R-CAS-V

VINYLESTER ANCHOR IN AN AMPOULE - SCREW-IN

Bonded screw anchor based on vinylester resin in an ampoule for concrete

FEATURES AND BENEFITS

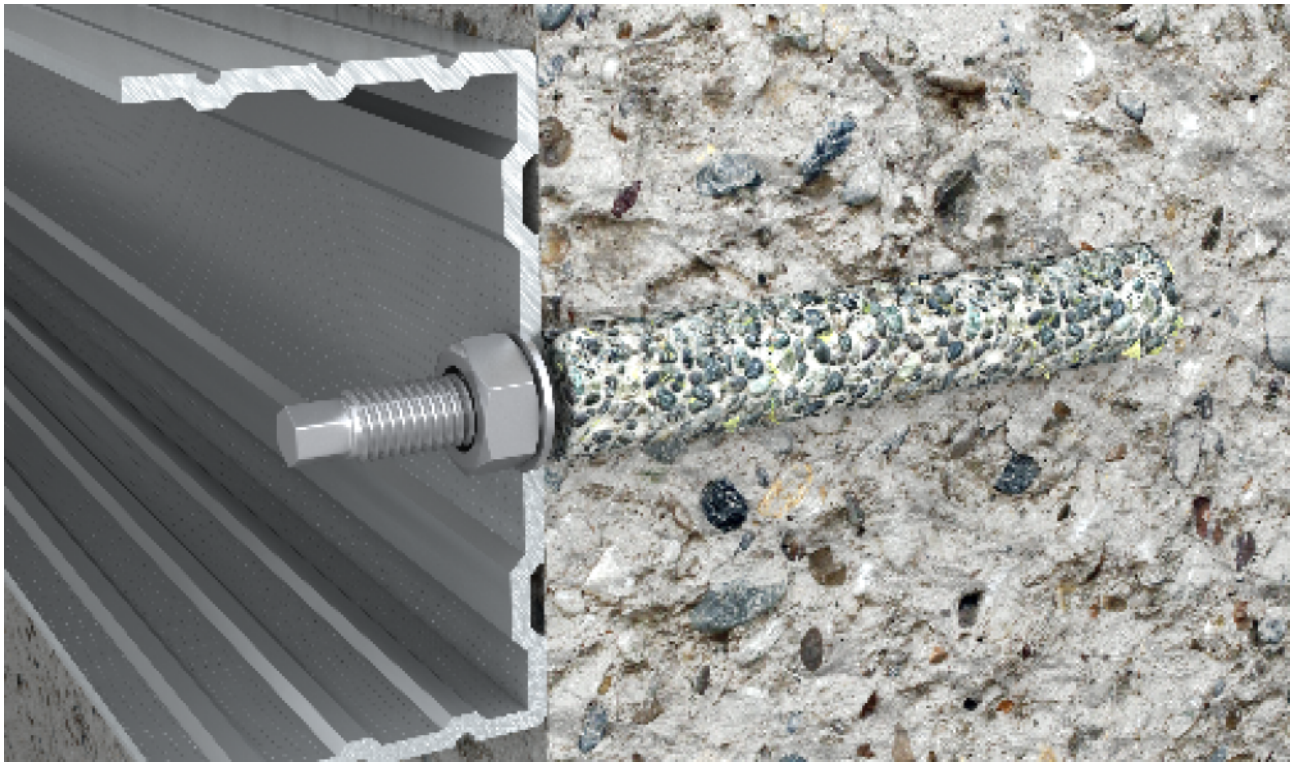
- Easy and quick installation of the product.
- Capsule contains precise amounts of ingredients making it a very consistent product.
- Styrene free - virtually odourless.
- Suitable for dry or wet non-cracked concrete.
- Approved for use with threaded rods in non-cracked concrete.

SUBSTRATES

- Non-cracked concrete C20/25-C50/60
- High-density natural stone

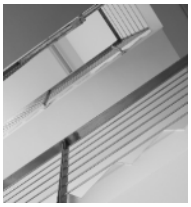


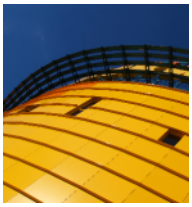
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APPLICATIONS

- Balustrades
- Barriers
- Steel structures
- Storage racks
- Ventilated facades



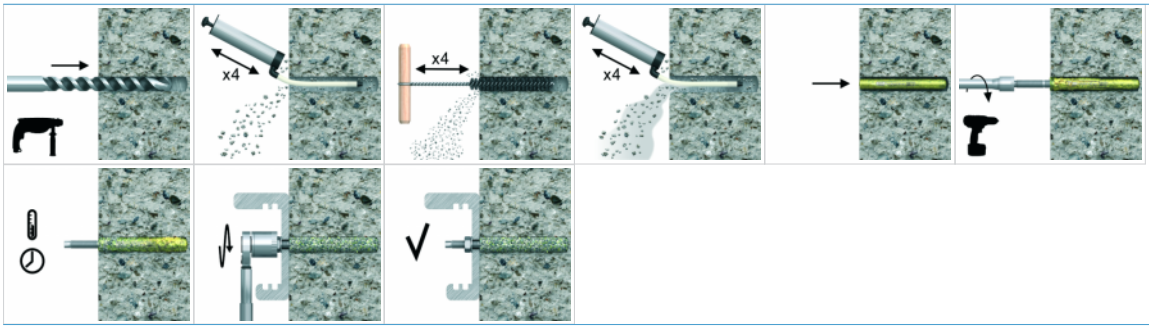







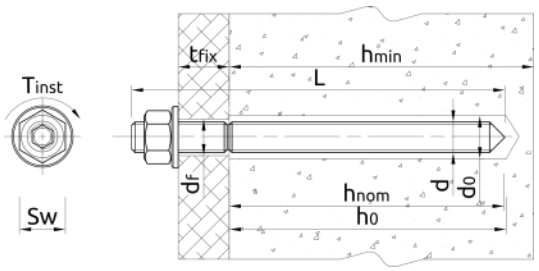


INSTALLATION GUIDE



1. Drill a hole of required diameter and depth.
2. Clean the drill hole thoroughly with brush and hand pump at least four times before installation.
3. Insert capsule into the hole.
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 unitl the curing time elapses.
6. Leave the fixing undisturbed until the curing time elapses.

INSTALLATION DATA



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
Hole diameter in fixture	d_f	[mm]	9	12	14	18	22	26	33
Max. installation torque	T_{inst}	[Nm]	10	20	40	80	120	180	300
Min. hole depth in substrate	h_0	[mm]	85	95	115	130	175	215	275
Min. substrate thickness	h_{min}	[mm]	110	120	140	155	210	258	330
Min. edge distance	c_{min}	[mm]	40	45	55	63	85	105	135
Min. spacing	s_{min}	[mm]	40	45	55	63	85	105	135
Installation depth	h_{nom}	[mm]	80	90	110	125	170	210	270

Processing and curing time										
Substrate (concrete) temperature	-	[˚C]	-5	0	5	10	15	20	30	40
Min. curing time [1]	-	[min]	480 (8h)	240 (4h)	150 (2,5h)	120 (2h)	90 (1,5h)	45	20	

Times are provided for resin temperatures (min = 5˚C; max = 25˚C) equal or the closest to base material temperature.

[1] For wet condition and flooded holes, 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/mm²]	500	500	500	500	500	500	500
Nominal yield strength	f_{yk}	[N/mm²]	400	400	400	400	400	400	400
Cross sectional area	A_s	[mm²]	36,6	58	84,3	156,7	244,8	352,3	560,6
Elastic section modulus	W_{el}	[mm³]	31,2	62,3	109,1	276,6	540,2	932,8	1872,1
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	19	37	65	166	324	561	1124

MECHANICAL PROPERTIES

Size			M8	M10	M12	M16	M20	M24	M30
Design bending resistance	M	[Nm]	15,2	29,6	52	132,8	259,2	448,8	899,2
R-STUDS Metric Threaded Rods - Steel Class 8.8									
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm²]	800	800	800	800	800	800	800
Nominal yield strength	f_{yk}	[N/mm²]	640	640	640	640	640	640	640
Cross sectional area	A_s	[mm²]	36,6	58	84,3	156,7	244,8	352,3	560,6
Elastic section modulus	W_{el}	[mm³]	31,2	62,3	109,1	276,6	540,2	932,8	1872,1
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	30	60	105	266	519	898	1799
Design bending resistance	M	[Nm]	24	48	84	212,8	415,2	718,4	1439,2
R-STUDS Metric Threaded Rods - A2/A4/HCR-50									
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm²]	700	700	700	700	700	700	700
Nominal yield strength	f_{yk}	[N/mm²]	450	450	450	450	450	450	450
Cross sectional area	A_s	[mm²]	36,6	58	84,3	156,7	244,8	352,3	560,6
Elastic section modulus	W_{el}	[mm³]	31,2	62,3	109,1	276,6	540,2	932,8	1872,1
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	26	52	92	233	454	786	1574
Design bending resistance	M	[Nm]	16,7	33,3	59	149,4	291	503,8	1009

BASIC PERFORMANCE DATA

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

Size			M8	M10	M12	M16	M20	M24	M30
UNCRACKED CONCRETE C20/25									
Embedment depth	h_{ef}	[mm]	80	90	110	125	170	210	270
MEAN ULTIMATE RESISTANCE									
TENSION LOAD									
Metric threaded rod, grade 5.8	$N_{Ru,m}$	[kN]	18,9	30,5	44,1	81,9	128,1	179,6	268,7
Metric threaded rod, grade 8.8	$N_{Ru,m}$	[kN]	30,5	41,4	64,1	88	131,9	179,6	268,7
Metric threaded rod, grade A4-70	$N_{Ru,m}$	[kN]	26,3	41,4	62	88	131,9	179,6	268,7
SHEAR LOAD									
Metric threaded rod, grade 5.8	$V_{Ru,m}$	[kN]	11,3	18,3	26,5	49,1	76,9	110,9	176,4
Metric threaded rod, grade 8.8	$V_{Ru,m}$	[kN]	18,3	29	42,2	78,8	123,5	177,7	282,2
Metric threaded rod, grade A4-70	$V_{Ru,m}$	[kN]	15,8	25,2	37,2	68,7	107,7	155,6	247
CHARACTERISTIC RESISTANCE									
TENSION LOAD									
Metric threaded rod, grade 5.8	N_{Rk}	[kN]	18	28,3	42	62,8	101,5	134,6	203,6
Metric threaded rod, grade 8.8	N_{Rk}	[kN]	24,1	28,3	45,6	62,8	101,5	134,6	203,6
Metric threaded rod, grade A4-70	N_{Rk}	[kN]	24,1	28,3	45,6	62,8	101,5	134,6	203,6
SHEAR LOAD									
Metric threaded rod, grade 5.8	V_{Rk}	[kN]	9	14	21	39	61	88	140
Metric threaded rod, grade 8.8	V_{Rk}	[kN]	14,6	23,2	33,7	62,7	97,9	140,9	224,2
Metric threaded rod, grade A4-70	V_{Rk}	[kN]	12,8	20,3	29,5	54,8	85,7	123,3	196,2
DESIGN RESISTANCE									
TENSION LOAD									
Metric threaded rod, grade 5.8	N_{Rd}	[kN]	12	15,7	25,3	34,9	56,4	74,8	113,1
Metric threaded rod, grade 8.8	N_{Rd}	[kN]	13,4	15,7	25,3	34,9	56,4	74,8	113,1
Metric threaded rod, grade A4-70	N_{Rd}	[kN]	13,4	15,7	25,3	34,9	56,4	74,8	113,1
SHEAR LOAD									
Metric threaded rod, grade 5.8	V_{Rd}	[kN]	7,2	11,2	16,8	31,2	48,8	70,4	112
Metric threaded rod, grade 8.8	V_{Rd}	[kN]	11,7	18,6	27	50,1	78,3	112,7	179,4
Metric threaded rod, grade A4-70	V_{Rd}	[kN]	8,2	13	18,9	35,1	54,9	79,1	125,8
RECOMMENDED LOAD									
TENSION LOAD									
Metric threaded rod, grade 5.8	N_{rec}	[kN]	8,6	11,2	18,1	24,9	40,3	53,4	80,8
Metric threaded rod, grade 8.8	N_{rec}	[kN]	9,6	11,2	18,1	24,9	40,3	53,4	80,8
Metric threaded rod, grade A4-70	N_{rec}	[kN]	9,5	11,2	18,1	24,9	40,3	53,4	80,8
SHEAR LOAD									
Metric threaded rod, grade 5.8	V_{rec}	[kN]	5,1	8	12	22,3	34,9	50,3	80
Metric threaded rod, grade 8.8	V_{rec}	[kN]	8,4	13,3	19,3	35,8	56	80,5	128,1
Metric threaded rod, grade A4-70	V_{rec}	[kN]	5,9	9,3	13,5	25,1	39,2	56,5	89,8

DESIGN PERFORMANCE DATA

Static loads

Size			M8	M10	M12	M16	M20	M24	M30
TENSION LOAD									
STEEL FAILURE; STEEL CLASS 5.8									
Characteristic resistance	$N_{Rk,s}$	[kN]	18	29	42	78	122	176	280
Partial safety factor	γ_{MS}	[-]	1,5	1,5	1,5	1,5	1,5	1,5	1,5
STEEL FAILURE; STEEL CLASS 8.8									
Characteristic resistance	$N_{Rk,s}$	[kN]	29	46	67	126	196	282	449
Partial safety factor	γ_{MS}	[-]	1,5	1,5	1,5	1,5	1,5	1,5	1,5
STEEL FAILURE; STEEL GRADE A4-70									
Characteristic resistance	$N_{Rk,s}$	[kN]	26	41	59	110	171	247	393
Partial safety factor	γ_{MS}	[-]	1,87	1,87	1,87	1,87	1,87	1,87	1,87
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; WORKING LIFE OF 50 YEARS									
NON-CRACKED CONCRETE C20/25									
Characteristic bond resistance (40°C/24°C)	τ_{Rk}	[N/mm²]	12	10	11	10	9,5	8,5	8
Characteristic bond resistance (80°C/50°C)	τ_{Rk}	[N/mm²]	12	10	11	10	9,5	8,5	8
FACTORS									
Increasing factors for concrete C30/37	Ψ_c	[-]	1,04	1,04	1,04	1,04	1,04	1	1
Increasing factors for concrete C40/50	Ψ_c	[-]	1,07	1,07	1,07	1,07	1,07	1	1
Increasing factors for concrete C50/60	Ψ_c	[-]	1,09	1,09	1,09	1,09	1,09	1	1
Factor of the influence of sustained load (40°C/24°C)	Ψ^0_{sus}	[-]	0,66	0,66	0,66	0,66	0,66	0,66	0,66
Factor of the influence of sustained load (80°C/50°C)	Ψ^0_{sus}	[-]	0,6	0,6	0,6	0,6	0,6	0,6	0,6
Installation safety factor	γ_{inst}	[-]	1,2	1,2	1,2	1,2	1,2	1,2	1,2
CONCRETE CONE FAILURE									
Factor for uncracked concrete	$k_{ucr,N}$	[-]	11	11	11	11	11	11	11
Edge distance	$c_{cr,N}$	[mm]	1)	1)	1)	1)	1)	1)	1)
Spacing	$s_{cr,N}$	[mm]	2)	2)	2)	2)	2)	2)	2)
Installation safety factor	γ_{inst}	[-]	1,2	1,2	1,2	1,2	1,2	1,2	1,2
CONCRETE SPLITTING FAILURE									
Edge distance	$c_{cr,sp}$	[mm]	3)	3)	3)	3)	3)	3)	3)
Spacing	$s_{cr,sp}$	[mm]	4)	4)	4)	4)	4)	4)	4)
Installation safety factor	γ_{inst}	[-]	1,2	1,2	1,2	1,2	1,2	1,2	1,2
SHEAR LOAD									
STEEL FAILURE; STEEL CLASS 5.8									
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	9	14	21	39	61	88	140
Ductility factor	k_7	[-]	1	1	1	1	1	1	1
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	19	37	65	166	324	561	1124
Partial safety factor	γ_{MS}	[-]	1,25	1,25	1,25	1,25	1,25	1,25	1,25
STEEL FAILURE; STEEL CLASS 8.8									
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	15	23	34	63	98	141	224
Ductility factor	k_7	[-]	1	1	1	1	1	1	1
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	30	60	105	266	519	898	1799
Partial safety factor	γ_{MS}	[-]	1,25	1,25	1,25	1,25	1,25	1,25	1,25
STEEL FAILURE; STEEL GRADE A4-70									
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	13	20	29	55	86	124	196
Ductility factor	k_7	[-]	1	1	1	1	1	1	1
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	26	52	92	233	454	786	1574
Partial safety factor	γ_{MS}	[-]	1,56	1,56	1,56	1,56	1,56	1,56	1,56
CONCRETE PRY-OUT FAILURE									
Factor	k	[-]	2	2	2	2	2	2	2
Installation safety factor	γ_2	[-]	1	1	1	1	1	1	1
CONCRETE EDGE FAILURE									
Anchor diameter	d_{nom}	[mm]	8	10	12	16	20	24	30
Effective embedment depth	h_{ef}	[mm]	5)	5)	5)	5)	5)	5)	6)
Installation safety factor	γ_{inst}	[-]	1	1	1	1	1	1	1

[1] $c_{cr,N}=1,5 \cdot h_{ef}$

[2] $s_{cr,N}=3,0 \cdot h_{ef}$

[3] $c_{cr,sp}$ = based on relevant ETA

[4] $s_{cr,sp}=2,0 \cdot c_{cr,sp}$

[5] $l_f=\max (h_{ef}; \leq 12 \cdot d_{nom})$

[6] $l_f=\max (h_{ef}; 8 \cdot d_{nom}; 300)$

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LOGISTICAL DATA

SKU	Base-sales unit	Unit pack	Bulk pack	Pallet	Single Package - Gross Weight	Bulk Package - Gross Weight	Palette - Gross Weight	Barcode
R-CAS-V-08	pcs.	10.0	480.0	5760.0	0.2	8.6	103.3	5906675280189
R-CAS-V-10	pcs.	10.0	480.0	5760.0	0.2	10.0	145.2	5906675280196
R-CAS-V-12	pcs.	10.0	480.0	5760.0	0.3	12.7	177.3	5906675280202
R-CAS-V-16	pcs.	10.0	480.0	5760.0	0.4	18.0	241.1	5906675280219
R-CAS-V-20	pcs.	6.0	108.0	1296.0	0.8	14.3	171.7	5906675280226
R-CAS-V-24	pcs.	6.0	108.0	1296.0	1.0	18.8	250.3	5906675280233
R-CAS-V-30	pcs.	4.0	32.0	384.0	1.7	14.0	192.8	5906675280240

RELATED PRODUCTS

SAFETY

Protective gloves for power tools
R-PGL



DRILLING

Rotary Hammer Drill SDS plus; 850W; 26mm; 2.5J
R-PRH-26850



Cordless Hammer 18V SDS plus
R-PRH18



Drill bits Aggressor SDS plus
RT-SDSA



Drill bits Rebardrill SDS plus
RT-SDSR



CLEANING

Blow Pump
R-BLOWPUMP



ANCHORING

Cordless RawlDriver 18V
R-PDD18

