



THE GUND COMPANY

MANUFACTURERS & FABRICATORS OF ENGINEERED MATERIAL SOLUTIONS

N180FR

Item:	N180FR - High Temperature Transit Grade Laminate			
Description:	N180FR is a high temperature, low-smoke and toxicity glass mat laminate designed to meet the stringent demands of traction transformer and other transit applications. It meets the HL3 performance requirements for interior (R22) and exterior (R23) according to European standards EN45545.			
Availability:	Laminate Sheets:		English Units (in)	SI Units (mm/cm)
		Thickness:	0.031 - 2.000 0.118 - 1.500	0.78 - 60 (mm) 3 - 38.1 (mm)
		Sheet Size:	36 x 72 48 x 96	91.4 - 182.8 (cm) 121.9 - 243.8 (cm)
	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)	R22, HL3 Requirement	N180FR Results
Oxygen Index	EN45545	%	32% min	55.3
Smoke Optical Density	EN45545	Ds Max dimensionless	150 max	117.2
Toxicity	EN45545A	CITnlp dimensionless	0.75 min	0.04
			NFPA 130, Table 8.4.1 requirement	
Surface Flammability	ASTM E162, Flaming mode		Is<=35)	10.1
Surface Flammability	ASTM E662, non-Flaming mode		Ds1.5 < 100	0
Surface Flammability	ASTM E662, non-Flaming mode		Ds4.0 < 200	0
Surface Flammability	ASTM E622, Flaming mode		Ds1.5 < 100	0.1
Surface Flammability	ASTM E662, Flaming mode		Ds4.0 < 200	2.4



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Key Characteristics	Test Method	Units - English (SI)	Typical Values
Standard Color	--	--	White
Density	--	lbs./in (g/cc)	0.069 (1.91)
Water Absorption (.125")	ASTM D-570	%	0.25
Tensile Strength	ASTM D-638	psi (MPa)	16,000 (110)
Compressive Strength, Flatwise	ASTM D-695	psi (MPa)	46,000 (317)
Flexural Strength Lengthwise Crosswise	ASTM D-790	psi (MPa)	29,000 (200) 32,000 (221)
Shear Strength	ASTM D-732	psi (MPa)	18,000 (124)
IZOD Impact Strength, Edgewise	ASTM D-256	ft.-lbs./in.	12
Arc Resistance	ASTM D-495	Seconds	180
Comparative Tracking Index (CTI)	IEC 60112	V	600
Dielectric Strength - Perpendicular in Oil (.0625")	ASTM D-149	V/mil (kV/mm)	500 (19.7)
Breakdown Voltage - Parallel Pin, in Oil	ASTM D-149	kV	45
Thermal Class	--	--	Class H (180°C)

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.