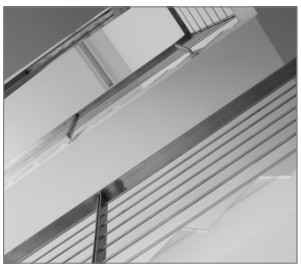
R-SPL-C SafetyPlus - Countersunk

High performance mechanical anchor - countersunk version



Approvals and Reports

- ETA-11/0126
- UKTA-22/6101

Product information

Features and benefits

- High performance in non-cracked concrete confirmed by ETA Option 7
- Design of SafetyPlus allows for easy through fixing
- Integral controlled collapse and anti-rotation feature ensures fixture is firmly secured
- Unique zig-zag feature provides balanced expansion, ensuring secure setting and maximised load-bearing capacity
- Case-hardened nut with optimum taper angle for enhanced expansion
- Fire resistant

Applications

- Structural steel
- Masonry support
- Cladding restraint
- Road Signs
- Heavy machinery
- Racking systems
- Industrial doors
- Safety barriers

Base materials

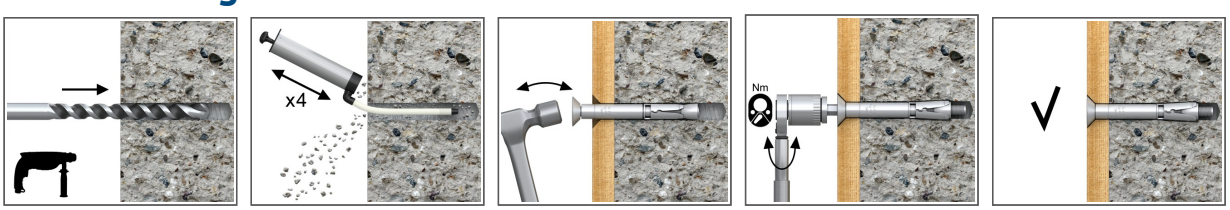
Approved for use in:

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

Also suitable for use in:

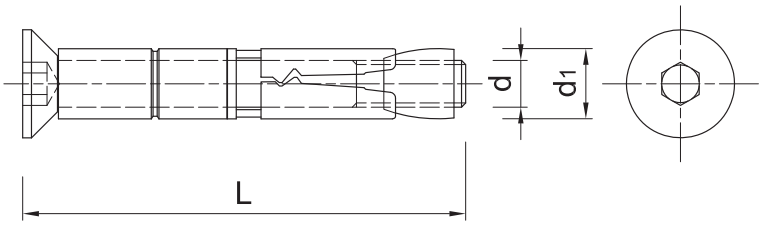
- Natural Stone (after site testing)

Installation guide



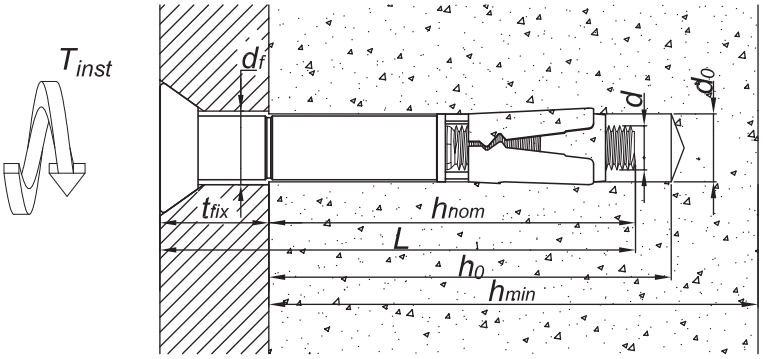
1. Drill a hole of required diameter and depth
2. Clear the hole of drilling dust and debris (using blowpump or equivalent method)
3. Insert anchor through fixture into hole and tap until required installation depth is achieved
4. Tighten to the recommended torque

Product information



Size	Product Code	Anchor			Fixture	
		Thread size	External diameter	Length	Max. thickness	Hole diameter
		d	d_{nom}	L	t_{fix}	d_f
		[mm]	[mm]	[mm]	[mm]	[mm]
M8	R-SPL-C-08090/20	8	12	90	20	14
M10	R-SPL-C-10105/25	10	15	105	25	17
M12	R-SPL-C-12125/30	12	18	125	30	20
M16	R-SPL-C-16145/30	16	24	145	30	26

Installation data



Size			M8	M10	M12	M16
Thread diameter	d	[mm]	8	10	12	16
Hole diameter in substrate	d_0	[mm]	12	15	18	24
Installation torque	T_{inst}	[Nm]	25	50	80	180
Wrench size	[English]:	[mm]	6	8	10	12
Min. hole depth in substrate	h_0	[mm]	85	95	105	130
Min. installation depth	h_{nom}	[mm]	70	80	90	110
Min. substrate thickness	h_{min}	[mm]	100	105	120	150
Min. spacing	s_{min}	[mm]	60	70	80	100
Min. edge distance	c_{min}	[mm]	90	105	120	150

Mechanical properties

Size			M8	M10	M12	M16
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm²]	800	800	800	800
Nominal yield strength - tension	f_{yk}	[N/mm²]	640	640	640	640
Cross sectional area - tension	A_s	[mm²]	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm³]	50.3	98.2	169.7	402.1
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	45.04	87.97	152.01	365.97
Design bending resistance	M	[Nm]	36.03	70.38	121.61	292.78

Basic performance data

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

Size		M8	M10	M12	M16
Effective embedment depth h_{ef}	[mm]	60.00	70.00	80.00	100.00
MEAN ULTIMATE LOAD					
TENSION LOAD $N_{Ru,m}$	[kN]	10.84	14.46	19.28	42.17
SHEAR LOAD $V_{Ru,m}$	[kN]	20.28	31.68	45.62	81.95
CHARACTERISTIC LOAD					
TENSION LOAD N_{Rk}	[kN]	9.00	12.00	16.00	35.00
SHEAR LOAD V_{Rk}	[kN]	19.20	30.00	43.20	77.60
DESIGN LOAD					
TENSION LOAD N_{Rd}	[kN]	5.00	6.67	8.89	19.44
SHEAR LOAD V_{Rd}	[kN]	15.36	24.00	34.56	62.08

Design performance data

(-) failure is not decisive

Size			M8	M10	M12	M16
Effective embedment depth	h_{ef}	[mm]	60.00	70.00	80.00	100.0
TENSION LOAD						
STEEL FAILURE						
Characteristic resistance	$N_{Rk,s}$	[kN]	29.30	46.40	57.40	125.6
Partial safety factor	γ_{Ms}	-	1.50	1.50	1.50	1.50
PULL-OUT FAILURE; NON-CRACKED CONCRETE C20/25						
Characteristic resistance	$N_{Rk,p}$	[kN]	9.00	12.00	16.00	35.00
PULL-OUT FAILURE						
Installation safety factor	γ_{inst}	-	1.20	1.20	1.20	1.20
Increasing factors for $N_{Rd,p}$ - C30/37	Ψ_c	-	1.22	1.22	1.22	1.22
Increasing factors for $N_{Rd,p}$ - C40/50	Ψ_c	-	1.41	1.41	1.41	1.41
Increasing factors for $N_{Rd,p}$ - C50/60	Ψ_c	-	1.55	1.55	1.55	1.55
CONCRETE CONE FAILURE						
Installation safety factor	γ_{inst}	-	1.20	1.20	1.20	1.20
Factor for non-cracked concrete	$k_{ucr,N}$	-	11.00	11.00	11.00	11.00
Spacing	$s_{cr,N}$	[mm]	180.0	210.0	240.0	300.0
Edge distance	$c_{cr,N}$	[mm]	90.00	105.0	120.0	150.0
CONCRETE SPLITTING FAILURE						
Installation safety factor	γ_{inst}	-	1.20	1.20	1.20	1.20
Spacing	$s_{cr,sp}$	[mm]	180.0	210.0	240.0	300.0
Edge distance	$c_{cr,sp}$	[mm]	90.00	105.0	120.0	150.0
SHEAR LOAD						
STEEL FAILURE						
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	19.20	30.00	43.20	77.60
Ductility factor	k_7	-	0.80	0.80	0.80	0.80
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	45.04	87.97	152.0	365.9
Partial safety factor	γ_{Ms}	-	1.25	1.25	1.25	1.25
CONCRETE PRY-OUT FAILURE						
Factor	k	-	2.00	2.00	2.00	2.00
Installation safety factor	γ_{inst}	-	1.00	1.00	1.00	1.00
CONCRETE EDGE FAILURE						
Effective length of anchor	ℓ_f	[mm]	60.00	70.00	80.00	100.0
Anchor diameter	d_{nom}	[mm]	8.00	10.00	12.00	16.00
Installation safety factor	γ_{inst}	-	1.00	1.00	1.00	1.00

Product commercial data

Product Code	Anchor		Quantity [pcs]			Weight [kg]			Bar Codes
	Thread size [mm]	Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
R-SPL-C-08090/20 [1]	8	90	50	50	8000	3.6	3.6	605.2	5010445502101
R-SPL-C-10105/25 [1]	10	105	50	50	8000	6.6	6.6	1085.2	5010445502200
R-SPL-C-12125/30 [1]	12	125	25	25	4000	5.8	5.8	949.2	5010445502354
R-SPL-C-16145/30 [1]	16	145	10	10	1600	4.6	4.6	763.4	5010445502507

1) ETA-11/0126