isola

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.

High Performance

370HR

Data Sheet

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

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

370HR Specifications

Part	Property		Typical Values				
Class Transition Temperature (Tg) by DSC 180 170 70 2.4.25					Units	Units Test Method	
Decomposition Temperature (1d) by 16 A 6 5% weight loss S40				Specification			
T280	Glass Transition Temperature (Tg) by DSC		180	170	°C	2.4.25	
T288	Decomposition Temperature (Td) by TGA @ 5% weight loss		340	_	°C	ASTM D3850	
CTE, Z-axisls B. Pien-Tig 45 APBUS ppm"C 2.4.24 CTE, X-, Y-axes A. Pien-Tig 13714 A-BBUS ppm"C 2.4.24 Z-axis Expansion (50-260°C) Description 2.8 — % 2.4.24 Thermal Conductivity 0.4 — Wmm ASTM D8930 Thermal Stress 10 soc @ 288°C A. Understand Pess Visual Relung 2.4.13 DK, Permittivity A. @ 100 MHz (#194265A) 4.74 5.4 — — 2.5.5.3 DK, Permittivity A. @ 200 MHz (#194265A) 4.74 5.4 — — 2.5.5.9 CLaminate & prepreg as laminated) C. @ 20 MHz (#194265A) 4.04 — — 2.5.5.9 DF, Lass Tangent A. @ 100 MHz (#194265A) 0.0150 0.035 — — 2.5.5.3 Laminate & prepreg as laminated) A. @ 100 MHz (#194265A) 0.0150 0.035 — — 2.5.5.3 Laminate & prepreg as laminated) A. @ 10 MHz (#194265A) 0.0150 0.035 — —	T260		60	_	Minutes	ASTM D3850	
CTE, X, Y-axes B. Post-Tg 39.14 AABUS ppm/C 2.424	T288		30	_	Minutes	ASTM D3850	
Cit. N Yeakes B. Post-Tig 14/17	CTE, Z-axis	B. Post-Tg	230		ppm/°C	2.4.24	
Thermal Conductivity			14/17			2.4.24	
Pass Pass Visual Rating 2.4.13.1	Z-axis Expansion (50-260°C)		2.8	_	%	2.4.24	
School B. Etched Pass Pass visual Pasting 2.4.131	Thermal Conductivity		0.4	-	W/mK	ASTM D5930	
B. @ 1 folk βF4291A		B. Etched			Rating	·	
Df. Loss Tangent (Laminate & propreg as laminated) B. Ø 1 GHz (H²4291A) (Caminate & propreg as laminated) O. Ø 2 GHz (Bereskin Stripline) 0.0210 0 0 0.0250 0 0.0	(Laminate & prepreg as laminated)	B. @ 1 GHz (HP4291A) C. @ 2 GHz (Bereskin Stripline) D. @ 5 GHz (Bereskin Stripline)	4.17 4.04 3.92	- -	-	2.5.5.9 2.5.5.5 2.5.5.5	
Volume Resistivity B. After moisture resistance C. At elevated temperature 3.0x10 [®] 1.0x10 [®] 1.0x10 [®] — MΩ - Cm 2.5.17.1 Surface Resistivity B. After moisture resistance C. At elevated temperature 2.0x10 [®] 1.0x10 [®] 1.0x10 [®] MΩ 2.5.6 Dielectric Breakdown >50 — kV 2.5.6 Acr Resistance 115 60 Seconds 2.5.1 Electric Strength (Laminate & prepreg as iminated) 54 (1350) 30 (750) kV/mm 2.5.6.2 Comparative Tracking Index (CTI) 3 (175-249) — Class (Volts) UL-746A ASTM D3638 Peel Strength (Laminate & prepreg as iminated) 1.14 (6.5) 0.70 (4.0) V/mm 2.4.8 Class (Volts) MIL-746A ASTM D3638 Peel Strength (Laminate & prepreg as iminated) 1.14 (6.5) 0.70 (4.0) N/mm 2.4.8 Class (Volts) MIL-746A ASTM D3638 A Low profile copper foil and very low profile capper weights >17 microns and profile copper in 1.4 (6.5) 0.70 (4.0) N/mm 2.4.8.2 Class (Volts) After thermal stress and prof	(Laminate & prepreg as laminated)	A. @ 100 MHz (HP4285A) B. @ 1 GHz (HP4291A) C. @ 2 GHz (Bereskin Stripline) D. @ 5 GHz (Bereskin Stripline)	0.0161 0.0210 0.0250		-	2.5.5.3 2.5.5.9 2.5.5.5 2.5.5.5	
Surface Resistivity B. After moisture resistance C. At elevated temperature 3.0x10° 2.0x10° 1.0x10³ 2.0x10° — 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) LUL-746A ASTIM 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 1.25 (7.0) 1.25 (7.0) 1.25 (7.0) 0.80 (4.5) 0.70 (4.0) 1.25 (7.0) 0.80 (4.5) 0.70 (4.0) 0.70 (4.	Volume Resistivity	B. After moisture resistance		-	MΩ-cm	2.5.17.1	
Arc Resistance	Surface Resistivity	B. After moisture resistance	3.0x10 ⁶	_	ΜΩ	2.5.17.1	
Electric Strength (Laminate & prepreg as laminated) 54 (1350) 30 (750) kV/mm (V/mil) 2.5.6.2	Dielectric Breakdown		>50	_	kV	2.5.6	
Comparative Tracking Index (CTI) 3 (175-249) - Class (Volts) UL-746A ASTM D3638	Arc Resistance		115	60	Seconds	2.5.1	
A. Low profile copper foil and very low profile - all copper weights >17 microns	Electric Strength (Laminate & prepreg as laminated)		54 (1350)	30 (750)		2.5.6.2	
Peel Strength B. Standard profile copper 1. After thermal stress 2. At 125°C (257°F) 3. After process solutions 1.14 (6.5) 0.55 (3.0) − N/mm (lb/inch) 2.4.8.2 (2.4.8.3) Flexural Strength A. Lengthwise direction B. Crosswise direction 35,620 90,000 − 1 lb/inch² − Ib/inch² 2.4.4 Young's Modulus A. Grain direction B. Fill direction D. 177 D. 171 − D. The strength D.	Comparative Tracking Index (CTI)		3 (175-249)	-	Class (Volts)		
B. Crosswise direction 77,000 -	Peel Strength	profile – all copper weights >17 microns B. Standard profile copper 1. After thermal stress 2. At 125°C (257°F) 3. After process solutions	1.25 (7.0) 1.25 (7.0) 1.14 (6.5)	0.80 (4.5) 0.70 (4.0)		2.4.8.2	
Second Processive direction Seco	Flexural Strength	B. Crosswise direction	77,000	-	lb/inch ²	2.4.4	
Poisson's Ratio	Tensile Strength	B. Crosswise direction	35,620	-	lb/inch²	-	
B. Fill direction 0.171 -	Young's Modulus	B. Fill direction	3178	-	ksi	ww	
Flammability (Laminate & prepreg as laminated) V-0 — Rating UL 94	Poisson's Ratio			-	-	XX	
	Moisture Absorption		0.15	_	%	2.6.2.1	
Max Operating Temperature 130 UL Cert °C -			V-0	-	Rating	UL 94	
	Max Operating Temperature		130	UL Cert	°C	-	

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.