

Glass Capsules

R-CAS-V:

- Spin-In Capsule with Threaded Rods

R-HAC-V:

- Hammer-In with Threaded Rods
- Hammer-In with Rebar

Capsule contains a precise volume of resin and hardener. No waste packaging.

Quick and easy to install by hammering or spinning in stud or rebar

Rounded capsule tip for insertion in to hole

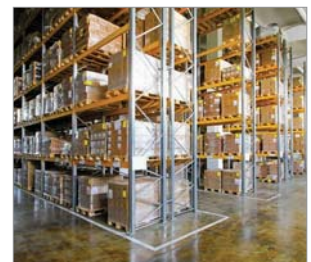
Hammer-in and spin-in capsules

Drill/hole diameter, stud size indicated on the capsule



R-CAS-V Spin-In Capsule with Threaded Rods

High-performance, quick-setting, styrene-free vinylester resin for concrete



Approvals and Reports

- ETA-10/0108; ETAG 001-05, Option 7



Installation movie

Product overview

Features and benefits

- Approved for use with threaded rods in non-cracked concrete (ETAG001 Option 7)
- High performance for use safety critical application - heavy-duty fastenings with small spacing and edge distances
- The system relies on the adhesion between the concrete and resin, which is free from expansion forces. This makes it an ideal choice where close edge and spacing distances are required
- Capsule contains a precise volume of constituents making it a very consistent product
- Suitable for making fixings underwater. Adhesive strength is not affected by unpolluted water
- Suitable for dry or wet non-cracked concrete
- Styrene free - odourless

Applications

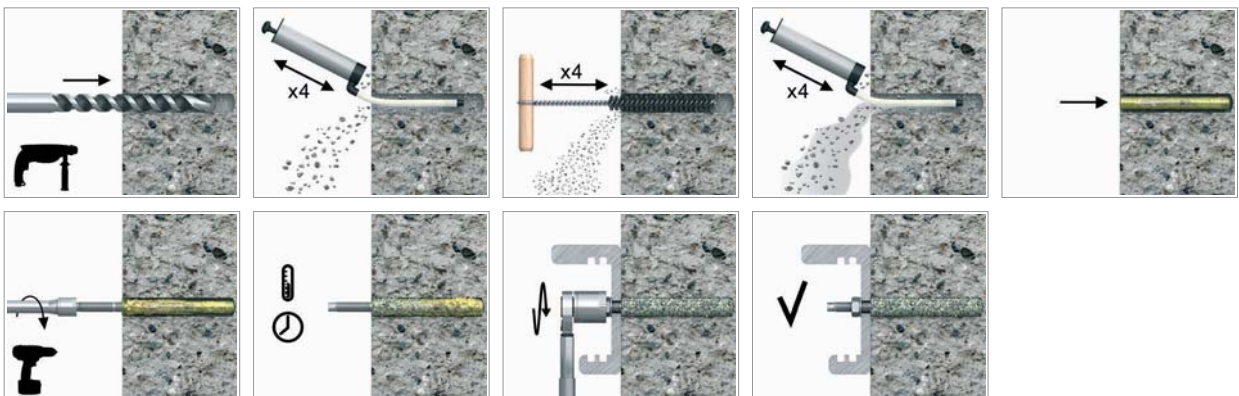
- Threaded rods
- Balustrading
- Railings
- Heavy machinery
- Structural steel
- Steel columns
- Cladding restraints
- Curtain walling
- Fencing & gates
- Formwork supports
- Garage doors
- Guard rails

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 capsule into the hole. Connect stud to drilling machine using appropriate driver system.
4. Position the stud into the glass capsule then switch on the drilling machine and drive stud into the capsule.
Switch off the drilling machine as soon as the bottom of hole is reached.
5. Leave the anchor undisturbed until the curing time elapses.
6. Attach fixture and tighten the nut to the required torque.

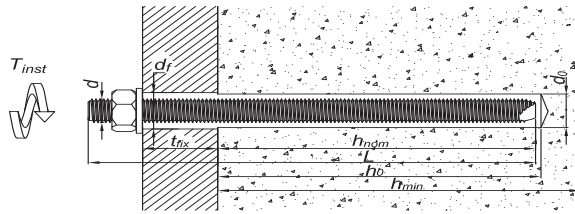
Product information

Size	Product Code	Description / Resin Type
M8	R-CAS-V-08	Styrene Free Vinylester Resin
M10	R-CAS-V-10	
M12	R-CAS-V-12	
M16	R-CAS-V-16	
M20	R-CAS-V-20	
M24	R-CAS-V-24	
M30	R-CAS-V-30	

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}
				[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						
Installation depth	h _{nom}	[mm]	80	90	110	125	170	210	270
Min. substrate thickness	h _{min}	[mm]	120	130	140	180	230	270	340
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	-	480
5	0	-	240
5	5	-	150
10	10	-	120
15	15	-	90
20	20	-	45
25	30	-	20
25	40	-	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]	520	520	520	520	520		
Nominal yield strength - tension	F _{yk}	[N/mm ²]	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	
Nominal yield strength - tension	F _{yk}	[N/mm ²]	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
R-STUDS METRIC THREADED RODS - A4									
Nominal ultimate tensile strength - tension	F _{uk}	[N/mm ²]	700	700	700	700	700	700	
Nominal yield strength - tension	F _{yk}	[N/mm ²]	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	785	1569
Design bending resistance	M	[Nm]	17	34	59	149	291	504	1009

Basic performance data

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

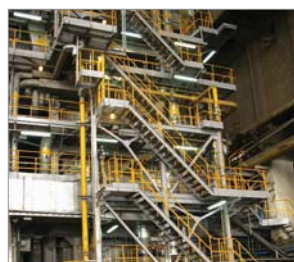
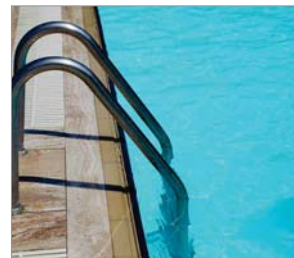
Size		M8	M10	M12	M16	M20	M24	M30
Substrate		Non-cracked concrete						
Embedment depth h_{ef}	[mm]	80	90	110	125	170	210	270
MEAN ULTIMATE LOAD								
TENSION LOAD $N_{Ru,m}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	21.6	34.8	50.4	75.5	119.2	158.4	239.6
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	28.9	35.9	55.7	75.5	119.2	158.4	239.6
R-STUDS METRIC THREADED RODS - A4	[kN]	28.9	35.9	55.7	75.5	119.2	158.4	239.6
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	[kN]	18	29	42	60	95	140	200
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	25	30	50	60	95	140	200
R-STUDS METRIC THREADED RODS - A4	[kN]	25	30	50	60	95	140	200
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]	12	16.67	27.78	33.33	52.78	77.78	111.11
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	13.89	16.67	27.78	33.33	52.78	77.78	111.11
R-STUDS METRIC THREADED RODS - A4	[kN]	13.89	16.67	27.78	33.33	52.78	77.78	111.11
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]	8.57	11.9	19.84	23.81	37.7	55.56	79.37
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	9.92	11.9	19.84	23.81	37.7	55.56	79.37
R-STUDS METRIC THREADED RODS - A4	[kN]	9.92	11.9	19.84	23.81	37.7	55.56	79.37
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	Size	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-CAS-V-08	M8	10	500	8000	0.13	6.5	133.2	5906675280189	18
R-CAS-V-10	M10	10	500	8000	0.16	8.1	158.8	5906675280196	18
R-CAS-V-12	M12	10	500	8000	0.24	12.0	222.0	5906675280202	18
R-CAS-V-16	M16	10	500	6000	0.38	18.8	255.6	5906675280219	18
R-CAS-V-20	M20	6	60	960	0.78	7.8	155.2	5906675280226	18
R-CAS-V-24	M24	6	60	720	1.09	10.9	160.9	5906675280233	18
R-CAS-V-30	M30	2	20	320	0.85	8.5	166.2	5906675280240	18

R-HAC-V Hammer-In with Threaded Rods

Heavy duty anchor with small spacing and edge distances, simply installed by hammering the stud



Approvals and Reports

- ETA-11/0002; ETAG 001-05, Option 7



Installation movie

Product overview

Features and benefits

- High performance anchor, for use in safety critical applications
- The system relies on the adhesion between concrete and resin, which is free from expansion forces. This makes it an ideal choice where close edge and spacing distances are required
- Capsule contains a precise volume of constituents making it a very consistent product
- Adhesive bond strength is not affected by unpolluted water
- Suitable for dry or wet non-cracked concrete
- Low cost tooling required for installation, quick and easy to install
- Styrene free - virtually odourless

Applications

- Balustrading & handrails
- Cable trays
- Guard rails
- Machinery
- Threaded rods
- Cladding restraints
- Curtain walling
- Fencing & gates
- Reinforcement bars

Base materials

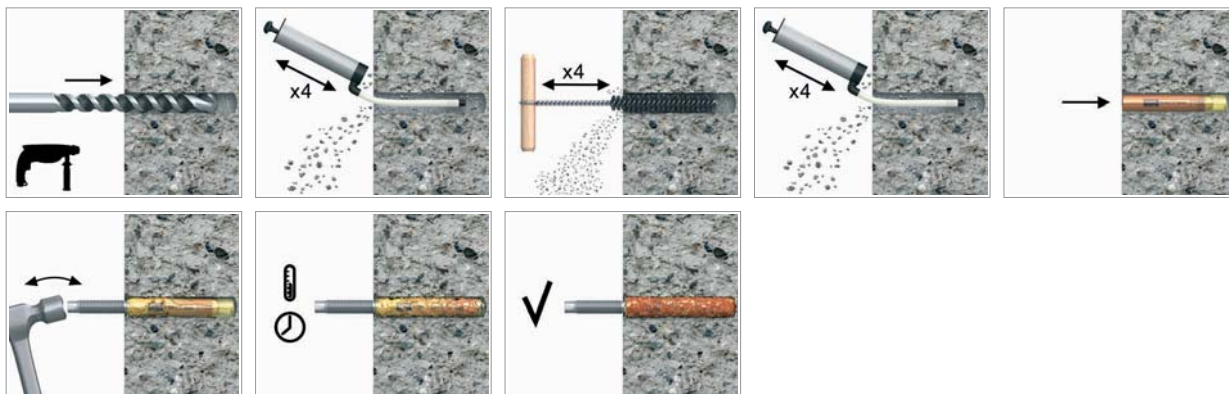
Approved for use in:

- 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 capsule into the hole
4. The stud is simply hammered through the capsule using a manual hammer (M8-M12) or mechanical hammer (M16-M30)
5. Leave the anchor undisturbed until the curing time elapses.
6. Attach fixture and tighten the nut to the required torque.

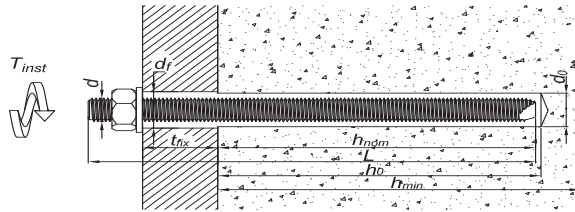
Product information

Size	Product Code	Description / Resin Type
M8	R-HAC-V-08	Styrene Free Vinylester Resin
M10	R-HAC-V-10	
M12	R-HAC-V-12	
M16	R-HAC-V-16	
M20	R-HAC-V-20	
M24	R-HAC-V-24	
M30	R-HAC-V-30	

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 _{nom}
				[mm]	[mm]	[mm]	[mm]
M8	R-STUDS-08110	R-STUDS-08110-88	R-STUDS-08110-A4	8	110	9	20
	R-STUDS-08160	-	-	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	-	-	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	-	-	12	260	14	135
	R-STUDS-12300	-	-	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-16220-88	-	16	220	18	76
	R-STUDS-16260	-	R-STUDS-16260-A4	16	260	18	116
	R-STUDS-16300	-	-	16	300	18	156
	R-STUDS-16380	-	-	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-20300-88	-	20	300	22	107
	R-STUDS-20350	-	-	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



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						
Installation depth	h _{nom}	[mm]	80	90	110	125	170	210	270
Min. substrate thickness	h _{min}	[mm]	120	130	140	180	230	270	340
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	-	1440
5	0	-	840
5	5	-	240
10	10	-	180
15	15	-	90
20	20	-	45
25	30	-	20
25	40	-	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]	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
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	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						
Embedment depth h_{ef}	[mm]	80	90	110	125	170	210	270
MEAN ULTIMATE LOAD								
TENSION LOAD $N_{R,u,m}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	21.6	31.7	46	64.7	107.6	146.8	207.8
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	22.1	31.7	46	64.7	107.6	146.8	207.8
R-STUDS METRIC THREADED RODS - A4	[kN]	22.1	31.7	46	64.7	107.6	146.8	207.8
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 $N_{R,k}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	18	25	40	50	95	115	170
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	20	25	40	50	95	115	170
R-STUDS METRIC THREADED RODS - A4	[kN]	20	25	40	50	95	115	170
SHEAR LOAD $V_{R,k}$								
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 $N_{R,d}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	9.52	11.9	22.22	23.81	45.24	54.76	80.95
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	9.52	11.9	22.22	23.81	45.24	54.76	80.95
R-STUDS METRIC THREADED RODS - A4	[kN]	9.52	11.9	22.22	23.81	45.24	54.76	80.95
SHEAR LOAD $V_{R,d}$								
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 $N_{R,ec}$								
R-STUDS METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	6.8	8.5	15.87	17.01	32.31	39.12	57.82
R-STUDS METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	6.8	8.5	15.87	17.01	32.31	39.12	57.82
R-STUDS METRIC THREADED RODS - A4	[kN]	6.8	8.5	15.87	17.01	32.31	39.12	57.82
SHEAR LOAD $V_{R,ec}$								
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	Size	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
		Box	Outer	Pallet	Box	Outer	Pallet		
R-HAC-V-08	M8	10	500	8000	0.13	6.6	135.3	5906675377827	18
R-HAC-V-10	M10	10	500	8000	0.14	6.8	138.0	5906675379913	18
R-HAC-V-12	M12	10	500	8000	0.19	9.5	181.2	5906675379920	18
R-HAC-V-16	M16	10	500	6000	0.30	15.1	210.6	5906675379937	18
R-HAC-V-20	M20	6	60	960	0.57	5.7	120.8	5906675379944	18
R-HAC-V-24	M24	6	54	960	0.76	6.9	152.0	5906675379951	18
R-HAC-V-30	M30	2	20	320	0.57	5.7	121.2	5906675379968	18

R-HAC-V Hammer-In with Rebar

Heavy duty anchor with small spacing and edge distances, simply installed by hammering the rebar



Approvals and Reports

- ETA-11/0002; ETAG 001-05, Option 7



Product overview

Features and benefits

- Approved for use with rebar in non-cracked concrete (ETAG001 Option 7)
- High performance anchor, for use in safety critical applications
- The system relies on the adhesion between concrete and resin, which is free from expansion forces. This makes it an ideal choice where close edge and spacing distances are required
- Capsule contains a precise volume of constituents making it a very consistent product
- Adhesive bond strength is not affected by unpolluted water
- Suitable for dry or wet non-cracked concrete
- Ideal for starter bar applications
- Low cost tooling required for installation, quick and easy to install
- Styrene free - virtually odourless

Applications

- Reinforcement bars
- Cable trays
- Machinery
- Fencing & gates
- Formwork supports

Base materials

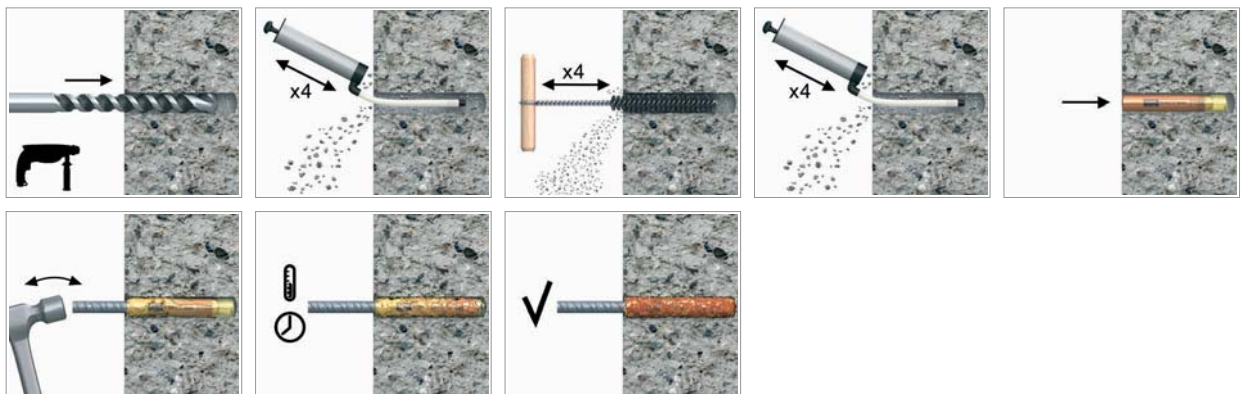
Approved for use in:

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

Also suitable for use in:

- Natural Stone

Installation guide



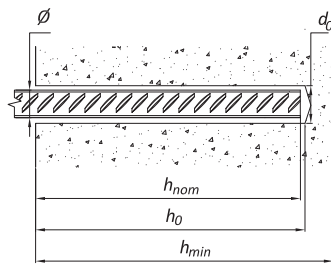
Product information

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 capsule into the hole
4. The stud is simply hammered through the capsule using a manual hammer (M8-M12) or mechanical hammer (M16-M30)
5. Leave the anchor undisturbed until the curing time elapses.
6. Attach fixture and tighten the nut to the required torque.

Installation guide (cont.)

Size	Product Code	Description / Resin Type
Ø8	R-HAC-V-10	Styrene Free Vinylester Resin
Ø10	R-HAC-V-12	
Ø12	R-HAC-V-16	
Ø14	R-HAC-V-16	
Ø16	R-HAC-V-20	
Ø20	R-HAC-V-24	
Ø25	R-HAC-V-30	

Installation data



REBARS

Size		Ø08	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25
Rebar diameter	d_s [mm]	8	10	12	14	16	20	25
Hole diameter in substrate	d_0 [mm]	12	14	16	18	22	26	35
Min. hole depth in substrate	h_0 [mm]	85	95	115	130	175	215	275
Embedment depth	l_v [mm]	80	90	110	125	170	210	270
Min. spacing	s_{min} [mm]	40	45	55	62	85	105	135
Min. edge distance	c_{min} [mm]	40	45	55	62	85	105	135

Minimum working and curing time

Resin temperature	Concrete temperature	Working time	Curing time*
[°C]	[°C]	[min]	[min]
5	-5	-	1440
5	0	-	840
5	5	-	240
10	10	-	180
15	15	-	90
20	20	-	45
25	30	-	20
25	40	-	10

*For wet concrete the curing time must be doubled

Mechanical properties

REBARS

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25
18G2									
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	480	480	480	480	480	480	480
Nominal yield strength - tension	f_{yk}	[N/mm ²]	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
Elastic section modulus	W_{el}	[mm ³]	50.3	98.2	169.6	269.4	402.1	785.4	1534
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	29	57	98	155	232	452	884
Design bending resistance	M	[Nm]	19	38	65	103	154	302	589
Allowable bending resistance	M_{rec}	[Nm]	14	27	47	74	110	215	421
34GS									
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]	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
Elastic section modulus	W_{el}	[mm ³]	50.3	98.2	169.6	269.4	402.1	785.4	1534
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	30	59	102	162	241	471	920
Design bending resistance	M	[Nm]	20	39	68	108	161	314	614
Allowable bending resistance	M_{rec}	[Nm]	14	28	48	77	115	224	438
B500SP									
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	575	575	575	575	575	575	575
Nominal yield strength - tension	f_{yk}	[N/mm ²]	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
Elastic section modulus	W_{el}	[mm ³]	50.3	98.2	169.6	269.4	402.1	785.4	1534
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	35	68	117	186	277	542	1059
Design bending resistance	M	[Nm]	23	45	78	124	185	361	706
Allowable bending resistance	M_{rec}	[Nm]	17	32	56	89	132	258	504
RB500/BSt500S									
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	550	550	550	550	550	550	550
Nominal yield strength - tension	f_{yk}	[N/mm ²]	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
Elastic section modulus	W_{el}	[mm ³]	50.3	98.2	169.6	269.4	402.1	785.4	1534
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	33	65	112	178	265	518	1012
Design bending resistance	M	[Nm]	22	43	75	119	177	346	675
Allowable bending resistance	M_{rec}	[Nm]	16	31	53	85	126	247	482

Basic performance data

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

Size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25
Substrate		Non-cracked concrete						
CHARACTERISTIC LOAD								
TENSION LOADS N_{Rk}								
A-II (18G2)								
Standard Embedment Depth	[kN]	16.0	20.0	30.0	40.0	50.0	60.0	95.0
A-III (34GS)								
Standard Embedment Depth	[kN]	16.0	20.0	30.0	40.0	50.0	60.0	95.0
A-IIIN (RB500, BSt500S, B500SP)								
Standard Embedment Depth	[kN]	16.0	20.0	30.0	40.0	50.0	60.0	95.0
SHEAR LOADS V_{Rk}								
A-II (18G2)								
	[kN]	12.1	18.8	27.1	36.9	48.3	75.4	117.8
A-III (34GS)								
	[kN]	12.6	19.6	28.3	38.5	50.3	78.5	122.7
A-IIIN (RB500, BSt500S, B500SP)								
	[kN]	13.8	21.6	31.1	42.3	55.3	86.4	135.0

Basic performance data (cont.)

R-STUDS

Size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25
Substrate		Non-cracked concrete						
DESIGN LOAD								
TENSION LOADS N_{Rd}								
A-II (18G2)								
Standard Embedment Depth	[kN]	8.9	11.1	16.7	22.2	27.8	33.3	52.8
A-III (34GS)								
Standard Embedment Depth	[kN]	8.9	11.1	16.7	22.2	27.8	33.3	52.8
A-IIIN (RB500, BSt500S, B500SP)								
Standard Embedment Depth	[kN]	8.9	11.1	16.7	22.2	27.8	33.3	52.8
SHEAR LOADS V_{Rd}								
A-II (18G2)	[kN]	8.0	12.6	18.1	24.6	32.2	50.3	78.5
A-III (34GS)	[kN]	8.4	13.1	18.8	25.7	33.5	52.4	81.8
A-IIIN (RB500, BSt500S, B500SP)	[kN]	9.2	14.4	20.7	28.2	36.9	57.6	90.0
RECOMMENDED LOAD*								
TENSION LOADS N_{rec}								
A-II (18G2)								
Standard Embedment Depth	[kN]	6.35	7.9	11.9	15.9	19.8	23.8	37.7
A-III (34GS)								
Standard Embedment Depth	[kN]	6.35	7.9	11.9	15.9	19.8	23.8	37.7
A-IIIN (RB500, BSt500S, B500SP)								
Standard Embedment Depth	[kN]	6.35	7.9	11.9	15.9	19.8	23.8	37.7
SHEAR LOADS V_{rec}								
A-II (18G2)	[kN]	5.74	8.98	12.9	17.6	23.0	35.9	56.1
A-III (34GS)	[kN]	5.98	9.35	13.5	18.3	23.9	37.4	58.4
A-IIIN (RB500, BSt500S, B500SP)	[kN]	6.58	10.3	14.8	20.2	26.3	41.1	64.3

Product commercial data

Product Code	Size	Diameter size	Quantity [pcs]			Weight [kg]			Bar Code	Shelf Life [month]
			Box	Outer	Pallet	Box	Outer	Pallet		
R-HAC-V-08	M8	Ø8	10	500	8000	0.13	6.6	135.3	5906675377827	18
R-HAC-V-10	M10	Ø10	10	500	8000	0.14	6.8	138.0	5906675379913	18
R-HAC-V-12	M12	Ø12	10	500	8000	0.19	9.5	181.2	5906675379920	18
R-HAC-V-16	M16	Ø16	10	500	6000	0.30	15.1	210.6	5906675379937	18
R-HAC-V-20	M20	Ø20	6	60	960	0.57	5.7	120.8	5906675379944	18
R-HAC-V-24	M24	Ø24	6	54	960	0.76	6.9	152.0	5906675379951	18
R-HAC-V-30	M30	Ø30	2	20	320	0.57	5.7	121.2	5906675379968	18