

# R-KEM II with Threaded Rods for Concrete

Universal polyester (styrene free) resin - European Approval for 15 substrates



## Approvals and Reports

• ETA-12/0394



## Product information

### Features and benefits

- The most convenient bonded anchor for general purpose use
- Quick, secure and simple installation
- Product with wide spectrum of use in the medium load capacity area
- Ideal for applications where mechanical anchors are not suitable
- Easy dosage thanks to patented self-opening system and use of manual or pneumatic gun
- Option of use standard manual silicone gun
- Suitable for multiple use. Partly used product can be reused after fitting new nozzle

### Applications

- Consoles
- Staircases
- Gates
- High racking
- Canopies
- Sanitary appliances
- Steel constructions
- Railings
- Handrails
- Ladders
- Cable trays

### Base materials

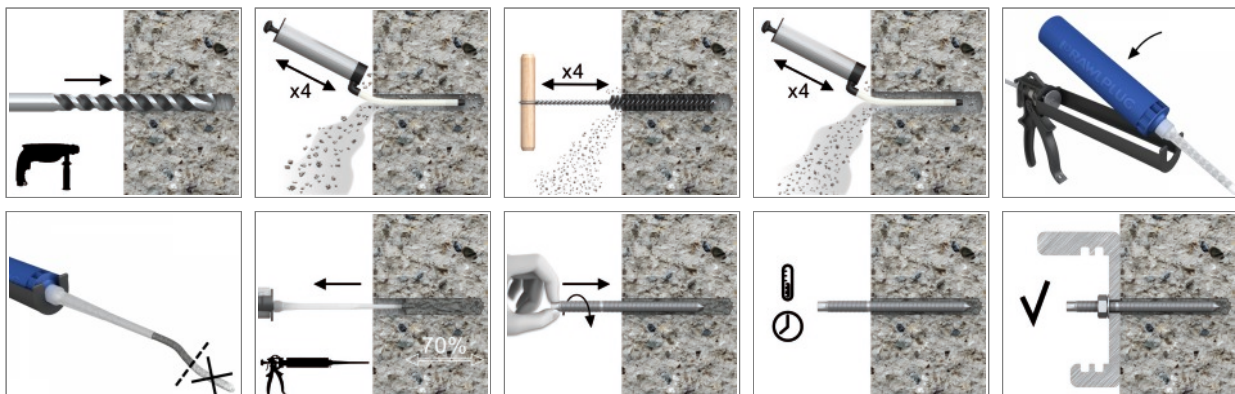
#### Approved for use in:

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

#### Also suitable for use in:

- Natural Stone (after site testing)

## Installation guide



## Product information

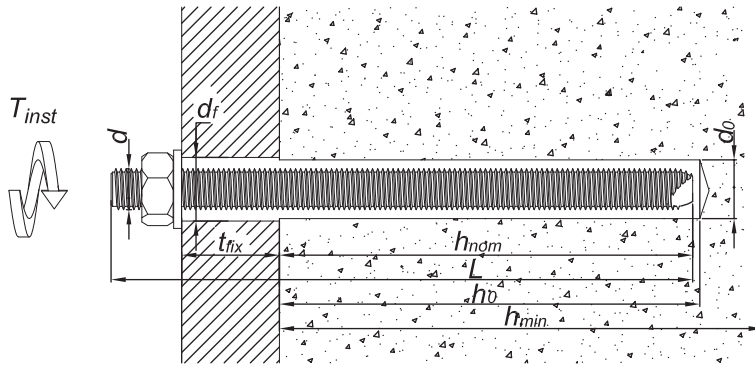
1. Drill hole to the required diameter and depth for stud size being used.
2. Solid substrates: clean the drill hole thoroughly with brush and hand pump at least four times before installation.
3. Insert cartridge into gun and attach nozzle.
4. Dispense to waste until even colour is obtained.
5. Insert 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-KEM-II-175	R-KEMII	Styrene Free Polyester Resin	175
R-KEM-II-300			300
R-KEM-II-380			380
R-KEM-II-410			410
R-KEM-II-175-W	R-KEMII-W	Low Temperature (Winter) / Rapid Cure Styrene Free Polyester Resin	175
R-KEM-II-300-W			300
R-KEM-II-175-S	R-KEMII-S	High Temperature (Summer) / Slow Cure Styrene Free Polyester Resin	175
R-KEM-II-300-S			300
R-KEM-II-175-SET	R-KEMII	Set with 4 studs and plastic sleeves	175
R-KEM-II-300-SET			300
R-KEM-II-300-STONE		Stone colour Styrene Free Polyester Resin	410
R-KEM-II-410-STONE			410
R-KEM-II-300-GREY		Grey colour Styrene Free Polyester Resin	300
R-KEM-II-410-GREY			410

### R-STUDS

Size	Product Code			Anchor		Fixture
	Steel class 5.8	Steel class 8.8	Steel grade A4	Diameter	Length	Hole diameter
				d	L	d <sub>f</sub>
				[mm]	[mm]	[mm]
M8	R-STUDS-08110	R-STUDS-08110-88	R-STUDS-08110-A4	8	110	9
	R-STUDS-08160	-	R-STUDS-08160-A4	8	160	9
M10	R-STUDS-10130	R-STUDS-10130-88	R-STUDS-10130-A4	10	130	12
	R-STUDS-10170	-	R-STUDS-10170-A4	10	170	12
	R-STUDS-10190	-	R-STUDS-10190-A4	10	190	12
M12	R-STUDS-12160	R-STUDS-12160-88	R-STUDS-12160-A4	12	160	14
	R-STUDS-12190	-	R-STUDS-12190-A4	12	190	14
	R-STUDS-12220	-	R-STUDS-12220-A4	12	220	14
	R-STUDS-12260	-	R-STUDS-12260-A4	12	260	14
	R-STUDS-12300	-	R-STUDS-12300-A4	12	300	14
M16	R-STUDS-16190	R-STUDS-16190-88	R-STUDS-16190-A4	16	190	18
	R-STUDS-16220	-	R-STUDS-16220-A4	16	220	18
	R-STUDS-16260	-	R-STUDS-16260-A4	16	260	18
	R-STUDS-16300	-	R-STUDS-16300-A4	16	300	18
	R-STUDS-16380	-	R-STUDS-16380-A4	16	380	18
M20	R-STUDS-20260	R-STUDS-20260-88	R-STUDS-20260-A4	20	260	22
	R-STUDS-20300	-	R-STUDS-20300-A4	20	300	22
	R-STUDS-20350	-	R-STUDS-20350-A4	20	350	22
M24	R-STUDS-24300	R-STUDS-24300-88	R-STUDS-24300-A4	24	300	26
M30	R-STUDS-30380	R-STUDS-30380-88	R-STUDS-30380-A4	30	380	32

### 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 <sub>0</sub>	[mm]	10	12	14	18	24	28	35
Hole diameter in fixture	d <sub>f</sub>	[mm]	9	12	14	18	22	26	32
Min. hole depth in substrate	h <sub>0</sub>	[mm]	h <sub>nom</sub> + 5	h <sub>nom</sub> + 5	h <sub>nom</sub> + 5	h <sub>nom</sub> + 5	h <sub>nom</sub> + 5	h <sub>nom</sub> + 5	h <sub>nom</sub> + 5
Min. substrate thickness	h <sub>min</sub>	[mm]	h <sub>nom</sub> + 2d <sub>0</sub>	h <sub>nom</sub> + 2d <sub>0</sub>	h <sub>nom</sub> + 2d <sub>0</sub>	h <sub>nom</sub> + 2d <sub>0</sub>	h <sub>nom</sub> + 2d <sub>0</sub>	h <sub>nom</sub> + 2d <sub>0</sub>	h <sub>nom</sub> + 2d <sub>0</sub>
Installation torque	T <sub>inst</sub>	[Nm]	10	20	40	80	120	180	300
Min. spacing	s <sub>min</sub>	[mm]	0.5 * h <sub>nom</sub> ≥ 40	0.5 * h <sub>nom</sub> ≥ 40	0.5 * h <sub>nom</sub> ≥ 40	0.5 * h <sub>nom</sub> ≥ 40	0.5 * h <sub>nom</sub> ≥ 40	0.5 * h <sub>nom</sub> ≥ 40	0.5 * h <sub>nom</sub> ≥ 40
Min. edge distance	c <sub>min</sub>	[mm]	0.5 * h <sub>nom</sub> ≥ 40	0.5 * h <sub>nom</sub> ≥ 40	0.5 * h <sub>nom</sub> ≥ 40	0.5 * h <sub>nom</sub> ≥ 40	0.5 * h <sub>nom</sub> ≥ 40	0.5 * h <sub>nom</sub> ≥ 40	0.5 * h <sub>nom</sub> ≥ 40
<b>MINIMUM EMBEDMENT DEPTH</b>									
Installation depth	h <sub>nom, min</sub>	[mm]	60	70	80	100	120	140	165
<b>MAXIMUM EMBEDMENT DEPTH</b>									
Installation depth	h <sub>nom, max</sub>	[mm]	100	120	145	190	240	290	360

### Minimum working and curing time

R-KEM II

Resin temperature	Concrete temperature	Curing time*	Working time
[°C]	[°C]	[min]	[min]
5	-20	-	-
5	-15	-	-
5	-10	-	-
5	-5	8 h	70
5	0	4 h	45
5	5	2 h	25
10	10	1.5 h	15
15	15	1 h	9
20	20	45	5
25	30	30	2
25	35	-	-
25	40	-	-

\*For wet concrete the curing time must be doubled

## Installation data

R-KEMII-W

Resin temperature	Concrete temperature	Curing time*	Working time
[°C]	[°C]	[min]	[min]
5	-20	24 h	45
5	-15	18 h	30
5	-10	8 h	20
5	-5	5 h	11
5	0	2 h	7
5	5	1 h	5
10	10	45	2
15	15	30	1.5
20	20	15	1
25	30	-	-
25	35	-	-
25	40	-	-

\*For wet concrete the curing time must be doubled

R-KEMII-S

Resin temperature	Concrete temperature	Curing time*	Working time
[°C]	[°C]	[min]	[min]
5	-20	-	-
5	-15	-	-
5	-10	-	-
5	-5	24 h	180
5	0	18 h	120
5	5	12 h	60
10	10	8 h	45
15	15	6 h	25
20	20	4 h	15
25	30	1.5 h	7
25	35	1 h	6
25	40	45	5

\*For wet concrete the curing time must be doubled

## Mechanical properties

Size			M8	M10	M12	M16	M20	M24	M30
<b>R-STUDS Metric Threaded Rods - Steel Class 5.8</b>									
Nominal ultimate tensile strength - tension	$f_{uk}$	[N/mm <sup>2</sup> ]	500	500	500	500	500	500	500
Nominal yield strength - tension	$f_{yk}$	[N/mm <sup>2</sup> ]	400	400	400	400	400	400	400
Cross sectional area - tension	$A_s$	[mm <sup>2</sup> ]	36.6	58	84.3	157	245	352.8	559.8
Elastic section modulus	$W_{el}$	[mm <sup>3</sup> ]	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
<b>R-STUDS Metric Threaded Rods - Steel Class 8.8</b>									
Nominal ultimate tensile strength - tension	$f_{uk}$	[N/mm <sup>2</sup> ]	800	800	800	800	800	800	800
Nominal yield strength - tension	$f_{yk}$	[N/mm <sup>2</sup> ]	640	640	640	640	640	640	640
Cross sectional area - tension	$A_s$	[mm <sup>2</sup> ]	36.6	58	84.3	157	245	352.8	559.8
Elastic section modulus	$W_{el}$	[mm <sup>3</sup> ]	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

## Mechanical properties

Size			M8	M10	M12	M16	M20	M24	M30
<b>R-STUDS Metric Threaded Rods - A4</b>									
Nominal ultimate tensile strength - tension	$f_{uk}$	[N/mm <sup>2</sup> ]	700	700	700	700	700	700	700
Nominal yield strength - tension	$f_{yk}$	[N/mm <sup>2</sup> ]	350	350	350	350	350	350	350
Cross sectional area - tension	$A_s$	[mm <sup>2</sup> ]	36.6	58	84.3	157	245	352.8	559.8
Elastic section modulus	$W_{el}$	[mm <sup>3</sup> ]	31.2	62.3	109.2	277.5	541	935	1868
Characteristic bending resistance	$M_{Rk,s}^0$	[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
Substrate		Non-cracked concrete						
<b>MEAN ULTIMATE LOAD</b>								
<b>TENSION LOAD <math>N_{Ru,m}</math></b>								
<b>R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8</b>								
Minimum embedment depth	[kN]	18.9	30.5	40.7	63.4	88.7	111.8	143.1
Maximum embedment depth	[kN]	18.9	30.5	44.1	81.9	128.1	184.8	294.0
<b>R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8</b>								
Minimum embedment depth	[kN]	21.1	30.8	40.7	65.4	88.7	111.8	143.1
Maximum embedment depth	[kN]	30.5	48.3	70.4	124.2	196.0	251.5	339.3
<b>R-STUDS METRIC THREADED RODS - A4</b>								
Minimum embedment depth	[kN]	21.1	30.8	40.7	65.4	88.7	111.8	143.1
Maximum embedment depth	[kN]	27.3	43.1	62.0	115.5	179.6	251.5	339.3
<b>SHEAR LOAD <math>V_{Ru,m}</math></b>								
<b>R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8</b>								
Minimum embedment depth	[kN]	11.3	18.3	26.5	49.1	76.9	110.9	176.4
Maximum embedment depth	[kN]	11.3	18.3	26.5	49.1	76.9	110.9	176.4
<b>R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8</b>								
Minimum embedment depth	[kN]	18.3	29.0	42.2	79.4	123.5	177.7	282.9
Maximum embedment depth	[kN]	18.3	29.0	42.2	79.4	123.5	177.7	282.9
<b>R-STUDS METRIC THREADED RODS - A4</b>								
Minimum embedment depth	[kN]	16.4	25.8	37.2	69.3	107.7	155.6	247.6
Maximum embedment depth	[kN]	16.4	25.8	37.2	69.3	107.7	155.6	247.6

### Basic performance data

Size		M8	M10	M12	M16	M20	M24	M30
<b>CHARACTERISTIC LOAD</b>								
TENSION LOAD $N_{Rk}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8								
Minimum embedment depth	[kN]	14.3	20.9	27.1	40.2	60.3	68.6	85.5
Maximum embedment depth	[kN]	18.0	29.0	42.0	76.4	120.6	142.1	186.6
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8								
Minimum embedment depth	[kN]	14.3	20.9	27.1	40.2	60.3	68.6	85.5
Maximum embedment depth	[kN]	23.9	35.8	49.2	76.4	120.6	142.1	186.6
R-STUDS METRIC THREADED RODS - A4								
Minimum embedment depth	[kN]	14.3	20.9	27.1	40.2	60.3	68.6	85.5
Maximum embedment depth	[kN]	23.9	35.8	49.2	76.4	120.6	142.1	186.6
SHEAR LOAD $V_{Rk}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8								
Minimum embedment depth	[kN]	9.00	14.0	21.0	39.0	61.0	88.0	140.0
Maximum embedment depth	[kN]	9.00	14.0	21.0	39.0	61.0	88.0	140.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8								
Minimum embedment depth	[kN]	15.0	23.0	34.0	63.0	98.0	137.2	171.1
Maximum embedment depth	[kN]	15.0	23.0	34.0	63.0	98.0	141.0	224.0
R-STUDS METRIC THREADED RODS - A4								
Minimum embedment depth	[kN]	13.0	20.0	29.0	55.0	86.0	124.0	171.1
Maximum embedment depth	[kN]	13.0	20.0	29.0	55.0	86.0	124.0	196.0
<b>DESIGN LOAD</b>								
TENSION LOAD $N_{Rd}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8								
Minimum embedment depth	[kN]	6.82	11.6	15.1	22.3	33.5	38.1	47.5
Maximum embedment depth	[kN]	11.4	19.3	27.3	42.5	67.0	79.0	103.7
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8								
Minimum embedment depth	[kN]	6.82	11.6	15.1	22.3	33.5	38.1	47.5
Maximum embedment depth	[kN]	11.4	19.9	27.3	42.5	67.0	79.0	103.7
R-STUDS METRIC THREADED RODS - A4								
Minimum embedment depth	[kN]	6.82	11.6	15.1	22.3	33.5	38.1	47.5
Maximum embedment depth	[kN]	11.4	19.9	27.3	42.5	67.0	79.0	103.7
SHEAR LOAD $V_{Rd}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8								
Minimum embedment depth	[kN]	7.20	11.2	16.8	31.2	48.8	70.4	112.0
Maximum embedment depth	[kN]	7.20	11.2	16.8	31.2	48.8	70.4	112.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8								
Minimum embedment depth	[kN]	12.0	18.4	27.2	50.4	78.4	91.5	114.0
Maximum embedment depth	[kN]	12.0	18.4	27.2	50.4	78.4	112.8	179.2
R-STUDS METRIC THREADED RODS - A4								
Minimum embedment depth	[kN]	8.33	12.8	18.6	35.3	55.1	79.5	114.0
Maximum embedment depth	[kN]	8.33	12.8	18.6	35.3	55.1	79.5	125.6

### Basic performance data

Size		M8	M10	M12	M16	M20	M24	M30
<b>RECOMMENDED LOAD</b>								
TENSION LOAD $N_{rec}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8								
Minimum embedment depth	[kN]	4.87	8.29	10.8	16.0	23.9	27.2	33.9
Maximum embedment depth	[kN]	8.12	13.8	19.5	30.3	47.9	56.4	74.1
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8								
Minimum embedment depth	[kN]	4.87	8.29	10.8	16.0	23.9	27.2	33.9
Maximum embedment depth	[kN]	8.12	14.2	19.5	30.3	47.9	56.4	74.1
R-STUDS METRIC THREADED RODS - A4								
Minimum embedment depth	[kN]	4.87	8.29	10.8	16.0	23.9	27.2	33.9
Maximum embedment depth	[kN]	8.12	14.2	19.5	30.3	47.9	56.4	74.1
SHEAR LOAD $V_{rec}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8								
Minimum embedment depth	[kN]	5.14	8.00	12.0	22.3	34.9	50.3	80.0
Maximum embedment depth	[kN]	5.14	8.00	12.0	22.3	34.9	50.3	80.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8								
Minimum embedment depth	[kN]	8.57	13.1	19.4	36.0	56.0	65.4	81.5
Maximum embedment depth	[kN]	8.57	13.1	19.4	36.0	56.0	80.6	128.0
R-STUDS METRIC THREADED RODS - A4								
Minimum embedment depth	[kN]	5.95	9.16	13.3	25.2	39.4	56.8	81.5
Maximum embedment depth	[kN]	5.95	9.16	13.3	25.2	39.4	56.8	89.7

### Design performance data

R-STUDS

Size			M8	M10	M12	M16	M20	M24	M30
<b>TENSION LOAD</b>									
<b>STEEL FAILURE; STEEL CLASS 5.8</b>									
Characteristic resistance	$N_{Rk,s}$	[kN]	18.00	29.00	42.00	78.00	122.00	176.00	280.00
Partial safety factor	$\gamma_{Ms}$	-	1.50	1.50	1.50	1.50	1.50	1.50	1.50
<b>STEEL FAILURE; STEEL CLASS 8.8</b>									
Characteristic resistance	$N_{Rk,s}$	[kN]	29.00	46.00	67.00	126.00	196.00	282.00	448.00
Partial safety factor	$\gamma_{Ms}$	-	1.50	1.50	1.50	1.50	1.50	1.50	1.50
<b>STEEL FAILURE; STEEL GRADE A4-70</b>									
Characteristic resistance	$N_{Rk,s}$	[kN]	26.00	41.00	59.00	110.00	171.00	247.00	392.00
Partial safety factor	$\gamma_{Ms}$	-	1.87	1.87	1.87	1.87	1.87	1.87	1.87
<b>COMBINED PULL-OUT AND CONCRETE CONE FAILURE; NON-CRACKED CONCRETE, C20/25 (40°C/24°C)</b>									
Characteristic bond resistance	$T_{Rk}$	[N/mm <sup>2</sup> ]	9.50	9.50	9.00	8.00	8.00	6.50	5.50
<b>COMBINED PULL-OUT AND CONCRETE CONE FAILURE; NON-CRACKED CONCRETE, C20/25 (80°C/50°C)</b>									
Characteristic bond resistance	$T_{Rk}$	[N/mm <sup>2</sup> ]	8.00	8.00	7.50	7.00	6.50	5.00	4.50
<b>COMBINED PULL-OUT AND CONCRETE CONE FAILURE</b>									
Installation safety factor	$\gamma_2$	-	1.40	1.20	1.20	1.20	1.20	1.20	1.20
Increasing factors for $N_{Rd,p}$ - C30/37	$\psi_c$	-	1.04	1.04	1.04	1.04	1.00	1.00	1.00
Increasing factors for $N_{Rd,p}$ - C40/50	$\psi_c$	-	1.07	1.07	1.07	1.07	1.00	1.00	1.00
Increasing factors for $N_{Rd,p}$ - C50/60	$\psi_c$	-	1.09	1.09	1.09	1.09	1.00	1.00	1.00
<b>CONCRETE CONE FAILURE</b>									
Installation safety factor	$\gamma_2$	-	1.40	1.20	1.20	1.20	1.20	1.20	1.20
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 <sub>ef</sub>	1.5*h <sub>ef</sub>	1.5*h <sub>ef</sub>	1.5*h <sub>ef</sub>	1.5*h <sub>ef</sub>	1.5*h <sub>ef</sub>	1.5*h <sub>ef</sub>
Spacing	$s_{cr,N}$	[mm]	3.0*h <sub>ef</sub>	3.0*h <sub>ef</sub>	3.0*h <sub>ef</sub>	3.0*h <sub>ef</sub>	3.0*h <sub>ef</sub>	3.0*h <sub>ef</sub>	3.0*h <sub>ef</sub>
<b>CONCRETE SPLITTING FAILURE</b>									
Installation safety factor	$\gamma_2$	-	1.40	1.20	1.20	1.20	1.20	1.20	1.20

## Design performance data

Size			M8	M10	M12	M16	M20	M24	M30
<b>SHEAR LOAD</b>									
<b>STEEL FAILURE; STEEL CLASS 5.8</b>									
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	$k_{\gamma}$	-	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	$\gamma_{Ms}$	-	1.25	1.25	1.25	1.25	1.25	1.25	1.25
<b>STEEL FAILURE; STEEL CLASS 8.8</b>									
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	$k_{\gamma}$	-	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	$\gamma_{Ms}$	-	1.25	1.25	1.25	1.25	1.25	1.25	1.25
<b>STEEL FAILURE; STEEL GRADE A4-70</b>									
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	$k_{\gamma}$	-	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	$\gamma_{Ms}$	-	1.56	1.56	1.56	1.56	1.56	1.56	1.56
<b>CONCRETE PRY-OUT FAILURE</b>									
Factor	k	-	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Installation safety factor	$\gamma_2$	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00
<b>CONCRETE EDGE FAILURE</b>									
Anchor diameter	$d_{nom}$	[mm]	8.00	10.00	12.00	16.00	20.00	24.00	30.00
Effective length of anchor	$\ell_f$	[mm]	min ( $h_{ef} \cdot 8d_{nom}$ )	min ( $h_{ef} \cdot 8d_{nom}$ )	min ( $h_{ef} \cdot 8d_{nom}$ )	min ( $h_{ef} \cdot 8d_{nom}$ )	min ( $h_{ef} \cdot 8d_{nom}$ )	min ( $h_{ef} \cdot 8d_{nom}$ )	min ( $h_{ef} \cdot 8d_{nom}$ )
Installation safety factor	$\gamma_2$	-	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 [m <sup>3</sup> ]	Quantity [pcs]			Weight [kg]			Bar Codes
			Box	Outer	Pallet	Box	Outer	Pallet	
M30	R-KEM-II-175 <sup>1)</sup>	175	10	50	600	3.8	18.9	257.2	5906675050249
	R-KEM-II-300 <sup>1)</sup>	300	10	10	840	5.9	5.9	529.0	5906675050256
	R-KEM-II-380 <sup>1)</sup>	380	10	10	560	8.2	8.2	486.3	5906675097770
	R-KEM-II-410 <sup>1)</sup>	410	10	10	560	8.4	8.4	498.7	5906675408163
	R-KEM-II-175-W <sup>1)</sup>	175	10	50	600	3.8	19.2	260.6	5906675064659
	R-KEM-II-300-W <sup>1)</sup>	300	10	10	840	5.9	5.9	527.2	5906675064666
	R-KEM-II-175-S <sup>1)</sup>	175	10	50	600	6.0	30.0	390.0	5906675064635
	R-KEM-II-300-S <sup>1)</sup>	300	10	50	600	6.0	30.0	390.0	5906675064642
	R-KEM-II-175-SET <sup>1)</sup>	175	5	5	525	3.0	3.0	348.3	5906675057866
	R-KEM-II-300-SET <sup>1)</sup>	300	5	5	320	4.9	4.9	345.9	5906675057859
	R-KEM-II-300-STONE <sup>1)</sup>	300	10	50	600	6.0	30.0	390.0	5906675038124
	R-KEM-II-410-STONE <sup>1)</sup>	410	10	10	560	8.4	8.4	498.7	5906675424958
	R-KEM-II-300-GREY <sup>1)</sup>	300	10	50	600	6.0	30.0	390.0	5906675038131
	R-KEM-II-410-GREY <sup>1)</sup>	410	10	10	560	8.4	8.4	498.7	5906675424941

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