



THE GUND COMPANY

MANUFACTURERS & FABRICATORS OF ENGINEERED MATERIAL SOLUTIONS

NEMA C, CE, LE - Phenolic Resin Cotton Cloth

Item:	Phenolic Resin Cotton Cloth (NEMA Grades C, CE & LE)		
Description:	NEMA Grades C, CE, and LE are cotton based phenolic laminates that provide more mechanical strength than paper grades. The finer surface allows for better machinability. These characteristics make phenolic resin cotton cloth materials ideal for mechanical applications such as gears, pinions, bearings, etc.		
Standards:	NEMA LI-1: Grades C, CE & LE • IEC 60893: PFCC 201 (C), 202 (CE), 204/305 (LE) • MIL-I-24768: 16 - FBM, 14 - FBG, 13 - FBE		
Availability:	Laminate Sheets:	English Units (in)	SI Units (mm/cm)
		Thickness:	0.008 - 4.0
		Sheet Size:	36 x 48 / 39 x 48 / 36 x 72 48 x 48 / 48 x 96 / 48 x 108
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		
				NEMA C	NEMA CE	NEMA LE
Standard Color		--	--	Natural	Natural	Natural/Black
Specic Gravity		--	--	1.37	1.37	1.34
Moisture Absorption		ASTM D-570	%	3.5	2.0	1.90
Tensile Strength (0.125")	Lengthwise	ASTM D-638	ksi (MPa)	12 (83)	11 (75)	13 (90)
	Crosswise			9.7 (67)	9 (62)	9 (62)
Compressive Strength (0.5"), Flatwise		ASTM D-695	ksi (MPa)	34 (234)	34 (234)	36 (248)
Flexural Strength	Lengthwise	ASTM D-695	ksi (MPa)	18 (124)	17.5 (121)	22 (152)
	Crosswise			17 (117)	15 (103)	16 (110)
Shear Strength		ASTM D-732	ksi (MPa)	14 (97)	14 (96)	13.5 (93)
Bond Strength	Lengthwise	ASTM D-732	lb (kg)	2,500 (1,134)	1,700 (772)	1,900 (862)
	Crosswise			2,300 (1,043)		
IZOD Impact Strength (0.50")	Lengthwise	ASTM D-732	ft-lb/in	1.95	1.95	1.35
	Crosswise			1.75	1.75	1.10
Arc Resistance		ASTM D-495	Seconds	15	15	15
Maximum Operating Temperature		--	°C	125	125	125
Breakdown Voltage (0.062")		Condition A	kV	20	40	50
		Condition D - 48/50		5	3	5
Rockwell Hardness		ASTM D-495	M Scale	100	100	100
Flammability Rating		UL 94	Class	HB	HB	HB
Dielectric Strength (0.062")		Condition A	V/mil	400	550	625
		Condition D - 48/50		150	300	500

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.