

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-17/0594



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

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

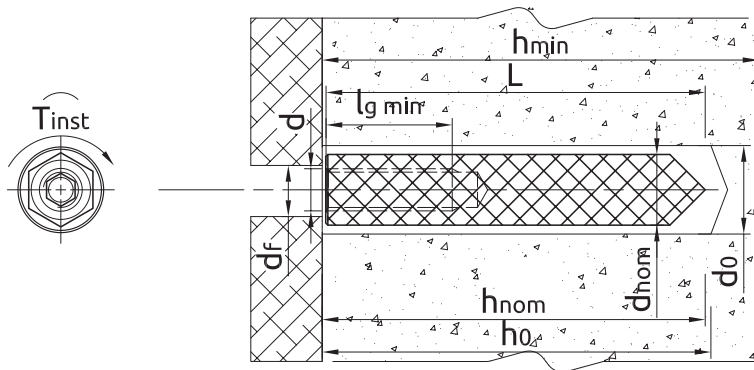
Product information

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	

SOCKETS

Size	Product Code		Anchor			Fixture	Hole diameter	
	Steel class 5.8	Steel grade A4	Socket diameter	Length	Internal thread length	d_f	d_1	
			d	L	l_g			
			[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	14	
	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]	$h_{nom} + 30$ ≥ 100	$h_{nom} + 30$ ≥ 100	$h_{nom} + 30$ ≥ 100	$h_{nom} + 2d_0$	$h_{nom} + 2d_0$	$h_{nom} + 2d_0$	$h_{nom} + 2d_0$
Installation torque	T_{inst} [Nm]	3	5	5	10	10	20	40
Min. spacing	s_{min} [mm]	40	40	50	40	50	50	70
Min. edge distance	c_{min} [mm]	40	40	50	40	50	50	70

Installation data

Minimum working and curing time

R-KER-II

Resin temperature	Concrete temperature	Curing time*	Working time
[°C]	[°C]	[min]	[min]
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	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

Mechanical properties

Size			M6	M8	M10	M12	M16
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	$M_{Rk,s}^0$	[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	$M_{Rk,s}^0$	[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 - A4							
Characteristic bending resistance	$M_{Rk,s}^0$	[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 - ETAG 001

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 - 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 - 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
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	70.6	10.00	18.0	18.0	23.4	29.0	36.0	37.7
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	16.0	29.0	29.0	32.8	46.0	50.5	70.6	16.0	23.4	29.0	23.4	36.0	36.0	37.7
METRIC THREADED RODS - A4	[kN]	14.0	25.0	25.0	32.8	40.0	50.5	70.6	14.0	23.4	25.0	23.4	36.0	36.0	37.7
SHEAR LOAD V_{Rk}															
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	5.00	9.00	9.00	14.5	14.5	21.0	39.0	5.00	9.00	9.00	14.5	14.5	21.0	39.0
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8.00	14.5	14.5	23.0	23.0	33.5	62.5	8.00	14.5	14.5	23.0	23.0	33.5	62.5
METRIC THREADED RODS - A4	[kN]	7.00	12.5	12.5	20.0	20.0	29.5	54.5	7.00	12.5	12.5	20.0	20.0	29.5	54.5

Basic performance data

Size		M6	M8	M10	M12	M16	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	19.3	19.3	28.0	47.1	6.67	12.0	12.0	15.6	19.3	24.0	25.1
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	10.7	19.3	19.3	21.9	30.7	33.7	47.1	10.7	15.6	19.3	15.6	24.0	24.0	25.1
METRIC THREADED RODS - A4	[kN]	7.49	13.4	13.4	21.4	21.4	32.6	47.1	7.49	13.4	13.4	15.6	21.4	24.0	25.1
SHEAR LOAD V_{Rd}															
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	4.00	7.20	7.20	11.6	11.6	16.8	31.2	4.00	7.20	7.20	11.6	11.6	16.8	31.2
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	6.40	11.6	11.6	18.4	18.4	26.8	50.0	6.40	11.6	11.6	18.4	18.4	26.8	50.0
METRIC THREADED RODS - A4	[kN]	4.49	8.01	8.01	12.8	12.8	18.9	34.9	4.49	8.01	8.01	12.8	12.8	18.9	34.9
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	33.6	4.76	8.57	8.57	11.1	13.8	17.1	18.0
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	7.62	13.8	13.8	15.6	21.9	24.1	33.6	7.62	11.1	13.8	11.1	17.1	17.1	20.0
METRIC THREADED RODS - A4	[kN]	5.35	9.55	9.55	15.3	15.3	22.5	33.6	5.35	9.55	9.55	11.1	15.3	17.1	18.0
SHEAR LOAD V_{rec}															
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	2.86	5.14	5.14	8.29	8.29	12.0	22.3	2.86	5.14	5.14	8.29	8.29	12.0	22.3
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	4.57	8.29	8.29	13.1	13.1	19.1	35.7	4.57	8.29	8.29	13.1	13.1	19.1	35.7
METRIC THREADED RODS - A4	[kN]	3.21	5.72	5.72	9.16	9.16	13.5	25.0	3.21	5.72	5.72	9.16	9.16	13.5	25.0

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
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
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
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
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
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
COMBINED PULL-OUT AND CONCRETE CONE FAILURE									
Installation safety factor	γ_2	-	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_2	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Factor for cracked concrete	k	-	7.20	7.20	7.20	7.20	7.20	7.20	7.20
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	-	10.10	10.10	10.10	10.10	10.10	10.10	10.10
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_2	-	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
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
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
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_2	-	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 ($h_{ef}; 8d_{nom}$)	min ($h_{ef}; 8d_{nom}$)	min ($h_{ef}; 8d_{nom}$)	min ($h_{ef}; 8d_{nom}$)	min ($h_{ef}; 8d_{nom}$)	min ($h_{ef}; 8d_{nom}$)	min ($h_{ef}; 8d_{nom}$)
Installation safety factor	γ_2	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Combined pull-out and concrete cone failure (TR 029, p.5.2.2.3. acc. to formula 5.2a - $N_{Rk,p}^0 = n \cdot d \cdot h_{ef} \cdot \tau_{Rk}$).

Concrete cone failure (TR 029, p.5.2.2.4. acc. to formula 5.3a - $N_{Rk,c}^0 = k_1 \cdot F_{ck,cube}^{0.5} \cdot h_{ef}^{1.5}$).

$h_{ef} = h_{nom}$

Product commercial data

Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Codes
		Box	Outer	Pallet	Box	Outer	Pallet	
R-CFS+KERII-600 ¹⁾	600	1	1	36	10.0	10.0	390.0	5906675464817
R-CFS+KERII-600-S ¹⁾	600	1	1	36	10.0	10.0	390.0	5906675464824

1) ETA-17/0594