

R-HPTII-A4 STAINLESS STEEL A4 THROUGHBOLT

Stainless steel throughbolt anchor for cracked and non-cracked concrete



FEATURES AND BENEFITS

Stainless steel anchor for the highest corrosion resistance.

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.

Suitable for installation in corrosive environments category C1, C2, C3, C4 and C5.

SUBSTRATES



Cracked concrete C20/25-C50/60



Non-cracked concrete C20/25-C50/60



Reinforced concrete



Unreinforced concrete

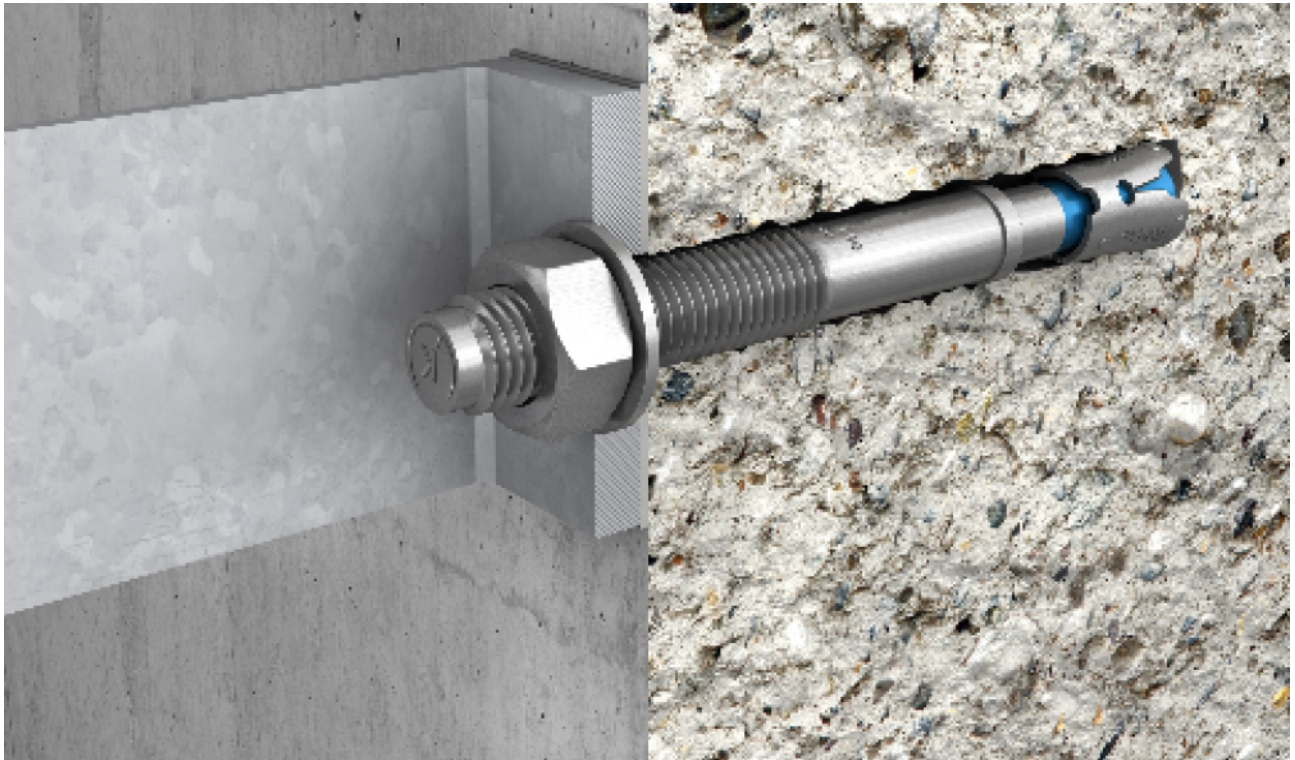


High-density natural stone



R-HPTII-A4

STAINLESS STEEL A4 THROUGHBOLT



APPLICATIONS

Elevators and escalators

Gates

Handrails

Seats in public facilities

Steel structures

Storage racks

Ventilated facades

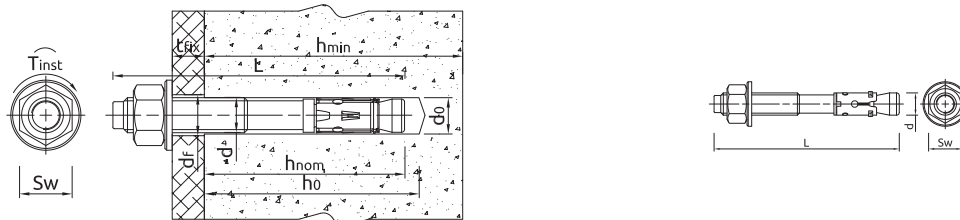


INSTALLATION GUIDE



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
Thread diameter	d	[mm]	8	10	12	16
Hole diameter in substrate	d ₀	[mm]	8	10	12	16
Hole diameter in fixture	d _f	[mm]	9	12	14	18
Installation torque	T _{inst}	[Nm]	10	30	50	100
Wrench size	Sw	[mm]	13	17	19	24
STANDARD EMBEDMENT DEPTH						
Min. hole depth in substrate	h _{0,s}	[mm]	65	79	90	110
Min. installation depth	h _{nom,s}	[mm]	55	69	70	90
Min. substrate thickness	h _{min,s}	[mm]	100	120	140	170
Min. spacing (Uncracked concrete)	s _{min,s}	[mm]	55	70	90	135
Min. spacing (Cracked concrete)	s _{min,s}	[mm]	55	70	90	135
Min. edge distance (Uncracked concrete)	c _{min,s}	[mm]	40	50	55	80
Min. edge distance (Cracked concrete)	c _{min,s}	[mm]	40	45	55	70
REDUCED EMBEDMENT DEPTH						
Min. hole depth in substrate	h _{0,r}	[mm]	50	59	70	90
Min. installation depth	h _{nom,r}	[mm]	40 ¹⁾	49 ¹⁾	60	80
Min. substrate thickness	h _{min,r}	[mm]	100	100	100	130
Min. spacing (Uncracked concrete)	s _{min,r}	[mm]	50	70	120	150
Min. spacing (Cracked concrete)	s _{min,r}	[mm]	50	70	120	150
Min. edge distance (Uncracked concrete)	c _{min,r}	[mm]	50	60	70	90
Min. edge distance (Cracked concrete)	c _{min,r}	[mm]	40	50	70	85

¹⁾ Use restricted to anchoring statically indeterminate structural components

MECHANICAL PROPERTIES

Size			M8	M10	M12	M16
Nominal ultimate tensile strength - tension	F _{uk}	[N/mm ²]	700	700	650	650
Nominal yield strength	F _{yk}	[N/mm ²]	560	560	520	520
Cross sectional area	A _s	[mm ²]	25,5	40,7	60,1	106,6
Elastic section modulus	W _{el}	[mm ³]	34,3	68,3	119,6	229,5
Characteristic bending resistance	M _{0,Rk,s}	[Nm]	22	45	72	180
Design bending resistance	M	[Nm]	17	36	57	144

BASIC PERFORMANCE DATA

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

R-HPTII-A4 STAINLESS STEEL A4 THROUGHBOLT

Size			M8	M10	M12	M16
Standard embedment depth	h_{ef}	[mm]	47	59	68	85
Reduced embedment depth	h_{ef}	[mm]	32 ¹⁾	39 ¹⁾	48	65
MEAN ULTIMATE RESISTANCE						
TENSION LOAD						
UNCRACKED CONCRETE						
Standard embedment depth	$N_{R,u,m}$	[kN]	15,4	22,8	29,2	55,8
Reduced embedment depth	$N_{R,u,m}$	[kN]	10,4	16	22,1	37,9
CRACKED CONCRETE						
Standard embedment depth	$N_{R,u,m}$	[kN]	9,7	11,5	18,6	30,4
Reduced embedment depth	$N_{R,u,m}$	[kN]	5,6	9,8	13,4	22,2
SHEAR LOAD						
UNCRACKED CONCRETE						
Standard embedment depth	$V_{R,u,m}$	[kN]	14	22,2	29,6	54,5
Reduced embedment depth	$V_{R,u,m}$	[kN]	12,22	19,73	22,45	54,5
CRACKED CONCRETE						
Standard embedment depth	$V_{R,u,m}$	[kN]	12,87	21,2	29,6	54,5
Reduced embedment depth	$V_{R,u,m}$	[kN]	8,6	13,88	15,8	49,78
CHARACTERISTIC RESISTANCE						
TENSION LOAD						
UNCRACKED CONCRETE						
Standard embedment depth	N_{Rk}	[kN]	9	16	25	38,55
Reduced embedment depth	N_{Rk}	[kN]	7,5	11,98	16,36	25,78
CRACKED CONCRETE						
Standard embedment depth	N_{Rk}	[kN]	6	9	12	25
Reduced embedment depth	N_{Rk}	[kN]	3	7,5	9	16
SHEAR LOAD						
UNCRACKED CONCRETE						
Standard embedment depth	V_{Rk}	[kN]	11,7	18,5	24,6	45,4
Reduced embedment depth	V_{Rk}	[kN]	8,9	14,38	16,36	45,4
CRACKED CONCRETE						
Standard embedment depth	V_{Rk}	[kN]	11,1	15,61	24,6	45,4
Reduced embedment depth	V_{Rk}	[kN]	6,23	10,06	11,45	36,09
DESIGN RESISTANCE						
TENSION LOAD						
UNCRACKED CONCRETE						
Standard embedment depth	N_{Rd}	[kN]	5	10,67	16,67	25,7
Reduced embedment depth	N_{Rd}	[kN]	4,17	6,66	10,91	17,19
CRACKED CONCRETE						
Standard embedment depth	N_{Rd}	[kN]	3,33	6	8	16,67
Reduced embedment depth	N_{Rd}	[kN]	1,67	4,17	6	10,67
SHEAR LOAD						
UNCRACKED CONCRETE						
Standard embedment depth	V_{Rd}	[kN]	9,36	14,8	19,68	36,32
Reduced embedment depth	V_{Rd}	[kN]	5,94	9,59	10,91	34,37
CRACKED CONCRETE						
Standard embedment depth	V_{Rd}	[kN]	7,4	10,4	19,68	35,98
Reduced embedment depth	V_{Rd}	[kN]	4,16	6,71	7,63	24,06
RECOMMENDED LOAD						
TENSION LOAD						
UNCRACKED CONCRETE						
Standard embedment depth	N_{rec}	[kN]	3,57	7,62	11,9	18,36
Reduced embedment depth	N_{rec}	[kN]	2,98	4,75	7,79	12,28
CRACKED CONCRETE						
Standard embedment depth	N_{rec}	[kN]	2,38	4,29	5,71	11,9
Reduced embedment depth	N_{rec}	[kN]	1,19	2,98	4,29	7,62
SHEAR LOAD						
UNCRACKED CONCRETE						
Standard embedment depth	V_{rec}	[kN]	6,69	10,57	14,06	25,94
Reduced embedment depth	V_{rec}	[kN]	4,24	6,85	7,79	24,55
CRACKED CONCRETE						
Standard embedment depth	V_{rec}	[kN]	5,29	7,43	14,06	25,7
Reduced embedment depth	V_{rec}	[kN]	2,97	4,79	5,45	17,19

¹⁾ Use restricted to anchoring statically indeterminate structural components

DESIGN PERFORMANCE DATA

Static loads

R-HPTII-A4 STAINLESS STEEL A4 THROUGHBOLT

Size			M8	M8	M10	M10	M12	M12	M16	M16
Nominal embedment depth	h_{nom}	[mm]	40 ¹⁾	55	49 ¹⁾	69	60	70	80	90
Effective embedment depth	h_{ef}	[mm]	32 ¹⁾	47	39 ¹⁾	59	48	68	65	85
TENSION LOAD										
STEEL FAILURE										
Characteristic resistance	$N_{Rk,s}$	[kN]	21,2	21,2	33,6	33,6	44,8	44,8	82,6	82,6
Partial safety factor	γ_{MS}	[-]	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
PULL-OUT FAILURE										
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p,ucr}$	[kN]	7,5	9	12	16	-	25	-	-
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p,cr}$	[kN]	3	6	7,5	9	9	12	16	25
Installation safety factor	γ_{inst}	[-]	1,2	1,2	1,2	1	1	1	1	1
Increasing factors for concrete C30/37	ψ_c	[-]	1,07	1,16	1,07	1,26	1,16	1,23	1,18	1,18
Increasing factors for concrete C40/50	ψ_c	[-]	1,13	1,33	1,13	1,52	1,32	1,45	1,37	1,37
Increasing factors for concrete C50/60	ψ_c	[-]	1,2	1,5	1,2	1,78	1,49	1,67	1,55	1,55
CONCRETE CONE FAILURE										
Installation safety factor	γ_{inst}	[-]	1,2	1,2	1,2	1	1	1	1	1
Factor for uncracked concrete	$k_{ucr,N}$	[-]	11	11	11	11	11	11	11	11
Factor for cracked concrete	$k_{cr,N}$	[-]	7,7	7,7	7,7	7,7	7,7	7,7	7,7	7,7
Spacing	$s_{cr,N}$	[mm]	96	141	117	177	144	204	195	255
Edge distance	$c_{cr,N}$	[mm]	48	71	59	89	72	102	98	128
CONCRETE SPLITTING FAILURE										
Spacing	$s_{cr,sp}$	[mm]	160	240	200	300	250	340	320	430
Edge distance	$c_{cr,sp}$	[mm]	80	120	100	150	125	170	160	215
Installation safety factor	γ_{inst}	[-]	1,2	1,2	1,2	1	1	1	1	1
SHEAR LOAD										
STEEL FAILURE										
Characteristic resistance without lever arm	$V_{Rk,s}^0$	[kN]	11,7	11,7	18,5	18,5	24,6	24,6	45,4	45,4
Ductility factor	k_f	[-]	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	22	22	45	45	72	72	180	180
Partial safety factor	γ_{MS}	[-]	1,25	1,25	1,25	1,25	1,25	1,25	1,25	1,25
CONCRETE PRY-OUT FAILURE										
Factor	k	[-]	1	1	1,2	1	1	2	2	2
Installation safety factor	γ_{inst}	[-]	1	1	1	1	1	1	1	1
CONCRETE EDGE FAILURE										
Effective length of anchor	ℓ_f	[mm]	32	47	39	59	48	68	65	85
Anchor diameter	d_{nom}	[mm]	8	8	10	10	12	12	16	16
Installation safety factor	γ_{inst}	[-]	1	1	1	1	1	1	1	1

¹⁾ Use restricted to anchoring statically indeterminate structural components

(-) failure is not decisive

Resistance to tension and shear loads under fire exposure

Size			M8	M8	M10	M10	M12	M12	M16	M16
R (for EI) = 30 min										
Effective embedment depth	h_{ef}	[mm]	32 ¹⁾	47	39 ¹⁾	59	48	68	65	85
TENSION LOAD										
STEEL FAILURE										
Characteristic resistance	$N_{Rk,s}$	[kN]	0,7	0,7	1,5	1,5	2,5	2,5	4,7	4,7
PULL-OUT FAILURE										
Characteristic resistance	$N_{Rk,s}$	[kN]	0,8	1,5	1,9	2,3	2,3	3	4	6,3
SHEAR LOAD										
STEEL FAILURE										
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	0,7	0,7	1,5	1,5	2,5	2,5	4,7	4,7
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	0,7	0,7	1,9	1,9	3,9	3,9	10	10
R (for EI) = 60 min										
Effective embedment depth	h_{ef}	[mm]	32 ¹⁾	47	39 ¹⁾	59	48	68	65	85
TENSION LOAD										
STEEL FAILURE										
Characteristic resistance	$N_{Rk,s}$	[kN]	0,6	0,6	1,2	1,2	2,1	2,1	3,9	3,9
PULL-OUT FAILURE										
Characteristic resistance	$N_{Rk,s}$	[kN]	0,8	1,5	1,9	2,3	2,3	3	4	6,3
SHEAR LOAD										
STEEL FAILURE										
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	0,6	0,6	1,2	1,2	2,1	2,1	3,9	3,9
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	0,6	0,6	1,5	1,5	3,3	3,3	8,3	8,3
R (for EI) = 90 min										
Effective embedment depth	h_{ef}	[mm]	32 ¹⁾	47	39 ¹⁾	59	48	68	65	85
TENSION LOAD										
STEEL FAILURE										
Characteristic resistance	$N_{Rk,s}$	[kN]	0,4	0,4	0,9	0,9	1,7	1,7	3,1	3,1
PULL-OUT FAILURE										
Characteristic resistance	$N_{Rk,s}$	[kN]	0,8	1,5	1,9	2,3	2,3	3	4	6,3

R-HPTII-A4 STAINLESS STEEL A4 THROUGHBOLT

Size			M8	M8	M10	M10	M12	M12	M16	M16
SHEAR LOAD										
STEEL FAILURE										
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	0,4	0,4	0,9	0,9	1,7	1,7	3,1	3,1
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	0,4	0,4	1,2	1,2	2,6	2,6	6,7	6,7
R (for EI) = 120 min										
Effective embedment depth	h_{ef}	[mm]	32 ¹⁾	47	39 ¹⁾	59	48	68	65	85
TENSION LOAD										
STEEL FAILURE										
Characteristic resistance	$N_{Rk,s}$	[kN]	0,4	0,4	0,8	0,8	1,3	1,3	2,5	2,5
PULL-OUT FAILURE										
Characteristic resistance	$N_{Rk,s}$	[kN]	0,6	1,2	1,5	1,8	1,8	2,4	3,2	5
SHEAR LOAD										
STEEL FAILURE										
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	0,4	0,4	0,8	0,8	1,3	1,3	2,5	2,5
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	0,4	0,4	1	1	2,1	2,1	5,3	5,3

¹⁾ Use restricted to anchoring statically indeterminate structural components

* In absence of other national regulations the partial safety factor for resistance under fire exposure. $V_{M,Ri} = 1,0$ is recommended

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

Size			M8	M8	M10	M10	M12	M12	M16	M16
Effective embedment depth	h_{ef}	[mm]	32 ¹⁾	47	39 ¹⁾	59	48 ¹⁾	68	65 ¹⁾	85
SEISMIC CATEGORY C1										
TENSION LOAD, STEEL FAILURE										
Characteristic resistance	$N_{Rk,s,C1}$	[kN]	21,2	21,2	33,6	33,6	44,8	44,8	82,6	82,6
Partial safety factor	$\gamma_{Mk,seisC1}$	[-]	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
TENSION LOAD, PULL-OUT FAILURE										
Characteristic resistance	$N_{Rk,p,C1}$	[kN]	3	6	7,5	9	9	12	16	25
Installation safety factor	γ_{inst}	[-]	1,2	1,2	1,2	1	1	1	1	1
SHEAR LOAD, STEEL FAILURE										
Characteristic resistance without lever arm	$V_{Rk,s,C1}$	[kN]	-	6,7	-	12,5	18,4	18,4	39	39
Partial safety factor	$\gamma_{MkV,seisC1}$	[-]	1,25	1,25	1,25	1,25	1,25	1,25	1,25	1,25
SEISMIC CATEGORY C2										
TENSION LOAD, STEEL FAILURE										
Characteristic resistance	$N_{Rk,s,C2}$	[kN]	-	-	33,6	33,6	44,8	44,8	-	-
Partial safety factor	$\gamma_{MkN,seisC2}$	[-]	-	-	1,5	1,5	1,5	1,5	-	-
Characteristic resistance	$N_{Rk,p,C2}$	[kN]	-	-	-	-	-	-	-	-
Characteristic resistance	$N_{Rk,p,C2}$	[kN]	-	-	2,6	3	3	4,2	-	-
Installation safety factor	γ_{inst}	[-]	-	-	1,2	1	1	1	-	-
SHEAR LOAD, STEEL FAILURE										
Characteristic resistance without lever arm	$V_{Rk,s,C2}$	[kN]	-	-	-	8,3	-	11,1	-	-
Partial safety factor	$\gamma_{MkV,seisC2}$	[-]	-	-	1,25	1,25	1,25	1,25	-	-

¹⁾ Use restricted to anchoring statically indeterminate structural components

LOGISTICAL DATA

SKU	Base-sales unit	Unit pack	Bulk pack	Pallet	Single Package - Gross Weight	Bulk Package - Gross Weight	Palette - Gross Weight	Barcode
R-HPTIIA4-08060/10	pcs.	100.0	100.0	16000.0	2.6	2.6	411.0	5906675046419
R-HPTIIA4-08075/10	pcs.	100.0	100.0	16000.0	3.1	3.1	490.1	5906675046426
R-HPTIIA4-08085/20	pcs.	100.0	100.0	16000.0	3.4	3.4	541.4	5906675046433
R-HPTIIA4-08095/30	pcs.	100.0	100.0	12000.0	3.7	3.7	469.0	5906675046440
R-HPTIIA4-08105/40	pcs.	50.0	50.0	8000.0	2.0	2.0	324.8	5906675046457
R-HPTIIA4-08115/50	pcs.	100.0	100.0	12000.0	4.3	4.3	517.9	5906675046464
R-HPTIIA4-10065/5	pcs.	50.0	50.0	8000.0	2.4	2.4	380.5	5906675046471
R-HPTIIA4-10080/20	pcs.	50.0	50.0	8000.0	2.7	2.7	439.7	5906675046488
R-HPTIIA4-10095/15	pcs.	50.0	50.0	8000.0	3.1	3.1	499.7	5906675046495
R-HPTIIA4-10115/35	pcs.	50.0	50.0	6000.0	3.7	3.7	438.1	5906675046501
R-HPTIIA4-10130/50	pcs.	50.0	50.0	8000.0	4.0	4.0	640.0	5906675046518
R-HPTIIA4-10140/60	pcs.	50.0	50.0	8000.0	4.2	4.2	679.7	5906675046532
R-HPTIIA4-12080/5	pcs.	50.0	50.0	8000.0	4.1	4.1	658.7	5906675046549
R-HPTIIA4-12100/5	pcs.	50.0	50.0	8000.0	4.8	4.8	767.4	5906675046556
R-HPTIIA4-12115/20	pcs.	50.0	50.0	6000.0	5.4	5.4	646.4	5906675388106
R-HPTIIA4-12125/30	pcs.	50.0	50.0	6000.0	5.8	5.8	691.9	5906675046563
R-HPTIIA4-12150/55	pcs.	50.0	50.0	4000.0	6.7	6.7	537.4	5906675046570
R-HPTIIA4-12180/85	pcs.	50.0	50.0	4000.0	7.8	7.8	621.3	5906675046587
R-HPTIIA4-16125/5	pcs.	25.0	25.0	4000.0	5.3	5.3	849.1	5906675046594
R-HPTIIA4-16140/20	pcs.	25.0	25.0	4000.0	5.8	5.8	927.4	5906675034898
R-HPTIIA4-16150/30	pcs.	25.0	25.0	4000.0	6.1	6.1	977.0	5906675046600
R-HPTIIA4-16180/60	pcs.	25.0	25.0	3000.0	7.2	7.2	858.7	5906675046617
R-HPTIIA4-20160/20	pcs.	25.0	25.0	3000.0	10.1	10.1	840.2	5906675137551

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 