R-RBP Rawlbolt® - Bolt Projecting for use in hollow core slab and ceramic substrates

World's most popular all-purpose expanding shield anchor - bolt projecting version

Product information

Features and benefits

- RAWLBOLT® - first ever mechanical anchor in the world, forerunner of all of the later mechanical anchors
- For use in cracked and non-cracked concrete (ETA option 1), hollow-core slabs, flooring blocks and ceramics
- Three-pieces expanding sleeve of maximum expansion provides optimal load and safety of use in any substrate
- Wide range of diameters (M6 to M20)

Applications

- Roller shutter doors
- Fire doors
- Steelwork
- Security grills
- Heavy machinery
- Pipework/duct work support

Base materials

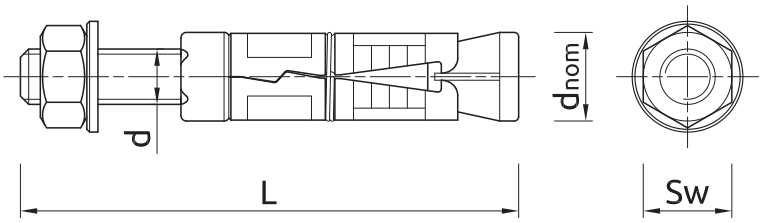
Approved for use in:

- Solid clay brick ≥ 20MPa
- Hollow Lightweight Concrete Block LAC 5 ≥ 5MPa
- Hollow Sand-lime Brick ≥ 15MPa
- Concrete hollow floor block (eg. Teriva)
- Hollow-core Slab C20/25
- Hollow-core Slab C30/37-C50/60

Installation guide

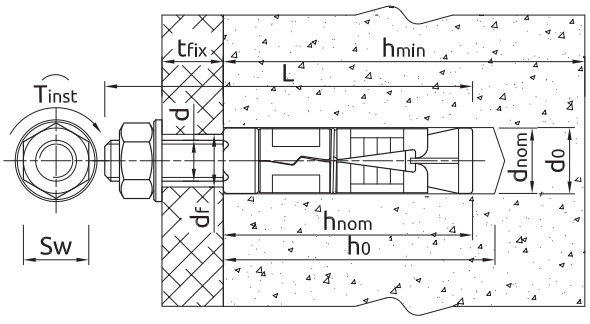
1. Drill a hole of required diameter and depth
2. Remove nut and washer and insert anchor into hole. Tap home with hammer until flush with surface
3. Position fixture over the projecting bolt
4. Add washer and nut and tighten to recommended torque

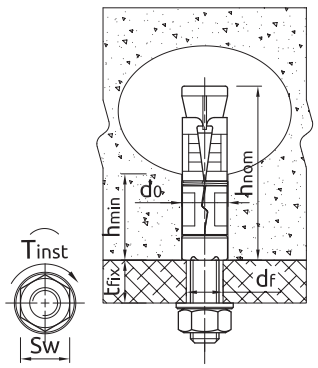
Product information



Size	Product Code	Anchor			Fixture		Approval type
		Diameter	External diameter	Length	Max. thickness	Hole diameter	
		d	d_{nom}	L	t_{fix}	d_f	
		[mm]	[mm]	[mm]	[mm]	[mm]	-
M6	R-RBP-M06/10W	6	12	65	10	6,5	-
	R-RBP-M06/25W	6	12	80	25	6,5	-
	R-RBP-M06/60W	6	12	115	60	6,5	-
M8	R-RBP-M08/10W	8	14	75	10	9	-
	R-RBP-M08/25W	8	14	90	25	9	-
	R-RBP-M08/60W	8	14	125	60	9	-
M10	R-RBP-M10/15W	10	16	90	15	11	-
	R-RBP-M10/30W	10	16	105	30	11	-
	R-RBP-M10/60W	10	16	135	60	11	-
M12	R-RBP-M12/15W	12	20	110	15	13	-
	R-RBP-M12/30W	12	20	125	30	13	-
	R-RBP-M12/75W	12	20	170	75	13	-
M16	R-RBP-M16/15W	16	25	150	15	17	-
	R-RBP-M16/35W	16	25	170	35	17	-
	R-RBP-M16/75W	16	25	210	75	17	-
M20	R-RBP-M20/15W	20	32	170	15	22	-
	R-RBP-M20/30W	20	32	185	30	22	-
	R-RBP-M20/100W	20	32	255	100	22	-
M24	R-RBP-M24/75W	24	38	255	75	26	-

Installation data





Size			M6	M8	M10	M12	M16	M20	M24
Thread diameter	d	[mm]	6	8	10	12	16	20	24
Hole diameter in substrate	d_0	[mm]	12	14	16	20	25	32	38
Min. installation depth	h_{nom}	[mm]	45	50	60	80	120	135	155
Min. hole depth in substrate	h_0	[mm]	50	55	65	85	125	140	160
Wrench size	Sw	[mm]	10	13	17	19	24	30	36

Installation data

Size			M6	M8	M10	M12	M16	M20	M24
SOLID SUBSTRATES									
Installation torque	T_{inst}	[Nm]	6.5	15	27	50	120	230	-
Min. substrate thickness	h_{min}	[mm]	100	100	100	100	142	172	-
Min. spacing	s_{min}	[mm]	35	40	50	60	95	115	-
Min. edge distance	c_{min}	[mm]	53	60	75	90	143	173	-
CERAMIC AND HOLLOW SUBSTRATES									
Installation torque	T_{inst}	[Nm]	3	5	8	10	15	20	-
Min. spacing	s_{min}	[mm]	100	100	100	100	100	115	-
Min. edge distance	c_{min}	[mm]	100	100	100	100	143	173	-
Installation torque	T_{inst}	[Nm]	-	-	-	-	-	-	400
Min. substrate thickness	h_{min}	[mm]	-	-	-	-	-	-	240
Min. spacing	s_{min}	[mm]	-	-	-	-	-	-	210
Min. edge distance	c_{min}	[mm]	-	-	-	-	-	-	188

Mechanical properties

Size			M6	M8	M10	M12	M16	M20	M24
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm²]	500	500	500	500	500	500	500
Nominal yield strength - tension	f_{yk}	[N/mm²]	400	400	400	400	400	400	400
Cross sectional area - tension	A_s	[mm²]	20.1	36.6	58	84.3	157	245	353
Elastic section modulus	W_{el}	[mm³]	21.21	50.27	98.17	169.65	402.12	785.4	1357.17
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	12.72	30.16	58.9	101.79	241.27	471.24	814.3
Design bending resistance	M	[Nm]	10.18	24.13	47.12	81.43	193.02	376.99	651.44

Basic performance data

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

Size		M24
NON-CRACKED CONCRETE		
Effective embedment depth h_{ef}	[mm]	125.00
CRACKED CONCRETE		
Effective embedment depth h_{ef}	[mm]	125.00
MEAN ULTIMATE LOAD		
TENSION LOAD $N_{Ru,m}$		
NON-CRACKED CONCRETE	[kN]	94.33
CRACKED CONCRETE	[kN]	66.38
SHEAR LOAD $V_{Ru,m}$		
NON-CRACKED CONCRETE	[kN]	97.13
CRACKED CONCRETE	[kN]	97.13
CHARACTERISTIC LOAD		
TENSION LOAD N_{Rk}		
NON-CRACKED CONCRETE	[kN]	68.75
CRACKED CONCRETE	[kN]	48.13
SHEAR LOAD V_{Rk}		
NON-CRACKED CONCRETE	[kN]	88.30
CRACKED CONCRETE	[kN]	88.30

Basic performance data

Size		M24
DESIGN LOAD		
TENSION LOAD N_{Rd}		
NON-CRACKED CONCRETE	[kN]	32.74
CRACKED CONCRETE	[kN]	22.92
SHEAR LOAD V_{Rd}		
NON-CRACKED CONCRETE	[kN]	70.64
CRACKED CONCRETE	[kN]	64.17

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

Size			M6	M8	M10	M12	M16	M20
CHARACTERISTIC LOAD								
TENSION LOAD N_{Rk}								
Hollow core slab min. C20/25								
Wall thickness	Material class							
23	C30/37	[kN]	4.00	4.50	-	-	-	-
	C35/45	[kN]	2.00	4.50	-	-	-	-
	C45/55	[kN]	2.00	4.50	-	-	-	-
	C50/60	[kN]	2.00	4.50	-	-	-	-
35	C30/37	[kN]	6.50	11.00	16.00	-	-	-
	C35/45	[kN]	7.00	12.00	17.00	-	-	-
	C45/55	[kN]	8.00	14.00	19.00	-	-	-
	C50/60	[kN]	8.50	15.00	20.00	-	-	-
40	C30/37	[kN]	7.00	16.00	19.00	24.00	-	-
	C35/45	[kN]	8.00	18.00	20.00	28.00	-	-
	C45/55	[kN]	8.50	20.00	22.00	30.00	-	-
	C50/60	[kN]	9.50	22.00	24.00	32.00	-	-
50	C20/25	[kN]	8.00	8.50	8.50	8.50	8.50	8.50
Beam-and-block floor (eg.Terriva 4.0/2), min. 25mm wall thickness		[kN]	1.20	2.00	-	-	-	-
Lightweight concrete LAC class 5		[kN]	5.50	5.50	5.50	5.50	-	-
Solid clay brick class 20		[kN]	6.00	6.00	6.00	6.00	-	-
Silicate hollow block class 15		[kN]	1.50	-	-	-	-	-
SHEAR LOAD V_{Rk}								
Hollow core slab min. C20/25								
Wall thickness	Material class							
23	C30/37	[kN]	4.00	4.50	-	-	-	-
	C35/45	[kN]	2.00	4.50	-	-	-	-
	C45/55	[kN]	2.00	4.50	-	-	-	-
	C50/60	[kN]	2.00	4.50	-	-	-	-
35	C30/37	[kN]	5.00	9.00	14.00	-	-	-
	C35/45	[kN]	5.00	9.00	14.00	-	-	-
	C45/55	[kN]	5.00	9.00	14.00	-	-	-
	C50/60	[kN]	5.00	9.00	14.00	-	-	-
40	C30/37	[kN]	5.00	9.00	14.00	20.00	-	-
	C35/45	[kN]	5.00	9.00	14.00	20.00	-	-
	C45/55	[kN]	5.00	9.00	14.00	20.00	-	-
	C50/60	[kN]	5.00	9.00	14.00	20.00	-	-
50	C20/25	[kN]	5.00	8.50	8.50	8.50	8.50	8.50
Beam-and-block floor (eg.Terriva 4.0/2), min. 25mm wall thickness		[kN]	1.20	2.00	-	-	-	-
Lightweight concrete LAC class 5		[kN]	5.00	5.50	5.50	5.50	-	-
Solid clay brick class 20		[kN]	5.00	6.00	6.00	6.00	-	-
Silicate hollow block class 15		[kN]	1.50	-	-	-	-	-

Basic performance data

Size			M6	M8	M10	M12	M16	M20
DESIGN LOAD								
TENSION LOAD N_{Rd}								
Hollow core slab min. C20/25								
Wall thickness	Material class							
23	C30/37	[kN]	2.20	2.50	-	-	-	-
	C35/45	[kN]	1.10	2.50	-	-	-	-
	C45/55	[kN]	1.10	2.50	-	-	-	-
	C50/60	[kN]	1.10	2.50	-	-	-	-
35	C30/37	[kN]	3.60	6.10	8.90	-	-	-
	C35/45	[kN]	3.90	6.70	9.40	-	-	-
	C45/55	[kN]	4.40	7.80	10.60	-	-	-
	C50/60	[kN]	4.70	8.30	11.10	-	-	-
40	C30/37	[kN]	3.90	8.90	10.60	13.30	-	-
	C35/45	[kN]	4.40	10.00	11.10	15.60	-	-
	C45/55	[kN]	4.70	11.10	12.20	16.70	-	-
	C50/60	[kN]	5.30	12.20	13.30	17.80	-	-
50	C20/25	[kN]	4.40	4.70	4.70	4.70	4.70	4.70
Beam-and-block floor (eg.Terriva 4.0/2), min. 25mm wall thickness		[kN]	0.70	1.10	-	-	-	-
Lightweight concrete LAC class 5		[kN]	2.00	2.20	2.20	2.20	-	-
[English]: Cegła ceramiczna pełna 20MPa		[kN]	2.00	2.40	2.40	2.40	-	-
Silicate hollow block class 15		[kN]	0.60	-	-	-	-	-
SHEAR LOAD V_{Rd}								
Hollow core slab min. C20/25								
Wall thickness	Material class							
23	C30/37	[kN]	3.20	3.60	-	-	-	-
	C35/45	[kN]	1.60	3.60	-	-	-	-
	C45/55	[kN]	1.60	3.60	-	-	-	-
	C50/60	[kN]	1.60	3.60	-	-	-	-
35	C30/37	[kN]	4.00	7.20	11.20	-	-	-
	C35/45	[kN]	4.00	7.20	11.20	-	-	-
	C45/55	[kN]	4.00	7.20	11.20	-	-	-
	C50/60	[kN]	4.00	7.20	11.20	-	-	-
40	C30/37	[kN]	4.00	7.20	11.20	16.00	-	-
	C35/45	[kN]	4.00	7.20	11.20	16.00	-	-
	C45/55	[kN]	4.00	7.20	11.20	16.00	-	-
	C50/60	[kN]	4.00	7.20	11.20	16.00	-	-
50	C20/25	[kN]	4.00	6.80	6.80	6.80	6.80	6.80
Beam-and-block floor (eg.Terriva 4.0/2), min. 25mm wall thickness		[kN]	1.00	1.60	-	-	-	-
Lightweight concrete LAC class 5		[kN]	4.00	4.40	4.40	4.40	-	-
[English]: Cegła ceramiczna pełna 20MPa		[kN]	4.00	4.80	4.80	4.80	-	-
Silicate hollow block class 15		[kN]	1.20	-	-	-	-	-

Basic performance data

Size			M6	M8	M10	M12	M16	M20
RECOMMENDED LOAD								
TENSION LOAD N_{rec}								
Hollow core slab min. C20/25								
Wall thickness	Material class							
23	C30/37	[kN]	1.60	1.80	-	-	-	-
	C35/45	[kN]	0.80	1.80	-	-	-	-
	C45/55	[kN]	1.60	1.80	-	-	-	-
	C50/60	[kN]	0.80	1.80	-	-	-	-
35	C30/37	[kN]	2.60	4.40	6.30	-	-	-
	C35/45	[kN]	2.80	4.80	6.70	-	-	-
	C45/55	[kN]	3.20	5.60	7.50	-	-	-
	C50/60	[kN]	3.40	6.00	7.90	-	-	-
40	C30/37	[kN]	2.80	6.30	7.50	9.50	-	-
	C35/45	[kN]	3.20	7.10	7.90	11.10	-	-
	C45/55	[kN]	3.40	7.90	8.70	11.90	-	-
	C50/60	[kN]	3.80	8.70	9.50	12.70	-	-
50	C20/25	[kN]	3.20	3.40	3.40	3.40	3.40	3.40
Beam-and-block floor (eg.Terriva 4.0/2), min. 25mm wall thickness		[kN]	0.50	0.80	-	-	-	-
Lightweight concrete LAC class 5		[kN]	1.40	1.60	1.60	1.60	-	-
[English]: Cegła ceramiczna pełna 20MPa		[kN]	1.40	1.70	1.70	1.70	-	-
Silicate hollow block class 15		[kN]	0.40	-	-	-	-	-
SHEAR LOAD V_{rec}								
Hollow core slab min. C20/25								
Wall thickness	Material class							
23	C30/37	[kN]	2.30	2.60	-	-	-	-
	C35/45	[kN]	1.10	2.60	-	-	-	-
	C45/55	[kN]	1.10	2.60	-	-	-	-
	C50/60	[kN]	1.10	2.60	-	-	-	-
35	C30/37	[kN]	2.90	5.10	8.00	-	-	-
	C35/45	[kN]	2.90	5.10	8.00	-	-	-
	C45/55	[kN]	2.90	5.10	8.00	-	-	-
	C50/60	[kN]	2.90	5.10	8.00	-	-	-
40	C30/37	[kN]	2.90	5.10	8.00	11.40	-	-
	C35/45	[kN]	2.90	5.10	8.00	11.40	-	-
	C45/55	[kN]	2.90	5.10	8.00	11.40	-	-
	C50/60	[kN]	2.90	5.10	8.00	11.40	-	-
50	C20/25	[kN]	2.90	4.90	4.90	4.90	4.90	4.90
Beam-and-block floor (eg.Terriva 4.0/2), min. 25mm wall thickness		[kN]	0.70	1.10	-	-	-	-
Lightweight concrete LAC class 5		[kN]	2.90	3.10	3.10	3.10	-	-
[English]: Cegła ceramiczna pełna 20MPa		[kN]	2.90	3.40	3.40	3.40	-	-
Silicate hollow block class 15		[kN]	0.90	-	-	-	-	-

Design performance data

Size			M24
Effective embedment depth	h_{ef}	[mm]	125.0
TENSION LOAD			
STEEL FAILURE			
Characteristic resistance	$N_{Rk,s}$	[kN]	176.5
Partial safety factor	γ_{Ms}	-	1.50
PULL-OUT FAILURE; NON-CRACKED CONCRETE C20/25			
Characteristic resistance	$N_{Rk,p}$	[kN]	-
PULL-OUT FAILURE; CRACKED CONCRETE C20/25			
Characteristic resistance	$N_{Rk,p}$	[kN]	-
PULL-OUT FAILURE			
Installation safety factor	γ_{inst}	-	1.40
Increasing factors for $N_{Rd,p}$ - C30/37	Ψ_c	-	1.00
Increasing factors for $N_{Rd,p}$ - C40/50	Ψ_c	-	1.00
Increasing factors for $N_{Rd,p}$ - C50/60	Ψ_c	-	1.00
CONCRETE CONE FAILURE			
Factor for cracked concrete	$k_{cr,N}$	-	7.70
Factor for non-cracked concrete	$k_{ucr,N}$	-	11.00
Installation safety factor	γ_{inst}	-	1.40
Spacing	$s_{cr,N}$	[mm]	375.0
Edge distance	$c_{cr,N}$	[mm]	188.0
CONCRETE SPLITTING FAILURE			
Spacing	$s_{cr,sp}$	[mm]	375.0
Edge distance	$c_{cr,sp}$	[mm]	188.0
Installation safety factor	γ_{inst}	-	1.40
SHEAR LOAD			
STEEL FAILURE			
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	88.30
Ductility factor	k_7	-	0.80
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	583.4
Partial safety factor	γ_{Ms}	-	1.25
CONCRETE PRY-OUT FAILURE			
Factor	k	-	2.00
Installation safety factor	γ_{inst}	-	1.00
CONCRETE EDGE FAILURE			
Effective length of anchor	ℓ_f	[mm]	125.0
Anchor diameter	d_{nom}	[mm]	24.00
Installation safety factor	γ_{inst}	-	1.00

Product commercial data

Product Code	Anchor		Quantity [pcs]			Weight [kg]			Bar Codes
	Diameter [mm]	Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
R-RBP-M06/10W	6	65	50	400	16000	1.59	12.7	538.8	5906675283593
R-RBP-M06/25W	6	80	50	400	16000	1.73	13.8	582.0	5906675283616
R-RBP-M06/60W	6	115	50	50	8000	2.0	2.0	354.0	5906675283630
R-RBP-M08/10W	8	75	50	400	9600	2.8	22.6	573.4	5906675283654
R-RBP-M08/25W	8	90	50	50	8000	3.1	3.1	528.4	5906675283678
R-RBP-M08/60W	8	125	50	50	8000	3.7	3.7	614.8	5906675283692
R-RBP-M10/15W	10	90	50	50	8000	5.0	5.0	825.2	5906675283715
R-RBP-M10/30W	10	105	50	50	6000	5.3	5.3	666.0	5906675283739
R-RBP-M10/60W	10	135	50	50	8000	6.1	6.1	998.0	5906675283753
R-RBP-M12/15W	12	110	25	25	4000	4.6	4.6	767.2	5906675283760
R-RBP-M12/30W	12	125	25	25	4000	4.9	4.9	818.4	5906675283777

Product commercial data

Product Code	Anchor		Quantity [pcs]			Weight [kg]			Bar Codes
	Diameter [mm]	Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
R-RBP-M12/75W	12	170	25	25	3000	5.8	5.8	721.8	5906675283784
R-RBP-M16/15W	16	150	10	10	1600	4.4	4.4	733.5	5906675283791
R-RBP-M16/35W	16	170	10	10	1600	4.7	4.7	773.5	5906675283807
R-RBP-M16/75W	16	210	10	10	1200	5.3	5.3	662.9	5906675283814
R-RBP-M20/15W	20	170	10	10	1200	8.0	8.0	985.1	5906675283821
R-RBP-M20/30W	20	185	10	10	1200	8.3	8.3	1030.4	5906675283838
R-RBP-M20/100W	20	255	10	10	1200	9.9	9.9	1219.2	5906675284781
R-RBP-M24/75W	24	255	5	5	600	7.1	7.1	887.2	5906675283852