

Bonded Anchors in Cartridges

R-KEX II

- with Threaded Rods
- with Sockets
- with Rebar as an Anchor
- with Post-Installed Rebar

R-KEX

- Pure Epoxy Resin

R-KER:

- with Threaded Rods
- with Sockets
- with Rebar as an Anchor
- with Post-Installed Rebar

R-KEM II:

- with Threaded Rods for Concrete
- with Threaded Rods for Masonry

R-KF2:

- with Threaded Rods



Patented self-opening clip

Peel-back label with additional info

Applications, benefits and substrates



Effortless extrusion with manual or pneumatic dispenser guns

R-KEX II with Threaded Rods

Premium pure epoxy resin approved for use in cracked and non-cracked concrete



Installation movie



Approvals and Reports

- ETA-13/0455; ETAG 001-05 Option 1



Product overview

Features and benefits

- The strongest resin in the epoxy resin class
- Approved for use with metric rods for use in cracked and non-cracked concrete (ETAG001 Option 1)
- Suitable for use in dry and wet substrates including under water
- Very high chemical resistance – suitable for applications exposed to influence of various agents (industrial or marine environment)
- Minimal shrinkage provides the option to use in diamond drilled holes and over-sized holes.
- Extended bonding time ensures easy installation of metal components (up to 30 min. in 20°)
- For use in positive temperatures

Applications

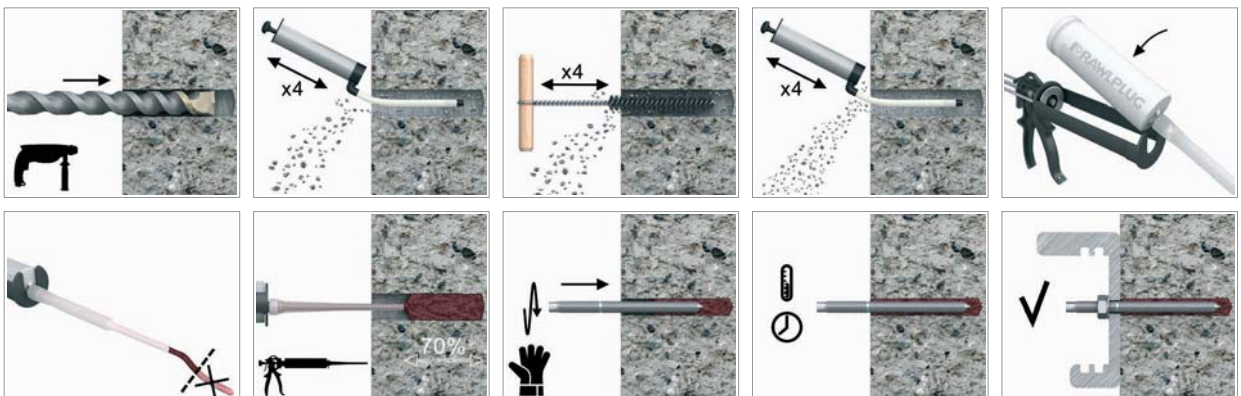
- Safety barriers
- Formworks support systems
- Structural steelwork
- Street lamps
- Curtain walling
- Racking systems
- Balustrading
- Barriers
- Cladding restraints
- Masonry support
- Machinery
- Platforms

Base materials

Approved for use in:

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

Installation guide



Installation guide (cont.)

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.
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.

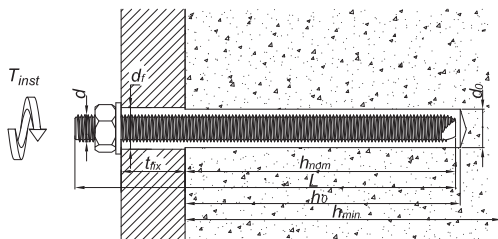
Product information

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-KEX-II-385	R-KEX II	Epoxy Resin	385

R-STUDS

Size	Product Code			Anchor		Fixture			
	Steel class 5.8	Steel class 8.8	Steel grade A4	Diameter	Length	Hole diameter	Max. thickness		
				d	L	d _f	t _{fix} for h _{ef,min}	t _{fix} for h _{ef,std}	t _{fix} for h _{ef,max}
				[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
M8	R-STUDS-08110	R-STUDS-08110-88	R-STUDS-08110-A4	8	110	9	40	20	-
	R-STUDS-08160	-	-	8	160	9	90	70	50
M10	R-STUDS-10130	R-STUDS-10130-88	R-STUDS-10130-A4	10	130	12	48	28	-
	R-STUDS-10170	-	R-STUDS-10170-A4	10	170	12	88	68	38
	R-STUDS-10190	-	-	10	190	12	108	88	58
M12	R-STUDS-12160	R-STUDS-12160-88	R-STUDS-12160-A4	12	160	14	65	35	-
	R-STUDS-12190	-	R-STUDS-12190-A4	12	190	14	95	65	30
	R-STUDS-12220	-	R-STUDS-12220-A4	12	220	14	125	95	60
	R-STUDS-12260	-	-	12	260	14	165	135	100
	R-STUDS-12300	-	-	12	300	14	205	175	140
M16	R-STUDS-16190	R-STUDS-16190-88	R-STUDS-16190-A4	16	190	18	71	46	-
	R-STUDS-16220	R-STUDS-16220-88	-	16	220	18	101	76	11
	R-STUDS-16260	-	R-STUDS-16260-A4	16	260	18	141	116	51
	R-STUDS-16300	-	-	16	300	18	181	156	91
	R-STUDS-16380	-	-	16	380	18	261	236	171
M20	R-STUDS-20260	R-STUDS-20260-88	R-STUDS-20260-A4	20	260	22	117	67	-
	R-STUDS-20300	R-STUDS-20300-88	-	20	300	22	157	107	37
	R-STUDS-20350	-	-	20	350	22	207	157	87
M24	R-STUDS-24300	R-STUDS-24300-88	R-STUDS-24300-A4	24	300	26	132	62	-
M30	R-STUDS-30380	R-STUDS-30380-88	R-STUDS-30380-A4	30	380	32	181	106	-

Installation data



Installation data (cont.)

R-STUDS

Size			M8	M10	M12	M16	M20	M24	M30	
Thread diameter	d	[mm]	8	10	12	16	20	24	30	
Hole diameter in fixture	d _f	[mm]	10	12	14	18	24	28	35	
Installation torque	T _{inst}	[Nm]	10	20	40	80	120	180	300	
Min. hole depth in substrate	h ₀	[mm]	h _{ef} + 5							
MINIMUM EMBEDMENT DEPTH										
Installation depth	h _{nom, min}	[mm]	60	70	80	100	120	140	165	
STANDARD EMBEDMENT DEPTH										
Installation depth	h _{nom, s}	[mm]	80	90	110	125	170	210	240	
MAXIMUM EMBEDMENT DEPTH										
Installation depth	h _{nom, max}	[mm]	100	120	145	190	240	290	360	
Min. substrate thickness	h _{min}	[mm]	h _{ef} + 30 ≥ 100				h _{ef} + 2*d ₀			
Min. spacing	s _{min}	[mm]	0.5 * h _{ef} ≥ 40							
Min. edge distance	c _{min}	[mm]	0.5 * h _{ef} ≥ 40							

Minimum working and curing time

Resin temperature	Concrete temperature	Working time	Curing time*
[°C]	[°C]	[min]	[min]
5	5	150	2880
10	10	120	1080
20	20	35	480
25	30	12	300

* For wet concrete the curing time must be doubled

Mechanical properties

R-STUDS

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	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]	21.6	34.8	50.4	78	102.5	129.1	165	32.6	54.3	73	97.7	
Standard embedment depth	[kN]	21.6	34.8	50.4	93.8	146.7	211.6	289.6	44.8	67.9	115.3	146.5	
Maximum embedment depth	[kN]	21.6	34.8	50.4	93.8	146.7	211.6	336.6	50.4	93.8	146.7	202.3	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8													
Minimum embedment depth	[kN]	34.9	45.7	55.6	78	102.5	129.1	165	32.6	54.3	73	97.7	
Standard embedment depth	[kN]	34.9	55.3	80.5	108.9	172.6	237.1	289.6	44.8	67.9	115.3	146.5	
Maximum embedment depth	[kN]	34.9	55.3	80.5	151.5	235.6	339	532	59	103.2	162.8	202.3	
R-STUDS METRIC THREADED RODS - A4													
Minimum embedment depth	[kN]	31.3	45.7	55.6	78	102.5	129.1	165	32.6	54.3	73	97.7	
Standard embedment depth	[kN]	31.3	49.3	70.9	108.9	172.6	237.1	289.6	44.8	67.9	115.3	146.5	
Maximum embedment depth	[kN]	31.3	49.3	70.9	132.2	205.6	296.9	532	59	103.2	162.8	202.3	
SHEAR LOAD $V_{Ru,m}$													
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	18.3	29	42.2	78.5	122.5	176.5	280.5	42.2	78.5	122.5	176.5	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	29.3	46.4	67.4	125.6	196	282.4	448.8	67.4	125.6	196	282.4	
R-STUDS METRIC THREADED RODS - A4	[kN]	25.6	40.6	59	109.9	171.5	247.1	392.7	59	109.9	171.5	247.1	
CHARACTERISTIC LOAD													
TENSION LOAD N_{Rk}													
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8													
Minimum embedment depth	[kN]	18	29	36.1	50.5	66.4	83.7	107	21.1	35.2	47.3	59.6	
Standard embedment depth	[kN]	18	29	42	70.6	111.9	153.7	187.8	29	44	74.8	95	
Maximum embedment depth	[kN]	18	29	42	78	122	176	280	38.3	66.9	105.6	131.2	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8													
Minimum embedment depth	[kN]	23.5	29.6	36.1	50.5	66.4	83.7	107	21.1	35.2	47.3	59.6	
Standard embedment depth	[kN]	29	43.1	58.3	70.6	111.9	153.7	187.8	29	44	74.8	95	
Maximum embedment depth	[kN]	29	46	67	126	187.8	249.4	344.9	38.3	66.9	105.6	131.2	
R-STUDS METRIC THREADED RODS - A4													
Minimum embedment depth	[kN]	23.5	29.6	36.1	50.5	66.4	83.7	107	21.1	35.2	47.3	59.6	
Standard embedment depth	[kN]	26	41	58.3	70.6	111.9	153.7	187.8	29	44	74.8	95	
Maximum embedment depth	[kN]	26	41	59	110	171	247	344.9	38.3	66.9	105.6	131.2	
SHEAR LOAD V_{Rk}													
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	9	14	21	39	61	88	140	21	39	61	88	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	15	23	34	63	98	141	224	34	63	98	141	
R-STUDS METRIC THREADED RODS - A4	[kN]	13	20	29	55	86	124	196	29	55	86	124	
DESIGN LOAD													
TENSION LOAD N_{Rd}													
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8													
Minimum embedment depth	[kN]	12	19.3	24.1	33.7	44.3	55.8	71.3	14.1	23.5	31.5	39.8	
Standard embedment depth	[kN]	12	19.3	28	47.1	74.6	102.5	125.2	19.4	29.3	49.8	63.3	
Maximum embedment depth	[kN]	12	19.3	28	52	81.3	117.3	186.7	25.5	44.6	70.4	87.5	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8													
Minimum embedment depth	[kN]	15.7	19.7	24.1	33.7	44.3	55.8	71.3	14.1	23.5	31.5	39.8	
Standard embedment depth	[kN]	19.3	28.7	38.9	47.1	74.6	102.5	125.2	19.4	29.3	49.8	63.3	
Maximum embedment depth	[kN]	19.3	30.7	44.7	84	125.2	166.3	229.9	25.5	44.6	70.4	87.5	

Basic performance data (cont.)

R-STUDS

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

Size		M8	M10	M12	M16	M20	M24	M30	M12	M16	M20	M24
R-STUDS METRIC THREADED RODS - A4												
Minimum embedment depth	[kN]	13.9	19.7	24.1	33.7	44.3	55.8	71.3	14.1	23.5	31.5	39.8
Standard embedment depth	[kN]	13.9	21.9	31.6	47.1	74.6	102.5	125.2	19.4	29.3	49.8	63.3
Maximum embedment depth	[kN]	13.9	21.9	31.6	58.8	91.4	132.1	210.2	25.5	44.6	70.4	87.5
SHEAR LOAD V_{Rd}												
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	7.2	11.2	16.8	31.2	48.8	70.4	112	16.8	31.2	48.8	70.4
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	12	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	[kN]	8.33	12.8	18.6	35.3	55.1	79.5	125.6	18.6	35.3	55.1	79.5
RECOMMENDED LOAD												
TENSION LOAD N_{rec}												
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8												
Minimum embedment depth	[kN]	8.57	13.8	17.2	24	31.6	39.9	51	10	16.8	22.5	28.4
Standard embedment depth	[kN]	8.57	13.8	20	33.6	53.3	73.2	89.4	13.8	21	35.6	45.2
Maximum embedment depth	[kN]	8.57	13.8	20	37.1	58.1	83.8	133.3	18.2	31.9	50.3	62.5
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8												
Minimum embedment depth	[kN]	11.2	14.1	17.2	24	31.6	39.9	51	10	16.8	22.5	28.4
Standard embedment depth	[kN]	13.8	20.5	27.8	33.6	53.3	73.2	89.4	13.8	21	35.6	45.2
Maximum embedment depth	[kN]	13.8	21.9	31.9	60	89.4	118.8	164.2	18.2	31.9	50.3	62.5
R-STUDS METRIC THREADED RODS - A4												
Minimum embedment depth	[kN]	9.93	14.1	17.2	24	31.6	39.9	51	10	16.8	22.5	28.4
Standard embedment depth	[kN]	9.93	15.7	22.6	33.6	53.3	73.2	89.4	13.8	21.0	35.6	45.2
Maximum embedment depth	[kN]	9.93	15.7	22.5	42	65.3	94.3	150.1	18.2	31.9	50.3	62.5
SHEAR LOAD V_{rec}												
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	5.14	8	12	22.3	34.9	50.3	80	12	22.3	34.9	50.3
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8.57	13.1	19.4	36	56	80.6	128	19.4	36	56	80.6
R-STUDS METRIC THREADED RODS - A4	[kN]	5.95	9.16	13.3	25.2	39.4	56.8	89.7	13.3	25.2	39.4	56.8

Product commercial data

Product Code	Volume [m]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-KEX-II-385	385	10	40	480	10.0	40.0	510.0	5906675028538	18

R-KEX II with Sockets

Premium pure epoxy resin approved for use with internally threaded sockets

Approvals and Reports

- ETA-13/0454; ETAG 001-05 Option 7



Product overview

Features and benefits

- Allows removal of bolt to leave a re-usable socket in place
- Approved for use with Sockets in non-cracked concrete (ETAG001 Option 7)
- Suitable for use in dry and wet substrates including under water
- Very high chemical resistance – suitable for applications exposed to influence of various agents (industrial or marine environment)
- Minimal shrinkage provides the option to use in diamond drilled holes and over-sized holes
- Extended bonding time ensures easy installation of metal components (up to 30 min. in 20°)
- For use in positive temperatures

Applications

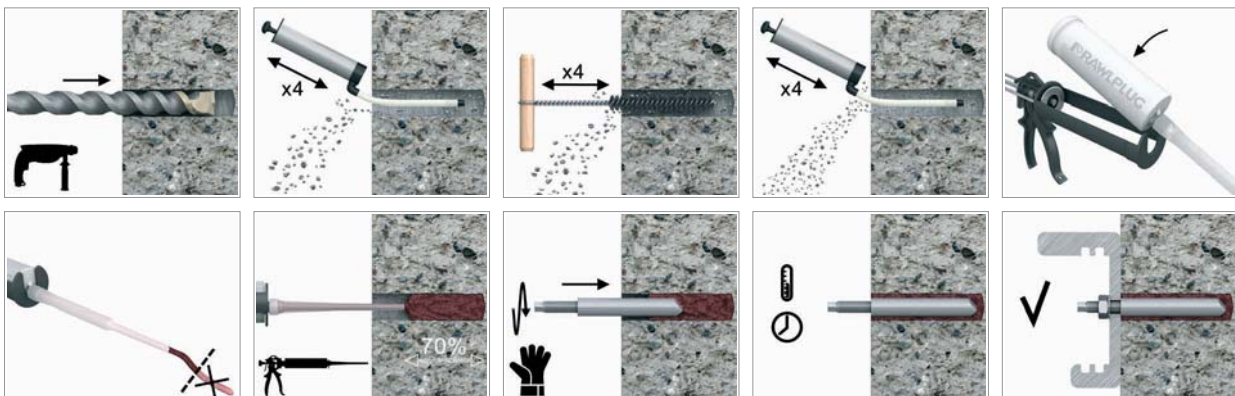
- Safety barriers
- Temporary works/formworks support systems
- Balustrading
- Barriers
- Cladding restraints
- Masonry support
- Machinery
- Platforms
- Steelwork

Base materials

Approved for use in:

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

Installation guide



Installation guide (cont.)

1. Drill hole to the required diameter and depth for socket 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.
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 socket, slowly and with slight twisting motion. Remove any access resin around the hole before it sets and leave it undisturbed until the curing time elapses.
7. Attach fixture and tighten the bolt to the required torque.

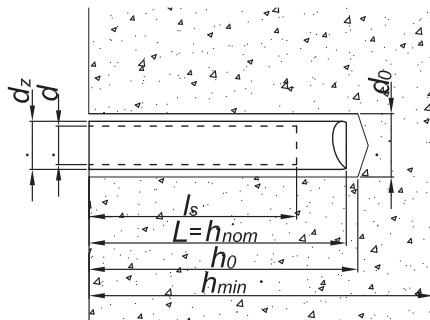
Product information

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-KEX-II-385	R-KEX II	Epoxy Resin	385

SOCKETS

Size	Product Code		Anchor			Fixture
	Steel class 5.8	Steel grade A4	Socket diameter	Length	Internal thread length	Hole diameter
			d	L	l_g	d_f
			[mm]	[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
	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		
Thread diameter	d	[mm]	6	8	8	10	10	12	16
Hole diameter in substrate	d_o	[mm]	12	14	14	20	20	20	28
Hole diameter in fixture	d_f	[mm]	7	9	9	12	12	14	18
Installation torque	T_{inst}	[Nm]	3	5	5	10	10	20	40
Thread engagement length	h_s	[mm]	6-24	8-25	8-25	10-30	10-30	12-35	16-50
Min. hole depth in substrate	h_o	[mm]	$h_{ef} + 5$						
Effective Installation depth	h_{ef}	[mm]	75	75	90	75	100	100	125
Min. substrate thickness	h_{min}	[mm]	105	105	120	115	140	140	181
Min. spacing	s_{min}	[mm]	40	40	45	40	50	50	63
Min. edge distance	c_{min}	[mm]	40	40	45	40	50	50	63

Installation data (cont.)

Minimum working and curing time

Resin temperature	Concrete temperature	Working time	Curing time*
[°C]	[°C]	[min]	[min]
5	5	150	2880
10	10	120	1080
15	15	80	720
20	20	35	480
25	30	12	300

* For wet concrete the curing time must be doubled

Mechanical properties

SOCKETS

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]	20.1	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm ³]	21.2	50.3	98.2	169.7	402.1
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]	20.1	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm ³]	21.2	50.3	98.2	169.7	402.1
R-STUDS METRIC THREADED RODS - steel class 5.8							
Characteristic bending resistance	$M^0_{Rk,s}$	[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
R-STUDS METRIC THREADED RODS - steel class 8.8							
Characteristic bending resistance	$M^0_{Rk,s}$	[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
R-STUDS METRIC THREADED RODS - A4							
Characteristic bending resistance	$M^0_{Rk,s}$	[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

Size		M6	M8	M10	M12	M16
Substrate		Non-cracked concrete				
Embedment depth h_{ef}	[mm]	75	90	75	100	125
MEAN ULTIMATE LOAD						
TENSION LOAD $N_{Ru,m}$						
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	12.5	21.6	21.6	34.8	34.8
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	19.2	34.8	34.8	50.6	55.2
R-STUDS METRIC THREADED RODS - A4	[kN]	16.8	31.2	31.2	49.2	49.2
SHEAR LOAD $V_{Ru,m}$						
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	6.0	10.8	10.8	16.8	16.8
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	9.6	18.0	18.0	27.6	27.6
R-STUDS METRIC THREADED RODS - A4	[kN]	8.4	15.6	15.6	24.0	24.0

Basic performance data (cont.)

SOCKETS

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

Size		M6	M8	M10	M12	M16		
CHARACTERISTIC LOAD								
TENSION LOAD N_{Rk}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	10.0	18.0	18.0	29.0	29.0	42.0	70.6
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	16.0	29.0	29.0	32.8	46.0	50.5	70.6
R-STUDS METRIC THREADED RODS - A4	[kN]	14.0	26.0	26.0	32.8	41.0	50.5	70.6
SHEAR LOAD V_{Rk}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	5.0	9.0	9.0	14.0	14.0	21.0	39.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8.0	15.0	15.0	23.0	23.0	34.0	63.0
R-STUDS METRIC THREADED RODS - A4	[kN]	7.0	13.0	13.0	20.0	20.0	29.0	55.0
DESIGN LOAD								
TENSION LOAD N_{Rd}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	6.67	12.0	12.0	18.2	19.3	28.0	39.2
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	10.5	18.2	19.3	18.2	28.1	28.1	39.2
R-STUDS METRIC THREADED RODS - A4	[kN]	7.49	13.9	13.9	18.2	21.9	28.1	39.2
SHEAR LOAD V_{Rd}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	4.0	7.2	7.2	11.2	11.2	16.8	31.2
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	6.4	12.0	12.0	18.4	18.4	27.2	50.4
R-STUDS METRIC THREADED RODS - A4	[kN]	4.49	8.33	8.33	12.8	12.8	18.6	35.3
RECOMMENDED LOAD								
TENSION LOAD N_{rec}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	4.76	8.57	8.57	13.0	13.8	20.0	28.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	7.50	13.0	13.8	13.0	20.1	20.0	28.0
R-STUDS METRIC THREADED RODS - A4	[kN]	5.35	9.93	9.93	13.0	15.6	20.0	28.0
SHEAR LOAD V_{rec}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	2.86	5.14	5.14	8.0	8.0	12.0	22.3
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	4.57	8.57	8.57	13.1	13.1	19.4	36
R-STUDS METRIC THREADED RODS - A4	[kN]	3.21	5.95	5.95	9.16	9.16	13.3	25.2

Product commercial data

Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-KEX-II-385	385	10	40	480	10.0	40.0	510.0	5906675028538	18

R-KEX II with Rebar as an Anchor

Premium pure epoxy resin approved for use with reinforcement bars



Installation movie



Approvals and Reports

- ETA-13/0454; ETAG 001-05, Option 7



Product overview

Features and benefits

- The strongest resin in the epoxy resin class
- Approved for use with rebar as in anchor in non-cracked concrete (ETAG001 Option 7)
- Suitable for use in dry and wet substrates including under water
- Very high chemical resistance – suitable for applications exposed to influence of various agents (industrial or marine environment)
- Minimal shrinkage provides the option to use in diamond drilled holes and over-sized holes
- Extended bonding time ensures easy installation of metal components (up to 30 min. in 20°)
- For use in positive temperatures

Applications

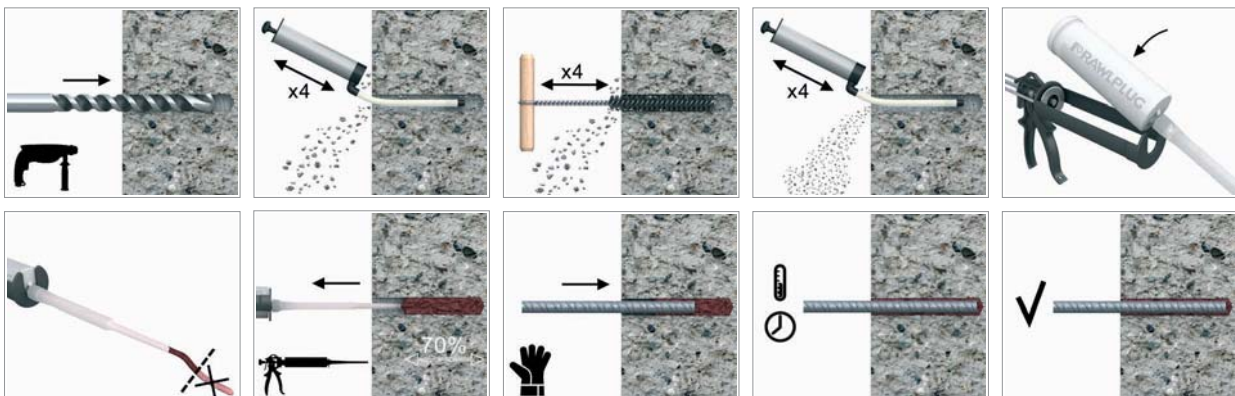
- Safety barriers
- Temporary works/formworks support systems
- Rebar
- Curtain walling
- Formwork supports
- Masonry support
- Platforms
- Steelwork
- Rebar dowelling
- Starter bars
- Rebar missed-outs

Base materials

Approved for use in:

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

Installation guide



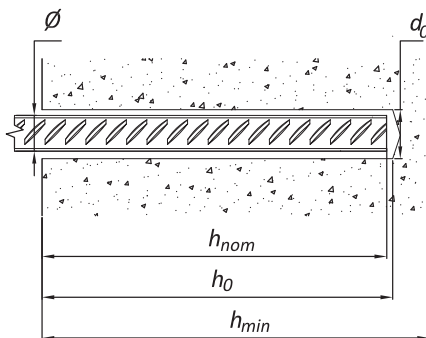
Installation guide (cont.)

1. Drill hole to the required diameter and depth for rebar 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.
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 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 information

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-KEX-II-385	R-KEX II	Epoxy Resin	385

Installation data



REBARS AS ANCHORS

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
Thread diameter	d	[mm]	8	10	12	14	16	20	25	32
Hole diameter in substrate	d ₀	[mm]	12	14	18		22	26	32	40
Min. hole depth in substrate	h ₀	[mm]	h _{ef} + 5							
MINIMUM EMBEDMENT DEPTH										
Installation depth	h _{nom, min}	[mm]	60	70	80		100	120	140	165
STANDARD EMBEDMENT DEPTH										
Installation depth	h _{nom, s}	[mm]	80	90	110		125	170	210	240
MAXIMUM EMBEDMENT DEPTH										
Installation depth	h _{nom, max}	[mm]	100	120	145		190	240	290	360
Min. substrate thickness	h _{min}	[mm]	h _{ef} + 30 ≥ 100			h _{ef} + 2*d ₀				
Min. spacing	s _{min}	[mm]	0.5 * h _{ef} ≥ 40							
Min. edge distance	c _{min}	[mm]	0.5 * h _{ef} ≥ 40							

Minimum working and curing time

Resin temperature	Concrete temperature	Working time	Curing time*
[°C]	[°C]	[min]	[min]
5	5	180	960
10	10	120	600
15	15	60	300
20	20	50	270
25	25	40	240
25	30	20	180

*For wet concrete the curing time must be doubled

Mechanical properties

REBARS AS ANCHORS

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
18G2										
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	480	480	480	480	480	480	480	480
Nominal yield strength - tension	f_{yk}	[N/mm ²]	355	355	355	355	355	355	355	355
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	804.2
Elastic section modulus	W_{el}	[mm ³]	50.3	98.2	169.6	269.4	402.1	785.4	1534	3217
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	29	57	98	155	232	452	884	1853
Design bending resistance	M	[Nm]	19	38	65	103	154	302	589	1235
Allowable bending resistance	M_{rec}	[Nm]	14	27	47	74	110	215	421	882
34GS										
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	500	500	500	500	500	500	500	500
Nominal yield strength - tension	f_{yk}	[N/mm ²]	410	410	410	410	410	410	410	410
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	804.2
Elastic section modulus	W_{el}	[mm ³]	50.3	98.2	169.6	269.4	402.1	785.4	1534	3217
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	30	59	102	162	241	471	920	1930
Design bending resistance	M	[Nm]	20	39	68	108	161	314	614	1287
Allowable bending resistance	M_{rec}	[Nm]	14	28	48	77	115	224	438	919
B500SP										
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]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	804.2
Elastic section modulus	W_{el}	[mm ³]	50.3	98.2	169.6	269.4	402.1	785.4	1534	3217
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	35	68	117	186	277	542	1059	2220
Design bending resistance	M	[Nm]	23	45	78	124	185	361	706	1480
Allowable bending resistance	M_{rec}	[Nm]	17	32	56	89	132	258	504	1057
RB500/BSt500S										
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	550	550	550	550	550	550	550	550
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]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	804.2
Elastic section modulus	W_{el}	[mm ³]	50.3	98.2	169.6	269.4	402.1	785.4	1534	3217
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	33	65	112	178	265	518	1012	2123
Design bending resistance	M	[Nm]	22	43	75	119	177	346	675	1415
Allowable bending resistance	M_{rec}	[Nm]	16	31	53	85	126	247	482	1011

Basic performance data

REBARS AS ANCHORS

Size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32	
Substrate		Non-cracked concrete								
CHARACTERISTIC LOAD										
TENSION LOAD N_{Rk}										
A-II (e.g. 18G2)										
Minimum embedment depth	[kN]	16.6	26.4	36.1	35.2	50.5	66.4	83.7	107	
Standard embedment depth	[kN]	22.1	33.9	49.8	48.4	70.6	111.9	153.7	187.8	
Maximum embedment depth	[kN]	24.1	37.7	54.3	63.8	96.5	150.8	216.4	307.6	
A-III (e.g. 34GS)										
Minimum embedment depth	[kN]	16.6	26.4	36.1	35.2	50.5	66.4	83.7	107	
Standard embedment depth	[kN]	22.1	33.9	49.8	48.4	70.6	111.9	153.7	187.8	
Maximum embedment depth	[kN]	25.1	39.3	56.5	63.8	100.5	157.1	216.4	307.6	
A-III-N (e.g. RB500, BSt500S, B500SP)										
Minimum embedment depth	[kN]	16.6	26.4	36.1	35.2	50.5	66.4	83.7	107	
Standard embedment depth	[kN]	22.1	33.9	49.8	48.4	70.6	111.9	153.7	187.8	
Maximum embedment depth	[kN]	27.6	43.2	62.2	63.8	110.6	172.8	216.4	307.6	

Basic performance data (cont.)

REBARS AS ANCHORS

Size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
SHEAR LOAD V_{Rk}									
A-II (e.g. 18G2)	[kN]	12.1	18.8	27.1	36.9	48.3	75.4	117.8	193
A-III (e.g. 34GS)	[kN]	12.6	19.6	28.3	38.5	50.3	78.5	122.7	201.1
A-III-N (e.g. RB500, BST500S, B500SP)	[kN]	13.8	21.6	31.1	42.3	55.3	86.4	135	221.2
DESIGN LOAD									
TENSION LOAD N_{Rd}									
A-II (e.g. 18G2)									
Minimum embedment depth	[kN]	9.2	14.7	20.1	19.5	28.1	36.9	46.5	59.5
Standard embedment depth	[kN]	12.3	18.8	27.6	26.9	39.2	62.2	85.4	104.3
Maximum embedment depth	[kN]	15.4	25.1	36.2	35.4	63.7	100.5	120.2	170.9
A-III (e.g. 34GS)									
Minimum embedment depth	[kN]	9.2	14.7	20.1	19.5	28.1	36.9	46.5	59.5
Standard embedment depth	[kN]	12.3	18.8	27.6	26.9	39.2	62.2	85.4	104.3
Maximum embedment depth	[kN]	15.4	25.1	36.4	35.4	63.7	100.5	120.2	170.9
A-III-N (e.g. RB500, BST500S, B500SP)									
Minimum embedment depth	[kN]	9.2	14.7	20.1	19.5	28.1	36.9	46.5	59.5
Standard embedment depth	[kN]	12.3	18.8	27.6	26.9	39.2	62.2	85.4	104.3
Maximum embedment depth	[kN]	15.4	25.1	36.4	35.4	63.7	100.5	120.2	170.9
SHEAR LOAD V_{Rd}									
A-II (e.g. 18G2)	[kN]	8	12.6	18.1	24.6	32.2	50.3	78.5	128.7
A-III (e.g. 34GS)	[kN]	8.4	13.1	18.8	25.7	33.5	52.4	81.8	134
A-III-N (e.g. RB500, BST500S, B500SP)	[kN]	9.2	14.4	20.7	28.2	36.9	57.6	90	147.4
RECOMMENDED LOAD									
TENSION LOAD N_{rec}									
A-II (e.g. 18G2)									
Minimum embedment depth	[kN]	6.58	10.5	14.3	14	20	26.3	33.2	42.5
Standard embedment depth	[kN]	8.78	13.5	19.7	19.2	28	44.4	61	74.5
Maximum embedment depth	[kN]	11	17.9	25.9	25.3	45.5	71.8	85.9	122.1
A-III (e.g. 34GS)									
Minimum embedment depth	[kN]	6.58	10.5	14.3	14	20	26.3	33.2	42.5
Standard embedment depth	[kN]	8.78	13.5	19.7	19.2	28	44.4	61	74.5
Maximum embedment depth	[kN]	11	17.9	26	25.3	45.5	71.8	85.9	122.1
A-III-N (e.g. RB500, BST500S, B500SP)									
Minimum embedment depth	[kN]	6.58	10.5	14.3	14	20	26.3	33.2	42.5
Standard embedment depth	[kN]	8.78	13.5	19.7	19.2	28	44.4	61	74.5
Maximum embedment depth	[kN]	11	17.9	26	25.3	45.5	71.8	85.9	122.1
SHEAR LOAD V_{rec}									
A-II (e.g. 18G2)	[kN]	5.7	9	12.9	17.6	23	35.9	56.1	91.9
A-III (e.g. 34GS)	[kN]	5.98	9.35	13.5	18.3	23.9	37.4	58.4	95.7
A-III-N (e.g. RB500, BST500S, B500SP)	[kN]	6.58	10.3	14.8	20.2	26.3	41.1	64.3	105.3

Product commercial data

Product Code	Volume [m ³]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-KEX-II-385	385	10	40	480	10.0	40.0	510.0	5906675028538	18

R-KEX II with Post-Installed Rebar

Premium pure epoxy resin approved for use with post-installed rebar connections



Installation movie

Approvals and Reports

- ETA-13/0585; ETAG 001-05, Option 7



Product overview

Features and benefits

- The strongest resin in the epoxy resin class
- Approved for use with post-installed rebars in non-cracked concrete (ETAG001 Option 7)
- Suitable for use in dry and wet substrates including under water
- High depth of anchoring – 2,5 m for rebar applications
- Very high chemical resistance – suitable for applications exposed to influence of various agents (industrial or marine environment)
- Minimal shrinkage provides the option to use in diamond drilled holes and over-sized holes
- Extended bonding time ensures easy installation of metal components (up to 30 min. in 20°)
- For use in positive temperatures

Applications

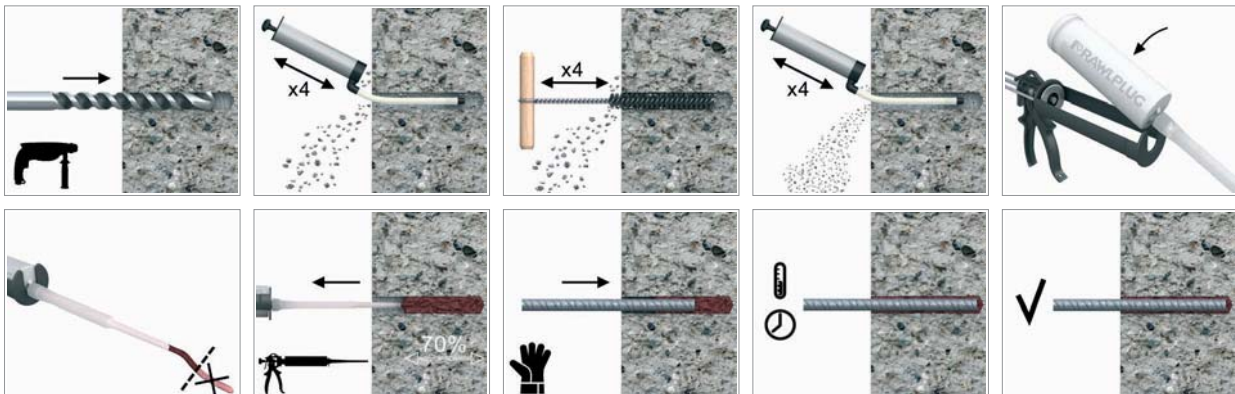
- Post-installed rebar connections
- Rebar
- Temporary works/Formworks support systems
- Safety barriers
- Barriers
- Platforms

Base materials

Approved for use in:

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

Installation guide



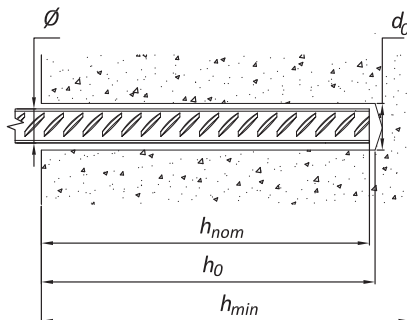
Installation guide (cont.)

1. Drill hole to the required diameter and depth for rebar 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.
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 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 information

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-KEX-II-385	R-KEX II	Epoxy Resin	385

Installation data



POST INSTALLED REBARS

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Rebar diameter	d_s	[mm]	8	10	12	14	16	20	25	28	32
Hole diameter in substrate	d_0	[mm]	12	14	16	18	20	25	30	35	40
Brush diameter	-	[mm]	14	16	18	20	22	27	32	37	42
A-II C20/25 Min. anchorage length	$l_{b,min.}$	[mm]	100	101	121	141	161	201	252	282	322
A-II C50/60 Min. anchorage length	$l_{b,min.}$	[mm]	100	100	120	140	160	200	250	280	320
A-III C20/25 Min. anchorage length	$l_{b,min.}$	[mm]	100	116	140	163	186	233	291	326	372
A-III C50/60 Min. anchorage length	$l_{b,min.}$	[mm]	100	100	120	140	160	200	250	280	320
A-IIIIN C20/25 Min. anchorage length	$l_{b,min.}$	[mm]	113	142	170	198	227	284	354	397	454
A-IIIIN C50/60 Min. anchorage length	$l_{b,min.}$	[mm]	100	100	120	140	160	200	250	280	348
Min. lap length (overlap splice)	$l_{0,min.}$	[mm]	200	200	200	210	240	300	375	420	480
Max. anchorage length	$l_{v,max.}$	[mm]	700	900	1100	1300	1400	1800	2200	2500	2500

Minimum working and curing time

Resin temperature	Concrete temperature	Working time	Curing time*
[°C]	[°C]	[min]	[min]
5	5	150	2880
10	10	120	1080
15	15	80	720
20	20	35	480
25	30	12	300

*For wet concrete the curing time must be doubled

Mechanical properties

POST INSTALLED REBARS

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
18G2											
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	480	480	480	480	480	480	480	480	480
Nominal yield strength - tension	f_{yk}	[N/mm ²]	355	355	355	355	355	355	355	355	355
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	615.8	804.2
34GS											
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	500	500	500	500	500	500	500	500	500
Nominal yield strength - tension	f_{yk}	[N/mm ²]	410	410	410	410	410	410	410	410	410
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	615.8	804.2
B500SP											
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	575	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	500
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	615.8	804.2
RB500/BSt500S											
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	550	550	550	550	550	550	550	550	550
Nominal yield strength - tension	f_{yk}	[N/mm ²]	500	500	500	500	500	500	500	500	500
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	615.8	804.2

Basic performance data

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C20/25, STEEL A-II (18G2) [kN]																												
$\frac{l_{bd}}{d_s}$ [mm]	100	105	125	145	165	185	205	230	255	285	300	325	350	400	450	500	550	600	700	800	850	900	950	1000	1100	Steel failure		
8	5.8	6.1	7.2	8.4	9.5	10.7	11.9	13.3	14.7	15.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.51	
10	-	7.6	9.0	10.5	11.9	13.4	14.8	16.6	18.4	20.6	21.7	23.5	24.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.23
12	-	-	10.8	12.6	14.3	16.0	17.8	19.9	22.1	24.7	26.0	28.2	30.3	34.7	34.9	-	-	-	-	-	-	-	-	-	-	-	-	34.89
14	-	-	-	14.7	16.7	18.7	20.7	23.3	25.8	28.8	30.3	32.9	35.4	40.5	45.5	47.5	-	-	-	-	-	-	-	-	-	-	-	47.50
16	-	-	-	-	19.1	21.4	23.7	26.6	29.5	32.9	34.7	37.6	40.5	46.2	52.0	57.8	62.0	-	-	-	-	-	-	-	-	-	-	62.04
20	-	-	-	-	-	29.6	33.2	36.9	41.2	43.4	47.0	50.6	57.8	65.0	72.3	79.5	86.7	96.9	-	-	-	-	-	-	-	-	-	96.93
25	-	-	-	-	-	-	-	46.1	51.5	54.2	58.7	63.2	72.3	81.3	90.3	99.4	108.4	126.4	144.5	151.5	-	-	-	-	-	-	-	151.45
28	-	-	-	-	-	-	-	-	57.7	60.7	65.8	70.8	80.9	91.0	101.2	111.3	121.4	141.6	161.9	172.0	182.1	190.0	-	-	-	-	-	189.98
32	-	-	-	-	-	-	-	-	-	-	75.1	80.9	92.5	104.0	115.6	127.2	138.7	161.9	185.0	196.5	208.1	219.7	231.2	248.1	-	-	-	248.14

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C50/60, STEEL A-II (18G2) [kN]																												
$\frac{l_{bd}}{d_s}$ [mm]	100	120	140	160	170	180	200	230	250	280	290	320	350	400	450	500	550	600	650	700	725	750	775	800	825	Steel failure		
8	10.1	12.1	14.1	15.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.51	
10	12.6	15.1	17.6	20.1	21.4	22.6	24.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.23
12	-	18.1	21.1	24.1	25.6	27.1	30.2	34.7	34.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.89
14	-	-	24.6	28.1	29.9	31.7	35.2	40.5	44.0	47.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47.50
16	-	-	-	32.2	34.2	36.2	40.2	46.2	50.3	56.3	58.3	62.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	62.04
20	-	-	-	-	-	46.5	53.5	58.1	65.1	67.4	74.4	81.4	93.0	96.9	-	-	-	-	-	-	-	-	-	-	-	-	-	96.93
25	-	-	-	-	-	-	-	72.6	81.4	84.3	93.0	101.7	116.2	130.8	145.3	151.5	-	-	-	-	-	-	-	-	-	-	-	151.45
28	-	-	-	-	-	-	-	-	83.7	86.7	95.7	104.7	119.6	134.6	149.5	164.5	179.4	190.0	-	-	-	-	-	-	-	-	-	189.98
32	-	-	-	-	-	-	-	-	-	-	96.5	105.6	120.6	135.7	150.8	165.9	181.0	196.0	211.1	218.7	226.2	233.7	241.3	248.1	-	-	-	248.14

Basic performance data (cont.)

OVERLAP SPLICE – DESIGN RESISTANCE* – CONCRETE C20/25, STEEL A-II (18G2) [kN]																										
$\frac{l_0}{d_s}$	200	210	240	250	260	300	330	375	400	420	440	460	480	500	530	550	600	670	750	800	830	900	930	1000	1100	Steel failure
8	11.6	12.1	13.9	14.5	15.0	15.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.51
10	14.5	15.2	17.3	18.1	18.8	21.7	23.8	24.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.23
12	17.3	18.2	20.8	21.7	22.5	26.0	28.6	32.5	34.7	34.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.89
14	-	21.2	24.3	25.3	26.3	30.3	33.4	37.9	40.5	42.5	44.5	46.5	47.5	-	-	-	-	-	-	-	-	-	-	-	-	47.50
16	-	-	27.7	28.9	30.1	34.7	38.2	43.4	46.2	48.6	50.9	53.2	55.5	57.8	61.3	62.0	-	-	-	-	-	-	-	-	-	62.04
20	-	-	-	-	-	43.4	47.7	54.2	57.8	60.7	63.6	66.5	69.4	72.3	76.6	79.5	86.7	96.8	96.9	-	-	-	-	-	-	96.93
25	-	-	-	-	-	-	-	67.7	72.3	75.9	79.5	83.1	86.7	90.3	95.7	99.4	108.4	121.0	135.5	144.5	149.9	151.5	-	-	-	151.45
28	-	-	-	-	-	-	-	-	-	85.0	89.0	93.1	97.1	101.2	107.2	111.3	121.4	135.6	151.7	161.9	167.9	182.1	188.2	190.0	-	189.98
32	-	-	-	-	-	-	-	-	-	-	-	-	111.0	115.6	122.5	127.2	138.7	154.9	173.4	185.0	191.9	208.1	215.0	231.2	248.1	248.14

OVERLAP SPLICE – DESIGN RESISTANCE* – CONCRETE C50/60, STEEL A-II (18G2) [kN]																										
$\frac{l_0}{d_s}$	200	210	240	270	300	325	350	375	400	420	450	480	500	525	550	575	600	625	650	675	700	725	750	800	825	Steel failure
8	15.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.51
10	24.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.23
12	30.2	31.7	34.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.89
14	-	36.9	42.2	47.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47.50
16	-	-	48.3	54.3	60.3	62.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	62.04
20	-	-	-	-	69.7	75.6	81.4	87.2	93.0	96.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96.93
25	-	-	-	-	-	-	-	109.0	116.2	122.1	130.8	139.5	145.3	151.5	-	-	-	-	-	-	-	-	-	-	-	151.45
28	-	-	-	-	-	-	-	-	-	125.6	134.6	143.6	149.5	157.0	164.5	172.0	179.4	186.9	190.0	-	-	-	-	-	-	189.98
32	-	-	-	-	-	-	-	-	-	-	-	144.8	150.8	158.3	165.9	173.4	181.0	188.5	196.0	203.6	211.1	218.7	226.2	241.3	248.1	248.14

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C20/25, STEEL A-III (34GS) [kN]																										
$\frac{l_{bd}}{d_s}$	100	120	140	165	190	210	235	290	310	330	375	400	450	500	550	600	650	700	750	800	900	1000	1100	1200	1300	Steel failure
8	5.8	6.9	8.1	9.5	11.0	12.1	13.6	16.8	17.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.91
10	-	8.7	10.1	11.9	13.7	15.2	17.0	21.0	22.4	23.8	27.1	28.0	-	-	-	-	-	-	-	-	-	-	-	-	-	27.99
12	-	-	12.1	14.3	16.5	18.2	20.4	25.1	26.9	28.6	32.5	34.7	39.0	40.3	-	-	-	-	-	-	-	-	-	-	-	40.30
14	-	-	-	16.7	19.2	21.2	23.8	29.3	31.4	33.4	37.9	40.5	45.5	50.6	54.9	-	-	-	-	-	-	-	-	-	-	54.85
16	-	-	-	-	22.0	24.3	27.2	33.5	35.8	38.2	43.4	46.2	52.0	57.8	63.6	69.4	71.7	-	-	-	-	-	-	-	-	71.65
20	-	-	-	-	-	34.0	41.9	44.8	47.7	54.2	57.8	65.0	72.3	79.5	86.7	93.9	101.2	108.4	112.0	-	-	-	-	-	-	111.95
25	-	-	-	-	-	-	-	52.4	56.0	59.6	67.7	72.3	81.3	90.3	99.4	108.4	117.4	126.4	135.5	144.5	162.6	174.9	-	-	-	174.92
28	-	-	-	-	-	-	-	-	-	66.8	75.9	80.9	91.0	101.2	111.3	121.4	131.5	141.6	151.7	161.9	182.1	202.3	219.4	-	-	219.42
32	-	-	-	-	-	-	-	-	-	-	86.7	92.5	104.0	115.6	127.2	138.7	150.3	161.9	173.4	185.0	208.1	231.2	254.3	277.5	286.6	286.59

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C50/60, STEEL A-III (34GS) [kN]																										
$\frac{l_{bd}}{d_s}$	100	120	140	160	190	200	240	250	280	290	300	320	350	400	450	500	550	600	700	750	800	850	900	950	1000	Steel failure
8	10.1	12.1	14.1	16.1	17.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.91
10	12.6	15.1	17.6	20.1	23.9	25.1	28.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27.99
12	-	18.1	21.1	24.1	28.7	30.2	36.2	37.7	40.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.30
14	-	-	24.6	28.1	33.4	35.2	42.2	44.0	49.3	51.0	52.8	54.9	-	-	-	-	-	-	-	-	-	-	-	-	-	54.85
16	-	-	-	32.2	38.2	40.2	48.3	50.3	56.3	58.3	60.3	64.3	70.4	71.7	-	-	-	-	-	-	-	-	-	-	-	71.65
20	-	-	-	-	46.5	55.8	58.1	65.1	67.4	69.7	74.4	81.4	93.0	104.6	112.0	-	-	-	-	-	-	-	-	-	-	111.95
25	-	-	-	-	-	-	72.6	81.4	84.3	87.2	93.0	101.7	116.2	130.8	145.3	159.8	174.4	174.9	-	-	-	-	-	-	-	174.92
28	-	-	-	-	-	-	-	83.7	86.7	89.7	95.7	104.7	119.6	134.6	149.5	164.5	179.4	209.4	219.4	-	-	-	-	-	-	219.42
32	-	-	-	-	-	-	-	-	-	-	96.5	105.6	120.6	135.7	150.8	165.9	181.0	211.1	226.2	241.3	256.4	271.4	286.5	286.6	286.6	286.59

Basic performance data (cont.)

OVERLAP SPLICE – DESIGN RESISTANCE* – CONCRETE C20/25, STEEL A-III (34GS) [kN]																											
l_0 [mm]	d_s [mm]	200	210	240	250	300	310	375	380	400	420	460	480	500	550	600	650	700	750	800	850	900	1000	1100	1200	1300	Steel failure
8		11.6	12.1	13.9	14.5	17.3	17.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.91
10		14.5	15.2	17.3	18.1	21.7	22.4	27.1	27.5	28.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27.99
12		17.3	18.2	20.8	21.7	26.0	26.9	32.5	32.9	34.7	36.4	39.9	40.3	-	-	-	-	-	-	-	-	-	-	-	-	-	40.30
14		-	21.2	24.3	25.3	30.3	31.4	37.9	38.4	40.5	42.5	46.5	48.6	50.6	54.9	-	-	-	-	-	-	-	-	-	-	-	54.85
16		-	-	27.7	28.9	34.7	35.8	43.4	43.9	46.2	48.6	53.2	55.5	57.8	63.6	69.4	71.7	-	-	-	-	-	-	-	-	-	71.65
20		-	-	-	-	43.4	44.8	54.2	54.9	57.8	60.7	66.5	69.4	72.3	79.5	86.7	93.9	101.2	108.4	112.0	-	-	-	-	-	-	111.95
25		-	-	-	-	-	-	67.7	68.6	72.3	75.9	83.1	86.7	90.3	99.4	108.4	117.4	126.4	135.5	144.5	153.5	162.6	174.9	-	-	-	174.92
28		-	-	-	-	-	-	-	-	-	85.0	93.1	97.1	101.2	111.3	121.4	131.5	141.6	151.7	161.9	172.0	182.1	202.3	219.4	-	-	219.42
32		-	-	-	-	-	-	-	-	-	-	-	111.0	115.6	127.2	138.7	150.3	161.9	173.4	185.0	196.5	208.1	231.2	254.3	277.5	286.6	286.59

OVERLAP SPLICE – DESIGN RESISTANCE* – CONCRETE C50/60, STEEL A-III (34GS) [kN]																											
l_0 [mm]	d_s [mm]	200	210	240	260	280	300	330	350	375	400	420	450	480	500	525	550	600	650	700	750	800	850	900	950	1000	Steel failure
8		17.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.91
10		25.1	26.4	28.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27.99
12		30.2	31.7	36.2	39.2	40.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.30
14		-	36.9	42.2	45.7	49.3	52.8	54.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54.85
16		-	-	48.3	52.3	56.3	60.3	66.4	70.4	71.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71.65
20		-	-	-	-	-	69.7	76.7	81.4	87.2	93.0	97.6	104.6	111.6	112.0	-	-	-	-	-	-	-	-	-	-	-	111.95
25		-	-	-	-	-	-	-	-	109.0	116.2	122.1	130.8	139.5	145.3	152.6	159.8	174.4	174.9	-	-	-	-	-	-	-	174.92
28		-	-	-	-	-	-	-	-	-	-	125.6	134.6	143.6	149.5	157.0	164.5	179.4	194.4	209.4	219.4	-	-	-	-	-	219.42
32		-	-	-	-	-	-	-	-	-	-	-	-	144.8	150.8	158.3	165.9	181.0	196.0	211.1	226.2	241.3	256.4	271.4	286.5	286.6	286.59

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C20/25, STEEL A-IIIN (RB500/BSt500S/BS500SP) [kN]																											
l_{bd} [mm]	d_s [mm]	115	145	160	170	200	230	250	285	300	355	375	400	455	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	Steel failure
8		6.6	8.4	9.2	9.8	11.6	13.3	14.5	16.5	17.3	20.5	21.7	21.8	-	-	-	-	-	-	-	-	-	-	-	-	-	21.84
10		-	10.5	11.6	12.3	14.5	16.6	18.1	20.6	21.7	25.7	27.1	28.9	32.9	34.1	-	-	-	-	-	-	-	-	-	-	-	34.13
12		-	-	-	14.7	17.3	19.9	21.7	24.7	26.0	30.8	32.5	34.7	39.5	43.4	49.2	-	-	-	-	-	-	-	-	-	-	49.15
14		-	-	-	-	20.2	23.3	25.3	28.8	30.3	35.9	37.9	40.5	46.0	50.6	60.7	66.9	-	-	-	-	-	-	-	-	-	66.90
16		-	-	-	-	-	26.6	28.9	32.9	34.7	41.0	43.4	46.2	52.6	57.8	69.4	80.9	87.4	-	-	-	-	-	-	-	-	87.37
20		-	-	-	-	-	-	-	41.2	43.4	51.3	54.2	57.8	65.8	72.3	86.7	101.2	115.6	130.1	136.5	-	-	-	-	-	-	136.52
25		-	-	-	-	-	-	-	-	-	64.1	67.7	72.3	82.2	90.3	108.4	126.4	144.5	162.6	180.6	198.7	213.3	-	-	-	-	213.32
28		-	-	-	-	-	-	-	-	-	-	-	80.9	92.1	101.2	121.4	141.6	161.9	182.1	202.3	222.6	242.8	263.0	267.6	-	-	267.58
32		-	-	-	-	-	-	-	-	-	-	-	-	105.2	115.6	138.7	161.9	185.0	208.1	231.2	254.3	277.5	300.6	323.7	346.8	349.5	349.50

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C50/60, STEEL A-IIIN (RB500/BSt500S/BS500SP) [kN]																											
l_{bd} [mm]	d_s [mm]	100	120	140	160	180	200	220	250	280	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1200	Steel failure
8		10.1	12.1	14.1	16.1	18.1	20.1	21.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.84
10		12.6	15.1	17.6	20.1	22.6	25.1	27.6	31.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.13
12		-	18.1	21.1	24.1	27.1	30.2	33.2	37.7	42.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49.15
14		-	-	24.6	28.1	31.7	35.2	38.7	44.0	49.3	52.8	61.6	66.9	-	-	-	-	-	-	-	-	-	-	-	-	-	66.90
16		-	-	-	32.2	36.2	40.2	44.2	50.3	56.3	60.3	70.4	80.4	87.4	87.4	-	-	-	-	-	-	-	-	-	-	-	87.37
20		-	-	-	-	-	46.5	51.1	58.1	65.1	69.7	81.4	93.0	104.6	116.2	127.9	136.5	-	-	-	-	-	-	-	-	-	136.52
25		-	-	-	-	-	-	-	72.6	81.4	87.2	101.7	116.2	130.8	145.3	159.8	174.4	188.9	203.4	213.3	-	-	-	-	-	-	213.32
28		-	-	-	-	-	-	-	-	83.7	89.7	104.7	119.6	134.6	149.5	164.5	179.4	194.4	209.4	224.3	239.3	254.2	267.6	-	-	-	267.58
32		-	-	-	-	-	-	-	-	-	-	105.6	120.6	135.7	150.8	165.9	181.0	196.0	211.1	226.2	241.3	256.4	271.4	286.5	301.6	349.5	349.50

Basic performance data (cont.)

OVERLAP SPLICE – DESIGN RESISTANCE – CONCRETE C20/25, STEEL A-IIIN (RB500/BS500S/BS500SP) [kN]																											
$\frac{l_0}{d_s}$	d_s	200	210	240	270	300	330	375	420	480	500	550	600	650	700	750	800	850	900	1000	1100	1200	1300	1400	1500	1600	Steel failure
		200	210	240	270	300	330	375	420	480	500	550	600	650	700	750	800	850	900	1000	1100	1200	1300	1400	1500	1600	
8		11.6	12.1	13.9	15.6	17.3	19.1	21.7	21.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.84
10		14.5	15.2	17.3	19.5	21.7	23.8	27.1	30.3	34.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.13
12		17.3	18.2	20.8	23.4	26.0	28.6	32.5	36.4	41.6	43.4	47.7	49.2	-	-	-	-	-	-	-	-	-	-	-	-	-	49.15
14		-	21.2	24.3	27.3	30.3	33.4	37.9	42.5	48.6	50.6	55.6	60.7	65.8	66.9	-	-	-	-	-	-	-	-	-	-	-	66.90
16		-	-	27.7	31.2	34.7	38.2	43.4	48.6	55.5	57.8	63.6	69.4	75.1	80.9	86.7	87.4	-	-	-	-	-	-	-	-	-	87.37
20		-	-	-	-	43.4	47.7	54.2	60.7	69.4	72.3	79.5	86.7	93.9	101.2	108.4	115.6	122.8	130.1	136.5	-	-	-	-	-	-	136.52
25		-	-	-	-	-	-	67.7	75.9	86.7	90.3	99.4	108.4	117.4	126.4	135.5	144.5	153.5	162.6	180.6	198.7	213.3	-	-	-	-	213.32
28		-	-	-	-	-	-	-	85.0	97.1	101.2	111.3	121.4	131.5	141.6	151.7	161.9	172.0	182.1	202.3	222.6	242.8	263.0	267.6	-	-	267.58
32		-	-	-	-	-	-	-	-	111.0	115.6	127.2	138.7	150.3	161.9	173.4	185.0	196.5	208.1	231.2	254.3	277.5	300.6	323.7	346.8	349.5	349.50

OVERLAP SPLICE – DESIGN RESISTANCE – CONCRETE C50/60, STEEL A-IIIN (RB500/BS500S/BS500SP) [kN]																											
$\frac{l_0}{d_s}$	d_s	200	210	230	240	290	300	330	350	375	390	410	420	470	480	550	600	650	700	750	800	850	900	1000	1100	1200	Steel failure
		200	210	230	240	290	300	330	350	375	390	410	420	470	480	550	600	650	700	750	800	850	900	1000	1100	1200	
8		20.1	21.1	21.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.84
10		25.1	26.4	28.9	30.2	34.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.13
12		30.2	31.7	34.7	36.2	43.7	45.2	49.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49.15
14		-	36.9	40.5	42.2	51.0	52.8	58.1	61.6	66.0	66.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66.90
16		-	-	-	48.3	58.3	60.3	66.4	70.4	75.4	78.4	82.4	84.4	87.4	-	-	-	-	-	-	-	-	-	-	-	-	87.37
20		-	-	-	-	-	69.7	76.7	81.4	87.2	90.7	95.3	97.6	109.3	111.6	127.9	136.5	-	-	-	-	-	-	-	-	-	136.52
25		-	-	-	-	-	-	-	-	109.0	113.3	119.1	122.1	136.6	139.5	159.8	174.4	188.9	203.4	213.3	-	-	-	-	-	-	213.32
28		-	-	-	-	-	-	-	-	-	-	-	125.6	140.6	143.6	164.5	179.4	194.4	209.4	224.3	239.3	254.2	267.6	-	-	-	267.58
32		-	-	-	-	-	-	-	-	-	-	-	-	-	144.8	165.9	181.0	196.0	211.1	226.2	241.3	256.4	271.4	301.6	331.8	349.5	349.50

Product commercial data

Product Code	Volume [m]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-KEX-II-385	385	10	40	480	10.0	40.0	510.0	5906675028538	18

R-KEX

High performance pure epoxy resin approved for use in non-cracked concrete

Approvals and Reports

- AT-15-7047/2010
- AT-15-7047/2010 - Aneks nr 1



Product information

Features and benefits

- Suitable for variable embedment, recommended for deep anchorage
- Minimal shrinkage
- Very high chemical resistance
- Longer curing time suitable for high temperature
- Can be installed in diamond-drilled holes

Applications

- Safety barriers
- Curtain walling
- Racking systems
- Balustrading
- Cladding restraints
- Formwork supports
- Heavy machinery
- Masonry support
- Steelwork

Base materials

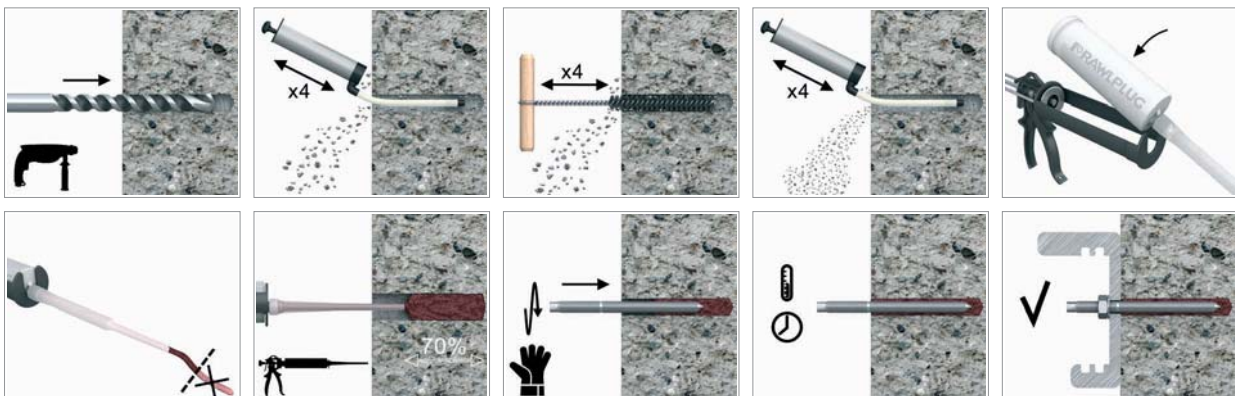
Approved for use in:

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

Also suitable for use in:

- Natural Stone

Installation guide



Installation guide (cont.)

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.
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.

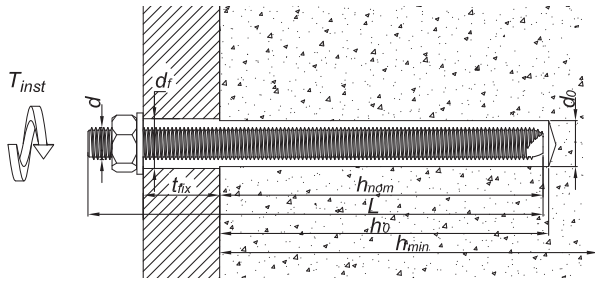
Product information

Product Code	Resin	Description / Resin Type	Volume
			[m ^l]
R-KEX-400	R-KEX	Epoxy 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
				d	L	d _i	t _{fix}
				[mm]	[mm]	[mm]	[mm]
M8	R-STUDS-08110	R-STUDS-08110-88	R-STUDS-08110-A4	8	110	9	20
	R-STUDS-08160	-	R-STUDS-08160-A4	8	160	9	70
M10	R-STUDS-10130	R-STUDS-10130-88	R-STUDS-10130-A4	10	130	12	28
	R-STUDS-10170	-	R-STUDS-10170-A4	10	170	12	68
	R-STUDS-10190	-	R-STUDS-10190-A4	10	190	12	88
M12	R-STUDS-12160	R-STUDS-12160-88	R-STUDS-12160-A4	12	160	14	35
	R-STUDS-12190	-	R-STUDS-12190-A4	12	190	14	65
	R-STUDS-12220	-	R-STUDS-12220-A4	12	220	14	95
	R-STUDS-12260	-	R-STUDS-12260-A4	12	260	14	135
	R-STUDS-12300	-	R-STUDS-12300-A4	12	300	14	175
M16	R-STUDS-16190	R-STUDS-16190-88	R-STUDS-16190-A4	16	190	18	46
	R-STUDS-16220	-	R-STUDS-16220-A4	16	220	18	76
	R-STUDS-16260	-	R-STUDS-16260-A4	16	260	18	116
	R-STUDS-16300	-	R-STUDS-16300-A4	16	300	18	156
	R-STUDS-16380	-	R-STUDS-16380-A4	16	380	18	236
M20	R-STUDS-20260	R-STUDS-20260-88	R-STUDS-20260-A4	20	260	22	67
	R-STUDS-20300	-	R-STUDS-20300-A4	20	300	22	107
	R-STUDS-20350	-	R-STUDS-20350-A4	20	350	22	157
M24	R-STUDS-24300	R-STUDS-24300-88	R-STUDS-24300-A4	24	300	26	62
M30	R-STUDS-30380	R-STUDS-30380-88	R-STUDS-30380-A4	30	380	32	76

Installation data



Size	M8	M10	M16	M20	M24	M30		
Thread diameter	d	[mm]	8	10	16	20	24	30
Hole diameter in substrate	d ₀	[mm]	10	12	18	24	28	35
Installation torque	T _{inst}	[Nm]	10	20	80	120	180	300
Min. hole depth in substrate	h ₀	[mm]	h _{ef} + 5					
Installation depth	h _{nom}	[mm]	80	90	125	170	210	270
Min. substrate thickness	h _{min}	[mm]	h _{ef} + 30 ≥ 100			h _{ef} + 2 * d ₀		
Min. spacing	s _{min}	[mm]	0.5 * h _{ef} ≥ 40					
Min. edge distance	c _{min}	[mm]	0.5 * h _{ef} ≥ 40					

Minimum working and curing time

Resin temperature	Concrete temperature	Working time	Curing time*
[°C]	[°C]	[min]	[min]
5	5	180	960
10	10	120	600
15	15	60	300
20	20	50	270
25	25	40	240
25	30	20	180

*For wet concrete the curing time must be doubled

Mechanical properties

R-STUDS

Size	M8	M10	M16	M20	M24	M30		
R-STUDS METRIC THREADED RODS - steel class 5.8								
Nominal ultimate tensile strength - tension	f _{uk}	[N/mm ²]	520	520	520	520		
Nominal yield strength - tension	f _{yk}	[N/mm ²]	420	420	420	420		
Cross sectional area - tension	A _s	[mm ²]	36.6	58	157	245	352.8	559.8
Elastic section modulus	W _{el}	[mm ³]	31.2	62.3	277.5	541	935	1868
Characteristic bending resistance	M ⁰ _{Rk,s}	[Nm]	20	39	173	338	583	1166
Design bending resistance	M	[Nm]	11	22	99	193	333	666
R-STUDS METRIC THREADED RODS - steel class 8.8								
Nominal ultimate tensile strength - tension	f _{uk}	[N/mm ²]	800	800	800	800	520	800
Nominal yield strength - tension	f _{yk}	[N/mm ²]	640	640	640	640	420	640
Cross sectional area - tension	A _s	[mm ²]	36.6	58	157	245	352.8	559.8
Elastic section modulus	W _{el}	[mm ³]	31.2	62.3	277.5	541	935	1868
Characteristic bending resistance	M ⁰ _{Rk,s}	[Nm]	30	60	266	519	898	1793
Design bending resistance	M	[Nm]	17	34	152	297	513	1025
R-STUDS METRIC THREADED RODS - A4								
Nominal ultimate tensile strength - tension	f _{uk}	[N/mm ²]	700	700	700	700	520	700
Nominal yield strength - tension	f _{yk}	[N/mm ²]	350	350	350	350	420	350
Cross sectional area - tension	A _s	[mm ²]	36.6	58	157	245	352.8	559.8
Elastic section modulus	W _{el}	[mm ³]	31.2	62.3	277.5	541	935	1868
Characteristic bending resistance	M ⁰ _{Rk,s}	[Nm]	26	52	233	454	785	1569
Design bending resistance	M	[Nm]	12	24	107	208	360	719

Basic performance data

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

Size		M8	M10	M12	M16	M20	M24	M30
Substrate		Non-cracked concrete						
Embedment depth h_{ef}	[mm]	80	90	110	125	170	210	270
MEAN ULTIMATE LOAD								
TENSION LOAD $N_{Ru,m}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	21.6	34.8	50.4	87.6	121.22	149.71	285.9
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	25.2	37.86	59.25	87.6	121.22	149.71	285.9
R-STUDS METRIC THREADED RODS - A4	[kN]	25.2	37.86	59.25	87.6	121.22	149.71	285.9
SHEAR LOAD $V_{Ru,m}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	18.3	29	42.15	78.5	122.5	176.5	280.5
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	29.28	46.4	67.44	125.6	196	282.4	448.8
R-STUDS METRIC THREADED RODS - A4	[kN]	25.62	40.6	59.01	109.9	171.5	247.1	392.7
CHARACTERISTIC LOAD								
TENSION LOAD N_{Rk}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	18	29	42	73.4	110.2	136.1	266.8
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	21.5	33.8	52.9	73.4	110.2	136.1	266.8
R-STUDS METRIC THREADED RODS - A4	[kN]	21.5	33.8	52.9	73.4	110.2	136.1	266.8
SHEAR LOAD V_{Rk}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	9	14	21	39	61	88	140
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	15	23	34	63	98	141	224
R-STUDS METRIC THREADED RODS - A4	[kN]	13	20	29	55	86	124	196
DESIGN LOAD								
TENSION LOAD N_{Rd}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	8.53	13.41	20.99	29.13	43.73	54.01	105.87
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8.53	13.41	20.99	29.13	43.73	54.01	105.87
R-STUDS METRIC THREADED RODS - A4	[kN]	8.53	13.41	20.99	29.13	43.73	54.01	105.87
SHEAR LOAD V_{Rd}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	7.2	11.2	16.8	31.2	48.8	70.4	112
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	12	18.4	27.2	50.4	78.4	112.8	179.2
R-STUDS METRIC THREADED RODS - A4	[kN]	8.33	12.82	18.59	35.26	55.13	79.49	125.64
RECOMMENDED LOAD								
TENSION LOAD N_{rec}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	6.09	9.58	14.99	20.8	31.24	38.58	75.62
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	6.09	9.58	14.99	20.8	31.24	38.58	75.62
R-STUDS METRIC THREADED RODS - A4	[kN]	6.09	9.58	14.99	20.8	31.24	38.58	75.62
SHEAR LOAD V_{rec}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	5.14	8	12	22.29	34.86	50.29	80
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8.57	13.14	19.43	36	56	80.57	128
R-STUDS METRIC THREADED RODS - A4	[kN]	5.95	9.16	13.28	25.18	39.38	56.78	89.74

Product commercial data

Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-KEX-400	400	10	10	480	7.0	7.0	365.5	5906675087849	18

R-KER with Threaded Rods

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



Installation movie



Approvals and Reports

- ETA-10/0055; ETAG 001-05, Option 1



Product overview

Features and benefits

- Approved for use with threaded rods in cracked and non-cracked concrete (ETAG001 Option 1)
- Suitable for use in low temperatures (down to -20° for winter option) enables use throughout the year
- 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 cartridge can continue to be used after fitting new nozzle

Applications

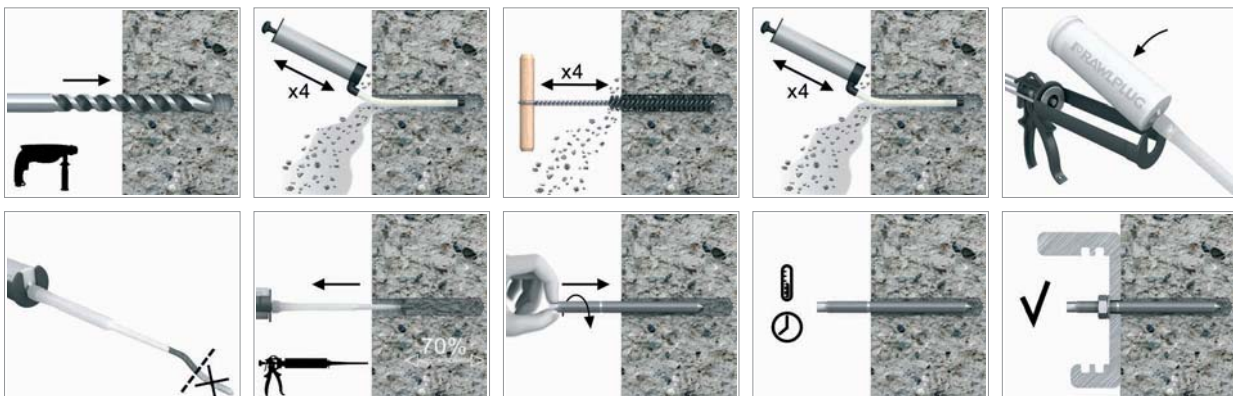
- Pipeline systems
- Curtain walling
- Balustrading
- Handrails
- Canopies
- Large panel reinforcing system -Copy Eco
- Cable conduits and trays
- Fencing & gates
- Pipework/ductwork supports
- Platforms
- Passenger lifts

Base materials

Approved for use in:

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

Installation guide



Installation guide (cont.)

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.
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.

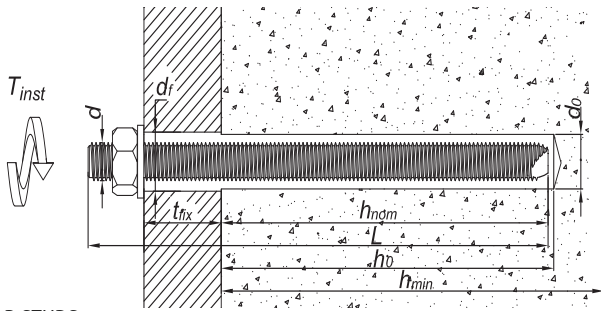
Product information

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-KER-280	R-KER	Styrene Free Vinylester Resin	280
R-KER-380			
R-KER-W-380	R-KER-W	Low Temperature (Winter) / Rapid Cure Styrene Free Vinylester Resin	380
R-KER-S-380	R-KER-S	High Temperature (Summer) / Slow Cure Styrene Free Polyester Resin	

R-STUDS

Size	Product Code			Anchor		Hole diameter	Fixture		
	Steel class 5.8	Steel class 8.8	Steel grade A4	Diameter	Length		Max. thickness		
				d	L	t _{fix} for h _{ef,min}	t _{fix} for h _{ef,std}	t _{fix} for h _{ef,max}	
				[mm]	[mm]	[mm]	[mm]	[mm]	
M8	R-STUDS-08110	R-STUDS-08110-88	R-STUDS-08110-A4	8	110	9	40	20	-
	R-STUDS-08160	-	-	8	160	9	90	70	50
M10	R-STUDS-10130	R-STUDS-10130-88	R-STUDS-10130-A4	10	130	12	48	28	-
	R-STUDS-10170	-	R-STUDS-10170-A4	10	170	12	88	68	38
	R-STUDS-10190	-	-	10	190	12	108	88	58
M12	R-STUDS-12160	R-STUDS-12160-88	R-STUDS-12160-A4	12	160	14	65	35	-
	R-STUDS-12190	-	R-STUDS-12190-A4	12	190	14	95	65	30
	R-STUDS-12220	-	R-STUDS-12220-A4	12	220	14	125	95	60
	R-STUDS-12260	-	-	12	260	14	165	135	100
	R-STUDS-12300	-	-	12	300	14	205	175	140
M16	R-STUDS-16190	R-STUDS-16190-88	R-STUDS-16190-A4	16	190	18	71	46	-
	R-STUDS-16220	R-STUDS-16220-88	-	16	220	18	101	76	11
	R-STUDS-16260	-	R-STUDS-16260-A4	16	260	18	141	116	51
	R-STUDS-16300	-	-	16	300	18	181	156	91
	R-STUDS-16380	-	-	16	380	18	261	236	171
M20	R-STUDS-20260	R-STUDS-20260-88	R-STUDS-20260-A4	20	260	22	117	67	-
	R-STUDS-20300	R-STUDS-20300-88	-	20	300	22	157	107	37
	R-STUDS-20350	-	-	20	350	22	207	157	87
M24	R-STUDS-24300	R-STUDS-24300-88	R-STUDS-24300-A4	24	300	26	132	62	-
M30	R-STUDS-30380	R-STUDS-30380-88	R-STUDS-30380-A4	30	380	32	181	106	-

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
Installation torque	T _{inst}	[Nm]	10	20	40	80	120	180	300
Min. hole depth in substrate	h ₀	[mm]	h _{ef} + 5						
MINIMUM EMBEDMENT DEPTH									
Installation depth	h _{nom,min}	[mm]	60	70	80	100	120	140	165
STANDARD EMBEDMENT DEPTH									
Installation depth	h _{nom,s}	[mm]	80	90	110	125	170	210	240
MAXIMUM EMBEDMENT DEPTH									
Installation depth	h _{nom,max}	[mm]	100	120	145	190	240	290	360
Min. substrate thickness	h _{min}	[mm]	h _{ef} + 30 ≥ 100				h _{ef} + 2*d ₀		
Min. spacing	s _{min}	[mm]	0.5 * h _{ef} ≥ 40						
Min. edge distance	c _{min}	[mm]	0.5 * h _{ef} ≥ 40						

Minimum working and curing time

R-KER

Resin temperature	Concrete temperature	Working time	Curing time*
[°C]	[°C]	[min]	[min]
5	-20	-	-
5	-15	-	-
5	-10	-	-
5	-5	60	360
5	0	40	180
5	5	20	120
10	10	12	80
15	15	8	60
20	20	5	45
25	25	3	30
25	30	2	20
25	40	0.5	10

R-KER-S

Resin temperature	Concrete temperature	Working time	Curing time*
[°C]	[°C]	[min]	[min]
5	-5	65	1440
5	0	50	960
5	5	35	720
10	10	20	480
15	15	12	240
20	20	9	240
25	25	7	180
25	30	6	120
25	40	4	45
25	45	3	35
25	50	2	25

R-KER-W

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

*For wet concrete the curing time must be doubled

Mechanical properties

R-STUDS

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	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]	21.6	34.8	50.4	78	102.5	129.1	165	30.2	34.8	46.6	65.1	
Standard embedment depth	[kN]	21.6	34.8	50.4	87.3	115.2	156.1	185.4	41.7	43.7	65.9	97.6	
Maximum embedment depth	[kN]	21.6	34.8	50.4	93.6	146.4	211.2	256.7	50.4	66.3	93	135	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8													
Minimum embedment depth	[kN]	30.2	44.1	55.6	78	102.5	129.1	165	30.2	34.8	46.6	65.1	
Standard embedment depth	[kN]	34.8	55.2	56.6	87.3	115.2	156.1	185.4	41.7	43.7	65.9	97.6	
Maximum embedment depth	[kN]	34.8	55.2	76	114.4	156.6	215.5	256.7	54.8	66.3	93	135	
R-STUDS METRIC THREADED RODS - A4													
Minimum embedment depth	[kN]	30.2	44.1	55.6	78	102.5	129.1	165	30.2	34.8	46.6	65.1	
Standard embedment depth	[kN]	31.2	49.2	56.6	87.3	115.2	156.1	185.4	41.7	43.7	65.9	97.6	
Maximum embedment depth	[kN]	31.2	49.2	70.8	114.4	156.6	215.5	256.7	54.8	66.3	93	135	
SHEAR LOAD $V_{Ru,m}$													
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	18.3	29	42.15	78.5	122.5	176.5	280.5	42.15	78.5	122.5	176.5	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	29.28	46.4	67.44	125.6	196	282.4	448.8	67.44	125.6	196	282.4	
R-STUDS METRIC THREADED RODS - A4	[kN]	25.62	40.6	59.01	109.9	171.5	247.1	392.7	59.01	109.9	171.5	247.1	

Basic performance data (cont.)

R-STUDS

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

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	28.6	36.1	50.5	66.4	83.7	107	19.6	22.62	30.16	42.22
Standard embedment depth	[kN]	18	29	42	69.1	101.5	142.5	158.3	26.95	28.27	42.73	63.33
Maximum embedment depth	[kN]	18	29	42	78	122	176	237.5	35.53	42.98	60.32	87.46
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	19.6	22.62	30.16	42.22
Standard embedment depth	[kN]	26.1	36.8	53.9	69.1	101.5	142.5	158.3	26.95	28.27	42.73	63.33
Maximum embedment depth	[kN]	29	46	67	105.1	143.3	196.8	237.5	35.53	42.98	60.32	87.46
R-STUDS METRIC THREADED RODS - A4												
Minimum embedment depth	[kN]	19.6	28.6	36.1	50.5	66.4	83.7	107	19.6	22.62	30.16	42.22
Standard embedment depth	[kN]	26	36.8	53.9	69.1	101.5	142.5	158.3	26.95	28.27	42.73	63.33
Maximum embedment depth	[kN]	26	41	59	105.1	143.3	196.8	237.5	35.53	42.98	60.32	87.46
SHEAR LOAD V_{Rk}												
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	9	14	21	39	61	88	140	21	39	61	88
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	15	23	34	63	98	141	224	34	63	98	141
R-STUDS METRIC THREADED RODS - A4	[kN]	13	20	29	55	86	124	196	29	55	86	124
DESIGN LOAD												
TENSION LOAD N_{Rd}												
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8												
Minimum embedment depth	[kN]	10.89	15.89	20.06	28.06	36.89	39.86	50.95	10.89	12.57	16.76	20.1
Standard embedment depth	[kN]	12	19.33	28	38.39	56.39	67.86	75.38	14.97	15.71	23.74	30.16
Maximum embedment depth	[kN]	12	19.33	28	52	79.61	93.71	113.1	19.74	23.88	33.51	41.65
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8												
Minimum embedment depth	[kN]	10.89	15.89	20.06	28.06	36.89	39.86	50.95	10.89	12.57	16.76	20.1
Standard embedment depth	[kN]	14.5	20.44	29.94	38.39	56.39	67.86	75.38	14.97	15.71	23.74	30.16
Maximum embedment depth	[kN]	18.17	27.22	39.5	58.39	79.61	93.71	113.1	19.74	23.88	33.51	41.65
R-STUDS METRIC THREADED RODS - A4												
Minimum embedment depth	[kN]	10.89	15.89	20.06	28.06	36.89	39.86	50.95	10.89	12.57	16.76	20.1
Standard embedment depth	[kN]	13.9	20.44	29.94	38.39	56.39	67.86	75.38	14.97	15.71	23.74	30.16
Maximum embedment depth	[kN]	13.9	21.93	31.55	58.39	79.61	93.71	113.1	19.74	23.88	33.51	41.65
SHEAR LOAD V_{Rd}												
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	7.2	11.2	16.8	31.2	48.8	70.4	112	16.8	31.2	48.8	70.4
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	12	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	[kN]	8.33	12.82	18.59	35.26	55.13	79.49	125.64	18.59	35.26	55.13	79.49
RECOMMENDED LOAD												
TENSION LOAD N_{Rc}												
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8												
Minimum embedment depth	[kN]	7.78	11.35	14.33	20.04	26.35	28.47	36.39	7.78	8.98	11.97	14.36
Standard embedment depth	[kN]	8.57	13.81	20	27.42	40.28	48.47	53.84	10.69	11.22	16.96	21.54
Maximum embedment depth	[kN]	8.57	13.81	20	37.14	56.87	66.94	80.78	14.1	17.06	23.94	29.75
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8												
Minimum embedment depth	[kN]	7.78	11.35	14.33	20.04	26.35	28.47	36.39	7.78	8.98	11.97	14.36
Standard embedment depth	[kN]	10.36	14.6	21.39	27.42	40.28	48.47	53.84	10.69	11.22	16.96	21.54
Maximum embedment depth	[kN]	12.98	19.44	28.21	41.71	56.87	66.94	80.78	14.1	17.06	23.94	29.75

Basic performance data (cont.)

R-STUDS

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

Size		M8	M10	M12	M16	M20	M24	M30	M12	M16	M20	M24
R-STUDS METRIC THREADED RODS - A4												
Minimum embedment depth	[kN]	7.78	11.35	14.33	20.04	26.35	28.47	36.39	7.78	8.98	11.97	14.36
Standard embedment depth	[kN]	9.93	14.6	21.39	27.42	40.28	48.47	53.84	10.69	11.22	16.96	21.54
Maximum embedment depth	[kN]	9.93	15.66	22.54	41.71	56.87	66.94	80.78	14.1	17.06	23.94	29.75
SHEAR LOAD V_{rec}												
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	5.14	8	12	22.29	34.86	50.29	80	12	22.29	34.86	50.29
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8.57	13.14	19.43	36	56	80.57	128	19.43	36	56	80.57
R-STUDS METRIC THREADED RODS - A4	[kN]	5.95	9.16	13.28	25.18	39.38	56.78	89.74	13.28	25.18	39.38	56.78

Product commercial data

Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-KER-280	280	10	50	600	6.3	31.5	378	5906675049663	18
R-KER-380	380	10	50	600	6.3	31.5	378	5906675290379	18
R-KER-380-W	380	10	40	480	8.31	33.24	399	5906675290379	12
R-KER-380-S	380	10	10	630	6.3	6.3	427	5906675222981	12

R-KER with Sockets

High performance vinylester resin approved for use with internally threaded sockets

Approvals and Reports

- ETA-13/0805; ETAG 001-05, Option 7



Product overview

Features and benefits

- Approved for use with sockets in non-cracked concrete (ETAG001 Option 7)
- Allows removal of bolt to leave a re-usable socket in place
- Suitable for use in low temperatures (down to -20° for winter option) enables use throughout the year
- 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 cartridge can continue to be used after fitting new nozzle

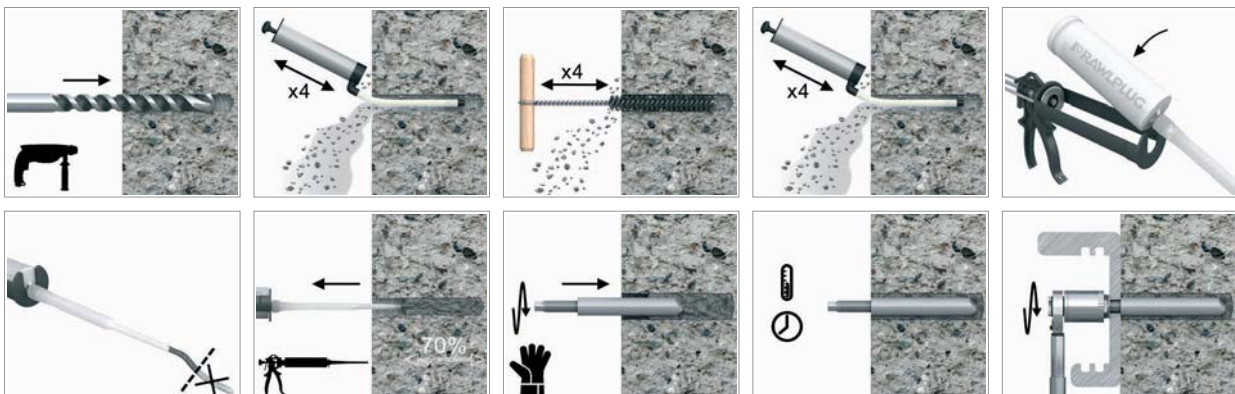
Applications

- Curtain walling
- Balustrading
- Handrails
- Canopies

Base materials

- Approved for use in:**
- Non-cracked concrete C20/25-C50/60

Installation guide



Installation guide (cont.)

1. Drill hole to the required diameter and depth for socket 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.
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 socket, 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 bolt to the required torque.

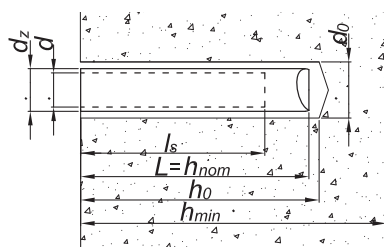
Product information

Product Code	Resin	Description / Resin Type	Volume
			[m ^l]
R-KER-280	R-KER	Styrene Free Vinylester Resin	280
R-KER-380			380
R-KER-W-380	R-KER-W	Low Temperature (Winter) / Rapid Cure Styrene Free Vinylester Resin	
R-KER-S-380	R-KER-S	High Temperature (Summer) / Slow Cure Styrene Free Polyester Resin	

SOCKETS

Size	Product Code		Anchor			Fixture
	Steel class 5.8	Steel grade A4	Socket diameter	Length	Internal thread length	Hole diameter
			d	L	l _s	d _f
			[mm]	[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
	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
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
Installation torque	T _{inst}	[Nm]	3	5	5	10	10	20	40
Thread engagement length	h _s	[mm]	6-24	8-25	8-25	10-30	10-30	12-35	16-50
Min. hole depth in substrate	h ₀	[mm]	h _{ef} + 5						
Effective Installation depth	h _{ef}	[mm]	75	75	90	75	100	100	125
Min. substrate thickness	h _{min}	[mm]	105	105	120	115	140	140	181
Min. spacing	s _{min}	[mm]	40	40	45	40	50	50	63
Min. edge distance	c _{min}	[mm]	40	40	45	40	50	50	63

Installation data

Minimum working and curing time

R-KER

Resin temperature	Concrete temperature	Working time	Curing time*
[°C]	[°C]	[min]	[min]
5	-5	60	360
5	0	40	180
5	5	20	120
10	10	12	80
15	15	8	60
20	20	5	45
25	25	3	30
25	30	2	20
25	40	0.5	10

R-KER-S

Resin temperature	Concrete temperature	Working time	Curing time*
[°C]	[°C]	[min]	[min]
5	-5	65	1440
5	0	50	960
5	5	35	720
10	10	20	480
15	15	12	360
20	20	9	240
25	25	7	180
25	30	6	120
25	40	4	45
25	45	3	35
25	50	2	25

R-KER-W

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

*For wet concrete the curing time must be doubled

Mechanical properties

SOCKETS

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]	20.1	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm ³]	21.21	50.27	98.17	169.65	402.12
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]	20.1	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm ³]	21.21	50.27	98.17	169.65	402.12
R-STUDS METRIC THREADED RODS - steel class 5.8							
Characteristic bending resistance	$M^0_{Rk,s}$	[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
R-STUDS METRIC THREADED RODS - steel class 8.8							
Characteristic bending resistance	$M^0_{Rk,s}$	[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
R-STUDS METRIC THREADED RODS - A4							
Characteristic bending resistance	$M^0_{Rk,s}$	[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

Size		M6	M8	M10	M12	M16		
Substrate		Non-cracked concrete						
Embedment depth h_{ef}	[mm]	75	90	75	100	125		
MEAN ULTIMATE LOAD								
TENSION LOAD $N_{Ru,m}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	12.5	21.6	21.6	34.8	34.8	50.4	93.6
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	19.2	34.8	34.8	50.6	55.2	63.0	97.4
R-STUDS METRIC THREADED RODS - A4	[kN]	16.8	31.2	31.2	49.2	49.2	63.0	97.4
SHEAR LOAD $V_{Ru,m}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	6.0	10.8	10.8	16.8	16.8	25.2	46.8
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	9.6	18.0	18.0	27.6	27.6	40.8	75.6
R-STUDS METRIC THREADED RODS - A4	[kN]	8.4	15.6	15.6	24.0	24.0	34.8	66
CHARACTERISTIC LOAD								
TENSION LOAD N_{Rk}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	10.0	18.0	18.0	29.0	29.0	42.0	66.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	16.0	25.4	29.0	32.8	46.0	42.7	66.0
R-STUDS METRIC THREADED RODS - A4	[kN]	14.0	25.4	26.0	32.8	41.0	42.7	66.0
SHEAR LOAD V_{Rk}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	5.0	9.0	9.0	14.0	14.0	21.0	39.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8.0	15.0	15.0	23.0	23.0	34.0	63.0
R-STUDS METRIC THREADED RODS - A4	[kN]	7.0	13.0	13.0	20.0	20.0	29.0	55.0
DESIGN LOAD								
TENSION LOAD N_{Rd}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	6.7	12.0	12.0	18.2	19.3	23.7	36.7
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	9.82	14.1	17.0	18.2	26.5	23.7	36.7
R-STUDS METRIC THREADED RODS - A4	[kN]	7.49	13.9	13.9	18.2	21.9	23.7	36.7
SHEAR LOAD V_{Rd}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	4.0	7.2	7.2	11.2	11.2	16.8	31.2
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	6.4	12.0	12.0	18.4	18.4	27.2	50.4
R-STUDS METRIC THREADED RODS - A4	[kN]	4.49	8.33	8.33	12.8	12.8	18.6	35.3
RECOMMENDED LOAD								
TENSION LOAD N_{rec}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	4.79	8.57	8.57	13.0	13.8	16.9	26.2
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	7.01	10.1	12.1	13.0	18.9	16.9	26.2
R-STUDS METRIC THREADED RODS - A4	[kN]	5.35	9.93	9.93	13.0	15.6	16.9	26.2
SHEAR LOAD V_{rec}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	2.86	5.14	5.14	8.0	8.0	12.0	22.3
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	4.57	8.57	8.57	13.1	13.1	19.4	36.0
R-STUDS METRIC THREADED RODS - A4	[kN]	3.21	5.95	5.95	9.16	9.16	13.3	25.2

Product commercial data

Product Code	Volume [m]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-KER-280	280	10	50	600	6.3	31.5	378	5906675049663	18
R-KER-380	380	10	50	600	6.3	31.5	378	5906675290379	18
R-KER-380-W	380	10	40	480	8.31	33.24	399	5906675290379	12
R-KER-380-S	380	10	10	630	6.3	6.3	427	5906675222981	12

R-KER with Rebar as an Anchor

High performance vinylester resin approved for use with reinforcement bars



Installation movie



Approvals and Reports

- ETA-13/0805; ETAG 001-05, Option 7



Product overview

Features and benefits

- Approved for use with rebar as an anchor in non-cracked concrete (ETAG001 Option 7)
- Suitable for use in low temperatures (down to -20° for winter option) enables use throughout the year
- 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 cartridge can continue to be used after fitting new nozzle

Applications

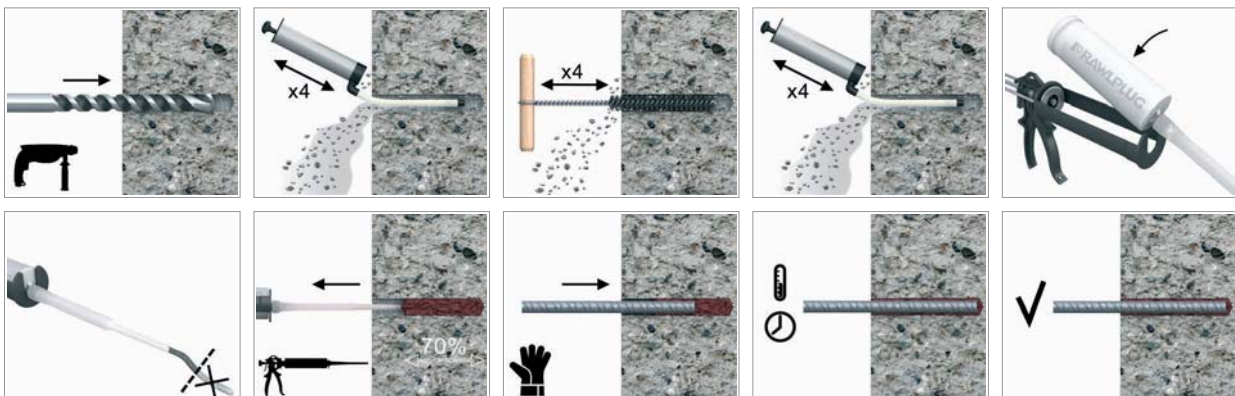
- Curtain walling
- Balustrading
- Barriers
- Cable trays
- Cladding restraints
- Steelwork
- Rebar dowelling
- Starter bars
- Rebar missed-outs

Base materials

Approved for use in:

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

Installation guide



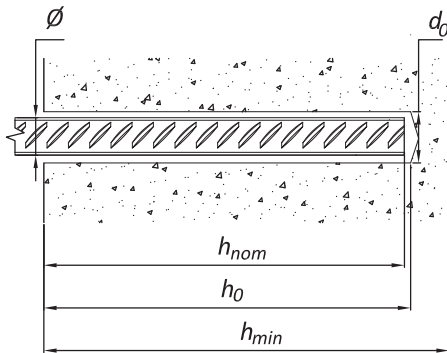
Installation guide (cont.)

1. Drill hole to the required diameter and depth for rebar 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.
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 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.
7. Attach fixture and tighten the nut to the required torque.

Product information

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-KER-280	R-KER	Styrene Free Vinylester Resin	280
R-KER-380			
R-KER-W-380	R-KER-W	Low Temperature (Winter) / Rapid Cure Styrene Free Vinylester Resin	380
R-KER-S-380	R-KER-S	High Temperature (Summer) / Slow Cure Styrene Free Polyester Resin	

Installation data



REBARS AS ANCHORS

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
Thread diameter	d	[mm]	8	10	12	14	16	20	25	32
Hole diameter in substrate	d_0	[mm]	12	14	18		22	26	32	40
Min. hole depth in substrate	h_0	[mm]	$h_{ef} + 5$							
MINIMUM EMBEDMENT DEPTH										
Installation depth	$h_{nom, min}$	[mm]	60	70	80		100	120	140	165
STANDARD EMBEDMENT DEPTH										
Installation depth	$h_{nom, s}$	[mm]	80	90	110		125	170	210	240
MAXIMUM EMBEDMENT DEPTH										
Installation depth	$h_{nom, max}$	[mm]	100	120	145		190	240	290	360
Min. substrate thickness	h_{min}	[mm]	$h_{ef} + 30 \geq 100$			$h_{ef} + 2 \cdot d_0$				
Min. spacing	s_{min}	[mm]	$0.5 \cdot h_{ef} \geq 40$							
Min. edge distance	c_{min}	[mm]	$0.5 \cdot h_{ef} \geq 40$							

Installation data (cont.)

Minimum working and curing time

R-KER

Resin temperature [°C]	Concrete temperature [°C]	Working time [min]	Curing time* [min]
5	-20	-	-
5	-15	-	-
5	-10	-	-
5	-5	60	360
5	0	40	180
5	5	20	120
10	10	12	80
15	15	8	60
20	20	5	45
25	25	3	30
25	30	2	20
25	40	0.5	10

R-KER-W

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

R-KER-S

Resin temperature [°C]	Concrete temperature [°C]	Working time [min]	Curing time* [min]
5	-5	65	1440
5	0	50	960
5	5	35	720
10	10	20	480
15	15	12	360
20	20	9	240
25	25	7	180
25	30	6	120
25	40	4	45
25	45	3	35
25	50	2	25

*For wet concrete the curing time must be doubled

Mechanical properties

REBARS AS ANCHORS

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
18G2										
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	480	480	480	480	480	480	480	480
Nominal yield strength - tension	f_{yk}	[N/mm ²]	355	355	355	355	355	355	355	355
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	804.2
Elastic section modulus	W_{el}	[mm ³]	50.3	98.2	169.6	269.4	402.1	785.4	1534	3217
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	29	57	98	155	232	452	884	1853
Design bending resistance	M	[Nm]	19	38	65	103	154	302	589	1235
Allowable bending resistance	M_{rec}	[Nm]	14	27	47	74	110	215	421	882
34GS										
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	500	500	500	500	500	500	500	500
Nominal yield strength - tension	f_{yk}	[N/mm ²]	410	410	410	410	410	410	410	410
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	804.2
Elastic section modulus	W_{el}	[mm ³]	50.3	98.2	169.6	269.4	402.1	785.4	1534	3217
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	30	59	102	162	241	471	920	1930
Design bending resistance	M	[Nm]	20	39	68	108	161	314	614	1287
Allowable bending resistance	M_{rec}	[Nm]	14	28	48	77	115	224	438	919

Mechanical properties (cont.)

REBARS AS ANCHORS

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
B500SP										
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]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	804.2
Elastic section modulus	W_{el}	[mm ³]	50.3	98.2	169.6	269.4	402.1	785.4	1534	3217
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	35	68	117	186	277	542	1059	2220
Design bending resistance	M	[Nm]	23	45	78	124	185	361	706	1480
Allowable bending resistance	M_{rec}	[Nm]	17	32	56	89	132	258	504	1057
RB500/BSt500S										
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	550	550	550	550	550	550	550	550
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]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	804.2
Elastic section modulus	W_{el}	[mm ³]	50.3	98.2	169.6	269.4	402.1	785.4	1534	3217
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	33	65	112	178	265	518	1012	2123
Design bending resistance	M	[Nm]	22	43	75	119	177	346	675	1415
Allowable bending resistance	M_{rec}	[Nm]	16	31	53	85	126	247	482	1011

Basic performance data

REBARS AS ANCHORS

Size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32	
Substrate		Non-cracked concrete								
CHARACTERISTIC LOAD										
TENSION LOAD N_{Rk}										
A-II (e.g. 18G2)										
Minimum embedment depth	[kN]	16.6	22	30.2	31.7	45.2	56.5	77	107	
Standard embedment depth	[kN]	22.1	28.3	41.5	43.5	56.5	80.1	115.5	156.8	
Maximum embedment depth	[kN]	24.1	37.7	54.3	57.4	86	113.1	159.4	235.2	
A-III (e.g. 34GS)										
Minimum embedment depth	[kN]	16.6	22	30.2	31.7	45.2	56.5	77	107	
Standard embedment depth	[kN]	22.1	28.3	41.5	43.5	56.5	80.1	115.5	156.8	
Maximum embedment depth	[kN]	25.1	37.7	54.7	57.4	86	113.1	159.4	235.2	
A-III-N (e.g. RB500, BSt500S, B500SP)										
Minimum embedment depth	[kN]	16.6	22	30.2	31.7	45.2	56.5	77	107	
Standard embedment depth	[kN]	22.1	28.3	41.5	43.5	56.5	80.1	115.5	156.8	
Maximum embedment depth	[kN]	27.6	37.7	54.7	57.4	86	113.1	159.4	235.2	
SHEAR LOAD V_{Rk}										
A-II (e.g. 18G2)	[kN]	12.1	18.8	27.1	36.9	48.3	75.4	117.8	193	
A-III (e.g. 34GS)	[kN]	12.6	19.6	28.3	38.5	50.3	78.5	122.7	201.1	
A-III-N (e.g. RB500, BSt500S, B500SP)	[kN]	13.8	21.6	31.1	42.3	55.3	86.4	135	221.2	
DESIGN LOAD										
TENSION LOAD N_{Rd}										
A-II (e.g. 18G2)										
Minimum embedment depth	[kN]	9.2	12.2	16.8	17.6	25.1	31.4	42.8	59.5	
Standard embedment depth	[kN]	12.3	15.7	23	24.2	31.4	44.5	64.1	87.1	
Maximum embedment depth	[kN]	15.4	20.9	30.4	31.9	47.8	62.8	88.6	130.7	
A-III (e.g. 34GS)										
Minimum embedment depth	[kN]	9.2	12.2	16.8	17.6	25.1	31.4	42.8	59.5	
Standard embedment depth	[kN]	12.3	15.7	23	24.2	31.4	44.5	64.1	87.1	
Maximum embedment depth	[kN]	15.4	20.9	30.4	31.9	47.8	62.8	88.6	130.7	

Basic performance data (cont.)

REBARS AS ANCHORS

Size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
A-III-N (e.g. RB500, BST500S, B500SP)									
Minimum embedment depth	[kN]	9.2	12.2	16.8	17.6	25.1	31.4	42.8	59.5
Standard embedment depth	[kN]	12.3	15.7	23	24.2	31.4	44.5	64.1	87.1
Maximum embedment depth	[kN]	15.4	20.9	30.4	31.9	47.8	62.8	88.6	130.7
SHEAR LOAD V_{Rd}									
A-II (e.g. 18G2)	[kN]	8	12.6	18.1	24.6	32.2	50.3	78.5	128.7
A-III (e.g. 34GS)	[kN]	8.4	13.1	18.8	25.7	33.5	52.4	81.8	134
A-III-N (e.g. RB500, BST500S, B500SP)	[kN]	9.2	14.4	20.7	28.2	36.9	57.6	90	147.4
RECOMMENDED LOAD									
TENSION LOAD N_{rec}									
A-II (e.g. 18G2)									
Minimum embedment depth	[kN]	6.57	8.71	12	12.6	17.9	22.4	30.6	42.5
Standard embedment depth	[kN]	8.79	11.2	16.4	17.3	22.4	31.8	45.8	62.2
Maximum embedment depth	[kN]	11	14.9	21.7	22.8	34.1	44.9	63.3	93.4
A-III (e.g. 34GS)									
Minimum embedment depth	[kN]	6.57	8.71	12	12.6	17.9	22.4	30.6	42.5
Standard embedment depth	[kN]	8.79	11.2	16.4	17.3	22.4	31.8	45.8	62.2
Maximum embedment depth	[kN]	11	14.9	21.7	22.8	34.1	44.9	63.3	93.4
A-III-N (e.g. RB500, BST500S, B500SP)									
Minimum embedment depth	[kN]	6.57	8.71	12	12.6	17.9	22.4	30.6	42.5
Standard embedment depth	[kN]	8.79	11.2	16.4	17.3	22.4	31.8	45.8	62.2
Maximum embedment depth	[kN]	11	14.9	21.7	22.8	34.1	44.9	63.3	93.4
SHEAR LOAD V_{rec}									
A-II (e.g. 18G2)	[kN]	5.74	8.98	12.93	17.59	22.98	35.9	56.1	91.91
A-III (e.g. 34GS)	[kN]	5.98	9.35	13.46	18.33	23.94	37.4	58.44	95.74
A-III-N (e.g. RB500, BST500S, B500SP)	[kN]	6.58	10.28	14.81	20.16	26.33	41.14	64.28	105.32

Product commercial data

Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-KER-280	280	10	50	600	6.3	31.5	378	5906675049663	18
R-KER-380	380	10	50	600	6.3	31.5	378	5906675290379	18
R-KER-380-W	380	10	40	480	8.31	33.24	399	5906675290379	12
R-KER-380-S	380	10	10	630	6.3	6.3	427	5906675222981	12

R-KER with Post-Installed Rebar

High performance vinylester resin approved for use with post-installed rebar connections



Installation movie



Approvals and Reports

- ETA-12/0319; ETAG 001-05, TR023



Product overview

Features and benefits

- Approved for use with post-installed rebar in non-cracked concrete (ETAG001 Option 7)
- Suitable for use in low temperatures (down to -20° for winter option) enables use throughout the year
- 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 cartridge can continue to be used after fitting new nozzle

Applications

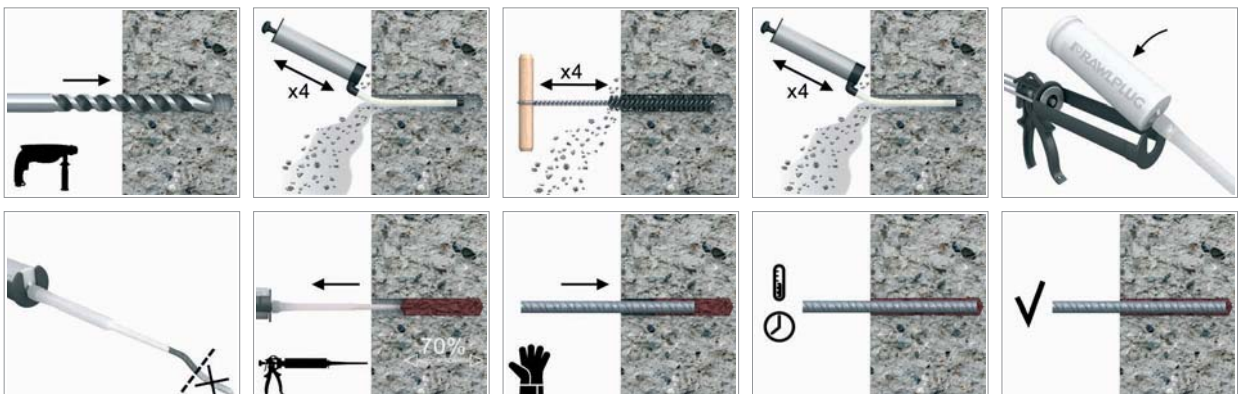
- Curtain walling
- Balustrading
- Handrails
- Canopies

Base materials

Approved for use in:

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

Installation guide



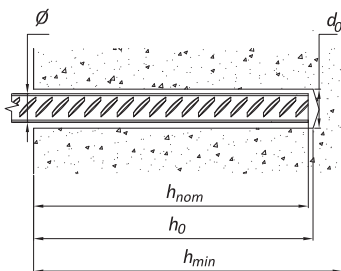
Installation guide (cont.)

1. Drill hole to the required diameter and depth for rebar 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.
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 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. Attach fixture and tighten the nut to the required torque.

Product information

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-KER-280	R-KER	Styrene Free Vinylester Resin	280
R-KER-380			380
R-KER-W-380	R-KER-W	Low Temperature (Winter) / Rapid Cure Styrene Free Vinylester Resin	
R-KER-S-380	R-KER-S	High Temperature (Summer) / Slow Cure Styrene Free Polyester Resin	

Installation data



POST INSTALLED REBARS

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Rebar diameter	d_s	[mm]	8	10	12	14	16	20	25	28	32
Hole diameter in substrate	d_0	[mm]	12	14	16	18	20	25	30	35	40
Brush diameter	-	[mm]	14	16	18	20	22	27	32	37	42
Min. anchorage length	$l_{b,min.}$	[mm]	115	145	170	200	230	285	355	400	455
Min. lap length (overlap splice)	$l_{0,min.}$	[mm]	200		210	240	300	375	420	480	
Max. anchorage length	$l_{v,max.}$	[mm]	400	500	600	700	800	1000			

Minimum working and curing time

R-KER

Resin temperature	Concrete temperature	Working time	Curing time*
[°C]	[°C]	[min]	[min]
5	-5	60	360
5	0	40	180
5	5	20	120
10	10	12	80
15	15	8	60
20	20	5	45
25	25	3	30
25	30	2	20
25	40	0.5	10

R-KER-W

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

Installation data (cont.)

Minimum working and curing time

R-KER-S

Resin temperature	Concrete temperature	Working time	Curing time*
[°C]	[°C]	[min]	[min]
5	-20	-	-
5	-15	-	-
5	-10	-	-
5	-5	65	1440
5	0	50	960
5	5	35	720
10	10	20	480
15	15	12	360
20	20	9	240
25	25	7	180
25	30	6	120
25	40	4	45
25	45	3	35
25	50	2	25

*For wet concrete the curing time must be doubled

Mechanical properties

POST INSTALLED REBARS

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
18G2											
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	480	480	480	480	480	480	480	480	480
Nominal yield strength - tension	f_{yk}	[N/mm ²]	355	355	355	355	355	355	355	355	355
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	615.8	804.2
34G5											
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	500	500	500	500	500	500	500	500	500
Nominal yield strength - tension	f_{yk}	[N/mm ²]	410	410	410	410	410	410	410	410	410
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	615.8	804.2
B500SP											
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	575	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	500
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	615.8	804.2
RB500/BS1500S											
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	550	550	550	550	550	550	550	550	550
Nominal yield strength - tension	f_{yk}	[N/mm ²]	500	500	500	500	500	500	500	500	500
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	615.8	804.2

Basic performance data

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C20/25. STEEL A-II (18G2) [kN]																									
$\frac{bd}{d_s}$	100	110	130	150	170	190	210	230	260	280	290	330	360	400	460	530	670	750	800	830	850	900	930	1000	Steel Failure
8	5.8	6.4	7.5	8.7	9.8	11.0	12.1	13.3	15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.51
10	-	7.9	9.4	10.8	12.3	13.7	15.2	16.6	18.8	20.2	20.9	23.8	-	-	-	-	-	-	-	-	-	-	-	-	24.23
12	-	-	11.3	13.0	14.7	16.5	18.2	19.9	22.5	24.3	25.1	28.6	31.2	34.7	-	-	-	-	-	-	-	-	-	-	34.89
14	-	-	-	15.2	17.2	19.2	21.2	23.3	26.3	28.3	29.3	33.4	36.4	40.4	46.5	-	-	-	-	-	-	-	-	-	47.50
16	-	-	-	-	19.6	22.0	24.3	26.6	30.0	32.4	33.5	38.1	41.6	46.2	53.2	61.2	-	-	-	-	-	-	-	-	62.04
20	-	-	-	-	-	-	30.3	33.2	37.6	40.4	41.9	47.7	52.0	57.8	66.4	76.6	96.8	-	-	-	-	-	-	-	96.93
25	-	-	-	-	-	-	-	-	46.9	50.6	52.4	59.6	65.0	72.2	83.1	95.7	121.0	135.4	144.4	149.9	-	-	-	-	151.45
28	-	-	-	-	-	-	-	-	-	-	58.6	66.7	72.8	80.9	93.0	107.2	135.5	151.7	161.8	167.8	171.9	182.0	188.1	-	189.98
32	-	-	-	-	-	-	-	-	-	-	-	76.3	83.2	92.4	106.3	122.5	154.8	173.3	184.9	191.8	196.4	208.0	214.9	231.1	248.14

Basic performance data (cont.)

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C50/60, STEEL A-II (18G2) [kN]																										
$\frac{l_{bd}}{d_s}$ [mm]	100	120	140	160	170	180	200	230	250	280	290	320	330	400	450	500	550	640	700	720	850	910	950	1000	Steel failure	
8	9.3	11.2	13.0	14.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.51
10	11.6	13.9	16.3	18.6	19.8	20.9	23.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.23
12	-	16.7	19.5	22.3	23.7	25.1	27.9	32.1	34.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.89
14	-	-	22.8	26.0	27.7	29.3	32.5	37.4	40.7	45.5	47.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47.50
16	-	-	-	29.7	31.6	33.5	37.2	42.8	46.5	52.0	53.9	59.5	61.3	-	-	-	-	-	-	-	-	-	-	-	-	62.04
20	-	-	-	-	-	-	42.7	49.1	53.4	59.8	61.9	68.3	70.5	85.4	96.1	-	-	-	-	-	-	-	-	-	-	96.93
25	-	-	-	-	-	-	-	-	58.9	65.9	68.3	75.4	77.7	94.2	106.0	117.8	129.5	150.7	-	-	-	-	-	-	-	151.45
28	-	-	-	-	-	-	-	-	-	73.9	76.5	84.4	87.0	105.5	118.7	131.9	145.1	168.8	184.6	189.9	-	-	-	-	-	189.98
32	-	-	-	-	-	-	-	-	-	-	-	86.8	89.5	108.5	122.1	135.6	149.2	173.6	189.9	195.3	230.6	246.9	-	-	-	248.14

OVERLAP SPLICE – DESIGN RESISTANCE* – CONCRETE C20/25, STEEL A-II (18G2) [kN]																										
$\frac{l_0}{d_s}$ [mm]	200	210	240	250	260	300	330	375	400	420	440	460	480	500	530	550	600	670	750	800	830	900	930	1000	Steel failure	
8	11.6	12.1	13.9	14.4	15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.51
10	14.4	15.2	17.3	18.1	18.8	21.7	23.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.23
12	17.3	18.2	20.8	21.7	22.5	26.0	28.6	32.5	34.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.89
14	-	21.2	24.3	25.3	26.3	30.3	33.4	37.9	40.4	42.5	44.5	46.5	-	-	-	-	-	-	-	-	-	-	-	-	-	47.50
16	-	-	27.7	28.9	30.0	34.7	38.1	43.3	46.2	48.5	50.8	53.2	55.5	57.8	61.2	-	-	-	-	-	-	-	-	-	-	62.04
20	-	-	-	-	-	43.3	47.7	54.2	57.8	60.7	63.6	66.4	69.3	72.2	76.6	79.4	86.7	96.8	-	-	-	-	-	-	-	96.93
25	-	-	-	-	-	-	-	67.7	72.2	75.8	79.4	83.1	86.7	90.3	95.7	99.3	108.3	121.0	135.4	144.4	149.9	-	-	-	-	151.45
28	-	-	-	-	-	-	-	-	-	84.9	89.0	93.0	97.1	101.1	107.2	111.2	121.3	135.5	151.7	161.8	167.8	182.0	188.1	-	-	189.98
32	-	-	-	-	-	-	-	-	-	-	-	-	110.9	115.6	122.5	127.1	138.7	154.8	173.3	184.9	191.8	208.0	214.9	231.1	-	248.14

OVERLAP SPLICE – DESIGN RESISTANCE* – CONCRETE C50/60, STEEL A-II (18G2) [kN]																										
$\frac{l_0}{d_s}$ [mm]	200	208	210	240	250	290	300	330	375	400	420	450	480	500	550	600	640	700	720	800	850	900	910	1000	Steel failure	
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.51
10	23.2	24.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.23
12	27.9	29.0	29.3	33.5	34.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.89
14	-	-	34.2	39.0	40.7	47.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47.50
16	-	-	-	44.6	46.5	53.9	55.8	61.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	62.04
20	-	-	-	-	-	-	64.1	70.5	80.1	85.4	89.7	96.1	-	-	-	-	-	-	-	-	-	-	-	-	-	96.93
25	-	-	-	-	-	-	-	-	88.3	94.2	98.9	106.0	113.0	117.8	129.5	141.3	150.7	-	-	-	-	-	-	-	-	151.45
28	-	-	-	-	-	-	-	-	-	110.8	118.7	126.6	131.9	145.1	158.3	168.8	184.6	189.9	-	-	-	-	-	-	-	189.98
32	-	-	-	-	-	-	-	-	-	-	-	-	130.2	135.6	149.2	162.8	173.6	189.9	195.3	217.0	230.6	244.2	246.9	-	-	248.14

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C20/25, STEEL A-III (34GS) [kN]																										
$\frac{l_{bd}}{d_s}$ [mm]	100	120	140	170	190	210	240	300	310	320	330	380	400	440	460	500	540	620	700	770	850	900	960	1000	Steel failure	
8	5.8	6.9	8.1	9.8	11.0	12.1	13.9	17.3	17.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.91
10	-	8.7	10.1	12.3	13.7	15.2	17.3	21.7	22.4	23.1	23.8	27.4	-	-	-	-	-	-	-	-	-	-	-	-	-	27.99
12	-	-	12.1	14.7	16.5	18.2	20.8	26.0	26.9	27.7	28.6	32.9	34.7	38.1	39.9	-	-	-	-	-	-	-	-	-	-	40.30
14	-	-	-	17.2	19.2	21.2	24.3	30.3	31.3	32.4	33.4	38.4	40.4	44.5	46.5	50.6	54.6	-	-	-	-	-	-	-	-	54.85
16	-	-	-	-	22.0	24.3	27.7	34.7	35.8	37.0	38.1	43.9	46.2	50.8	53.2	57.8	62.4	71.6	-	-	-	-	-	-	-	71.65
20	-	-	-	-	-	-	34.7	43.3	44.8	46.2	47.7	54.9	57.8	63.6	66.4	72.2	78.0	89.6	101.1	111.2	-	-	-	-	-	111.95
25	-	-	-	-	-	-	-	54.2	56.0	57.8	59.6	68.6	72.2	79.4	83.1	90.3	97.5	111.9	126.4	139.0	153.5	162.5	173.3	-	-	174.92
28	-	-	-	-	-	-	-	-	-	-	66.7	76.8	80.9	89.0	93.0	101.1	109.2	125.4	141.6	155.7	171.9	182.0	194.1	202.2	-	219.42
32	-	-	-	-	-	-	-	-	-	-	-	87.8	92.4	101.7	106.3	115.6	124.8	143.3	161.8	178.0	196.4	208.0	221.9	231.1	-	286.59

Basic performance data (cont.)

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C50/60. STEEL A-III (34GS) [kN]																									
$\frac{l_{bd}}{d_s}$ [mm]	100	120	140	160	190	200	240	250	280	290	300	320	330	380	450	520	550	600	700	740	830	900	950	1000	Steel failure
8	9.3	11.2	13.0	14.9	17.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.91
10	11.6	13.9	16.3	18.6	22.1	23.2	27.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27.99
12	-	16.7	19.5	22.3	26.5	27.9	33.5	34.9	39.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.30
14	-	-	22.8	26.0	30.9	32.5	39.0	40.7	45.5	47.2	48.8	52.0	53.7	-	-	-	-	-	-	-	-	-	-	-	54.85
16	-	-	-	29.7	35.3	37.2	44.6	46.5	52.0	53.9	55.8	59.5	61.3	70.6	-	-	-	-	-	-	-	-	-	-	71.65
20	-	-	-	-	42.7	51.2	53.4	59.8	61.9	64.1	68.3	70.5	81.1	96.1	111.0	-	-	-	-	-	-	-	-	-	111.95
25	-	-	-	-	-	58.9	65.9	68.3	70.7	75.4	77.7	89.5	106.0	122.5	129.5	141.3	164.9	174.3	-	-	-	-	-	-	174.92
28	-	-	-	-	-	-	73.9	76.5	79.1	84.4	87.0	100.2	118.7	137.2	145.1	158.3	184.6	195.2	218.9	-	-	-	-	-	219.42
32	-	-	-	-	-	-	-	-	-	-	86.8	89.5	103.1	122.1	141.1	149.2	162.8	189.9	200.8	225.2	244.2	257.7	271.3	286.59	

OVERLAP SPLICE – DESIGN RESISTANCE* – CONCRETE C20/25. STEEL A-III (34GS) [kN]																									
$\frac{l_o}{d_s}$ [mm]	200	210	240	250	300	310	375	380	400	420	460	480	500	540	600	620	700	750	770	800	850	900	960	1000	Steel failure
8	11.6	12.1	13.9	14.4	17.3	17.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.91
10	14.4	15.2	17.3	18.1	21.7	22.4	27.1	27.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27.99
12	17.3	18.2	20.8	21.7	26.0	26.9	32.5	32.9	34.7	36.4	39.9	-	-	-	-	-	-	-	-	-	-	-	-	-	40.30
14	-	21.2	24.3	25.3	30.3	31.3	37.9	38.4	40.4	42.5	46.5	48.5	50.6	54.6	-	-	-	-	-	-	-	-	-	-	54.85
16	-	-	27.7	28.9	34.7	35.8	43.3	43.9	46.2	48.5	53.2	55.5	57.8	62.4	69.3	71.6	-	-	-	-	-	-	-	-	71.65
20	-	-	-	-	43.3	44.8	54.2	54.9	57.8	60.7	66.4	69.3	72.2	78.0	86.7	89.6	101.1	108.3	111.2	-	-	-	-	-	111.95
25	-	-	-	-	-	-	67.7	68.6	72.2	75.8	83.1	86.7	90.3	97.5	108.3	111.9	126.4	135.4	139.0	144.4	153.5	162.5	173.3	-	174.92
28	-	-	-	-	-	-	-	-	-	84.9	93.0	97.1	101.1	109.2	121.3	125.4	141.6	151.7	155.7	161.8	171.9	182.0	194.1	202.2	219.42
32	-	-	-	-	-	-	-	-	-	-	-	110.9	115.6	124.8	138.7	143.3	161.8	173.3	178.0	184.9	196.4	208.0	221.9	231.1	286.59

OVERLAP SPLICE – DESIGN RESISTANCE* – CONCRETE C50/60. STEEL A-III (34GS) [kN]																									
$\frac{l_o}{d_s}$ [mm]	200	210	240	260	280	300	330	350	375	380	400	420	480	500	520	600	650	700	740	800	830	900	950	1000	Steel failure
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.91
10	23.2	24.4	27.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27.99
12	27.9	29.3	33.5	36.2	39.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.30
14	-	34.2	39.0	42.3	45.5	48.8	53.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54.85
16	-	-	44.6	48.3	52.0	55.8	61.3	65.1	69.7	70.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71.65
20	-	-	-	-	-	64.1	70.5	74.7	80.1	81.1	85.4	89.7	102.5	106.8	111.0	-	-	-	-	-	-	-	-	-	111.95
25	-	-	-	-	-	-	-	-	88.3	89.5	94.2	98.9	113.0	117.8	122.5	141.3	153.1	164.9	174.3	-	-	-	-	-	174.92
28	-	-	-	-	-	-	-	-	-	-	-	110.8	126.6	131.9	137.2	158.3	171.4	184.6	195.2	211.0	218.9	-	-	-	219.42
32	-	-	-	-	-	-	-	-	-	-	-	-	130.2	135.6	141.1	162.8	176.3	189.9	200.8	217.0	225.2	244.2	257.7	271.3	286.59

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C20/25. STEEL A-IIIN (RB500/BS500S/BS500SP) [kN]																									
$\frac{l_{bd}}{d_s}$ [mm]	120	150	160	180	200	230	250	290	300	360	370	400	460	470	560	600	660	700	750	800	850	900	940	1000	Steel failure
8	6.9	8.7	9.2	10.4	11.6	13.3	14.4	16.8	17.3	20.8	21.4	-	-	-	-	-	-	-	-	-	-	-	-	-	21.84
10	-	10.8	11.6	13.0	14.4	16.6	18.1	20.9	21.7	26.0	26.7	28.9	33.2	33.9	-	-	-	-	-	-	-	-	-	-	34.13
12	-	-	-	15.6	17.3	19.9	21.7	25.1	26.0	31.2	32.1	34.7	39.9	40.7	48.5	-	-	-	-	-	-	-	-	-	49.15
14	-	-	-	-	20.2	23.3	25.3	29.3	30.3	36.4	37.4	40.4	46.5	47.5	56.6	60.7	66.7	-	-	-	-	-	-	-	66.90
16	-	-	-	-	-	26.6	28.9	33.5	34.7	41.6	42.8	46.2	53.2	54.3	64.7	69.3	76.3	80.9	86.7	-	-	-	-	-	87.37
20	-	-	-	-	-	-	-	41.9	43.3	52.0	53.4	57.8	66.4	67.9	80.9	86.7	95.3	101.1	108.3	115.6	122.8	130.0	135.8	-	136.52
25	-	-	-	-	-	-	-	-	-	65.0	66.8	72.2	83.1	84.9	101.1	108.3	119.2	126.4	135.4	144.4	153.5	162.5	169.7	180.6	213.32
28	-	-	-	-	-	-	-	-	-	-	-	80.9	93.0	95.0	113.2	121.3	133.5	141.6	151.7	161.8	171.9	182.0	190.1	202.2	267.58
32	-	-	-	-	-	-	-	-	-	-	-	-	106.3	108.6	129.4	138.7	152.5	161.8	173.3	184.9	196.4	208.0	217.2	231.1	349.50

Basic performance data (cont.)

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C50/60. STEEL A-IIIN (RB500/BSt500S/BS500SP) [kN]																										
$\frac{l_{bd}}{d_s}$	d_s [mm]	100	120	140	160	180	200	220	230	280	290	310	350	390	410	450	470	500	630	750	800	850	900	950	1000	Steel failure
		8	9.3	11.2	13.0	14.9	16.7	18.6	20.4	21.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	11.6	13.9	16.3	18.6	20.9	23.2	25.6	26.7	32.5	33.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.13
12	-	16.7	19.5	22.3	25.1	27.9	30.7	32.1	39.0	40.4	43.2	48.8	-	-	-	-	-	-	-	-	-	-	-	-	-	49.15
14	-	-	22.8	26.0	29.3	32.5	35.8	37.4	45.5	47.2	50.4	56.9	63.4	66.7	-	-	-	-	-	-	-	-	-	-	-	66.90
16	-	-	-	29.7	33.5	37.2	40.9	42.8	52.0	53.9	57.6	65.1	72.5	76.2	83.6	87.4	-	-	-	-	-	-	-	-	-	87.37
20	-	-	-	-	42.7	47.0	49.1	59.8	61.9	66.2	74.7	83.3	87.5	96.1	100.4	106.8	134.5	-	-	-	-	-	-	-	-	136.52
25	-	-	-	-	-	-	-	65.9	68.3	73.0	82.4	91.8	96.6	106.0	110.7	117.8	148.4	176.6	188.4	200.2	212.0	-	-	-	-	213.32
28	-	-	-	-	-	-	-	-	-	-	81.8	92.3	102.9	108.1	118.7	124.0	131.9	166.2	197.8	211.0	224.2	237.4	250.6	263.8	-	267.58
32	-	-	-	-	-	-	-	-	-	-	-	-	105.8	111.2	122.1	127.5	135.6	170.9	203.5	217.0	230.6	244.2	257.7	271.3	-	349.50

OVERLAP SPLICE – DESIGN RESISTANCE* – CONCRETE C20/25. STEEL A-III (34GS) [kN]																										
$\frac{l_0}{d_s}$	d_s [mm]	200	210	240	250	300	310	375	380	400	420	460	480	500	540	600	620	700	750	770	800	850	900	960	1000	Steel failure
		8	11.6	12.1	13.9	14.4	17.3	17.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	14.4	15.2	17.3	18.1	21.7	22.4	27.1	27.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27.99
12	17.3	18.2	20.8	21.7	26.0	26.9	32.5	32.9	34.7	36.4	39.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.30
14	-	21.2	24.3	25.3	30.3	31.3	37.9	38.4	40.4	42.5	46.5	48.5	50.6	54.6	-	-	-	-	-	-	-	-	-	-	-	54.85
16	-	-	27.7	28.9	34.7	35.8	43.3	43.9	46.2	48.5	53.2	55.5	57.8	62.4	69.3	71.6	-	-	-	-	-	-	-	-	-	71.65
20	-	-	-	-	43.3	44.8	54.2	54.9	57.8	60.7	66.4	69.3	72.2	78.0	86.7	89.6	101.1	108.3	111.2	-	-	-	-	-	-	111.95
25	-	-	-	-	-	-	67.7	68.6	72.2	75.8	83.1	86.7	90.3	97.5	108.3	111.9	126.4	135.4	139.0	144.4	153.5	162.5	173.3	-	-	174.92
28	-	-	-	-	-	-	-	-	-	84.9	93.0	97.1	101.1	109.2	121.3	125.4	141.6	151.7	155.7	161.8	171.9	182.0	194.1	202.2	-	219.42
32	-	-	-	-	-	-	-	-	-	-	-	-	110.9	115.6	124.8	138.7	143.3	161.8	173.3	178.0	184.9	196.4	208.0	221.9	231.1	286.59

OVERLAP SPLICE – DESIGN RESISTANCE – CONCRETE C50/60. STEEL A-IIIN (RB500/BSt500S/BS500SP) [kN]																										
$\frac{l_0}{d_s}$	d_s [mm]	200	210	230	240	290	300	330	350	375	390	410	420	470	480	550	600	630	700	750	800	850	900	950	1000	Steel failure
		8	18.6	19.5	21.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	23.2	24.4	26.7	27.9	33.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.13
12	27.9	29.3	32.1	33.5	40.4	41.8	46.0	48.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49.15
14	-	34.2	37.4	39.0	47.2	48.8	53.7	56.9	61.0	63.4	66.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66.90
16	-	-	-	44.6	53.9	55.8	61.3	65.1	69.7	72.5	76.2	78.1	87.4	-	-	-	-	-	-	-	-	-	-	-	-	87.37
20	-	-	-	-	64.1	70.5	74.7	80.1	83.3	87.5	89.7	100.4	102.5	117.4	128.1	134.5	-	-	-	-	-	-	-	-	-	136.52
25	-	-	-	-	-	-	-	-	88.3	91.8	96.6	98.9	110.7	113.0	129.5	141.3	148.4	164.9	176.6	188.4	200.2	212.0	-	-	-	213.32
28	-	-	-	-	-	-	-	-	-	-	-	110.8	124.0	126.6	145.1	158.3	166.2	184.6	197.8	211.0	224.2	237.4	250.6	263.8	-	267.58
32	-	-	-	-	-	-	-	-	-	-	-	-	-	130.2	149.2	162.8	170.9	189.9	203.5	217.0	230.6	244.2	257.7	271.3	-	349.50

Product commercial data

Product Code	Volume [m]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-KER-280	280	10	50	600	6.3	31.5	378	5906675049663	18
R-KER-380	380	10	50	600	6.3	31.5	378	5906675290379	18
R-KER-380-W	380	10	40	480	8.31	33.24	399	5906675290379	12
R-KER-380-S	380	10	10	630	6.3	6.3	427	5906675222981	12

R-KEM II with Threaded Rods for Concrete

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



Installation movie



Approvals and Reports

- ETA-12/0394; ETAG 001-05, Option 7



Product overview

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 using standard manual silicone gun
- Suitable for multiple use. Partly used product can be reused after fitting spare nozzle

Applications

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

Base materials

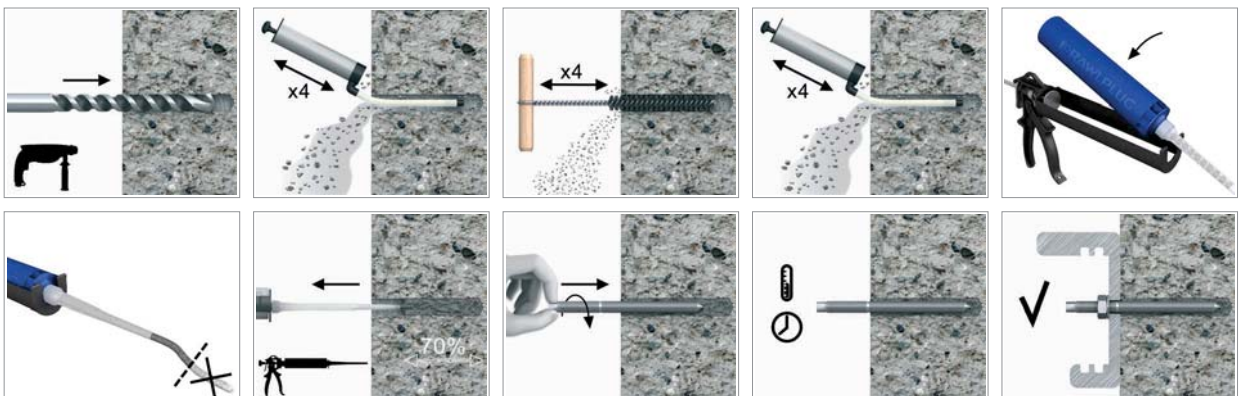
Approved for use in:

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

Also suitable for use in:

- Natural Stone

Installation guide



Installation guide (cont.)

1. Drill hole to the required diameter and depth for stud size being used.
2. Solid substrates: clean the hole with brush and hand pump at least four times each. It is very important and necessary before installation. Hollow substrates: insert mesh sleeve into the hole.
3. Insert cartridge into gun and attach nozzle.
4. Dispense to waste until even colour is obtained.
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.

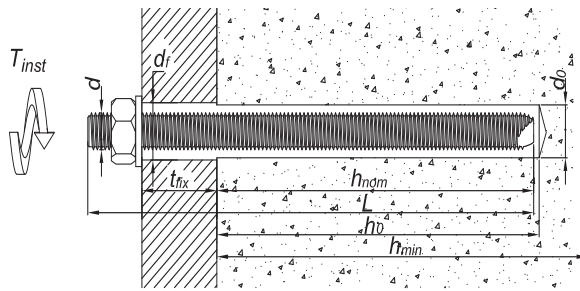
Product information

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-KEM-II-175	R-KEMII	Styrene Free Polyester Resin	175
R-KEM-II-175-SET		Set with 4 studs and plastic sleeves	
R-KEM-II-300		Styrene Free Polyester Resin	300
R-KEM-II-300-SET		Set with 4 studs and plastic sleeves	
R-KEM-II-300S	R-KEMII-S	High Temperature (Summer) / Slow Cure Styrene Free Polyester Resin	380
R-KEM-II-380	R-KEMII	Styrene Free Polyester Resin	

THREADED RODS

Size	Product Code			Anchor		Fixture			
	Steel class 5.8	Steel class 8.8	Steel grade A4	Diameter	Length	Hole diameter	Max. thickness		
				d	L	d _f	t _{fix} for h _{ef,min}	t _{fix} for h _{ef,std}	t _{fix} for h _{ef,max}
				[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
M8	R-STUDS-08110	R-STUDS-08110-88	R-STUDS-08110-A4	8	110	9	40	20	-
	R-STUDS-08160	-	-	8	160	9	90	70	50
M10	R-STUDS-10130	R-STUDS-10130-88	R-STUDS-10130-A4	10	130	12	48	28	-
	R-STUDS-10170	-	R-STUDS-10170-A4	10	170	12	88	68	38
	R-STUDS-10190	-	-	10	190	12	108	88	58
M12	R-STUDS-12160	R-STUDS-12160-88	R-STUDS-12160-A4	12	160	14	65	35	-
	R-STUDS-12190	-	R-STUDS-12190-A4	12	190	14	95	65	30
	R-STUDS-12220	-	R-STUDS-12220-A4	12	220	14	125	95	60
	R-STUDS-12260	-	-	12	260	14	165	135	100
	R-STUDS-12300	-	-	12	300	14	205	175	140
M16	R-STUDS-16190	R-STUDS-16190-88	R-STUDS-16190-A4	16	190	18	71	46	-
	R-STUDS-16220	R-STUDS-16220-88	-	16	220	18	101	76	11
	R-STUDS-16260	-	R-STUDS-16260-A4	16	260	18	141	116	51
	R-STUDS-16300	-	-	16	300	18	181	156	91
	R-STUDS-16380	-	-	16	380	18	261	236	171
M20	R-STUDS-20260	R-STUDS-20260-88	R-STUDS-20260-A4	20	260	22	117	67	-
	R-STUDS-20300	R-STUDS-20300-88	-	20	300	22	157	107	37
	R-STUDS-20350	-	-	20	350	22	207	157	87
M24	R-STUDS-24300	R-STUDS-24300-88	R-STUDS-24300-A4	24	300	26	132	62	-
M30	R-STUDS-30380	R-STUDS-30380-88	R-STUDS-30380-A4	30	380	32	181	106	-

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	
Installation torque	T _{inst}	[Nm]	10	20	40	80	120	180	300	
Min. hole depth in substrate	h ₀	[mm]	h _{ef} + 5							
MINIMUM EMBEDMENT DEPTH										
Installation depth	h _{nom, min}	[mm]	60	70	80	100	120	140	165	
STANDARD EMBEDMENT DEPTH										
Installation depth	h _{nom, s}	[mm]	80	90	110	125	170	210	240	
MAXIMUM EMBEDMENT DEPTH										
Installation depth	h _{nom, max}	[mm]	100	120	145	190	240	290	360	
Min. substrate thickness	h _{min}	[mm]	h _{ef} + 30 ≥ 100				h _{ef} + 2*d ₀			
Min. spacing	s _{min}	[mm]	0.5 * h _{ef} ≥ 40							
Min. edge distance	c _{min}	[mm]	0.5 * h _{ef} ≥ 40							

Minimum working and curing time

Resin temperature [°C]	Concrete temperature [°C]	Working time [min]			Curing time* [min]		
		R-KEMII-S	R-KEMII	R-KEMII-W	R-KEMII-S	R-KEMII	R-KEMII-W
5	-20	-	-	45	-	-	24h
5	-15	-	-	30	-	-	18h
5	-10	-	-	20	-	-	8h
5	-5	4h	70	11	24h	8h	5h
5	0	2h	45	7	18h	4h	2h
5	5	60	25	5	12h	2h	60
10	10	45	15	2	8h	90	45
15	15	25	9	1,5	6h	60	30
20	20	15	5	1	4h	45	15
25	30	7	2	-	90	30	-
25	40	5	-	-	45	-	-

*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/mm ²]	520	520	520	520	520	520	520
Nominal yield strength - tension	f_{yk}	[N/mm ²]	420	420	420	420	420	420	420
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	$M_{Rk,s}^0$	[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	$M_{Rk,s}^0$	[Nm]	30	60	105	266	519	898	1793
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	$M_{Rk,s}^0$	[Nm]	26	52	92	233	454	785	1569
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	
Substrate		Non-cracked concrete							
MEAN ULTIMATE LOAD									
TENSION LOAD $N_{Ru,m}$									
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8									
Minimum embedment depth	[kN]	16.3	23.7	31	47.3	68.4	76.9	95.7	
Standard embedment depth	[kN]	20.4	32.2	42.6	68.6	102.6	115.4	150.8	
Maximum embedment depth	[kN]	21.6	34.8	50.4	89.9	136.7	159.4	208.8	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8									
Minimum embedment depth	[kN]	16.3	23.7	31	47.3	68.4	76.9	95.7	
Standard embedment depth	[kN]	20.4	32.2	42.6	68.6	102.6	115.4	150.8	
Maximum embedment depth	[kN]	21.6	34.8	50.4	89.9	136.7	159.4	208.8	
R-STUDS METRIC THREADED RODS - A4									
Minimum embedment depth	[kN]	16.3	23.7	31	47.3	68.4	76.9	95.7	
Standard embedment depth	[kN]	20.4	32.2	42.6	68.6	102.6	115.4	150.8	
Maximum embedment depth	[kN]	21.6	34.8	50.4	89.9	136.7	159.4	208.8	
SHEAR LOAD $V_{Ru,m}$									
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	18.3	29	42.15	78.5	122.5	176.5	280.5	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	29.28	46.4	67.44	125.6	196	282.4	448.8	
R-STUDS METRIC THREADED RODS - A4	[kN]	25.62	40.6	59.01	109.9	171.5	247.1	392.7	

Basic performance data (cont.)

R-STUDS

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

Size		M8	M10	M12	M16	M20	M24	M30
CHARACTERISTIC LOAD								
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
Standard embedment depth	[kN]	18	26.9	37.3	50.3	85.5	102.9	124.4
Maximum embedment depth	[kN]	18	29	42	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
Standard embedment depth	[kN]	19.1	26.9	37.3	50.3	85.5	102.9	124.4
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
Standard embedment depth	[kN]	19.1	26.9	37.3	50.3	85.5	102.9	124.4
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	[kN]	9.0	14.0	21.0	39.0	61.0	88.0	140.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	15.0	23.0	34.0	63.0	98.0	141.0	224.0
R-STUDS METRIC THREADED RODS - A4	[kN]	13.0	20.0	29.0	55.0	86.0	124.0	196.0
DESIGN LOAD								
TENSION LOAD N_{Rd}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8								
Minimum embedment depth	[kN]	6.8	11.61	15.1	22.3	33.5	38.1	47.5
Standard embedment depth	[kN]	9.10	14.9	20.7	27.9	47.5	57.2	69.1
Maximum embedment depth	[kN]	11.4	19.3	27.3	42.4	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
Standard embedment depth	[kN]	9.10	14.9	20.7	27.9	47.5	57.2	69.1
Maximum embedment depth	[kN]	11.4	19.9	27.3	42.4	67.0	79.0	103.7
R-STUDS METRIC THREADED RODS - A4								
Minimum embedment depth	[kN]	6.80	11.6	15.1	22.3	33.5	38.1	47.5
Standard embedment depth	[kN]	9.10	14.9	20.7	27.9	47.5	57.2	69.1
Maximum embedment depth	[kN]	11.4	19.9	27.3	42.4	67.0	79.0	103.7
SHEAR LOAD V_{Rd}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	7.20	11.2	16.8	31.2	48.8	70.4	112.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	12.0	18.4	27.2	50.4	78.4	112.8	179.2
R-STUDS METRIC THREADED RODS - A4	[kN]	8.33	12.8	18.6	35.3	55.1	79.5	125.6
RECOMMENDED LOAD								
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
Standard embedment depth	[kN]	6.50	10.7	14.8	20.0	33.9	40.9	49.4
Maximum embedment depth	[kN]	8.14	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]	4.9	8.29	10.8	16.0	23.9	27.2	33.9
Standard embedment depth	[kN]	6.5	10.7	14.8	20.0	33.9	40.9	49.4
Maximum embedment depth	[kN]	8.14	14.2	19.5	30.3	47.9	56.4	74.1

Basic performance data (cont.)

Size		M8	M10	M12	M16	M20	M24	M30
Substrate		Non-cracked concrete						
RECOMMENDED LOAD								
R-STUDS METRIC THREADED RODS - A4								
Minimum embedment depth	[kN]	4.87	8.29	10.8	16.0	23.9	27.2	33.9
Standard embedment depth	[kN]	6.50	10.7	14.8	20.0	33.9	40.9	49.4
Maximum embedment depth	[kN]	8.14	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	[kN]	5.14	8.0	12.0	22.3	34.9	50.3	80.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8.57	13.1	19.4	36.0	56.0	80.6	128.0
R-STUDS METRIC THREADED RODS - A4	[kN]	5.95	9.16	13.3	25.2	39.4	56.8	89.7

Product commercial data

Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-KEM-II-175	175	10	50	600	6	30	360	5906675050249	18
R-KEM-II-175-SET	175	5	5	315	7.1	7.1	447.3	5906675057866	18
R-KEM-II-300	300	10	50	600	6	30	360	5906675050256	18
R-KEM-II-300-SET	300	5	5	315	7.1	7.1	447.3	5906675057859	18
R-KEM-II-300-S	300	10	50	600	6	30	360	5906675064642	12
R-KEM-II-380	380	10	40	480	7.70	32	384	5906675097770	18

R-KEM II with Threaded Rods for Masonry

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



Installation movie



Approvals and Reports

- ETA-12/0528; ETAG 029



Product overview

Features and benefits

- The most convenient bonded anchor for general purpose use
- Approved for 15 substrates
- 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 using standard manual silicone gun
- Suitable for multiple use. Partly used product can be reused after fitting spare nozzle

Applications

- Gates
- Window elements
- Canopies
- Sanitary appliances
- Railings
- Handrails
- Consoles
- Ladders
- Cable trays

Base materials

Approved for use in:

- Solid Concrete Block
- Solid Brick
- Solid Sand-lime Brick
- Hollow Sand-lime Brick
- Hollow Brick
- Hollow Lightweight Concrete Block
- Hollow-core Slab

Installation guide



Installation guide (cont.)

1. Drill hole to the required diameter and depth for stud size being used.
- 2a. Solid substrates: Clean the hole with brush and hand pump at least four times each. It is very important and necessary before installation.
- 2b. Hollow substrates: Insert mesh sleeve into the hole.
3. Insert cartridge into gun and attach nozzle.
4. Dispense to waste until even colour is obtained.
- 5a. Solid Substrates: 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.
- 5b. Hollow substrate: Insert the mixing nozzle to the far end of the hole and inject resin, slowly withdrawing the nozzle as the hole is filled to the surface.
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 information

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-KEM-II-175	R-KEMII	Styrene Free Polyester Resin	175
R-KEM-II-175-SET		Set with 4 studs and plastic sleeves	
R-KEM-II-300		Styrene Free Polyester Resin	300
R-KEM-II-300-SET		Set with 4 studs and plastic sleeves	
R-KEM-II-300S	R-KEMII-S	High Temperature (Summer) / Slow Cure Styrene Free Polyester Resin	380
R-KEM-II-380	R-KEMII	Styrene Free Polyester Resin	

THREADED RODS

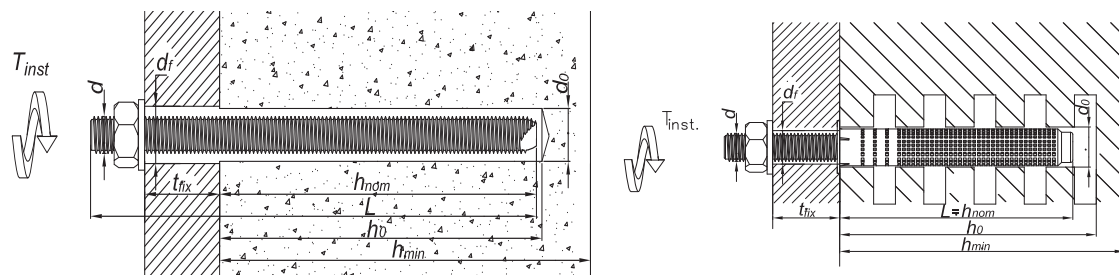
Size	Product Code			Anchor		Hole diameter	Fixture		
	Steel grade A4	Steel class 5.8	Steel class 8.8	Diameter	Length		Max. thickness		
						Solid substrates	Hollow substrates		
	d	L	d _i	t _{fix} for h _{nom}	t _{fix} for h _{nom,std}		t _{fix} for h _{nom,max}		
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]			
M8	R-STUDS-08110	R-STUDS-08110-88	R-STUDS-08110-A4	8	110	9	20	50	20
	R-STUDS-08160	-	-	8	160	9	70	100	70
M10	R-STUDS-10130	R-STUDS-10130-88	R-STUDS-10130-A4	10	130	12	33	33	-
	R-STUDS-10170	-	R-STUDS-10170-A4	10	170	12	73	73	33
	R-STUDS-10190	-	-	10	190	12	93	93	53
M12	R-STUDS-12160	R-STUDS-12160-88	R-STUDS-12160-A4	12	160	14	50	60	20
	R-STUDS-12190	-	R-STUDS-12190-A4	12	190	14	80	90	50
	R-STUDS-12220	-	R-STUDS-12220-A4	12	220	14	110	120	80
	R-STUDS-12260	-	-	12	260	14	150	160	120
	R-STUDS-12300	-	-	12	300	14	190	200	160
M16	R-STUDS-16190	R-STUDS-16190-88	R-STUDS-16190-A4	16	190	18	66	86	-
	R-STUDS-16220	R-STUDS-16220-88	-	16	220	18	96	116	-
	R-STUDS-16260	-	R-STUDS-16260-A4	16	260	18	136	156	-
	R-STUDS-16300	-	-	16	300	18	176	196	-
	R-STUDS-16380	-	-	16	380	18	256	276	-

Product information (cont.)

R-PLS Plastic Mesh Sleeves and SP-CE Wire Mesh Sleeves

Product Code	Size		Quantity [pcs]		Weight [kg]		Bar Code
	Sleeve [mm]	Stud	Outer	Pallet	Box	Outer	
R-PLS-12050-10	12x50	M6-M8	10	480	0.06	0.06	5906675377520
R-PLS-15085-10	15x85	M8-M10	10	6000	0.06	0.06	5906675291840
R-PLS-15125-10	15x125	M8-M10	10	6000	0.08	0.08	5906675291857
R-PLS-20085-10	20x85	M12-M16	10	4800	0.08	0.08	5906675291864
SP-CE-R08	10x1000	M6-M8	10	-	0,129	0,129	5906675266138
SP-CE-R10	12x1000	M8	10	-	0,129	0,129	5906675610122
SP-CE-R12	16x1000	M10	10	-	0,129	0,129	5906675610320
SP-CE-R16	22x1000	M12	10	-	0,129	0,129	5906675610528
SP-CE-R20	28x1000	M16	5	-	0,258	0,258	5906675610726
SP-CE-ED-1M	-	-	10	-	0,002	0,002	5906675601120

Installation data



SOLID SUBSTRATES

Size			M8	M10	M12	M16	M8	M10	M12	M16
Substrate			Ceramic solid substrates				Aerated concrete			
Thread diameter	d	[mm]	8	10	12	16	8	10	12	16
Hole diameter in substrate	d ₀	[mm]	10	12	14	18	10	12	14	18
Installation torque	T _{inst}	[Nm]	5	8	10	15	3	4	6	10
Min. hole depth in substrate	h ₀	[mm]	h _{nom} + 5							
Installation depth	h _{nom,min}	[mm]	80	85	95	105	80	85	95	105
Min. spacing	s _{min}	[mm]	50	50	50	54	50	50	50	54
Min. edge distance	c _{min}	[mm]	50	50	50	54	50	50	50	54

HOLLOW SUBSTRATES

Size			M10	M10	M12	M16				
Substrate			Hollow substrates							
Thread diameter	d	[mm]	8	8	10	10	12	12	16	
Plastic mesh sleeve size	d _{xl}	[mm]	12x50	12x80	15x85	15x125	15x85	15x125	20x85	
Hole diameter in substrate	d ₀	[mm]	12	12	16	16	16	16	20	
Installation torque	T _{inst}	[Nm]	3	3	4	4	6	6	10	
Min. hole depth in substrate	h ₀	[mm]	h _{nom} + 5							
Installation depth	h _{nom,std}	[mm]	50	-	85	-	85	-	85	
	h _{nom,max}	[mm]	-	80	-	125	-	125	-	
Min. spacing	s _{min}	[mm]	100	100	100	100	100	100	120	
Min. edge distance	c _{min}	[mm]	100	100	100	100	100	100	120	

Installation data

Minimum working and curing time

Resin temperature [°C]	Concrete temperature [°C]	Working time [min]			Curing time* [min]		
		R-KEMII-S	R-KEMII	R-KEMII-W	R-KEMII-S	R-KEMII	R-KEMII-W
5	-20	-	-	45	-	-	1440
5	-15	-	-	30	-	-	1080
5	-10	-	-	20	-	-	480
5	-5	180	70	11	1440	480	360
5	0	120	45	7	1080	240	120
5	5	60	25	5	720	120	60
10	10	45	15	2	480	90	45
15	15	25	9	1,5	360	60	30
20	20	15	5	1	240	45	15
25	30	7	2	-	90	30	-
25	35	6	-	-	60	-	-
25	40	5	-	-	45	-	-

*For wet concrete the curing time must be doubled

Mechanical properties

R-STUDS

Size			M8	M10	M12	M16
R-STUDS METRIC THREADED RODS - steel class 5.8						
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	500	500	500	500
Nominal yield strength - tension	f_{yk}	[N/mm ²]	400	400	400	400
Cross sectional area - tension	A_s	[mm ²]	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm ³]	31.2	62.3	109.2	277.5
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	19	37	65	166
Design bending resistance	M	[Nm]	15	30	52	133
R-STUDS METRIC THREADED RODS - steel class 8.8						
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	800	800	800	800
Nominal yield strength - tension	f_{yk}	[N/mm ²]	640	640	640	640
Cross sectional area - tension	A_s	[mm ²]	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm ³]	31.2	62.3	109.2	277.5
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	30	60	105	266
Design bending resistance	M	[Nm]	24	48	84	213
R-STUDS METRIC THREADED RODS - A4						
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	700	700	700	700
Nominal yield strength - tension	f_{yk}	[N/mm ²]	350	350	350	350
Cross sectional area - tension	A_s	[mm ²]	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm ³]	31.2	62.3	109.2	277.5
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	26	52	92	233
Design bending resistance	M	[Nm]	17	34	59	149

Basic performance data

SOLID SUBSTRATES

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

Size			M8	M10	M12	M16
Substrate	Solid substrates					
Plastic mesh sleeve (dxl)	[mm]		-	-	-	-
MEAN ULTIMATE LOAD						
TENSION LOADS $N_{Ru,m}$						
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]		8.78	10.9	11.3	11.5
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]		2.65	3.24	4.11	4.68
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]		7.54	8.00	8.30	8.50

Basic performance data (cont.)

SOLID SUBSTRATES

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

Size		M8	M10	M12	M16
SHEAR LOADS $V_{Ru,m}$					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	5.79	8.35	11.6	11.5
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	2.43	3.41	4.36	4.48
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	5.86	8.11	7.91	8.23
CHARACTERISTIC LOAD*					
TENSION LOADS N_{Rk}					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	6.0	7.0	7.0	7.0
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	1.5	2.0	2.5	3.0
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	5.0	5.0	5.0	5.0
SHEAR LOADS V_{Rk}					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	3.5	5.0	7.0	7.0
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	1.5	2.0	2.5	2.5
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	3.5	5.0	5.0	5.0
DESIGN LOAD					
TENSION LOAD N_{Rd}					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	2.40	2.80	2.80	2.80
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	0.75	1.00	1.25	1.50
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	2.00	2.00	2.00	2.00
SHEAR LOAD V_{Rd}					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	1.40	2.00	2.80	2.80
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	0.75	1.00	1.25	1.25
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	1.40	2.00	2.00	2.00
RECOMMENDED LOAD**					
TENSION LOAD N_{rec}					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	1.71	2.00	2.00	2.00
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	0.54	0.71	0.89	1.07
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	1.43	1.43	1.43	1.43
SHEAR LOAD V_{rec}					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	1.00	1.43	2.00	2.00
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	0.54	0.71	0.89	0.89
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	1.00	1.43	1.43	1.43

*According to ETAG 029, **Partial safety factor 1.4

HOLLOW SUBSTRATES

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

Size		M8	M10	M12	M16			
Substrate		Hollow substrates						
Plastic mesh sleeve (dxl)	[mm]	12x50	12x80	15x85	15x125	15x85	15x125	20x85
MEAN ULTIMATE LOAD								
TENSION AND SHEAR LOADS $F_{Ru,m}$								
Silicate hollow block min 12MPa (eg KS Ratio Block 8 DF)	[kN]	3.42	3.50	3.73	5.11	4.16	4.48	4.24
Perforated ceramic blocks min 12MPa (eg Proton Hz 12/0.9 DF)	[kN]	3.21	3.54	3.87	4.03	3.97	4.16	3.69
Perforated ceramic blocks min 15MPa (eg Wienerberger Porotherm)	[kN]	2.04	2.84	3.07	3.68	3.74	3.99	3.51
Perforated ceramic blocks min 10MPa (eg Leiter Thermopor)	[kN]	2.08	2.98	3.19	3.78	3.68	4.03	3.77
Perforated ceramic blocks min 15MPa (eg MEGA MAX)	[kN]	2.86	3.43	3.74	3.59	3.71	3.94	3.80
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Mono Rect)	[kN]	1.24	1.25	2.49	2.74	2.82	2.78	2.14
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Rect)	[kN]	1.73	1.60	2.37	2.51	2.41	2.68	2.10
Perforated ceramic blocks min 6.0MPa (eg LS Monomur)	[kN]	1.30	1.39	1.99	2.06	2.05	2.12	2.05
Perforated ceramic blocks min 6MPa (eg SM BGV Thermo)	[kN]	1.45	1.45	2.22	2.17	2.19	2.24	2.25
Perforated ceramic blocks min 6.0MPa (eg SM BGV Thermo Plus)	[kN]	1.51	1.60	1.39	1.45	1.86	2.07	1.75
Lightweight concrete hollow block min 2.0MPa	[kN]	1.73	2.38	3.52	3.00	3.93	3.75	3.92

Basic performance data (cont.)

HOLLOW SUBSTRATES

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

Size		M8	M10	M12	M16		
CHARACTERISTIC LOAD*							
TENSION AND SHEAR LOADS F_{Rk}							
Silicate hollow block min 12MPa (eg KS Ratio Block 8 DF)	[kN]	2.5	2.5	2.5	3.0	3.0	3.0
Perforated ceramic blocks min 12MPa (eg Proton Hz 12/0.9 DF)	[kN]	2.0	2.5	2.5	2.5	2.5	2.5
Perforated ceramic blocks min 15MPa (eg Wienerberger Porotherm)	[kN]	1.5	2.0	2.0	2.5	2.5	2.5
Perforated ceramic blocks min 10MPa (eg Leiter Thermopor)	[kN]	1.5	2.0	2.0	2.5	2.5	2.5
Perforated ceramic blocks min 15MPa (eg MEGA MAX)	[kN]	2.0	2.5	2.5	2.5	2.5	2.5
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Mono Rect)	[kN]	0.9	0.9	1.5	2.0	2.0	2.0
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Rect)	[kN]	0.9	1.2	1.5	1.5	1.5	2.0
Perforated ceramic blocks min 6.0MPa (eg LS Monomur)	[kN]	0.9	0.9	1.2	1.5	1.5	1.5
Perforated ceramic blocks min 6MPa (eg SM BGV Thermo)	[kN]	0.9	0.9	1.5	1.5	1.5	1.5
Perforated ceramic blocks min 6.0MPa (eg SM BGV Thermo Plus)	[kN]	0.9	1.2	0.9	0.9	1.2	1.5
Lightweight concrete hollow block min 2.0MPa	[kN]	1.2	1.5	2.5	2.0	2.5	2.5
DESIGN LOAD							
TENSION AND SHEAR LOADS F_{Rd}							
Silicate hollow block min 12MPa (eg KS Ratio Block 8 DF)	[kN]	1.0	1.0	1.0	1.4	1.2	1.2
Perforated ceramic blocks min 12MPa (eg Proton Hz 12/0.9 DF)	[kN]	0.88	1.0	1.2	1.4	1.4	1.6
Perforated ceramic blocks min 15MPa (eg Wienerberger Porotherm)	[kN]	0.6	0.8	1.0	1.0	1.4	1.4
Perforated ceramic blocks min 10MPa (eg Leiter Thermopor)	[kN]	0.6	0.8	0.8	1.0	1.0	1.4
Perforated ceramic blocks min 15MPa (eg MEGA MAX)	[kN]	0.8	1.0	1.4	1.4	1.6	1.6
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Mono Rect)	[kN]	0.36	0.36	0.8	0.8	0.8	0.8
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Rect)	[kN]	0.48	0.48	0.6	0.6	0.8	0.8
Perforated ceramic blocks min 6.0MPa (eg LS Monomur)	[kN]	0.36	0.36	0.6	0.6	0.6	0.6
Perforated ceramic blocks min 6MPa (eg SM BGV Thermo)	[kN]	0.36	0.36	0.6	0.6	0.6	0.6
Perforated ceramic blocks min 6.0MPa (eg SM BGV Thermo Plus)	[kN]	0.48	0.48	0.48	0.48	0.48	0.60
Lightweight concrete hollow block min 2.0MPa	[kN]	0.48	0.6	1.0	1.0	1.0	1.4
RECOMMENDED LOAD**							
TENSION AND SHEAR LOADS F_{rec}							
Silicate hollow block min 12MPa (eg KS Ratio Block 8 DF)	[kN]	0.71	0.71	0.71	1.0	0.86	0.86
Perforated ceramic blocks min 12MPa (eg Proton Hz 12/0.9 DF)	[kN]	0.63	0.71	0.86	1.0	1.0	1.14
Perforated ceramic blocks min 15MPa (eg Wienerberger Porotherm)	[kN]	0.43	0.57	0.71	0.71	1.0	1.0
Perforated ceramic blocks min 10MPa (eg Leiter Thermopor)	[kN]	0.43	0.57	0.57	0.71	0.71	1.0
Perforated ceramic blocks min 15MPa (eg MEGA MAX)	[kN]	0.57	0.71	1.0	1.0	1.14	1.14
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Mono Rect)	[kN]	0.26	0.26	0.57	0.57	0.57	0.57
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Rect)	[kN]	0.34	0.34	0.43	0.43	0.57	0.57
Perforated ceramic blocks min 6.0MPa (eg LS Monomur)	[kN]	0.26	0.26	0.43	0.43	0.43	0.43
Perforated ceramic blocks min 6MPa (eg SM BGV Thermo)	[kN]	0.26	0.26	0.43	0.43	0.43	0.43
Perforated ceramic blocks min 6.0MPa (eg SM BGV Thermo Plus)	[kN]	0.34	0.34	0.34	0.34	0.34	0.43
Lightweight concrete hollow block min 2.0MPa	[kN]	0.34	0.43	0.71	0.71	0.71	1.0

Product commercial data

Product Code	Volume [m ³]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-KEM-II-175	175	10	50	600	6	30	360	5906675050249	18
R-KEM-II-175-SET	175	5	5	315	7.1	7.1	447.3	5906675057866	18
R-KEM-II-300	300	10	50	600	6	30	360	5906675050256	18
R-KEM-II-300-SET	300	5	5	315	7.1	7.1	447.3	5906675057859	18
R-KEM-II-300-S	300	10	50	600	6	30	360	5906675064642	12
R-KEM-II-380	380	10	40	480	7.70	32	384	5906675097770	18

R-KF2 with Threaded Rods

Economy polyester resin approved for use in non-cracked concrete

Approvals and Reports

- ETA-11/0141; ETAG 001-05, Option 7



Product overview

Features and benefits

- Economical fixings resin for medium duty load applications
- Can be used in damp conditions and underwater applications
- Wide range of steel studs with different lengths and diameters
- Small edge and spacing distances
- Suitable for repetitive use. Partly used product can be reused by fitting a new mixing nozzle

Applications

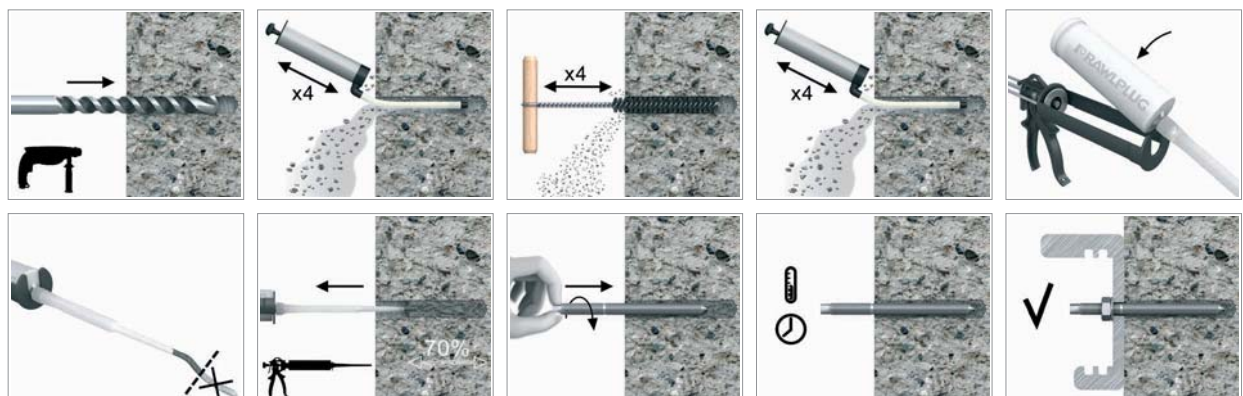
- Guard rails
- Handrails
- Canopies
- Masonry support
- Balustrading
- Cable trays
- Curtain walling
- Fencing & gates

Base materials

Approved for use in:

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

Installation guide



Installation guide (cont.)

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.
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.

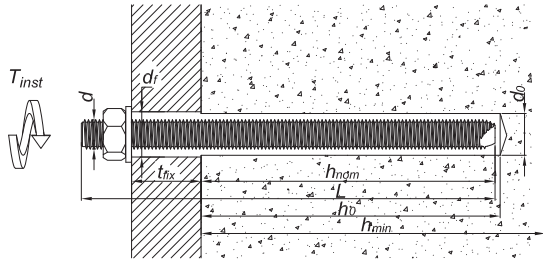
Product information

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-KF2-380	R-KF2	Polyester Resin	380

R-STUDS

Size	Product Code			Anchor		Fixture			
	Steel class 5.8	Steel class 8.8	Steel grade A4	Diameter	Length	Hole diameter	Max. thickness		
				d	L	d _f	t _{fix} for h _{ef,min}	t _{fix} for h _{ef,std}	t _{fix} for h _{ef,max}
				[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
M8	R-STUDS-08110	R-STUDS-08110-88	R-STUDS-08110-A4	8	110	9	40	20	-
	R-STUDS-08160	-	-	8	160	9	90	70	50
M10	R-STUDS-10130	R-STUDS-10130-88	R-STUDS-10130-A4	10	130	12	48	28	-
	R-STUDS-10170	-	R-STUDS-10170-A4	10	170	12	88	68	38
	R-STUDS-10190	-	-	10	190	12	108	88	58
M12	R-STUDS-12160	R-STUDS-12160-88	R-STUDS-12160-A4	12	160	14	65	35	-
	R-STUDS-12190	-	R-STUDS-12190-A4	12	190	14	95	65	30
	R-STUDS-12220	-	R-STUDS-12220-A4	12	220	14	125	95	60
	R-STUDS-12260	-	-	12	260	14	165	135	100
	R-STUDS-12300	-	-	12	300	14	205	175	140
M16	R-STUDS-16190	R-STUDS-16190-88	R-STUDS-16190-A4	16	190	18	71	46	-
	R-STUDS-16220	R-STUDS-16220-88	-	16	220	18	101	76	11
	R-STUDS-16260	-	R-STUDS-16260-A4	16	260	18	141	116	51
	R-STUDS-16300	-	-	16	300	18	181	156	91
	R-STUDS-16380	-	-	16	380	18	261	236	171
M20	R-STUDS-20260	R-STUDS-20260-88	R-STUDS-20260-A4	20	260	22	117	67	-
	R-STUDS-20300	R-STUDS-20300-88	-	20	300	22	157	107	37
	R-STUDS-20350	-	-	20	350	22	207	157	87
M24	R-STUDS-24300	R-STUDS-24300-88	R-STUDS-24300-A4	24	300	26	132	62	-
M30	R-STUDS-30380	R-STUDS-30380-88	R-STUDS-30380-A4	30	380	32	181	106	-

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	
Installation torque	T _{inst}	[Nm]	10	20	40	80	120	180	300	
Min. hole depth in substrate	h ₀	[mm]	h _{ef} + 5							
MINIMUM EMBEDMENT DEPTH										
Installation depth	h _{nom, min}	[mm]	60	70	80	100	120	140	165	
STANDARD EMBEDMENT DEPTH										
Installation depth	h _{nom, s}	[mm]	80	90	110	125	170	210	240	
MAXIMUM EMBEDMENT DEPTH										
Installation depth	h _{nom, max}	[mm]	100	120	145	190	240	290	360	
Min. substrate thickness	h _{min}	[mm]	h _{ef} + 30 ≥ 100				h _{ef} + 2*d ₀			
Min. spacing	s _{min}	[mm]	0.5 * h _{ef} ≥ 40							
Min. edge distance	c _{min}	[mm]	0.5 * h _{ef} ≥ 40							

Minimum working and curing time

Resin temperature	Concrete temperature	Working time	Curing time*
[°C]	[°C]	[min]	[min]
5	-5	60	360
5	0	40	180
5	5	20	120
10	10	12	80
15	15	8	60
20	20	5	45
25	30	2	20

*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/mm ²]	520	520	520	520	520	520	520
Nominal yield strength - tension	F _{yk}	[N/mm ²]	420	420	420	420	420	420	420
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]	20	39	68	173	338	583	1166
Design bending resistance	M	[Nm]	15	30	52	133	259	449	899
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	1793
Design bending resistance	M	[Nm]	24	48	84	213	416	718	1439

Mechanical properties (cont.)

Size			M8	M10	M12	M16	M20	M24	M30
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	$M_{Rk,s}^0$	[Nm]	26	52	92	233	454	785	1569
Design bending resistance	M	[Nm]	17	34	59	149	291	504	1009

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	
Substrate		Non-cracked concrete							
MEAN ULTIMATE LOAD									
TENSION LOAD $N_{Ru,m}$									
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8									
Minimum embedment depth	[kN]	18.2	28	35.1	57.1	79.5	91.6	99.7	
Standard embedment depth	[kN]	21.6	34.8	48.3	82.9	119.3	137.4	157.1	
Maximum embedment depth	[kN]	21.6	34.8	50.4	93.6	146.4	189.8	217.6	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8									
Minimum embedment depth	[kN]	18.2	28	35.1	57.1	79.5	91.6	99.7	
Standard embedment depth	[kN]	22.7	38	48.3	82.9	119.3	137.4	157.1	
Maximum embedment depth	[kN]	30.3	48	63.6	108.6	159.1	189.8	217.6	
R-STUDS METRIC THREADED RODS - A4									
Minimum embedment depth	[kN]	18.2	28	35.1	57.1	79.5	91.6	99.7	
Standard embedment depth	[kN]	22.7	38	48.3	82.9	119.3	137.4	157.1	
Maximum embedment depth	[kN]	30.3	48	63.6	108.6	159.1	189.8	217.6	
SHEAR LOAD $V_{Ru,m}$									
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	18.3	29	42.15	78.5	122.5	176.5	280.5	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	29.28	46.4	67.44	125.6	196	282.4	448.8	
R-STUDS METRIC THREADED RODS - A4	[kN]	25.62	40.6	59.01	109.9	171.5	247.1	392.7	
CHARACTERISTIC LOAD									
TENSION LOAD N_{Rk}									
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8									
Minimum embedment depth	[kN]	14.3	22	28.7	45.2	64.1	73.9	77.8	
Standard embedment depth	[kN]	18	28.3	39.4	56.5	90.8	110.8	113.1	
Maximum embedment depth	[kN]	18	29	42	78	122	153.1	169.6	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8									
Minimum embedment depth	[kN]	14.3	22	28.7	45.2	64.1	73.9	77.8	
Standard embedment depth	[kN]	19.1	28.3	39.4	56.5	90.8	110.8	113.1	
Maximum embedment depth	[kN]	23.9	37.7	51.9	86	128.2	153.1	169.6	
R-STUDS METRIC THREADED RODS - A4									
Minimum embedment depth	[kN]	14.3	22	28.7	45.2	64.1	73.9	77.8	
Standard embedment depth	[kN]	19.1	28.3	39.4	56.5	90.8	110.8	113.1	
Maximum embedment depth	[kN]	23.9	37.7	51.9	86	128.2	153.1	169.6	
SHEAR LOAD V_{Rk}									
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	9	14	21	39	61	88	140	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	15	23	34	63	98	141	224	
R-STUDS METRIC THREADED RODS - A4	[kN]	13	20	29	55	86	124	196	

Basic performance data (cont.)

R-STUDS

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

Size		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]	7.94	12.22	15.94	25.11	35.61	35.19	37.05
Standard embedment depth	[kN]	10.61	15.72	21.89	31.39	50.44	52.76	53.86
Maximum embedment depth	[kN]	12	19.33	28	47.78	71.22	72.9	80.76
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8								
Minimum embedment depth	[kN]	7.94	12.22	15.94	25.11	35.61	35.19	37.05
Standard embedment depth	[kN]	10.61	15.72	21.89	31.39	50.44	52.76	53.86
Maximum embedment depth	[kN]	13.28	20.94	28.83	47.78	71.22	72.9	80.76
R-STUDS METRIC THREADED RODS - A4								
Minimum embedment depth	[kN]	7.94	12.22	15.94	25.11	35.61	35.19	37.05
Standard embedment depth	[kN]	10.61	15.72	21.89	31.39	50.44	52.76	53.86
Maximum embedment depth	[kN]	13.28	20.94	28.83	47.78	71.22	72.9	80.76
SHEAR LOAD V_{rd}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	7.2	11.2	16.8	31.2	48.8	70.4	112
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	12	18.4	27.2	50.4	78.4	112.8	179.2
R-STUDS METRIC THREADED RODS - A4	[kN]	8.33	12.82	18.59	35.26	55.13	79.49	125.64
RECOMMENDED LOAD								
TENSION LOAD N_{rec}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8								
Minimum embedment depth	[kN]	5.67	8.73	11.39	17.94	25.44	25.14	26.46
Standard embedment depth	[kN]	7.58	11.23	15.63	22.42	36.03	37.69	38.47
Maximum embedment depth	[kN]	8.57	13.81	20	34.13	50.87	52.07	57.69
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8								
Minimum embedment depth	[kN]	5.67	8.73	11.39	17.94	25.44	25.14	26.46
Standard embedment depth	[kN]	7.58	11.23	15.63	22.42	36.03	37.69	38.47
Maximum embedment depth	[kN]	8.57	13.81	20	34.13	50.87	52.07	57.69
R-STUDS METRIC THREADED RODS - A4								
Minimum embedment depth	[kN]	5.67	8.73	11.39	17.94	25.44	25.14	26.46
Standard embedment depth	[kN]	7.58	11.23	15.63	22.42	36.03	37.69	38.47
Maximum embedment depth	[kN]	8.57	13.81	20	34.13	50.87	52.07	57.69
SHEAR LOAD V_{rec}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	5.14	8	12	22.29	34.86	50.29	80
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8.57	13.14	19.43	36	56	80.57	128
R-STUDS METRIC THREADED RODS - A4	[kN]	5.95	9.16	13.28	25.18	39.38	56.78	89.74

Product commercial data

Product Code	Volume [m ³]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-KF2-380	380	10	40	480	10.0	40.0	510.0	5010445602009	18

CFS+ Cartridge Free System

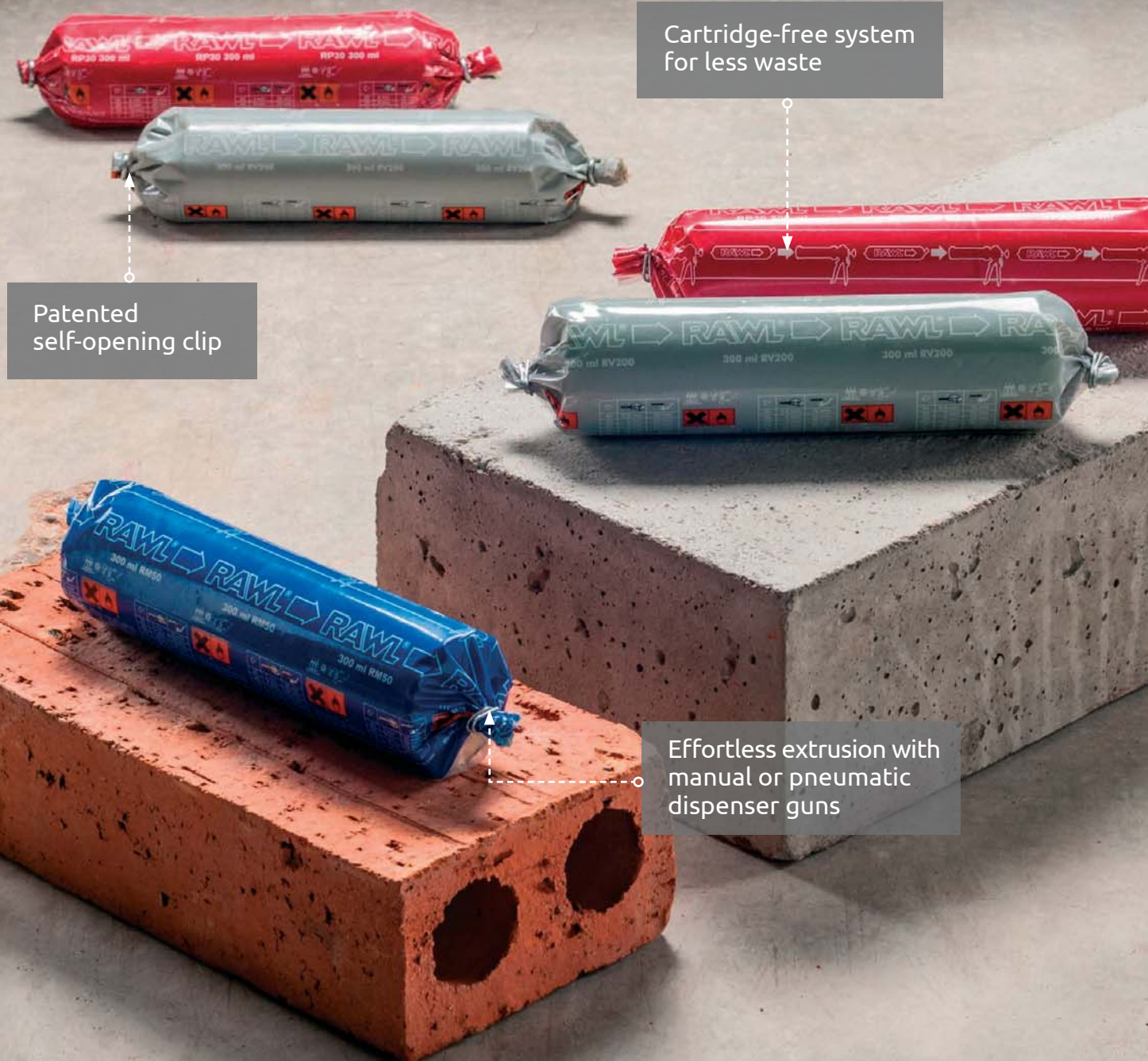
RV200

- with Threaded Rods
- with Sockets
- with Rebar as an Anchor
- with Post-Installed Rebar

RM50

- with Threaded Rods for Concrete
- with Threaded Rods for Masonry

RP30



Cartridge-free system
for less waste

Patented
self-opening clip

Effortless extrusion with
manual or pneumatic
dispenser guns

RV200 with Threaded Rods (CFS+)

High performance vinylester resin approved for use in cracked and non-cracked concrete - Cartridge Free System (CFS+)



Approvals and Reports

- ETA-10/0055; ETAG 001-05, Option 1



Installation movie

Product overview

Features and benefits

- Approved for use with threaded rods in cracked and non-cracked concrete (ETAG001 Option 1)
- Suitable for most solid and hollow substrates including overhead applications
- Very high load capacity
- Suitable for use in low temperatures (down to -20° for winter option) enables use throughout the year; 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
- Unique soft foil pack for less waste
- Effortless extrusion due to patented self-opening system with manual or pneumatic dispenser guns
- Anchor does not generate tensions in the substrate which enables RV200 to be specified where closer edge and spacing distances are required
- Suitable for multiple use. Partly used cartridge can continue to be used after fitting new nozzle

Applications

- Curtain walling
- Balustrading
- Handrails
- Canopies
- Cable trays
- Formwork supports
- Heavy machinery
- Lighting columns
- Public seating
- Large panel reinforcing system -Copy Eco

Base materials

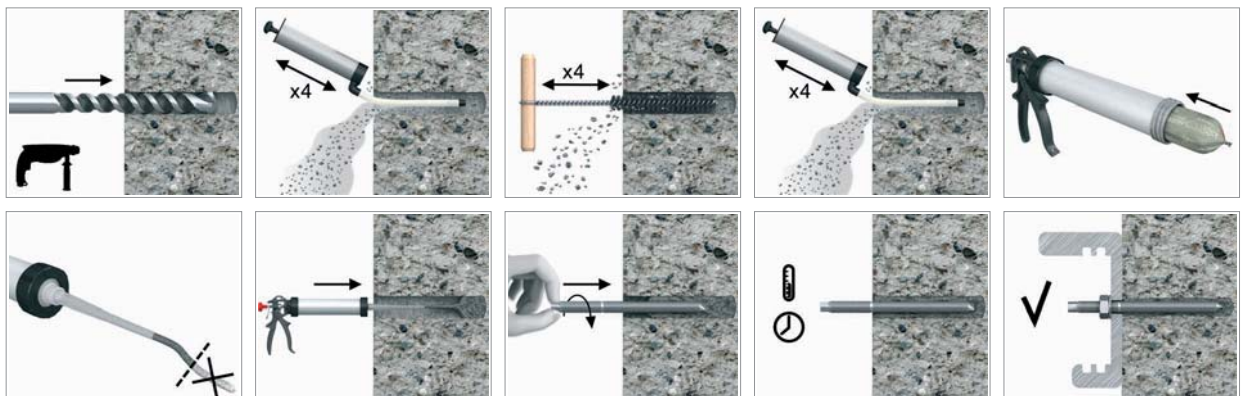
Approved for use in:

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

Also suitable for use in:

- High-Density Natural Stone
- Natural Stone
- Solid Brick
- Solid Concrete Block
- Solid Sand-lime Brick
- Reinforced concrete

Installation guide



Installation guide (cont.)

1. Drill hole to the required diameter and depth for rebar 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 foil into gun and attach nozzle.
4. Dispense to waste until even colour is obtained.
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 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.
7. Attach fixture and tighten the nut to the required torque.

Product information

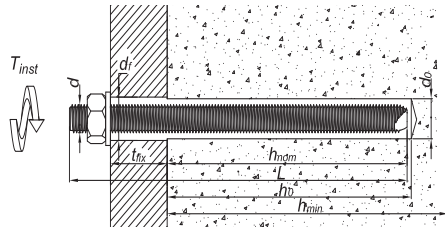
Product Code	Resin	Description / Resin Type	Volume
			[m]
R-CFS+RV200-4	RV200	Styrene Free Vinylester Resin	300
R-CFS+RV200W-4	RV200-W	Low Temperature (Winter) / Rapid Cure Styrene Free Vinylester Resin	
R-CFS+RV200S-4	RV200-S	High Temperature (Summer) / Slow Cure Styrene Free Polyester Resin	
R-CFS+RV200-600-8	RV200	Styrene Free Vinylester Resin	600

R-STUDS

Size	Product Code			Anchor		Hole diameter	Fixture		
	Steel class 5.8	Steel class 8.8	Steel grade A4	Diameter	Length		Max. thickness		
				d	L	t _{fix} for h _{ef,min}	t _{fix} for h _{ef,std}	t _{fix} for h _{ef,max}	
				[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
M8	R-STUDS-08110	R-STUDS-08110-88	R-STUDS-08110-A4	8	110	9	40	20	-
	R-STUDS-08160	-	-	8	160	9	90	70	50
M10	R-STUDS-10130	R-STUDS-10130-88	R-STUDS-10130-A4	10	130	12	48	28	-
	R-STUDS-10170	-	R-STUDS-10170-A4	10	170	12	88	68	38
	R-STUDS-10190	-	-	10	190	12	108	88	58
M12	R-STUDS-12160	R-STUDS-12160-88	R-STUDS-12160-A4	12	160	14	65	35	-
	R-STUDS-12190	-	R-STUDS-12190-A4	12	190	14	95	65	30
	R-STUDS-12220	-	R-STUDS-12220-A4	12	220	14	125	95	60
	R-STUDS-12260	-	-	12	260	14	165	135	100
	R-STUDS-12300	-	-	12	300	14	205	175	140
M16	R-STUDS-16190	R-STUDS-16190-88	R-STUDS-16190-A4	16	190	18	71	46	-
	R-STUDS-16220	R-STUDS-16220-88	-	16	220	18	101	76	11
	R-STUDS-16260	-	R-STUDS-16260-A4	16	260	18	141	116	51
	R-STUDS-16300	-	-	16	300	18	181	156	91
	R-STUDS-16380	-	-	16	380	18	261	236	171
M20	R-STUDS-20260	R-STUDS-20260-88	R-STUDS-20260-A4	20	260	22	117	67	-
	R-STUDS-20300	R-STUDS-20300-88	-	20	300	22	157	107	37
	R-STUDS-20350	-	-	20	350	22	207	157	87
M24	R-STUDS-24300	R-STUDS-24300-88	R-STUDS-24300-A4	24	300	26	132	62	-
M30	R-STUDS-30380	R-STUDS-30380-88	R-STUDS-30380-A4	30	380	32	181	106	-

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
Installation torque	T _{inst}	[Nm]	10	20	40	80	120	180	300
Min. hole depth in substrate	h ₀	[mm]	h _{ef} + 5						
MINIMUM EMBEDMENT DEPTH									
Installation depth	h _{nom, min}	[mm]	60	70	80	100	120	140	165
STANDARD EMBEDMENT DEPTH									
Installation depth	h _{nom, s}	[mm]	80	90	110	125	170	210	240
MAXIMUM EMBEDMENT DEPTH									
Installation depth	h _{nom, max}	[mm]	100	120	145	190	240	290	360
Min. substrate thickness	h _{min}	[mm]	h _{ef} + 30 ≥ 100				h _{ef} + 2*d ₀		
Min. spacing	s _{min}	[mm]	0.5 * h _{ef} ≥ 40						
Min. edge distance	c _{min}	[mm]	0.5 * h _{ef} ≥ 40						

Minimum working and curing time

Resin temperature °C	Concrete temperature °C	Working time [min.]			Curing time* [min.]		
		RV200-S	RV200	RV200-W	RV200-S	RV200	RV200-W
5	-20	-	-	100	-	-	1440
5	-15	-	-	60	-	-	960
5	-10	-	-	30	-	-	480
5	-5	65	60	16	1440	360	240
5	0	50	40	12	960	180	120
5	5	35	20	8	720	120	60
10	10	20	12	5	480	80	45
15	15	12	8	3	360	60	30
20	20	9	5	2	240	45	10
25	25	7	3	-	180	30	-
25	30	6	2	-	120	20	-
25	40	4	0.5	-	45	10	-
25	45	3	-	-	35	-	-
25	50	2	-	-	25	-	-

*For wet concrete the curing time must be doubled

Mechanical properties

R-STUDS

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		
Nominal yield strength - tension	f _{yk}	[N/mm ²]	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		

Mechanical properties (cont.)

R-STUDS

Size			M8	M10	M12	M16	M20	M24	M30
R-STUDS METRIC THREADED RODS - steel class 8.8									
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	$M_{Rk,s}^0$	[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	$M_{Rk,s}^0$	[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

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]	21.6	34.8	50.4	78	102.5	129.1	165	30.2	34.8	46.6	65.1	
Standard embedment depth	[kN]	21.6	34.8	50.4	87.3	115.2	156.1	185.4	41.7	43.7	65.9	97.6	
Maximum embedment depth	[kN]	21.6	34.8	50.4	93.6	146.4	211.2	256.7	50.4	66.3	93	135	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8													
Minimum embedment depth	[kN]	30.2	44.1	55.6	78	102.5	129.1	165	30.2	34.8	46.6	65.1	
Standard embedment depth	[kN]	34.8	55.2	56.6	87.3	115.2	156.1	185.4	41.7	43.7	65.9	97.6	
Maximum embedment depth	[kN]	34.8	55.2	76	114.4	156.6	215.5	256.7	54.8	66.3	93	135	
R-STUDS METRIC THREADED RODS - A4													
Minimum embedment depth	[kN]	30.2	44.1	55.6	78	102.5	129.1	165	30.2	34.8	46.6	65.1	
Standard embedment depth	[kN]	31.2	49.2	56.6	87.3	115.2	156.1	185.4	41.7	43.7	65.9	97.6	
Maximum embedment depth	[kN]	31.2	49.2	70.8	114.4	156.6	215.5	256.7	54.8	66.3	93	135	
SHEAR LOAD $V_{Ru,m}$													
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	18.3	29	42.15	78.5	122.5	176.5	280.5	42.15	78.5	122.5	176.5	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	29.28	46.4	67.44	125.6	196	282.4	448.8	67.44	125.6	196	282.4	
R-STUDS METRIC THREADED RODS - A4	[kN]	25.62	40.6	59.01	109.9	171.5	247.1	392.7	59.01	109.9	171.5	247.1	
CHARACTERISTIC LOAD													
TENSION LOAD N_{Rk}													
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8													
Minimum embedment depth	[kN]	18	28.6	36.1	50.5	66.4	83.7	107	19.6	22.62	30.16	42.22	
Standard embedment depth	[kN]	18	29	42	69.1	101.5	142.5	158.3	26.95	28.27	42.73	63.33	
Maximum embedment depth	[kN]	18	29	42	78	122	176	237.5	35.53	42.98	60.32	87.46	
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	19.6	22.62	30.16	42.22	
Standard embedment depth	[kN]	26.1	36.8	53.9	69.1	101.5	142.5	158.3	26.95	28.27	42.73	63.33	
Maximum embedment depth	[kN]	29	46	67	105.1	143.3	196.8	237.5	35.53	42.98	60.32	87.46	
R-STUDS METRIC THREADED RODS - A4													
Minimum embedment depth	[kN]	19.6	28.6	36.1	50.5	66.4	83.7	107	19.6	22.62	30.16	42.22	
Standard embedment depth	[kN]	26	36.8	53.9	69.1	101.5	142.5	158.3	26.95	28.27	42.73	63.33	
Maximum embedment depth	[kN]	26	41	59	105.1	143.3	196.8	237.5	35.53	42.98	60.32	87.46	

Basic performance data (cont.)

R-STUDS

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

Size		M8	M10	M12	M16	M20	M24	M30	M12	M16	M20	M24	
Substrate		Non-cracked concrete						Cracked concrete					
SHEAR LOAD V_{rk}													
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	9	14	21	39	61	88	140	21	39	61	88	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	15	23	34	63	98	141	224	34	63	98	141	
R-STUDS METRIC THREADED RODS - A4	[kN]	13	20	29	55	86	124	196	29	55	86	124	
DESIGN LOAD													
TENSION LOAD N_{rd}													
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8													
Minimum embedment depth	[kN]	10.89	15.89	20.06	28.06	36.89	39.86	50.95	10.89	12.57	16.76	20.1	
Standard embedment depth	[kN]	12	19.33	28	38.39	56.39	67.86	75.38	14.97	15.71	23.74	30.16	
Maximum embedment depth	[kN]	12	19.33	28	52	79.61	93.71	113.1	19.74	23.88	33.51	41.65	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8													
Minimum embedment depth	[kN]	10.89	15.89	20.06	28.06	36.89	39.86	50.95	10.89	12.57	16.76	20.1	
Standard embedment depth	[kN]	14.5	20.44	29.94	38.39	56.39	67.86	75.38	14.97	15.71	23.74	30.16	
Maximum embedment depth	[kN]	18.17	27.22	39.5	58.39	79.61	93.71	113.1	19.74	23.88	33.51	41.65	
R-STUDS METRIC THREADED RODS - A4													
Minimum embedment depth	[kN]	10.89	15.89	20.06	28.06	36.89	39.86	50.95	10.89	12.57	16.76	20.1	
Standard embedment depth	[kN]	13.9	20.44	29.94	38.39	56.39	67.86	75.38	14.97	15.71	23.74	30.16	
Maximum embedment depth	[kN]	13.9	21.93	31.55	58.39	79.61	93.71	113.1	19.74	23.88	33.51	41.65	
SHEAR LOAD V_{rd}													
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	7.2	11.2	16.8	31.2	48.8	70.4	112	16.8	31.2	48.8	70.4	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	12	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	[kN]	8.33	12.82	18.59	35.26	55.13	79.49	125.64	18.59	35.26	55.13	79.49	
RECOMMENDED LOAD													
TENSION LOAD N_{rec}													
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8													
Minimum embedment depth	[kN]	7.78	11.35	14.33	20.04	26.35	28.47	36.39	7.78	8.98	11.97	14.36	
Standard embedment depth	[kN]	8.57	13.81	20	27.42	40.28	48.47	53.84	10.69	11.22	16.96	21.54	
Maximum embedment depth	[kN]	8.57	13.81	20	37.14	56.87	66.94	80.78	14.1	17.06	23.94	29.75	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8													
Minimum embedment depth	[kN]	7.78	11.35	14.33	20.04	26.35	28.47	36.39	7.78	8.98	11.97	14.36	
Standard embedment depth	[kN]	10.36	14.6	21.39	27.42	40.28	48.47	53.84	10.69	11.22	16.96	21.54	
Maximum embedment depth	[kN]	12.98	19.44	28.21	41.71	56.87	66.94	80.78	14.1	17.06	23.94	29.75	
R-STUDS METRIC THREADED RODS - A4													
Minimum embedment depth	[kN]	7.78	11.35	14.33	20.04	26.35	28.47	36.39	7.78	8.98	11.97	14.36	
Standard embedment depth	[kN]	9.93	14.6	21.39	27.42	40.28	48.47	53.84	10.69	11.22	16.96	21.54	
Maximum embedment depth	[kN]	9.93	15.66	22.54	41.71	56.87	66.94	80.78	14.1	17.06	23.94	29.75	
SHEAR LOAD V_{rec}													
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	5.14	8	12	22.29	34.86	50.29	80	12	22.29	34.86	50.29	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8.57	13.14	19.43	36	56	80.57	128	19.43	36	56	80.57	
R-STUDS METRIC THREADED RODS - A4	[kN]	5.95	9.16	13.28	25.18	39.38	56.78	89.74	13.28	25.18	39.38	56.78	

Product commercial data

Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-CFS+RV200-4	300	4	32	384	2.44	7.32	263.52	5906675205830	18
R-CFS+RV200W-4	300	4	32	384	2.44	7.32	263.52	5906675375762	12
R-CFS+RV200S-4	300	4	32	384	2.44	7.32	263.52	5906675201375	12
R-CFS+RV200-600-8	600	8	-	288	8.30	8.30	298.8	5906675119045	18

RV200 with Sockets (CFS+)

High performance vinylester resin approved for use with internally threaded sockets - Cartridge Free System (CFS+)



Approvals and Reports

- ETA-13/0805; ETAG 001-05, Option 7



Product overview

Features and benefits

- Approved for use with sockets in non-cracked concrete (ETAG001 Option 7)
- Suitable for most solid and hollow substrates including overhead applications
- Very high load capacity
- Allows removal of bolt to leave a re-usable sockets in place
- Suitable for use in low temperatures (down to -20° for winter option) enables use throughout the year; 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
- Unique soft foil pack for less waste
- Effortless extrusion due to patented self-opening system with manual or pneumatic dispenser guns
- Rapid bonding time enables quick execution of works
- Suitable for multiple use. Partly used cartridge can continue to be used after fitting new nozzle

Applications

- Curtain walling
- Balustrading
- Handrails
- Canopies
- Cable trays
- Formwork supports
- Heavy machinery
- Lighting columns
- Public seating

Base materials

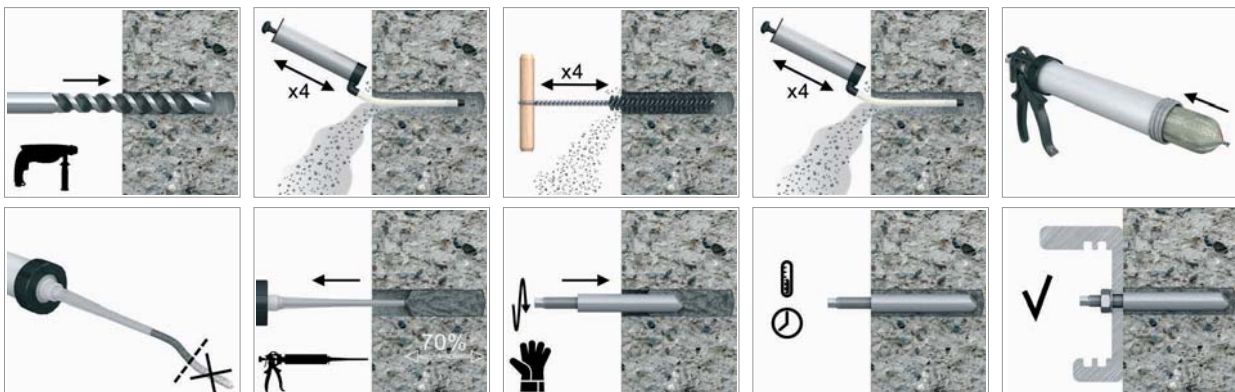
Approved for use in:

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

Also suitable for use in:

- Natural Stone
- Solid Concrete Block
- Solid Brick

Installation guide



Installation guide (cont.)

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 foil into gun and attach nozzle.
4. Dispense to waste until even colour is obtained.
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.

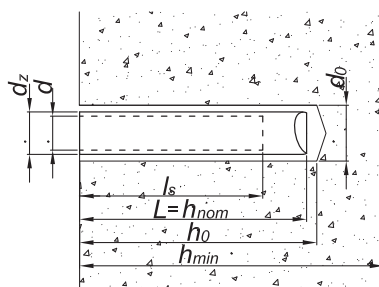
Product information

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-CFS+RV200-4	RV200	Styrene Free Vinylester Resin	300
R-CFS+RV200W-4	RV200-W	Low Temperature (Winter) / Rapid Cure Styrene Free Vinylester Resin	
R-CFS+RV200S-4	RV200-S	High Temperature (Summer) / Slow Cure Styrene Free Polyester Resin	
R-CFS+RV200-600-8	RV200	Styrene Free Vinylester Resin	600

SOCKETS

Size	Product Code		Anchor			Fixture
	Steel class 5.8	Steel grade A4	Socket diameter	Length	Internal thread length	Hole diameter
			d	L	l_g	d_f
			[mm]	[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
	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
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
Installation torque	T_{inst}	[Nm]	3	5	5	10	10	20	40
Thread engagement length	h_s	[mm]	6-24	8-25	8-25	10-30	10-30	12-35	16-50
Min. hole depth in substrate	h_0	[mm]	$h_{ef} + 5$						

Installation data (cont.)

SOCKETS

Size			M6	M8		M10		M12	M16
Effective Installation depth	h_{ef}	[mm]	75	75	90	75	100	100	125
Min. substrate thickness	h_{min}	[mm]	105	105	120	115	140	140	181
Min. spacing	s_{min}	[mm]	40	40	45	40	50	50	63
Min. edge distance	c_{min}	[mm]	40	40	45	40	50	50	63

Minimum working and curing time

Resin temperature [°C]	Concrete temperature [°C]	Working time [min]			Curing time* [min]		
		RV200-S	RV200	RV200-W	RV200-S	RV200	RV200-W
5	-20	-	-	100	-	-	1440
5	-15	-	-	60	-	-	960
5	-10	-	-	30	-	-	480
5	-5	65	60	16	1440	360	240
5	0	50	40	12	960	180	120
5	5	35	20	8	720	120	60
10	10	20	12	5	480	80	45
15	15	12	8	3	360	60	30
20	20	9	5	2	240	45	10
25	25	7	3	-	180	30	-
25	30	6	2	-	120	20	-
25	40	4	0.5	-	45	10	-
25	45	3	-	-	35	-	-
25	50	2	-	-	25	-	-

*For wet concrete the curing time must be doubled

Mechanical properties

SOCKETS

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]	20.1	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm ³]	21.21	50.27	98.17	169.65	402.12
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]	20.1	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm ³]	21.21	50.27	98.17	169.65	402.12
R-STUDS 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
R-STUDS 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
R-STUDS 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

Size		M6	M8	M10	M12	M16		
Substrate		Non-cracked concrete						
Embedment depth h_{ef}	[mm]	75	75	90	75	100	100	125
MEAN ULTIMATE LOAD								
TENSION LOAD $N_{R_{u,m}}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	12.5	21.6	21.6	34.8	34.8	50.4	93.6
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	19.2	34.8	34.8	50.6	55.2	63.0	97.4
R-STUDS METRIC THREADED RODS - A4	[kN]	16.8	31.2	31.2	49.2	49.2	63.0	97.4
SHEAR LOAD $V_{R_{u,m}}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	6.0	10.8	10.8	16.8	16.8	25.2	46.8
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	9.6	18.0	18.0	27.6	27.6	40.8	75.6
R-STUDS METRIC THREADED RODS - A4	[kN]	8.4	15.6	15.6	24.0	24.0	34.8	66.0
CHARACTERISTIC LOAD								
TENSION LOAD N_{R_k}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	10.4	18.0	18.0	29	29.0	42.0	66.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	16.0	25.4	29.0	32.8	46.0	42.7	66.0
R-STUDS METRIC THREADED RODS - A4	[kN]	14.0	25.4	26.0	32.8	41.0	42.7	66.0
SHEAR LOAD V_{R_k}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	5.0	9.0	9.0	14.0	14.0	21.0	39.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8.0	15.0	15.0	23.0	23.0	34.0	63.0
R-STUDS METRIC THREADED RODS - A4	[kN]	7.0	13.0	13.0	20.0	20.0	29.0	55.0
DESIGN LOAD								
TENSION LOAD N_{R_d}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	6.7	12.0	12.0	18.2	19.3	23.7	36.7
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	9.82	14.1	17.0	18.2	26.5	23.7	36.7
R-STUDS METRIC THREADED RODS - A4	[kN]	7.49	13.9	13.9	18.2	21.9	23.7	36.7
SHEAR LOAD V_{R_d}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	4.0	7.20	7.20	11.2	11.2	16.8	31.2
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	6.40	12.0	12.0	18.4	18.4	27.2	50.4
R-STUDS METRIC THREADED RODS - A4	[kN]	4.49	8.33	8.33	12.8	12.8	18.6	35.3
RECOMMENDED LOAD								
TENSION LOAD N_{rec}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	4.79	8.57	8.57	13.0	13.8	16.9	26.2
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	7.01	10.1	12.1	13.0	18.9	16.9	26.2
R-STUDS METRIC THREADED RODS - A4	[kN]	5.35	9.93	9.93	13.0	15.6	16.9	26.2
SHEAR LOAD V_{rec}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	2.86	5.14	5.14	8.0	8.0	12.0	22.3
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	4.57	8.57	8.57	13.1	13.1	19.4	36.0
R-STUDS METRIC THREADED RODS - A4	[kN]	3.21	5.95	5.95	9.16	9.16	13.3	25.2

Product commercial data

Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-CFS+RV200-4	300	4	32	384	2.44	7.32	263.52	5906675205830	18
R-CFS+RV200W-4	300	4	32	384	2.44	7.32	263.52	5906675375762	12
R-CFS+RV200S-4	300	4	32	384	2.44	7.32	263.52	5906675201375	12
R-CFS+RV200-600-8	600	8	-	288	8.30	8.30	298.8	5906675119045	18

RV200 with Rebar as an Anchor (CFS+)

High performance vinylester resin approved for use with reinforcement bars - Cartridge Free System (CFS+)



Approvals and Reports

- ETA-13/0805; ETAG 001-05, Option 7



Product overview

Features and benefits

- Approved for use with rebar as an anchor in non-cracked concrete (ETAG001 Option 7)
- Suitable for most solid and hollow substrates including overhead applications
- Very high load capacity
- Suitable for use in low temperatures (down to -20° for winter option) enables use throughout the year; 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
- Unique soft foil pack for less waste
- Effortless extrusion due to patented self-opening system with manual or pneumatic dispenser guns
- Rapid bonding time enables quick execution of works
- Suitable for multiple use. Partly used cartridge can continue to be used after fitting new nozzle

Applications

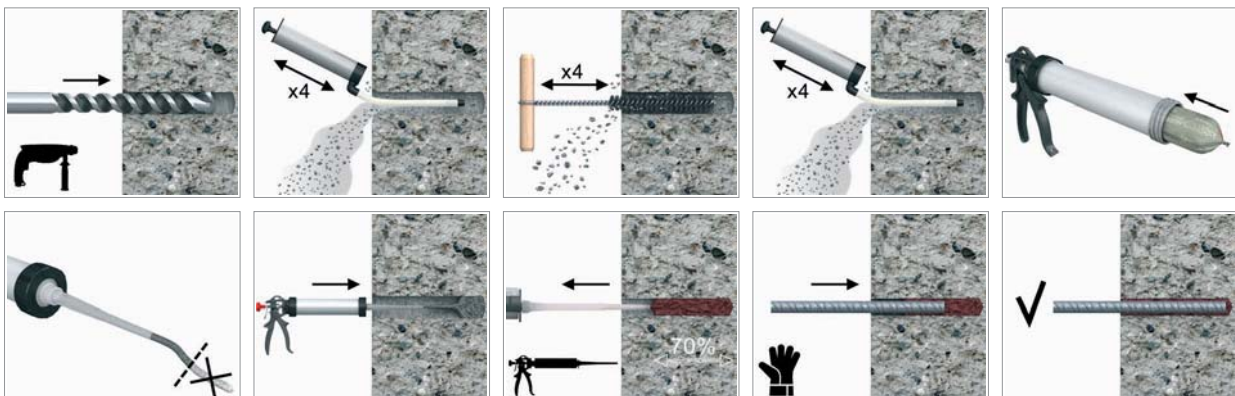
- Curtain walling
- Canopies
- Cable trays
- Formwork supports
- Heavy machinery

Base materials

Approved for use in:

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

Installation guide



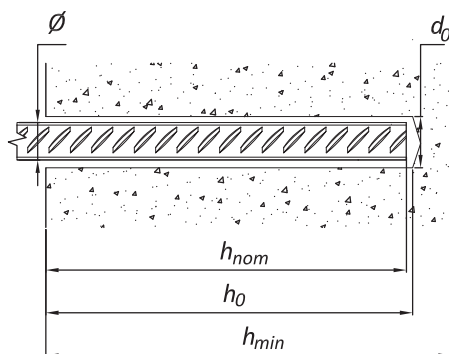
Installation guide (cont.)

1. Drill hole to the required diameter and depth for rebar 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 foil into gun and attach nozzle.
4. Dispense to waste until even colour is obtained.
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 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.
7. Attach fixture and tighten the nut to the required torque.

Product information

Product Code	Resin	Description / Resin Type	Volume
			[m ^l]
R-CFS+RV200-4	RV200	Styrene Free Vinylester Resin	300
R-CFS+RV200W-4	RV200-W	Low Temperature (Winter) / Rapid Cure Styrene Free Vinylester Resin	
R-CFS+RV200S-4	RV200-S	High Temperature (Summer) / Slow Cure Styrene Free Polyester Resin	
R-CFS+RV200-600-8	RV200	Styrene Free Vinylester Resin	600

Installation data



REBARS AS ANCHORS

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
Thread diameter	d	[mm]	8	10	12	14	16	20	25	32
Hole diameter in substrate	d ₀	[mm]	12	14	18		22	26	32	40
Min. hole depth in substrate	h ₀	[mm]	h _{ef} + 5							
MINIMUM EMBEDMENT DEPTH										
Installation depth	h _{nom, min}	[mm]	60	70	80		100	120	140	165
STANDARD EMBEDMENT DEPTH										
Installation depth	h _{nom, s}	[mm]	80	90	110		125	170	210	240
MAXIMUM EMBEDMENT DEPTH										
Installation depth	h _{nom, max}	[mm]	100	120	145		190	240	290	360
Min. substrate thickness	h _{min}	[mm]	h _{ef} + 30 ≥ 100			h _{ef} + 2*d ₀				
Min. spacing	s _{min}	[mm]	0.5 * h _{ef} ≥ 40							
Min. edge distance	c _{min}	[mm]	0.5 * h _{ef} ≥ 40							

Installation data (cont.)

Minimum working and curing time

Resin temperature °C	Concrete temperature °C	Working time [min.]			Curing time* [min.]		
		RV200-S	RV200	RV200-W	RV200-S	RV200	RV200-W
5	-20	-	-	100	-	-	1440
5	-15	-	-	60	-	-	960
5	-10	-	-	30	-	-	480
5	-5	65	60	16	1440	360	240
5	0	50	40	12	960	180	120
5	5	35	20	8	720	120	60
10	10	20	12	5	480	80	45
15	15	12	8	3	360	60	30
20	20	9	5	2	240	45	10
25	25	7	3	-	180	30	-
25	30	6	2	-	120	20	-
25	40	4	0.5	-	45	10	-
25	45	3	-	-	35	-	-
25	50	2	-	-	25	-	-

*For wet concrete the curing time must be doubled

Mechanical properties

REBARS AS ANCHORS

Size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32	
18G2										
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	480	480	480	480	480	480	480	480
Nominal yield strength - tension	f_{yk}	[N/mm ²]	355	355	355	355	355	355	355	355
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	804.2
Elastic section modulus	W_{el}	[mm ³]	50.3	98.2	169.6	269.4	402.1	785.4	1534	3217
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	29	57	98	155	232	452	884	1853
Design bending resistance	M	[Nm]	19	38	65	103	154	302	589	1235
Allowable bending resistance	M_{rec}	[Nm]	14	27	47	74	110	215	421	882
34GS										
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	500	500	500	500	500	500	500	500
Nominal yield strength - tension	f_{yk}	[N/mm ²]	410	410	410	410	410	410	410	410
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	804.2
Elastic section modulus	W_{el}	[mm ³]	50.3	98.2	169.6	269.4	402.1	785.4	1534	3217
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	30	59	102	162	241	471	920	1930
Design bending resistance	M	[Nm]	20	39	68	108	161	314	614	1287
Allowable bending resistance	M_{rec}	[Nm]	14	28	48	77	115	224	438	919
B500SP										
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]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	804.2
Elastic section modulus	W_{el}	[mm ³]	50.3	98.2	169.6	269.4	402.1	785.4	1534	3217
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	35	68	117	186	277	542	1059	2220
Design bending resistance	M	[Nm]	23	45	78	124	185	361	706	1480
Allowable bending resistance	M_{rec}	[Nm]	17	32	56	89	132	258	504	1057
RB500/BSt500S										
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	550	550	550	550	550	550	550	550
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]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	804.2
Elastic section modulus	W_{el}	[mm ³]	50.3	98.2	169.6	269.4	402.1	785.4	1534	3217
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	33	65	112	178	265	518	1012	2123
Design bending resistance	M	[Nm]	22	43	75	119	177	346	675	1415
Allowable bending resistance	M_{rec}	[Nm]	16	31	53	85	126	247	482	1011

Basic performance data

REBARS AS ANCHORS

Size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
Substrate		Non-cracked concrete							
CHARACTERISTIC LOAD									
TENSION LOAD N_{Rk}									
A-II (e.g. 18G2)									
Minimum embedment depth	[kN]	16.6	22	30.2	31.7	45.2	56.5	77	107
Standard embedment depth	[kN]	22.1	28.3	41.5	43.5	56.5	80.1	115.5	156.8
Maximum embedment depth	[kN]	24.1	37.7	54.3	57.4	86	113.1	159.4	235.2
A-III (e.g. 34GS)									
Minimum embedment depth	[kN]	16.6	22	30.2	31.7	45.2	56.5	77	107
Standard embedment depth	[kN]	22.1	28.3	41.5	43.5	56.5	80.1	115.5	156.8
Maximum embedment depth	[kN]	25.1	37.7	54.7	57.4	86	113.1	159.4	235.2
A-III-N (e.g. RB500, BST500S, B500SP)									
Minimum embedment depth	[kN]	16.6	22	30.2	31.7	45.2	56.5	77	107
Standard embedment depth	[kN]	22.1	28.3	41.5	43.5	56.5	80.1	115.5	156.8
Maximum embedment depth	[kN]	27.6	37.7	54.7	57.4	86	113.1	159.4	235.2
SHEAR LOAD V_{Rk}									
A-II (e.g. 18G2)	[kN]	12.1	18.8	27.1	36.9	48.3	75.4	117.8	193
A-III (e.g. 34GS)	[kN]	12.6	19.6	28.3	38.5	50.3	78.5	122.7	201.1
A-III-N (e.g. RB500, BST500S, B500SP)	[kN]	13.8	21.6	31.1	42.3	55.3	86.4	135	221.2
DESIGN LOAD									
TENSION LOAD N_{Rd}									
A-II (e.g. 18G2)									
Minimum embedment depth	[kN]	9.2	12.2	16.8	17.6	25.1	31.4	42.8	59.5
Standard embedment depth	[kN]	12.3	15.7	23	24.2	31.4	44.5	64.1	87.1
Maximum embedment depth	[kN]	15.4	20.9	30.4	31.9	47.8	62.8	88.6	130.7
A-III (e.g. 34GS)									
Minimum embedment depth	[kN]	9.2	12.2	16.8	17.6	25.1	31.4	42.8	59.5
Standard embedment depth	[kN]	12.3	15.7	23	24.2	31.4	44.5	64.1	87.1
Maximum embedment depth	[kN]	15.4	20.9	30.4	31.9	47.8	62.8	88.6	130.7
A-III-N (e.g. RB500, BST500S, B500SP)									
Minimum embedment depth	[kN]	9.2	12.2	16.8	17.6	25.1	31.4	42.8	59.5
Standard embedment depth	[kN]	12.3	15.7	23	24.2	31.4	44.5	64.1	87.1
Maximum embedment depth	[kN]	15.4	20.9	30.4	31.9	47.8	62.8	88.6	130.7
SHEAR LOAD V_{Rd}									
A-II (e.g. 18G2)	[kN]	8	12.6	18.1	24.6	32.2	50.3	78.5	128.7
A-III (e.g. 34GS)	[kN]	8.4	13.1	18.8	25.7	33.5	52.4	81.8	134
A-III-N (e.g. RB500, BST500S, B500SP)	[kN]	9.2	14.4	20.7	28.2	36.9	57.6	90	147.4
RECOMMENDED LOAD									
TENSION LOAD N_{rec}									
A-II (e.g. 18G2)									
Minimum embedment depth	[kN]	6.57	8.71	12	12.6	17.9	22.4	30.6	42.5
Standard embedment depth	[kN]	8.79	11.2	16.4	17.3	22.4	31.8	45.8	62.2
Maximum embedment depth	[kN]	11	14.9	21.7	22.8	34.1	44.9	63.3	93.4
A-III (e.g. 34GS)									
Minimum embedment depth	[kN]	6.57	8.71	12	12.6	17.9	22.4	30.6	42.5
Standard embedment depth	[kN]	8.79	11.2	16.4	17.3	22.4	31.8	45.8	62.2
Maximum embedment depth	[kN]	11	14.9	21.7	22.8	34.1	44.9	63.3	93.4

Basic performance data (cont.)

REBARS AS ANCHORS

Size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
A-III-N (e.g. RB500, BST500S, B500SP)									
Minimum embedment depth	[kN]	6.57	8.71	12	12.6	17.9	22.4	30.6	42.5
Standard embedment depth	[kN]	8.79	11.2	16.4	17.3	22.4	31.8	45.8	62.2
Maximum embedment depth	[kN]	11	14.9	21.7	22.8	34.1	44.9	63.3	93.4
SHEAR LOAD V_{rec}									
A-II (e.g. 18G2)	[kN]	5.74	8.98	12.93	17.59	22.98	35.9	56.1	91.91
A-III (e.g. 34GS)	[kN]	5.98	9.35	13.46	18.33	23.94	37.4	58.44	95.74
A-III-N (e.g. RB500, BST500S, B500SP)	[kN]	6.58	10.28	14.81	20.16	26.33	41.14	64.28	105.32

Product commercial data

Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-CFS+RV200-4	300	4	32	384	2.44	7.32	263.52	5906675205830	18
R-CFS+RV200W-4	300	4	32	384	2.44	7.32	263.52	5906675375762	12
R-CFS+RV200S-4	300	4	32	384	2.44	7.32	263.52	5906675201375	12
R-CFS+RV200-600-8	600	8	-	288	8.30	8.30	298.8	5906675119045	18

RV200 with Post-Installed Rebar (CFS+)

High performance vinylester resin approved for use with post-installed rebar connections - Cartridge Free System (CFS+)



Approvals and Reports

- ETA-13/0319; ETAG 001-05



Product overview

Features and benefits

- Approved for use with post-installed rebar in non-cracked concrete (ETAG001 Option 7)
- Suitable for most solid and hollow substrates including overhead applications
- Very high load capacity
- Suitable for use in low temperatures (down to -20° for winter option) enables use throughout the year; Winter version can be used in warmer temperatures for faster curing
- Unique soft foil pack for less waste
- Effortless extrusion due to patented self-opening system with manual or pneumatic dispenser guns
- 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
- Suitable for multiple use. Partly used cartridge can continue to be used after fitting new nozzle

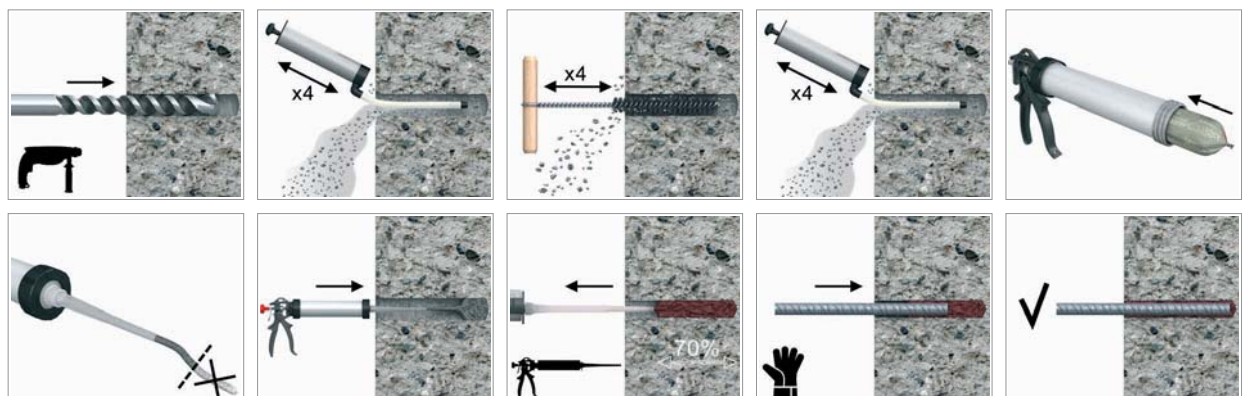
Applications

- Shear dowel connections
- Foundation wall connections

Base materials

- Approved for use in:
- Non-cracked concrete C20/25-C50/60

Installation guide



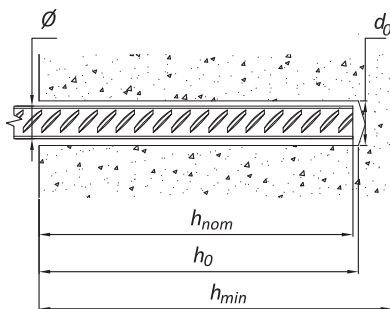
Installation guide (cont.)

1. Drill hole to the required diameter and depth for rebar 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 foil into gun and attach nozzle.
4. Dispense to waste until even colour is obtained.
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 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.
7. Attach fixture and tighten the nut to the required torque.

Product information

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-CFS+RV200-4	RV200	Styrene Free Vinylester Resin	300
R-CFS+RV200W-4	RV200-W	Low Temperature (Winter) / Rapid Cure Styrene Free Vinylester Resin	
R-CFS+RV200S-4	RV200-S	High Temperature (Summer) / Slow Cure Styrene Free Polyester Resin	
R-CFS+RV200-600-8	RV200	Styrene Free Vinylester Resin	600

Installation data



POST INSTALLED REBARS

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Rebar diameter	d_s	[mm]	8	10	12	14	16	20	25	28	32
Hole diameter in substrate	d_0	[mm]	12	14	16	18	20	25	30	35	40
Brush diameter		[mm]	14	16	18	20	22	27	32	37	42
Min. anchorage length	$l_{b, min.}$	[mm]	115	145	170	200	230	285	355	400	455
Min. lap length (overlap splice)	$l_{l, min.}$	[mm]		200		210	240	300	375	420	480
Max. anchorage length	$l_{b, max.}$	[mm]	400	500	600	700	800	1000			

Minimum working and curing time

RV200

Resin temperature	Concrete temperature	Working time	Curing time*
[°C]	[°C]	[min]	[min]
5	-5	60	360
5	0	40	180
5	5	20	120
10	10	12	80
15	15	8	60
20	20	5	45
25	25	3	30
25	30	2	20
25	40	0.5	10

RV200-W

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

*For wet concrete the curing time must be doubled

Installation data (cont.)

Minimum working and curing time

RV200-S

Resin temperature [°C]	Concrete temperature [°C]	Working time [min]	Curing time* [min]
5	-5	65	1440
5	0	50	960
5	5	35	720
10	10	20	480
15	15	12	360
20	20	9	240
25	25	7	180
25	30	6	120
25	40	4	45
25	45	3	35
25	50	2	25

*For wet concrete the curing time must be doubled

Mechanical properties

POST INSTALLED REBARS

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
18G2											
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	480	480	480	480	480	480	480	480	480
Nominal yield strength - tension	f_{yk}	[N/mm ²]	355	355	355	355	355	355	355	355	355
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	615.8	804.2
34GS											
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	500	500	500	500	500	500	500	500	500
Nominal yield strength - tension	f_{yk}	[N/mm ²]	410	410	410	410	410	410	410	410	410
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	615.8	804.2
B500SP											
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	575	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	500
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	615.8	804.2
RB500/BSL500S											
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	550	550	550	550	550	550	550	550	550
Nominal yield strength - tension	f_{yk}	[N/mm ²]	500	500	500	500	500	500	500	500	500
Cross sectional area - tension	A_s	[mm ²]	50.3	78.5	113.1	153.9	201.1	314.2	490.9	615.8	804.2

Basic performance data

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C20/25, STEEL A-II (18G2) [kN]																									
$\frac{l_{bd}}{d_s}$ (mm)	100	110	130	150	170	190	210	230	260	280	290	330	360	400	460	530	670	750	800	830	850	900	930	1000	Steel failure
8	5.8	6.4	7.5	8.7	9.8	11.0	12.1	13.3	15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.51
10	-	7.9	9.4	10.8	12.3	13.7	15.2	16.6	18.8	20.2	20.9	23.8	-	-	-	-	-	-	-	-	-	-	-	-	24.23
12	-	-	11.3	13.0	14.7	16.5	18.2	19.9	22.5	24.3	25.1	28.6	31.2	34.7	-	-	-	-	-	-	-	-	-	-	34.89
14	-	-	-	15.2	17.2	19.2	21.2	23.3	26.3	28.3	29.3	33.4	36.4	40.4	46.5	-	-	-	-	-	-	-	-	-	47.50
16	-	-	-	-	19.6	22.0	24.3	26.6	30.0	32.4	33.5	38.1	41.6	46.2	53.2	61.2	-	-	-	-	-	-	-	-	62.04
20	-	-	-	-	-	30.3	33.2	37.6	40.4	41.9	47.7	52.0	57.8	66.4	76.6	96.8	-	-	-	-	-	-	-	-	96.93
25	-	-	-	-	-	-	-	46.9	50.6	52.4	59.6	65.0	72.2	83.1	95.7	121.0	135.4	144.4	149.9	-	-	-	-	-	151.45
28	-	-	-	-	-	-	-	-	58.6	66.7	72.8	80.9	93.0	107.2	135.5	151.7	161.8	167.8	171.9	182.0	188.1	-	-	-	189.98
32	-	-	-	-	-	-	-	-	-	-	76.3	83.2	92.4	106.3	122.5	154.8	173.3	184.9	191.8	196.4	208.0	214.9	231.1	-	248.14

Basic performance data (cont.)

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C50/60, STEEL A-II (18G2) [kN]																									
$\frac{l_{bd}}{d_s}$ [mm]	100	120	140	160	170	180	200	230	250	280	290	320	330	400	450	500	550	640	700	720	850	910	950	1000	Steel failure
8	9.3	11.2	13.0	14.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.51
10	11.6	13.9	16.3	18.6	19.8	20.9	23.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.23
12	-	16.7	19.5	22.3	23.7	25.1	27.9	32.1	34.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.89
14	-	-	22.8	26.0	27.7	29.3	32.5	37.4	40.7	45.5	47.2	-	-	-	-	-	-	-	-	-	-	-	-	-	47.50
16	-	-	-	29.7	31.6	33.5	37.2	42.8	46.5	52.0	53.9	59.5	61.3	-	-	-	-	-	-	-	-	-	-	-	62.04
20	-	-	-	-	-	-	42.7	49.1	53.4	59.8	61.9	68.3	70.5	85.4	96.1	-	-	-	-	-	-	-	-	-	96.93
25	-	-	-	-	-	-	-	58.9	65.9	68.3	75.4	77.7	94.2	106.0	117.8	129.5	150.7	-	-	-	-	-	-	-	151.45
28	-	-	-	-	-	-	-	-	-	73.9	76.5	84.4	87.0	105.5	118.7	131.9	145.1	168.8	184.6	189.9	-	-	-	-	189.98
32	-	-	-	-	-	-	-	-	-	-	-	86.8	89.5	108.5	122.1	135.6	149.2	173.6	189.9	195.3	230.6	246.9	-	-	248.14

OVERLAP SPLICE – DESIGN RESISTANCE* – CONCRETE C20/25, STEEL A-II (18G2) [kN]																										
$\frac{l_o}{d_s}$ [mm]	200	210	240	250	260	300	330	375	400	420	440	460	480	500	530	550	600	670	750	800	830	900	930	1000	Steel failure	
8	11.6	12.1	13.9	14.4	15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.51	
10	14.4	15.2	17.3	18.1	18.8	21.7	23.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.23	
12	17.3	18.2	20.8	21.7	22.5	26.0	28.6	32.5	34.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.89	
14	-	21.2	24.3	25.3	26.3	30.3	33.4	37.9	40.4	42.5	44.5	46.5	-	-	-	-	-	-	-	-	-	-	-	-	47.50	
16	-	-	27.7	28.9	30.0	34.7	38.1	43.3	46.2	48.5	50.8	53.2	55.5	57.8	61.2	-	-	-	-	-	-	-	-	-	62.04	
20	-	-	-	-	-	43.3	47.7	54.2	57.8	60.7	63.6	66.4	69.3	72.2	76.6	79.4	86.7	96.8	-	-	-	-	-	-	96.93	
25	-	-	-	-	-	-	-	67.7	72.2	75.8	79.4	83.1	86.7	90.3	95.7	99.3	108.3	121.0	135.4	144.4	149.9	-	-	-	151.45	
28	-	-	-	-	-	-	-	-	-	84.9	89.0	93.0	97.1	101.1	107.2	111.2	121.3	135.5	151.7	161.8	167.8	182.0	188.1	-	189.98	
32	-	-	-	-	-	-	-	-	-	-	-	-	-	110.9	115.6	122.5	127.1	138.7	154.8	173.3	184.9	191.8	208.0	214.9	231.1	248.14

OVERLAP SPLICE – DESIGN RESISTANCE* – CONCRETE C50/60, STEEL A-II (18G2) [kN]																									
$\frac{l_o}{d_s}$ [mm]	200	208	210	240	250	290	300	330	375	400	420	450	480	500	550	600	640	700	720	800	850	900	910	1000	Steel failure
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.51
10	23.2	24.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.23
12	27.9	29.0	29.3	33.5	34.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.89
14	-	-	34.2	39.0	40.7	47.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47.50
16	-	-	-	44.6	46.5	53.9	55.8	61.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	62.04
20	-	-	-	-	-	-	64.1	70.5	80.1	85.4	89.7	96.1	-	-	-	-	-	-	-	-	-	-	-	-	96.93
25	-	-	-	-	-	-	-	-	88.3	94.2	98.9	106.0	113.0	117.8	129.5	141.3	150.7	-	-	-	-	-	-	-	151.45
28	-	-	-	-	-	-	-	-	-	110.8	118.7	126.6	131.9	145.1	158.3	168.8	184.6	189.9	-	-	-	-	-	-	189.98
32	-	-	-	-	-	-	-	-	-	-	-	-	130.2	135.6	149.2	162.8	173.6	189.9	195.3	217.0	230.6	244.2	246.9	-	248.14

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C20/25, STEEL A-III (34GS) [kN]																									
$\frac{l_{bd}}{d_s}$ [mm]	100	120	140	170	190	210	240	300	310	320	330	380	400	440	460	500	540	620	700	770	850	900	960	1000	Steel failure
8	5.8	6.9	8.1	9.8	11.0	12.1	13.9	17.3	17.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.91
10	-	8.7	10.1	12.3	13.7	15.2	17.3	21.7	22.4	23.1	23.8	27.4	-	-	-	-	-	-	-	-	-	-	-	-	27.99
12	-	-	12.1	14.7	16.5	18.2	20.8	26.0	26.9	27.7	28.6	32.9	34.7	38.1	39.9	-	-	-	-	-	-	-	-	-	40.30
14	-	-	-	17.2	19.2	21.2	24.3	30.3	31.3	32.4	33.4	38.4	40.4	44.5	46.5	50.6	54.6	-	-	-	-	-	-	-	54.85
16	-	-	-	-	22.0	24.3	27.7	34.7	35.8	37.0	38.1	43.9	46.2	50.8	53.2	57.8	62.4	71.6	-	-	-	-	-	-	71.65
20	-	-	-	-	-	-	34.7	43.3	44.8	46.2	47.7	54.9	57.8	63.6	66.4	72.2	78.0	89.6	101.1	111.2	-	-	-	-	111.95
25	-	-	-	-	-	-	-	54.2	56.0	57.8	59.6	68.6	72.2	79.4	83.1	90.3	97.5	111.9	126.4	139.0	153.5	162.5	173.3	-	174.92
28	-	-	-	-	-	-	-	-	-	-	66.7	76.8	80.9	89.0	93.0	101.1	109.2	125.4	141.6	155.7	171.9	182.0	194.1	202.2	219.42
32	-	-	-	-	-	-	-	-	-	-	-	87.8	92.4	101.7	106.3	115.6	124.8	143.3	161.8	178.0	196.4	208.0	221.9	231.1	286.59

Basic performance data (cont.)

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C50/60. STEEL A-III (34GS) [kN]																									
$\frac{l_{bd}}{d_s}$	100	120	140	160	190	200	240	250	280	290	300	320	330	380	450	520	550	600	700	740	830	900	950	1000	Steel Failure
8	9.3	11.2	13.0	14.9	17.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.91
10	11.6	13.9	16.3	18.6	22.1	23.2	27.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27.99
12	-	16.7	19.5	22.3	26.5	27.9	33.5	34.9	39.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.30
14	-	-	22.8	26.0	30.9	32.5	39.0	40.7	45.5	47.2	48.8	52.0	53.7	-	-	-	-	-	-	-	-	-	-	-	54.85
16	-	-	-	29.7	35.3	37.2	44.6	46.5	52.0	53.9	55.8	59.5	61.3	70.6	-	-	-	-	-	-	-	-	-	-	71.65
20	-	-	-	-	42.7	51.2	53.4	59.8	61.9	64.1	68.3	70.5	81.1	96.1	111.0	-	-	-	-	-	-	-	-	-	111.95
25	-	-	-	-	-	-	58.9	65.9	68.3	70.7	75.4	77.7	89.5	106.0	122.5	129.5	141.3	164.9	174.3	-	-	-	-	-	174.92
28	-	-	-	-	-	-	-	73.9	76.5	79.1	84.4	87.0	100.2	118.7	137.2	145.1	158.3	184.6	195.2	218.9	-	-	-	-	219.42
32	-	-	-	-	-	-	-	-	-	-	86.8	89.5	103.1	122.1	141.1	149.2	162.8	189.9	200.8	225.2	244.2	257.7	271.3	286.59	

OVERLAP SPLICE – DESIGN RESISTANCE* – CONCRETE C20/25. STEEL A-III (34GS) [kN]																									
$\frac{l_o}{d_s}$	200	210	240	250	300	310	375	380	400	420	460	480	500	540	600	620	700	750	770	800	850	900	960	1000	Steel Failure
8	11.6	12.1	13.9	14.4	17.3	17.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.91
10	14.4	15.2	17.3	18.1	21.7	22.4	27.1	27.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27.99
12	17.3	18.2	20.8	21.7	26.0	26.9	32.5	32.9	34.7	36.4	39.9	-	-	-	-	-	-	-	-	-	-	-	-	-	40.30
14	-	21.2	24.3	25.3	30.3	31.3	37.9	38.4	40.4	42.5	46.5	48.5	50.6	54.6	-	-	-	-	-	-	-	-	-	-	54.85
16	-	-	27.7	28.9	34.7	35.8	43.3	43.9	46.2	48.5	53.2	55.5	57.8	62.4	69.3	71.6	-	-	-	-	-	-	-	-	71.65
20	-	-	-	-	43.3	44.8	54.2	54.9	57.8	60.7	66.4	69.3	72.2	78.0	86.7	89.6	101.1	108.3	111.2	-	-	-	-	-	111.95
25	-	-	-	-	-	-	67.7	68.6	72.2	75.8	83.1	86.7	90.3	97.5	108.3	111.9	126.4	135.4	139.0	144.4	153.5	162.5	173.3	-	174.92
28	-	-	-	-	-	-	-	-	-	84.9	93.0	97.1	101.1	109.2	121.3	125.4	141.6	151.7	155.7	161.8	171.9	182.0	194.1	202.2	219.42
32	-	-	-	-	-	-	-	-	-	-	-	110.9	115.6	124.8	138.7	143.3	161.8	173.3	178.0	184.9	196.4	208.0	221.9	231.1	286.59

OVERLAP SPLICE – DESIGN RESISTANCE* – CONCRETE C50/60. STEEL A-III (34GS) [kN]																									
$\frac{l_o}{d_s}$	200	210	240	260	280	300	330	350	375	380	400	420	480	500	520	600	650	700	740	800	830	900	950	1000	Steel Failure
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.91
10	23.2	24.4	27.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27.99
12	27.9	29.3	33.5	36.2	39.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.30
14	-	34.2	39.0	42.3	45.5	48.8	53.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54.85
16	-	-	44.6	48.3	52.0	55.8	61.3	65.1	69.7	70.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71.65
20	-	-	-	-	-	64.1	70.5	74.7	80.1	81.1	85.4	89.7	102.5	106.8	111.0	-	-	-	-	-	-	-	-	-	111.95
25	-	-	-	-	-	-	-	-	88.3	89.5	94.2	98.9	113.0	117.8	122.5	141.3	153.1	164.9	174.3	-	-	-	-	-	174.92
28	-	-	-	-	-	-	-	-	-	-	-	110.8	126.6	131.9	137.2	158.3	171.4	184.6	195.2	211.0	218.9	-	-	-	219.42
32	-	-	-	-	-	-	-	-	-	-	-	-	130.2	135.6	141.1	162.8	176.3	189.9	200.8	217.0	225.2	244.2	257.7	271.3	286.59

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C20/25. STEEL A-IIIN (RB500/BS500S/BS500SP) [kN]																									
$\frac{l_{bd}}{d_s}$	120	150	160	180	200	230	250	290	300	360	370	400	460	470	560	600	660	700	750	800	850	900	940	1000	Steel Failure
8	6.9	8.7	9.2	10.4	11.6	13.3	14.4	16.8	17.3	20.8	21.4	-	-	-	-	-	-	-	-	-	-	-	-	-	21.84
10	-	10.8	11.6	13.0	14.4	16.6	18.1	20.9	21.7	26.0	26.7	28.9	33.2	33.9	-	-	-	-	-	-	-	-	-	-	34.13
12	-	-	-	15.6	17.3	19.9	21.7	25.1	26.0	31.2	32.1	34.7	39.9	40.7	48.5	-	-	-	-	-	-	-	-	-	49.15
14	-	-	-	-	20.2	23.3	25.3	29.3	30.3	36.4	37.4	40.4	46.5	47.5	56.6	60.7	66.7	-	-	-	-	-	-	-	66.90
16	-	-	-	-	-	26.6	28.9	33.5	34.7	41.6	42.8	46.2	53.2	54.3	64.7	69.3	76.3	80.9	86.7	-	-	-	-	-	87.37
20	-	-	-	-	-	-	-	41.9	43.3	52.0	53.4	57.8	66.4	67.9	80.9	86.7	95.3	101.1	108.3	115.6	122.8	130.0	135.8	-	136.52
25	-	-	-	-	-	-	-	-	-	65.0	66.8	72.2	83.1	84.9	101.1	108.3	119.2	126.4	135.4	144.4	153.5	162.5	169.7	180.6	213.32
28	-	-	-	-	-	-	-	-	-	-	-	80.9	93.0	95.0	113.2	121.3	133.5	141.6	151.7	161.8	171.9	182.0	190.1	202.2	267.58
32	-	-	-	-	-	-	-	-	-	-	-	-	106.3	108.6	129.4	138.7	152.5	161.8	173.3	184.9	196.4	208.0	217.2	231.1	349.50

Basic performance data (cont.)

ANCHORAGES – DESIGN RESISTANCE – CONCRETE C50/60. STEEL A-IIIN (RB500/BS500S/BS500SP) [kN]																										
$\frac{l_{bd}}{d_s}$	d_s [mm]																								Steel failure	
	100	120	140	160	180	200	220	230	280	290	310	350	390	410	450	470	500	630	750	800	850	900	950	1000		
8	9.3	11.2	13.0	14.9	16.7	18.6	20.4	21.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.84
10	11.6	13.9	16.3	18.6	20.9	23.2	25.6	26.7	32.5	33.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.13
12	-	16.7	19.5	22.3	25.1	27.9	30.7	32.1	39.0	40.4	43.2	48.8	-	-	-	-	-	-	-	-	-	-	-	-	-	49.15
14	-	-	22.8	26.0	29.3	32.5	35.8	37.4	45.5	47.2	50.4	56.9	63.4	66.7	-	-	-	-	-	-	-	-	-	-	-	66.90
16	-	-	-	29.7	33.5	37.2	40.9	42.8	52.0	53.9	57.6	65.1	72.5	76.2	83.6	87.4	-	-	-	-	-	-	-	-	-	87.37
20	-	-	-	-	-	42.7	47.0	49.1	59.8	61.9	66.2	74.7	83.3	87.5	96.1	100.4	106.8	134.5	-	-	-	-	-	-	-	136.52
25	-	-	-	-	-	-	-	-	65.9	68.3	73.0	82.4	91.8	96.6	106.0	110.7	117.8	148.4	176.6	188.4	200.2	212.0	-	-	-	213.32
28	-	-	-	-	-	-	-	-	-	-	-	81.8	92.3	102.9	108.1	118.7	124.0	131.9	166.2	197.8	211.0	224.2	237.4	250.6	263.8	267.58
32	-	-	-	-	-	-	-	-	-	-	-	-	-	105.8	111.2	122.1	127.5	135.6	170.9	203.5	217.0	230.6	244.2	257.7	271.3	349.50

OVERLAP SPLICE – DESIGN RESISTANCE* – CONCRETE C20/25. STEEL A-III (34GS) [kN]																										
$\frac{l_0}{d_s}$	d_s [mm]																								Steel failure	
	200	210	240	250	300	310	375	380	400	420	460	480	500	540	600	620	700	750	770	800	850	900	960	1000		
8	11.6	12.1	13.9	14.4	17.3	17.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.91
10	14.4	15.2	17.3	18.1	21.7	22.4	27.1	27.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27.99
12	17.3	18.2	20.8	21.7	26.0	26.9	32.5	32.9	34.7	36.4	39.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.30
14	-	21.2	24.3	25.3	30.3	31.3	37.9	38.4	40.4	42.5	46.5	48.5	50.6	54.6	-	-	-	-	-	-	-	-	-	-	-	54.85
16	-	-	27.7	28.9	34.7	35.8	43.3	43.9	46.2	48.5	53.2	55.5	57.8	62.4	69.3	71.6	-	-	-	-	-	-	-	-	-	71.65
20	-	-	-	-	43.3	44.8	54.2	54.9	57.8	60.7	66.4	69.3	72.2	78.0	86.7	89.6	101.1	108.3	111.2	-	-	-	-	-	-	111.95
25	-	-	-	-	-	-	67.7	68.6	72.2	75.8	83.1	86.7	90.3	97.5	108.3	111.9	126.4	135.4	139.0	144.4	153.5	162.5	173.3	-	-	174.92
28	-	-	-	-	-	-	-	-	-	84.9	93.0	97.1	101.1	109.2	121.3	125.4	141.6	151.7	155.7	161.8	171.9	182.0	194.1	202.2	-	219.42
32	-	-	-	-	-	-	-	-	-	-	-	-	110.9	115.6	124.8	138.7	143.3	161.8	173.3	178.0	184.9	196.4	208.0	221.9	231.1	286.59

OVERLAP SPLICE – DESIGN RESISTANCE – CONCRETE C50/60, STEEL A-IIIN (RB500/BS500S/BS500SP) [kN]																										
$\frac{l_0}{d_s}$	d_s [mm]																								Steel failure	
	200	210	230	240	290	300	330	350	375	390	410	420	470	480	550	600	630	700	750	800	850	900	950	1000		
8	18.6	19.5	21.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.84
10	23.2	24.4	26.7	27.9	33.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.13
12	27.9	29.3	32.1	33.5	40.4	41.8	46.0	48.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49.15
14	-	34.2	37.4	39.0	47.2	48.8	53.7	56.9	61.0	63.4	66.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66.90
16	-	-	-	44.6	53.9	55.8	61.3	65.1	69.7	72.5	76.2	78.1	87.4	-	-	-	-	-	-	-	-	-	-	-	-	87.37
20	-	-	-	-	-	64.1	70.5	74.7	80.1	83.3	87.5	89.7	100.4	102.5	117.4	128.1	134.5	-	-	-	-	-	-	-	-	136.52
25	-	-	-	-	-	-	-	-	88.3	91.8	96.6	98.9	110.7	113.0	129.5	141.3	148.4	164.9	176.6	188.4	200.2	212.0	-	-	-	213.32
28	-	-	-	-	-	-	-	-	-	-	-	-	110.8	124.0	126.6	145.1	158.3	166.2	184.6	197.8	211.0	224.2	237.4	250.6	263.8	267.58
32	-	-	-	-	-	-	-	-	-	-	-	-	-	130.2	149.2	162.8	170.9	189.9	203.5	217.0	230.6	244.2	257.7	271.3	-	349.50

Product commercial data

Product Code	Volume [m]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-CFS+RV200-4	300	4	32	384	2.44	7.32	263.52	5906675205830	18
R-CFS+RV200W-4	300	4	32	384	2.44	7.32	263.52	5906675375762	12
R-CFS+RV200S-4	300	4	32	384	2.44	7.32	263.52	5906675201375	12
R-CFS+RV200-600-8	600	8	-	288	8.30	8.30	298.8	5906675119045	18

RM50 with Threaded Rods for Concrete (CFS+)

Universal polyester (styrene free) resin - European Approval for 15 substrates
- Cartridge Free System (CFS+)



Approvals and Reports

- ETA-13/0394



Installation movie

Product overview

Features and benefits

- The most contemporary general use wbonded anchor
- Quick, secure and simple installation
- Unique soft foil pack for less waste
- Effortless extrusion due to patented self-opening system with manual or pneumatic dispenser guns
- Product with wide spectrum of use in the medium load capacity area
- Ideal for applications without the possibility of mechanical anchorage
- Suitable for multiple use. Partly used product can be reused after fitting spare nozzle

Applications

- Balustrading
- Handrails
- Canopies
- Curtain walling

Base materials

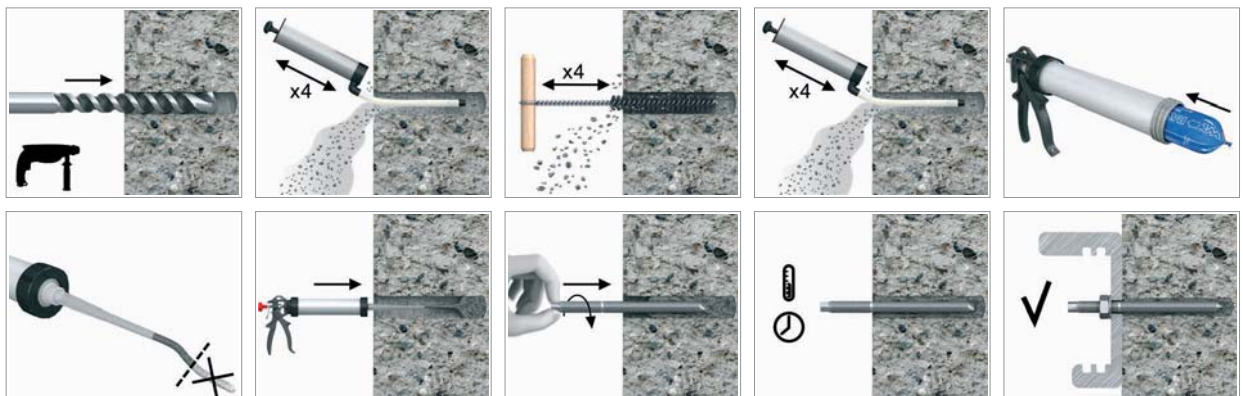
Approved for use in:

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

Also suitable for use in:

- Natural Stone

Installation guide



Installation guide (cont.)

1. Drill hole to the required diameter and depth for stud size being used.
2. Solid substrates: Clean the hole with brush and hand pump at least four times each. It is very important and necessary before installation. Hollow substrates: insert mesh sleeve before injection.
3. Insert foil into gun and attach nozzle.
4. Dispense to waste until even colour is obtained.
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.

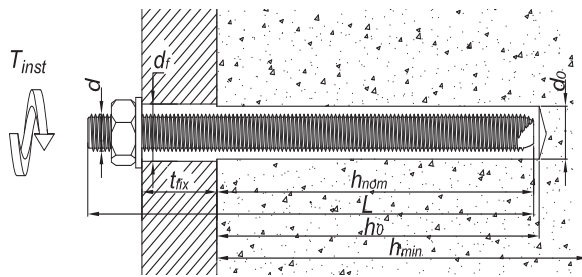
Product information

Product Code	Resin	Description / Resin Type	Volume
			[m]
R-CFS+RM50-4	RM50	Styrene Free Polyester Resin	300
R-CFS+RM50S-4	RM50-S	High Temperature (Summer) / Slow Cure Styrene Free Polyester Resin	
R-CFS+RM50W-4	RM50-W	Low Temperature (Winter) / Rapid Cure Styrene Free Polyester Resin	
R-CFS+RM50-600-8	RM50	Styrene Free Polyester Resin	600

THREADED RODS

Size	Product Code			Anchor		Fixture			
	Steel class 5.8	Steel class 8.8	Steel grade A4	Diameter	Length	Hole diameter	Max. thickness		
				d	L		d _f	t _{fix} for h _{ef,min}	t _{fix} for h _{ef,std}
				[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
M8	R-STUDS-08110	R-STUDS-08110-88	R-STUDS-08110-A4	8	110	9	40	20	-
	R-STUDS-08160	-	-	8	160	9	90	70	50
M10	R-STUDS-10130	R-STUDS-10130-88	R-STUDS-10130-A4	10	130	12	48	28	-
	R-STUDS-10170	-	R-STUDS-10170-A4	10	170	12	88	68	38
	R-STUDS-10190	-	-	10	190	12	108	88	58
M12	R-STUDS-12160	R-STUDS-12160-88	R-STUDS-12160-A4	12	160	14	65	35	-
	R-STUDS-12190	-	R-STUDS-12190-A4	12	190	14	95	65	30
	R-STUDS-12220	-	R-STUDS-12220-A4	12	220	14	125	95	60
	R-STUDS-12260	-	-	12	260	14	165	135	100
	R-STUDS-12300	-	-	12	300	14	205	175	140
M16	R-STUDS-16190	R-STUDS-16190-88	R-STUDS-16190-A4	16	190	18	71	46	-
	R-STUDS-16220	R-STUDS-16220-88	-	16	220	18	101	76	11
	R-STUDS-16260	-	R-STUDS-16260-A4	16	260	18	141	116	51
	R-STUDS-16300	-	-	16	300	18	181	156	91
	R-STUDS-16380	-	-	16	380	18	261	236	171
M20	R-STUDS-20260	R-STUDS-20260-88	R-STUDS-20260-A4	20	260	22	117	67	-
	R-STUDS-20300	R-STUDS-20300-88	-	20	300	22	157	107	37
	R-STUDS-20350	-	-	20	350	22	207	157	87
M24	R-STUDS-24300	R-STUDS-24300-88	R-STUDS-24300-A4	24	300	26	132	62	-
M30	R-STUDS-30380	R-STUDS-30380-88	R-STUDS-30380-A4	30	380	32	181	106	-

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	
Installation torque	T _{inst}	[Nm]	10	20	40	80	120	180	300	
Min. hole depth in substrate	h ₀	[mm]	h _{ef} + 5							
MINIMUM EMBEDMENT DEPTH										
Installation depth	h _{nom, min}	[mm]	60	70	80	100	120	140	165	
STANDARD EMBEDMENT DEPTH										
Installation depth	h _{nom, s}	[mm]	80	90	110	125	170	210	240	
MAXIMUM EMBEDMENT DEPTH										
Installation depth	h _{nom, max}	[mm]	100	120	145	190	240	290	360	
Min. substrate thickness	h _{min}	[mm]	h _{ef} + 30 ≥ 100				h _{ef} + 2*d ₀			
Min. spacing	s _{min}	[mm]	0.5 * h _{ef} ≥ 40							
Min. edge distance	c _{min}	[mm]	0.5 * h _{ef} ≥ 40							

Minimum working and curing time

Resin temperature [°C]	Concrete temperature [°C]	Working time [min]			Curing time* [min]		
		RM50-S	RM50	RM50-W	RM50-S	RM50	RM50-W
5	-20	-	-	45	-	-	24h
5	-15	-	-	30	-	-	18h
5	-10	-	-	20	-	-	8h
5	-5	4h	70	11	24h	8h	5h
5	0	2h	45	7	18h	4h	2h
5	5	60	25	5	12h	2h	60
10	10	45	15	2	8h	90	45
15	15	25	9	1,5	6h	60	30
20	20	15	5	1	4h	45	15
25	30	7	2	-	90	30	-
25	40	5	-	-	45	-	-

*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/mm ²]	520	520	520	520	520	520	520
Nominal yield strength - tension	f_{yk}	[N/mm ²]	420	420	420	420	420	420	420
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	$M_{Rk,s}^0$	[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	$M_{Rk,s}^0$	[Nm]	30	60	105	266	519	898	1793
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	$M_{Rk,s}^0$	[Nm]	26	52	92	233	454	785	1569
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	
Substrate		Non-cracked concrete							
MEAN ULTIMATE LOAD									
TENSION LOAD $N_{R,u,m}$									
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8									
Minimum embedment depth	[kN]	16.3	23.7	31	47.3	68.4	76.9	95.7	
Standard embedment depth	[kN]	20.4	32.2	42.6	68.6	102.6	115.4	150.8	
Maximum embedment depth	[kN]	21.6	34.8	50.4	89.9	136.7	159.4	208.8	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8									
Minimum embedment depth	[kN]	16.3	23.7	31	47.3	68.4	76.9	95.7	
Standard embedment depth	[kN]	20.4	32.2	42.6	68.6	102.6	115.4	150.8	
Maximum embedment depth	[kN]	21.6	34.8	50.4	89.9	136.7	159.4	208.8	
R-STUDS METRIC THREADED RODS - A4									
Minimum embedment depth	[kN]	16.3	23.7	31	47.3	68.4	76.9	95.7	
Standard embedment depth	[kN]	20.4	32.2	42.6	68.6	102.6	115.4	150.8	
Maximum embedment depth	[kN]	21.6	34.8	50.4	89.9	136.7	159.4	208.8	
SHEAR LOAD $V_{R,u,m}$									
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	18.3	29	42.15	78.5	122.5	176.5	280.5	
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	29.28	46.4	67.44	125.6	196	282.4	448.8	
R-STUDS METRIC THREADED RODS - A4	[kN]	25.62	40.6	59.01	109.9	171.5	247.1	392.7	
CHARACTERISTIC LOAD									
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	
Standard embedment depth	[kN]	18	26.9	37.3	50.3	85.5	102.9	124.4	
Maximum embedment depth	[kN]	18	29	42	76.4	120.6	142.1	186.6	

Basic performance data (cont.)

Size		M8	M10	M12	M16	M20	M24	M30
Substrate		Non-cracked concrete						
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
Standard embedment depth	[kN]	19.1	26.9	37.3	50.3	85.5	102.9	124.4
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
Standard embedment depth	[kN]	19.1	26.9	37.3	50.3	85.5	102.9	124.4
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	[kN]	9.0	14.0	21.0	39.0	61.0	88.0	140.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	15.0	23.0	34.0	63.0	98.0	141.0	224.0
R-STUDS METRIC THREADED RODS - A4	[kN]	13.0	20.0	29.0	55.0	86.0	124.0	196.0
DESIGN LOAD								
TENSION LOAD N_{Rd}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8								
Minimum embedment depth	[kN]	6.8	11.61	15.1	22.3	33.5	38.1	47.5
Standard embedment depth	[kN]	9.10	14.9	20.7	27.9	47.5	57.2	69.1
Maximum embedment depth	[kN]	11.4	19.3	27.3	42.4	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
Standard embedment depth	[kN]	9.10	14.9	20.7	27.9	47.5	57.2	69.1
Maximum embedment depth	[kN]	11.4	19.9	27.3	42.4	67.0	79.0	103.7
R-STUDS METRIC THREADED RODS - A4								
Minimum embedment depth	[kN]	6.80	11.6	15.1	22.3	33.5	38.1	47.5
Standard embedment depth	[kN]	9.10	14.9	20.7	27.9	47.5	57.2	69.1
Maximum embedment depth	[kN]	11.4	19.9	27.3	42.4	67.0	79.0	103.7
SHEAR LOAD V_{Rd}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	7.20	11.2	16.8	31.2	48.8	70.4	112.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	12.0	18.4	27.2	50.4	78.4	112.8	179.2
R-STUDS METRIC THREADED RODS - A4	[kN]	8.33	12.8	18.6	35.3	55.1	79.5	125.6
RECOMMENDED LOAD								
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
Standard embedment depth	[kN]	6.50	10.7	14.8	20.0	33.9	40.9	49.4
Maximum embedment depth	[kN]	8.14	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]	4.9	8.29	10.8	16.0	23.9	27.2	33.9
Standard embedment depth	[kN]	6.5	10.7	14.8	20.0	33.9	40.9	49.4
Maximum embedment depth	[kN]	8.14	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
Standard embedment depth	[kN]	6.50	10.7	14.8	20.0	33.9	40.9	49.4
Maximum embedment depth	[kN]	8.14	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	[kN]	5.14	8.0	12.0	22.3	34.9	50.3	80.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8.57	13.1	19.4	36.0	56.0	80.6	128.0
R-STUDS METRIC THREADED RODS - A4	[kN]	5.95	9.16	13.3	25.2	39.4	56.8	89.7

Product commercial data

Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-CFS+RM50-4	300	1	3	108	2.44	7.32	263.52	5906675205892	18
R-CFS+RM50W-4	300	1	3	108	2.44	7.32	263.52	-	12
R-CFS+RM50S-4	300	1	3	108	2.44	7.32	263.53	-	12
R-CFS+RM50-600-8	600	1	1	36	8.30	8.30	298.8	5906675078823	18

RM50 with Threaded Rods for Masonry (CFS+)

Universal polyester (styrene free) resin - European Approval for 15 substrates
- Cartridge Free System (CFS+)



Approvals and Reports

- ETA-13/0528; ETAG 029



Product overview

Features and benefits

- The most contemporary general use bonded anchor for masonry
- Approved for 15 substrates
- Quick, secure and simple installation
- Unique soft foil pack for less waste
- Effortless extrusion due to patented self-opening system with manual or pneumatic dispenser guns
- Product with wide spectrum of use in the medium load capacity area
- Ideal for applications without the possibility of mechanical anchorage
- Suitable for multiple use. Partly used product can be reused after fitting spare nozzle

Applications

- Balustrading
- Handrails
- Canopies
- Curtain walling
- Bathroom fittings
- Cable trays
- Barriers
- Cladding restraint
- Fencing & gates
- Pipework

Base materials

Approved for use in:

- Solid Concrete Block
- Lightweight Concrete Block
- Solid Brick
- Concrete Slab
- Solid Sand-lime Brick
- Aerated Concrete Block
- Hollow Sand-lime Brick
- Hollow Brick
- Hollow Lightweight Concrete Block

Installation guide



Installation guide (cont.)

1. Drill hole to the required diameter and depth for stud size being used.
- 2a. Solid substrates: Clean the hole with brush and hand pump at least four times each. It is very important and necessary before installation.
- 2b. Hollow substrates: Insert mesh sleeve into the hole.
3. Insert cartridge into gun and attach nozzle.
4. Dispense to waste until even colour is obtained.
- 5a. Solid Substrates: 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.
- 5b. Hollow substrate: Insert the mixing nozzle to the far end of the hole and inject resin, slowly withdrawing the nozzle as the hole is filled to the surface.
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 information

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-CFS+RM50-4	RM50	Styrene Free Polyester Resin	300
R-CFS+RM50S-4	RM50-S	High Temperature (Summer) / Slow Cure Styrene Free Polyester Resin	
R-CFS+RM50W-4	RM50-W	Low Temperature (Winter) / Rapid Cure Styrene Free Polyester Resin	
R-CFS+RM50-600-8	RM50	Styrene Free Polyester Resin	600

THREADED RODS

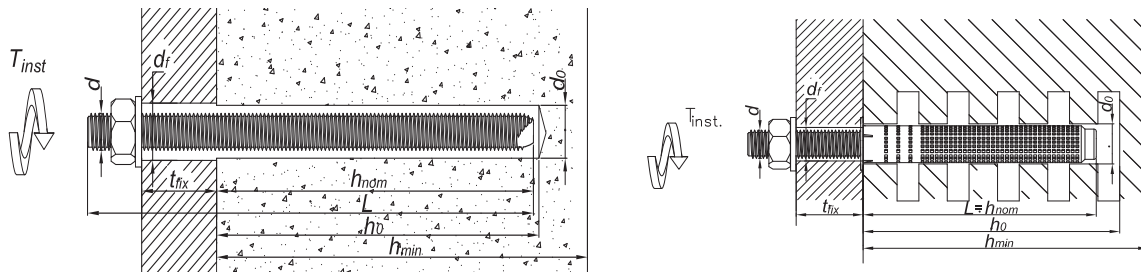
Size	Product Code			Anchor		Fixture			
	Steel grade A4	Steel class 5.8	Steel class 8.8	Diameter	Length	Hole diameter	Max. thickness		
							Solid substrates	Hollow substrates	
				d	L	d _f	t _{fix} for h _{nom}	t _{fix} for h _{nom,std}	t _{fix} for h _{nom,max}
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]			
M8	R-STUDS-08110	R-STUDS-08110-88	R-STUDS-08110-A4	8	110	9	20	50	20
	R-STUDS-08160	-	-	8	160	9	70	100	70
M10	R-STUDS-10130	R-STUDS-10130-88	R-STUDS-10130-A4	10	130	12	33	33	-
	R-STUDS-10170	-	R-STUDS-10170-A4	10	170	12	73	73	33
	R-STUDS-10190	-	-	10	190	12	93	93	53
M12	R-STUDS-12160	R-STUDS-12160-88	R-STUDS-12160-A4	12	160	14	50	60	20
	R-STUDS-12190	-	R-STUDS-12190-A4	12	190	14	80	90	50
	R-STUDS-12220	-	R-STUDS-12220-A4	12	220	14	110	120	80
	R-STUDS-12260	-	-	12	260	14	150	160	120
M16	R-STUDS-12300	-	-	12	300	14	190	200	160
	R-STUDS-16190	R-STUDS-16190-88	R-STUDS-16190-A4	16	190	18	66	86	-
	R-STUDS-16220	R-STUDS-16220-88	-	16	220	18	96	116	-
	R-STUDS-16260	-	R-STUDS-16260-A4	16	260	18	136	156	-
	R-STUDS-16300	-	-	16	300	18	176	196	-
R-STUDS-16380	-	-	16	380	18	256	276	-	

Product information (cont.)

R-PLS Plastic Mesh Sleeves and SP-CE Mesh Sleeves

Product Code	Size		Quantity [pcs]		Weight [kg]		Bar Code
	Sleeve [mm]	Stud	Outer	Pallet	Box	Outer	
R-PLS-12050-10	12x50	M6-M8	10	480	0.06	0.06	5906675377520
R-PLS-15085-10	15x85	M8-M10	10	6000	0.06	0.06	5906675291840
R-PLS-15125-10	15x125	M8-M10	10	6000	0.08	0.08	5906675291857
R-PLS-20085-10	20x85	M12-M16	10	4800	0.08	0.08	5906675291864
SP-CE-R08	10x1000	M6-M8	10	-	0,129	0,129	5906675266138
SP-CE-R10	12x1000	M8	10	-	0,129	0,129	5906675610122
SP-CE-R12	16x1000	M10	10	-	0,129	0,129	5906675610320
SP-CE-R16	22x1000	M12	10	-	0,129	0,129	5906675610528
SP-CE-R20	28x1000	M16	5	-	0,258	0,258	5906675610726
SP-CE-ED-1M	-	-	10	-	0,002	0,002	5906675601120

Installation data



SOLID SUBSTRATES

Size			Mw8	M10	M12	M16	M8	M10	M12	M16
Substrate			Ceramic solid substrates				Aerated concrete			
Thread diameter	d	[mm]	8	10	12	16	8	10	12	16
Hole diameter in substrate	d ₀	[mm]	10	12	14	18	10	12	14	18
Installation torque	T _{inst.}	[Nm]	5	8	10	15	3	4	6	10
Min. hole depth in substrate	h ₀	[mm]	h _{nom} + 5							
Installation depth	h _{nom,min}	[mm]	80	85	95	105	80	85	95	105
Min. spacing	s _{min}	[mm]	50	50	50	54	50	50	50	54
Min. edge distance	c _{min}	[mm]	50	50	50	54	50	50	50	54

HOLLOW SUBSTRATES

Size			M10	M10	M12	M16			
Substrate			Hollow substrates						
Thread diameter	d	[mm]	8	8	10	10	12	12	16
Plastic mesh sleeve size	dxl	[mm]	12x50	12x80	15x85	15x125	15x85	15x125	20x85
Hole diameter in substrate	d ₀	[mm]	12	12	16	16	16	16	20
Installation torque	T _{inst.}	[Nm]	3	3	4	4	6	6	10
Min. hole depth in substrate	h ₀	[mm]	h _{nom} + 5						
Installation depth	h _{nom,std}	[mm]	50	-	85	-	85	-	85
	h _{nom,max}	[mm]	-	80	-	125	-	125	-
Min. spacing	s _{min}	[mm]	100	100	100	100	100	100	120
Min. edge distance	c _{min}	[mm]	100	100	100	100	100	100	120

Installation data (cont.)

Minimum working and curing time

Resin temperature [°C]	Concrete temperature [°C]	Working time [min]			Curing time* [min]		
		RM50-S	RM50	RM50-W	RM50-S	RM50	RM50-W
5	-20	-	-	45	-	-	1440
5	-15	-	-	30	-	-	1080
5	-10	-	-	20	-	-	480
5	-5	180	70	11	1440	480	360
5	0	120	45	7	1080	240	120
5	5	60	25	5	720	120	60
10	10	45	15	2	480	90	45
15	15	25	9	1,5	360	60	30
20	20	15	5	1	240	45	15
25	30	7	2	-	90	30	-
25	35	6	-	-	60	-	-
25	40	5	-	-	45	-	-

*For wet concrete the curing time must be doubled

Mechanical properties

R-STUDS

Size			M8	M10	M12	M16
R-STUDS METRIC THREADED RODS - steel class 5.8						
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	500	500	500	500
Nominal yield strength - tension	f_{yk}	[N/mm ²]	400	400	400	400
Cross sectional area - tension	A_s	[mm ²]	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm ³]	31.2	62.3	109.2	277.5
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	19	37	65	166
Design bending resistance	M	[Nm]	15	30	52	133
R-STUDS METRIC THREADED RODS - steel class 8.8						
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	800	800	800	800
Nominal yield strength - tension	f_{yk}	[N/mm ²]	640	640	640	640
Cross sectional area - tension	A_s	[mm ²]	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm ³]	31.2	62.3	109.2	277.5
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	30	60	105	266
Design bending resistance	M	[Nm]	24	48	84	213
R-STUDS METRIC THREADED RODS - A4						
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	700	700	700	700
Nominal yield strength - tension	f_{yk}	[N/mm ²]	350	350	350	350
Cross sectional area - tension	A_s	[mm ²]	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm ³]	31.2	62.3	109.2	277.5
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	26	52	92	233
Design bending resistance	M	[Nm]	17	34	59	149

Basic performance data

SOLID SUBSTRATES

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

Size			M8	M10	M12	M16
Substrate	Solid substrates					
Plastic mesh sleeve (dxl)	[mm]		-	-	-	-
MEAN ULTIMATE LOAD						
TENSION LOADS $N_{Ru,m}$						
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]		8.78	10.9	11.3	11.5
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]		2.65	3.24	4.11	4.68
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]		7.54	8.00	8.30	8.50

Basic performance data (cont.)

SOLID SUBSTRATES

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

Size		M8	M10	M12	M16
SHEAR LOADS $V_{R,u,m}$					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	5.79	8.35	11.6	11.5
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	2.43	3.41	4.36	4.48
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	5.86	8.11	7.91	8.23
CHARACTERISTIC LOAD*					
TENSION LOADS $N_{R,k}$					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	6.0	7.0	7.0	7.0
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	1.5	2.0	2.5	3.0
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	5.0	5.0	5.0	5.0
SHEAR LOADS $V_{R,k}$					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	3.5	5.0	7.0	7.0
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	1.5	2.0	2.5	2.5
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	3.5	5.0	5.0	5.0
DESIGN LOAD					
TENSION LOAD $N_{R,d}$					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	2.40	2.80	2.80	2.80
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	0.75	1.00	1.25	1.50
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	2.00	2.00	2.00	2.00
SHEAR LOAD $V_{R,d}$					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	1.40	2.00	2.80	2.80
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	0.75	1.00	1.25	1.25
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	1.40	2.00	2.00	2.00
RECOMMENDED LOAD**					
TENSION LOAD $N_{R,ec}$					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	1.71	2.00	2.00	2.00
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	0.54	0.71	0.89	1.07
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	1.43	1.43	1.43	1.43
SHEAR LOAD $V_{R,ec}$					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	1.00	1.43	2.00	2.00
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	0.54	0.71	0.89	0.89
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	1.00	1.43	1.43	1.43

*According to ETAG 029, **Partial safety factor 1.4

HOLLOW SUBSTRATES

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

Size		M8	M10	M12	M16			
Substrate		Hollow substrates						
Plastic mesh sleeve (dxl)	[mm]	12x50	12x80	15x85	15x125	15x85	15x125	20x85
MEAN ULTIMATE LOAD								
TENSION AND SHEAR LOADS $F_{R,u,m}$								
Silicate hollow block min 12MPa (eg KS Ratio Block 8 DF)	[kN]	3.42	3.50	3.73	5.11	4.16	4.48	4.24
Perforated ceramic blocks min 12MPa (eg Proton Hz 12/0.9 DF)	[kN]	3.21	3.54	3.87	4.03	3.97	4.16	3.69
Perforated ceramic blocks min 15MPa (eg Wienerberger Porotherm)	[kN]	2.04	2.84	3.07	3.68	3.74	3.99	3.51
Perforated ceramic blocks min 10MPa (eg Leiter Thermopor)	[kN]	2.08	2.98	3.19	3.78	3.68	4.03	3.77
Perforated ceramic blocks min 15MPa (eg MEGA MAX)	[kN]	2.86	3.43	3.74	3.59	3.71	3.94	3.80
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Mono Rect)	[kN]	1.24	1.25	2.49	2.74	2.82	2.78	2.14
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Rect)	[kN]	1.73	1.60	2.37	2.51	2.41	2.68	2.10
Perforated ceramic blocks min 6.0MPa (eg LS Monomur)	[kN]	1.30	1.39	1.99	2.06	2.05	2.12	2.05

Basic performance data (cont.)

HOLLOW SUBSTRATES

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

Size		M8		M10		M12		M16
Perforated ceramic blocks min 6MPa (eg SM BGV Thermo)	[kN]	1.45	1.45	2.22	2.17	2.19	2.24	2.25
Perforated ceramic blocks min 6.0MPa (eg SM BGV Thermo Plus)	[kN]	1.51	1.60	1.39	1.45	1.86	2.07	1.75
Lightweight concrete hollow block min 2.0MPa	[kN]	1.73	2.38	3.52	3.00	3.93	3.75	3.92
CHARACTERISTIC LOAD*								
TENSION AND SHEAR LOADS F_{rk}								
Silicate hollow block min 12MPa (eg KS Ratio Block 8 DF)	[kN]	2.5	2.5	2.5	3.5	3.0	3.0	3.0
Perforated ceramic blocks min 12MPa (eg Proton Hz 12/0.9 DF)	[kN]	2.0	2.5	2.5	2.5	2.5	2.5	2.5
Perforated ceramic blocks min 15MPa (eg Wienerberger Porotherm)	[kN]	1.5	2.0	2.0	2.5	2.5	2.5	2.5
Perforated ceramic blocks min 10MPa (eg Leiter Thermopor)	[kN]	1.5	2.0	2.0	2.5	2.5	2.5	2.5
Perforated ceramic blocks min 15MPa (eg MEGA MAX)	[kN]	2.0	2.5	2.5	2.5	2.5	2.5	2.5
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Mono Rect)	[kN]	0.9	0.9	1.5	2.0	2.0	2.0	2.0
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Rect)	[kN]	0.9	1.2	1.5	1.5	1.5	2.0	2.0
Perforated ceramic blocks min 6.0MPa (eg LS Monomur)	[kN]	0.9	0.9	1.2	1.5	1.5	1.5	1.5
Perforated ceramic blocks min 6MPa (eg SM BGV Thermo)	[kN]	0.9	0.9	1.5	1.5	1.5	1.5	1.5
Perforated ceramic blocks min 6.0MPa (eg SM BGV Thermo Plus)	[kN]	0.9	1.2	0.9	0.9	1.2	1.5	1.5
Lightweight concrete hollow block min 2.0MPa	[kN]	1.2	1.5	2.5	2.0	2.5	2.5	2.5
DESIGN LOAD								
TENSION AND SHEAR LOADS F_{Rd}								
Silicate hollow block min 12MPa (eg KS Ratio Block 8 DF)	[kN]	1.0	1.0	1.0	1.4	1.2	1.2	1.2
Perforated ceramic blocks min 12MPa (eg Proton Hz 12/0.9 DF)	[kN]	0.88	1.0	1.2	1.4	1.4	1.6	1.6
Perforated ceramic blocks min 15MPa (eg Wienerberger Porotherm)	[kN]	0.6	0.8	1.0	1.0	1.4	1.4	1.0
Perforated ceramic blocks min 10MPa (eg Leiter Thermopor)	[kN]	0.6	0.8	0.8	1.0	1.0	1.4	1.2
Perforated ceramic blocks min 15MPa (eg MEGA MAX)	[kN]	0.8	1.0	1.4	1.4	1.6	1.6	1.6
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Mono Rect)	[kN]	0.36	0.36	0.8	0.8	0.8	0.8	0.6
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Rect)	[kN]	0.48	0.48	0.6	0.6	0.8	0.8	0.6
Perforated ceramic blocks min 6.0MPa (eg LS Monomur)	[kN]	0.36	0.36	0.6	0.6	0.6	0.6	0.6
Perforated ceramic blocks min 6MPa (eg SM BGV Thermo)	[kN]	0.36	0.36	0.6	0.6	0.6	0.6	0.6
Perforated ceramic blocks min 6.0MPa (eg SM BGV Thermo Plus)	[kN]	0.48	0.48	0.48	0.48	0.48	0.60	0.48
Lightweight concrete hollow block min 2.0MPa	[kN]	0.48	0.6	1.0	1.0	1.0	1.4	1.4
RECOMMENDED LOAD**								
TENSION AND SHEAR LOADS F_{rec}								
Silicate hollow block min 12MPa (eg KS Ratio Block 8 DF)	[kN]	0.71	0.71	0.71	1.0	0.86	0.86	0.86
Perforated ceramic blocks min 12MPa (eg Proton Hz 12/0.9 DF)	[kN]	0.63	0.71	0.86	1.0	1.0	1.14	1.14
Perforated ceramic blocks min 15MPa (eg Wienerberger Porotherm)	[kN]	0.43	0.57	0.71	0.71	1.0	1.0	0.71
Perforated ceramic blocks min 10MPa (eg Leiter Thermopor)	[kN]	0.43	0.57	0.57	0.71	0.71	1.0	0.86
Perforated ceramic blocks min 15MPa (eg MEGA MAX)	[kN]	0.57	0.71	1.0	1.0	1.14	1.14	1.14
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Mono Rect)	[kN]	0.26	0.26	0.57	0.57	0.57	0.57	0.43
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Rect)	[kN]	0.34	0.34	0.43	0.43	0.57	0.57	0.43
Perforated ceramic blocks min 6.0MPa (eg LS Monomur)	[kN]	0.26	0.26	0.43	0.43	0.43	0.43	0.43
Perforated ceramic blocks min 6MPa (eg SM BGV Thermo)	[kN]	0.26	0.26	0.43	0.43	0.43	0.43	0.43
Perforated ceramic blocks min 6.0MPa (eg SM BGV Thermo Plus)	[kN]	0.34	0.34	0.34	0.34	0.34	0.43	0.34
Lightweight concrete hollow block min 2.0MPa	[kN]	0.34	0.43	0.71	0.71	0.71	1.0	1.0

*According to ETAG 029, **Partial safety factor 1.4

Product commercial data

Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-CFS+RM50-4	300	1	3	108	2.44	7.32	263.52	5906675205892	18
R-CFS+RM50W-4	300	1	3	108	2.44	7.32	263.52	-	12
R-CFS+RM50S-4	300	1	3	108	2.44	7.32	263.53	-	12
R-CFS+RM50-600-8	600	1	1	36	8.30	8.30	298.8	5906675078823	18

RP30 (CFS+)

Economy polyester resin approved for use in non-cracked concrete
- Cartridge Free System (CFS+)



Approvals and Reports

- ETA-11/0141; ETAG 001-05, Option 7



Product overview

Features and benefits

- Effortless extrusion due to patented self-opening system with manual or pneumatic dispenser guns
- Medium load capacity in non-cracked concrete
- Wide range of steel studs with different lengths and diameters
- Small edge and space distances
- Partly-used product can be reused after a break after fitting a new mixing nozzle. Suitable for repetitive and frequent use
- Suitable for repetitive use. Partly used product can be reused by fitting a new mixing nozzle

Applications

- Fixing into tarmac
- Cable trays
- Handrails
- Fencing & gates
- Pipework

Base materials

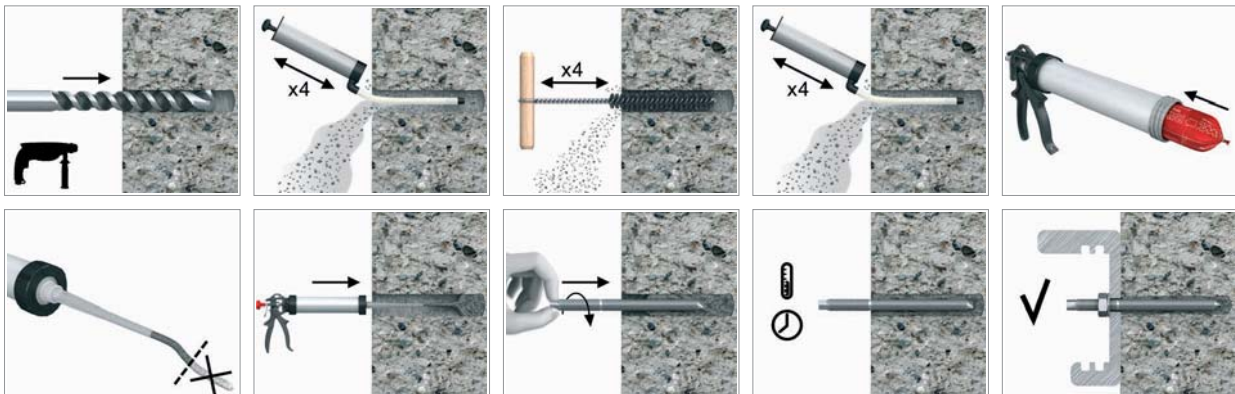
Approved for use in:

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

Also suitable for use in:

- Natural Stone
- Solid Concrete Block
- Solid Brick

Installation guide



Installation guide (cont.)

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 foil into gun and attach nozzle.
4. Dispense to waste until even colour is obtained.
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.

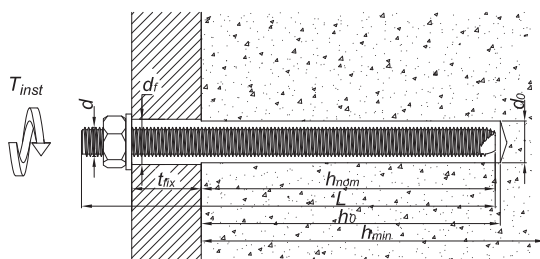
Product information

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-CFS+RP30	RP30	Polyester Resin	300
R-CFS+RP30-600-8	RP30	Polyester Resin	600

R-STUDS

Size	Product Code			Anchor		Fixture			
	Steel class 5.8	Steel class 8.8	Steel grade A4	Diameter	Length	Hole diameter	Max. thickness		
				d	L		t_{fix} for $h_{ef,min}$	t_{fix} for $h_{ef,std}$	t_{fix} for $h_{ef,max}$
				[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
M8	R-STUDS-08110	R-STUDS-08110-88	R-STUDS-08110-A4	8	110	9	40	20	-
	R-STUDS-08160	-	-	8	160	9	90	70	50
M10	R-STUDS-10130	R-STUDS-10130-88	R-STUDS-10130-A4	10	130	12	48	28	-
	R-STUDS-10170	-	R-STUDS-10170-A4	10	170	12	88	68	38
	R-STUDS-10190	-	-	10	190	12	108	88	58
M12	R-STUDS-12160	R-STUDS-12160-88	R-STUDS-12160-A4	12	160	14	65	35	-
	R-STUDS-12190	-	R-STUDS-12190-A4	12	190	14	95	65	30
	R-STUDS-12220	-	R-STUDS-12220-A4	12	220	14	125	95	60
	R-STUDS-12260	-	-	12	260	14	165	135	100
M16	R-STUDS-12300	-	-	12	300	14	205	175	140
	R-STUDS-16190	R-STUDS-16190-88	R-STUDS-16190-A4	16	190	18	71	46	-
	R-STUDS-16220	R-STUDS-16220-88	-	16	220	18	101	76	11
	R-STUDS-16260	-	R-STUDS-16260-A4	16	260	18	141	116	51
	R-STUDS-16300	-	-	16	300	18	181	156	91
M20	R-STUDS-16380	-	-	16	380	18	261	236	171
	R-STUDS-20260	R-STUDS-20260-88	R-STUDS-20260-A4	20	260	22	117	67	-
	R-STUDS-20300	R-STUDS-20300-88	-	20	300	22	157	107	37
M24	R-STUDS-20350	-	-	20	350	22	207	157	87
	R-STUDS-24300	R-STUDS-24300-88	R-STUDS-24300-A4	24	300	26	132	62	-
M30	R-STUDS-30380	R-STUDS-30380-88	R-STUDS-30380-A4	30	380	32	181	106	-

Installation data



Installation data (cont.)

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	
Installation torque	T _{inst}	[Nm]	10	20	40	80	120	180	300	
Min. hole depth in substrate	h ₀	[mm]	h _{ef} + 5							
MINIMUM EMBEDMENT DEPTH										
Installation depth	h _{nom, min}	[mm]	60	70	80	100	120	140	165	
STANDARD EMBEDMENT DEPTH										
Installation depth	h _{nom, s}	[mm]	80	90	110	125	170	210	240	
MAXIMUM EMBEDMENT DEPTH										
Installation depth	h _{nom, max}	[mm]	100	120	145	190	240	290	360	
Min. substrate thickness	h _{min}	[mm]	h _{ef} + 30 ≥ 100				h _{ef} + 2*d ₀			
Min. spacing	s _{min}	[mm]	0.5 * h _{ef} ≥ 40							
Min. edge distance	c _{min}	[mm]	0.5 * h _{ef} ≥ 40							

Minimum working and curing time

Resin temperature	Concrete temperature	Working time	Curing time*
[°C]	[°C]	[min]	[min]
5	-5	60	360
5	0	40	180
5	5	20	120
10	10	12	80
15	15	8	60
20	20	5	45
25	30	2	20

*For wet concrete the curing time must be doubled

Mechanical properties

R-STUDS

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	58.0	84.3	157.0	245.0	352.8	559.8
Elastic section modulus	W _{el}	[mm ³]	31.2	62.3	109.2	277.5	541.0	935.0	1868.0
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	58.0	84.3	157.0	245.0	352.8	559.8
Elastic section modulus	W _{el}	[mm ³]	31.2	62.3	109.2	277.5	541.0	935.0	1868.0
Characteristic bending resistance	M ⁰ _{Rk,s}	[Nm]	30	60	105	266	519	898	1793
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	58.0	84.3	157.0	245.0	352.8	559.8
Elastic section modulus	W _{el}	[mm ³]	31.2	62.3	109.2	277.5	541.0	935.0	1868.0
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

Size		M8	M10	M12	M16	M20	M24	M30
Substrate		Non-cracked concrete						
MEAN ULTIMATE LOAD								
TENSION LOAD $N_{Ru,m}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8								
Minimum embedment depth	[kN]	18.2	28.0	35.1	57.1	79.5	91.6	99.7
Standard embedment depth	[kN]	21.6	34.8	48.3	82.9	119.3	137.4	157.1
Maximum embedment depth	[kN]	21.6	34.8	50.4	93.6	146.4	189.8	217.6
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8								
Minimum embedment depth	[kN]	18.2	28	35.1	57.1	79.5	91.6	99.7
Standard embedment depth	[kN]	22.7	38	48.3	82.9	119.3	137.4	157.1
Maximum embedment depth	[kN]	30.3	48	63.6	108.6	159.1	189.8	217.6
R-STUDS METRIC THREADED RODS - A4								
Minimum embedment depth	[kN]	18.2	28	35.1	57.1	79.5	91.6	99.7
Standard embedment depth	[kN]	22.7	38	48.3	82.9	119.3	137.4	157.1
Maximum embedment depth	[kN]	30.3	48	63.6	108.6	159.1	189.8	217.6
SHEAR LOAD $V_{Ru,m}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	18.3	29.0	42.2	78.5	122.5	176.5	280.5
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	29.3	46.4	67.4	125.6	196.0	282.4	448.8
R-STUDS METRIC THREADED RODS - A4	[kN]	25.6	40.6	59.0	109.9	171.5	247.1	392.7
CHARACTERISTIC LOAD								
TENSION LOAD N_{Rk}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8								
Minimum embedment depth	[kN]	14.3	22.0	28.7	45.2	64.1	73.9	77.8
Standard embedment depth	[kN]	18.0	28.3	39.4	56.5	90.8	110.8	113.1
Maximum embedment depth	[kN]	18.0	29.0	42.0	78.0	122	153.1	169.6
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8								
Minimum embedment depth	[kN]	14.3	22.0	28.7	45.2	64.1	73.9	77.8
Standard embedment depth	[kN]	19.1	28.3	39.4	56.5	90.8	110.8	113.1
Maximum embedment depth	[kN]	23.9	37.7	51.9	86	128.2	153.1	169.6
R-STUDS METRIC THREADED RODS - A4								
Minimum embedment depth	[kN]	14.3	22.0	28.7	45.2	64.1	73.9	77.8
Standard embedment depth	[kN]	19.1	28.3	39.4	56.5	90.8	110.8	113.1
Maximum embedment depth	[kN]	23.9	37.7	51.9	86	128.2	153.1	169.6
SHEAR LOAD V_{Rk}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	9.0	14.0	21.0	39.0	61.0	88.0	140.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	15.0	23.0	34.0	63.0	98.0	141.0	224.0
R-STUDS METRIC THREADED RODS - A4	[kN]	13.0	20.0	29.0	55.0	86.0	124.0	196.0
DESIGN LOAD								
TENSION LOAD N_{Rd}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8								
Minimum embedment depth	[kN]	7.9	12.2	15.9	25.1	35.6	35.2	37.1
Standard embedment depth	[kN]	10.6	15.7	21.9	31.4	50.4	52.8	53.9
Maximum embedment depth	[kN]	12.0	19.3	28.0	47.8	71.2	72.9	80.78
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8								
Minimum embedment depth	[kN]	7.94	12.2	15.9	25.1	35.6	35.2	37.1
Standard embedment depth	[kN]	10.6	15.7	21.9	31.4	50.4	52.8	53.9
Maximum embedment depth	[kN]	13.3	20.9	28.8	47.8	71.2	72.9	80.8
R-STUDS METRIC THREADED RODS - A4								
Minimum embedment depth	[kN]	7.9	12.2	15.9	25.1	35.6	35.2	37.1
Standard embedment depth	[kN]	10.6	15.7	21.9	31.4	50.4	52.8	53.9
Maximum embedment depth	[kN]	13.3	20.9	28.8	47.8	71.2	72.9	80.8

Basic performance data (cont.)

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

Size		M8	M10	M12	M16	M20	M24	M30
DESIGN LOAD								
SHEAR LOAD V_{Rd}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	7.2	11.2	16.8	31.2	48.8	70.4	112.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	12.0	18.4	27.2	50.4	78.4	112.8	179.2
R-STUDS METRIC THREADED RODS - A4	[kN]	8.3	12.8	18.6	35.3	55.1	79.5	125.6
RECOMMENDED LOAD								
TENSION LOAD N_{rec}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8								
Minimum embedment depth	[kN]	5.67	8.73	11.4	17.9	25.4	25.1	26.5
Standard embedment depth	[kN]	7.58	11.2	15.6	22.4	36.0	37.7	38.5
Maximum embedment depth	[kN]	8.57	13.8	20.0	34.1	50.9	52.1	57.7
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8								
Minimum embedment depth	[kN]	5.67	8.73	11.4	17.9	25.4	25.1	26.5
Standard embedment depth	[kN]	7.58	11.2	15.6	22.4	36.0	37.7	38.5
Maximum embedment depth	[kN]	8.57	13.8	20.0	34.1	50.9	52.1	57.7
R-STUDS METRIC THREADED RODS - A4								
Minimum embedment depth	[kN]	5.67	8.73	11.4	17.9	25.4	25.1	26.5
Standard embedment depth	[kN]	7.58	11.2	15.6	22.4	36.0	37.7	38.5
Maximum embedment depth	[kN]	8.57	13.8	20.0	34.1	50.8	52.1	57.7
SHEAR LOAD V_{rec}								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	5.14	8.0	12	22.3	34.7	50.3	80.0
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8.57	13.1	19.4	36.0	56.0	80.6	128.0
R-STUDS METRIC THREADED RODS - A4	[kN]	5.95	9.16	13.3	25.2	39.4	56.8	89.7

Product commercial data

Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-CFS+RP30	300	1	3	108	2.44	7.32	263.52	5906675205861	18
R-CFS+RP30-600-8	600	1	1	36	8.30	8.30	298.8	5906675085876	18

Resin consumption for bonded anchors

Cartridge size	Stud diameter	d	[mm]	M8	M10	M12	M16	M20	M24	M30
	Hole diameter in substrate	d _o	[mm]	10	12	14	18	24	28	35
175ml	Reduced Embedment	h _{nom}	[mm]	60	70	80	100	120	140	165
	Quantity of anchored studs			42	28	19	11	4,7	3,2	1,8
	Standard Embedment	h _{nom}	[mm]	80	90	110	125	170	210	240
	Quantity of anchored studs			32	22	14	9	3,4	4	2,1
	Maximum Embedment	h _{nom}	[mm]	100	120	145	190	240	290	360
	Quantity of anchored studs			26	17	11	6	2,4	1,6	0,8
280 ml	Reduced Embedment	h _{nom}	[mm]	60	70	80	100	120	140	165
	Quantity of anchored studs			73	49	34	19	8,3	5,6	3,1
	Standard Embedment	h _{nom}	[mm]	80	90	110	125	170	210	240
	Quantity of anchored studs			57	39	26	16	6,0	3,8	2,2
	Maximum Embedment	h _{nom}	[mm]	100	120	145	190	240	290	360
	Quantity of anchored studs			46	30	20	10	4,3	2,8	1,5
300 ml	Reduced Embedment	h _{nom}	[mm]	60	70	80	100	120	140	165
	Quantity of anchored studs			79	53	37	21	9,0	6,0	3,4
	Standard Embedment	h _{nom}	[mm]	80	90	110	125	170	210	240
	Quantity of anchored studs			61	42	28	17	6,5	4,1	2,4
	Maximum Embedment	h _{nom}	[mm]	100	120	145	190	240	290	360
	Quantity of anchored studs			50	32	21	11	4,6	3,0	1,6
310 ml	Reduced Embedment	h _{nom}	[mm]	60	70	80	100	120	140	165
	Quantity of anchored studs			82	55	38	22	9,3	6,3	3,5
	Standard Embedment	h _{nom}	[mm]	80	90	110	125	170	210	240
	Quantity of anchored studs			64	44	29	18	6,7	4,3	2,4
	Maximum Embedment	h _{nom}	[mm]	100	120	145	190	240	290	360
	Quantity of anchored studs			52	33	22	12	4,8	3,1	1,6
345 ml	Reduced Embedment	h _{nom}	[mm]	60	70	80	100	120	140	165
	Quantity of anchored studs			93	62	43	24	10,5	7,1	4,0
	Standard Embedment	h _{nom}	[mm]	80	90	110	125	170	210	240
	Quantity of anchored studs			72	49	32	20	7,6	4,8	2,8
	Maximum Embedment	h _{nom}	[mm]	100	120	145	190	240	290	360
	Quantity of anchored studs			59	38	25	13	5,4	3,5	1,9
380 ml	Reduced Embedment	h _{nom}	[mm]	60	70	80	100	120	140	165
	Quantity of anchored studs			104	69	48	27	11,7	7,9	4,4
	Standard Embedment	h _{nom}	[mm]	80	90	110	125	170	210	240
	Quantity of anchored studs			80	55	36	22	8,4	5,4	3,1
	Maximum Embedment	h _{nom}	[mm]	100	120	145	190	240	290	360
	Quantity of anchored studs			65	42	28	15	6,1	3,9	2,1
385 ml	Reduced Embedment	h _{nom}	[mm]	60	70	80	100	120	140	165
	Quantity of anchored studs			105	70	49	28	11,8	8,0	4,5
	Standard Embedment	h _{nom}	[mm]	80	90	110	125	170	210	240
	Quantity of anchored studs			81	56	37	22	8,5	5,4	3,1
	Maximum Embedment	h _{nom}	[mm]	100	120	145	190	240	290	360
	Quantity of anchored studs			66	43	28	15	6,1	4,0	2,1