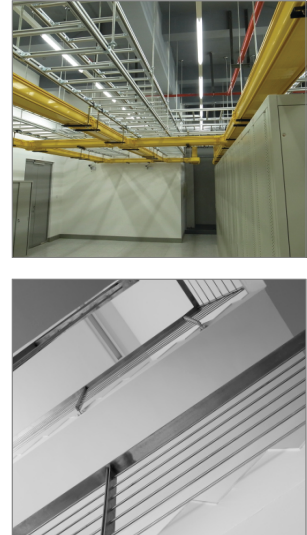


R-KER-II Hybrid resin with Threaded Rods

High strength and versatile application in cracked and non-cracked concrete with threaded rods

Approvals and Reports

- ETA-17/0594



Product information

Features and benefits

- Approved for use with threaded rods for use in cracked and non-cracked concrete
- 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
- For faster curing in warmer temperatures can be used winter version of the resin
- Special nozzle with longer mixer for more comfortable and precise application
- Suitable for multiple use. Partly used product can be reused after fitting new nozzle
- Very high load capacity

Applications

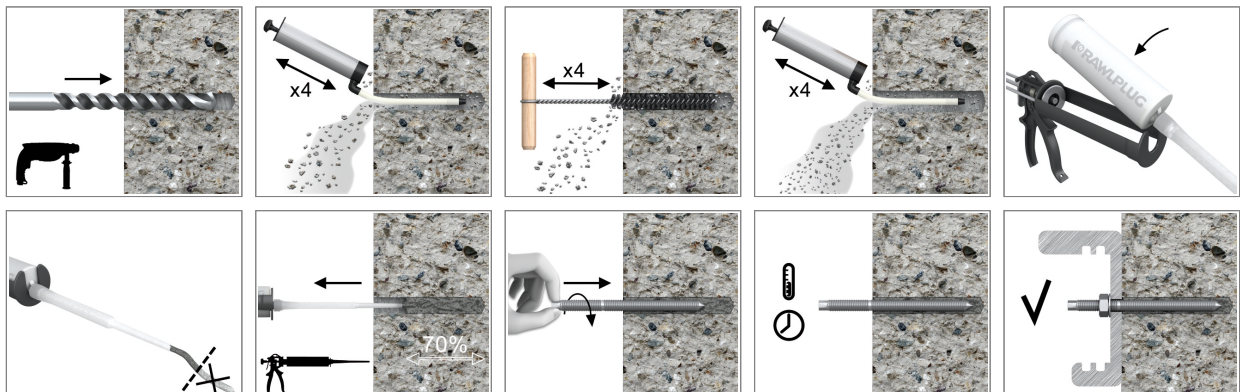
- Curtain walling
- Balustrading
- Handrails
- Canopies
- Cable conduits and trays
- Fencing & gates manufacturing and installation
- Pipework/ductwork supports
- Platforms
- Pipelines systems
- Passenger lifts

Base materials

Approved for use in:

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

Installation guide



Product information

1. Drill hole to the required diameter and depth for stud 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 (min. 10cm).
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 stud, 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 nut to the required torque.

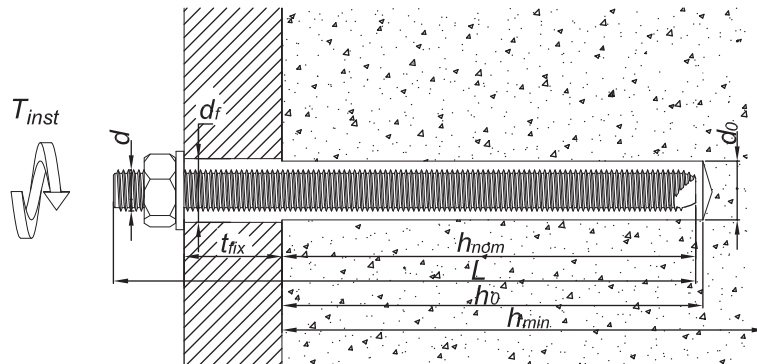
Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-KER-II-300	R-KER-II	R-KER II Hybrid Resin	300
R-KER-II-345			345
R-KER-II-400			400
R-KER-II-300-S	R-KER-II S	R-KER II Hybrid Resin for High Temperature (Summer) / Slow Cure Styrene Free Hybrid Resin	300
R-KER-II-345-S	R-KER-II-S		345
R-KER-II-400-S			400

Size	Product Code	Resin	Description / Resin Type	Volume
				[ml]
Ø32	R-KER-II-300	R-KER-II	R-KER II Hybrid Resin	300
	R-KER-II-345			345
	R-KER-II-400			400
Ø40	R-KER-II-300-S	R-KER-II S	R-KER II Hybrid Resin for High Temperature (Summer) / Slow Cure Styrene Free Hybrid Resin	300
Ø32	R-KER-II-345-S	R-KER-II-S		345
	R-KER-II-400-S			400

R-STUDS

Size	Product Code			Anchor		Fixture		
	Steel class 5.8	Steel class 8.8	Steel grade A4	Diameter	Length	Hole diameter	Max. thickness t_{fix} for:	
				d	L	d _f	$h_{nom, min}$	$h_{nom, max}$
				[mm]	[mm]	[mm]	[mm]	[mm]
M8	R-STUDS-08110	R-STUDS-08110-88	R-STUDS-08110-A4	8	110	9	40	-
	R-STUDS-08160	-	R-STUDS-08160-A4	8	160	9	90	-
M10	R-STUDS-10130	R-STUDS-10130-88	R-STUDS-10130-A4	10	130	12	58	-
	R-STUDS-10170	-	R-STUDS-10170-A4	10	170	12	98	-
	R-STUDS-10190	-	R-STUDS-10190-A4	10	190	12	118	-
M12	R-STUDS-12160	R-STUDS-12160-88	R-STUDS-12160-A4	12	160	14	85	-
	R-STUDS-12190	-	R-STUDS-12190-A4	12	190	14	115	-
	R-STUDS-12220	-	R-STUDS-12220-A4	12	220	14	145	-
	R-STUDS-12260	-	R-STUDS-12260-A4	12	260	14	185	-
	R-STUDS-12300	-	R-STUDS-12300-A4	12	300	14	225	45
M16	R-STUDS-16190	R-STUDS-16190-88	R-STUDS-16190-A4	16	190	18	111	-
	R-STUDS-16220	-	R-STUDS-16220-A4	16	220	18	141	-
	R-STUDS-16260	-	R-STUDS-16260-A4	16	260	18	181	-
	R-STUDS-16300	-	R-STUDS-16300-A4	16	300	18	221	-
	R-STUDS-16380	-	R-STUDS-16380-A4	16	380	18	301	41
M20	R-STUDS-20260	R-STUDS-20260-88	R-STUDS-20260-A4	20	260	22	157	-
	R-STUDS-20300	-	R-STUDS-20300-A4	20	300	22	197	-
	R-STUDS-20350	-	R-STUDS-20350-A4	20	350	22	247	-
M24	R-STUDS-24300	R-STUDS-24300-88	R-STUDS-24300-A4	24	300	26	176	-
M30	R-STUDS-30380	R-STUDS-30380-88	R-STUDS-30380-A4	30	380	32	226	-

Installation data



R-STUDS

Size			M8	M10	M12	M16	M20	M24	M30
Thread diameter	d	[mm]	8	10	12	16	20	24	30
Hole diameter in substrate	d ₀	[mm]	10	12	14	18	24	28	35
Hole diameter in fixture	d _f	[mm]	9	12	14	18	22	26	32
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]	10	20	40	80	120	160	200
Min. spacing	s _{min}	[mm]	40	40	40	40	40	50	60
Min. edge distance	c _{min}	[mm]	40	40	40	40	40	50	60
MINIMUM EMBEDMENT DEPTH									
Installation depth	h _{nom, min}	[mm]	60	60	60	60	80	96	120
MAXIMUM EMBEDMENT DEPTH									
Installation depth	h _{nom, max}	[mm]	160	200	240	320	400	480	600

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

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	13
25	25	3 h	9.5
25	30	2 h	7
25	35	2 h	6.5
25	40	1.5 h	6.5

Installation data

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

Mechanical properties

Size			M8	M10	M12	M16	M20	M24	M30
R-STUDS Metric Threaded Rods - Steel Class 5.8									
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	500	500	500	500	500	500	500
Nominal yield strength - tension	f_{yk}	[N/mm ²]	400	400	400	400	400	400	400
Cross sectional area - tension	A_s	[mm ²]	36.6	58	84.3	157	245	352.8	559.8
Elastic section modulus	W_{el}	[mm ³]	31.2	62.3	109.2	277.5	541	935	1868
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	19	37	65	166	324	561	1124
Design bending resistance	M	[Nm]	15	30	52	133	259	449	899
Allowable bending resistance	M_{rec}	[Nm]	11	21	37	95	185	321	642
R-STUDS Metric Threaded Rods - Steel Class 8.8									
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	800	800	800	800	800	800	800
Nominal yield strength - tension	f_{yk}	[N/mm ²]	640	640	640	640	640	640	640
Cross sectional area - tension	A_s	[mm ²]	36.6	58	84.3	157	245	352.8	559.8
Elastic section modulus	W_{el}	[mm ³]	31.2	62.3	109.2	277.5	541	935	1868
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	30	60	105	266	519	898	1799
Design bending resistance	M	[Nm]	24	48	84	213	416	718	1439
Allowable bending resistance	M_{rec}	[Nm]	17	34	60	152	297	513	1028
R-STUDS Metric Threaded Rods - A4									
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	700	700	700	700	700	700	700
Nominal yield strength - tension	f_{yk}	[N/mm ²]	350	350	350	350	350	350	350
Cross sectional area - tension	A_s	[mm ²]	36.6	58	84.3	157	245	352.8	559.8
Elastic section modulus	W_{el}	[mm ³]	31.2	62.3	109.2	277.5	541	935	1868
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	26	52	92	233	454	786	1574
Design bending resistance	M	[Nm]	17	34	59	149	291	504	1009
Allowable bending resistance	M_{rec}	[Nm]	12	24	42	107	208	360	721

Basic performance data

R-STUDS

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

Size		M8	M10	M12	M16	M20	M24	M30	M8	M10	M12	M16	M20	M24	M30
Substrate		Non-cracked concrete							Cracked concrete						
MEAN ULTIMATE LOAD															
TENSION LOAD $N_{Ru,m}$															
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8															
Minimum embedment depth	[kN]	22.0	28.2	28.2	28.2	43.4	57.0	79.7	20.1	20.1	20.1	20.1	30.9	40.6	56.8
Maximum embedment depth	[kN]	22.0	34.8	50.6	94.2	147.0	211.7	335.9	22.0	34.8	50.6	94.2	147.0	211.7	335.9
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8															
Minimum embedment depth	[kN]	28.2	28.2	28.2	28.2	43.4	57.0	79.7	20.1	20.1	20.1	20.1	30.9	40.6	56.8
Maximum embedment depth	[kN]	32.9	52.2	75.9	141.3	220.5	317.5	503.8	32.9	52.2	75.9	141.3	220.5	317.5	503.8
R-STUDS METRIC THREADED RODS - A4															
Minimum embedment depth	[kN]	28.2	28.2	28.2	28.2	43.4	57.0	79.7	20.1	20.1	20.1	20.1	30.9	40.6	56.8
Maximum embedment depth	[kN]	28.9	45.8	66.6	124.0	193.6	278.7	442.2	28.9	45.8	66.6	124.0	193.6	278.7	442.2
SHEAR LOAD $V_{Ru,m}$															
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8															
Minimum embedment depth	[kN]	11.0	17.4	25.3	47.1	73.5	105.8	167.9	11.0	17.4	25.3	47.1	73.5	105.8	135.7
Maximum embedment depth	[kN]	11.0	17.4	25.3	47.1	73.5	105.8	167.9	11.0	17.4	25.3	47.1	73.5	105.8	167.9
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8															
Minimum embedment depth	[kN]	16.5	26.1	37.9	70.7	110.3	158.8	194.3	16.5	26.1	37.9	64.3	84.8	114.1	115.0
Maximum embedment depth	[kN]	16.5	26.1	37.9	70.7	110.3	158.8	240.4	16.5	26.1	37.9	70.7	110.3	158.8	226.9
R-STUDS METRIC THREADED RODS - A4															
Minimum embedment depth	[kN]	14.5	22.9	33.3	62.0	96.8	139.4	221.1	14.5	22.9	33.3	62.0	85.3	114.3	170.7
Maximum embedment depth	[kN]	14.5	22.9	33.3	62.0	96.8	139.4	221.1	14.5	22.9	33.3	62.0	96.8	139.4	221.1
CHARACTERISTIC LOAD															
TENSION LOAD N_{Rk}															
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8															
Minimum embedment depth	[kN]	18.0	23.5	23.5	23.5	36.1	47.5	66.4	15.1	16.7	16.7	16.7	25.8	33.9	47.3
Maximum embedment depth	[kN]	18.0	29.0	42.0	78.0	122.0	176.0	280.0	18.0	29.0	42.0	78.0	122.0	176.0	280.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8															
Minimum embedment depth	[kN]	23.5	23.5	23.5	23.5	36.1	47.5	66.4	15.1	16.7	16.7	16.7	25.8	33.9	47.3
Maximum embedment depth	[kN]	29.0	46.0	67.0	126.0	196.0	282.0	448.0	29.0	46.0	67.0	126.0	188.5	253.3	282.7
R-STUDS METRIC THREADED RODS - A4															
Minimum embedment depth	[kN]	23.5	23.5	23.5	23.5	36.1	47.5	66.4	15.1	16.7	16.7	16.7	25.8	33.9	47.3
Maximum embedment depth	[kN]	26.0	41.0	59.0	110.0	171.0	247.0	293.0	26.0	41.0	59.0	110.0	171.0	247.0	282.7
SHEAR LOAD V_{Rk}															
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8															
Minimum embedment depth	[kN]	9.00	14.5	21.0	39.0	61.0	88.0	140.0	9.00	14.5	21.0	39.0	61.0	88.0	113.1
Maximum embedment depth	[kN]	9.00	14.5	21.0	39.0	61.0	88.0	140.0	9.00	14.5	21.0	39.0	61.0	88.0	140.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8															
Minimum embedment depth	[kN]	14.5	23.0	33.5	63.0	98.0	141.0	181.0	14.5	23.0	33.5	57.3	75.4	101.3	113.1
Maximum embedment depth	[kN]	14.5	23.0	33.5	63.0	98.0	141.0	224.0	14.5	23.0	33.5	63.0	98.0	141.0	224.0
R-STUDS METRIC THREADED RODS - A4															
Minimum embedment depth	[kN]	13.0	20.5	29.5	55.0	85.5	123.5	146.5	13.0	20.5	29.5	55.0	75.4	101.3	113.1
Maximum embedment depth	[kN]	13.0	20.5	29.5	55.0	85.5	123.5	146.5	13.0	20.5	29.5	55.0	85.5	123.5	146.5

Basic performance data

Size		M8	M10	M12	M16	M20	M24	M30	M8	M10	M12	M16	M20	M24	M30
DESIGN LOAD															
TENSION LOAD N_{Rd}															
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8															
Minimum embedment depth	[kN]	12.0	15.7	15.7	15.7	24.1	31.7	44.3	10.1	11.2	11.2	11.2	17.2	22.6	31.6
Maximum embedment depth	[kN]	12.0	19.3	28.0	52.0	81.3	117.3	186.7	12.0	19.3	28.0	52.0	81.3	117.3	186.7
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8															
Minimum embedment depth	[kN]	15.7	15.7	15.7	15.7	24.1	31.7	44.3	10.1	11.2	11.2	11.2	17.2	22.6	31.6
Maximum embedment depth	[kN]	19.3	30.7	44.7	84.0	130.7	188.0	298.7	19.3	30.7	44.7	84.0	125.7	168.9	188.5
R-STUDS METRIC THREADED RODS - A4															
Minimum embedment depth	[kN]	13.9	15.7	15.7	15.7	24.1	31.7	44.3	10.1	11.2	11.2	11.2	17.2	22.6	31.6
Maximum embedment depth	[kN]	13.9	21.9	31.6	58.8	91.4	132.1	156.7	13.9	21.9	31.6	58.8	91.4	132.1	156.7
SHEAR LOAD V_{Rd}															
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8															
Minimum embedment depth	[kN]	7.20	11.6	16.8	31.2	48.8	70.4	112.0	7.20	11.6	16.8	31.2	48.8	67.6	75.4
Maximum embedment depth	[kN]	7.20	11.6	16.8	31.2	48.8	70.4	112.0	7.20	11.6	16.8	31.2	48.8	70.4	112.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8															
Minimum embedment depth	[kN]	11.6	18.4	26.8	50.4	67.0	96.5	120.6	11.6	18.4	26.8	38.2	50.3	67.6	75.4
Maximum embedment depth	[kN]	11.6	18.4	26.8	50.4	78.4	112.8	179.2	11.6	18.4	26.8	50.4	78.4	112.8	179.2
R-STUDS METRIC THREADED RODS - A4															
Minimum embedment depth	[kN]	8.33	13.1	18.9	35.3	54.8	79.2	93.9	8.33	13.1	18.9	35.3	50.3	67.6	75.4
Maximum embedment depth	[kN]	8.33	13.1	18.9	35.3	54.8	79.2	93.9	8.33	13.1	18.9	35.3	54.8	79.2	93.9
RECOMMENDED LOAD															
TENSION LOAD N_{rec}															
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8															
Minimum embedment depth	[kN]	8.57	11.2	11.2	11.2	17.2	22.6	31.6	7.18	7.97	7.97	7.97	12.3	16.1	22.5
Maximum embedment depth	[kN]	8.57	13.8	20.0	37.1	58.1	83.8	133.3	8.57	13.8	20.0	37.1	58.1	83.8	133.3
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8															
Minimum embedment depth	[kN]	11.2	11.2	11.2	11.2	17.2	22.6	31.6	7.18	7.97	7.97	7.97	12.3	16.1	22.5
Maximum embedment depth	[kN]	13.8	21.9	31.9	60.0	93.3	134.3	213.3	13.8	21.9	31.9	60.0	89.8	120.6	134.6
R-STUDS METRIC THREADED RODS - A4															
Minimum embedment depth	[kN]	9.93	11.2	11.2	11.2	17.2	22.6	31.6	7.18	7.97	7.97	7.97	12.3	16.1	22.5
Maximum embedment depth	[kN]	9.93	15.7	22.5	42.0	65.3	94.4	111.9	9.93	15.7	22.5	42.0	65.3	94.4	111.9
SHEAR LOAD V_{rec}															
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8															
Minimum embedment depth	[kN]	5.14	8.29	12.0	22.3	34.9	50.3	80.0	5.14	8.29	12.0	22.3	34.9	48.3	53.9
Maximum embedment depth	[kN]	5.14	8.29	12.0	22.3	34.9	50.3	80.0	5.14	8.29	12.0	22.3	34.9	50.3	80.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8															
Minimum embedment depth	[kN]	8.29	13.1	19.1	36.0	47.9	68.9	86.2	8.29	13.1	19.1	27.3	35.9	48.3	53.9
Maximum embedment depth	[kN]	8.29	13.1	19.1	36.0	56.0	80.6	128.0	8.29	13.1	19.1	36.0	56.0	80.6	128.0
R-STUDS METRIC THREADED RODS - A4															
Minimum embedment depth	[kN]	5.95	9.39	13.5	25.2	39.2	56.6	67.1	5.95	9.39	13.5	25.2	35.9	48.3	53.9
Maximum embedment depth	[kN]	5.95	9.39	13.5	25.2	39.2	56.6	67.1	5.95	9.39	13.5	25.2	39.2	56.6	67.1

Design performance data

R-STUDS

Size			M8	M10	M12	M16	M20	M24	M30
TENSION LOAD									
STEEL FAILURE; STEEL CLASS 5.8									
Characteristic resistance	$N_{Rk,s}$	[kN]	18.00	29.00	42.00	78.00	122.00	176.00	280.00
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]	29.00	46.00	67.00	126.00	196.00	282.00	448.00
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]	26.00	41.00	59.00	110.00	171.00	247.00	293.00
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, K1=10,1, C20/25 (40°C/24°C)									
Characteristic bond resistance	T_{Rk}	[N/mm ²]	16.00	15.00	15.00	13.00	10.00	10.00	8.00
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; NON-CRACKED CONCRETE, K1=10,1, C20/25 (80°C/50°C)									
Characteristic bond resistance	T_{Rk}	[N/mm ²]	16.00	15.00	15.00	13.00	10.00	10.00	8.00
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; NON-CRACKED CONCRETE, K1=10,1, C20/25 (120°C/80°C)									
Characteristic bond resistance	T_{Rk}	[N/mm ²]	8.50	8.00	8.00	7.00	5.50	5.50	4.50
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; CRACKED CONCRETE, K1=7,2, C20/25 (40°C/24°C)									
Characteristic bond resistance	T_{Rk}	[N/mm ²]	10.00	11.00	11.00	9.50	7.50	7.00	5.00
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; CRACKED CONCRETE, K1=7,2, C20/25 (80°C/50°C)									
Characteristic bond resistance	T_{Rk}	[N/mm ²]	10.00	11.00	11.00	9.50	7.50	7.00	5.00
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; CRACKED CONCRETE, K1=7,2, C20/25 (120°C/80°C)									
Characteristic bond resistance	T_{Rk}	[N/mm ²]	5.00	6.00	6.00	5.00	4.00	4.00	3.00
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	-	1.05	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
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]	$1.5 \cdot h_{ef}$	$1.5 \cdot h_{ef}$	$1.5 \cdot h_{ef}$	$1.5 \cdot h_{ef}$	$1.5 \cdot h_{ef}$	$1.5 \cdot h_{ef}$	$1.5 \cdot h_{ef}$
Spacing	$s_{cr,N}$	[mm]	$3.0 \cdot h_{ef}$	$3.0 \cdot h_{ef}$	$3.0 \cdot h_{ef}$	$3.0 \cdot h_{ef}$	$3.0 \cdot h_{ef}$	$3.0 \cdot h_{ef}$	$3.0 \cdot h_{ef}$
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			M8	M10	M12	M16	M20	M24	M30
SHEAR LOAD									
STEEL FAILURE; STEEL CLASS 5.8									
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	9.00	14.00	21.00	39.00	61.00	88.00	140.00
Ductility factor	k_γ	-	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	19.00	37.00	65.00	166.00	324.00	561.00	1124.00
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]	15.00	23.00	34.00	63.00	98.00	141.00	224.00
Ductility factor	k_γ	-	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	30.00	60.00	105.00	266.00	519.00	898.00	1799.00
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]	13.00	20.00	29.00	55.00	86.00	124.00	196.00
Ductility factor	k_γ	-	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	26.00	52.00	92.00	233.00	454.00	786.00	1574.00
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]	8.00	10.00	12.00	16.00	20.00	24.00	30.00
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

Size	Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Codes
			Box	Outer	Pallet	Box	Outer	Pallet	
Ø32	R-KER-II-300 ¹⁾	300	10	10	840	5.2	5.2	466.8	5906675293738
	R-KER-II-345 ¹⁾	345	10	10	840	7.6	7.6	668.4	5906675395203
	R-KER-II-400 ¹⁾	400	10	10	560	8.2	8.2	489.2	5906675392103
Ø40	R-KER-II-300-S ¹⁾	300							
Ø32	R-KER-II-345-S ¹⁾	345							
	R-KER-II-400-S ¹⁾	400							

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