R-KER with Threaded Rods

High performance vinylester resin approved for use in cracked and non-cracked concrete







Approvals and Reports

- ETA-10/0055

Product information

Features and benefits

- Approved for use with threaded rods for use in cracked and non-cracked concrete (EAD 330499-00-0601)
- 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

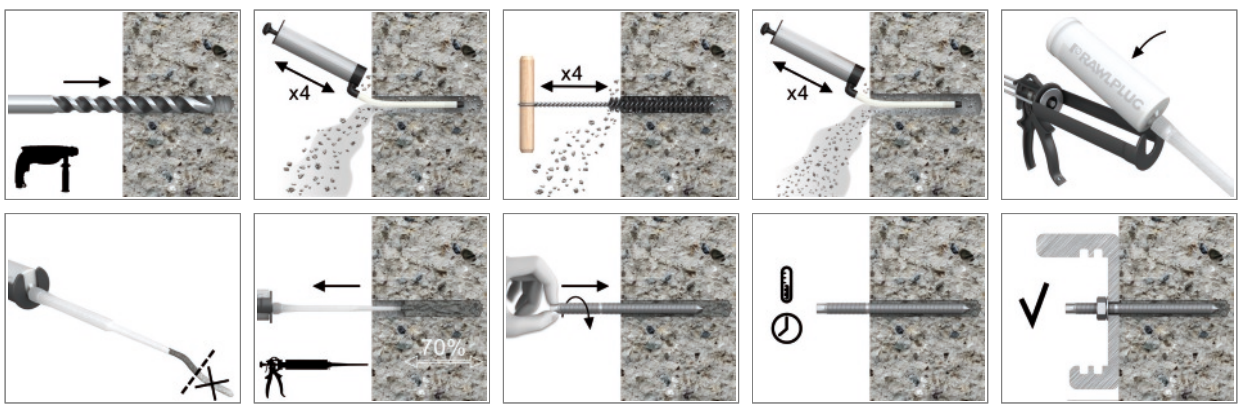
- Curtain walling
- Balustrading
- Handrails
- Canopies
- Large panel reinforcing system - Copy Eco
- Cable conduits and trays
- Fencing & gates manufacturing and installation
- Pipework/ductwork supports
- Platforms
- Pipelines systems
- Passenger lifts

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 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 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-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-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:		Max. thickness t_{fix} for:	
				d	L	d_f	$h_{nom,\ 6d}$	$h_{nom,\ 12d}$	$h_{nom,min}$	$h_{nom,\ max}$
				[mm]	[mm]	[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	50
M10	R-STUDS-10130	R-STUDS-10130-88	R-STUDS-10130-A4	10	130	12	-	-	48	-
	R-STUDS-10170	-	R-STUDS-10170-A4	10	170	12	-	-	88	38
	R-STUDS-10190	-	R-STUDS-10190-A4	10	190	12	-	-	108	58
M12	R-STUDS-12160	R-STUDS-12160-88	R-STUDS-12160-A4	12	160	14	-	-	65	-
	R-STUDS-12190	-	R-STUDS-12190-A4	12	190	14	-	-	95	30
	R-STUDS-12220	-	R-STUDS-12220-A4	12	220	14	-	-	125	60
	R-STUDS-12260	-	R-STUDS-12260-A4	12	260	14	-	-	165	100
	R-STUDS-12300	-	R-STUDS-12300-A4	12	300	14	-	-	205	140
M16	R-STUDS-16190	R-STUDS-16190-88	R-STUDS-16190-A4	16	190	18	-	-	71	-
	R-STUDS-16220	R-STUDS-16220-88	R-STUDS-16220-A4	16	220	18	-	-	101	11
	R-STUDS-16260	-	R-STUDS-16260-A4	16	260	18	-	-	141	51
	R-STUDS-16300	-	R-STUDS-16300-A4	16	300	18	-	-	181	91
	R-STUDS-16380	-	R-STUDS-16380-A4	16	380	18	-	-	261	171
M20	R-STUDS-20260	R-STUDS-20260-88	R-STUDS-20260-A4	20	260	22	-	-	117	-
	R-STUDS-20300	-	R-STUDS-20300-A4	20	300	22	-	-	157	37
	R-STUDS-20350	-	R-STUDS-20350-A4	20	350	22	-	-	207	87
M24	R-STUDS-24300	R-STUDS-24300-88	R-STUDS-24300-A4	24	300	26	-	-	132	-
M30	R-STUDS-30380	R-STUDS-30380-88	R-STUDS-30380-A4	30	380	32	226	-	180	-

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} + 30 ≥ 100	h_{nom} + $2d_0$	h_{nom} + $2d_0$	h_{nom} + $2d_0$
Installation torque	T_{inst}	[Nm]	10	20	40	80	120	180	300
Min. spacing	s_{min}	[mm]	0.5 * h_{nom} ≥ 40	0.5 * h_{nom} ≥ 40	0.5 * h_{nom} ≥ 40	0.5 * h_{nom} ≥ 40	0.5 * h_{nom} ≥ 40	0.5 * h_{nom} ≥ 40	0.5 * h_{nom} ≥ 40
Min. edge distance	c_{min}	[mm]	0.5 * h_{nom} ≥ 40	0.5 * h_{nom} ≥ 40	0.5 * h_{nom} ≥ 40	0.5 * h_{nom} ≥ 40	0.5 * h_{nom} ≥ 40	0.5 * h_{nom} ≥ 40	0.5 * h_{nom} ≥ 40
MINIMUM EMBEDMENT DEPTH									
Min. installation depth	$h_{nom,min}$	[mm]	60	70	80	100	120	140	165
MAXIMUM EMBEDMENT DEPTH									
Min. installation depth	$h_{nom, max}$	[mm]	100	120	145	190	240	290	360

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	6 h	60
5	0	3 h	40
5	5	2 h	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
25	45	-	-
25	50	-	-

**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	24 h	100
5	-15	16 h	60
5	-10	8 h	30
5	-5	4 h	16
5	0	2 h	12
5	5	1 h	8
10	10	45	5
15	15	30	3
20	20	10	2
25	25	-	-
25	30	-	-
25	40	-	-
25	45	-	-
25	50	-	-

**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	24 h	65
5	0	16 h	50
5	5	12 h	35
10	10	8 h	20
15	15	6 h	12
20	20	4 h	9
25	25	3 h	7
25	30	2 h	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			M8	M10	M12	M16	M20	M24	M30
R-STUDS Metric Threaded Rods - Steel Class 5.8									
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm²]	500	500	500	500	500	500	500
Nominal yield strength - tension	f_{yk}	[N/mm²]	400	400	400	400	400	400	400
Cross sectional area - tension	A_s	[mm²]	37	58	84	157	245	353	560
Elastic section modulus	W_{el}	[mm³]	31	62	109	278	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

Mechanical properties

Size			M8	M10	M12	M16	M20	M24	M30
R-STUDS Metric Threaded Rods - Steel Class 8.8									
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm²]	800	800	800	800	800	800	800
Nominal yield strength - tension	f_{yk}	[N/mm²]	640	640	640	640	640	640	640
Cross sectional area - tension	A_s	[mm²]	37	58	84	157	245	353	560
Elastic section modulus	W_{el}	[mm³]	31	62	109	278	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/mm²]	700	700	700	700	700	700	700
Nominal yield strength - tension	f_{yk}	[N/mm²]	450	450	450	450	450	450	450
Cross sectional area - tension	A_s	[mm²]	37	58	84	157	245	353	560
Elastic section modulus	W_{el}	[mm³]	31	62	109	278	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 - ETAG 001

Size		M8	M10	M12	M16	M20	M24	M30	M12	M16	M20	M24
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]	18.9	37.4	44.1	67.5	88.7	111.8	140.0	32.2	34.2	46.6	65.1
Maximum embedment depth	[kN]	18.9	43.1	44.1	81.9	128.1	184.8	294.0	44.1	64.9	93.2	134.9
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8												
Minimum embedment depth	[kN]	25.6	37.4	48.3	67.5	88.7	111.8	140.0	32.2	34.2	46.6	65.1
Maximum embedment depth	[kN]	30.5	48.3	70.4	132.3	203.6	251.5	305.4	58.4	64.9	93.2	134.9
R-STUDS METRIC THREADED RODS - A4												
Minimum embedment depth	[kN]	25.6	37.4	48.3	67.5	88.7	111.8	140.0	32.2	34.2	46.6	65.1
Maximum embedment depth	[kN]	27.3	43.1	62.0	115.5	179.6	251.5	305.4	58.4	64.9	93.2	134.9
SHEAR LOAD $V_{Ru,m}$												
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8												
Minimum embedment depth	[kN]	11.3	25.8	26.5	49.1	76.9	110.9	176.4	26.5	49.1	76.9	110.9
Maximum embedment depth	[kN]	11.3	25.8	26.5	49.1	76.9	110.9	176.4	26.5	49.1	76.9	110.9
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8												
Minimum embedment depth	[kN]	18.3	29.0	42.2	79.4	123.5	177.7	279.9	42.2	68.4	93.2	130.3
Maximum embedment depth	[kN]	18.3	29.0	42.2	79.4	123.5	177.7	282.9	42.2	79.4	123.5	177.7
R-STUDS METRIC THREADED RODS - A4												
Minimum embedment depth	[kN]	16.4	25.8	37.2	69.3	107.7	155.6	247.6	37.2	68.4	93.2	130.3
Maximum embedment depth	[kN]	16.4	25.8	37.2	69.3	107.7	155.6	247.6	37.2	69.3	107.7	155.6

Basic performance data

Size		M8	M10	M12	M16	M20	M24	M30	M12	M16	M20	M24
CHARACTERISTIC LOAD												
TENSION LOAD N_{Rk}												
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8												
Minimum embedment depth	[kN]	18.0	28.6	36.1	50.5	66.4	83.7	107.0	19.6	22.6	30.2	42.2
Maximum embedment depth	[kN]	18.0	41.0	42.0	78.0	122.0	176.0	237.5	35.5	43.0	60.3	87.5
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8												
Minimum embedment depth	[kN]	19.6	28.6	36.1	50.5	66.4	83.7	107.0	19.6	22.6	30.2	42.2
Maximum embedment depth	[kN]	29.0	46.0	67.0	105.1	143.3	196.8	237.5	35.5	43.0	60.3	87.5
R-STUDS METRIC THREADED RODS - A4												
Minimum embedment depth	[kN]	19.6	28.6	36.1	50.5	66.4	83.7	107.0	19.6	22.6	30.2	42.2
Maximum embedment depth	[kN]	26.0	41.0	59.0	105.1	143.3	196.8	237.5	35.5	43.0	60.3	87.5
SHEAR LOAD V_{Rk}												
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8												
Minimum embedment depth	[kN]	9.00	20.0	21.0	39.0	61.0	88.0	140.0	21.0	39.0	60.3	84.5
Maximum embedment depth	[kN]	9.00	20.0	21.0	39.0	61.0	88.0	140.0	21.0	39.0	61.0	88.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8												
Minimum embedment depth	[kN]	15.0	23.0	34.0	63.0	98.0	141.0	214.1	34.0	45.2	60.3	84.5
Maximum embedment depth	[kN]	15.0	23.0	34.0	63.0	98.0	141.0	224.0	34.0	63.0	98.0	141.0
R-STUDS METRIC THREADED RODS - A4												
Minimum embedment depth	[kN]	13.0	20.0	29.0	55.0	86.0	124.0	196.0	29.0	45.2	60.3	84.5
Maximum embedment depth	[kN]	13.0	20.0	29.0	55.0	86.0	124.0	196.0	29.0	55.0	86.0	124.0
DESIGN LOAD												
TENSION LOAD N_{Rd}												
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8												
Minimum embedment depth	[kN]	10.9	15.9	20.1	28.1	36.9	39.8	51.0	10.9	12.6	16.8	20.1
Maximum embedment depth	[kN]	12.0	21.9	28.0	52.0	79.6	93.7	113.1	19.7	23.9	33.5	41.7
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8												
Minimum embedment depth	[kN]	10.9	15.9	20.1	28.1	36.9	39.8	51.0	10.9	12.6	16.8	20.1
Maximum embedment depth	[kN]	18.2	27.2	39.5	58.4	79.6	93.7	113.1	19.7	23.9	33.5	41.7
R-STUDS METRIC THREADED RODS - A4												
Minimum embedment depth	[kN]	10.9	15.9	20.1	28.1	36.9	39.8	51.0	10.9	12.6	16.8	20.1
Maximum embedment depth	[kN]	13.9	21.9	31.6	58.4	79.6	93.7	113.1	19.7	23.9	33.5	41.7
SHEAR LOAD V_{Rd}												
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8												
Minimum embedment depth	[kN]	7.20	12.8	16.8	31.2	48.8	70.4	112.0	16.8	30.2	40.2	56.3
Maximum embedment depth	[kN]	7.20	12.8	16.8	31.2	48.8	70.4	112.0	16.8	31.2	48.8	70.4
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8												
Minimum embedment depth	[kN]	12.0	18.4	27.2	50.4	78.4	111.5	142.7	26.1	30.2	40.2	56.3
Maximum embedment depth	[kN]	12.0	18.4	27.2	50.4	78.4	112.8	179.2	27.2	50.4	78.4	112.8
R-STUDS METRIC THREADED RODS - A4												
Minimum embedment depth	[kN]	8.33	12.8	18.6	35.3	55.1	79.5	125.6	18.6	30.2	40.2	56.3
Maximum embedment depth	[kN]	8.33	12.8	18.6	35.3	55.1	79.5	125.6	18.6	35.3	55.1	79.5

Basic performance data

Size		M8	M10	M12	M16	M20	M24	M30	M12	M16	M20	M24
RECOMMENDED LOAD												
TENSION LOAD N_{rec}												
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8												
Minimum embedment depth	[kN]	7.78	11.3	14.3	20.0	26.3	28.5	36.4	7.78	8.98	12.0	14.4
Maximum embedment depth	[kN]	8.57	15.7	20.0	37.1	56.9	66.9	80.8	14.1	17.1	23.9	29.8
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8												
Minimum embedment depth	[kN]	7.78	11.3	14.3	20.0	26.3	28.5	36.4	7.78	8.98	12.0	14.4
Maximum embedment depth	[kN]	13.0	19.5	28.2	41.7	56.9	66.9	80.8	14.1	17.1	23.9	29.8
R-STUDS METRIC THREADED RODS - A4												
Minimum embedment depth	[kN]	7.78	11.3	14.3	20.0	26.3	28.5	36.4	7.78	8.98	12.0	14.4
Maximum embedment depth	[kN]	9.93	15.7	22.5	41.7	56.9	66.9	80.8	14.1	17.1	23.9	29.8
SHEAR LOAD V_{rec}												
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8												
Minimum embedment depth	[kN]	5.14	9.16	12.0	22.3	34.9	50.3	80.0	12.0	21.5	28.7	40.2
Maximum embedment depth	[kN]	5.14	9.16	12.0	22.3	34.9	50.3	80.0	12.0	22.3	34.9	50.3
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8												
Minimum embedment depth	[kN]	8.57	13.1	19.4	36.0	56.0	79.7	101.9	18.7	21.5	28.7	40.2
Maximum embedment depth	[kN]	8.57	13.1	19.4	36.0	56.0	80.6	128.0	19.4	36.0	56.0	80.6
R-STUDS METRIC THREADED RODS - A4												
Minimum embedment depth	[kN]	5.95	9.16	13.3	25.2	39.4	56.8	89.7	13.3	21.5	28.7	40.2
Maximum embedment depth	[kN]	5.95	9.16	13.3	25.2	39.4	56.8	89.7	13.3	25.2	39.4	56.8

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	392.00
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]	13.00	13.00	13.00	11.00	9.50	9.00	7.00
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; NON-CRACKED CONCRETE, C20/25 (80°C/50°C)									
Characteristic bond resistance	T_{Rk}	[N/mm²]	10.00	11.00	10.00	9.00	7.50	7.00	5.50
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; CRACKED CONCRETE, C20/25 (40°C/24°C)									
Characteristic bond resistance	T_{Rk}	[N/mm²]	-	-	6.50	4.50	4.00	4.00	-
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; CRACKED CONCRETE, C20/25 (80°C/50°C)									
Characteristic bond resistance	T_{Rk}	[N/mm²]	-	-	5.50	4.00	3.00	3.00	-
COMBINED PULL-OUT AND CONCRETE CONE FAILURE									
Installation safety factor	γ_2	-	1.20	1.20	1.20	1.20	1.20	1.40	1.40
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
CONCRETE CONE FAILURE									
Installation safety factor	γ_2	-	1.20	1.20	1.20	1.20	1.20	1.40	1.40
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	-	1.20	1.20	1.20	1.20	1.20	1.40	1.40

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_7	-	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_7	-	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_7	-	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 - $N^0_{Rk,p}=\pi*d*h_{ef}*\tau_{Rk}$).
Concrete cone failure (TR 029, p.5.2.2.4. acc. to formula 5.3a - $N^0_{Rk,c}=k_1*f_{ck,cube}{}^{0,5}*h_{ef}{}^{1,5}$).
$h_{ef} = h_{nom}$

Product commercial data

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

1) ETA-10/0055