PROVENTURE PROV500

PRO V500 V4 PURE EPOXY RESIN TECHNICAL DATA

Product Description

PRO V500 V4 is an ultimate performance high strength pure epoxy chemical anchoring resin system. It is designed for deep embedment and large diameter holes due to its zero shrinkage, and longer working times. For diamond drilled holes, with rebar, and in areas of high chemical exposure including marine environments. European Technical Approval, approval for seismic loads and WRAS approval for use in potable water.

Pack size: 385ml side by side cartridge + 1 mixer nozzle

Contents

Specific benefits

- Long working times
- High bond strength
- High chemical resistance
- Use with potable water
- Studs and rebar
- Fixing studs in wood
- 24 month shelf life
- 100 years service life
- Zero shrinkage
- Diamond drilled holes
- Low odour
- Dust free drilling (hollow drilling) approved
- Fire approved
- A+ Rating VOC content
- Seismic approved
- WRAS approved
- European Technical Approval

Approvals

- ETA Option 1 ETAG 001 for cracked concrete with studs and rebar TR029
- ETA Option 1 ETAG 001 for rebar TR023 : Approved for Seismic Loads C2
- ETA approved in flooded holes, wet and dry concrete
- WRAS approved for use with potable drinking water
- Tested to BS6920
- Tested according to LEED 2021 v4 , SCAQMD rule 1168 (2017).
- CE certification

Shelf life and storage

The shelf life of the product is 24 months from the date of manufacture.

The product should be stored between +5˚C and +25˚C.

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Features and Benefits

- *High bond strength with high load resistance*
- *Used with all grades of threaded rods and rebar in accordance with TR029*
- *Ideal for deep embedment installations*
- *Used in non-cracked, cracked concrete, **seismic C1** and **seismic C2** applications*
- *Used in dry and wet concrete and also in wood*
- *Used in flooded holes*
- *Used for overhead applications*
- *ETA approved for diamond drilled holes and hollow drilling-dust free drilling*
- *Ideal for elevated temperatures - temperature ranges I and II*
- *ETA approved for anchoring under EN1992-4:2018 EC2 and TR055 edition 2018*
- *ETA approved for rebar installations under TR023 and EN1992-1-1:2004 EC2 + AC: 2010*
- *ETA approved for rebar installations under seismic loading in accordance to EN1998-1*
- *ETA approved for rebar installations under fire exposure in accordance with EN 1992-1-2:2004 + AC 2008*
- *Zero shrinkage enables large diameter installations*
- *WRAS Approval*
- *Tested to BS6920*
- *Manual cleaning up to 20mm diameter and embedment depths of 240mm*
- *Independently tested and approved - anchor life 50 years and 100 years*

Static and quasi-static resistance for a single anchor

The data is applied to:
Correct setting
No edge distance and spacing influence
Steel failure
Threaded bars steel class 5.8, 8.8, 10.9 or stainless steel class 70 and 80 and rebar B500B
Base material thickness as specified in the Table 1 for threaded bars and Table 2 for rebar
The embedment depth as specified in the Table 1 for threaded bars and Table 2 for rebar
Concrete C20 /25
Temperature range I (min base material temperature -40°C,
max long/short term base material temperature +24°C/+40°C)

Embedment depth and base material thickness: Threaded bars

Table 1 **ETA 19 /0705**

Anchor size		M8	M10	M12	M16	M20	M24	M27	M30
Effective anchorage depth	[mm]	80	90	110	125	170	210	240	270
Base material thickness	[mm]	110	120	140	161	218	266	304	340

Embedment depth and base material thickness: Rebar

Table 2 **ETA 19 / 0705**

Anchor size		ϕ8	ϕ10	ϕ12	ϕ14	ϕ16	ϕ20	ϕ25	ϕ28	ϕ32
Effecticve anchorage depth	[mm]	80	90	110	120	125	170	210	270	300
Base material thickness	[mm]	110	120	140	156	161	218	274	340	380

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PRO V500 V4 PURE EPOXY RESIN TECHNICAL DATA

For hammer drilling and compressed air drilling: Threaded bars

Characteristic resistance for non-cracked concrete C20/25			**ETA 19 / 0705**							
Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Tension NRk	5.8	[kN]	18	29	42	78	122	176	230	280
	8.8		29	46	67	125	196	282	367	449
	10.9		37	58	84	157	245	354	422	494
	A4-70		18	29	42	79	122	176	230	280
	A4-80		29	46	67	126	196	282	367	449
Shear VRk	5.8	[kN]	9	15	21	39	61	88	115	140
	8.8		15	23	34	63	98	141	184	224
	10.9		18	29	42	79	123	177	230	281
	A4-70		13	20	30	55	86	124	161	196
	A4-80		15	23	34	63	98	141	184	224

Characteristic resistance for cracked concrete C20/25			**ETA 19 / 0705**							
Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Tension NRk	5.8	[kN]	18	29	42	78	122	176	229	280
	8.8		26	39	54	91	142	193	229	282
	10.9		26	39	54	91	142	193	229	282
	A4-70		18	29	42	79	122	176	229	280
	A4-80		29	39	54	91	142	193	229	282
Shear VRk	5.8	[kN]	9	15	21	39	61	88	115	140
	8.8		15	23	34	63	98	141	184	224
	10.9		18	29	42	79	123	177	230	281
	A4-70		13	20	30	55	86	124	161	196
	A4-80		15	23	34	63	98	141	184	224

Note: The Tension and Shear loads represented in the table are calculated based on the full range allowed for the anchor length, up to the maximum embedment depth alowed (20 x diameter)

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For hammer drilling and compressed air drilling: Threaded bars

Design resistance for non-cracked concrete C20/25			**ETA 19 / 0705**							
Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Tension NRk	5.8	[kN]	11.9	19.3	27.9	51.5	81.2	117.3	153.3	187.3
	8.8		19.3	30.5	44.5	83.2	130.5	187.5	244.5	299
	10.9		26.4	41.4	59.9	112.1	174.9	252.1	327.8	400.7
	A4-70		13.9	21.9	31.5	58.8	91.4	132	171.6	210.1
	A4-80		18.1	28.7	41.8	78.1	122.4	176.2	229.3	280.6
Shear VRk	5.8	[kN]	7.1	11.9	16.7	31.1	48.7	70.3	91.7	111.5
	8.8		11.9	18.3	27.1	50.3	78.3	112.5	147	179
	10.9		11.9	19.3	27.9	52.6	81.9	117.9	149.9	187.3
	A4-70		8.3	12.8	19.2	35.1	55.1	79.4	103.2	125.6
	A4-80		11.2	17.2	25.5	47.3	73.6	106	138.3	168.4

Design resistance for cracked concrete C20/25			**ETA 19 / 0705**							
Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Tension NRk	5.8	[kN]	11.9	19.3	27.9	51.5	81.2	117.3	109.5	187.3
	8.8		19.3	30.5	44.5	83.2	130.5	187.5	229	282.5
	10.9		26.4	39.7	54.2	91.1	142.4	193	229	282.5
	A4-70		13.9	21.9	31.5	58.8	91.4	132	171.6	210.1
	A4-80		18.1	28.7	41.8	78.1	122.3	176.2	229	280.6
Shear VRk	5.8	[kN]	7.1	11.9	16.7	31.1	48.7	70.3	91.7	111.5
	8.8		11.9	18.3	27.1	50.3	78.3	112.5	147	179
	10.9		11.9	19.3	27.9	52.6	81.9	117.9	149.9	187.3
	A4-70		8.3	12.8	19.2	35.1	55.1	79.4	103.2	125.6
	A4-80		11.2	17.2	25.5	47.3	73.6	106	138.3	168.4

Note: For M8 and M10, the bond strength wasn't assessed in the ETA for cracked concrete

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For hammer drilling and compressed air drilling: Threaded bars

Recommended loads for non-cracked concrete C20/25			ETA 19 / 0705							
Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Tension NRk	5.8	[kN]	8.5	13.8	19.9	36.8	58.0	83.8	109.5	133.8
	8.8		13.8	21.8	31.8	59.4	93.2	133.9	174.6	213.6
	10.9		18.9	29.6	42.8	80.1	124.9	180.1	234.1	286.2
	A4-70		9.9	15.6	22.5	42.0	65.3	94.3	122.6	150.1
	A4-80		12.9	20.5	29.9	55.8	87.4	125.9	163.8	200.4
Shear VRk	5.8	[kN]	5.1	8.5	11.9	22.2	34.8	50.2	65.5	79.6
	8.8		8.5	13.1	19.4	35.9	55.9	80.4	105.0	127.9
	10.9		8.5	13.8	19.9	37.6	58.5	84.2	107.1	133.8
	A4-70		5.9	9.1	13.7	25.1	39.4	56.7	73.7	89.7
	A4-80		8.0	12.3	18.2	33.8	52.6	75.7	98.8	120.3

Recommended loads for cracked concrete C20/25			ETA 19 / 0705							
Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Tension NRk	5.8	[kN]	8.5	13.8	19.9	36.8	58.0	83.8	109.5	133.8
	8.8		13.8	21.8	31.8	59.4	93.2	133.9	174.6	213.6
	10.9		18.9	29.6	42.8	80.1	124.9	180.1	234.1	286.2
	A4-70		9.9	15.6	22.5	42.0	65.3	94.3	122.6	150.1
	A4-80		12.9	20.5	29.9	55.8	87.4	125.9	163.8	200.4
Shear VRk	5.8	[kN]	5.1	8.5	11.9	22.2	34.8	50.2	65.5	79.6
	8.8		8.5	13.1	19.4	35.9	55.9	80.4	105.0	127.9
	10.9		8.5	13.8	19.9	37.6	58.5	84.2	107.1	133.8
	A4-70		5.9	9.1	13.7	25.1	39.4	56.7	73.7	89.7
	A4-80		8.0	12.3	18.2	33.8	52.6	75.7	98.8	120.3

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For hammer drilling and compressed air drilling: Rebar

Embedment depth and base material thickness:

Table 2 **ETA 19 / 0705**

Anchor size		ϕ8	ϕ10	ϕ12	ϕ14	ϕ16	ϕ20	ϕ25	ϕ28	ϕ32
Eff. anchorage depth	[mm]	80	90	110	120	125	170	210	270	300
Base material thickness	[mm]	110	120	140	156	161	218	274	340	380

Characteristic resistance for non-cracked concrete			**ETA 19 / 0705**								
Anchor size			ϕ8	ϕ10	ϕ12	ϕ14	ϕ16	ϕ20	ϕ25	ϕ28	ϕ32
Tension NRk	B500B	[kN]	28	43	62	85	111	173	270	339	442
Shear VRk	B500B	[kN]	14	22	31	42.5	55	86	135	169	221

Characteristic resistance for cracked concrete			**ETA 19 / 0705**								
Anchor size			ϕ8	ϕ10	ϕ12	ϕ14	ϕ16	ϕ20	ϕ25	ϕ28	ϕ32
Tension NRk	B500B	[kN]	N/A	N/A	62	85	111	173	270	339	442
Shear VRk	B500B	[kN]	N/A	N/A	31	42.5	55	86	135	169	221

Design resistance for non-cracked concrete			**ETA 19 / 0705**								
Anchor size			ϕ8	ϕ10	ϕ12	ϕ14	ϕ16	ϕ20	ϕ25	ϕ28	ϕ32
Tension NRk	B500B	[kN]	19.9	30.5	44.2	60.5	79	123.5	192	242	315
Shear VRk	B500B	[kN]	9.3	14.6	20.6	28.2	36.5	57.3	89.9	112.5	147

Design resistance for cracked concrete			**ETA 19 / 0705**								
Anchor size			ϕ8	ϕ10	ϕ12	ϕ14	ϕ16	ϕ20	ϕ25	ϕ28	ϕ32
Tension NRk	B500B	[kN]	N/A	N/A	39.2	57	75	117	183	242	315
Shear VRk	B500B	[kN]	N/A	N/A	20.6	28.2	36.5	57.3	89.9	112.5	147

Recommended loads for non-cracked concrete			**ETA 19 / 0705**								
Anchor size			ϕ8	ϕ10	ϕ12	ϕ14	ϕ16	ϕ20	ϕ25	ϕ28	ϕ32
Tension NRk	B500B	[kN]	14.2	21.8	31.6	43.2	56.4	88.2	137.1	172.9	225.0
Shear VRk	B500B	[kN]	6.6	10.4	14.7	20.1	26.1	40.9	64.2	80.4	105.2

Recommended loads for cracked concrete			**ETA 19 / 0705**								
Anchor size			ϕ8	ϕ10	ϕ12	ϕ14	ϕ16	ϕ20	ϕ25	ϕ28	ϕ32
Tension NRk	B500B	[kN]	N/A	N/A	28.0	40.7	53.6	83.6	130.7	172.9	225.0
Shear VRk	B500B	[kN]	N/A	N/A	14.7	20.1	26.1	40.9	64.2	80.4	105.2

Note: For rebar 8 and 10 mm, the bond strength wasn't assessed in the ETA for cracked concrete

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Bond Strength Factors - threaded bars

Influence of concrete strength on combined pull out and concrete cone resistance

Concrete Strength N/mm2 (Mpa)	C15/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
non-cracked concrete fc =	0.98	1.00	1.05	1.10	1.15	1.18	1.22	1.25
cracked cpncrete fc =	0.98	1.00	1.07	1.13	1.18	1.23	1.28	1.32

Influence of environmental conditions in non cracked concrete

		M8	M10	M12	M16	M20	M24	M27	M30	M33	M36
Temp I 40°C / 24°C	Dry and Wet	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Flooded	1.00	1.00	1.00	1.00	0.87	0.75	0.73	0.73	0.70	0.70
Temp II 60°C / 43°C	Dry and Wet	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
	Flooded	0.90	0.90	0.90	0.90	0.80	0.70	0.67	0.65	0.60	0.60

Influence of environmental conditions in cracked concrete

		M8	M10	M12	M16	M20	M24	M27	M30	M33	M36
Temp I 40°C / 24°C	Dry and Wet	0.52	0.52	0.50	0.50	0.53	0.50	0.50	0.50	0.50	0.50
	Flooded	0.52	0.52	0.50	0.50	0.46	0.46	0.40	0.40	0.40	0.40
Temp II 60°C / 43°C	Dry and Wet	0.47	0.50	0.44	0.44	0.46	0.46	0.46	0.46	0.40	0.40
	Flooded	0.47	0.50	0.44	0.44	0.44	0.38	0.36	0.36	0.30	0.30

Influence of environmental conditions in seismic C1

		M8	M10	M12	M16	M20	M24	M27	M30	M33	M36
Temp I 40°C / 24°C	Dry and Wet	0.50	0.50	0.50	0.50	0.50	0.45	0.40	0.40	0.35	0.35
	Flooded	0.50	0.50	0.50	0.50	0.45	0.40	0.35	0.25	0.25	0.25
Temp II 60°C / 43°C	Dry and Wet	0.45	0.45	0.45	0.43	0.43	0.38	0.32	0.23	0.20	0.20
	Flooded	0.45	0.45	0.45	0.43	0.40	0.35	0.30	0.20	0.15	0.15

Influence of environmental conditions in seismic C2

		M8	M10	M12	M16	M20	M24	M27	M30	M33	M36
Temp I 40°C / 24°C	Dry and Wet	N/A	N/A	0.22	0.14	0.16	0.27	N/A	N/A	N/A	N/A
	Flooded	N/A	N/A	0.22	0.14	0.14	0.20	N/A	N/A	N/A	N/A
Temp II 60°C / 43°C	Dry and Wet	N/A	N/A	0.20	0.13	0.15	0.24	N/A	N/A	N/A	N/A
	Flooded	N/A	N/A	0.20	0.13	0.13	0.18	N/A	N/A	N/A	N/A

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Bond Strength Factors - REBAR

Influence of concrete strength on combined pull out and concrete cone resistance

Concrete Strength N/mm2 (MPa)	C15/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
fc =	0.98	1.00	1.04	1.08	1.11	1.15	1.18	1.20
Concrete Strength N/mm2 (MPa)	C55/67	C60/75	C70/85	C80/96	C90/105	-	-	-
fc =	1.20	1.20	1.20	1.20	1.20	-	-	-

Influence of environmental conditions in non cracked concrete

		Ø 8	Ø 10	Ø 12	Ø 16	Ø 20	Ø 25	Ø 28	Ø 32
Temp I 40°C / 24°C	Dry and Wet	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Flooded	1.00	1.00	1.00	1.00	0.86	0.77	0.73	0.68
Temp II 60°C / 43°C	Dry and Wet	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
	Flooded	0.90	0.90	0.90	0.90	0.81	0.68	0.68	0.63

Influence of environmental conditions in cracked concrete

		Ø 8	Ø 10	Ø 12	Ø 16	Ø 20	Ø 25	Ø 28	Ø 32
Temp I 40°C / 24°C	Dry and Wet	n/a	n/a	0.60	0.64	0.64	0.64	0.68	0.68
	Flooded	n/a	n/a	0.60	0.64	0.54	0.54	0.54	0.54
Temp II 60°C / 43°C	Dry and Wet	n/a	n/a	0.54	0.54	0.60	0.60	0.64	0.64
	Flooded	n/a	n/a	0.54	0.60	0.60	0.50	0.5	0.50

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Post installed rebar connections

Minimum anchorage length [1] and lap splice length for C20/25 and maximum installation length (l_{max})

Rebar		$l_{b,min}$ (mm)	$l_{0,min}$ (mm)	$l_{max,min}$ (mm)
Ø d_s	$f_{y,k}$ (N/mm^2)			
8mm	500	113	200	1000
10mm	500	142	200	1000
12mm	500	170	200	1200
14mm	500	198	210	1400
16mm	500	227	240	1600
20mm	500	284	300	2000
22mm	500	312	330	2000
24mm	500	340	360	2000
25mm	500	354	375	2000
28mm	500	397	420	2000
32mm	500	454	480	2000
34mm	500	482	510	2000
36mm	500	534	540	2000
40mm	500	621	600	2000

N/mm^2 = MPa

1) According to EN 1992-1-1:2004 $l_{b,min}$ (8.6) and $l_{0,min}$ (8.11) for good bond conditions and a_δ = 1,0
with maximum yield stress for rebar B500 B and γ_M = 1,15

STATIC LOADING

Design values of the ultimate bond resistance f_{bd} [1] in N/mm^2 for all drilling methods for good conditions

Rebar Ø	Concrete Class								
Ø d_s	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/60	C50/60
8mm to 25mm	1.6	2.0	2.3	2.7	3.0	3.4	3.7	4.0	4.3
28 to 36mm								3.7	4.0
40mm						3.0	3.0	3.4	3.4

2) Tabulated values for fbd are valid for good bond condition according to EN1992-1-1:2004. For all other bond conditions multiply the values for fbd by 0.7.

SEISMIC LOADING

Rebar Ø	Concrete Class							
Ø d_s	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/60	C50/60
8mm to 25mm	2.0	2.3	2.7	3.0	3.4	3.7	4.0	4.3
24mm							3.7	3.7
25mm							3.4	3.4
28mm						3.4	3.4	3.0
30mm					3.0	3.0	3.0	3.0
32mm						2.7	2.7	2.7
36mm			2.3	2.3	2.3	2.3	2.3	2.3
40mm		2.0	2.0	2.0	2.0	2.0	2.0	2.0

3) Tabulated values for fbd are valid for good bond condition according to EN1992-1-1:2004 + AC2004. For all other bond conditions multiply the values for fbd by 0.7.

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Post installed rebar schematics

Application examples of post-installed rebar

Figure 1: Overlap joints in slabs and beams.

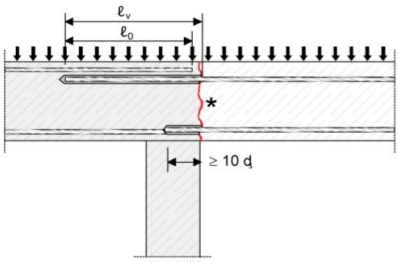


Figure 2: Overlap joint in foundation of a column or wall where the rebars are stressed in tension.

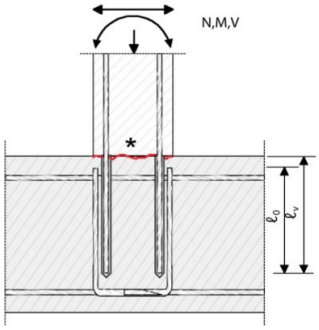


Figure 3: End anchoring of slabs or beams, designed as simply supported.

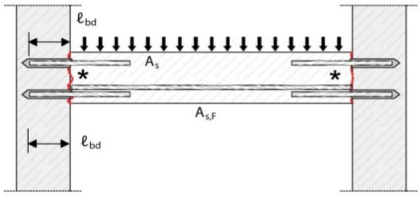


Figure 4: Rebar connection of components stressed primarily in compression. The rebar are stressed in compression.

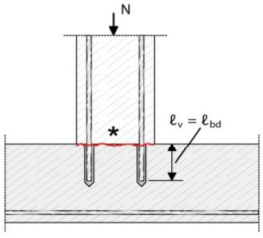
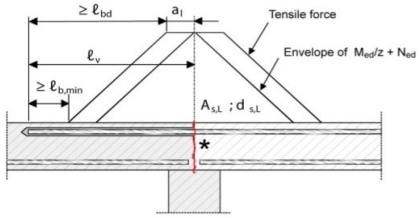


Figure 5: Anchoring of reinforcement to cover the line of acting tensile force.



Note to figure 1 to 5 :
In the figures no transverse reinforcement is plotted, the transverse reinforcement as required by EC 2 shall be present.
The shear transfer between old and new concrete shall be designed according to EC2. Description of the bonded-in rebars and overlap joints see Annex 4 and 5.

*** Roughened joint**

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PRO V500 V4 PURE EPOXY RESIN TECHNICAL DATA

Effect of Anchor Spacing - Tension

Anchor Spacing	Stud / Rebar Diameter										
(mm)	8	10	12	16	20	24	27	30	33	36	40
40	0.64										
50	0.67	0.63									
60	0.70	0.65	0.63								
70	0.73	0.67	0.64								
80	0.76	0.69	0.66	0.63							
90	0.79	0.72	0.68	0.64							
100	0.82	0.74	0.70	0.65	0.63						
120	0.87	0.79	0.74	0.68	0.65	0.63	0.63				
150	0.96	0.86	0.80	0.73	0.68	0.65	0.64	0.63			
160	1.00	0.88	0.82	0.74	0.70	0.66	0.65	0.63	0.63	0.63	0.63
175		0.92	0.85	0.76	0.71	0.67	0.66	0.64	0.63	0.63	0.63
200		1.00	0.90	0.80	0.74	0.69	0.69	0.66	0.65	0.65	0.65
225			0.95	0.84	0.77	0.72	0.71	0.68	0.67	0.67	0.66
240			1.00	0.86	0.79	0.73	0.72	0.69	0.68	0.68	0.67
250				0.87	0.80	0.74	0.73	0.70	0.69	0.68	0.68
275				0.91	0.83	0.76	0.75	0.72	0.71	0.70	0.69
280				0.92	0.84	0.77	0.76	0.73	0.71	0.70	0.69
300				0.95	0.86	0.79	0.78	0.74	0.73	0.72	0.71
320				1.00	0.88	0.81	0.80	0.76	0.74	0.73	0.72
350					0.92	0.83	0.82	0.78	0.77	0.75	0.73
400					1.00	0.88	0.87	0.82	0.80	0.78	0.76
440						0.92	0.91	0.85	0.83	0.81	0.79
480						1.00	0.94	0.88	0.86	0.84	0.81
540							1.00	0.93	0.91	0.88	0.84
600								1.00	0.96	0.92	0.88
660									1.00	0.96	0.91
720										1.00	0.95
800											1.00

Effect of Edge Distance - Tension

Edge Distance	Stud / Rebar Diameter										
(mm)	8	10	12	16	20	24	27	30	33	36	40
40	0.64										
50	0.73	0.63									
60	0.82	0.70	0.63								
70	0.90	0.77	0.68								
80	1.00	0.84	0.74	0.63							
90		0.91	0.80	0.67							
100		1.00	0.86	0.71	0.63						
110			0.92	0.76	0.66						
120			1.00	0.80	0.70	0.64					
140				0.89	0.77	0.67	0.63	0.63			
160				1.00	0.84	0.72	0.70	0.65	0.63	0.67	
180					0.91	0.78	0.75	0.70	0.66	0.71	0.68
200					1.00	0.84	0.81	0.76	0.71	0.74	0.71
220						0.89	0.86	0.81	0.75	0.78	0.75
240						1.00	0.92	0.86	0.80	0.82	0.78
270							1.00	0.94	0.87	0.87	0.83
300								1.00	0.94	0.93	0.88
330									1.00	0.98	0.93
360										1.00	0.98
400											1.00

Effect of Edge Distance - Shear

Edge Distance	Stud / Rebar Diameter										
(mm)	8	10	12	16	20	24	27	30	33	36	40
40	0.25										
50	0.44	0.30									
60	0.63	0.48	0.30								
70	0.81	0.65	0.44								
80	1.00	0.83	0.58	0.40							
90		1.00	0.72	0.53							
100			0.86	0.67	0.35						
110			1.00	0.80	0.44						
125				1.00	0.58	0.35					
140					0.72	0.46	0.35	0.30			
160					0.91	0.62	0.51	0.35	0.32	0.33	
180					1.00	0.77	0.63	0.46	0.37	0.43	
200						0.92	0.75	0.57	0.46	0.50	0.32
220						1.00	0.88	0.68	0.56	0.56	0.53
240							1.00	0.78	0.65	0.63	0.59
280								1.00	0.84	0.77	0.72
310									1.00	1.00	0.82
330										1.00	0.89
400											1.00

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PRO V500 V4 PURE EPOXY RESIN TECHNICAL DATA

Minimum Curing Time

Concrete Temperature	Gel - Working Time	Minimum curing time in dry concrete	Minimum curing time in wet concrete
5°C	70 min	60 h	x 2
10°C	32 min	40 h	x 2
15°C	28min	30 h	x 2
20°C	25 min	18 h	x 2
25°C	22 min	17 h	x 2
30°C	20 min	16 h	x 2
35°C	19 min	14 h	x 2
40°C	18 min	12 h	x 2

- All specifications based on supplied mixer

Temperature Ranges

Temperature Range	Concrete Service Temperature	Maximum Long Term Concrete Temp	Maximum Short Term Concrete Temp
Range I	-40°C to +40°C	+24°C	+40°C
Range II	-40°C to +60°C	+43°C	+60°C

Service temperature range: Range of ambient temperatures after installation and during the lifetime of the anchor.

Short term temperature: Temperatures within the service temperature range which vary over short intervals, e.g. day/night cycles and freeze/thaw cycles.

Long term temperature: Temperature, within the service temperature range, which will be approximately constant over significant periods of time.

Long term temperatures will include constant or near constant temperatures, such as those experienced in cold stores or next to heating installations.

Physical Properties

	N/mm2 (MPa)	Test Method
Tensile Strength	21.5	ASTM D638
Compressive Strengt	100	EN 196 Part 1
Flexural Strength	46	EN 196 Part 1
Flexural Modulus	2985.2	ASTM D790
E Modulus	3420	EN 196 Part 1
Density	1.45 kg/dm^3	-
Shrinkage	< 0.4%	-
VOC Content	A+ Rating	-

Note: Measures done after 72h curing time

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PRO V500 V4 PURE EPOXY RESIN TECHNICAL DATA

Installation parameters for threaded rods

Anchor size		M8	M10	M12	M16	M20	M24	M27	M30
Nominal drill hole	d_0 [mm] =	10	12	14	18	22	28	32	35
Diameter steel brush	[mm] ≥	10	12	14	18	22	28	32	35
Torque moment	T_{inst} [Nm]≤	10	20	40	60	120	160	250	300
Minimum spacing	s_{min} [mm]	40	40	60	75	95	115	125	140
Min edge distance	c_{min} [mm]	35	40	45	50	60	65	75	80

Installation parameters for rebar

Rebar size		ø 8	ø 10	ø 12	ø 14	ø 16	ø 20	ø 24	ø 25	ø 28	ø 30	ø 32
Outer diameter of anchor	d_{nom} [mm] =	8	10	12	14	16	20	24	25	28	30	32
Nominal drill hole diameter	d_o [mm] =	10/12	12/14	14/16	18	20	24	30/32	32	32/35	35	40
Effective anchorage depth	$h_{ef,min}$ [mm] =	60	60	70	75	80	90	96	100	112	120	128
	$h_{ef,max}$ [mm] =	160	200	240	280	320	400	480	500	560	600	640
Diameter steel brush	d_o [mm] ≥	10/12	12/14	14/16	18	20	24	30/32	32	32/35	35	40
Minimum thickness of member	h_{min} [mm]	h_{ef} +30mm ≥ 100mm					h_{ef} + $2d_O$					
Minimum spacing	s_{min} [mm]	40	40	60	60	75	95	120	120	130	140	150
Min edge distance	c_{min} [mm]	35	40	45	50	50	60	70	70	75	115	120

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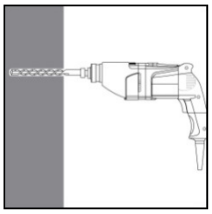
Installation instructions

Hole preparation: The hole can be prepared by : (1) hammer drilling followed by cleaning,
(2) dust free drilling using a hollow drill bit or, (3) diamond drilling

(1)

Hammer drilling

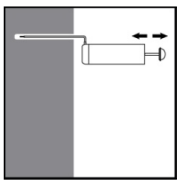


Drill hole in the substrate to the required diameter and embedment depth using the appropriate size drill bit.

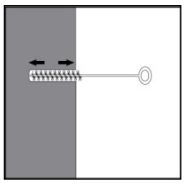
If hammer drilling, the hole must be thoroughly cleaned to ensure it is free of dust and debris before setting an anchor.

Cleaning

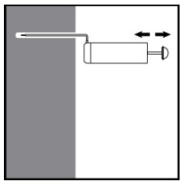
A **manual blow out pump** can be used for blowing out drilled holes up to 24mm diameter and embedment depths up to 10 x drill hole diameter.



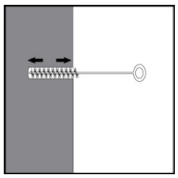
Blow out at least **2 times** from the back of the drilled hole, (if required with an extension)



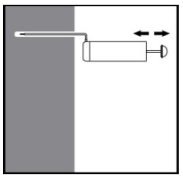
Brush 2 times with the specified brush size (see table) by inserting the steel brush to the back of the hole (if required with an extension) in a twisting motion and remove the debris.



Blow out again with pump **at least 2 times.**



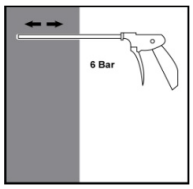
Brush 2 times with the specified brush size (see table)



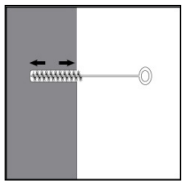
Blow out again with pump **at least 2 times.**

OR

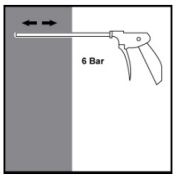
Clean with **compressed air,** which is suitable for all bore hole diameters and depths



Blow twice from the back of the hole (if needed with a nozzle extension) over the whole length with oil-free compressed air (min. 6 bar at 6 m^3/h).



Brush twice with the specified brush size (see table page 19) by inserting the steel brush to the back of the hole (if required with an extension) in a twisting motion and remove the debris.



Blow out again with compressed air at least **twice**.

(2)

Dust free drilling using hollow drill bits

Select a suitable hollow drill bit and insert into the hammer drilling machine.

Connect the dust extraction system to the adaptor in the hollow drill bit.

Drill hole to the required embedment depth with the hammer drill set in rotation hammer mode and with the dust extraction system working permanently at full power.

Drill hole cleaning is not necessary when using the self cleaning drilling method

(3)

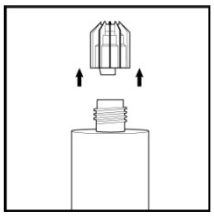
Wet diamond core drilling

Select a suitable wet diamond coredrill and drill using diamond rig procedures
Drill hole to the required embedment depth.

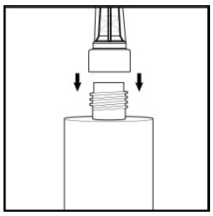
Rinse with water until clean water flows.

Inject and Install

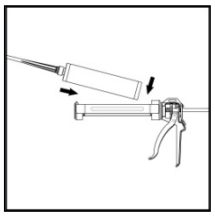
Inject



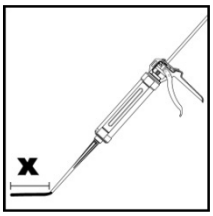
Remove the threaded cap from the cartridge.



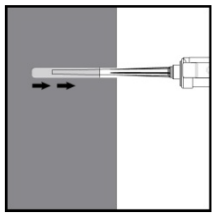
Tightly attach the mixing nozzle.
Do not modify the mixer in any way.
Make sure the mixing element is inside the mixer.
Use only the supplied mixer.



Insert the cartridge into the dispenser gun.

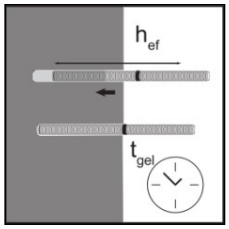


Discard the initial trigger pulls (12ml) of resin, until resin appears uniformly mixed. After every subsequent mixer nozzle change, 12ml of resin should be extruded to waste to continue with even mixing.



Inject the adhesive starting at the back of the hole, slowly withdrawing the mixer with each trigger pull. Fill holes approximately 2/3 full, to ensure that the annular gap between the anchor and the concrete is completely filled with resin along the embedment depth.

Install

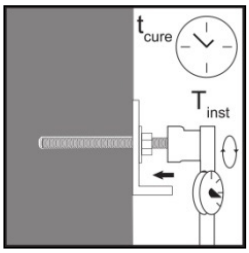


Before use, verify that the threaded rod is dry and free of contaminants. Install the threaded rod to the required embedment depth before the **gel working time** has elapsed. (see minimum curing times in table opposite)

Minimum curing time

Concrete Temperature	Gel Working Time	Minimum curing time in dry concrete	Minimum curing time in wet concrete
5°C	70 min	60 hr	x2
10°C	32 min	40 hr	x2
15°C	28 min	30 hr	x2
20°C	25 min	18 hr	x2
25°C	22 min	17 hr	x2
30°C	20 min	16 hr	x2
35°C	19 min	14 hr	x2
40°C	18 min	12 hr	x2

All specifications based on supplied mixer



The anchor can be loaded after the required **curing time** (see minimum curing times in table above).

The applied torque should not exceed the maximum value given in the table below.

Installation parameters for threaded rods

Anchor Size		M8	M10	M12	M16	M20	M24	M27	M30
Nominal drill hole	d_0 [mm] =	10	12	14	18	22	28	32	35
Diameter steel brush	[mm] ≥	10	12	14	18	22	28	32	35
Torque moment	T_{inst} [Nm]≤	10	20	40	60	120	160	250	300
Minimum spacing	s_{min} [mm]	40	40	60	75	95	115	125	140
Min edge distance	c_{min} [mm]	35	40	45	50	60	65	75	80

Hole cleaning - required brush sizes

If hammer drilling, the hole must be thoroughly cleaned to ensure it is free of dust and debris before setting an anchor. The table below specifies brush size required for each drill hole diameter:

Drill hole diameter (mm)	Brush diameter (mm)	Description	Length (mm)	Item code
8	9	9 x 120mm hole cleaning brush (for 8mm hole)	120	HC8
10	11	11 x 120mm hole cleaning brush (for 10mm hole)	120	HC10
12	13	13 x 150mm hole cleaning brush (for 12mm hole)	150	HC12
14	16	16 x 250mm hole cleaning brush (for 14mm hole)	250	HC14
16 / 18	20	20 x 250mm hole cleaning brush (for 16/18mm hole)	250	HC16
20 / 22	25	25 x 180mm hole cleaning brush (for 20/22mm hole)	180	HC20
24	26	26 x 300mm hole cleaning brush (for 24mm hole)	300	HC24
25	27	27 x 300mm hole cleaning brush (for 25mm hole)	300	HC25
28	30	30 x 350mm hole cleaning brush (for 28mm hole)	350	HC28
30 / 32 / 35	40	40 x 400mm hole cleaning brush (for 30/32/35mm hole)	400	HC30
40 *	42	42 x 170mm hole cleaning brush (for 40mm hole)	170	HC40
45 *	47	47 x 170mm hole cleaning brush (for 45mm hole)	170	HC45
55 *	58	58 x 170mm hole cleaning brush (for 55mm hole)	170	HC55
		M8 x 420mm brush extension	420	HCEXT420
		90mm SDS adapter for brush (40mm hole and over)	90	HCEXT90SDS

* 90mm SDS adapter must be used with hole diameters 40mm and over.