

TABLE OF PROPERTIES FOR HERMOSET LAMINATES



PROPERTIES	X	XX	XXX	XP	XPC	XXP	XXXXP	C	CE	L	LE	N-1	FR-2	FR-3	A	AA	G-3	G-5	G-7	G-9	G-10 G-11 FR-4	GPO-1	GPO-2	GPO-3	
Flexural Strength, psi, 1/8" th. Lengthwise Crosswise	25,000 22,000	15,000 14,000	13,500 11,800	14,000 12,000	12,000 10,000	14,000 12,000	12,000 10,500	17,000 16,000	17,000 14,000	18,000 14,000	15,000 13,500	10,000 9,500	12,000 10,500	25,000 23,000	13,000 11,000	18,000 16,000	40,000 30,000	44,000 38,000	20,000 18,000	55,000 35,000	55,000 45,000	18,000 18,000	18,000 18,000	18,000 18,000	
Bonding Strength Pounds, 1/2" th., Condition A	700	800	950	—	—	—	—	1,800	1,800	1,600	1,600	1,000	—	—	700	1,900	650	1,570	650	1,700	G-10, 2000 FR-4, 2000	850	850	850	
Izod Impact, ft.-lbs./inch of notch, 1/8" Edgewise, Crosswise	0.50	0.35	0.35	0.50	0.55	0.40	0.30	1.90	1.40	1.10	1.00	2.00	0.45	0.59	0.60	3.0	5.50	5.5	7.50	8.00	5.50	8.0	8.0	8.0	
Water Absorption, %, 24 hrs. 1/16" 1/8" 1/2"	6.0 3.3 1.1	2.0 1.3 0.55	1.40 0.95 0.45	3.60 2.20	5.5 3.0	1.80 1.10	1.00 0.75	4.40 2.50 1.20	2.20 1.60 0.75	2.50 1.60 0.90	1.95 1.30 0.70	0.60 0.40 0.35	0.75 0.55	0.65 0.50	1.50 0.55	3.00 2.50 1.25	2.70 2.00 1.50	2.70 2.00 1.50	0.55 0.35 0.20	0.90 0.70 0.40	0.25 0.15 0.10	1.00 0.70 0.35	0.80 0.60 0.25	0.60 0.50 0.25	
Dielectric Breakdown, kv, 1/16" Parallel to Laminations Step X Step, Cont. A	—	40	50	40	—	60	60	15	35	15	40	60	60	60	5	—	—	23	32	60	45	40	40	40	
Arc Resistance, Seconds, Cond. A	—	—	—	—	—	—	—	—	—	—	—	—	120	110	—	—	—	180	180	180	—	100	100	150	
Dispipation Factor, MHz, Cond. A	—	0.045	0.038	—	—	0.040	0.035	—	—	—	0.085	0.038	0.035	.035	—	—	—	0.020	0.003	0.017	0.025	0.03	—	—	
Dielectric constant, MHz, Cond. A	—	5.5	5.3	—	—	5.0	4.6	—	—	—	5.8	3.9	4.6	4.6	—	—	—	7.8	4.2	7.2	5.2	4.3	—	—	
Tensile Strength, psi Lengthwise Crosswise	20,000 16,000	16,000 13,000	15,000 12,000	12,000 9,000	10,500 8,500	11,000 8,500	12,400 9,500	10,000 8,000	9,000 7,000	13,000 9,000	12,000 8,500	8,500 8,000	12,500 9,500	14,000 12,000	10,000 8,000	12,000 10,000	23,000 20,000	37,000 30,000	23,000 18,500	37,000 30,000	37,000 30,000	40,000 35,000	12,000 10,000	10,000 9,000	10,000 9,000
Compressive Strength, psi Flatwise Edgewise	36,000 19,000	34,000 23,000	32,000 25,500	25,000	22,000	25,000	25,000	37,000 23,500	39,000 24,500	35,000 23,500	37,600 25,000	—	25,000	28,000	40,000 17,000	38,000 21,000	50,000 17,500	70,000 25,000	45,000 14,000	70,000 25,000	60,000 35,000	30,000 20,000	30,000 20,000	30,000 20,000	
Modulus of Elasticity in Flexure Lengthwise, psi Crosswise, psi	1.8 x 10 ⁶ 1.3 x 10 ⁶	1.4 x 10 ⁶ 1.1 x 10 ⁶	1.3 x 10 ⁶ 1.0 x 10 ⁶	1.2 x 10 ⁶ 0.9 x 10 ⁶	1.0 x 10 ⁶ 0.8 x 10 ⁶	0.9 x 10 ⁶ 0.7 x 10 ⁶	1.0 x 10 ⁶ 0.7 x 10 ⁶	1.0 x 10 ⁶ 0.9 x 10 ⁶	.09 x 10 ⁶ .08 x 10 ⁶	1.1 x 10 ⁶ 0.8 x 10 ⁶	1.0 x 10 ⁶ 0.8 x 10 ⁶	0.6 x 10 ⁶ 0.5 x 10 ⁶	1.0 x 10 ⁶ 0.7 x 10 ⁶	1.2 x 10 ⁶ 1.0 x 10 ⁶	2.3 x 10 ⁶ 1.4 x 10 ⁶	1.6 x 10 ⁶ 1.4 x 10 ⁶	1.5 x 10 ⁶ 1.2 x 10 ⁶	1.7 x 10 ⁶ 1.5 x 10 ⁶	1.4 x 10 ⁶ 1.2 x 10 ⁶	2.5 x 10 ⁶ 2.2 x 10 ⁶	2.7 x 10 ⁶ 2.2 x 10 ⁶	1.2 x 10 ⁶ 1.0 x 10 ⁶	1.2 x 10 ⁶ 1.0 x 10 ⁶	1.3 x 10 ⁶ 1.0 x 10 ⁶	
Shear Strength, psi	12,000	11,000	10,000	8,000	—	11,000	11,000	12,000	11,000	12,000	11,500	14,000	11,000	11,000	9,000	12,000	18,000	20,000	17,000	20,000	19,000	14,000	14,000	14,000	
Izod Impact, ft.-lbs./inch of notch, 1/2" Flatwise, Crosswise	4.0	1.3	1.0	—	—	—	—	3.2	2.3	2.5	1.8	4.0	—	—	1.8	3.6	6.5	12.0	8.5	12.0	7.0	8.0	8.0	8.0	
Rockwell Hardness, M Scale	110	105	110	95	75	100	105	103	105	105	105	105	105	100	111	103	100	120	100	120	110	—	—	—	
Specific Gravity	1.36	1.34	1.32	1.33	1.34	1.32	1.30	1.36	1.33	1.35	1.33	1.15	1.38	1.45	1.72	1.70	1.80	1.90	1.85	1.90	1.82	1.9	1.9	1.95	
Insulation Resistance, Megohms Condition 96 hrs., 90% R.H., 95°F	—	60	1000	—	—	500	20,000	—	—	—	30	50,000	5000	190,000	—	—	—	100	200,000	10,000	200,000	—	—	—	
Coefficient of Thermal Expansion Cm./Cm./°C/Cm	2 x 10 ⁻⁴	2 x 10 ⁻⁴	2 x 10 ⁻⁴	2 x 10 ⁻⁴	2 x 10 ⁻⁴	2 x 10 ⁻⁴	2 x 10 ⁻⁴	2 x 10 ⁻⁴	2 x 10 ⁻⁴	2 x 10 ⁻⁴	2 x 10 ⁻⁴	8 x 10 ⁻⁴	2 x 10 ⁻⁴	1.7 x 10 ⁻⁴	1.8 x 10 ⁻⁴	1.5 x 10 ⁻⁴	1.5 x 10 ⁻⁴	1.0 x 10 ⁻⁴	1.0 x 10 ⁻⁴	1.0 x 10 ⁻⁴	1.0 x 10 ⁻⁴	2.0 x 10 ⁻⁴	2.0 x 10 ⁻⁴	2.0 x 10 ⁻⁴	
Thermal Conductivity Calories/Sec./Cm ² /C/Cm	7 x 10 ⁻⁴	7 x 10 ⁻⁴	7 x 10 ⁻⁴	7 x 10 ⁻⁴	7 x 10 ⁻⁴	7 x 10 ⁻⁴	7 x 10 ⁻⁴	7 x 10 ⁻⁴	7 x 10 ⁻⁴	7 x 10 ⁻⁴	7 x 10 ⁻⁴	—	7 x 10 ⁻⁴	7 x 10 ⁻⁴	5 x 10 ⁻⁴	5 x 10 ⁻⁴	—	7 x 10 ⁻⁴	7 x 10 ⁻⁴	7 x 10 ⁻⁴	7 x 10 ⁻⁴	—	—	—	
Max. Constant Operating Temp., °F	280	280	280	280	280	280	270	250	250	:50	250	165	265	250	300	310	350	280	460	280	G-10, 280 FR-4, 280	—	—	—	

These values are representative of those obtained under standard ASTM conditions and should not be used to design parts which function under different conditions.