



# THE GUND COMPANY

Manufacturers & fabricators of engineered material solutions

Item:	NEMA Grade G-10 Glass Epoxy Laminate		
Description:	NEMA Grade G-10 material is a continuous filament woven fiberglass sheet bonded with epoxy resin. The material has the ability to maintain excellent mechanical, electrical, and physical properties at elevated temperatures to 130°C. NEMA G-10 is a non-brominated, non-flame retardant grade of glass epoxy laminate. NEMA G-10 from The Gund Company is RoHs and REACH compliant to ensure reliability, safety, & consistency.		
Standards:	NEMA LI-1: Grade G-10	IEC 60893: EP GC 201 (sheet) IEC 61212: EPGC21 (tube)	MIL-I-24768: /2 GEE
Availability:	Laminate Sheets:	Thickness:	English Units (in) SI Units (mm/cm)
			.006 to 5.0 0.15 to 127 (mm)
	Sheet Sizes:	30 x 48, 60 x 48 48 x 120	76 x 122, 122 x 152 122 x 305 (cm)
	Fabricated Parts:	The Gund Company custom fabricates insulation materials to the exact specifications and drawings of our customers.	
Convolute Tubing:	NEMA Grade G-10 is available in an infinite number of inner diameter/outer diameter combinations as per customer requirements		

Key Characteristics	Units - English (SI)	Typical Values
Standard Color	--	Light Green <sup>1</sup>
Specific Gravity	lbs./in <sup>3</sup> (g/cc)	0.067 (1.85)

<sup>1</sup> Custom colors available upon request

## Engineering Properties

Key Characteristics	Test Method	Units - English (SI)	Typical Values
Rockwell Hardness (0.062")	--	M Scale	98
Comparative Tracking Index (0.125")	ASTM D-3638	V	200
Arc Resistance (0.125")	ASTM D-495	Seconds	130
Dielectric Strength (⊥)	ASTM D-149	V/mil	485
Punch Shear Strength (0.125")	ASTM D-732	ksi (MPa)	25 (172)

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**Material Data Sheet**

**NEMA Grade G-10**

## NEMA LI-1 G-10 Required Properties

Key Characteristics	Test Method	Units	NEMA Required	Typical Values
Breakdown Voltage (0.187") // Condition A Condition D-48/50	ASTM D-149	kV	45.0 min 40.0 min	50 47
Permittivity @ 1MHz (0.187") Condition A Condition D-24/30 Condition D-48/50	ASTM D-150	--	5.20 5.40 5.80	4.60 4.60 4.70
Dissipation Factor@ 1MHz (0.187") Condition A Condition D-24/30 Condition D-48/50	ASTM D-150	--	0.025 0.035 0.045	0.018 0.019 0.020
Flexural Strength (0.187") Condition E-48/50 LW CW	ASTM D-790	ksi (MPa)	55 (380) min 45 (311) min	80 (552) 70 (483)
IZOD Impact Strength (0.187") LW (Length-Wise) CW (Cross-Wise)	ASTM D-256	ft.-lb/in Notched	7.0 min 5.5 min	15 10
Bonding Strength (0.5") Condition A Condition E-48/50	ASTM D-229	Lb	2,000 min 1,600 min	2,300 2,200
Moisture Absorption (0.187") Condition D-24/30	ASTM D-570	%	0.15 max	0.02
Flammability	UL94	Class	HB	HB

## IEC 60893 EPGC 201 Required properties

Flammability	Test Method	Units	IEC Required	Typical Values
Flexural Strength	ISO 178	MPa	340 min	483
IZOD Impact Strength // Parallel to limitations	ISO 180	kJ/m <sup>2</sup>	34 min	45
Perpendicular Electric Strength (90°C in Oil, 1.5mm) ⊥	IEC 60243-1	kV/mm	13 min	15
Parallel Breakdown Voltage // (Stepped 90°C in Oil, 3mm)	IEC 60243-1	kV	35 min	>45
Insulation Resistance (After Water Immersion)	IEC 60167	MΩ	5 x 10 <sup>4</sup> min	>10 <sup>7</sup>
Water Absorption (4mm)	ISO 62	mg	23 max	15