ProVenture

ProV150

VINYLESTER
STYRENE FREE RESIN

Product Description

ProV150 Low Odour Resin is a high performance, rapid curing two part chemical anchoring system based on a high reactivity Vinylester. Applied in one single action this resin will produce a strong, chemical resistant fixing.

Key Features

- European Technical Approval (Option 7).
- High Load & Critical Loads (overhead applications).
- Guaranteed 50 years working life of anchor.
- Suitable for Underwater Applications
- High Chemical Resistance

Approvals

CE Approval

ETA Option 7
(Galvanised & A4 Steel)

Tested by:
Imperial College London
Consultants

Pack Size

410ml 10:1 Co-axial Cartridge + 1 Mixer

IMPORTANT NOTE: Performance based on clean holes; HAMMER DRILLED - blown and then brushed with a stiff metal brush & blown again.

Typical Gel and Curing Time*

*Figures are based on M12 fixings. Full cure is achieved after 24 hours. All specifications are based on use of a supplied Mixer

BASE MATERIAL TEMPERATURE (°C)	35	25	15	5	-5	-10**
TYPICAL GEL TIME (mins)	3	6	7	20	50	60
MIN. LOAD TIME (mins)	20	20	20	30	90	180

**Resin temperature must be at least 20°C

Typical Performance Data at Standard Embedment Depth

Size	Concrete, $f_{ck,cube}$ = 25N/mm² (C20/25)									SETTING DATA			
	Characteristic Resistance (kN)		Design Resistance (kN)		Recommended Load (kN)		Characteristic Edge Distance (mm)		Characteristic Spacing	Hole Diameter In Concrete	Hole Diameter In Fixture	Standard Embedment In Concrete	Recommend-ed Torque
	Tension (N_{rk})	Shear (V_{rk})	Tension (N_{rd})	Shear (V_{rd})	Tension (N_{rec})	Shear (V_{rec})	Tension ($C_{cr,N}$)	Shear ($C_{cr,V}$)	(mm)	(mm)	(mm)	(mm)	(Nm)
M8	19.0	9.5	12.7	7.6	9.1	5.4	80	100	160	10	9	80	11
M10	30.2	15.1	19.3	12.1	13.8	8.6	90	130	180	12	11	90	22
M12	43.8	21.9	27.2	17.5	19.4	12.5	110	150	220	14	13	110	38
M16	81.0	40.8	37.5	32.7	26.8	23.3	125	170	250	18	17	125	95
M20	126.0	63.7	50.0	51.0	35.7	36.4	170	190	340	24	22	170	170
M24	157.5	91.8	62.5	73.4	44.6	52.4	210	240	420	28	26	210	260
M30	183.0	207.1	72.6	166.1	51.9	118.6	280	350	560	35	33	280	480

Typical Ultimate Physical Properties

	N/mm²	TEST METHOD	STORAGE / SHELF LIFE	IMPORTANT
COMPRESSIVE STRENGTH	86.30	(EN ISO 604) / (ASTM 695)	This product should be stored between +5°C & +25°C. Avoid Direct Sunlight The Shelf life of the product is 12 months from the manufacture date.	The information and data given is based on our own experience, research and testing and is believed to be reliable and accurate. However, as ProVenture cannot know the varied uses to which its products may be applied, or the methods of application used, no warranty as to the fitness or suitability of its products is given or implied. It is the users responsibility to determine suitability of use. For further information please contact our Technical Department.
FLEXURAL STRENGTH	29.47	(EN ISO 178) / (ASTM 795)		
FLEXURAL MODULUS	3852	"		
TENSILE STRENGTH	13.84	(EN ISO 527) / (ASTM 638)		
E MODULUS	10560	"		

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Performance Data for Various Stud Strengths, and Rebar

Concrete Strength Class: C20/25 (25N/mm² Cylinder; 30N/mm² 150mm cube).

IMPORTANT NOTE:
Performance based on clean holes;
HAMMER DRILLED - Blown and then brushed with a stiff metal brush & blown again.

5.8 Grade Studding

Stud Diameter (mm)	Hole Diameter (mm)	Design Resistance (N_{rd}) (kN)																			Fd,s	
																					hef failure (mm)	design load (kN)
8	10	12.7																			71	12.7
10	12		19.3	20.1													=	Steel Failure			94	20.1
12	14				27.2	29.2															118	29.2
16	18					36.0	39.0	41.9	44.9	47.9	50.9	53.9	54.4								182	54.4
Depth (mm)		80	90	100	110	120	130	140	150	160	170	180	190	200	220	240	260	280	300	350		
20	24	50.0	52.9	55.9	58.8	64.7	70.6	76.5	82.3	84.9											289	84.9
24	28				59.3	65.2	71.1	77.1	83.0	88.9	103.7	118.5	122.4								413	122.4
30	40								72.6	77.8	90.7	103.7	116.6	129.6	142.6	155.5	181.5	207.4	233.3	259.2	1076	278.9
Depth (mm)		170	180	190	200	220	240	260	280	300	350	400	450	500	550	600	700	800	900	1000		

8.8 Grade Studding

Stud Diameter (mm)	Hole Diameter (mm)	Design Resistance (N_{rd}) (kN)																			Fd,s	
																					hef failure (mm)	design load (kN)
8	10	14.2	16.0	17.8	19.5																110	19.5
10	12		19.3	21.5	23.6	25.8	27.9	30.0	30.9								=	Steel Failure			144	30.9
12	14				27.2	29.7	32.2	34.7	37.2	39.6	42.1	45.0									181	45.0
16	18					36.0	39.0	41.9	44.9	47.9	50.9	53.9	56.9	59.9	65.9	71.9	77.9	83.7			279	83.7
Depth (mm)		80	90	100	110	120	130	140	150	160	170	180	190	200	220	240	260	280	300	350		
20	24	50.0	52.9	55.9	58.8	64.7	70.6	76.5	82.3	88.2	102.9	117.6	130.7								444	130.7
24	28				59.3	65.2	71.1	77.1	83.0	88.9	103.7	118.5	133.4	148.2	163.0	177.8	188.3				635	188.3
30	40								72.6	77.8	90.7	103.7	116.6	129.6	142.6	155.5	181.5	207.4	233.3	259.2	1076	278.9
Depth (mm)		170	180	190	200	220	240	260	280	300	350	400	450	500	550	600	700	800	900	1000		

10.9 Grade Studding

Stud Diameter (mm)	Hole Diameter (mm)	Design Resistance (N_{rd}) (kN)																			Fd,s	
																					hef failure (mm)	design load (kN)
8	10	14.2	16.0	17.8	19.6	21.4	23.1	24.9	26.7	27.2								=	Steel Failure		153	27.2
10	12		19.3	21.5	23.6	25.8	27.9	30.0	32.2	34.3	36.5	38.6	40.8	43.1							201	43.1
12	14				27.2	29.7	32.2	34.7	37.2	39.6	42.1	44.6	47.1	49.5	54.5	59.5	62.6				253	62.6
16	18					36.0	39.0	41.9	44.9	47.9	50.9	53.9	56.9	59.9	65.9	71.9	77.9	83.9	89.9	104.9	389	116.6
Depth (mm)		80	90	100	110	120	130	140	150	160	170	180	190	200	220	240	260	280	300	350		
20	24	50.0	52.9	55.9	58.8	64.7	70.6	76.5	82.3	88.2	102.9	117.6	132.3	147.0	161.8	176.5	182.0				619	182.0
24	28				59.3	65.2	71.1	77.1	83.0	88.9	103.7	118.5	133.4	148.2	163.0	177.8	207.4	237.1	262.2		885	262.2
30	40								72.6	77.8	90.7	103.7	116.6	129.6	142.6	155.5	181.5	207.4	233.3	259.2	1499	388.5
Depth (mm)		170	180	190	200	220	240	260	280	300	350	400	450	500	550	600	700	800	900	1000		

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A4-70 Stainless Steel Studding

Stud Diameter (mm)	Hole Diameter (mm)	Design Resistance (N_{rd}) (kN)																			Fd,s hef failure (mm)	Fd,s design load (kN)
8	10	13.7																			77	13.7
10	12		19.3	21.7													=	Steel Failure			101	21.7
12	14				27.2	29.7	31.6														127	31.6
16	18					36.0	39.0	41.9	44.9	47.9	50.9	53.9	56.9	58.8							196	58.8
Depth (mm)		80	90	100	110	120	130	140	150	160	170	180	190	200	220	240	260	280	300	350		
20	24	50.0	52.9	55.9	58.8	64.7	70.6	76.5	82.3	88.2	91.7										312	91.7
24	28				59.3	65.2	71.1	77.1	83.0	88.9	103.7	118.5	132.1								446	132.1
30	40								72.6	77.8	90.7	103.7	116.6	129.6	139.8						539	139.8
Depth (mm)		170	180	190	200	220	240	260	280	300	350	400	450	500	550	600	700	800	900	1000		

A4-80 Stainless Steel Studding

Stud Diameter (mm)	Hole Diameter (mm)	Design Resistance (N_{rd}) (kN)																			Fd,s hef failure (mm)	Fd,s design load (kN)
8	10	14.2	15.7																		88	15.7
10	12		19.3	21.5	23.6	24.8											=	Steel Failure			116	24.8
12	14				27.2	29.7	32.2	24.8	36.1												146	36.1
16	18					36.0	39.0	41.9	44.9	47.9	50.9	53.9	56.9	65.9	67.2						224	67.2
Depth (mm)		80	90	100	110	120	130	140	150	160	170	180	190	200	220	240	260	280	300	350		
20	24	50.0	52.9	55.9	58.8	64.7	70.6	76.5	82.3	88.2	102.9	104.8									356	104.8
24	28				59.3	65.2	71.1	77.1	83.0	88.9	103.7	118.5	133.4	148.2	151.0						510	151.0
30	40								72.6	77.8	90.7	103.7	116.6	129.6	142.6	155.5	181.5	207.4	223.7		863	223.7
Depth (mm)		170	180	190	200	220	240	260	280	300	350	400	450	500	550	600	700	800	900	1000		

High Bond Reinforcing Bars fyk=500N/mm²

Rebar Diameter (mm)	Hole Diameter (mm)	Design Resistance (N_{rd}) (kN)																			Fd,s hef failure (mm)	Fd,s design load (kN)
8	12	14.2	17.8	21.4	21.9																123	21.9
10	14		21.5	25.8	30.0	34.1											=	Steel Failure			159	34.1
12	16			29.7	34.7	39.6	44.6	49.2													199	49.2
14	18				38.6	44.1	49.6	55.2	60.7	66.2	66.9										243	66.9
16	22					47.9	53.9	59.9	65.9	71.9	77.9	83.9	87.4								292	87.4
Depth (mm)		80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	450	500		
20	28	58.8	66.2	73.5	80.9	88.2	102.9	117.6	132.3	136.6											465	136.6
25	32			77.2	84.9	92.6	108.0	123.5	138.9	154.4	169.8	185.2	213.4								691	213.4
32	40					82.9	96.8	110.6	124.4	138.2	152.1	165.9	193.5	221.2	248.8	276.5	304.1	331.8	349.7		1265	349.7
40	50							125.7	141.4	157.1	172.8	188.5	219.9	251.4	282.8	314.2	245.6	377.0	408.5	439.9	1739	546.3
Depth (mm)		200	225	250	275	300	350	400	450	500	550	600	700	800	900	1000	1100	1200	1300	1400		

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Typical Performance in Hollow Substrate

SIZE	Recommended Load (kN) Tension or Shear (F_{ec})	
	Brickwork 20.5 N/mm²	Blockwork 7 N/mm²
M8	1.7	0.8
M10	3.4	1.7
M12	4.8	2.7
M16	5.6	3.6

Edge Reduction Factor (Concrete)

EDGE (mm)	TENSILE						
	M8	M10	M12	M16	M20	M24	M30
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	0.72	0.63		
110			0.92	0.77	0.66		
120			1.00	0.81	0.70	0.64	
140				0.91	0.78	0.67	0.63
160				1.00	0.85	0.73	0.66
180					0.93	0.80	0.72
200					1.00	0.86	0.78
220						0.92	0.84
240						1.00	0.90
265							1.00

EDGE (mm)	SHEAR						
	M8	M10	M12	M16	M20	M24	M30
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	0.30
160					0.91	0.62	0.35
180					1.00	0.77	0.46
200						0.92	0.57
220						1.00	0.68
240							0.78
280							1.00

Spacing Reduction Factor (Concrete)

Spacing (mm)	TENSILE						
	M8	M10	M12	M16	M20	M24	M30
40	0.64						
50	0.67	0.63					
60	0.70	0.65	0.63				
70	0.73	0.68	0.64				
80	0.76	0.70	0.66	0.63			
90	0.79	0.73	0.68	0.64			
100	0.82	0.75	0.70	0.65	0.63		
125	0.89	0.81	0.73	0.69	0.66	0.63	
150	0.96	0.88	0.75	0.73	0.69	0.65	0.63
160	1.00	0.90	0.81	0.74	0.70	0.66	0.64
175		0.94	0.88	0.76	0.72	0.68	0.65
200		1.00	0.90	0.80	0.75	0.70	0.68
225			0.94	0.84	0.78	0.73	0.70
240			1.00	0.86	0.80	0.75	0.72
250				0.87	0.81	0.76	0.73
275				0.91	0.84	0.78	0.75
280				0.92	0.85	0.79	0.76
300				0.95	0.88	0.81	0.78
320				1.00	0.90	0.83	0.80
350					0.94	0.86	0.83
400					1.00	0.92	0.88
440						0.96	0.92
480						1.00	0.96
500							0.98
525							1.00

Characteristic (Vrk,s) & Design (Vrd,s) Shear Loads for Various Stud Grades + Rebar

Stud Diameter (mm)	Stud Grade 5.8		Stud Grade 8.8		Stud Grade 10.9		Stud Grade A4-70		Stud Grade A4-80	
	Vrk,s (kN)	Vrd,s (kN)	Vrk,s (kN)	Vrd,s (kN)	Vrk,s (kN)	Vrd,s (kN)	Vrk,s (kN)	Vrd,s (kN)	Vrk,s (kN)	Vrd,s (kN)
M8	9.5	7.6	14.6	11.7	19.0	15.2	12.8	8.2	14.6	9.4
M10	15.1	12.1	23.2	18.6	30.2	24.1	20.3	13.0	23.2	14.9
M12	21.9	17.5	33.7	27.0	43.8	35.1	29.5	18.9	33.7	21.6
M16	40.8	32.7	62.8	50.2	81.6	65.3	55.0	32.5	62.8	40.3
M20	63.7	51.0	98.0	78.4	127.4	101.9	85.8	55.0	98.0	62.8
M24	91.8	73.4	141.2	113.0	183.6	146.8	123.6	79.2	141.2	90.5
M30	207.1	166.1	207.6	166.1	269.9	215.9	129.8	64.9	207.6	103.8

Rebar Diameter (mm)	BSt 500 Rebar	
	Vrk,s (kN)	Vrd,s (kN)
8	16.6	11.1
10	25.9	17.3
12	37.3	24.9
14	50.8	33.9
16	66.4	44.3
20	103.9	69.3
25	162.0	108.0
32	265.1	176.7
40	414.6	276.4

Notes:

All grades shown for information. M30 studding is 8.8 grade instead of 5.8 grade. M30 for A4-70 tensile strength of 500N/mm2, instead of 700N/mm2. Safety Factor is 1.25 for all carbon steel. Safety Factor is 1.56 for stainless steel, up to M24, M30 is 2.0. Safety Factor is 1.5 for BSt 500 rebar.