

R-KER with Rebar as an Anchor

High performance vinylester resin approved for use with reinforcement bars



Approvals and Reports

- ETA-13/0805



Product information

Features and benefits

- Approved for use with rebar as an anchor for use in non-cracked concrete
- 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 expansion forces in the concrete which means reduced spacing and edge distances.
- Suitable for multiple use. Partly used product can be reused after fitting new nozzle

Applications

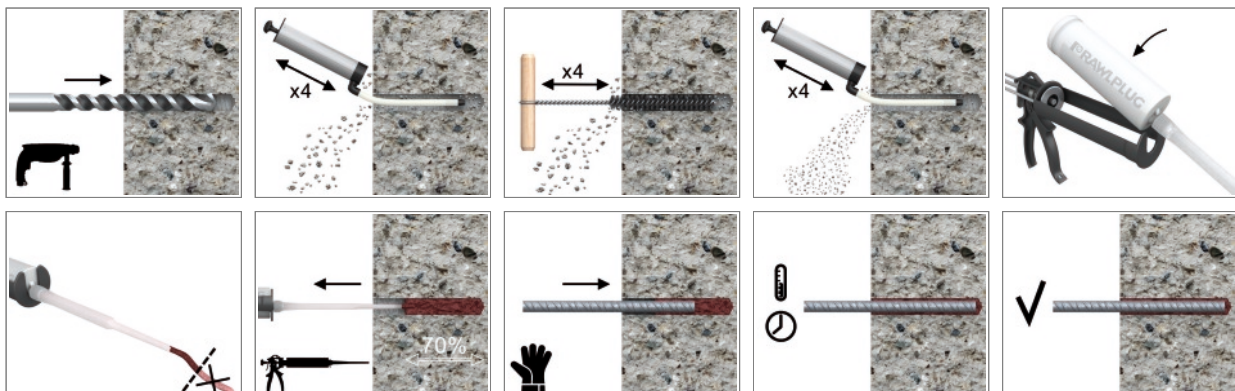
- Curtain walling
- Balustrading
- Barriers
- Cable trays
- Cladding restraints
- Structural steelwork
- Rebar dowelling
- Starter bars
- Rebar missed-outs

Base materials

Approved for use in:

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

Installation guide

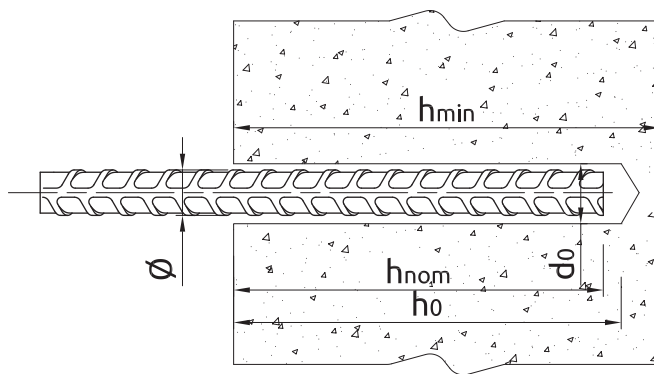


Product information

1. Drill hole to the required diameter and depth for rebar size being used.
2. 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 rebar, 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.

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-KER-300	R-KER	Styrene Free Vinylester Resin	300
R-KER-345			345
R-KER-380			380
R-KER-400			400
R-KER-300-W	R-KER-W	Low Temperature (Winter) / Rapid Cure Styrene Free Vinylester Resin	300
R-KER-380-W			380
R-KER-400-W			400
R-KER-380-S	R-KER-S	High Temperature (Summer) / Slow Cure Styrene Free Vinylester Resin	380
R-KER-400-S			400

Installation data



REBARS AS ANCHORS

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
Rebar diameter	d_s	[mm]	8	10	12	14	16	20	25	32
Hole diameter in substrate	d_0	[mm]	12	14	18	18	22	26	32	40
Min. hole depth in substrate	h_0	[mm]	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$
Min. substrate thickness	h_{min}	[mm]	$h_{nom} + 30$ ≥ 100	$h_{nom} + 30$ ≥ 100	$h_{nom} + 2d_0$	$h_{nom} + 2d_0$	$h_{nom} + 2d_0$	$h_{nom} + 2d_0$	$h_{nom} + 2d_0$	$h_{nom} + 2d_0$
Min. spacing	s_{min}	[mm]	$0.5 * h_{nom} \geq 40$	$0.5 * h_{nom} \geq 40$	$0.5 * h_{nom} \geq 40$	$0.5 * h_{nom} \geq 40$	$0.5 * h_{nom} \geq 40$	$0.5 * h_{nom} \geq 40$	$0.5 * h_{nom} \geq 40$	$0.5 * h_{nom} \geq 40$
Min. edge distance	c_{min}	[mm]	$0.5 * h_{nom} \geq 40$	$0.5 * h_{nom} \geq 40$	$0.5 * h_{nom} \geq 40$	$0.5 * h_{nom} \geq 40$	$0.5 * h_{nom} \geq 40$	$0.5 * h_{nom} \geq 40$	$0.5 * h_{nom} \geq 40$	$0.5 * h_{nom} \geq 40$
MINIMUM EMBEDMENT DEPTH										
Min. installation depth	$h_{nom, min}$	[mm]	60	70	80	80	100	120	140	165
MAXIMUM EMBEDMENT DEPTH										
Min. installation depth	$h_{nom, max}$	[mm]	100	120	145	145	190	240	290	360

Installation data

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	240	60
5	0	180	40
5	5	120	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

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

R-KER-W

Resin temperature	Concrete temperature	Curing time*	Working time
[°C]	[°C]	[min]	[min]
5	-20	1440	100
5	-15	960	60
5	-10	480	30
5	-5	240	16
5	0	120	12
5	5	60	8
10	10	45	5
15	15	30	3
20	20	10	2

**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	1440	65
5	0	960	50
5	5	720	35
10	10	480	20
15	15	360	12
20	20	240	9
25	25	180	7
25	30	120	6
25	40	45	4
25	45	35	3
25	50	25	2

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

Mechanical properties

REBARS AS ANCHORS

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
f_{uk} = 540 (e.g. 500 B acc. to BS 4449; B 500 B acc. to SS 560)										
Nominal ultimate tensile strength - tension	f _{uk}	[N/mm ²]	540	540	540	540	540	540	540	540
Nominal yield strength - tension	f _{yk}	[N/mm ²]	500	500	500	500	500	500	500	500
Cross sectional area - tension	A _s	[mm ²]	50	79	113	154	201	314	491	804
Elastic section modulus	W _{el}	[mm ³]	50	98	170	269	402	785	1534	3217
f_{uk} = 575 (e.g. B 500 SP acc. to EC2)										
Nominal ultimate tensile strength - tension	f _{uk}	[N/mm ²]	575	575	575	575	575	575	575	575
Nominal yield strength - tension	f _{yk}	[N/mm ²]	500	500	500	500	500	500	500	500
Cross sectional area - tension	A _s	[mm ²]	50	79	113	154	201	314	491	804
Elastic section modulus	W _{el}	[mm ³]	50	98	170	269	402	785	1534	3217
f_{uk} = 620 (e.g. G-60 acc. to ASTM 615)										
Nominal ultimate tensile strength - tension	f _{uk}	[N/mm ²]	620	620	620	620	620	620	620	620
Nominal yield strength - tension	f _{yk}	[N/mm ²]	420	420	420	420	420	420	420	420
Cross sectional area - tension	A _s	[mm ²]	50	79	113	154	201	314	491	804
Elastic section modulus	W _{el}	[mm ³]	50	98	170	269	402	785	1534	3217

Basic performance data

REBARS AS ANCHORS

Size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
Substrate		Non-cracked concrete							
MEAN ULTIMATE LOAD									
TENSION LOAD N _{Ru,m}									
f _{uk} = 540 (e.g. 500 B acc. to BS 4449; B 500 B acc. to SS 560)									
Minimum embedment depth	[kN]	26.8	37.3	48.3	48.3	67.5	88.7	111.8	143.1
Maximum embedment depth	[kN]	28.5	44.5	64.1	87.3	114.0	178.1	246.7	348.2
f _{uk} = 575 (e.g. B 500 SP acc. to EC2)									
Minimum embedment depth	[kN]	26.8	37.3	48.3	48.3	67.5	88.7	111.8	143.1
Maximum embedment depth	[kN]	30.4	47.4	68.3	92.9	121.4	189.7	246.7	348.2
f _{uk} = 620 (e.g. G-60 acc. to ASTM 615)									
Minimum embedment depth	[kN]	26.8	37.3	48.3	48.3	67.5	88.7	111.8	143.1
Maximum embedment depth	[kN]	32.7	51.1	73.6	100.2	130.9	190.6	246.7	348.2
SHEAR LOAD V _{Ru,m}									
f _{uk} = 540 (e.g. 500 B acc. to BS 4449; B 500 B acc. to SS 560)									
Minimum embedment depth	[kN]	17.1	26.7	38.5	52.4	68.4	106.9	167.0	273.6
Maximum embedment depth	[kN]	17.1	26.7	38.5	52.4	68.4	106.9	167.0	273.6
f _{uk} = 575 (e.g. B 500 SP acc. to EC2)									
Minimum embedment depth	[kN]	18.2	28.5	41.0	55.8	72.8	113.8	177.8	276.1
Maximum embedment depth	[kN]	18.2	28.5	41.0	55.8	72.8	113.8	177.8	291.3
f _{uk} = 620 (e.g. G-60 acc. to ASTM 615)									
Minimum embedment depth	[kN]	19.6	30.7	44.2	60.1	78.5	122.7	191.7	286.1
Maximum embedment depth	[kN]	19.6	30.7	44.2	60.1	78.5	122.7	191.7	314.1

Basic performance data

Size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
CHARACTERISTIC LOAD									
TENSION LOAD N_{Rk}									
$f_{uk} = 540$ (e.g. 500 B acc. to BS 4449; B 500 B acc. to SS 560)									
Minimum embedment depth	[kN]	16.6	22.0	30.2	31.7	45.3	56.6	77.0	107.0
Maximum embedment depth	[kN]	27.1	37.7	54.7	57.4	86.0	113.1	159.4	235.2
$f_{uk} = 575$ (e.g. B 500 SP acc. to EC2)									
Minimum embedment depth	[kN]	16.6	22.0	30.2	31.7	45.2	56.6	77.0	107.0
Maximum embedment depth	[kN]	27.7	37.7	54.7	57.4	86.0	113.1	159.4	235.2
$f_{uk} = 620$ (e.g. G-60 acc. to ASTM 615)									
Minimum embedment depth	[kN]	16.6	22.0	30.2	31.7	45.2	56.6	77.0	107.0
Maximum embedment depth	[kN]	27.7	37.7	54.7	57.4	86.0	113.1	159.4	235.2
SHEAR LOAD V_{Rk}									
$f_{uk} = 540$ (e.g. 500 B acc. to BS 4449; B 500 B acc. to SS 560)									
Minimum embedment depth	[kN]	13.6	21.2	30.5	41.6	54.3	84.8	132.5	214.1
Maximum embedment depth	[kN]	13.6	21.2	30.5	41.6	54.3	84.8	132.5	217.2
$f_{uk} = 575$ (e.g. B 500 SP acc. to EC2)									
Minimum embedment depth	[kN]	14.5	22.6	32.5	44.3	57.8	90.3	141.1	214.1
Maximum embedment depth	[kN]	14.5	22.6	32.5	44.3	57.8	90.3	141.1	231.2
$f_{uk} = 620$ (e.g. G-60 acc. to ASTM 615)									
Minimum embedment depth	[kN]	15.6	24.4	35.1	47.7	62.3	97.4	152.2	214.1
Maximum embedment depth	[kN]	15.6	24.4	35.1	47.7	62.3	97.4	152.2	249.3
DESIGN LOAD									
TENSION LOAD N_{Rd}									
$f_{uk} = 540$ (e.g. 500 B acc. to BS 4449; B 500 B acc. to SS 560)									
Minimum embedment depth	[kN]	9.22	12.2	16.8	17.6	25.1	31.4	42.8	59.5
Maximum embedment depth	[kN]	15.4	20.9	30.4	31.9	47.8	62.8	88.6	130.7
$f_{uk} = 575$ (e.g. B 500 SP acc. to EC2)									
Minimum embedment depth	[kN]	9.22	12.2	16.8	17.6	25.1	31.4	42.8	59.5
Maximum embedment depth	[kN]	15.4	20.9	30.4	31.9	47.8	62.8	88.6	130.7
$f_{uk} = 620$ (e.g. G-60 acc. to ASTM 615)									
Minimum embedment depth	[kN]	9.22	12.2	16.8	17.6	25.1	31.4	42.8	59.5
Maximum embedment depth	[kN]	15.4	20.9	30.4	31.9	47.8	62.8	88.6	130.7
SHEAR LOAD V_{Rd}									
$f_{uk} = 540$ (e.g. 500 B acc. to BS 4449; B 500 B acc. to SS 560)									
Minimum embedment depth	[kN]	9.05	14.1	20.4	27.7	36.2	56.6	88.4	142.7
Maximum embedment depth	[kN]	9.05	14.1	20.4	27.7	36.2	56.6	88.4	144.8
$f_{uk} = 575$ (e.g. B 500 SP acc. to EC2)									
Minimum embedment depth	[kN]	9.63	15.1	21.7	29.5	38.5	60.2	94.1	142.7
Maximum embedment depth	[kN]	9.63	15.1	21.7	29.5	38.5	60.2	94.1	154.2
$f_{uk} = 620$ (e.g. G-60 acc. to ASTM 615)									
Minimum embedment depth	[kN]	10.4	16.2	23.4	31.8	41.6	64.9	101.5	142.7
Maximum embedment depth	[kN]	10.4	16.2	23.4	31.8	41.6	64.9	101.5	166.2

Basic performance data

Size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
RECOMMENDED LOAD									
TENSION LOAD N_{rec}									
$f_{uk} = 540$ (e.g. 500 B acc. to BS 4449; B 500 B acc. to SS 560)									
Minimum embedment depth	[kN]	6.58	8.73	12.0	12.6	18.0	22.4	30.5	42.3
Maximum embedment depth	[kN]	11.0	15.0	21.7	22.8	34.1	44.9	63.3	93.4
$f_{uk} = 575$ (e.g. B 500 SP acc. to EC2)									
Minimum embedment depth	[kN]	6.58	8.73	12.0	12.6	18.0	22.4	30.5	42.5
Maximum embedment depth	[kN]	11.0	15.0	21.7	22.8	34.1	44.9	63.3	93.4
$f_{uk} = 620$ (e.g. G-60 acc. to ASTM 615)									
Minimum embedment depth	[kN]	6.58	8.73	12.0	12.6	18.0	22.4	30.5	42.5
Maximum embedment depth	[kN]	11.0	15.0	21.7	22.8	34.1	44.9	63.3	93.6
SHEAR LOAD V_{rec}									
$f_{uk} = 540$ (e.g. 500 B acc. to BS 4449; B 500 B acc. to SS 560)									
Minimum embedment depth	[kN]	6.46	10.1	14.5	19.8	25.9	40.4	63.1	101.9
Maximum embedment depth	[kN]	6.46	10.1	14.5	19.8	25.9	40.4	63.1	103.4
$f_{uk} = 575$ (e.g. B 500 SP acc. to EC2)									
Minimum embedment depth	[kN]	6.88	10.8	15.5	21.1	27.5	43.0	67.2	101.9
Maximum embedment depth	[kN]	6.88	10.8	15.5	21.1	27.5	43.0	67.2	110.1
$f_{uk} = 620$ (e.g. G-60 acc. to ASTM 615)									
Minimum embedment depth	[kN]	7.42	11.6	16.7	22.7	29.7	46.4	72.5	101.9
Maximum embedment depth	[kN]	7.42	11.6	16.7	22.7	29.7	46.4	72.5	118.7

Design performance data

REBARS AS ANCHORS

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
TENSION LOAD										
STEEL FAILURE; F _{UK} = 540 (E.G. 500 B ACC. TO BS 4449; B 500 B ACC. TO SS 560)										
Characteristic resistance	N _{Rk,s}	[kN]	27.14	42.41	61.07	83.13	108.57	169.65	265.07	434.29
Partial safety factor	γ _{Ms}	-	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
STEEL FAILURE; F _{UK} = 575 (E.G. B 500 SP ACC. TO EC2)										
Characteristic resistance	N _{Rk,s}	[kN]	28.90	45.16	65.03	88.51	115.61	180.64	282.25	462.44
Partial safety factor	γ _{Ms}	-	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
STEEL FAILURE; F _{UK} = 620 (E.G. G-60 ACC. TO ASTM 615)										
Characteristic resistance	N _{Rk,s}	[kN]	31.16	48.69	70.12	95.44	124.66	194.78	304.34	498.63
Partial safety factor	γ _{Ms}	-	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
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	10.00	10.00	9.00	9.00	7.50	7.00	6.50
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; NON-CRACKED CONCRETE, C20/25 (80°C/50°C)										
Characteristic bond resistance	T _{Rk}	[N/mm ²]	9.00	8.00	8.00	7.00	7.00	6.00	6.00	5.00
COMBINED PULL-OUT AND CONCRETE CONE FAILURE										
Installation safety factor	γ ₂	-	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Increasing factors for N _{Rd,p} - C30/37	ψ _c	-	1.04	1.04	1.04	1.04	1.04	1.00	1.00	1.00
Increasing factors for N _{Rd,p} - C40/50	ψ _c	-	1.07	1.07	1.07	1.07	1.07	1.00	1.00	1.00
Increasing factors for N _{Rd,p} - C50/60	ψ _c	-	1.09	1.09	1.09	1.09	1.09	1.00	1.00	1.00
CONCRETE CONE FAILURE										
Installation safety factor	γ ₂	-	1.20	1.20	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	10.10
Factor for non-cracked concrete	k _{ucr,N}	-	11.00	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}	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}	3.0*h _{ef}
CONCRETE SPLITTING FAILURE										
Installation safety factor	γ ₂	-	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20

Design performance data

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
SHEAR LOAD										
STEEL FAILURE; F _{UK} = 540 (E.G. 500 B ACC. TO BS 4449; B 500 B ACC. TO SS 560)										
Characteristic resistance without lever arm	V _{Rk,s}	[kN]	13.57	21.21	30.54	41.56	54.29	84.82	132.54	217.15
Ductility factor	k _γ	-	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Characteristic resistance with lever arm	M _{Rk,s}	[Nm]	32.57	63.62	109.93	174.57	260.58	508.94	994.02	2084.61
Partial safety factor	γ _{Ms}	-	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
STEEL FAILURE; F _{UK} = 575 (E.G. B 500 SP ACC. TO EC2)										
Characteristic resistance without lever arm	V _{Rk,s}	[kN]	14.45	22.59	32.52	44.26	57.81	90.32	141.13	231.22
Ductility factor	k _γ	-	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Characteristic resistance with lever arm	M _{Rk,s}	[Nm]	34.68	67.74	117.06	185.88	277.47	541.92	1058.45	2219.72
Partial safety factor	γ _{Ms}	-	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
STEEL FAILURE; F _{UK} = 620 (E.G. G-60 ACC. TO ASTM 615)										
Characteristic resistance without lever arm	V _{Rk,s}	[kN]	15.58	24.35	35.06	47.72	62.33	97.39	152.17	249.32
Ductility factor	k _γ	-	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Characteristic resistance with lever arm	M _{Rk,s}	[Nm]	37.40	73.04	126.22	200.43	299.18	584.34	1141.28	2393.44
Partial safety factor	γ _{Ms}	-	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
CONCRETE PRY-OUT FAILURE										
Factor	k	-	2.00	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	1.00
CONCRETE EDGE FAILURE										
Anchor diameter	d _{nom}	[mm]	8.00	10.00	12.00	14.00	16.00	20.00	25.00	32.00
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})	min (h _{ef} ; 8d _{nom})
Installation safety factor	γ ₂	-	1.00	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-KER-300 ¹⁾	300	10	10	840	6.3	6.3	559.2	5906675075167
R-KER-345 ¹⁾	345	10	10	840	7.1	7.1	623.3	5906675291086
R-KER-380 ¹⁾	380	10	10	560	8.2	8.2	486.6	5906675222707
R-KER-400 ¹⁾	400	10	10	560	8.1	8.1	483.8	5906675329444
R-KER-300-W ¹⁾	300	10	10	840	6.3	6.3	559.2	5906675432021
R-KER-380-W ¹⁾	380	10	10	560	8.2	8.2	486.6	5906675222981
R-KER-400-W ¹⁾	400	10	10	560	8.2	8.2	489.2	5906675380445
R-KER-380-S ¹⁾	380	10	10	560	6.5	6.5	391.2	5906675099088
R-KER-400-S ¹⁾	400	10	10	560	8.2	8.2	489.2	5906675380452

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