

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)
- Available in full size sheet or panel form

Copper Foil Type

- HTE Grade 3
- RTF (Reverse Treat Foil)

Copper Weight

- ½ to 2 oz (18 to 70 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
- Square weave glass
- Mechanically spread glass

370HR laminates and prepregs, deigned 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



HIGH DENSITY
INTERCONNECT



HIGH THERMAL
RELIABILITY

TYPICAL MARKET APPLICATIONS



AUTOMOTIVE &
TRANSPORTATION



NETWORKING &
COMMUNICATIONS



AEROSPACE
& DEFENSE



COMPUTING, STORAGE
& PERIPHERALS



CONSUMER
ELECTRONICS



MEDICAL, INDUSTRIAL
& INSTRUMENTATION

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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 B. T288	60 30	Minutes	2.4.24.1
Z-Axis CTE	A. Pre-Tg B. Post-Tg C. 50 to 260°C, (Total Expansion)	45 230 2.8	ppm/°C 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. @ 1 GHz C. @ 2 GHz D. @ 5 GHz E. @ 10 GHz	4.24 4.17 4.04 3.92 3.92	—	2.5.5.3 2.5.5.9 Bereskin Stripline Bereskin Stripline Bereskin Stripline
Df, Loss Tangent	A. @ 100 MHz B. @ 1 GHz C. @ 2 GHz D. @ 5 GHz E. @ 10 GHz	0.0150 0.0161 0.0210 0.0250 0.0250	— — —	2.5.5.3 2.5.5.9 Bereskin Stripline 2.5.5.5 2.5.5.5
Volume Resistivity	A. After moisture resistance B. At elevated temperature	3.0×10^8 7.0×10^8	MΩ-cm	2.5.17.1
Surface Resistivity	A. After moisture resistance B. At elevated temperature	3.0×10^6 2.0×10^8	MΩ	2.5.17.1
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] 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	90.0 77.0	ksi	2.4.4B
Tensile Strength	A. Length direction B. Cross direction	55.9 35.6	ksi	ASTM D3039
Young's Modulus	A. Length direction B. Cross direction	3744 3178	ksi	ASTM D790-15e2
Poisson's Ratio	A. Length direction B. Cross direction	0.177 0.171	—	ASTM D3039
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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