



THE GUND COMPANY

MANUFACTURERS & FABRICATORS OF ENGINEERED MATERIAL SOLUTIONS

NEMA G-12 (G-11H)

Fiberglass Composite Sheets & Tubes

NEMA Grade G-12 (G-11H) materials are continuous filament woven fiberglass sheets bonded with high-temperature epoxy resin. This material maintains excellent mechanical, electrical, and physical properties at elevated temperatures, with a maximum continuous operational temperature of 180°C. **Our NEMA G-12 meets or exceeds NEMA G-11** and is RoHS and REACH-compliant to ensure reliability, safety, and consistency.

STANDARDS: NEMA IM 60000: GRADE G-12 | IEC 60893: EP GC 308 (sheet) | IEC 61212: High Temperature EP GC 22 (tube)

Currently, there is not a standard for NEMA G-12 tubes. However, tubes can be categorized as High-temperature G-10 (180°C) or EP GC 22 (180°C). NEMA G-12 can be manufactured into convolute tubes and fabricated to multiple interior and exterior diameters. The Gund Company custom fabricates insulation materials to the exact specifications and drawings specified by our customers. We offer our customers the proper product for their specific application. The standard color is green. Custom colors are available upon request.

		ISO/IEC 60893				ASTM			
PROPERTIES		Test Method	Units	IEC Req.	G-11	Test Method	Units	NEMA Req.	G-11
PHYSICAL	Density		g/cc		1.9		lbs/in ³		0.069
	Water Absorption: 4 mm	ISO 62	mg	23**	4.2				
	Water Absorption: 0.062"					ASTM D570	%	0.25**	0.01
THERMAL	Coefficient of Thermal Expansion						/°C·10 ⁻⁶		10
	Thermal Endurance	IEC 60216	°C	180	180				
	Flammability (0.250")					UL94	Class	HB	HB
MECHANICAL	Tensile Strength: Perp., LW (0.125")					ASTM D638	KSI (MPa)		41 (283)
	Compressive Strength (0.500")					ASTM D695	KSI (MPa)		70 (483)
	Flexural Strength: Cond. A, LW (0.062")					ASTM D790	KSI (MPa)	60 (414)*	80 (552)
	Flexural Strength: Cond. A, CW (0.062")					ASTM D790	KSI (MPa)	50 (345)*	70 (486)
	Flexural Strength: Cond. E-150/T150, LW (0.062")					ASTM D790	KSI (MPa)	30 (207)*	40 (276)
	Flexural Strength: Cond. A, LW	ISO 178	MPa	340*	486				
	Flexural Strength: Cond. E-150/T150, LW	ISO 178	MPa	170*	276				
	Flexural Modulus: LW (0.062")					ASTM D790	KSI (GPa)		4,200 (29.0)
	Flexural Modulus: CW (0.062")					ASTM D790	KSI (GPa)		4,000 (27.6)
	Bonding Strength: Cond. A (0.5")					ASTM D229	lb (kg)	1,600*	2,200 (998)
	Bonding Strength: Cond. D-48/50 (0.5")					ASTM D229	lb (kg)	1,500*	2,000 (907)
	Charpy Impact Strength	ISO 179	kJ/m ²	33*	45				
	IZOD Impact Strength: Cond. E-48/50, LW (0.125")					ASTM D256	ft-lb/in, Notched	7.0*	11
	IZOD Impact Strength: Cond. E-48/50, CW (0.125")					ASTM D256	ft-lb/in, Notched	5.5*	10
ELECTRICAL	Dielectric Strength: Cond. A in Oil (0.062")					ASTM D149	V/mil		485
	Comparative Track Index (0.125")					ASTM D3638	V		180
	Breakdown Voltage: Par., COND A (0.062")					ASTM D149	kV	45*	>50
	Breakdown Voltage: Par., COND D-48/50 (0.062")					ASTM D149	kV	40*	>50
	Breakdown Voltage: Par., Stepped (90°C) in Oil (3 mm)	IEC 60243-1	kV	35*	>45				
	Permittivity: Cond. A at 1 MHz (0.125")					ASTM D150		5.2	4.7
	Permittivity: Cond. D-24/30 at 1 MHz (0.125")					ASTM D150		5.4	4.8
	Dissipation Factor: Cond. A at 1 MHz (0.187")					ASTM D150		0.025**	0.014
	Dissipation Factor: Cond. D-24/30 at 1 MHz (0.187")					ASTM D150		0.035**	0.017
	Electric Strength: Perp. (90°C) in Oil (1.5 mm)	IEC 60243-1	kV/mm	13*	15				
	Insulation Resistance: After Water Immersion	IEC 60167	MΩ	5·10 ⁴ *	>10 ⁷				

Cond. = Condition | Par. = Parallel | Perp. = Perpendicular | LW = Lengthwise | CW = Crosswise

*Minimum | **Maximum

LAMINATE SHEET AVAILABILITY

THICKNESS
0.010 - 5.000 in.

SHEET SIZE
• 48 x 96 in. • 48 x 110 in. • 48 x 125 in.

LAMINATE SHEET AVAILABILITY (SI)

THICKNESS
0.25 - 127 mm

SHEET SIZE (SI)
• 122 x 244 cm • 122 x 280 cm • 122 x 317 cm

The data supplied are typical values. They are not to be considered specification values. All of the information, suggestions, and recommendations about these properties and uses of the products herein are based on tests and data believed to be accurate; however, the final determination regarding the 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, warranties of merchantability or fitness for a particular purpose. Under no circumstances shall we be liable for incidental or consequential loss or damage.



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MARKETS



Switchgear



Electronics



Power Generators



Motor Applications



Transformers



Metals Processing



Electric Vehicles



Military/Aerospace



Oil & Gas



Medical



Space

OUR EXPERTISE IS YOUR COMPETITIVE ADVANTAGE

The Gund Company provides a wide range of material solutions from rigid, glass epoxy composites to high-temperature, silicone sponges.

We take a consultative approach to understanding your application by working with your engineers and buyers to find materials that fit the application. By understanding the most important material properties, we often find cost-reduction opportunities. Our Application Engineering Teams have decades of material experience and look forward to working with you on your upcoming project.

Material Families:

- Thermoset Rigid Laminates and Composites
- Flexible Laminates, Papers, Films, and Felts
- Thermoplastic Materials
- Elastomeric Materials

Our Manufacturing Capabilities Include:

- Compression Molding
- Pultrusion
- Filament & Convoluted Wound Tube
- Infusion & B-Stage Composites Lay-up and Molding
- Injection Molding
- Extrusion of Thermoplastics

Our Engineering Capabilities Include:

- Custom Material Development
- Resin Formulation
- Laboratory Testing
- Comparative Materials Evaluation



THE GUND COMPANY GLOBAL FOOTPRINT – LOCAL SERVICE

