

GSFR4



Globally Sourced FR-4 Sheet Data Sheet

Definition: GSFR4 is constructed from a woven glass fabric with an epoxy resin binder. The epoxy resin system is flame retardant and typically contains bromine on the epoxy resin backbone.

Characteristics: GSFR4 exhibits extremely high mechanical strength (flexural, impact, and bonding) at room temperature and has good dielectric loss and electric strength properties under both dry and humid conditions.

Colors: Natural and Black

Certifications*: The manufactures of GSFR4 has informed Norplex-Micarta that the product meets NEMA LI 1-1998 Grade FR-4, ANSI/NEMA IM 60000-2021 Grade FR-4 MIL-I-24768/27 Type GEE-F and ASTM D 709 Type IV Grade FR-4(i.e., V-0) vertical flammability requirement for thicknesses 1/32"-1/4". No vertical flammability exception needed <1/32" or >1/4").

TYPICAL PROPERTIES

GENERAL PHYSICAL PROPERTIES	Thickness	UNITS	VALUE
Izod Impact Strength Lengthwise – ASTM D229 E-48/50	0.125" and above	ft-lb/in	7.5
Izod Impact Strength Crosswise – ASTM D229 E-48/50	0.125" and above	ft-lb/in	6.5
Flexural Strength Lengthwise – ASTM D229 Condition A	0.031"	psi	60,000
	0.062"	psi	60,000
	0.125"	psi	55,000
Flexural Strength Crosswise – ASTM D229 Condition A	0.031"	psi	50,000
	0.062"	psi	50,000
	0.125"	psi	45,000
Bond Strength – ASTM D229 Condition A	0.500" and above	lb	2,100
Bond Strength – ASTM D229 D-48/50	0.500" and above	lb	1,700

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Water Absorption – ASTM D229 D1-24/23	0.031"	%	0.30
	0.062"	%	0.20
	0.125"	%	0.10

TYPICAL PROPERTIES

THERMAL & ELECTRICAL PROPERTIES	Thickness	UNITS	VALUE
Flammability Rating – U.L. 94 Condition A	0.031" and above	Class	V-1
Breakdown Voltage – ASTM D229 Condition A	0.031" - 1.000"	kV	55
Breakdown Voltage – ASTM D-48/50	0.031" - 1.000"	kV	50
Permittivity @ 1 MHz – ASTM D229 Condition A	0.031" - 1.000"	-	5.0
Permittivity @ 1 MHz – ASTM D229 Condition D-24/23	0.031" and above	-	5.2
Permittivity @ 1 MHz – ASTM D229 Condition D-48/50	0.125"	-	5.4
Dissipation Factor @ 1 MHz – ASTM D229 Condition A	0.031" and above	-	0.025
Dissipation Factor @ 1 MHz – ASTM D229 D-24/23	0.031" and above	-	0.035
Dissipation Factor @ 1 MHz – ASTM D229 D-48/50	0.125"	-	0.045

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