

Concrete Protection Products, Inc.



Mechanical Properties - V•ROD Fiberglass Rebar (Straight)

		#2 GFRP	#3 GFRP	#4 GFRP	#5 GFRP	#6 GFRP	#7 GFRP	#8 GFRP
		V•ROD	V•ROD	V•ROD	V•ROD	V•ROD	V•ROD	V•ROD
Nominal Tensile Strength	MPa	874	852	786	751	728	693	675
	ksi	127	124	114	109	106	100	98
Guaranteed Design Tensile Strength	MPa	784	765	708	683	656	625	597
	ksi	114	111	103	99	95	91	87
Nominal Tensile Modulus	GPa	46.1	45.4	46.3	48.2	47.6	46.4	51.9
	ksi	6681	6580	6710	6986	6899	6725	7522
Tensile Strain	%	1.90	1.89	1.70	1.56	1.53	1.49	1.30
Poisson's Ratio		0.25	0.21	0.26	0.25	0.25	0.25	0.28
Development Length (CSA-S6-00 clause 16.8.3)								
Development Length (CSA-S6-00 clause 16.8.3.1)	inch	10.09	13.95	17.05	20.99	23.10	25.33	28.42
Splice Length (CSA-S6-00 clause 16.8.3.1)	inch	13.12	18.13	22.16	27.29	30.03	32.93	36.94
Development Length (CSA-S806-02 clause 9.3)	inch	10.32	14.26	17.43	21.46	23.61	25.90	29.05
Development Length (ACI 440.1R-06 clause 11.3)								
Development Length (ACI 440.1R-06 clause 11.3)	inch	12.15	16.57	19.49	23.59	25.24	26.82	28.90
Splice Length (ACI 440.1R-06 clause 11.3)	inch	15.80	21.55	25.34	30.67	32.81	34.86	37.57
Ratio of Modulus of Elasticity to Strength								
		52.7	53.0	58.9	64.2	65.4	67.0	76.9
Nominal Compressive Strength								
	MPa	553	538	473	504	519	488	339
	ksi	80	78	69	73	75	71	73
Nominal Flexural Strength								
	MPa	1200	1161	1005	930	882	811	776
	ksi	174	168	146	135	128	117	112
Nominal Flexural Modulus								
	GPa	48.8	46.1	46.8	46.8	45.1	44.6	45.1
	ksi	7071	6685	6787	6786	6533	6466	6539
Flexural Strain	%	2.46	2.52	2.15	1.99	1.96	1.82	1.72
Nominal Shear Strength								
	MPa	225	183	212	195	200	203	203
	ksi	32.6	26.5	30.7	28.3	29.0	29.4	29.4
Nominal Bond Strength								
	MPa	20.5	17.5	14.1	13.7	16.7	16.5	14.8
	psi	2971	2536	2043	1986	2420	2391	2145
Bond dependent coefficient		0.8	0.8	0.8	0.8	0.8	0.8	0.8
Longitudinal Coefficient of Thermal Expansion								
	xE-6/C	5.9	5.5	5.5	6.4	6.0	6.0	6.1
	xE-6/F	3.2	3.0	3.0	3.5	3.3	3.3	3.4
Transverse Coefficient of Thermal Expansion								
	xE-6/C	27.3	27.3	29.5	29.1	27.3	23.4	23.2
	xE-6/F	15.2	15.2	16.4	16.2	15.2	13.0	12.9
Moisture absorption								
	%	0.65	0.47	0.38	0.42	0.21	0.38	0.17
Glass content								
	% weight	77.1	77.4	77.9	77.8	78.3	77.8	78.2
	% vol	59.1	59.6	60.3	60.1	60.8	60.1	60.7
Weight								
	# / LF	0.0520	0.1130	0.1820	0.2860	0.4130	0.5610	0.7330
Cross-sectional area								
	(mm ²)	31.7	71.3	126.7	197.9	285.1	387.7	506.7
	inch ²	0.049	0.11	0.196	0.307	0.442	0.601	0.785
Cross-sectional area (effective, with coating)								
	(mm ²)	38.97	78	136.7	224.36	292.57	387.9	527.34
	inch ²	0.06	0.121	0.212	0.348	0.464	0.611	0.817