

## 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



### Product information

#### Features and benefits

- Allows removal of bolt to leave a re-usable socket in place
- Approved for use in non-cracked concrete
- Suitable for use in low temperatures (down to -20°C for winter option) enables use throughout the year
- Suitable for use in dry or wet substrates and water filled holes
- Anchor does not generate tensions in the substrate which enables RV200 to be specified where closer edge and spacing distances are required
- Unique soft foil pack for less waste
- Effortless extrusion due to patented self-opening system with manual or battery dispenser guns
- Very high load capacity

#### Applications

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

#### Base materials

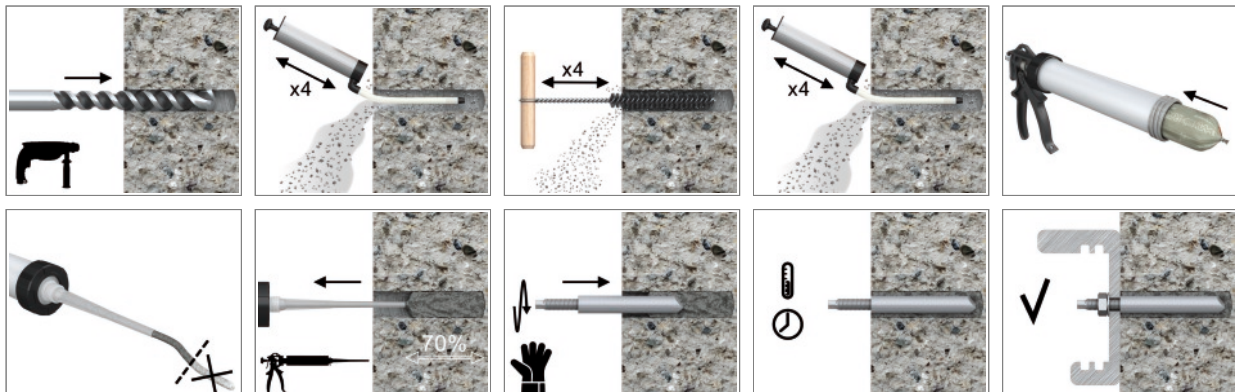
##### Approved for use in:

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

##### Also suitable for use in:

- Natural Stone (after site testing)
- Solid Concrete Block
- Solid Brick

### Installation guide



## Product information

1. Drill hole to the required diameter and depth for socket size being used.
2. Clean the hole thoroughly with brush and hand pump at least four times before installation.
3. Insert foil into gun and attach nozzle.
4. Dispense to waste until even colour is obtained.
5. Insert the mixer nozzle to the bottom of the drill hole and inject resin, slowly withdrawing the nozzle as the hole is filled to 70% of its depth.
6. Immediately insert the 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 nut to the required torque.

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-CFS+RV200-4	RV200	Styrene Free Vinylester Resin	300
R-CFS+RV200-600-8			600

### SOCKETS

Size	Product Code		Anchor			Fixture
	Steel class 5.8	Steel grade A4	Socket diameter	Length	Internal thread length	Hole diameter
			d	L	$l_s$	$d_f$
			[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		
Min. installation depth	$h_{nom}$	[mm]	75	75	90	100	75	100	125
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
Thread engagement length	$h_s$	[mm]	24	25	25	30	30	35	50
Min. hole depth in substrate	$h_0$	[mm]	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$
Min. substrate thickness	$h_{min}$	[mm]	105	105	120	140	115	140	181
Installation torque	$T_{inst}$	[Nm]	3	5	5	10	10	20	40
Min. spacing	$s_{min}$	[mm]	40	40	45	50	40	50	63
Min. edge distance	$c_{min}$	[mm]	40	40	45	50	40	50	63

## Installation data

### Minimum working and curing time

RV200

Resin temperature	Concrete temperature	Curing time*	Working time
[°C]	[°C]	[min]	[min]
5	-20	-	-
5	-15	-	-
5	-10	-	-
5	-5	240	60
5	0	180	40
5	5	120	20
10	10	80	12
15	15	60	8
20	20	45	5
25	25	30	3
25	30	20	2
25	40	10	0.5
25	45	-	-
25	50	-	-

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

RV200-W

Resin temperature	Concrete temperature	Curing time*	Working time
[°C]	[°C]	[min]	[min]
5	-20	1440	100
5	-15	960	60
5	-10	480	30
5	-5	240	16
5	0	120	12
5	5	60	8
10	10	45	5
15	15	30	3
20	20	10	2
25	25	-	-
25	30	-	-
25	40	-	-
25	45	-	-
25	50	-	-

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

## Installation data

RV200-S

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

\*For wet concrete the curing time must be doubled

## Mechanical properties

Size			M6	M8	M10	M12	M16
<b>R-ITS-Z Internally Threaded Sockets</b>							
Nominal ultimate tensile strength - tension	$f_{uk}$	[N/mm <sup>2</sup> ]	520	500	500	500	500
Nominal yield strength - tension	$f_{yk}$	[N/mm <sup>2</sup> ]	420	400	400	400	400
Cross sectional area - tension	$A_s$	[mm <sup>2</sup> ]	20	37	58	84	157
Elastic section modulus	$W_{el}$	[mm <sup>3</sup> ]	21	50	98	170	402
<b>R-ITS-A4 Internally Threaded Sockets</b>							
Nominal ultimate tensile strength - tension	$f_{uk}$	[N/mm <sup>2</sup> ]	700	700	700	700	700
Nominal yield strength - tension	$f_{yk}$	[N/mm <sup>2</sup> ]	350	350	350	350	350
Cross sectional area - tension	$A_s$	[mm <sup>2</sup> ]	20	37	58	84	157
Elastic section modulus	$W_{el}$	[mm <sup>3</sup> ]	21	50	98	170	402
<b>Metric Threaded Rods - Steel Class 5.8</b>							
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
<b>Metric Threaded Rods - Steel Class 8.8</b>							
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
<b>Metric Threaded Rods - A4</b>							
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 - ETAG 001

Size		M6	M8	M10	M12	M16		
Substrate		Non-cracked concrete						
Effective embedment depth $h_{ef}$	[mm]	75.0	90.0	75.0	100.0	125.0		
<b>MEAN ULTIMATE LOAD</b>								
TENSION LOAD $N_{Ru,m}$								
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	12.5	21.6	21.6	34.8	34.8	50.4	93.6
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	19.2	34.8	34.8	50.6	55.2	63.0	97.4
METRIC THREADED RODS - A4	[kN]	16.8	31.2	31.2	49.2	49.2	63.0	97.4
SHEAR LOAD $V_{Ru,m}$								
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	6.00	10.8	10.8	16.8	16.8	25.2	46.8
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	9.60	18.0	18.0	27.6	27.6	40.8	75.6
METRIC THREADED RODS - A4	[kN]	8.40	15.6	15.6	24.0	24.0	34.8	66.0
<b>CHARACTERISTIC LOAD</b>								
TENSION LOAD $N_{Rk}$								
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	10.00	18.0	18.0	29.0	29.0	42.0	66.0
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	16.0	25.5	29.0	32.8	46.0	42.7	66.0
METRIC THREADED RODS - A4	[kN]	14.0	25.5	26.0	32.8	41.0	42.7	66.0
SHEAR LOAD $V_{Rk}$								
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	5.00	9.00	9.00	14.0	14.0	21.0	39.0
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8.00	15.0	15.0	23.0	23.0	34.0	63.0
METRIC THREADED RODS - A4	[kN]	7.00	13.0	13.0	20.0	20.0	29.0	55.0
<b>DESIGN LOAD</b>								
TENSION LOAD $N_{Rd}$								
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	6.67	12.0	12.0	18.2	19.3	23.7	36.7
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	9.82	14.1	17.0	18.2	26.5	23.7	36.7
METRIC THREADED RODS - A4	[kN]	7.49	13.9	13.9	18.2	21.9	23.7	36.7
SHEAR LOAD $V_{Rd}$								
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	4.00	7.20	7.20	11.2	11.2	16.8	31.2
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	6.40	12.0	12.0	18.4	18.4	27.2	50.4
METRIC THREADED RODS - A4	[kN]	4.49	8.33	8.33	12.8	12.8	18.6	35.3
<b>RECOMMENDED LOAD</b>								
TENSION LOAD $N_{rec}$								
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	4.76	8.57	8.57	13.0	13.8	17.0	26.2
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	7.01	10.1	12.1	13.0	19.0	17.0	26.2
METRIC THREADED RODS - A4	[kN]	5.35	9.93	9.93	13.0	15.7	17.0	26.2
SHEAR LOAD $V_{rec}$								
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	2.86	5.14	5.14	8.00	8.00	12.0	22.3
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	4.57	8.57	8.57	13.1	13.1	19.4	36.0
METRIC THREADED RODS - A4	[kN]	3.21	5.95	5.95	9.16	9.16	13.3	25.2

## Design performance data

### SOCKETS

Size			M6	M8	M10	M12	M16		
Effective embedment depth	$h_{ef}$	[mm]	75.00	75.00	90.00	75.00	100.00	100.00	125.00
<b>TENSION LOAD</b>									
<b>STEEL FAILURE; STEEL CLASS 5.8</b>									
Characteristic resistance	$N_{Rk,s}$	[kN]	10.00	18.00	18.00	29.00	29.00	42.00	78.00
Partial safety factor	$\gamma_{Ms}$	-	1.50	1.50	1.50	1.50	1.50	1.50	1.50
<b>STEEL FAILURE; STEEL CLASS 8.8</b>									
Characteristic resistance	$N_{Rk,s}$	[kN]	16.00	29.00	29.00	46.00	46.00	67.00	126.00
Partial safety factor	$\gamma_{Ms}$	-	1.50	1.50	1.50	1.50	1.50	1.50	1.50
<b>STEEL FAILURE; STEEL GRADE A4-70</b>									
Characteristic resistance	$N_{Rk,s}$	[kN]	14.00	26.00	26.00	41.00	41.00	59.00	110.00
Partial safety factor	$\gamma_{Ms}$	-	1.87	1.87	1.87	1.87	1.87	1.87	1.87
<b>COMBINED PULL-OUT AND CONCRETE CONE FAILURE; NON-CRACKED CONCRETE, C20/25 (40°C/24°C)</b>									
Characteristic bond resistance	$T_{Rk}$	[N/mm <sup>2</sup> ]	7.50	9.00	9.00	9.50	9.50	8.50	7.00
<b>COMBINED PULL-OUT AND CONCRETE CONE FAILURE; NON-CRACKED CONCRETE, C20/25 (80°C/50°C)</b>									
Characteristic bond resistance	$T_{Rk}$	[N/mm <sup>2</sup> ]	6.00	7.00	7.00	7.50	7.50	6.50	5.50
<b>COMBINED PULL-OUT AND CONCRETE CONE FAILURE</b>									
Installation safety factor	$\gamma_2$	-	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Increasing factors for $N_{Rd,p}$ - C30/37	$\psi_c$	-	1.04	1.04	1.04	1.04	1.04	1.04	1.00
Increasing factors for $N_{Rd,p}$ - C40/50	$\psi_c$	-	1.07	1.07	1.07	1.07	1.07	1.07	1.00
Increasing factors for $N_{Rd,p}$ - C50/60	$\psi_c$	-	1.09	1.09	1.09	1.09	1.09	1.09	1.00
<b>CONCRETE CONE FAILURE</b>									
Installation safety factor	$\gamma_2$	-	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Factor for non-cracked concrete	$k$	-	10.10	10.10	10.10	10.10	10.10	10.10	10.10
Factor for non-cracked concrete	$k_{ucr,N}$	-	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Edge distance	$c_{cr,N}$	[mm]	1.5* $h_{ef}$	1.5* $h_{ef}$	1.5* $h_{ef}$	1.5* $h_{ef}$	1.5* $h_{ef}$	1.5* $h_{ef}$	1.5* $h_{ef}$
Spacing	$s_{cr,N}$	[mm]	3.0* $h_{ef}$	3.0* $h_{ef}$	3.0* $h_{ef}$	3.0* $h_{ef}$	3.0* $h_{ef}$	3.0* $h_{ef}$	3.0* $h_{ef}$
<b>CONCRETE SPLITTING FAILURE</b>									
Installation safety factor	$\gamma_2$	-	1.20	1.20	1.20	1.20	1.20	1.20	1.20
<b> SHEAR LOAD</b>									
<b>STEEL FAILURE; STEEL CLASS 5.8</b>									
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	5.00	9.00	9.00	14.00	14.00	21.00	39.00
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	7.60	19.00	19.00	37.00	37.00	64.00	166.00
Partial safety factor	$\gamma_{Ms}$	-	1.25	1.25	1.25	1.25	1.25	1.25	1.25
<b>STEEL FAILURE; STEEL CLASS 8.8</b>									
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	8.00	15.00	15.00	23.00	23.00	34.00	63.00
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	12.20	30.00	30.00	60.00	60.00	105.00	266.00
Partial safety factor	$\gamma_{Ms}$	-	1.25	1.25	1.25	1.25	1.25	1.25	1.25
<b>STEEL FAILURE; STEEL GRADE A4-70</b>									
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	7.00	13.00	13.00	20.00	20.00	29.00	55.00
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	10.70	26.00	26.00	52.00	52.00	92.00	233.00
Partial safety factor	$\gamma_{Ms}$	-	1.56	1.56	1.56	1.56	1.56	1.56	1.56
<b>CONCRETE PRY-OUT FAILURE</b>									
Factor	$k$	-	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Installation safety factor	$\gamma_2$	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00
<b>CONCRETE EDGE FAILURE</b>									
Anchor diameter	$d_{nom}$	[mm]	10.00	12.00	12.00	16.00	16.00	16.00	24.00
Effective length of anchor	$\ell_f$	[mm]	min ( $h_{ef}; 8d_{nom}$ )	min ( $h_{ef}; 8d_{nom}$ )	min ( $h_{ef}; 8d_{nom}$ )	min ( $h_{ef}; 8d_{nom}$ )	min ( $h_{ef}; 8d_{nom}$ )	min ( $h_{ef}; 8d_{nom}$ )	min ( $h_{ef}; 8d_{nom}$ )
Installation safety factor	$\gamma_2$	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00

## Product commercial data

Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Codes
		Box	Outer	Pallet	Box	Outer	Pallet	
R-CFS+RV200-4 <sup>1)</sup>	300	1	8	96	2.4	19.3	261.3	5906675205830
R-CFS+RV200-600-8 <sup>1)</sup>	600	1	1	36	10.0	10.0	390.0	5906675119045

1) ETA-13/0805