

R-HPTIII-ZP ZINC PLATED THROUGHBOLT

Zinc Plated throughbolt anchor for cracked and non-cracked concrete



FEATURES AND BENEFITS

Optimized cone shape, increasing the rake angle floor straps.

Identification mark of anchor length, facilitating control after installation.

Two kinds washers DIN 125, DIN 9021.

Depth marker facilitating the installation anchors in the hole.

High performance in cracked and non-cracked concrete confirmed by ETA Option 1.

Steel expansion band with optimized design, providing secure anchoring.

Thickness of fastened elements can be increased thanks to high carrying capacity and shallow depth anchoring.

Can be used for fastening steel/ aluminum and wooden elements.

SUBSTRATES



Cracked concrete C20/25-C50/60



Non-cracked concrete C20/25-C50/60



Unreinforced concrete



Reinforced concrete



R-HPTIII-ZP ZINC PLATED THROUGHBOLT



APPLICATIONS

Balustrades

Barriers

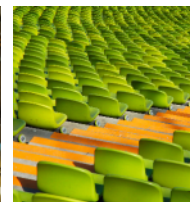
Elevators and escalators

Seats in public facilities

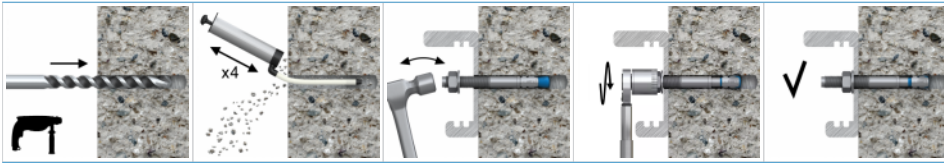
Steel structures

Storage racks

Ventilated facades

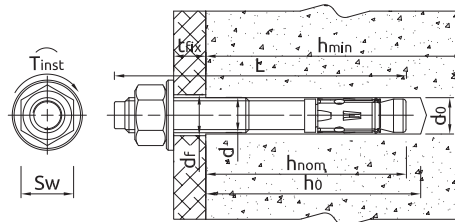


INSTALLATION GUIDE



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 anchor through the fixture into hole with hammer, until fixing depth is reached.
4. Insert bolt through fixture and tighten to the recommended torque.

INSTALLATION DATA



Size			M8	M10	M12	M16	M20
Thread diameter	d	[mm]	8	10	12	16	20
Hole diameter in substrate	d ₀	[mm]	8	10	12	16	20
Hole diameter in fixture	d _f	[mm]	9	12	14	18	22
Installation torque	T _{inst}	[Nm]	15	30	50	80	180
Wrench size	Sw	[mm]	13	17	19	24	30
STANDARD EMBEDMENT DEPTH							
Min. hole depth in substrate	h _{0,s}	[mm]	60	73	88	110	130
Min. installation depth	h _{nom,s}	[mm]	55	68	80	98	117
Min. substrate thickness	h _{min,s}	[mm]	100	120	140	140	180
Min. spacing	s _{min,s}	[mm]	35	40	50	65	90
Min. edge distance	c _{min,s}	[mm]	40	45	55	65	80
REDUCED EMBEDMENT DEPTH							
Min. hole depth in substrate	h _{0,r}	[mm]	45	53	68	90	110
Min. installation depth	h _{nom,r}	[mm]	40	48	60	78	97
Min. substrate thickness	h _{min,r}	[mm]	80	80	100	120	160
Min. spacing	s _{min,r}	[mm]	35	40	50	65	90
Min. edge distance	c _{min,r}	[mm]	40	45	55	65	80

MECHANICAL PROPERTIES

Size			M8	M10	M12	M16	M20
Nominal ultimate tensile strength - tension	f _{tk}	[N/mm ²]	850	870	900	740	730
Nominal yield strength	f _{yk}	[N/mm ²]	750	780	720	630	620
Cross sectional area	A _s	[mm ²]	36,6	58,0	84,3	157	245
Elastic section modulus	W _{el}	[mm ³]	50,3	98,2	169,6	402,1	785,4
Characteristic bending resistance	M ⁰ _{Rk,s}	[Nm]	30,0	57,0	104,0	169,0	402,0
Design bending resistance	M	[Nm]	20,0	38,0	69,3	112,7	268,0

BASIC PERFORMANCE DATA

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

R-HPTIII-ZP ZINC PLATED THROUGHBOLT

Size			M8	M10	M12	M16	M20
Standard embedment depth	h_{nom}	[mm]	55	68	80	98	117
Reduced embedment depth	h_{nom}	[mm]	40	48	60	78	97
MEAN ULTIMATE RESISTANCE							
TENSION LOAD $N_{Ru,m}$							
UNCRACKED CONCRETE							
Standard embedment depth	-	[kN]	18,30	31,37	39,53	52,90	67,50
Reduced embedment depth	-	[kN]	12,80	17,08	23,86	35,37	48,30
CRACKED CONCRETE							
Standard embedment depth	-	[kN]	15,80	22,80	27,82	37,22	47,50
Reduced embedment depth	-	[kN]	9,00	12,02	16,79	24,89	33,99
SHEAR LOAD $V_{Ru,m}$							
UNCRACKED CONCRETE							
Standard embedment depth	-	[kN]	15,95	26,84	35,86	47,96	66,77
Reduced embedment depth	-	[kN]	15,95	26,84	35,86	47,96	66,77
CRACKED CONCRETE							
Standard embedment depth	-	[kN]	15,95	26,84	35,86	47,96	66,77
Reduced embedment depth	-	[kN]	15,95	26,84	35,86	47,96	66,77
CHARACTERISTIC RESISTANCE							
TENSION LOAD N_{Rk}							
UNCRACKED CONCRETE							
Standard embedment depth	-	[kN]	12,00	22,86	28,81	38,55	49,19
Reduced embedment depth	-	[kN]	8,50	12,45	17,39	25,78	35,20
CRACKED CONCRETE							
Standard embedment depth	-	[kN]	7,50	16,00	20,17	26,99	34,44
Reduced embedment depth	-	[kN]	6,53	8,71	12,17	18,05	24,64
SHEAR LOAD V_{Rk}							
UNCRACKED CONCRETE							
Standard embedment depth	-	[kN]	14,50	24,40	32,60	43,60	60,70
Reduced embedment depth	-	[kN]	14,50	24,40	32,60	43,60	60,70
CRACKED CONCRETE							
Standard embedment depth	-	[kN]	14,50	24,40	32,60	43,60	60,70
Reduced embedment depth	-	[kN]	14,50	24,40	32,60	43,60	60,70
DESIGN RESISTANCE							
TENSION LOAD N_{Rd}							
UNCRACKED CONCRETE							
Standard embedment depth	-	[kN]	8,00	15,24	19,21	25,70	32,80
Reduced embedment depth	-	[kN]	5,67	8,30	11,60	17,19	23,47
CRACKED CONCRETE							
Standard embedment depth	-	[kN]	5,00	10,67	13,45	17,99	22,96
Reduced embedment depth	-	[kN]	4,35	5,81	8,12	12,03	16,43
SHEAR LOAD V_{Rd}							
UNCRACKED CONCRETE							
Standard embedment depth	-	[kN]	9,67	16,27	21,73	29,07	40,47
Reduced embedment depth	-	[kN]	9,67	16,27	21,73	29,07	40,47
CRACKED CONCRETE							
Standard embedment depth	-	[kN]	9,67	16,27	21,73	29,07	40,47
Reduced embedment depth	-	[kN]	8,41	13,94	19,48	28,07	40,47
RECOMMENDED LOAD							
TENSION LOAD N_{rec}							
UNCRACKED CONCRETE							
Standard embedment depth	-	[kN]	5,71	10,89	13,72	18,36	23,43
Reduced embedment depth	-	[kN]	4,05	5,93	8,29	12,28	16,76
CRACKED CONCRETE							
Standard embedment depth	-	[kN]	3,57	7,62	9,61	12,85	16,40
Reduced embedment depth	-	[kN]	3,11	4,15	5,80	8,59	11,74
SHEAR LOAD V_{rec}							
UNCRACKED CONCRETE							
Standard embedment depth	-	[kN]	6,91	11,62	15,52	20,76	28,91
Reduced embedment depth	-	[kN]	6,91	11,62	15,52	20,76	28,91
CRACKED CONCRETE							
Standard embedment depth	-	[kN]	6,91	11,62	15,52	20,76	28,91
Reduced embedment depth	-	[kN]	6,91	11,62	15,52	20,76	28,91

DESIGN PERFORMANCE DATA

Static loads

Size			M8	M8	M10	M10	M12	M12	M16	M16	M20	M20
Nominal embedment depth	h_{nom}	[mm]	40	55	48	68	60	80	78	98	97	117
Effective embedment depth	h_{ef}	[mm]	33	48	40	60	50	70	65	85	80	100
TENSION LOAD												
STEEL FAILURE												

R-HPTIII-ZP ZINC PLATED THROUGHBOLT

Size			M8	M8	M10	M10	M12	M12	M16	M16	M20	M20
Characteristic resistance	$N_{Rk,s}$	[kN]	19,8	19,8	31,1	31,1	48,7	48,7	69,7	69,7	121,4	121,4
Partial safety factor	γ_{MS}	[-]	1,40	1,40	1,40	1,40	1,50	1,50	1,41	1,41	1,41	1,41
PULL-OUT FAILURE												
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p,ucr}$	[kN]	8,5	12,0	22,9	22,9	30,0	30,0	45,0	45,0	50,0	50,0
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p,cr}$	[kN]	7,1	7,5	16,0	16,0	20,2	20,2	27,0	27,0	40,9	40,9
Installation safety factor	γ_{inst}	[-]	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
Increasing factors for concrete C30/37	ψ_c	[-]	1,20	1,12	1,17	1,10	1,08	1,18	1,19	1,17	1,22	1,22
Increasing factors for concrete C40/50	ψ_c	[-]	1,37	1,22	1,30	1,19	1,15	1,33	1,34	1,32	1,40	1,41
Increasing factors for concrete C50/60	ψ_c	[-]	1,51	1,29	1,42	1,25	1,20	1,47	1,48	1,45	1,56	1,58
CONCRETE CONE FAILURE												
Installation safety factor	γ_{inst}	[-]	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
Factor for uncracked concrete	$k_{ucr,N}$	[-]	11,0	11,0	11,0	11,0	11,0	11,0	11,0	11,0	11,0	11,0
Factor for cracked concrete	$k_{cr,N}$	[-]	7,7	7,7	7,7	7,7	7,7	7,7	7,7	7,7	7,7	7,7
Spacing	$s_{cr,N}$	[mm]	99,0	144,0	120,0	180,0	150,0	210,0	195,0	255,0	240,0	300,0
Edge distance	$c_{cr,N}$	[mm]	49,5	72,0	60,0	90,0	75,0	105,0	97,5	127,5	120,0	150,0
STEEL FAILURE												
Characteristic resistance without lever arm	$V_{Rk,s}^0$	[kN]	14,5	14,5	24,4	24,4	32,6	32,6	43,6	43,6	60,7	60,7
Ductility factor	k_7	[-]	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	30	30	57	57	104	104	169	169	402	402
Partial safety factor	γ_{MS}	[-]	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
CONCRETE PRY-OUT FAILURE												
Factor	k	[-]	2,9	2,9	3,6	3,6	3,6	3,6	3,5	3,5	3,7	3,7
Installation safety factor	γ_{inst}	[-]	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
CONCRETE EDGE FAILURE												
Effective length of anchor	ℓ_f	[mm]	33	48	40	60	50	70	65	85	80	100
Anchor diameter	d_{nom}	[mm]	8	8	10	10	12	12	16	16	20	20
Installation safety factor	γ_{inst}	[-]	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0

Resistance to tension and shear loads under fire exposure

Size			M8	M8	M10	M10	M12	M12	M16	M16	M20	M20
R (for EI) = 30 min												
Effective embedment depth	h_{ef}	[mm]	33	48	40	60	50	70	65	85	80	100
TENSION LOAD												
STEEL FAILURE												
Characteristic resistance	$N_{Rk,s}$	[kN]	0,79	0,79	1,66	1,66	3,21	3,21	4,38	4,38	7,74	7,74
PULL-OUT FAILURE												
Characteristic resistance	$N_{Rk,s}$	[kN]	1,78	1,88	4,00	4,00	5,05	5,05	9,00	9,00	10,55	10,55
SHEAR LOAD												
STEEL FAILURE												
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	1,25	1,25	2,70	2,70	5,00	5,00	7,31	7,31	11,40	11,40
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	1,28	1,28	3,48	3,48	7,77	7,77	15,50	15,50	30,21	30,21
R (for EI) = 60 min												
Effective embedment depth	h_{ef}	[mm]	33	48	40	60	50	70	65	85	80	100
TENSION LOAD												
STEEL FAILURE												
Characteristic resistance	$N_{Rk,s}$	[kN]	0,60	0,60	1,28	1,28	2,48	2,48	3,39	3,39	5,99	5,99
PULL-OUT FAILURE												
Characteristic resistance	$N_{Rk,s}$	[kN]	1,78	1,88	4,00	4,00	5,05	5,05	9,00	9,00	10,55	10,55
SHEAR LOAD												
STEEL FAILURE												
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	0,95	0,95	2,08	2,08	3,87	3,87	5,65	5,65	8,82	8,82
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	0,97	0,97	2,68	2,68	6,01	6,01	11,99	11,99	23,37	23,37
R (for EI) = 90 min												
Effective embedment depth	h_{ef}	[mm]	33	48	40	60	50	70	65	85	80	100
TENSION LOAD												
STEEL FAILURE												
Characteristic resistance	$N_{Rk,s}$	[kN]	0,41	0,41	1,01	1,01	1,36	1,36	1,85	1,85	2,77	2,77
PULL-OUT FAILURE												
Characteristic resistance	$N_{Rk,s}$	[kN]	1,78	1,88	4,00	4,00	5,05	5,05	9,00	9,00	10,55	10,55
SHEAR LOAD												
STEEL FAILURE												
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	0,65	0,65	1,26	1,26	2,12	2,12	3,09	3,09	4,82	4,82
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	0,66	0,66	1,63	1,63	3,29	3,29	6,56	6,56	12,78	12,78
R (for EI) = 120 min												
Effective embedment depth	h_{ef}	[mm]	33	48	40	60	50	70	65	85	80	100
TENSION LOAD												

R-HPTIII-ZP ZINC PLATED THROUGH BOLT

Size			M8	M8	M10	M10	M12	M12	M16	M16	M20	M20
STEEL FAILURE												
Characteristic resistance	$N_{Rk,s}$	[kN]	0,32	0,32	0,51	0,51	0,79	0,79	1,09	1,09	1,92	1,92
PULL-OUT FAILURE												
Characteristic resistance	$N_{Rk,s}$	[kN]	1,42	1,50	3,20	3,20	4,04	4,04	7,20	7,20	8,44	8,44
SHEAR LOAD												
STEEL FAILURE												
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	0,50	0,50	0,82	0,82	1,21	1,21	1,81	1,81	2,82	2,82
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	0,51	0,51	1,06	1,06	1,88	1,88	3,84	3,84	7,48	7,48










Allowable values for resistance in case of seismic performance category C1 & C2

Size			M8	M8	M10	M10	M12
Effective embedment depth	h_{ef}	[mm]	48	60	70	85	100
SEISMIC CATEGORY C1							
TENSION LOAD, STEEL FAILURE							
Characteristic resistance	$N_{Rk,s,C1}$	[kN]	19,8	31,1	48,7	69,67	121,36
Partial safety factor	$\gamma_{Mn,seisc1}$	[-]	1,40	1,40	1,50	1,41	1,41
TENSION LOAD, PULL-OUT FAILURE							
Characteristic resistance seismic C1	$N_{Rk,p,C1}$	[kN]	7,05	14,88	20,20	24,84	26,49
Installation safety factor	γ_{inst}	[-]	1,0	1,0	1,0	1,0	1,0
SHEAR LOAD, STEEL FAILURE							
Characteristic resistance without lever arm	$V_{Rk,s,C1}$	[kN]	9,43	17,32	26,08	39,24	54,63
Partial safety factor	$\gamma_{Msv,seisc1}$	[-]	1,5	1,5	1,5	1,5	1,5
SEISMIC CATEGORY C2							
TENSION LOAD, STEEL FAILURE							
Characteristic resistance	$N_{Rk,s,C2}$	[kN]	-	31,1	48,7	69,67	121,36
Partial safety factor	$\gamma_{Mn,seisc2}$	[-]	-	1,40	1,50	1,41	1,41
TENSION LOAD, PULL-OUT FAILURE							
Characteristic resistance seismic C2	$N_{Rk,p,C2}$	[kN]	-	10,56	9,49	16,87	16,14
Installation safety factor	γ_{inst}	[-]	-	1,0	1,0	1,0	1,0
SHEAR LOAD, STEEL FAILURE							
Characteristic resistance without lever arm	$V_{Rk,s,C2}$	[kN]	-	17,32	26,08	39,24	54,63
Partial safety factor	$\gamma_{Msv,seisc2}$	[-]	-	1,5	1,5	1,5	1,5

LOGISTICAL DATA

SKU	Base-sales unit	Unit pack	Bulk pack	Pallet	Single Package - Gross Weight	Bulk Package - Gross Weight	Palette - Gross Weight	Barcode
R-HPTIII-ZP08060/10		100.0	100.0	28800.0	2.6	2.6	754.6	5906675525624
R-HPTIII-ZP08075/25		100.0	100.0	16000.0	3.1	3.1	489.3	5906675525631
R-HPTIII-ZP08085/35		100.0	100.0	12000.0	3.3	3.3	418.2	5906675525648
R-HPTIII-ZP08095/45		100.0	100.0	12000.0	3.8	3.8	477.3	5906675525655
R-HPTIII-ZP08105/55		100.0	100.0	12000.0	4.0	4.0	501.3	5906675525662
R-HPTIII-ZP08115/65		100.0	100.0	12000.0	4.3	4.3	536.3	5906675525679
R-HPTIII-ZP10065/5		50.0	50.0	8000.0	2.3	2.3	371.2	5906675525686
R-HPTIII-ZP10080/20		50.0	50.0	8000.0	2.8	2.8	466.1	5906675525693
R-HPTIII-ZP10095/35		50.0	50.0	8000.0	3.1	3.1	489.6	5906675525709
R-HPTIII-ZP10115/55		50.0	50.0	6000.0	3.5	3.5	424.8	5906675525716
R-HPTIII-ZP10130/70		50.0	50.0	8000.0	3.9	3.9	627.2	5906675525723
R-HPTIII-ZP12080/5		50.0	50.0	16000.0	4.1	4.1	1324.5	5906675522432
R-HPTIII-ZP12100/25		50.0	50.0	16000.0	4.8	4.8	1553.6	5906675522449
R-HPTIII-ZP12115/40		50.0	50.0	6000.0	5.3	5.3	662.8	5906675522456
R-HPTIII-ZP12125/50		50.0	50.0	12000.0	5.5	5.5	1348.6	5906675522463
R-HPTIII-ZP12135/60		50.0	50.0	6000.0	6.0	6.0	745.0	5906675522470
R-HPTIII-ZP12150/75		50.0	50.0	4000.0	6.6	6.6	552.2	5906675522487
R-HPTIII-ZP12180/105		50.0	50.0	4800.0	7.8	7.8	745.0	5906675645834
R-HPTIII-ZP16105/5		25.0	25.0	4000.0	4.6	4.6	760.7	5906675560564
R-HPTIII-ZP16125/25		25.0	25.0	4000.0	5.2	5.2	864.5	5906675560571
R-HPTIII-ZP16140/40		25.0	25.0	4000.0	5.7	5.7	936.2	5906675560588
R-HPTIII-ZP16150/50		25.0	25.0	4000.0	5.8	5.8	957.0	5906675560595
R-HPTIII-ZP16180/80		25.0	25.0	3000.0	7.1	7.1	878.3	5906675560601
R-HPTIII-ZP20125/5		25.0	25.0	3000.0	8.0	8.0	600.0	5906675560618
R-HPTIII-ZP20160/40		25.0	25.0	2000.0	10.0	10.0	500.0	5906675560625
R-HPTIII-ZP20180/60		10.0	10.0	1200.0	5.0	5.0	595.0	5906675560632
R-HPTIII-ZP20200/80		10.0	10.0	1200.0	5.4	5.4	648.0	5906675560649

RELATED PRODUCTS

SAFETY	Protective gloves for power tools R-PGL 			
DRILLING	Rotary Hammer Drill SDS plus; 850W; 26mm; 2.5J R-PRH-26850 	Drill bits Aggressor SDS plus RT-SDSA 	Drill bits Rebardrill SDS plus RT-SDSR 	Cordless RawlHammer 18V SDS plus R-PRH18-S 
CLEANING	Blow Pump R-BLOWPUMP 			
ANCHORING	Hammer RT-HAM-0500 	Long impact sockets RT-IS 	Torque wrench RT-RW-20-400 	MECHANICAL ANCHOR SETTING TOOL SDS PLUS RT-SDSI-MA 