High Performance

370HR
Data Sheet

Tg 180, Td 340
Dk 4.04, Df 0.0210
/98 /99 /101 /126

370HR Laminate and Prepreg

370HR is a high performance 180°C glass transition temperature (Tg) FR-4 system for multilayer Printed Wiring Board (PWB) applications where maximum thermal performance and reliability are required. 370HR laminate and prepreg products are manufactured with a unique high performance multifunctional epoxy resin, reinforced with electrical grade (E-glass) glass fabric. This system provides improved thermal performance and low expansion rates in comparison to traditional FR-4 while retaining FR-4 processability.

In addition to this superior thermal performance, the mechanical, chemical and moisture resistance properties all equal or exceed the performance of traditional FR-4 materials. The 370HR system is also laser fluorescing and UV blocking for maximum compatibility with Automated Optical Inspection (AOI) systems, optical positioning systems and photoimagable solder mask imaging.

370HR has proven to be best in class for sequential lamination designs.

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Features

- High Thermal Performance
  - Tg: 180°C (DSC)
  - Td: 340°C (TGA @ 5% wt loss)
  - Low CTE for reliability
- T260: 60 minutes
- T288: 30 minutes
- RoHS Compliant
- UV Blocking and AOI Fluorescence
  - High throughput and accuracy during PCB fabrication and assembly
- CAF Resistant
- Superior Processing
  - Closest to conventional FR-4 processing
- Core Material Standard Availability
  - Thickness: 0.002″ (0.05 mm) to 0.125″ (3.2 mm)
  - Available in full size sheet or panel form
- Prepreg Standard Availability
  - Roll or panel form
  - Tooling of prepreg panels available
- Copper Foil Type Availability
  - Standard HTE Grade 3
  - RTF (Reverse Treat Foil)
- Copper Weights
  - ½, 1 and 2 oz (18, 35 and 70 µm) available
  - Heavier copper available upon request
  - Thinner copper foil available upon request
- Glass Fabric Availability
  - Standard E-glass
  - Square weave glass fabric available
  - Spread glass fabric available
- Industry Approvals
  - IPC-4101D WAM1 /98 /99 /101 /126 (IPC-4101C /21 /24 /26 /97 /98 /99 /101 /126)
  - UL - File Number E41625 as PCL-FR-370HR
  - Qualified to UL's MCIL Program

ORDERING INFORMATION:

Contact your local sales representative or visit **www.isola-group.com** for further information.

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370HR Specifications

Property		Typical Values			
				Units	Test Method
		Typical Value	Specification	Metric (English)	IPC-TM-650 (or as noted)
Glass Transition Temperature (Tg) by DSC		180	170	ºC	2.4.25
Decomposition Temperature (Td) by TGA @ 5% weight loss		340	–	ºC	ASTM D3850
T260		60	–	Minutes	ASTM D3850
T288		30	–	Minutes	ASTM D3850
CTE, Z-axis	A. Pre-Tg B. Post-Tg	45 230	AABUS –	ppm/ºC	2.4.24
CTE, X-, Y-axes	A. Pre-Tg B. Post-Tg	13/14 14/17	AABUS –	ppm/ºC	2.4.24
Z-axis Expansion (50-260ºC)		2.8	–	%	2.4.24
Thermal Conductivity		0.4	–	W/mK	ASTM D5930
Thermal Stress 10 sec @ 288ºC (550.4ºF)	A. Unetched B. Etched	Pass	Pass Visual	Rating	2.4.13.1
Dk, Permittivity (Laminate & prepreg as laminated) Tested at 50% resin	A. @ 100 MHz (HP4285A) B. @ 1 GHz (HP4291A) C. @ 2 GHz (Bereskin Stripline) D. @ 5 GHz (Bereskin Stripline) E. @ 10 GHz (Bereskin Stripline)	4.24 4.17 4.04 3.92 3.92	5.4 – – – –	–	2.5.5.3 2.5.5.9 2.5.5.5 2.5.5.5 2.5.5.5
Df, Loss Tangent (Laminate & prepreg as laminated) Tested at 50% resin	A. @ 100 MHz (HP4285A) B. @ 1 GHz (HP4291A) C. @ 2 GHz (Bereskin Stripline) D. @ 5 GHz (Bereskin Stripline) E. @ 10 GHz (Bereskin Stripline)	0.0150 0.0161 0.0210 0.0250 0.0250	0.035 – – – –	–	2.5.5.3 2.5.5.9 2.5.5.5 2.5.5.5 2.5.5.5
Volume Resistivity	A. 96/35/90 B. After moisture resistance C. At elevated temperature	– $3.0x10^8$ $7.0x10^8$	$1.0x10^6$ – $1.0x10^3$	MΩ-cm	2.5.17.1
Surface Resistivity	A. 96/35/90 B. After moisture resistance C. At elevated temperature	– $3.0x10^6$ $2.0x10^8$	$1.0x10^4$ – $1.0x10^3$	MΩ	2.5.17.1
Dielectric Breakdown		>50	–	kV	2.5.6
Arc Resistance		115	60	Seconds	2.5.1
Electric Strength (Laminate & prepreg as laminated)		54 (1350)	30 (750)	kV/mm (V/mil)	2.5.6.2
Comparative Tracking Index (CTI)		3 (175-249)	–	Class (Volts)	UL-746A ASTM D3638
Peel Strength	A. Low profile copper foil and very low profile – all copper weights >17 microns B. Standard profile copper 1. After thermal stress 2. At 125ºC (257ºF) 3. After process solutions	1.14 (6.5) – 1.25 (7.0) 1.25 (7.0) 1.14 (6.5)	0.70 (4.0) – 0.80 (4.5) 0.70 (4.0) 0.55 (3.0)	N/mm (lb/inch)	2.4.8 2.4.8.2 2.4.8.3 – –
Flexural Strength	A. Lengthwise direction B. Crosswise direction	90,000 77,000	–	$lb/inch^2$	2.4.4
Tensile Strength	A. Lengthwise direction B. Crosswise direction	55,900 35,620	–	$lb/inch^2$	–
Young's Modulus	A. Grain direction B. Fill direction	3744 3178	–	ksi	ww
Poisson's Ratio	A. Grain direction B. Fill direction	0.177 0.171	–	–	xx
Moisture Absorption		0.15	–	%	2.6.2.1
Flammability (Laminate & prepreg as laminated)		V-0	–	Rating	UL 94
Max Operating Temperature		130	UL Cert	ºC	–

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.

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