

R-CFS+KERII Hybrid resin with Sockets

High strength and versatile application in cracked and non-cracked concrete with internally threaded sockets (ITS)



Approvals and Reports

- ETA-21-0242



Product information

Features and benefits

- Approved for use in cracked and non-cracked concrete
- Allows removal of bolt to leave a re-usable socket in place
- Winter version can be used in warmer temperatures for faster curing
- Suitable for use in dry and wet substrates as well as holes and substrates covered with water
- 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
- Suitable for multiple use. Partly used product can be reused after fitting new nozzle
- Unique soft foil pack for less waste
- Effortless extrusion due to the patented self-opening system with manual or battery dispenser guns
- Tests in fire conditions confirm the fire resistance up to R120

Applications

- Curtain walling
- Balustrading
- Handrails
- Canopies

Base materials

Approved for use in:

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

Installation guide

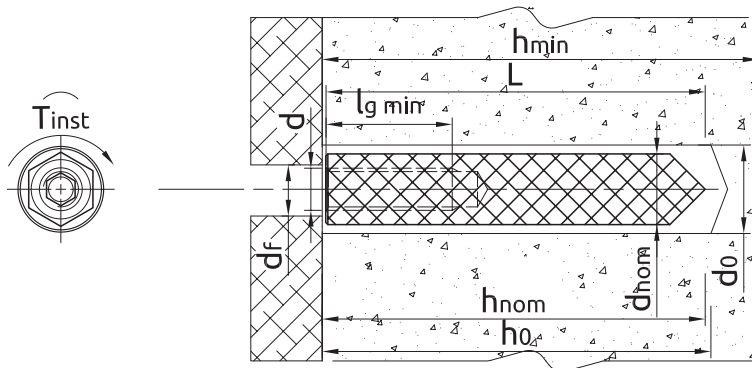
Product information

Product Code	Resin	Description / Resin Type	Volume
			[m]
R-CFS+KERII-600	R-CFS+KERII	R-KER II Hybrid Resin	600
R-CFS+KERII-600-S		R-KER II Hybrid Resin for High Temperature (Summer) / Slow Cure Styrene Free Hybrid Resin	
R-CFS+KERII-600-W		R-KER II Hybrid Resin for High Temperature (Winter) / Fast Cure Styrene Free Hybrid Resin	

SOCKETS

Size	Product Code		Anchor			Fixture	Diameter
	Steel class 5.8	Steel grade A4	Socket diameter	Length	Internal thread length	Hole diameter	
			d	L	l_s	d_f	
			[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
Thread diameter	d [mm]	6	8	8	10	10
Hole diameter in substrate	d_0 [mm]	12	14	14	20	20
Hole diameter in fixture	d_f [mm]	7	9	9	12	12
Thread engagement length	h_s [mm]	24	25	25	30	30
Min. hole depth in substrate	h_0 [mm]	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$
Min. substrate thickness	h_{min} [mm]	$h_{nom} + 30$ ≥ 100	$h_{nom} + 30$ ≥ 100	$h_{nom} + 30$ ≥ 100	$h_{nom} + 2d_0$	$h_{nom} + 2d_0$
Installation torque	T_{inst} [Nm]	3	5	5	10	10
Min. spacing	s_{min} [mm]	40	40	50	40	50
Min. edge distance	c_{min} [mm]	40	40	50	40	50

Installation data

Minimum working and curing time

R-KER-II

Resin temperature	Concrete temperature	Curing time*	Working time
[°C]	[°C]	[min]	[min]
5	-5	24 h	40
5	0	3 h	30
5	5	90	15
10	10	60	8
15	15	60	5
20	20	45	2.5
25	25	45	2
25	30	45	2
25	35	30	1.5
25	40	30	1.5

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

R-KER-II S

Resin temperature	Concrete temperature	Curing time*	Working time
[°C]	[°C]	[min]	[min]
5	5	12 h	40
10	10	8 h	20
15	15	6 h	15
20	20	4 h	10
25	25	3 h	9.5
25	30	2 h	7
25	35	2 h	6.5
25	40	1.5 h	6.5

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

R-KER-II W

Resin temperature	Concrete temperature	Curing time*	Working time
[°C]	[°C]	[min]	[min]
5	-20	24 h	80
5	-15	16 h	60
5	-10	8 h	40
5	-5	4 h	20
5	0	2 h	14
5	5	60	9
10	10	45	5.5
15	15	30	3
20	20	15	2
25	25	10	1.5
25	30	10	1.5
25	35	5	1
25	40	5	1

**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/mm ²]	520	500	500	500	500
Nominal yield strength - tension	f_{yk}	[N/mm ²]	420	400	400	400	400
Cross sectional area - tension	A_s	[mm ²]	20	37	58	84	157
Elastic section modulus	W_{el}	[mm ³]	21	50	98	170	402
R-ITS-A4 Internally Threaded Sockets							
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	700	700	700	700	700
Nominal yield strength - tension	f_{yk}	[N/mm ²]	350	350	350	350	350
Cross sectional area - tension	A_s	[mm ²]	20	37	58	84	157
Elastic section modulus	W_{el}	[mm ³]	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
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	M6	M8	M10	M12	M16					
Substrate	Non-cracked concrete					Cracked concrete									
Effective embedment depth h_{ef} [mm]	75.0	90.0	75.0	100.0	125.0	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	100.1	12.5	21.6	21.6	28.1	34.8	43.2	45.2
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	19.2	34.8	34.8	39.4	55.2	60.6	100.1	19.2	28.1	34.8	28.1	43.2	43.2	45.2
METRIC THREADED RODS - STEEL CLASS A4	[kN]	16.8	31.2	31.2	39.4	49.2	60.6	100.1	16.8	28.1	31.2	28.1	43.2	43.2	45.2
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	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	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	8.40	15.6	15.6	24.0	24.0	34.8	66.0

Basic performance data

Size		M6	M8	M10	M12	M16	M6	M8	M10	M12	M16				
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	68.8	10.00	18.0	18.0	22.4	29.0	34.4	37.7
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	16.0	29.0	29.0	32.0	46.0	49.2	68.8	16.0	22.4	29.0	22.4	34.4	34.4	37.7
METRIC THREADED RODS - STEEL CLASS A4	[kN]	14.0	25.0	25.0	32.0	40.0	49.2	68.8	14.0	22.4	25.0	22.4	34.4	34.4	37.7
SHEAR LOAD V_{Rk}															
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	5.00	9.20	9.20	14.5	14.5	21.1	39.3	5.00	9.20	9.20	14.5	14.5	21.1	39.3
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8.00	14.6	14.6	23.2	23.2	33.7	62.8	8.00	14.6	14.6	23.2	23.2	33.7	62.8
METRIC THREADED RODS - STEEL CLASS A4	[kN]	7.00	12.8	12.8	20.3	20.3	29.5	55.0	7.00	12.8	12.8	20.3	20.3	29.5	55.0
DESIGN LOAD															
TENSION LOAD N_{Rd}															
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	6.67	12.0	12.0	19.3	19.3	28.0	45.8	6.67	12.0	12.0	14.9	19.3	23.0	25.1
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	10.7	19.3	19.3	21.3	30.7	32.8	45.8	10.7	14.9	19.3	14.9	23.0	23.0	25.1
METRIC THREADED RODS - STEEL CLASS A4	[kN]	7.49	13.4	13.4	21.3	21.4	31.6	45.8	7.49	13.4	13.4	14.9	23.0	23.0	25.1
SHEAR LOAD V_{Rd}															
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	4.00	7.36	7.36	11.6	11.6	16.9	31.4	4.00	7.36	7.36	11.6	11.6	16.9	31.4
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	6.40	11.7	11.7	18.6	18.6	27.0	50.2	6.40	11.7	11.7	18.6	18.6	27.0	50.2
METRIC THREADED RODS - STEEL CLASS A4	[kN]	4.49	8.21	8.21	13.0	13.0	18.9	35.3	4.49	8.10	8.24	13.0	13.0	18.9	35.3
RECOMMENDED LOAD															
TENSION LOAD N_{rec}															
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	4.76	8.57	8.57	13.8	13.8	20.0	32.7	4.76	8.57	8.57	10.7	13.8	16.4	18.0
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	7.62	13.8	13.8	15.2	21.9	23.4	32.7	7.62	10.7	13.8	10.7	16.4	16.4	20.0
METRIC THREADED RODS - STEEL CLASS A4	[kN]	5.35	9.55	9.55	15.2	15.3	22.5	32.7	5.35	9.55	9.55	10.7	16.4	16.4	18.0
SHEAR LOAD V_{rec}															
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	2.86	5.26	5.26	8.29	8.29	12.1	22.5	2.86	5.26	5.26	8.29	8.29	12.1	22.5
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	4.57	8.34	8.34	13.3	13.3	19.3	35.9	4.57	8.34	8.34	13.3	13.3	19.3	35.9
METRIC THREADED RODS - STEEL CLASS A4	[kN]	3.21	5.86	5.86	9.29	9.29	13.5	25.2	3.21	5.86	5.86	9.29	9.29	13.5	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	125.00
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	25.00	25.00	40.00	40.00	59.00	109.00
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/mm ²]	11.00	14.00	14.00	11.00	11.00	11.00	8.00
Sustained load factor	ψ_{sus}^0	-	0.72	0.72	0.72	0.72	0.72	0.72	0.72
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; NON-CRACKED CONCRETE, C20/25 (80°C/50°C)									
Characteristic bond resistance	T_{Rk}	[N/mm ²]	11.00	14.00	14.00	11.00	11.00	11.00	8.00
Sustained load factor	ψ_{sus}^0	-	0.72	0.72	0.72	0.72	0.72	0.72	0.72
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; NON-CRACKED CONCRETE, C20/25 (120°C/80°C)									
Characteristic bond resistance	T_{Rk}	[N/mm ²]	6.00	7.00	7.00	6.00	6.00	6.00	4.00
Sustained load factor	ψ_{sus}^0	-	0.61	0.61	0.61	0.61	0.61	0.61	0.61
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; CRACKED CONCRETE, C20/25 (40°C/24°C)									
Characteristic bond resistance	T_{Rk}	[N/mm ²]	10.00	10.00	10.00	9.50	9.50	9.00	4.00
Sustained load factor	ψ_{sus}^0	-	0.72	0.72	0.72	0.72	0.72	0.72	0.72
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; CRACKED CONCRETE, C20/25 (80°C/50°C)									
Characteristic bond resistance	T_{Rk}	[N/mm ²]	10.00	10.00	10.00	9.50	9.50	9.00	4.00
Sustained load factor	ψ_{sus}^0	-	0.72	0.72	0.72	0.72	0.72	0.72	0.72
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; CRACKED CONCRETE, C20/25 (120°C/80°C)									
Characteristic bond resistance	T_{Rk}	[N/mm ²]	5.00	6.00	6.00	5.00	5.00	5.00	2.00
Sustained load factor	ψ_{sus}^0	-	0.61	0.61	0.61	0.61	0.61	0.61	0.61
COMBINED PULL-OUT AND CONCRETE CONE FAILURE									
Installation safety factor	γ_{inst}	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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}	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Factor for cracked concrete	$k_{cr,N}$	-	7.70	7.70	7.70	7.70	7.70	7.70	7.70
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}	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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	9.20	9.20	14.50	14.50	21.10	39.30
Ductility factor	k_7	-	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	7.60	18.70	18.70	37.40	37.40	65.50	166.50
Partial safety factor	γ_{Ms}	-	1.25	1.25	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	14.60	14.60	23.20	23.20	33.70	62.80
Ductility factor	k_7	-	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	12.20	30.00	30.00	59.80	59.80	104.80	266.40
Partial safety factor	γ_{Ms}	-	1.25	1.25	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	12.80	12.80	20.30	20.30	29.50	55.00
Ductility factor	k_7	-	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	10.70	26.20	26.20	52.30	52.30	91.70	233.10
Partial safety factor	γ_{Ms}	-	1.56	1.56	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	2.00	2.00
Installation safety factor	γ_{inst}	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CONCRETE EDGE FAILURE									
Anchor diameter	d_{nom}	[mm]	10.00	12.00	12.00	16.00	16.00	16.00	24.00
Effective length of anchor	l_f	[mm]	$\min(300; h_{ef}; 12d_{nom})$	$\min(300; h_{ef}; 12d_{nom})$	$\min(300; h_{ef}; 12d_{nom})$	$\min(300; h_{ef}; 12d_{nom})$	$\min(300; h_{ef}; 12d_{nom})$	$\min(300; h_{ef}; 12d_{nom})$	$\min(300; h_{ef}; 12d_{nom})$
Installation safety factor	γ_{inst}	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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

Product commercial data

Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Codes
		Box	Outer	Pallet	Box	Outer	Pallet	
R-CFS+KERII-600	600	1	1	40	10.0	10.0	430.0	5906675464817
R-CFS+KERII-600-S	600	1	1	16	10.0	10.0	190.0	5906675464824
R-CFS+KERII-600-W	600	1	1	40	10.0	10.0	430.0	5906675478050

1) ETA-21-0242