R-SPL SAFETYPLUS - LOOSE BOLT

High performance mechanical anchor - loose bolt option

FEATURES AND BENEFITS

Integral controlled collapse and anti-rotation feature ensures fixture is firmly secured.

Fire resistant.

Design of SafetyPlus allows for easy through fixing.

Case-hardened nut with optimum taper angle for enhanced expansion.

Unique zig-zag feature provides balanced expansion, ensuring secure setting and maximised load-bearing capacity.

High performance in non-cracked concrete confirmed by ETA Option 7.

SUBSTRATES

- Non-cracked concrete C20/25-C50/60
- Unreinforced concrete
- Reinforced concrete
- High-density natural stone



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APPLICATIONS

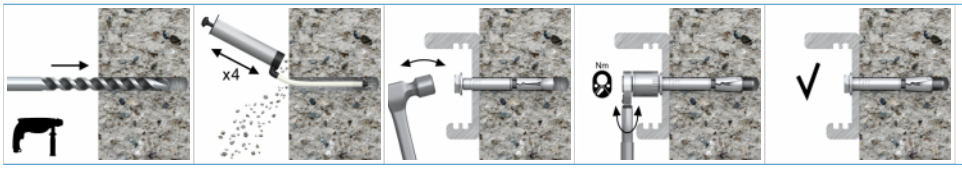
- Barriers
- Concrete structures
- Gates
- Poles and road signs
- Steel structures
- Storage racks
- Ventilated facades





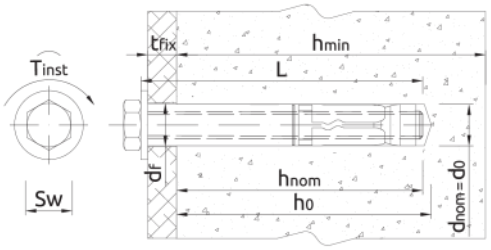
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INSTALLATION GUIDE



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]	12	15	18	24	28
Hole diameter in fixture	d_f	[mm]	14	17	20	26	30
Installation torque	T_{inst}	[Nm]	25	50	80	180	275
Wrench size	Sw	[mm]	13	17	19	24	30
Min. hole depth in substrate	$h_{0,s}$	[mm]	85	95	105	130	160
Min. installation depth	h_{nom}	[mm]	70	80	90	110	130
Min. substrate thickness	h_{min}	[mm]	100	105	120	150	187,5
Min. spacing	s_{min}	[mm]	60	70	80	100	125
Min. edge distance	c_{min}	[mm]	90	105	120	150	185,5

MECHANICAL PROPERTIES

Size			M8	M10	M12	M16	M20
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm²]	800	800	800	800	800
Nominal yield strength	f_{yk}	[N/mm²]	640	640	640	640	640
Cross sectional area	A_s	[mm²]	36,6	58,0	84,3	157,0	245,0
Elastic section modulus	W_{el}	[mm³]	50,3	98,2	169,7	402,1	785,4
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	45,0	87,9	152,0	365,9	728,5
Design bending resistance	M	[Nm]	36,0	70,3	121,6	292,7	592,8

BASIC PERFORMANCE DATA

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

Size			M8	M10	M12	M16	M20
Effective embedment depth	h_{ef}	[mm]	60	70	80	100	125
MEAN ULTIMATE RESISTANCE							
Tension load	$N_{Ru,m}$	[kN]	9,90	13,20	17,60	38,50	44,00
Shear load	$V_{Ru,m}$	[kN]	21,12	33,00	47,52	77,66	81,05
CHARACTERISTIC RESISTANCE							
Tension load	N_{Rk}	[kN]	9,00	12,00	16,00	35,00	40,00
Shear load	V_{Rk}	[kN]	19,20	30,00	43,20	70,60	73,68
DESIGN RESISTANCE							
Tension load	N_{Rd}	[kN]	5,00	6,67	8,89	19,44	22,22
Shear load	V_{Rd}	[kN]	15,36	24,00	34,56	56,48	58,94

DESIGN PERFORMANCE DATA

Static loads

Size			M8	M10	M12	M16	M20
Effective embedment depth	h_{ef}	[mm]	60	70	80	100	125
TENSION LOAD							
STEEL FAILURE							
Characteristic resistance	$N_{Rk,s}$	[kN]	29,3	46,4	57,4	125,6	196,0
Partial safety factor	γ_{MS}	[-]	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]	9,0	12,0	16,0	35,0	40,0
Installation safety factor	γ_{inst}	[-]	1,2	1,2	1,2	1,2	1,2
Increasing factors for concrete C30/37	Ψ_c	[-]	1,22	1,22	1,22	1,22	1,22
Increasing factors for concrete C40/50	Ψ_c	[-]	1,41	1,41	1,41	1,41	1,41
Increasing factors for concrete C50/60	Ψ_c	[-]	1,55	1,55	1,55	1,55	1,55
CONCRETE CONE FAILURE							
Factor for uncracked concrete	$k_{ucr,N}$	[-]	11,0	11,0	11,0	11,0	11,0
Installation safety factor	γ_{inst}	[-]	1,2	1,2	1,2	1,2	1,2
Spacing	$s_{cr,N}$	[mm]	180	210	240	300	375
Edge distance	$c_{cr,N}$	[mm]	90	105	120	150	188
CONCRETE SPLITTING FAILURE							
Spacing	$s_{cr,N}$	[mm]	180	210	240	300	375
Edge distance	$c_{cr,N}$	[mm]	90	105	120	150	188
Installation safety factor	γ_{inst}	[-]	1,2	1,2	1,2	1,2	1,2
SHEAR LOAD							
STEEL FAILURE							
Characteristic resistance without lever arm	$V^0_{Rk,s}$	[kN]	19,20	30,00	43,20	77,60	73,68
Ductility factor	k_7	[-]	0,8	0,8	0,8	0,8	0,8
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	45,04	87,97	152,01	365,97	728,54
Partial safety factor	γ_{MS}	[-]	1,25	1,25	1,25	1,25	1,25
CONCRETE PRY-OUT FAILURE							
Factor	k	[-]	2,0	2,0	2,0	2,0	2,0
Installation safety factor	γ_{inst}	[-]	1,0	1,0	1,0	1,0	1,0
CONCRETE EDGE FAILURE							
Effective length of anchor	ℓ_f	[mm]	60	70	80	100	125
Anchor diameter	d_{nom}	[mm]	8	10	12	16	20
Installation safety factor	γ_{inst}	[-]	1,5	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-SPL-08090/15	pcs.	50.0	50.0	8000.0	3.8	3.8	632.5	5010445500107
R-SPL-08110/40	pcs.	50.0	50.0	8000.0	4.6	4.6	765.3	5010445500152
R-SPL-10105/20	pcs.	50.0	50.0	8000.0	6.6	6.6	1084.2	5010445500206
R-SPL-10120/40	pcs.	50.0	50.0	6000.0	7.9	7.9	970.7	5010445500251
R-SPL-10140/60	pcs.	50.0	50.0	4000.0	9.0	9.0	746.8	5010445500305
R-SPL-12120/25	pcs.	25.0	25.0	4000.0	5.8	5.8	951.2	5010445500350
R-SPL-12150/50	pcs.	25.0	25.0	3000.0	7.0	7.0	865.4	5010445500404
R-SPL-16145/25	pcs.	10.0	10.0	1600.0	4.8	4.8	796.4	5010445500503
R-SPL-16170/50	pcs.	10.0	10.0	1200.0	5.6	5.6	779.1	5010445500558
R-SPL-20175/30	pcs.	10.0	10.0	1200.0	8.4	8.4	1028.4	5010445500657

RELATED PRODUCTS

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