

**IPC-4101 /40 /41 UL - File Number E41625**

Isola offers a product line of polyimide-based prepreg (P25) and core material (P95) for high temperature printed circuit applications.

**PRODUCT FEATURES**

Industry Recognition

- UL File Number: E41625
- RoHS Compliant

Performance Attributes

- Lead-free assembly compatible
- 6x 260°C reflow capable

Processing Advantages

- Via filling capability
- Multiple reflow capable
- Multiple lamination cycles

**PRODUCT AVAILABILITY**

Standard Material Offering: Laminate

- 2 to 125 mil (0.05 to 3.2 mm)
- Available in full size sheet or panel form

Copper Foil Type

- HTE Grade 3
- RTF (Reverse Treat Foil)

Copper Weight

- ½ to 3 oz (18 to 105 µm) available
- Heavier copper available
- Thinner copper foil available

Standard Material Offering: Prepreg

- Roll or panel form
- Tooling of prepreg panels

Glass Fabric Availability

- E-glass

These products consist of an HB flammability rated polyimide resin system suitable for military, commercial or industrial electronic applications requiring superior performance and the utmost in thermal properties. These products utilize a polyimide and thermoplastic blend resin, fully cured without the use of MDA (Methylenedianiline). This results in a polymer with a high Tg without the characteristic difficulties of brittleness and low initial bond strength associated with traditional thermoset polyimides.

**PRODUCT ATTRIBUTES**



HIGH THERMAL RELIABILITY



HIGH TEMPERATURE

**TYPICAL MARKET APPLICATIONS**



AUTOMOTIVE & TRANSPORTATION



AEROSPACE & DEFENSE

**ORDERING INFORMATION:**

Contact your local sales representative or contact [info@isola-group.com](mailto:info@isola-group.com) for further information.

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# Typical Values Table

Property	Typical Value	Units		Test Method
		Metric (English)		IPC-TM-650 (or as noted)
Glass Transition Temperature (Tg) by DSC	260		°C	2.4.25C
Decomposition Temperature (Td) by TGA @ 5% weight loss	416		°C	2.4.24.6
Time to Delaminate by TMA (Copper removed)	A. T260 B. T288	60	Minutes	2.4.24.1
Z-Axis CTE	A. Pre-Tg B. 50 to 260°C, (Total Expansion)	55 1.5	ppm/°C %	2.4.24C
X/Y-Axis CTE	Pre-Tg	13/14	ppm/°C	2.4.24C
Thermal Conductivity		0.4	W/m-K	ASTM E1952
Thermal Stress 10 sec @ 288°C (550.4°F)	A. Unetched B. Etched	Pass	Pass Visual	2.4.13.1
Dk, Permittivity	A. @ 100 MHz B. @ 500 MHz C. @ 1 GHz D. @ 2 GHz E. @ 5 GHz F. @ 10 GHz	3.83 3.80 3.78 3.76 3.73 3.73	—	2.5.5.9 2.5.5.9 2.5.5.9 Bereskin Stripline Bereskin Stripline Bereskin Stripline
Df, Loss Tangent	A. @ 100 MHz B. @ 500 MHz C. @ 1 GHz D. @ 2 GHz E. @ 5 GHz F. @ 10 GHz	0.0135 0.0151 0.0172 0.0179 0.0188 0.021	—	2.5.5.9 2.5.5.9 2.5.5.9 Bereskin Stripline Bereskin Stripline Bereskin Stripline
Volume Resistivity	A. After moisture resistance B. At elevated temperature	$3.0 \times 10^8$ $7.0 \times 10^8$	MΩ-cm	2.5.17.1
Surface Resistivity	A. After moisture resistance B. At elevated temperature	$3.0 \times 10^6$ $2.0 \times 10^8$	MΩ	2.5.17.1
Dielectric Breakdown		>55	kV	2.5.6B
Arc Resistance		130	Seconds	2.5.1B
Electric Strength (Laminate & laminated prepreg)		44 (1100)	kV/mm (V/mil)	2.5.6.2A
Comparative Tracking Index (CTI)		2 (250-399)	Class (Volts)	UL 746A ASTM D3638
Peel Strength	A. Low profile copper foil and very low profile copper foil all copper foil >17 μm [0.669 mil] B. Standard profile copper 1. After thermal stress 2. At 125°C (257°F) 3. After process solutions	1.14 (6.5) 1.25 (7.0) 1.25 (7.0) 1.14 (6.5)	N/mm (lb/inch)	2.4.8C 2.4.8.2A 2.4.8.3 2.4.8.3
Flexural Strength	A. Length direction B. Cross direction	58.7 66.2	ksi	2.4.4B
Tensile Strength	A. Length direction B. Cross direction	54.5 36.1	ksi	ASTM D3039
Young's Modulus	A. Length direction B. Cross direction	3892 3490	ksi	ASTM D790-15e2
Poisson's Ratio	A. Length direction B. Cross direction	0.187 0.164	—	ASTM D3039
Moisture Absorption		0.5	%	2.6.2.1A
Flammability (Laminate & laminated prepreg)		HB	Rating	UL 94
Relative Thermal Index (RTI)		140	°C	UL 796

## NOTES

Visit our site <http://www.isola-group.com> for more details.

Revisions:

A: Initial release - 4/17

B: Corrected units for Flexural and Tensile Strength - 8/18

C: Corrected MOT value to match UL file - 11/18

D: Change MOT to RTI 5/19

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