R-KER with Internally Threaded Sockets (ITS)

High performance vinylester resin approved for use with internally threaded sockets

Approvals and Reports

- ETA-13/0805

Product information

Features and benefits

- Approved for use in non-cracked concrete
- Allows removal of bolt to leave a re-usable socket in place
- Suitable for use in low temperatures (down to -20°C for winter option) enables use throughout the year
- Winter version can be used in warmer temperatures for faster curing
- Suitable for use in dry or wet substrates and water filled holes
- Rapid bonding time enables quick execution of works
- Very high load capacity
- Anchor does not generate tensions in the substrate which enables R-KER to be specified where closer edge and spacing distances are required

Applications

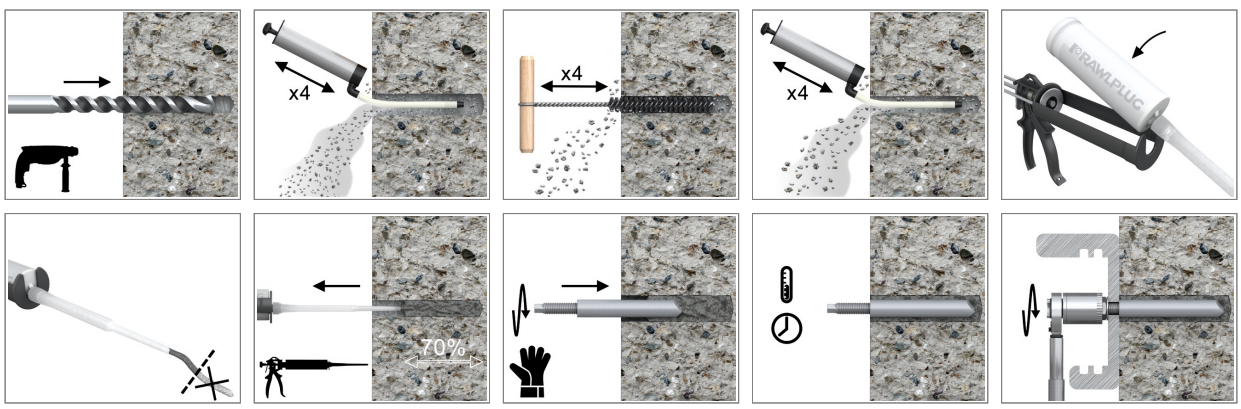
- Curtain walling
- Balustrading
- Handrails
- Canopies

Base materials

Approved for use in:

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

Installation guide



Product information

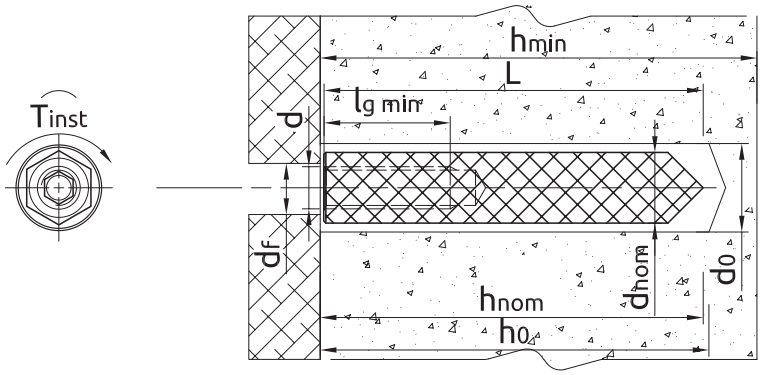
1. Drill hole to the required diameter and depth for socket size being used.
2. Clean the hole thoroughly with brush and hand pump at least four times before installation.
3. Insert cartridge into gun and attach nozzle.
4. Dispense to waste until even colour is obtained.
5. Insert the mixer nozzle to the bottom of the drill hole and inject resin, slowly withdrawing the nozzle as the hole is filled to 70% 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.

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-KER-300	R-KER	Styrene Free Vinylester Resin	300
R-KER-300-SV			
R-KER-345			345
R-KER-380-W	R-KER-W	Low Temperature (Winter) / Rapid Cure Styrene Free Vinylester Resin	380
R-KER-400	R-KER	Styrene Free Vinylester Resin	400
R-KER-II-400-FR			

SOCKETS

Size	Product Code		Anchor			Fixture	
	Steel class 5.8	Steel grade A4	Socket diameter	Length	Internal thread length	Hole diameter	Diameter
			d	L	l_g	d_f	d_1
			[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
Min. installation depth	h_{nom}	[mm]	75	75	90	75	100	100	125
Thread diameter	d	[mm]	6	8	8	10	10	12	16
Hole diameter in substrate	d_0	[mm]	12	14	14	20	20	20	28
Hole diameter in fixture	d_f	[mm]	7	9	9	12	12	14	18
Thread engagement length	h_s	[mm]	24	25	25	30	30	35	50
Min. hole depth in substrate	h_0	[mm]	h_{nom} + 5	h_{nom} + 5	h_{nom} + 5	h_{nom} + 5	h_{nom} + 5	h_{nom} + 5	h_{nom} + 5
Min. substrate thickness	h_{min}	[mm]	105	105	120	115	140	140	181
Installation torque	T_{inst}	[Nm]	3	5	5	10	10	20	40
Min. spacing	s_{min}	[mm]	40	40	45	40	50	50	63
Min. edge distance	c_{min}	[mm]	40	40	45	40	50	50	63

Minimum working and curing time

R-KER

Resin temperature	Concrete temperature	Curing time*	Working time
[°C]	[°C]	[min]	[min]
5	-20	-	-
5	-15	-	-
5	-10	-	-
5	-5	240	60
5	0	180	40
5	5	120	20
10	10	80	12
15	15	60	8
20	20	45	5
25	25	30	3
25	30	20	2
25	40	10	0.5

**For wet concrete the curing time must be doubled*

Installation data

R-KER-W

Resin temperature	Concrete temperature	Curing time*	Working time
[°C]	[°C]	[min]	[min]
5	-20	1440	100
5	-15	960	60
5	-10	480	30
5	-5	240	16
5	0	120	12
5	5	60	8
10	10	45	5
15	15	30	3
20	20	10	2

**For wet concrete the curing time must be doubled*

R-KER-S

Resin temperature	Concrete temperature	Curing time*	Working time
[°C]	[°C]	[min]	[min]
5	-20	-	-
5	-15	-	-
5	-10	-	-
5	-5	1440	65
5	0	960	50
5	5	720	35
10	10	480	20
15	15	360	12
20	20	240	9
25	25	180	7
25	30	120	6
25	40	45	4
25	45	35	3
25	50	25	2

**For wet concrete the curing time must be doubled*

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	37	58	84	157
Elastic section modulus	W_{el}	[mm³]	21	50	98	170	402
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	37	58	84	157
Elastic section modulus	W_{el}	[mm³]	21	50	98	170	402
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

Mechanical properties

Size			M6	M8	M10	M12	M16
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
Metric Threaded Rods - Steel Class A4							
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	11	26	52	92	233
Design bending resistance	M	[Nm]	7	17	34	59	149
Allowable bending resistance	M_{rec}	[Nm]	5	12	24	42	107

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 $N_{Ru,m}$								
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	12.5	21.6	21.6	34.8	34.8	50.4	93.6
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	19.2	34.8	34.8	50.6	55.2	63.0	97.4
METRIC THREADED RODS - STEEL CLASS A4	[kN]	16.8	31.2	31.2	49.2	49.2	63.0	97.4
SHEAR LOAD $V_{Ru,m}$								
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	6.00	10.8	10.8	16.8	16.8	25.2	46.8
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	9.60	18.0	18.0	27.6	27.6	40.8	75.6
METRIC THREADED RODS - STEEL CLASS A4	[kN]	8.40	15.6	15.6	24.0	24.0	34.8	66.0
CHARACTERISTIC LOAD								
TENSION LOAD N_{Rk}								
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	10.00	18.0	18.0	29.0	29.0	42.0	66.0
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	16.0	25.5	29.0	32.0	46.0	42.7	66.0
METRIC THREADED RODS - STEEL CLASS A4	[kN]	14.0	25.5	26.0	32.0	41.0	42.7	66.0
SHEAR LOAD V_{Rk}								
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	5.00	9.00	9.00	14.0	14.0	21.0	39.0
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8.00	15.0	15.0	23.0	23.0	34.0	63.0
METRIC THREADED RODS - STEEL CLASS A4	[kN]	7.00	13.0	13.0	20.0	20.0	29.0	55.0

Basic performance data

Size		M6	M8		M10		M12	M16
DESIGN LOAD								
TENSION LOAD N_{Rd}								
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	6.67	12.0	12.0	17.8	19.3	23.7	36.7
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	9.82	14.1	17.0	17.8	26.5	23.7	36.7
METRIC THREADED RODS - STEEL CLASS A4	[kN]	7.49	13.9	13.9	17.8	21.9	23.7	36.7
SHEAR LOAD V_{Rd}								
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	4.00	7.20	7.20	11.2	11.2	16.8	31.2
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	6.40	12.0	12.0	18.4	18.4	27.2	50.4
METRIC THREADED RODS - STEEL CLASS A4	[kN]	4.49	8.33	8.33	12.8	12.8	18.6	35.3
RECOMMENDED LOAD								
TENSION LOAD N_{rec}								
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	4.76	8.57	8.57	12.7	13.8	17.0	26.2
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	7.01	10.1	12.1	12.7	19.0	17.0	26.2
METRIC THREADED RODS - STEEL CLASS A4	[kN]	5.35	9.93	9.93	12.7	15.7	17.0	26.2
SHEAR LOAD V_{rec}								
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	2.86	5.14	5.14	8.00	8.00	12.0	22.3
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	4.57	8.57	8.57	13.1	13.1	19.4	36.0
METRIC THREADED RODS - STEEL CLASS A4	[kN]	3.21	5.95	5.95	9.16	9.16	13.3	25.2

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
Partial safety factor	γ_{Ms}	-	1.50	1.50	1.50	1.50	1.50	1.50	1.50
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
Partial safety factor	γ_{Ms}	-	1.50	1.50	1.50	1.50	1.50	1.50	1.50
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
Partial safety factor	γ_{Ms}	-	1.87	1.87	1.87	1.87	1.87	1.87	1.87
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; NON-CRACKED CONCRETE, C20/25 (40°C/24°C)									
Characteristic bond resistance	T_{Rk}	[N/mm²]	7.50	9.00	9.00	9.50	9.50	8.50	7.00
Sustained load factor	Ψ^0_{sus}	-	0.60	0.60	0.60	0.60	0.60	0.60	0.60
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; NON-CRACKED CONCRETE, C20/25 (80°C/50°C)									
Characteristic bond resistance	T_{Rk}	[N/mm²]	6.00	7.00	7.00	7.50	7.50	6.50	5.50
Sustained load factor	Ψ^0_{sus}	-	0.60	0.60	0.60	0.60	0.60	0.60	0.60
COMBINED PULL-OUT AND CONCRETE CONE FAILURE									
Installation safety factor	γ_{inst}	-	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Increasing factors for $N_{Rd,p}$ - C30/37	Ψ_c	-	1.04	1.04	1.04	1.04	1.04	1.04	1.00
Increasing factors for $N_{Rd,p}$ - C40/50	Ψ_c	-	1.07	1.07	1.07	1.07	1.07	1.07	1.00
Increasing factors for $N_{Rd,p}$ - C50/60	Ψ_c	-	1.09	1.09	1.09	1.09	1.09	1.09	1.00
CONCRETE CONE FAILURE									
Installation safety factor	γ_{inst}	-	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Factor for non-cracked concrete	$k_{ucr,N}$	-	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Edge distance	$c_{cr,N}$	[mm]	$1.5*h_{ef}$	$1.5*h_{ef}$	$1.5*h_{ef}$	$1.5*h_{ef}$	$1.5*h_{ef}$	$1.5*h_{ef}$	$1.5*h_{ef}$
Spacing	$s_{cr,N}$	[mm]	$3.0*h_{ef}$	$3.0*h_{ef}$	$3.0*h_{ef}$	$3.0*h_{ef}$	$3.0*h_{ef}$	$3.0*h_{ef}$	$3.0*h_{ef}$
CONCRETE SPLITTING FAILURE									
Installation safety factor	γ_{inst}	-	1.20	1.20	1.20	1.20	1.20	1.20	1.20

Design performance data

Size			M6	M8	M10	M12	M16
SHEAR LOAD							
STEEL FAILURE; STEEL CLASS 5.8							
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	5.00	9.00	14.00	21.00	39.00
Ductility factor	k_7	-	0.80	0.80	0.80	0.80	0.80
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	7.60	19.00	37.00	64.00	166.00
Partial safety factor	γ_{Ms}	-	1.25	1.25	1.25	1.25	1.25
STEEL FAILURE; STEEL CLASS 8.8							
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	8.00	15.00	23.00	34.00	63.00
Ductility factor	k_7	-	0.80	0.80	0.80	0.80	0.80
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	12.20	30.00	60.00	105.00	266.00
Partial safety factor	γ_{Ms}	-	1.25	1.25	1.25	1.25	1.25
STEEL FAILURE; STEEL GRADE A4-70							
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	7.00	13.00	20.00	29.00	55.00
Ductility factor	k_7	-	0.80	0.80	0.80	0.80	0.80
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	10.70	26.00	52.00	92.00	233.00
Partial safety factor	γ_{Ms}	-	1.56	1.56	1.56	1.56	1.56
CONCRETE PRY-OUT FAILURE							
Factor	k	-	2.00	2.00	2.00	2.00	2.00
Installation safety factor	γ_{inst}	-	1.00	1.00	1.00	1.00	1.00
CONCRETE EDGE FAILURE							
Anchor diameter	d_{nom}	[mm]	10.00	12.00	16.00	16.00	24.00
Effective length of anchor	ℓ_f	[mm]	min(300; h_{ef};12d_{nom})	min(300; h_{ef};12d_{nom})	min(300; h_{ef};12d_{nom})	min(300; h_{ef};12d_{nom})	min(300; h_{ef};12d_{nom})
Installation safety factor	γ_{inst}	-	1.00	1.00	1.00	1.00	1.00

Combined pull-out and concrete cone failure (EN 1992-4:2018, p.7.2.1.6., 7.14 - $N^0_{Rk,p}=\psi^0_{sus}*\tau_{Rk}*\pi*d*h_{ef}$).
$h_{ef} = h_{nom}$

Product commercial data

Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Codes
		Box	Outer	Pallet	Box	Outer	Pallet	
R-KER-300 [1]	300	10	10	840	6.3	6.3	559.2	5906675075167
R-KER-300-SV [1]	300	10	10	840	6.3	6.3	559.2	5906675417080
R-KER-345 [1]	345	10	10	840	7.1	7.1	623.3	5906675291086
R-KER-380-W [1]	380	10	10	560	8.2	8.2	486.6	5906675222981
R-KER-400 [1]	400	10	10	560	8.1	8.1	483.8	5906675329444
R-KER-II-400-FR	400	10	10	560	8.2	8.2	489.2	5906675435831

1) ETA-13/0805