R-KEX II with Sockets

Premium pure epoxy resin approved for use with internally threaded sockets

Approvals and Reports

- ETA-13/0454

Product information

Features and benefits

- Allows removal of bolt to leave a re-usable socket in place
- Approved for use with Sockets in non-cracked concrete (ETAG001 Option 7)
- Suitable for use in dry and wet substrates including under water
- Very high chemical resistance – suitable for applications exposed to influence of various agents (industrial or marine environment)
- Minimal shrinkage provides option of use in diamond-drilled holes and oversized holes
- Extended bonding time ensures easy installation of metal components (up to 30 min. in 20°C)
- For use in positive temperatures
- Suitable for use in dry and wet substrates including under water

Applications

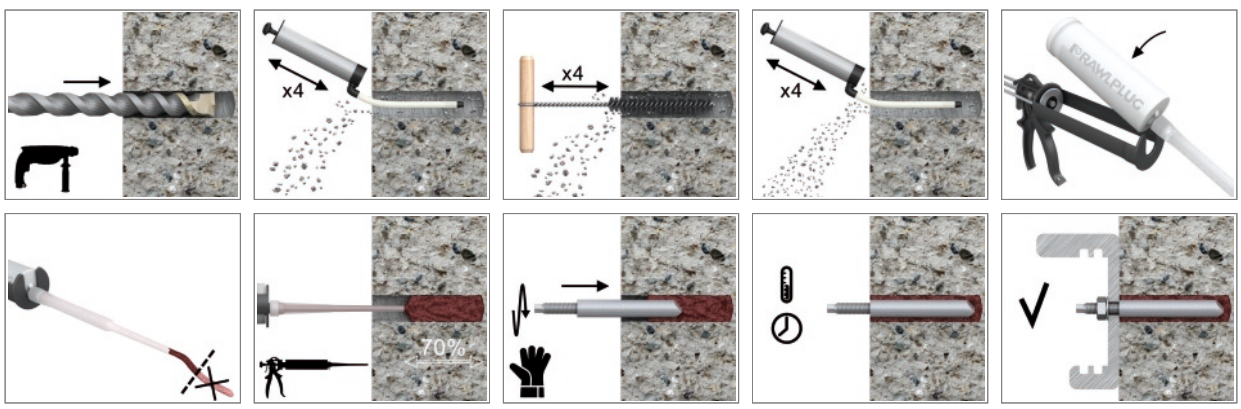
- Safety barriers
- Temporary works/formworks support systems
- Balustrading
- Barriers
- Cladding restraints
- Masonry support
- Heavy machinery
- Platforms
- Structural steelwork

Base materials

Approved for use in:

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

Installation guide



Product information

1. Drill hole to the required diameter and depth for socket size being used.
2. Clean the hole with brush and hand pump at least four times each. It is very important and necessary before installation.
3. Insert cartridge into gun and attach nozzle.
4. Dispense to waste until even colour is obtained.
5. Insert the mixing nozzle to the far end of the hole and inject resin, slowly withdrawing the nozzle as the hole is filled to 2/3 of its depth.
6. Immediately insert the socket, slowly and with slight twisting motion. Remove any excess resin around the hole before it sets and leave it undisturbed until the curing time elapses.
7. Attach fixture and tighten the bolt to the required torque.

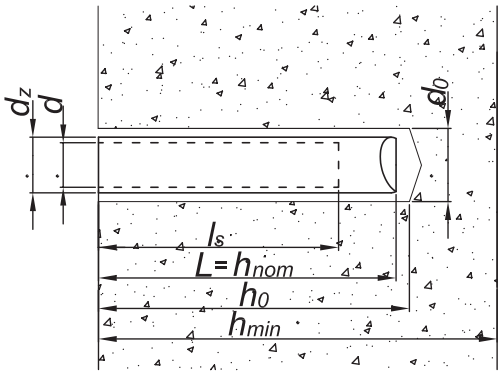
Size	Product Code	Resin	Description / Resin Type	Volume
				[ml]
M8	R-KEX-II-385	R-KEX II	Epoxy Resin	385
M30	R-KEX-II-600			600

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-KEX-II-385	R-KEX II	Epoxy Resin	385
R-KEX-II-600			600

SOCKETS

Size	Product Code		Anchor			Fixture	
	Steel class 5.8	Steel grade A4	Socket diameter	Length	Internal thread length	Hole diameter	Max. thickness t_{fix} for:
			d	L	l_g	d_f	$h_{nom,std}$
			[mm]	[mm]	[mm]	[mm]	[mm]
M6	R-ITS-Z-06075	R-ITS-A4-06075	10	75	24	7	-
M8	R-ITS-Z-08075	R-ITS-A4-08075	12	75	25	9	-
	R-ITS-Z-08090	R-ITS-A4-08090	12	90	25	9	-
M10	R-ITS-Z-10075	R-ITS-A4-10075	16	75	30	12	-
	R-ITS-Z-10100	R-ITS-A4-10100	16	100	30	12	-
M12	R-ITS-Z-12100	R-ITS-A4-12100	16	100	35	14	-
M16	R-ITS-Z-16125	R-ITS-A4-16125	24	125	50	18	-

Installation data



SOCKETS

Size			M6	M8	M10	M12	M16
Thread diameter	d	[mm]	6	8	10	12	16
Hole diameter in substrate	d_0	[mm]	12	14	20	20	28
Hole diameter in fixture	d_f	[mm]	7	9	12	14	18
Installation torque	T_{inst}	[Nm]	3	5	10	20	40
Thread engagement length	h_s	[mm]	6-24	8-25	10-30	12-35	16-50
Min. hole depth in substrate	h_0	[mm]	h_{ef} + 5	h_{ef} + 5	h_{ef} + 5	h_{ef} + 5	h_{ef} + 5
Min. substrate thickness	h_{min}	[mm]	105	105	140	140	181
Min. spacing	s_{min}	[mm]	40	40	50	50	63
Min. edge distance	c_{min}	[mm]	40	40	50	50	63

Minimum working and curing time

Resin temperature	Concrete temperature	Curing time*	Working time
[°C]	[°C]	[min]	[min]
5	5	150	2880
10	10	120	1080
20	20	35	480
25	30	12	300

Mechanical properties

Size			M6	M8	M10	M12	M16
R-ITS-Z Internally Threaded Sockets							
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm²]	520	500	500	500	500
Nominal yield strength - tension	f_{yk}	[N/mm²]	420	400	400	400	400
Cross sectional area - tension	A_s	[mm²]	20.1	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm³]	21.2	50.3	98.2	169.7	402.1
R-ITS-A4 Internally Threaded Sockets							
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm²]	700	700	700	700	700
Nominal yield strength - tension	f_{yk}	[N/mm²]	350	350	350	350	350
Cross sectional area - tension	A_s	[mm²]	20.1	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm³]	21.2	50.3	98.2	169.7	402.1
R-STUDS Metric Threaded Rods - Steel Class 5.8							
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	8	19	37	65	166
Design bending resistance	M	[Nm]	6	15	30	52	133
Allowable bending resistance	M_{rec}	[Nm]	5	11	21	37	95
R-STUDS Metric Threaded Rods - Steel Class 8.8							
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	12	30	60	105	266
Design bending resistance	M	[Nm]	10	24	48	84	213
Allowable bending resistance	M_{rec}	[Nm]	7	17	34	60	152

Mechanical properties

Basic performance data

SOCKETS

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

Size		M6	M8		M10		M12	M16
Substrate		Non-cracked concrete						
Effective embedment depth h_{ef}	[mm]	75.0		90.0	75.0	100.0		125.0
MEAN ULTIMATE LOAD								
TENSION LOAD $N_{Ru,m}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	13	22	22	35	35	50	94
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	19	35	35	51	55	78	109
R-STUDS METRIC THREADED RODS - A4	[kN]	17	31	31	49	49	71	109
SHEAR LOAD $V_{Ru,m}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	6	11	11	17	17	25	47
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	10	18	18	28	28	41	76
R-STUDS METRIC THREADED RODS - A4	[kN]	8	16	16	24	24	35	66
CHARACTERISTIC LOAD								
TENSION LOAD N_{Rk}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	10	18	18	29	29	42	71
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	16	29	29	33	46	51	71
R-STUDS METRIC THREADED RODS - A4	[kN]	14	26	26	33	41	51	71
SHEAR LOAD V_{Rk}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	5	9	9	14	14	21	39
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8	15	15	23	23	34	63
R-STUDS METRIC THREADED RODS - A4	[kN]	7	13	13	20	20	29	55
DESIGN LOAD								
TENSION LOAD N_{Rd}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	7	12	12	18	19	28	39
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	11	18	19	18	28	28	39
R-STUDS METRIC THREADED RODS - A4	[kN]	7	14	14	18	22	28	39
SHEAR LOAD V_{Rd}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	4	7	7	11	11	17	31
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	6	12	12	18	18	27	50
R-STUDS METRIC THREADED RODS - A4	[kN]	4	8	8	13	13	19	35
RECOMMENDED LOAD								
TENSION LOAD N_{rec}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	5	9	9	13	14	20	28
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8	13	14	13	20	20	28
R-STUDS METRIC THREADED RODS - A4	[kN]	5	10	10	13	16	20	28
SHEAR LOAD V_{rec}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	3	5	5	8	8	12	22
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	5	9	9	13	13	19	36
R-STUDS METRIC THREADED RODS - A4	[kN]	3	6	6	9	9	13	25

Design performance data

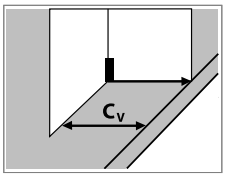
SOCKETS

Size			M6	M8		M10		M12	M16
Effective embedment depth	h_{ef}	[mm]	75.00	75.00	90.00	75.00	100.00	100.00	125.00
TENSION LOAD									
STEEL FAILURE; STEEL CLASS 5.8									
Characteristic resistance	$N_{Rk,s}$	[kN]	10.00	18.00	18.00	29.00	29.00	42.00	78.00
Design resistance γ_{Ms}= 1.5	$N_{Rd,s}$	[kN]	6.67	12.00	12.00	19.30	19.30	28.00	52.00
STEEL FAILURE; STEEL CLASS 8.8									
Characteristic resistance	$N_{Rk,s}$	[kN]	16.00	29.00	29.00	46.00	46.00	67.00	126.00
Design resistance γ_{Ms}= 1.5	$N_{Rd,s}$	[kN]	10.70	19.30	19.30	30.70	30.70	44.70	84.00
STEEL FAILURE; STEEL GRADE A4-70									
Characteristic resistance	$N_{Rk,s}$	[kN]	14.00	26.00	26.00	41.00	41.00	59.00	110.00
Design resistance γ_{Ms}= 1.87	$N_{Rd,s}$	[kN]	7.49	13.90	13.90	21.90	21.90	31.60	58.80
PULL-OUT FAILURE; NON-CRACKED CONCRETE C20/25 (40°C/24°C)									
Characteristic resistance	$N_{Rk,p}$	-	18.80	32.80	40.70	32.80	50.50	50.50	70.60
Design resistance γ_{Mp}= 1.8	$N_{Rd,p}$	-	10.50	18.20	22.60	18.20	28.10	28.10	39.20
CONCRETE CONE FAILURE; NON-CRACKED CONCRETE C20/25 (40°C/24°C)									
Characteristic resistance	$N_{Rk,c}$	-	-	32.80	-	32.80	50.50	50.50	70.60
Design resistance	$N_{Rd,c}$	-	-	18.20	-	18.20	28.10	28.10	39.20
PULL-OUT FAILURE; NON-CRACKED CONCRETE C20/25 (80°C/50°C)									
Characteristic resistance	$N_{Rk,p}$	[kN]	17.70	31.10	37.30	32.80	50.50	50.30	70.60
Design resistance γ_{Mp}= 1.8	$N_{Rd,p}$	[kN]	9.80	17.30	20.70	18.20	28.10	27.90	39.20
CONCRETE CONE FAILURE; NON-CRACKED CONCRETE C20/25 (80°C/50°C)									
Characteristic resistance	$N_{Rk,c}$	-	-	-	-	32.80	50.50	-	70.60
Design resistance	$N_{Rd,c}$	-	-	-	-	18.20	28.10	-	39.20
Increasing factors for $N_{Rd,p}$ - C30/37	Ψ_c	-	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Increasing factors for $N_{Rd,p}$ - C40/50	Ψ_c	-	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Increasing factors for $N_{Rd,p}$ - C50/60	Ψ_c	-	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Spacing	$s_{cr,N}$	[mm]	207.00	225.00	270.00	225.00	300.00	300.00	375.00
Edge distance	$c_{cr,N}$	[mm]	103.00	113.00	135.00	113.00	150.00	150.00	188.00
SHEAR LOAD									
CONCRETE EDGE FAILURE; NON-CRACKED CONCRETE C20/25									
Edge distance	C_{min}	[mm]	40.00	40.00	45.00	40.00	50.00	50.00	63.00
Characteristic resistance for C_{min}	$V_{Rk,c}$	[kN]	5.77	5.99	7.27	6.36	9.06	9.06	14.00
Design resistance γ_{Mc}= 1.5	$V_{Rd,c}$	[kN]	3.85	3.99	4.85	4.24	6.04	6.04	9.32
STEEL FAILURE; STEEL CLASS 5.8									
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	5.00	9.00	9.00	14.00	14.00	21.00	39.00
Design resistance γ_{Ms}= 1.25	$V_{Rd,s}$	[kN]	4.00	7.20	7.20	11.20	11.20	16.80	31.20
STEEL FAILURE; STEEL CLASS 8.8									
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	8.00	15.00	15.00	23.00	23.00	34.00	63.00
Design resistance γ_{Ms}= 1.25	$V_{Rd,s}$	[kN]	6.40	12.00	12.00	18.40	18.40	27.20	50.40
STEEL FAILURE; STEEL GRADE A4-70									
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	7.00	13.00	13.00	20.00	20.00	29.00	55.00
Design resistance γ_{Ms}= 1.56	$V_{Rd,s}$	[kN]	4.49	8.33	8.33	12.80	12.80	18.60	35.30

Design performance data

Reduction / increasing resistance factors for edge distance and spacing

Edge distance (shear)



Tables only valid for one edge $>c_{min}$ and $s \geq 3c_V$ For other cases use the Rawlplug Anchor Calculator

Increasing factors for edge distance $>C_{min}$ applicable to $V_{Rd,c}$ for non-cracked concrete from Design Performance table

C_V [mm]	M6x75		M8x75		M8x90		M10x75		M10x100		M12x100		M16x125	
	$h \geq 1.5c_v$	h_{min}	$h \geq 1.5c_v$	h_{min}	$h \geq 1.5c_v$	h_{min}	$h \geq 1.5c_v$	h_{min}	$h \geq 1.5c_v$	h_{min}	$h \geq 1.5c_v$	h_{min}	$h \geq 1.5c_v$	h_{min}
40	1.00	1.00	1.00	1.00			1.00	1.00						
45	1.19	1.19	1.19	1.19	1.00	1.00	1.19	1.19						
50	1.40	1.40	1.40	1.40	1.17	1.17	1.40	1.40	1.00	1.00	1.00	1.00		
63	1.98	1.98	1.98	1.98	1.66	1.66	1.98	1.98	1.41	1.41	1.41	1.41	1.00	1.00
80	2.83	2.65	2.83	2.65	2.37	2.37	2.83	2.77	2.02	2.02	2.02	2.02	1.43	1.43
90		2.98	3.38	2.98	2.83	2.67	3.38	3.11	2.41	2.41	2.41	2.41	1.71	1.71
100			3.95	3.31	3.31	2.96	3.95	3.46	2.83	2.73	2.83	2.73	2.00	2.00
115				3.80		3.41	4.87	3.98	3.49	3.14	3.49	3.14	2.47	2.47
130							5.86	4.50	4.19	3.55	4.19	3.55	2.96	2.86
150								5.19		4.10	5.20	4.10	3.67	3.30
175								6.06			6.55	4.78	4.63	3.84
200												5.47	5.66	4.39
225												6.15	6.75	4.94
250														5.49
300														6.59

Edge distance (tension)

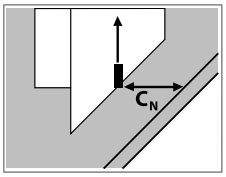


Table only valid for one edge $<C_{cr,N}$ and $S \geq S_{cr,N}$ For other cases use the Rawlplug Anchor Calculator

Reduction factors for edge distance $<C_{cr,N}$ applicable to N_{Rd} or N_{rec} for cracked and non-cracked concrete from 'Basic Performance' table

c_N [mm]	M6x75		M8x75		M8x90		M10x75		M10x100		M12x100		M16x125
	$\geq 1.27h_{min}$	h_{min}	$\geq 1.27h_{min}$	h_{min}	$\geq 1.31h_{min}$	h_{min}	$\geq 1.19h_{min}$	h_{min}	$\geq 1.27h_{min}$	h_{min}	$\geq 1.27h_{min}$	h_{min}	$\geq h_{min}$
40	0.57	0.52	0.55	0.51			0.55	0.51					
45	0.60	0.54	0.57	0.53	0.53	0.50	0.57	0.53					
50	0.63	0.56	0.60	0.56	0.56	0.52	0.60	0.56	0.53	0.50	0.53	0.50	
65	0.72	0.64	0.69	0.63	0.63	0.57	0.69	0.63	0.59	0.55	0.59	0.55	0.54
75	0.79	0.69	0.75	0.68	0.67	0.61	0.75	0.68	0.64	0.58	0.64	0.58	0.57
90	0.90	0.77	0.85	0.75	0.75	0.68	0.85	0.75	0.70	0.64	0.70	0.64	0.62
105	1.00	0.85	0.95	0.83	0.83	0.74	0.95	0.83	0.77	0.69	0.77	0.69	0.68
115		0.88	1.00	0.88	0.88	0.78	1.00	0.88	0.82	0.73	0.82	0.73	0.71
135		0.95		0.95	1.00	0.88		0.95	0.92	0.81	0.92	0.81	0.79
150		1.00		1.00		0.92		1.00	1.00	0.88	1.00	0.88	0.85
180						1.00				0.95		0.95	0.97
190										0.98		0.98	1.00
200										1.00		1.00	

Design performance data

Spacing

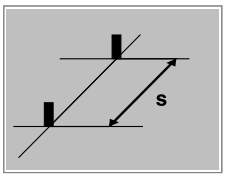


Table only valid for one spacing $<s_{cr,N}$ and $c \geq c_{cr,N}$ For other cases use the Rawlplug Anchor Calculator

Reduction factors for spacing $<S_{cr,N}$ applicable to N_{Rd} / V_{Rd} or N_{rec} / V_{rec} for non-cracked concrete from 'Basic Performance' table

s [mm]	M6x75		M8x75		M8x90		M10x75		M10x100		M12x100		M16x125
	≥1.27h_{min}	h_{min}	≥1.27h_{min}	h_{min}	≥1.31h_{min}	h_{min}	≥1.19h_{min}	h_{min}	≥1.27h_{min}	h_{min}	≥1.27h_{min}	h_{min}	≥h_{min}
40	0.60	0.57	0.59	0.57			0.59	0.57					
45	0.61	0.58	0.60	0.58	0.58	0.56	0.60	0.58					
50	0.62	0.58	0.61	0.58	0.59	0.57	0.61	0.58	0.58	0.56	0.58	0.56	
65	0.66	0.61	0.64	0.61	0.62	0.59	0.64	0.61	0.61	0.58	0.61	0.58	0.59
80	0.71	0.64	0.69	0.64	0.66	0.62	0.69	0.64	0.64	0.61	0.64	0.61	0.61
100	0.74	0.67	0.72	0.67	0.69	0.64	0.72	0.67	0.67	0.63	0.67	0.63	0.63
125	0.80	0.71	0.78	0.71	0.73	0.67	0.78	0.71	0.71	0.66	0.71	0.66	0.67
150	0.86	0.75	0.83	0.75	0.78	0.71	0.83	0.75	0.75	0.69	0.75	0.69	0.70
180	0.94	0.80	0.90	0.80	0.83	0.75	0.90	0.80	0.80	0.73	0.80	0.73	0.74
200	0.98	0.83	0.94	0.83	0.87	0.78	0.94	0.83	0.83	0.75	0.83	0.75	0.77
210	1.00	0.85	0.97	0.85	0.89	0.79	0.97	0.85	0.85	0.76	0.85	0.76	0.78
225		0.88	1.00	0.88	0.92	0.81	1.00	0.88	0.88	0.78	0.88	0.78	0.80
250		0.92		0.92	0.96	0.85		0.92	0.92	0.81	0.92	0.81	0.83
275		0.96		0.96	1.00	0.88		0.96	0.96	0.84	0.96	0.84	0.87
300		1.00		1.00		0.92		1.00	1.00	0.88	1.00	0.88	0.90
325						0.95				0.91		0.91	0.93
375						1.00				0.97		0.97	1.00
400										1.00		1.00	

Product commercial data

Size	Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Codes
			Box	Outer	Pallet	Box	Outer	Pallet	
Ø32	R-KEX-II-385[1)]	385	10	10	380	6.7	6.7	285.0	5906675028538
	R-KEX-II-600[1)]	600	7	7	441	7.0	7.0	472.7	5906675293721

[1)] ETA-13/0454