHA1		
Anchor size		M8	M10	M12
Seismic Category C1				
Tension load	$N_{rec,seis,C1}$ [kN]	8.00	10.70	14.60
Shear load	$V_{rec,seis,C1}$ [kN]	7.20	10.80	14.60
Seismic Category C2				
Tension load	$N_{rec,seis,C2}$ [kN]	3.60	10.90	14.60
Shear load	$V_{rec,seis,C2}$ [kN]	5.10	8.20	12.60

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

Characteristic values of resistance to tension and shear load under fire exposure in C20/25 to C50/60 concrete¹⁾

Anchor Type		WTB1		
Anchor Size		M8	M10	M12
Steel failure, R30				
Tension load	$N_{Rk,s,fi}$ [kN]	1.90	4.30	6.30
Shear load without lever arm	$V_{Rk,s,fi}$ [kN]	1.90	4.30	6.30
Shear load with lever arm	$M^0_{Rk,s,fi}$ [Nm]	2.00	5.60	9.70
Steel failure, R60				
Tension load	$N_{Rk,s,fi}$ [kN]	1.50	3.20	4.60
Shear load without lever arm	$V_{Rk,s,fi}$ [kN]	1.50	3.20	4.60
Shear load with lever arm	$M^0_{Rk,s,fi}$ [Nm]	1.50	4.10	7.20
Steel failure, R90				
Tension load	$N_{Rk,s,fi}$ [kN]	1.00	2.10	3.00
Shear load without lever arm	$V_{Rk,s,fi}$ [kN]	1.00	2.10	3.00
Shear load with lever arm	$M^0_{Rk,s,fi}$ [Nm]	1.00	2.70	4.70
Steel failure, R120				
Tension load	$N_{Rk,s,fi}$ [kN]	0.80	1.50	2.00
Shear load without lever arm	$V_{Rk,s,fi}$ [kN]	0.80	1.50	2.00
Shear load with lever arm	$M^0_{Rk,s,fi}$ [Nm]	0.80	1.90	3.10

The characteristic resistances for pull-out failure, concrete cone failure, concrete pry-out and concrete edge failure can be calculated according to TR020 / CEN/TS 1992-4
If the fire attack is from more than one side, the edge distance of the anchor has to be ≥ 300 mm and $\geq 2 \times h_{ef}$