Product and Solutions Offering

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

- **PWB Substrates**
  - FR-4s
    - FR402
  - Composites
- **Advanced PWB Substrates**
  - BT/Epoxy
  - Polyimide
  - Specialty Prepregs
- **HDI Materials**
- **Signal Integrity Substrates**
- **Buried Passive Solutions**
- **Packaging Substrates**

FR402

Tetrafunctional Epoxy Laminate and Prepreg

Isola Laminate Systems' FR402 consists of a modified tetrafunctional epoxy resin system engineered for multilayer applications that require performance characteristics exceeding those of difunctional epoxies. The formulation of FR402 is designed to enhance throughput and accuracy of laser based Automated Optical Inspection (AOI) equipment. FR402 offers superior resistance to chemical and thermal degradation.

Performance and Processing Advantages

- **High Tg - 140°C**
  Superior performance through multiple thermal excursions
  Resistance to measling
  Extended capabilities

- **UV Blocking & AOI Compatible**
  Increased throughput and accuracy
  Compatible with all AOI equipment

- **FR-4 System**
  Processes as a standard FR-4

Purchasing Information

- **Industry Approvals**
  IPC 4101/21
  UL Recognized - FR-4, File Number E41625
  (Part of Isola's UL FR-4 Family)
  CSA

- **Availability**
  Thicknesses: 0.002" [.05 mm] to 0.125" [3.2 mm]
  Available in sheet or panel form
  Copper Foil Cladding: 1/2, 1, and 2 oz. HTE
  Options - Double-Treat, Reverse Treat
  Prepregs: Available in roll or panel form
  Glass Styles - 106, 1080, 2113, 2313, 2116, 1652, 7628, 7629

isola

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

FR402 Typical Laminate Properties, 0.008" [0.20mm]

PROPERTY	UNITS	IPC 4101	FR402 VALUE	CONDITIONING
Thickness	inches	<.030	0.008	—
	mm	[<0.78]	[0.20]	—
Construction	—	—	2-2116	—
Retained Resin	%	—	44	—
Thermal				
Tg, min. (DSC)	°C	110	140	E-2/105
CTE - x-axis	ppm/°C	—	13	Ambient to Tg
y-axis	ppm/°C	—	13	Ambient to Tg
z-axis	ppm/°C	—	165	Ambient to 288 °C
Solder Float, 288°C	seconds	—	>220	Condition A
Electrical				
Permittivity (DK), max. @				
1 MHz (2 Fluid Cell)	—	5.4	4.7	C-24/23/50
500 MHz (HP 4291)	—	—	4.27	C-24/23/50
1 GHz (HP4291)	—	—	4.25	C-24/23/50
Loss Tangent (DF), max. @				
1 MHz (2 Fluid Cell)	—	0.035	0.025	C-24/23/50
500 MHz (HP 4291)	—	—	0.016	C-24/23/50
1 GHz (HP4291)	—	—	0.016	C-24/23/50
Surface Resistivity, min.	megohms	$1x10^4$	$5x10^6$	C-96/35/90
	megohms	$1x10^3$	$1x10^6$	E-24/125
Volume Resistivity, min.	megohms-cm	$1x10^6$	$1x10^6$	C-96/35/90
	megohms-cm	$1x10^3$	$1x10^6$	E-24/125
Electric Strength, min.	volts/mil	737	1100	D-48/50
Arc Resistance, min.	seconds	60	120	D-48/50
Physical				
Peel Strength, min. - 1 oz.	lb/in	—	9.0	Condition A
	[Kg/M]	—	[161]	Condition A
	lb/in	4.5	9.0	After Thermal Stress
	[Kg/M]	[80]	[161]	After Thermal Stress
	lb/in	3.9	8.0	E-1/125
	[Kg/M]	[70]	[143]	—
Flammability	—	V-0	V-0	UL94
Moisture Absorption, max.	%	0.80*	0.20*	D-24/23

**Material Thickness Tested - 0.028"*

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