Current Industrial Composites

Sheeting · Tubes · Rods · Fabricated Parts · Epoxy · Phenolic

MATERIAL DATA SHEET

Material: Grade FR-5 Glass/Epoxy Sheet

Description: -11 FR-5 is a thermosetting industrial fiber glass composite laminate consisting of a continuous filament glass cloth material with an epoxy resin binder. has characteristics of high strength, low moisture absorption, excellent electrical properties and chemical resistance. These properties are maintained not only at room temperature but also under humid or moist conditions. NEMA G11 was the designation given to Glass Epoxy sheet composite by the National Electrical Manufacture Association (NEMA) to specify a consistent product between manufactures.

Standards: NEMA LI-1 Grade G-11/FR-5

MIL-I-24768 / 28 Type GEB-F

Physical Properties	Test Condition		ASTM	Typical Values
For Thickness				.125"
Specific Gravity			D792	1.85
Rockwell Hardness (M Scale)			D785	115
Water Absorption (maximum)			D229	.10%
Flexural Strength	Condition A:	Lengthwise Crosswise	D229	55,000 psi 45,000 psi
Tensile Strength	Condition A:	Lengthwise Crosswise		50,000 psi 40,000 psi
Compressive Strength (.500" thick)	Condition A:	Flatwise Edgewise	D695	60,000 psi 30,000 psi
Izod Impact Strength (.500" thick)	E48/40:	Lengthwise Crosswise	D229	7.0 ft-lb/in.(notch) 5.5 ft-lb/in.(notch)
Bond Strength (.500" thick)	Condition A D 48/50		D229	1600 lbs. 1500 lbs.

Thermal & Electrical Properties	Test Condition	ASTM	Typical Values
Temperature Index Electrical / Mechanical			140° C
Volume resistivity			$5x10^6$ megohms-cm
Surface resistivity			$1x10^7$ megohms
Dielectric Breakdown Voltage (step x step)	Condition A / D 48/50	D229	45kV
Maximum Permittivity @ 1 MHz	Condition A / D 24/23	D229	5.5
Maximum Dissipation @ 1 MHz	Condition A / D 24/23 / D48 / 50	D229	0.045
Dielectric Strength (short time)	Condition A	D229	550 Vpm
Arc Resistance	Condition A	D 495	120Seconds