



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.

www.isola-group.com/products/370HR

ORDERING INFORMATION:

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

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High Performance

370HR Data Sheet

Tg 180, Td 340
Dk 4.04, Df 0.0210
/21 /24 /26 /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
- 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-4101C /21 /24 /26 /98 /99 /101 /126
 - ▶ UL - File Number E41625 as PCL-FR-370HR
 - ▶ Qualified to UL's MCIL Program

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 | 170-200 | °C | 2.4.25 | |
| Decomposition Temperature (Td) by TGA @ 5% weight loss | 340 | – | °C | ASTM D3850 | |
| T260 | 60 | – | Minutes | ASTM D3850 | |
| T288 | 30 | – | Minutes | ASTM D3850 | |
| CTE, Z-axis | A. Pre-Tg B. Post-Tg | AABUS – | ppm/°C | 2.4.24 | |
| CTE, X-, Y-axes | A. Pre-Tg B. Post-Tg | AABUS – | ppm/°C | 2.4.24 | |
| Z-axis Expansion (50-260°C) | 2.8 | – | % | 2.4.24 | |
| Thermal Conductivity | 0.4 | – | W/mK | ASTM D5930 | |
| Thermal Stress 10 sec @ 288°C (550.4°F) | 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) | 4.24 | 5.4 | 2.5.5.3 | |
| | B. @ 1 GHz (HP4291A) | 4.17 | – | 2.5.5.9 | |
| | C. @ 2 GHz (Bereskin Stripline) | 4.04 | – | 2.5.5.5 | |
| | D. @ 5 GHz (Bereskin Stripline) | 3.92 | – | 2.5.5.5 | |
| | E. @ 10 GHz (Bereskin Stripline) | 3.92 | – | 2.5.5.5 | |
| Df, Loss Tangent (Laminate & prepreg as laminated) Tested at 50% resin | A. @ 100 MHz (HP4285A) | 0.0150 | 0.035 | 2.5.5.3 | |
| | B. @ 1 GHz (HP4291A) | 0.0161 | – | 2.5.5.9 | |
| | C. @ 2 GHz (Bereskin Stripline) | 0.0210 | – | 2.5.5.5 | |
| | D. @ 5 GHz (Bereskin Stripline) | 0.0250 | – | 2.5.5.5 | |
| | E. @ 10 GHz (Bereskin Stripline) | 0.0250 | – | 2.5.5.5 | |
| Volume Resistivity | A. 96/35/90 B. After moisture resistance C. At elevated temperature | – 3.0x10 ⁹ 7.0x10 ⁹ | 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 | 1.14 (6.5) | 0.70 (4.0) | | 2.4.8 |
| | B. Standard profile copper | – | – | N/mm (lb/inch) | 2.4.8.2 |
| | 1. After thermal stress | 1.25 (7.0) | 0.80 (4.5) | | 2.4.8.3 |
| | 2. At 125°C (257°F) | 1.25 (7.0) | 0.70 (4.0) | | – |
| | 3. After process solutions | 1.14 (6.5) | 0.55 (3.0) | | – |
| Flexural Strength | A. Lengthwise direction | 90,000 | – | lb/inch ² | 2.4.4 |
| | B. Crosswise direction | 77,000 | – | | |
| Tensile Strength | A. Lengthwise direction | 55,900 | – | lb/inch ² | – |
| | B. Crosswise direction | 35,620 | – | | |
| Young's Modulus | A. Grain direction | 3744 | – | ksi | ww |
| | B. Fill direction | 3178 | – | | |
| Poisson's Ratio | A. Grain direction | 0.177 | – | – | xx |
| | B. Fill direction | 0.171 | – | | |
| Moisture Absorption | 0.15 | – | % | 2.6.2.1 | |
| Flammability (Laminate & prepreg as laminated) | 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.

www.isola-group.com/products/370HR

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04/14 DS370HRC

