



THE GUND COMPANY

MANUFACTURERS & FABRICATORS OF ENGINEERED MATERIAL SOLUTIONS

NEMA X, XX, XXX

Item:	NEMA X, XX, XXX		
Description:	NEMA Grades X, XX, and XXX are paper based laminate with a phenolic resin binder that provides good electrical properties such as high dielectric strength and arc resistance. Paper phenolic insulating materials provide low cost electrical and mechanical properties. They are widely used for switchboards, panel boards, insulating washers, bushings, and intricate punched parts.		
Standards:	NEMA IM 60000: Grade X, XX, XXX • IEC 60893: PF CP 201 (X), 203 (XX), 204 (XXX) • MIL-I-24768: 12-PBM, 11-PBG, 10-PBE		
Availability:	Laminate Sheets:		English Units (in)
		Thickness:	0.008 - 4.0
		Sheet Size:	36 x 48 / 39 x 48, 36 x 72 / 48 x 48 / 48 x 96
	Fabricated Parts:	The Gund Company custom fabricates insulation materials to the exact specifications and drawings specified by our customers.	

Key Characteristics	Test Method	Units - English (SI)	Typical Values		
			Grade X	Grade XX	Grade XXX
Moisture Absorption (0.062")	ASTM D-570	%	1.80	2.0	1.30
Rockwell Hardness (0.062")	ASTM D-785	M Scale	90	95	101
Compressive Strength, Flatwise (0.5")	ASTM D-695	ksi (MPa)	35 (241)	25 (172.3)	30 (206)
Tensile Strength (0.125")	ASTM D-638	ksi (MPa)	17 (117)	13.5 (93)	14 (96)
			13 (89)	11.5 (79.2)	12 (82)
Shear Strength, Perpendicular (0.062")	ASTM D-732	ksi (MPa)	15 (103)	11.5 (79.23)	12.8 (88)
Flexural Strength	ASTM D-790	ksi (MPa)	34 (234)	22 (151.6)	20 (137)
			28 (193)	17 (117.13)	15 (103)
Dielectric Strength	ASTM D-149 Condition A	V/mil	600	500	700
IZOD Impact Strength	ASTM D-256	ft-lb/in	0.82	0.50	0.55
			0.76	0.40	0.45
Breakdown Voltage (0.062")	ASTM D-149	kV	40	40	40
Relative Permittivity @ 1MHz (0.062) Condition D-24/23	ASTM D-150	--	--	6.20	6.10
Bond Strength (0.500")	ASTM D-229	lb (kg)	1,000 (454)	900 (409)	1,000 (454)
Maximum Operating Temperature	--	°C	130	130	130
Flammability Rating	UL 94	--	HB	HB	HB
Arc Resistance	ASTM D-495 Condition A	Seconds	90	--	110
Standard Color	--	--	Natural	Natural	Natural
Density (0.5" thick)	ASTM D-634	g/cm3	1.4	1.35	1.38

Data supplied above are typical values and are not to be considered specification values. All of the information, suggestions and recommendations pertaining to the properties and uses of the products herein are based upon tests and data believed to be accurate; however, the final determination regarding suitability of any material described herein for the contemplated application, the manner of such use, and whether the use infringes any patents is the sole responsibility of the user. There is no warranty, expressed or implied, including, without limitation warranty of merchantability or fitness for a particular purpose. Under no circumstances shall we be liable for incidental or consequential loss or damage.