

R-HPTIII ZP Zinc Plated Throughbolt

Throughbolt anchor with corrosion-resistant coating for cracked and non-cracked concrete



Approvals and Reports

- ETA-21/1082



Product information

Features and benefits

- A new generation of band anchors with a galvanized zinc coating
- High performance in cracked and non-cracked concrete confirmed by ETA Option 1
- Highest quality ensures maximum load capability
- For applications requiring fire resistance up to 120 minutes
- Suitable for reduced embedment to avoid contact with reinforcement
- Embedment depth markings help to ensure precise installation of the anchor
- Design of R-HPTII allows drilling and installing directly through the fixture and helps to reduce installation time
- Fire resistant
- Anchors can be used in earthquake risk zones - seismic category C1 and C2
- Adjustable embedment depth in cracked and uncracked concrete C20/25-C50/60

Applications

- Cladding restraints
- Consoles
- Barriers
- Structural steel
- Curtain walling
- Handrails
- Heavy Plant
- Balustrading
- Passenger lifts
- Facades
- Racking systems
- Platforms
- Fencing & gates manufacturing and installation

Base materials

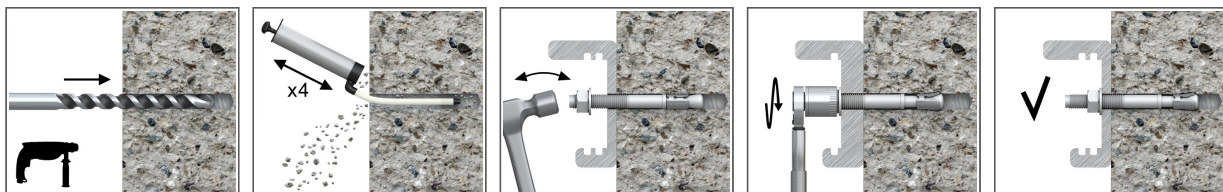
Approved for use in:

- Cracked concrete C20/25-C50/60
- Non-cracked concrete C20/25-C50/60
- Reinforced concrete
- Unreinforced concrete

Also suitable for use in:

- Natural Stone (after site testing)

Installation guide



1. Drill a hole of required diameter and depth
2. Clear the hole of drilling dust and debris (using blowpump or equivalent method)
3. Lightly tap the throughbolt through the fixture into hole with a hammer, until fixing depth is reached
4. Tighten to the recommended torque

Product information

Size	Product Code	Anchor		Fixture	
		Diameter	Length	Max. thickness	Hole diameter
		d	L	t _{fix}	d _f
		[mm]	[mm]	[mm]	[mm]
M8	R-HPTIIIIP08060/10	8	60	10	9
	R-HPTIIIIP08075/25	8	75	25	9
	R-HPTIIIIP08085/35	8	85	35	9
	R-HPTIIIIP08095/45	8	95	45	9
	R-HPTIIIIP08105/55	10	105	55	9
	R-HPTIIIIP08115/65	8	115	65	9
M10	R-HPTIIIIP10065/5	10	65	5	12
	R-HPTIIIIP10080/20	10	80	20	12
	R-HPTIIIIP10095/35	10	95	35	12
	R-HPTIIIIP10130/70	10	130	70	12
M12	R-HPTIIIIP12080/5	12	80	5	14
	R-HPTIIIIP12100/25	12	100	25	14
	R-HPTIIIIP12115/40	12	115	40	14
	R-HPTIIIIP12125/50	12	120	50	14
	R-HPTIIIIP12135/60	12	135	60	14
	R-HPTIIIIP12150/75	12	150	75	14

Installation data

Size			M8	M10	M12
Thread diameter	d	[mm]	8	10	12
Hole diameter in substrate	d ₀	[mm]	8	10	12
Installation torque	T _{inst}	[Nm]	15	40	50
Wrench size	Sw	[mm]	13	17	19
External diameter of washer		[mm]	16	20	24
STANDARD EMBEDMENT DEPTH					
Min. hole depth in substrate	h _{0,s}	[mm]	60	73	88
Min. installation depth	h _{nom,s}	[mm]	55	68	80
Min. substrate thickness	h _{min,s}	[mm]	100	120	140
REDUCED EMBEDMENT DEPTH					
Min. hole depth in substrate	h _{0,r}	[mm]	45	53	68
Min. installation depth	h _{nom,r}	[mm]	40	48	60
Min. substrate thickness	h _{min,r}	[mm]	80	80	100
Min. edge distance	c _{min}	[mm]	40	45	55
Min. spacing	s _{min}	[mm]	35	40	50

Mechanical properties

Size			M8	M10	M12
Nominal ultimate tensile strength - tension	f _{uk}	[N/mm ²]	875	930	900
Nominal ultimate tensile strength - shear	f _{uk}	[N/mm ²]	815	685	790
Nominal yield strength - tension	f _{yk}	[N/mm ²]	850	800	720
Nominal yield strength - shear	f _{yk}	[N/mm ²]	680	600	632
Cross sectional area - tension	A _s	[mm ²]	23.31	35.76	54.08
Cross sectional area - shear	A _s	[mm ²]	36.6	58	84.3
Elastic section modulus	W _{el}	[mm ³]	31.2	62.3	109.2
Characteristic bending resistance	M ⁰ _{Rk,s}	[Nm]	31	51	104
Design bending resistance	M	[Nm]	20.6	34	69.3

Basic performance data

Performance data for single anchor without influence of edge distance and spacing

Size		M8	M10	M12
NON-CRACKED CONCRETE				
Standard embedment depth h_{ef}	[mm]	48.00	60.00	70.00
Reduced embedment depth h_{ef}	[mm]	33.00	40.00	50.00
CRACKED CONCRETE				
Standard embedment depth h_{ef}	[mm]	48.00	60.00	70.00
Reduced embedment depth h_{ef}	[mm]	33.00	40.00	50.00
MEAN ULTIMATE LOAD				
TENSION LOAD $N_{R,u,m}$				
NON-CRACKED CONCRETE				
Standard embedment depth	[kN]	18.30	29.37	39.53
Reduced embedment depth	[kN]	12.80	17.08	23.86
CRACKED CONCRETE				
Standard embedment depth	[kN]	15.80	22.08	27.82
Reduced embedment depth	[kN]	9.00	12.02	16.79
SHEAR LOAD $V_{R,u,m}$				
NON-CRACKED CONCRETE				
Standard embedment depth	[kN]	16.06	25.08	35.86
Reduced embedment depth	[kN]	16.06	25.08	35.86
CRACKED CONCRETE				
Standard embedment depth	[kN]	16.06	25.08	35.86
Reduced embedment depth	[kN]	16.06	25.08	35.86
CHARACTERISTIC LOAD				
TENSION LOAD $N_{R,k}$				
NON-CRACKED CONCRETE				
Standard embedment depth	[kN]	12.00	20.00	28.81
Reduced embedment depth	[kN]	8.50	12.45	17.39
CRACKED CONCRETE				
Standard embedment depth	[kN]	7.50	15.00	20.17
Reduced embedment depth	[kN]	6.53	8.71	12.17
SHEAR LOAD $V_{R,k}$				
NON-CRACKED CONCRETE				
Standard embedment depth	[kN]	14.60	22.80	32.60
Reduced embedment depth	[kN]	14.60	22.80	32.60
CRACKED CONCRETE				
Standard embedment depth	[kN]	14.60	22.80	32.60
Reduced embedment depth	[kN]	14.60	22.80	32.60
DESIGN LOAD				
TENSION LOAD $N_{R,d}$				
NON-CRACKED CONCRETE				
Standard embedment depth	[kN]	8.00	13.33	19.21
Reduced embedment depth	[kN]	5.67	8.30	11.60
CRACKED CONCRETE				
Standard embedment depth	[kN]	5.00	10.00	13.45
Reduced embedment depth	[kN]	4.35	5.81	8.12
SHEAR LOAD $V_{R,d}$				
NON-CRACKED CONCRETE				
Standard embedment depth	[kN]	9.73	15.20	26.08
Reduced embedment depth	[kN]	9.73	15.20	26.08
CRACKED CONCRETE				
Standard embedment depth	[kN]	9.73	15.20	26.08
Reduced embedment depth	[kN]	9.73	15.20	26.08

Design performance data

(-) Failure is not decisive

Size			M8		M10		M12	
Effective embedment depth	h_{ef}	[mm]	33.00	48.00	40.00	60.00	50.00	70.00
TENSION LOAD								
STEEL FAILURE								
Characteristic resistance	$N_{Rk,s}$	[kN]	20.40	20.40	33.30	33.30	48.70	48.70
Partial safety factor	γ_{Ms}	-	1.40	1.40	1.40	1.40	1.50	1.50
PULL-OUT FAILURE; NON-CRACKED CONCRETE C20/25								
Characteristic resistance	$N_{Rk,p}$	[kN]	8.50	12.00	18.50	20.00	30.00	30.00
PULL-OUT FAILURE; CRACKED CONCRETE C20/25								
Characteristic resistance	$N_{Rk,p}$	[kN]	7.10	7.50	13.40	15.00	20.20	20.20
PULL-OUT FAILURE								
Installation safety factor	γ_{inst}	-	1.00	1.00	1.00	1.00	1.00	1.00
Increasing factors for $N_{Rd,p}$ - C30/37	ψ_c	-	1.20	1.12	1.18	1.09	1.08	1.18
Increasing factors for $N_{Rd,p}$ - C40/50	ψ_c	-	1.37	1.22	1.34	1.16	1.15	1.33
Increasing factors for $N_{Rd,p}$ - C50/60	ψ_c	-	1.51	1.29	1.47	1.21	1.20	1.47
CONCRETE CONE FAILURE								
Factor for cracked concrete	$k_{cr,N}$	-	7.70	7.70	7.70	7.70	7.70	7.70
Factor for non-cracked concrete	$k_{ucr,N}$	-	11.00	11.00	11.00	11.00	11.00	11.00
Installation safety factor	γ_{inst}	-	1.00	1.00	1.00	1.00	1.00	1.00
Spacing	$s_{cr,N}$	[mm]	99.00	144.0	120.0	180.0	150.0	210.0
Edge distance	$c_{cr,N}$	[mm]	48.00	72.00	60.00	90.00	75.00	105.0
SHEAR LOAD								
STEEL FAILURE								
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	14.60	14.60	22.80	22.80	32.60	32.60
Ductility factor	k_γ	-	1.00	1.00	1.00	1.00	1.00	1.00
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	31.00	31.00	51.00	51.00	104.0	104.0
Partial safety factor	γ_{Ms}	-	1.50	1.50	1.50	1.50	1.25	1.25
CONCRETE PRY-OUT FAILURE								
Factor	k	-	2.90	2.90	3.60	3.60	3.60	3.60
Installation safety factor	γ_{inst}	-	1.00	1.00	1.00	1.00	1.00	1.00
CONCRETE EDGE FAILURE								
Effective length of anchor	ℓ_f	[mm]	33.00	48.00	40.00	60.00	50.00	70.00
Anchor diameter	d_{nom}	[mm]	8.00	8.00	10.00	10.00	12.00	12.00
Installation safety factor	γ_{inst}	-	1.00	1.00	1.00	1.00	1.00	1.00

Design performance data

Resistance to tension and shear loads under fire exposure

Size			M8		M10		M12	
R (for EI) = 30 min								
Effective embedment depth	h_{ef}	[mm]	33.00	48.00	40.00	60.00	50.00	70.00
TENSION LOAD								
STEEL FAILURE								
Characteristic resistance	$N_{Rk,s}$	[kN]	0.23	0.23	0.89	0.89	1.08	1.08
PULL-OUT FAILURE								
Characteristic resistance	$N_{Rk,p}$	[kN]	1.78	1.88	3.35	3.75	4.93	5.05
SHEAR LOAD								
STEEL FAILURE								
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	0.58	0.58	1.45	1.45	1.69	1.69
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	1.12	1.12	1.87	1.87	2.62	2.62
R (for EI) = 60 min								
Effective embedment depth	h_{ef}	[mm]	33.00	48.00	40.00	60.00	50.00	70.00
TENSION LOAD								
STEEL FAILURE								
Characteristic resistance	$N_{Rk,s}$	[kN]	0.21	0.21	0.72	0.72	0.81	0.81
PULL-OUT FAILURE								
Characteristic resistance	$N_{Rk,p}$	[kN]	1.78	1.88	3.35	3.75	4.93	5.05
SHEAR LOAD								
STEEL FAILURE								
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	0.52	0.52	1.16	1.16	1.26	1.26
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	0.97	0.97	1.50	1.50	1.97	1.97
R (for EI) = 90 min								
Effective embedment depth	h_{ef}	[mm]	33.00	48.00	40.00	60.00	50.00	70.00
TENSION LOAD								
STEEL FAILURE								
Characteristic resistance	$N_{Rk,s}$	[kN]	0.16	0.16	0.57	0.57	0.70	0.70
PULL-OUT FAILURE								
Characteristic resistance	$N_{Rk,p}$	[kN]	1.78	1.88	3.35	3.75	4.93	5.05
SHEAR LOAD								
STEEL FAILURE								
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	0.41	0.41	0.93	0.93	1.10	1.10
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	0.75	0.75	1.20	1.20	1.70	1.70
R (for EI) = 120 min								
Effective embedment depth	h_{ef}	[mm]	33.00	48.00	40.00	60.00	50.00	70.00
TENSION LOAD								
STEEL FAILURE								
Characteristic resistance	$N_{Rk,s}$	[kN]	0.12	0.12	0.50	0.50	0.54	0.54
PULL-OUT FAILURE								
Characteristic resistance	$N_{Rk,p}$	[kN]	1.42	1.50	2.68	3.00	3.94	4.04
SHEAR LOAD								
STEEL FAILURE								
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	0.29	0.29	0.81	0.81	0.84	0.84
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	0.60	0.60	1.05	1.05	1.31	1.31

Product commercial data

Product Code	Anchor		Quantity [pcs]			Weight [kg]			Bar Codes
	Diameter [mm]	Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
R-HPTIII ZP08060/10 ¹⁾	8	60	100	100	16000	2.7	2.7	465.2	5906675525624
R-HPTIII ZP08075/25 ¹⁾	8	75	100	100	16000	2.9	2.9	496.4	5906675525631
R-HPTIII ZP08085/35 ¹⁾	8	85	100	100	12000	3.3	3.3	429.6	5906675525648
R-HPTIII ZP08095/45 ¹⁾	8	95	100	100	12000	3.7	3.7	470.4	5906675525655
R-HPTIII ZP08105/55 ¹⁾	10	105	100	100	12000	4.1	4.1	520.8	5906675525662
R-HPTIII ZP08115/65 ¹⁾	8	115	100	100	12000	4.3	4.3	541.3	5906675525679
R-HPTIII ZP10065/5 ¹⁾	10	65	50	50	8000	2.4	2.4	409.4	5906675525686
R-HPTIII ZP10080/20 ¹⁾	10	80	50	50	8000	2.8	2.8	471.1	5906675525693
R-HPTIII ZP10095/35 ¹⁾	10	95	50	50	8000	3.1	3.1	528.2	5906675525709
R-HPTIII ZP10130/70 ¹⁾	10	130	50	50	8000	4.0	4.0	670.2	5906675525723
R-HPTIII ZP12080/5 ¹⁾	12	80	50	50	16000	10.4	10.4	3366.0	5906675522432
R-HPTIII ZP12100/25 ¹⁾	12	100	50	50	16000	12.0	12.0	3857.2	5906675522449
R-HPTIII ZP12115/40 ¹⁾	12	115	50	50	12000	13.8	13.8	3330.0	5906675522456
R-HPTIII ZP12125/50 ¹⁾	12	120	50	50	12000	14.4	14.4	3486.0	5906675522463
R-HPTIII ZP12135/60 ¹⁾	12	135	50	50	6000	14.8	14.8	1806.0	5906675522470
R-HPTIII ZP12150/75 ¹⁾	12	150	50	50	4000	16.2	16.2	1326.0	5906675522487

1) ETA-21/1082