

ISOLA LAMINATE SYSTEMS

Product and Solutions Offering

Isola Laminate Systems' broad range of laminate, prepreg and foil products and solutions includes:

- **PWB Substrates**
 - FR-4s
 - Composites
- **Advanced PWB Substrates**
 - BT/Epoxy
 - Polyimide
 - P97 & P27**
 - Specialty Prepregs
- **HDI Materials**
- **Signal Integrity Substrates**
- **Buried Passive Solutions**
- **Packaging Substrates**

P97 & P27

Polyimide Laminate and Prepreg

Isola Laminate Systems offers a product line of polyimide-based prepreg and copper clad laminates for high temperature printed circuit applications. These products consist of a flame resistant polyimide resin system suitable for military, commercial or industrial electronic applications requiring superior performance and the utmost in thermal properties. They utilize a polyimide and thermoplastic blend of resin, fully cured without the use of MDA (Methylene Dianiline). 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.

Performance and Processing Advantages

- **High Tg - 260°C TMA**
 - Greater thermal performance over epoxy-bismaleimide blends
- **Maintains Bond Strength at High Temperature**
- **Tough Resin System**
 - Improved processing due to less brittleness
 - Less delamination from machining
- **Flammability Rating - V-0**
- **Non-MDA (Methylene Dianiline) Chemistry**
 - Meets all OSHA 1910.1050 requirements

Purchasing Information

- **Industry Approvals**
 - IPC 4101/40/41/42
 - UL Recognized - GPY, UL File Number E41625
- **Standard Availability**
 - Overall Thicknesses:** 0.0025" to 0.125"
 - Available in sheet or panel form
 - Copper Foil Cladding:** 1/2, 1, & 2 oz.
 - Options - Double-Treat, HTE, Copper-Invar-Copper
 - Prepregs:** Available in roll or panel form
 - Glass Styles - 106, 1080, 2313, 2116, 7628

Ordering Information

Contact your local sales representative or the Inside Sales Department in La Crosse, WI.

Phone: 1-800-845-2904 or
608-784-6070

Fax: 1-800-344-1825 or
608-791-2428

Isola Laminate Systems Corp.
230 North Front Street
La Crosse, WI 54601

For further information visit
www.isolalaminatesystems.com

P97 Typical Laminate Properties, 0.008" [0.20mm]

| <u>PROPERTY</u> | <u>UNITS</u> | <u>IPC 4101</u> | <u>P97 VALUE</u> | <u>CONDITIONING</u> |
|-----------------------------|--------------|-------------------------|------------------------|----------------------|
| Thickness | inches | <0.030 | 0.008 | — |
| | mm | [<0.78] | [0.20] | — |
| Construction | — | — | 2313/2116 | — |
| Retained Resin | % | — | 47 | — |
| <u>Thermal</u> | | | | |
| Tg, min - (TMA) | °C | 250 | 260* | E-2/105 |
| CTE - x-axis | ppm/°C | — | 17 | Ambient to Tg |
| y-axis | ppm/°C | — | 14 | Ambient to Tg |
| z-axis | ppm/°C | — | 54 | Ambient to 288°C |
| Thermal Stress, 288°C | seconds | 10 | >900 | E-2/105 |
| <u>Electrical</u> | | | | |
| Permittivity (Dk), max. @ | | | | |
| 1 MHz (2 Fluid Cell) | — | 5.4 | 4.4 | C-40/23/50 |
| 500 MHz (HP 4291) | — | — | 4.2 | C-40/23/50 |
| 1 GHz (HP4291) | — | — | 4.2 | C-40/23/50 |
| Loss Tangent (DF), max. @ | | | | |
| 1 MHz (2 Fluid Cell) | — | 0.035 | 0.014 | C-40/23/50 |
| 500 MHz (HP 4291) | — | — | 0.012 | C-40/23/50 |
| 1 GHz (HP4291) | — | — | 0.014 | C-40/23/50 |
| Surface Resistivity, min. | megohms | 1x10 ⁴ | 5.0x10 ⁵ | C-96/35/90 |
| | megohms | 6x10 ⁴ | 1.6x10 ⁸ | E-24/204 |
| Volume Resistivity, min. | megohm-cm | 1x10 ⁴ | 3.4x10 ⁸ | C-96/35/90 |
| | megohm-cm | 6x10 ⁴ | 1.3x10 ⁸ | E-24/204 |
| Electric Strength, min. | volts/mil | 737 | 1340 | D-48/50 |
| | [volts/mm] | [2.90x10 ⁴] | [5.3x10 ⁴] | — |
| Arc Resistance, min. | seconds | 120 | 130 | D-48/50 |
| <u>Physical</u> | | | | |
| Peel Strength, min. - 1 oz. | lb/in | — | 9.1 | Condition A |
| | [Kg/M] | — | [162] | Condition A |
| | lb/in | 3.9 | 8.6 | After Thermal Stress |
| | [Kg/M] | [70] | [152] | After Thermal Stress |
| | lb/in | 3.35 | 7.2 | E-1/170 |
| | [Kg/M] | [60] | [130] | E-1/170 |
| Flammability | — | — | V-0 | UL94 |
| Moisture Absorption, max. | % | 1.0 | .54 * | D-24/23 |

* Material Thickness Tested 0.028"

"The data, while believed to be accurate and based on analytical methods considered to be reliable, is for information purposes only. Any sales of these products will be governed by the terms and conditions of the agreement under which they are sold."