MATERIAL PROPERTIES

SuperStud!™ System with Molded ISOPLAST* Flanged Hex Nuts

Property (coupon values)	ASTM Test	Units	Diameter /Threads per Inch 3/8" 16 UNC	1/2" 13 UNC	5/8" 11 UNC	3/4" 10 UNC	1" 8 UNC
Ultimate Thread Shear Capacity Using CP Hex Nut [1 2 6]		lbs	1,250	2,500	3,900	5,650	7,400
Max. Ultimate Design Tensile Load Using CP Hex Nut [1 2 5 6]		lbs	1,000	2,000	3,120	4,520	6,200
Flexural Strength [2 3]	D790	psi	60,000	60,000	60,000	60,000	60,000
Flexural Modulus [2 3]	D790	10^6 psi	2.0	2.0	2.0	2.5	2.75
Compressive Strength (LW) [2 3]	D695	psi	55,000	55,000	55,000	55,000	60,000
Ultimate Transverse Shear [2 3]	B565	load lb.	4,200	7,400	11,600	17,200	27,400
Transverse Shear Yield [2 3]		load lb.	2,100	3,300	4,500	7,500	12,500
Dielectric Strength [2 3]	D149	KV/in	40	40	40	40	40
Water Absorption [3]	D570	%	1	1	1	1	1
Coefficient of Thermal Expansion (LW)	D696	10^{-6} in/in/°F	3.0	3.0	3.0	3.0	3.0
Torque Strength Using CP Hex Nut Lubricated With SAE 10W30 Motor Oil [2 4 5 6]	Ultimate	ft-lb	8	15	33	50	115
	Recommended	ft-lb	4	8	16	24	50
Stud Weight [3]		lb/ft	.076	.129	.209	.315	.592
Thickness Hex Nut		in	.750	.855	1.220	1.590	1.750
Diameter of Flange		in	.745	1.000	1.250	1.950	2.000

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L W = lengthwise

Notes: 1. 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.

[1]Applies to single nut only; multiple nuts do not yield corresponding results.
[2]Ultimate strength values are average obtained in design testing.
[3]Values are based on unthreaded rod.
[4]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.
[5]Appropriate safety factors must be applied.
[6]Properties apply to Superstud!Ê used with CP Hex Nut.

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PSHN011-0401r4.lc
Revision Date: 4/29/10

Chemical Resistance Molded ISOPLAST* Flanged Hex Nuts

Test Procedures

All tests were conducted by immersing an injection-molded, 0.125-inch thick sample of the chemical. Unless otherwise indicated, the samples were exposed for 28 days at 73°F, then were removed and tested.

Chemical	Change in Weight (%)	Strength at Yield (%)	Elongation at Yield (%)	Modulus
Acetic Acid, 5%	+0.7	90	96	88
Acetic Acid, 20%	+0.7	96	98	-
Acetic Acid, glacial	+5.3	82	106	80
Ammonia, concentrated	+1.0	86	86	97
ANDEROL, 401 Lubricant	-	119	87	-
ASTM Fuel A	+0.2	103	97	-
ASTM Fuel B	+0.2	101	97	-
ASTM Fuel C	+0.2	101	100	-
ASTM #1 Oil	+0.2	111	103	-
ASTM #3 Oil	+0.3	101	102	-
Benzene	+1.4	89	100	93
Calcium Chloride, saturate	+0.4	103	97	-
Carbon Tetrachloride	+0.2	98	98	103
Clorox Bleach	+0.5	93	94	102
Cottonseed Oil	+0.2	106	94	102
Dioctyl Phthalate	+0.2	106	97	-
Ethanol, 50%	+1.0	91	98	92
Ethanol, 95%	+2.5	83	98	84
Ethylene Glycol, 100%	-0.3	103	110	98
Ethylene Glycol, 50%	+0.3	94	100	94
Freon Fluorocarbon	0	105	91	-
Gasoline, high test	+0.1	101	102	-
Heptane	0	102	100	103
Hydrochloric, Acid, 20%	+0.2	96	96	96
Hydrogen Peroxide, 3%	+0.6	92	90	84
Hydrogen Peroxide, 30%	+0.8	90	96	96
Isopropanol	+0.2	100	106	99
Kerosene	-0.1	101	96	104
Magnesium Chloride, saturated	-	128	141	-
Mineral Oil	+0.2	101	98	-
Motor Oil, 10W40	+0.3	101	100	-
Mr. Clean Cleaner	+0.7	93	98	-
Nitric Acid, 40%	+1.1	95	102	94
Perchloroethane	+0.6	102	102	109
Phosphoric Acid, 60%	+0.6	99	100	-
Sodium Chloride, 10%	+.02	92	92	90
Sodium Hydroxide, 10%	+0.3	94	94	108
Sodium Hydroxide, 20%	+0.6	98	100	-
Sulfuric Acid, 20%	+0.5	97	98	-
Sulfuric Acid, 30%	+0.3	97	93	97
Sulfuric Acid, 70%	-0.1	101	102	100
Toluene	+1.5	97	98	111
Transmission Fluid, Type A	+0.2	101	103	-
Tricresyl Phosphate	0	106	102	-
Triethylamine	-0.2	104	104	104
Water, distilled	+0.6	89	92	106
Water, distilled*	+1.5	106	110	-
Water, sea	+0.8	92	97	-
Zinc Chloride, 50%**	-	106	102	104

28 days at 158°F.
***21 days at 73°F.*
Note: Testing results provided by Craftech® Industries, Hudson, NY