

IPC-4101 /98 /99 /101 /126    UL - File E41625 Grade PCL-FR-370HR

370HR is the industry's “best in class” lead-free compatible product for high-reliability applications across a wide range of markets.

#### PRODUCT FEATURES

##### Industry Recognition

- UL File Number: E41625
- Polyclad® Grade PCL-FR-370HR
- Qualified to UL's MCIL Program
- RoHS Compliant

##### Performance Attributes

- CAF resistant

##### Processing Advantages

- FR-4 process compatible
- UV blocking and AOI fluorescence
- Multiple reflow capable
- HDI technology compatible

#### PRODUCT AVAILABILITY

##### Standard Material Offering: Laminate

- 2 to 125 mil (0.05 to 3.2 mm)

##### Copper Foil Type

- HTE Grade 3
- RTF (Reverse Treat Foil)
- Embedded resistor foil

##### Copper Weight

- ½, 1 and 2 oz (18, 35 and 70 µm) available
- Heavier copper foil available
- Thinner copper foil available

##### Standard Material Offering: Prepreg

- Tooling of prepreg panels

##### Glass Fabric Availability

- E-glass
- Square weave glass
- Mechanically spread glass

370HR laminates and prepregs, designed by Polyclad, are made using a patented high performance 180°C Tg FR-4 multifunctional epoxy resin system that is designed for multilayer Printed Wiring Board (PWB) applications where maximum thermal performance and reliability are required. We manufacture 370HR laminates and prepregs with high quality E-glass glass fabric for superior Conductive Anodic Filament (CAF) resistance. 370HR provides superior thermal performance with low Coefficient of Thermal Expansion (CTE) and the mechanical, chemical and moisture resistance properties that equal or exceed the performance of traditional FR-4 materials.

370HR is used in thousands of PWB designs and has proven to be best in class for thermal reliability, CAF performance, ease of processing and proven performance on sequential lamination designs.

#### PRODUCT ATTRIBUTES



#### TYPICAL MARKET APPLICATIONS



#### 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		180	°C	2.4.25C
Decomposition Temperature (Td) by TGA @ 5% weight loss		340	°C	2.4.24.6
Time to Delaminate by TMA (Copper removed)	A. T260	60	Minutes	2.4.24.1
	B. T288	30		
Z-Axis CTE	A. Pre-Tg	45	ppm/°C	2.4.24C
	B. Post-Tg	230	ppm/°C	
	C. 50 to 260°C, (Total Expansion)	2.8	%	
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	Pass	Pass Visual	2.4.13.1
	B. Etched			
Dk, Permittivity	A. @ 100 MHz	4.24	—	2.5.5.3
	B. @ 1 GHz	4.17		2.5.5.9
	C. @ 2 GHz	4.04		Bereskin Stripline
	D. @ 5 GHz	3.92		Bereskin Stripline
	E. @ 10 GHz	3.92		Bereskin Stripline
Df, Loss Tangent	A. @ 100 MHz	0.0150	—	2.5.5.3
	B. @ 1 GHz	0.0161		2.5.5.9
	C. @ 2 GHz	0.0210		Bereskin Stripline
	D. @ 5 GHz	0.0250		2.5.5.5
	E. @ 10 GHz	0.0250		2.5.5.5
Volume Resistivity	A. After moisture resistance	3.0 x 10 <sup>8</sup>	MΩ-cm	2.5.17.1
	B. At elevated temperature	7.0 x 10 <sup>8</sup>		
Surface Resistivity	A. After moisture resistance	3.0 x 10 <sup>6</sup>	MΩ	2.5.17.1
	B. At elevated temperature	2.0 x 10 <sup>8</sup>		
Dielectric Breakdown		>50	kV	2.5.6B
Arc Resistance		115	Seconds	2.5.1B
Electric Strength (Laminate & laminated prepreg)		54 (1350)	kV/mm (V/mil)	2.5.6.2A
Comparative Tracking Index (CTI)		3 (175-249)	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]	1.14 (6.5)	N/mm (lb/inch)	2.4.8C
	B. Standard profile copper	1.25 (7.0)		2.4.8.2A
	1. After thermal stress	1.25 (7.0)		2.4.8.3
	2. At 125°C (257°F)	1.14 (6.5)		2.4.8.3
Flexural Strength	A. Length direction	90.0	ksi	2.4.4B
	B. Cross direction	77.0		
Tensile Strength	A. Length direction	55.9	ksi	ASTM D3039
	B. Cross direction	35.6		
Young's Modulus	A. Length direction	3744	ksi	ASTM D790-15e2
	B. Cross direction	3178		
Poisson's Ratio	A. Length direction	0.177	—	ASTM D3039
	B. Cross direction	0.171		
Moisture Absorption		0.15	%	2.6.2.1A
Flammability (Laminate & laminated prepreg)		V-0	Rating	UL 94
Relative Thermal Index (RTI)		130	°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: Change MOT to RTI 5/19

D: Changed VLP2 to HVLP to align with common industry terms 4/21

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