PROVENTURE PROV500

PRO V500 PURE EPOXY RESIN TECHNICAL DATA

Product Description

PRO V500 is a two component 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.

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

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Specific benefits

- Long working times
- High bond strength
- High chemical resistance
- WRAS approved
- European Technical Approval
- 24 Month shelf life
- Diamond drilled holes
- Zero shrinkage
- Low odour
- Fire approved
- Studs and rebar
- A+ Rating VOC content

Approvals

- ETA Option 1 ETAG 001 for cracked concrete with studs and rebar TR029
- ETA Option 1 ETAG 001 for rebar TR023
- ETA approved in flooded holes, wet and dry concrete
- WRAS approved for use with potable drinking water
- Tested according to LEED 2009 EQ c4.1, SCAQMD rule 1168 (2005).
- CE certification
- Approved for seismic loads C2

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.

IMPORTANT The information and data given is based on our own experience, research and testing and is believed to be reliable and accurate. However, as we cannot know the varied uses to whichthe product may be applied, or the methods of application used, no warranty as to the fitness or suitability of the product is given or implied. It is the users responsibility to determine suitability of use. For further information please contact our technical department.

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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 and cracked concrete*
- *Used in dry and wet concrete.*
- *Used in flooded holes*
- *Used for overhead applications*
- *ETA Approval for diamond drilled holes*
- *Ideal for elevated temperatures - temperature ranges I, II and III*
- *ETA Approval for rebar installations under TR023 and EN1992-1-1:2004 EC2*
- *ETA approval for seismic loads C2*
- *WRAS Approval*
- *Manual cleaning up to 20mm diameter and embedment depths of 240mm*
- *Independently tested and approved - anchor life 50 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:

Table 1 **ETA 15 / 0130**

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

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PRO V500 PURE EPOXY RESIN TECHNICAL DATA

For hammer drilling and compressed air drilling: Threaded bars

Characteristic resistance for non-cracked concrete			**ETA 15 / 0130**							
Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Tension NRk	5.8	[kN]	18	29	42	79	122	176	230	280
	8.8		29	46	64	79	122	176	230	280
	10.9		29	46	64	79	122	176	230	280
	A4-70		18	29	42	79	122	176	230	280
	A4-80		29	46	64	79	122	176	230	280
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		15	23	34	63	98	141	184	224
	A4-70		9	15	21	39	61	88	115	140
	A4-80		13	20	30	55	86	124	115	140

Characteristic resistance for cracked concrete			**ETA 15 / 0130**							
Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Tension NRk	5.8	[kN]	N/A	N/A	31	41	72	101	136	177
	8.8		N/A	N/A	31	41	72	101	136	177
	10.9		N/A	N/A	31	41	72	101	136	177
	A4-70		N/A	N/A	31	41	72	101	136	177
	A4-80		N/A	N/A	31	41	72	101	136	177
Shear VRk	5.8	[kN]	N/A	N/A	21	39	61	88	115	140
	8.8		N/A	N/A	34	63	98	141	184	224
	10.9		N/A	N/A	34	63	98	141	184	224
	A4-70		N/A	N/A	21	39	61	88	115	140
	A4-80		N/A	N/A	30	55	86	124	115	140

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

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PRO V500 PURE EPOXY RESIN TECHNICAL DATA

For hammer drilling and compressed air drilling: Threaded bars

Design resistance for non-cracked concrete			**ETA 15 / 0130**							
Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Tension NRk	5.8	[kN]	11.9	19.3	27.9	39.1	53.3	73	89	106.5
	8.8		16.7	23.5	32.3	39.2	53.3	73	89	106.5
	10.9		16.7	23.5	32.3	39.2	53.3	73	89	106.5
	A4-70		13.9	21.9	31.5	39.2	53.3	73	89	106.5
	A4-80		16.7	23.5	32.3	39.2	53.3	73	89	106.5
Shear VRk	5.8	[kN]	7.18	11.98	16.75	31.15	48.7	70.3	91.7	111.5
	8.8		11.98	18.35	27.15	50.3	78.3	112.5	147	179
	10.9		11.98	19.3	27.9	52.5	81.7	117	159	194
	A4-70		8.33	12.8	19.2	35.15	55	79.3	73.5	89.5
	A4-80		11.55	18.35	27.15	50.3	78.3	70.6	91.7	111.5

Design resistance for cracked concrete			**ETA 15 / 0130**							
Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Tension NRk	5.8	[kN]	N/A	N/A	17.2	22.6	30.5	41.3	53.3	66.5
	8.8		N/A	N/A	17.2	22.6	30.5	41.3	53.3	66.5
	10.9		N/A	N/A	17.2	22.6	30.5	41.3	53.3	66.5
	A4-70		N/A	N/A	17.2	22.6	30.5	41.3	53.3	54.5
	A4-80		N/A	N/A	17.2	22.6	30.5	41.3	53.3	54.5
Shear VRk	5.8	[kN]	N/A	N/A	16.75	31.15	48.7	70.3	91.7	111.5
	8.8		N/A	N/A	27.15	50.3	78.3	112.5	147	179
	10.9		N/A	N/A	27.9	52.5	81.7	116	149	186
	A4-70		N/A	N/A	19.2	35.15	55	79.3	73.5	89.5
	A4-80		N/A	N/A	27.15	50.3	78.3	70.6	91.7	111.5

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

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PRO V500 PURE EPOXY RESIN TECHNICAL DATA

For hammer drilling and compressed air drilling: Threaded bars

Recommended loads for non-cracked concrete			**ETA 15 / 0130**							
Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Tension NRk	5.8	[kN]	8.5	13.8	19.9	27.9	38.1	52.1	63.6	76.1
	8.8		11.9	16.8	23.1	28.0	38.1	52.1	63.6	76.1
	10.9		11.9	16.8	23.1	28.0	38.1	52.1	63.6	76.1
	A4-70		9.9	15.6	22.5	28.0	38.1	52.1	63.6	76.1
	A4-80		11.9	16.8	23.1	28.0	38.1	52.1	63.6	76.1
Shear VRk	5.8	[kN]	5.1	8.6	12.0	22.3	34.8	50.2	65.5	79.6
	8.8		8.6	13.1	19.4	35.9	55.9	80.4	105.0	127.9
	10.9		8.6	13.8	19.9	37.5	58.4	83.6	113.6	138.6
	A4-70		6.0	9.1	13.7	25.1	39.3	56.6	52.5	63.9
	A4-80		8.3	13.1	19.4	35.9	55.9	50.4	65.5	79.6

Recommended loads for cracked concrete			**ETA 15 / 0130**							
Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Tension NRk	5.8	[kN]	N/A	N/A	12.3	16.1	21.8	29.5	38.1	47.5
	8.8		N/A	N/A	12.3	16.1	21.8	29.5	38.1	47.5
	10.9		N/A	N/A	12.3	16.1	21.8	29.5	38.1	47.5
	A4-70		N/A	N/A	12.3	16.1	21.8	29.5	38.1	38.9
	A4-80		N/A	N/A	12.3	16.1	21.8	29.5	38.1	38.9
Shear VRk	5.8	[kN]	N/A	N/A	12.0	22.3	34.8	50.2	65.5	79.6
	8.8		N/A	N/A	19.4	35.9	55.9	80.4	105.0	127.9
	10.9		N/A	N/A	19.9	37.5	58.4	82.9	106.4	132.9
	A4-70		N/A	N/A	13.7	25.1	39.3	56.6	52.5	63.9
	A4-80		N/A	N/A	19.4	35.9	55.9	50.4	65.5	79.6

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

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PRO V500 PURE EPOXY RESIN TECHNICAL DATA

For hammer drilling and compressed air drilling: Rebar

Embedment depth and base material thickness:

Table 2 **ETA 15 / 0130**

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

Characteristic resistance for non-cracked concrete			**ETA 15 / 0130**							
Anchor size			ϕ8	ϕ10	ϕ12	ϕ16	ϕ20	ϕ25	ϕ28	ϕ32
Tension NRk	B500B	[kN]	22	31	42	60	96	148	187	225
Shear VRk	B500B	[kN]	14	22	31	55	86	135	169	221

Characteristic resistance for cracked concrete			**ETA 15 / 0130**							
Anchor size			ϕ8	ϕ10	ϕ12	ϕ16	ϕ20	ϕ25	ϕ28	ϕ32
Tension NRk	B500B	[kN]	N/A	N/A	30	42	68	106	147	194
Shear VRk	B500B	[kN]	N/A	N/A	31	55	86	135	169	221

Design resistance for non-cracked concrete			**ETA 15 / 0130**							
Anchor size			ϕ8	ϕ10	ϕ12	ϕ16	ϕ20	ϕ25	ϕ28	ϕ32
Tension NRk	B500B	[kN]	15.6	21.9	29.9	39.2	53.3	73	106.6	124.8
Shear VRk	B500B	[kN]	9.3	14.6	20.6	36.5	57.3	89.9	112.6	147.3

Design resistance for cracked concrete			**ETA 15 / 0130**							
Anchor size			ϕ8	ϕ10	ϕ12	ϕ16	ϕ20	ϕ25	ϕ28	ϕ32
Tension NRk	B500B	[kN]	N/A	N/A	17.2	22.6	30.5	43	62.2	78.9
Shear VRk	B500B	[kN]	N/A	N/A	20.6	36.5	57.3	89.9	112.5	147

Recommended loads for non-cracked concrete			**ETA 15 / 0130**							
Anchor size			ϕ8	ϕ10	ϕ12	ϕ16	ϕ20	ϕ25	ϕ28	ϕ32
Tension NRk	B500B	[kN]	11.14	15.64	21.36	28.00	38.07	52.14	76.14	89.14
Shear VRk	B500B	[kN]	6.64	10.43	14.71	26.07	40.93	64.21	80.43	105.21

Recommended loads for cracked concrete			**ETA 15 / 0130**							
Anchor size			ϕ8	ϕ10	ϕ12	ϕ16	ϕ20	ϕ25	ϕ28	ϕ32
Tension NRk	B500B	[kN]	N/A	N/A	12.29	16.14	21.79	30.71	44.43	56.36
Shear VRk	B500B	[kN]	N/A	N/A	14.71	26.07	40.93	64.21	80.36	105.00

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

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	1.02	1.04	1.06	1.08	1.09	1.10

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	0.94	0.87	0.79	0.71	0.65	0.65	0.60	0.57	0.55
Temp II 60°C / 43°C	**Dry and Wet**	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
	Flooded	0.65	0.63	0.61	0.59	0.57	0.54	0.50	0.49	0.46	0.44
Temp III 72°C / 43°C	**Dry and Wet**	0.57	0.56	0.54	0.53	0.52	0.51	0.50	0.49	0.47	0.46
	Flooded	0.57	0.54	0.52	0.51	0.50	0.49	0.46	0.45	0.43	0.42

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**	n/a	n/a	0.50	0.48	0.46	0.45	0.44	0.42	0.41	0.39
	Flooded	n/a	n/a	0.50	0.42	0.38	0.38	0.35	0.30	0.27	0.24
Temp II 60°C / 43°C	**Dry and Wet**	n/a	n/a	0.32	0.31	0.30	0.29	0.29	0.28	0.27	0.26
	Flooded	n/a	n/a	0.32	0.29	0.28	0.27	0.27	0.25	0.24	0.23
Temp III 72°C / 43°C	**Dry and Wet**	n/a	n/a	0.27	0.27	0.26	0.25	0.24	0.23	0.23	0.22
	Flooded	n/a	n/a	0.27	0.27	0.26	0.25	0.24	0.23	0.23	0.22

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PRO V500 PURE EPOXY RESIN TECHNICAL DATA

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	1.02	1.04	1.06	1.08	1.09	1.10
Concrete Strength N/mm2 (MPa)	C55/67	C60/75	C70/85	C80/96	C90/105	-	-	-
fc =	1.10	1.12	1.13	1.14	1.15	-	-	-

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	0.94	0.90	0.85	0.80	0.71	0.65	0.63
Temp II 60°C / 43°C	Dry and Wet	0.67	0.65	0.63	0.62	0.61	0.60	0.60	0.59
	Flooded	0.65	0.64	0.61	0.59	0.58	0.56	0.55	0.47
Temp III 72°C / 43°C	Dry and Wet	0.60	0.58	0.57	0.56	0.56	0.55	0.54	0.53
	Flooded	0.58	0.56	0.53	0.50	0.47	0.45	0.43	0.41

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	0.55	0.47	0.44	0.43	0.42	0.41
	Flooded	n/a	n/a	0.55	0.42	0.40	0.38	0.36	0.35
Temp II 60°C / 43°C	Dry and Wet	n/a	n/a	0.30	0.28	0.26	0.24	0.23	0.23
	Flooded	n/a	n/a	0.30	0.27	0.25	0.23	0.22	0.22
Temp I 72°C / 43°C	Dry and Wet	n/a	n/a	0.30	0.26	0.25	0.24	0.23	0.22
	Flooded	n/a	n/a	0.30	0.26	0.24	0.23	0.23	0.22

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PRO V500 PURE EPOXY RESIN TECHNICAL DATA

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 y_M = 1,15

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 32mm	1.6	2	2.3	2.7	3	3.4	3.7	4	4.3
34mm	1.6	2	2.3	2.6	2.9	3.3	3.6	3.9	4.2
36mm	1.5	1.9	2.2	2.6	2.9	3.3	3.6	3.8	4.1
40mm	1.5	1.8	2.1	2.5	2.8	3.1	3.4	3.7	4

1) 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.

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PRO V500 PURE EPOXY RESIN TECHNICAL DATA

Post installed rebar connections

Values for pre-calculation of anchoring

Rebar - Ø ds	$\alpha_1=\alpha_2=\alpha_3=\alpha_4=\alpha_5=1.0$			α_2 or $\alpha_5=0.7$; $\alpha_1=\alpha_3=\alpha_4=1.0$		
	Anchorage length l_{bd}	Design value N_{rd}	Mortar volume	Anchorage length l_{bd}	Design value N_{rd}	Mortar volume
(mm)	(mm)	(kN)	(ml)	(mm)	(kN)	(ml)
	113*	6.53	9	113*	9.33	9
	180	10.4	14	150	12.39	11
	250	14.45	19	190	15.69	14
8	378	21.85	29	265	21.88	20
	142*	10.26	13	142*	14.66	13
	220	15.9	20	190	19.61	17
	310	22.4	28	240	24.77	22
	390	28.18	35	280	28.9	25
10	473	34.18	43	331	34.17	30
	170*	14.74	18	170*	21.06	18
	270	23.41	29	230	28.49	24
	370	32.08	39	280	34.68	30
	470	40.75	50	340	42.12	36
12	567	49.16	60	397	49.18	42
	198*	20.03	24	198*	28.61	24
	310	31.36	37	260	37.57	31
	430	43.5	52	330	47.69	40
	550	55.64	66	400	57.81	48
14	662	66.97	80	463	66.91	56
	227*	26.24	31	227*	37.49	31
	360	41.62	49	300	49.55	41
	490	56.65	67	380	62.76	52
	620	71.68	84	450	74.32	61
16	756	87.4	103	529	87.37	72
	284*	41.04	60	284*	58.63	60
	450	65.03	95	380	78.45	81
	610	88.15	129	470	91.03	100
	780	112.72	165	570	117.68	121
20	945	136.57	200	662	136.67	140
	312*	49.6	88	312*	70.85	88
	490	77.89	139	420	95.38	119
	680	108.1	192	520	118.09	147
	860	136.71	243	620	140.8	175
22	1040	165.32	294	728	165.32	206
	340*	58.96	144	340*	84.23	144
	540	93.64	228	450	111.8	190
	740	128.33	312	570	141.21	241
	940	163.01	397	680	168.46	287
24	1134	196.65	479	794	196.7	335
	354*	63.95	133	354*	91.35	133
	560	101.16	211	470	121.29	177
	770	139.09	290	590	152.26	222
	970	175.22	365	710	183.22	267
25	1181	213.34	444	827	213.42	311

example for:
C20/25;
good bond condition;
Rebar Yield Strength
500 N/mm² (500 MPa)

Continued

*** Minimum anchorage length. The design value is valid for "good bond conditions" according to EN 1992-1-1.**

All other condition: multiply value by 0.7. Mortar volume based on equation: $V = 1.2 \cdot (d_0^2 - d_d^2) \cdot \pi \cdot l_b / 4$

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Values for pre-calculation of anchoring

	397	80.33	165	397*	114.78	165
	600	121.41	249	600	173.49	249
	840	169.97	349	840	242.88	349
	1120	226.63	466			
28	1323	267.70	550	926	267.75	385
	454	104.99	246	454*	149.8	246
	640	148.00	347	640	211.34	347
	960	222.00	521	960	317	521
	1280	296.00	695			
32	1512	349.65	821	1059	349.7	575
	482	118.43	395	482*	169.2	395
	680	167.08	557	680	238.7	557
	1020	250.62	835	1020	358	835
	1360	334.16	1114			
34	1607	394.85	1316	1125	394.9	921
	534	132.88	367	534*	189.7	367
	720	179.17	495	720	255.95	495
	1080	268.75	742	1080	383.9	742
	1440	358.34	989			
36	1780	442.95	1222	1191	423.4	818
	621	163.90	834	621*	234.2	834
	800	211.14	1074	800	301.7	1074
	1200	316.71	1612	1200	452.5	1612
	1600	422.28	2149			
40	2070	546.33	2781	1323	498.9	1777

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PRO V500 PURE EPOXY RESIN TECHNICAL DATA

Post installed rebar connections

Values for pre-calculation of overlap joints

Rebar - Ø ds	$\alpha_1=\alpha_2=\alpha_3=\alpha_4=\alpha_5=1.0$			α_2 or $\alpha_5=0.7$; $\alpha_1=\alpha_3=\alpha_4=1.0$		
	Anchorage length l_{bd}	Design value N_{rd}	Mortar volume	Anchorage length l_{bd}	Design value N_{rd}	Mortar volume
(mm)	(mm)	(kN)	(ml)	(mm)	(kN)	(ml)
	200	11.56	15	200	16.52	15
	240	13.87	18	220	18.17	17
	290	16.76	22	230	18.99	17
8	378	21.85	29	265	21.88	20
	200	14.45	18	200	20.64	18
	270	19.51	24	230	23.74	21
	340	24.57	31	270	27.87	24
	400	28.9	36	300	30.97	27
10	473	34.18	43	331	34.17	30
	200	17.34	21	200	24.77	21
	290	25.15	31	250	30.97	26
	380	32.95	40	300	37.16	32
	480	41.62	51	350	43.35	37
12	567	49.16	60	397	49.18	42
	210	21.24	25	210	30.35	25
	320	32.37	39	270	39.02	33
	440	44.51	53	340	49.13	41
	550	55.64	66	400	57.81	48
14	662	66.97	80	463	66.91	56
	240	27.75	33	240	39.64	33
	370	42.78	50	310	51.2	42
	500	57.81	68	380	62.76	52
	630	72.83	86	460	75.97	62
16	756	87.4	103	529	87.37	72
	300	43.35	64	300	61.93	64
	460	66.48	98	390	80.51	83
	620	89.6	131	480	99.09	102
	780	112.72	165	570	117.68	121
20	945	136.57	200	662	136.67	140
	330	52.46	93	330	74.94	93
	510	81.07	144	430	97.65	122
	680	108.1	192	530	120.36	150
	860	136.71	243	630	143.07	178
22	1040	165.32	294	728	165.32	206
	360	62.43	152	360	89.19	152
	550	95.38	232	470	116.44	198
	750	130.06	317	580	143.69	245
	940	163.01	397	690	170.94	291
24	1134	196.65	479	794	196.7	335
	375	67.74	141	375	96.77	141
	580	104.77	218	490	126.45	184
	780	140.9	293	600	154.84	226
	980	177.03	369	710	183.22	267
25	1181	213.34	444	827	213.42	311

example for:
C20/25;
good bond condition;
Rebar Yield Strength
500 N/mm² (500 MPa)

*** Minimum anchorage length. The design value is valid for "good bond conditions" according to EN 1992-1-1.**

All other condition: multiply value by 0.7. Mortar volume based on equation: $V = 1.2 \cdot (d_0^2 - d_d^2) \cdot \pi \cdot l_b / 4$

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Values for pre-calculation of overlap joints

	420	84.98	175	420*	121.4	175
	600	121.41	249	600	173.49	249
	840	169.97	349	840	242.88	349
	1120	226.63	466			
28	1323	267.70	550	926	267.75	385
	480	111.00	261	480*	158.5	261
	640	148.00	347	640	211.34	347
	960	222.00	521	960	317	521
	1280	296.00	695			
32	1512	349.65	821	1059	349.7	575
	510	125.31	418	510*	179	418
	680	167.08	557	680	238.7	557
	1020	250.62	835	1020	358	835
	1360	334.16	1114			
34	1607	394.85	1316	1125	394.9	921
	540	134.38	371	540*	191.97	371
	720	179.17	495	720	255.95	495
	1080	268.75	742	1080	383.9	742
	1440	358.34	989			
36	1780	442.95	1222	1191	423.4	818
	621	163.90	834	621*	234.2	834
	800	211.14	1074	800	301.7	1074
	1200	316.71	1612	1200	452.5	1612
	1600	422.28	2149			
40	2070	546.33	2781	1323	498.9	1777

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PRO V500 PURE EPOXY RESIN TECHNICAL DATA

Post installed rebar schematics

Application examples of post-installed rebar

Figure 1: Overlap joints in slabs and beams.

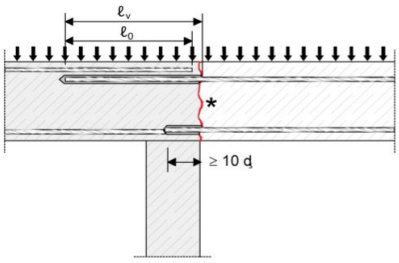


Figure 2: Overlap joint in foundation of a column or wall where the rebars are stressed in tension.

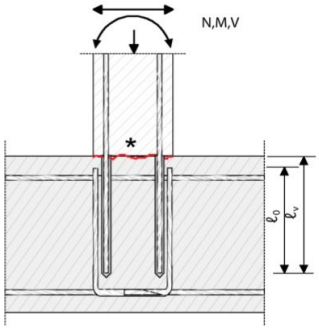


Figure 3: End anchoring of slabs or beams, designed as simply supported.

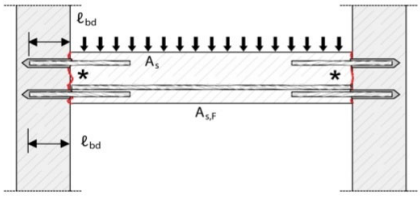


Figure 4: Rebar connection of components stressed primarily in compression. The rebar are stressed in compression.

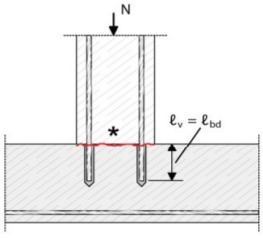
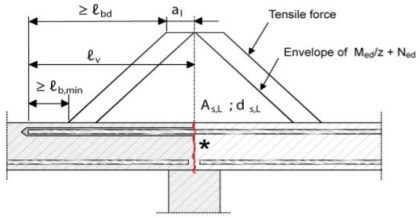


Figure 5: Anchoring of reinforcement to cover the line of acting tensile force.



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 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 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	120 min	50 h	x 2
10°C	90 min	30 h	x 2
15°C	60 min	20 h	x 2
20°C	30 min	10 h	x 2
25°C	25 min	8 h	x 2
30°C	20 min	6 h	x 2
35°C	16 min	5 h	x 2
40°C	12 min	4 h	x 2

- All data based on using 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
Range III	-40°C to +72°C	+43°C	+72°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	29.36	ASTM D638
Compressive Strengt	120	EN 196 Part 1
Flexural Strength	39	EN 196 Part 1
Flexural Modulus	3706	ASTM D790
E Modulus	3420	EN 196 Part 1
Density	1.42 kg/dm^3	-
Shrinkage	< 0.4%	-
VOC Content	A+ Rating	-

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	80	120	160	180	200
Minimum spacing	**s_{min} [mm]**	40	50	60	80	100	120	135	150
Min edge distance	**c_{min} [mm]**	40	50	60	80	100	120	135	150

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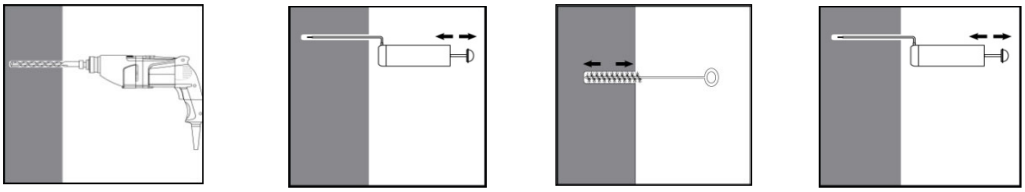
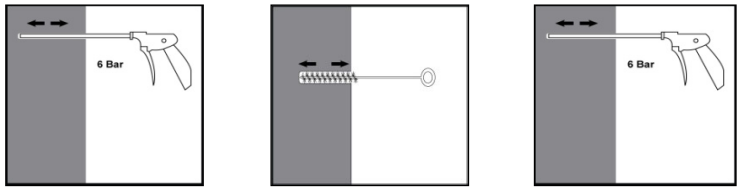
PRO V500 PURE EPOXY RESIN TECHNICAL DATA

Installation parameters: drilling, hole cleaning and installation

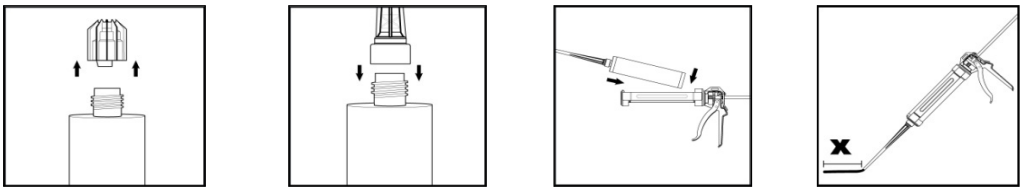


Drill hole in the substrate to the required embedment depth using the appropriate size drill bit. Clean the hole -see instructions below. Before setting an anchor, the drilled hole must be free of dust and debris. A blow out pump must be used for blowing out drilled holes up to diameters ≤ 24mm and embedment depths up to 10 x drilled hole diameters. Blow out at least four times from the back of the drilled hole, using an extension nozzle if needed. Brush 4 times with correct steel brush size by inserting the steel brush to the back of the hole (if needed with an extension) in a twisting motion and remove debris. Blow out again with manual pump at least 4 times.

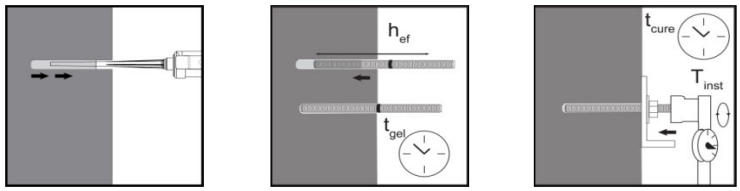
Cleaning with compressed air is suitable for all drill hole diameters and depths



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 m³/h).
Brush twice with the correct brush size by inserting the steel brush to the back of the hole (if needed with an extension) in a twisting motion and remove the debris.
Blow out again with compressed air at least twice.



Remove the threaded cap from the cartridge. Tightly attach the mixing nozzle. Do not modify the mixer in any way. Made 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 (10ml) of resin.



Inject the resin 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. Before use, verify that the threaded rod is dry and free of contaminants. Install the threaded rod to the required embedment depth before the working gel time tgel has elapsed. The working time tgel is shown in the Minimum Curing Time table on Page 15. The anchor can be loaded after the required curing time tcure (see Page 15). The applied torque shall not exceed the maximum value Tmax given in table on Page 2.

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