

# TECHNICAL DATA SHEET

## G-9

G-9 is a woven glass fabric melamine resin laminate. It is an extremely hard material and flame resistant. This machining grade phenolic exhibits excellent electrical properties in high humidity conditions. It has high physical strength and arc resistance. It is flame retardant and meets UL94 flammability classification V-0.

### GENERAL DESCRIPTION

Phenolic Laminates are produced by applying heat and pressure to layers of paper, canvas, linen or glass cloth impregnated with synthetic thermosetting resins. When heat and pressure are applied to the layers, a chemical reaction (polymerization) transforms the separate layers into a single laminated material with a “set” shape that cannot be softened again – therefore, these materials are called “Thermosets”. A variety of resin types and cloth materials can be used to manufacture thermoset laminates with a range of mechanical, thermal, and electrical properties.

### TYPICAL PROPERTIES of GLASS LAMINATES (SHEET FORM)

( mechanical properties of rod and tube forms may differ )

ASTM or UL test	Property	G-3	G-5/G-9	G-7	G-10	G-11
<b>PHYSICAL</b>						
D792	Density (lb/in <sup>3</sup> ) (g/cm <sup>3</sup> )	0.065 1.80	0.067 1.85	0.065 1.80	0.065 1.80	0.065 1.80
D570	Water Absorption, 24 hrs (%)	2.65	0.60	0.10	0.10	0.20
<b>MECHANICAL</b>						
D638	Tensile Strength (psi)					
	-lengthwise	42,000	61,600	20,000	45,000	43,000
	-crosswise	34,000	51,100	-	38,000	37,000
D790	Flexural Strength (psi)					
	-lengthwise	40,500	61,600	30,000	75,000	80,000
	-crosswise	34,000	51,100	-	65,000	70,000
D790	Flexural Modulus (Kpsi)					
	-lengthwise	1,800	2,000	1,600	2,700	3,000
	-crosswise	1,400	1,700	-	2,400	2,700
D256	IZOD Notched Impact (ft-lb/in)					
	-lengthwise	12.0	12.5	13.0	14.0	12.0
	-crosswise	11.0	8.5	-	12.0	9.0
D695	Compressive Strength (psi)	55,000	65,000	50,000	65,000	63,000
D785	Hardness, Rockwell M	M110	M115	M105	M110	M112
<b>THERMAL</b>						
D696	Coefficient of Linear Thermal Expansion (x 10 <sup>-5</sup> in./in./°F)					
	-lengthwise	0.83	0.83	0.72	0.55	0.72
	-crosswise	1.00	1.00	0.90	0.66	0.83
-	Max Operating Temp (°F / °C)	340 / 170	285 / 140	430 / 220	284 / 140	329 / 165
C177	Thermal Conductivity (BTU-in/ft <sup>2</sup> -hr-°F)	2.0	2.0	2.0	2.0	2.0
	(x 10 <sup>-4</sup> cal/cm-sec-°C)	7.0	7.0	7.0	7.0	7.0
UL94	Flammability Rating	H-B	V-0	H-B	H-B	H-B
<b>ELECTRICAL</b>						
D149	Dielectric Strength (V/mil) short time, 1/8" thick	460	300	350	800	900
D150	Dielectric Constant at 1 MHz	7.3	6.3	4.5	5.0	4.5
D150	Dissipation Factor at 1 MHz	0.023	0.019	0.018	0.019	0.020
D495	Arc Resistance (sec)	180	180	240	100	120

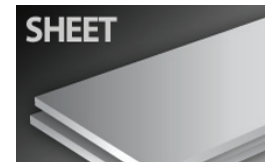
### Benefits

- Chemical resistance in humid environments
- Mechanical strength
- Excellent electrical properties
- High arc resistance
- Self extinguishing

### Applications

- Terminal blocks
- Structural electronic parts
- Switch board panels
- Circuit breakers

### SHAPES AVAILABLE



NOTE: The information contained herein are typical values intended for reference and comparison purposes only. They should NOT be used as a basis for design specifications or quality control. Contact us for manufacturers' complete material property datasheets. All values at 73°F (23°C) unless otherwise noted.