

# MATERIAL PROPERTIES

## Superstud!<sup>TM</sup>/Nuts! Square Nuts Fiber Reinforced Polymer Fastener System Metric Version

Note: Available in Imperial Only

Property (coupon values)	ASTM Test	Units	Diameter /Threads per Millimeter					
			9.5 16 UNC	12.7 13 UNC	15.9 11 UNC	19.1 10 UNC	25.4 8 UNC	
Ultimate Thread Shear Capacity Using CP Square Nut <sup>1 2 6</sup>		kg	454	907	1,406	2,041	2,812	
Max. Ultimate Design Tensile Load Using CP Square Nut <sup>1 2 5 6</sup>		kg	363	726	1,125	1,633	2,250	
Flexural Strength <sup>2 3</sup>	D790	MPa	413	413	413	413	413	
Flexural Modulus <sup>2 3</sup>	D790	GPa	13.8	13.8	13.8	17.3	19	
Compressive Strength (LW) <sup>2 3</sup>	D695	MPa	379	379	379	379	414	
Ultimate Transverse Shear <sup>2 3</sup>	B565	load kg	1,905	3,357	5,262	7,802	12,428	
Transverse Shear Yield <sup>2 3</sup>		load kg	953	1,497	2,041	3,401	5,670	
Dielectric Strength <sup>2 3</sup>	D149	kV/mm	1.58	1.58	1.58	1.58	1.58	
Water Absorption <sup>2</sup>	D570	%	1	1	1	1	1	
Coefficient of Thermal Expansion (LW)	D696	10 <sup>-6</sup> K <sup>-1</sup>	9.5	9.5	9.5	9.5	9.5	
Torque Strength Using CP Square Nut Lubricated With SAE 10W30 Motor Oil <sup>2 4 5 6</sup>	Ultimate	m-Kg	1.1	2.0	4.5	6.9	15.8	
	Recommended	m-Kg	0.55	1.1	2.21	3.32	6.91	
Stud Weight <sup>3</sup>		Kg/m	0.1	0.18	0.31	0.47	0.88	
Flammability	D635	Self-Extinguishing on All						
Thickness Square Nut		mm	11.1	14.3	17.5	20.7	27.0	
Width of Square Nut		mm	17.5	22.2	27.0	31.8	41.3	

LW = lengthwise

Note: the results are average values based on random sampling and testing of production lots. Composite materials are not homogeneous; and therefore, the location of the coupon extraction can cause variances in the coupon results. Creative Pultrusions publishes an average value of random samples from production lots.

<sup>1</sup>Applies to single nut only; multiple nuts do not yield corresponding results.

<sup>2</sup>Ultimate strength values are average obtained in design testing.

<sup>3</sup>Values are based on unthreaded rod.

<sup>4</sup>Torque results are dependent on several variable factors including the lubricant used, the length of stud between nuts, alignment, washer surfaces, etc. Therefore, if such results of torque tightening are important, it is vital that torque limits be determined experimentally for the exact installation conditions.

<sup>5</sup>Appropriate safety factors must be applied.

<sup>6</sup>Properties apply to Superstud!<sup>TM</sup> used with CP Square Nut.

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