



## ENGINEERING DATA SHEET

### GRADE: SPAULDITE® T-640 LAMINATE SHEET

Spaldite® T-640 is a paper base phenolic laminate made from an exclusive Spaulding resin which produces an unusual combination of desirable properties. The excellent electrical characteristics of this material are retained under both dry and humid conditions. Ease of fabrication, exceptional mechanical strength, and low deformation under load are among the other features offered by this versatile Grade. This grade exceeds NEMA XX and XXX; L-P-513, I XXX.

#### MAJOR FEATURES

- Excellent Electrical Properties
- Low Loss Factor
- Low Moisture Absorption
- High Mechanical Strength
- Outstanding Machinability
- Low Cold Flow

#### Applications

The dimensional stability and ease of fabrication of Grade T-640, together with its unusual combination of electrical and mechanical characteristics, qualify it for a broad range of electronic and electrical insulation applications. Its uses include high voltage insulation, terminal boards, electronic components, circuit breaker arms, washers, spacers and other parts fabricated by machining operations.

#### ELECTRICAL CHARACTERISTICS

Low moisture absorption and relatively stable electrical properties under varying conditions of temperature and humidity are hallmarks of Grade T-640. The electrical properties are of the order necessary to meet the demands of many critical electrical and electronic insulation requirements.

#### MECHANICAL CHARACTERISTICS

The excellent electrical properties of Grade T-640 are attained without the usual accompanying depression of mechanical strength. This laminate also demonstrates superior dimensional stability and low deformation under load with fluctuating temperature and humidity.

#### FABRICATION

Grade T-640 fabricates readily into finely detailed, close tolerance parts by turning, milling, drilling and shaping. Standard production equipment and techniques produce clean smooth surfaces finishes.

STANDARD SHEET SIZE 48" x 36"  
48" x 48"

COLOR: NATURAL, BLACK

THICKNESS: .015" – 2.000

*"To the best of our knowledge the information contained herein is accurate; however, Spaulding Composites Company, Inc. does not accept any liability regarding the accuracy or completeness of such information. Further, such information is based on standard base material and thus may change if the product ordered by purchaser requires further processing of base material by us and/or the purchaser. Purchaser has the sole responsibility in determining the suitability of any material described herein for the use contemplated and the processing of such material by purchaser."*



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### PROPERTY CHARACTERISTICS

PROPERTY	ASTM TEST METHOD	CONDITIONING & TYPE OF TEST	THICKNESS INCHES	AVERAGE TYPICAL VALUES		INDUSTRY REQUIREMENTS	
				ENGLISH	SI	ENGLISH	SI
<b>ELECTRICAL</b>							
Dielectric Breakdown (Parallel-Taper Pin)	D-229	A (S.S.) D48/50 (S.S.)	.062	80 kV	80 kV	≥50 kV	≥50 kV
			.062	40 kV	40 kV	≥6 kV	≥6 kV
Dielectric Strength (Perpendicular)	D-229	A (S.T.) A (S.S.)	.062	650 V/mil	25.6 kV/mm	NR	NR
			.062	450 V/mil	17.7 kV/mm	NR	NR
Dielectric Loss Index (1 MHz)	D-229	A D-24/23	.062	0.147	0.147	≤0.200	≤0.200
			.062	0.187	0.187	≤0.280	≤0.280
Dissipation Factor (1 MHz)	D-229	A D-24/23	.062	0.030	0.030	≤0.038	≤0.038
			.062	0.036	0.036	≤0.047	≤0.047
Permittivity (1 MHz)	D-229	A D-24/23 D-48/50	.062	4.90	4.90	≤5.30	≤5.30
			.062	5.20	5.20	≤5.90	≤5.90
			.062	5.40	5.40	≤6.00	≤6.00
Insulation Resistance	D-229	C-96/35/90	.062	1.5X10 <sup>3</sup> MΩ	1.5X10 <sup>3</sup> MΩ	NR	NR
Surface Resistance	D-229	C-96/35/90	.125	1.0X10 <sup>3</sup> MΩ	1.0X10 <sup>3</sup> MΩ	NR	NR
<b>MECHANICAL</b>							
Bonding Strength	D-229	A D-48/50	.500	1,050 lbs	4.67 kN	≥950 lbs	≥4.23 kN
			.500	975 lbs	4.34 kN	≥700 lbs	≥3.11 kN
Compressive Strength Flatwise	D-229	A	.062	40.0 ksi	275.8 MPa	NR	NR
Deformation Under Load Plus Shrinkage	D-621	E-4/65 + C-68/35/90 Tested at 50°C	.062	0.80%	0.80%	NR	NR
Flexural Strength Flatwise	D-229	A Lengthwise Crosswise	.062	19.0 ksi	(MPa) 131.0	≥13.5 ksi	(MPa) ≥93.1
			.062	14.5 ksi	100.0	≥11.8 ksi	≥81.4
Izod Impact Edgewise Notched	D-229	E-48/50 Lengthwise Crosswise	.500	0.44 ft-lbs/in	0.023 J/mm	≥0.40 ft-lbs/in	≥0.021 J/mm
			.500	0.39 ft-lbs/in	0.021 J/mm	≥0.35 ft-lbs/in	≥0.019 J/mm
Tensile Strength	D-229	A Lengthwise Crosswise	.062	15.0 ksi	103.4 MPa	NR	NR
			.062	12.0 ksi	82.7 MPa	NR	NR
<b>PHYSICAL</b>							
Density	D-792	A	.125	.049 lbs/in <sup>3</sup>	1.37 g/cm <sup>3</sup>	NR	NR
Rockwell Hardness	D-229	A	.125	M-112	M-112	NR	NR
Water Absorption	D-229	D1-24/23	.062	0.40%	0.40%	≤1.40%	≤1.40%
Flammability	UL 94	A	.031+	HB	HB	HB	HB

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