



# THE GUND COMPANY

MANUFACTURERS & FABRICATORS OF ENGINEERED MATERIAL SOLUTIONS

## N220

### Class R - GPO-1 Laminate Sheet

N220 is a specialty-grade random glass mat, polyester resin, insulating material for high-temperature NEMA GPO-1 applications. This sheet has a relative temperature index of 220°C (electrical) and 210°C (mechanical). It retains excellent physical and electrical properties at elevated temperatures. UL File # E323105.

**STANDARDS:** NEMA IM 6000: GPO-1 | IEC 60893: UPGM 201

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. A variety of dimensions and diameter sizes are available. Product colors vary according to material type.

|            |   | ASTM                | TYPICAL VALUES |               |
|------------|---|---------------------|----------------|---------------|
| PROPERTIES |   | Test Method         | Units          | N220          |
| PHYSICAL   | Color                                       |                     |                | Natural Beige |
|            | Density                                     |                     | lbs/in         | 0.061         |
|            | Density                                     |                     | g/cc           | 1.70          |
|            | Water Absorption (0.125")                   | ASTM D570           | %              | 0.20          |
| MECHANICAL | Tensile Strength                            | ASTM D638           | PSI            | 11,000        |
|            | Tensile Strength                            | ASTM D638           | MPa            | 76            |
|            | Compressive Strength: Flatwise              | ASTM D695           | PSI            | 32,000        |
|            | Compressive Strength: Flatwise              | ASTM D695           | MPa            | 220           |
|            | Flexural Strength: Lengthwise               | ASTM D790           | PSI            | 21,000        |
|            | Flexural Strength: Lengthwise               | ASTM D790           | MPa            | 145           |
|            | Bond Strength (0.50")                       | ASTM D229           | lbs            | 1,080         |
|            | Bond Strength (0.50")                       | ASTM D229           | kg             | 490           |
|            | Shear Strength                              | ASTM D732           | PSI            | 12,000        |
|            | Shear Strength                              | ASTM D732           | MPa            | 83            |
|            | IZOD Impact Strength: Edgewise              | ASTM D256           | ft-lbs/in      | 11            |
|            | Relative Temperature Index                  | UL746B              | °C             | 210           |
| THERMAL    | Dissipation Factor: 1 MHz                   | ASTM D150           |                | 0.015         |
|            |   |                     |                |               |
| ELECTRICAL | Arc Resistance                              | ASTM D495           | Seconds        | 180           |
|            | Dielectric Strength: Perp. in Oil (0.0625") | ASTM D149           | V/mil          | 550           |
|            | Dielectric Strength: Perp. in Oil (0.0625") | ASTM D149           | kV/mm          | 21.70         |
|            | Breakdown Voltage: Parallel in Oil          | ASTM D149 (Cond. A) | kV             | 70            |
|            | Relative Temperature Index                  | UL746B              | °C             | 220           |
|            | Permittivity (Dielectric Constant): 1 MHz   | ASTM D150           |                | 3.37          |

#### LAMINATE SHEET AVAILABILITY (Sheet Size / Thicknesses)

- 36" x 72" / 0.031" - 2.000"
- 48" x 96" / 0.118" - 1.500"

#### LAMINATE SHEET AVAILABILITY (SI) (Sheet Size / Thicknesses)

- 914 cm x 1828 cm / 0.78 mm - 50.80 mm
- 1219 cm x 2438 cm / 3.00 mm - 38.10 mm

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 Engineering Capabilities Include:*

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

### *Our Manufacturing Capabilities Include:*

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



## THE GUND COMPANY GLOBAL FOOTPRINT – LOCAL SERVICE

