



# DuPont™ Pyralux® FR

Flame Retardant Acrylic-Based Bond Ply

Flexible Circuit Materials

## Product Description

DuPont™ Pyralux® FR Bond Ply features DuPont™ Kapton® polyimide film, coated on both sides with a proprietary flame retardant B-staged modified acrylic adhesive. This bond ply can be used to encapsulate etched details for environmental protection and electrical insulation. Using bond ply can eliminate a layer of Kapton® dielectric and a layer of adhesive in low layer count multilayer constructions.

## Key Features and Benefits

- Flame retardant modified acrylic adhesive composition
- Excellent bond strength affords high reliability
- Able to withstand multiple lamination cycles
- No refrigeration required for storage
- Certified to IPC-4203/1
- UL 94 VTM-0, UL File E124294
- RoHS Compliant

## Packaging

Pyralux® FR Bond Ply is supplied on 24 in (610 mm) wide by 250 ft (76 m) long rolls, on nominal 3 in (76 mm) cores. Narrower widths or cut sheets are also available by special order.

## Storage Conditions and Warranty

DuPont™ Pyralux® FR Bond Ply should be stored in original packaging at temperatures of 4 - 29 °C (40 - 85 °F) and below 70% relative humidity. The product should not be frozen and should be kept dry, clean, and well-protected. Subject to compliance with the foregoing handling and storage recommendations, DuPont's warranties as provided in the DuPont Standard Conditions of Sale shall remain in effect for a period of two years following the date on the Certificate of Analysis.

## Processing

Lamination conditions for DuPont™ Pyralux® FR flexible circuit materials are typically in the following ranges:

Part Temperature: .....182 - 199 °C (360 - 390 °F)

Pressure: ..... 14 - 28 kg/cm<sup>2</sup> (200 - 400 psi)

Time: .....1 - 2 hours, at temperature

Pyralux® FR Bond Ply processing guide available from your DuPont sales representative.

Table 1 - Standard Pyralux® FR Bond Ply Offerings

Product Code	Adhesive Thickness µm (mil)	Kapton® Thickness µm (mil)
FR7016	25 (1.0)	13 (0.5)
FR0111	25 (1.0)	25 (1.0)
FR0121	25 (1.0)	51 (2.0)
FR0131	25 (1.0)	76 (3.0)
FR0212	51 (2.0)	25 (1.0)
FR7021	13 (0.5)	13 (0.5)
FR1515	13 (0.5)	25 (1.0)

## Pyralux® FR Bond Ply Construction Selection

A variety of Pyralux® FR Bond Ply constructions, both balanced and unbalanced, are commercially available. For help beyond the standard offerings in Table 1, please use the Laminate Product Selector at [pyralux.dupont.com](http://pyralux.dupont.com) to identify the appropriate product code for your bond ply solution.



## Safe Handling

Prior to handling, DuPont recommends referencing the Pyralux® Safe Handling Guide available at [pyralux.dupont.com](http://pyralux.dupont.com). Pyralux® FR flexible circuit materials DO NOT contain polybrominated biphenyls (PBBs), polybrominated biphenyl oxides (PBBOs), or polybrominated diphenyl ethers (PBDEs).

## Quality and Traceability

DuPont™ Pyralux® FR Bond Ply is manufactured under a certified ISO9001:2015 Quality Management System facility. Complete material and manufacturing records, which include archive samples of finished product, are maintained by DuPont. Each manufactured lot is identified for reference traceability. The packaging label serves as the primary tracking mechanism in the event of customer inquiry and includes the product name, batch number, size, and quantity.

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## Product Performance

Table 2 - DuPont™ Pyralux® FR Bond Ply Properties

Property	FR0111 Typical Value	Test Method
Dielectric Constant (Dk)		
1 MHz	3.6	IPC-TM-650 2.5.5.3
10 GHz	3.0	ASTM D2520
Loss Tangent (Df)		
1 MHz	0.020	IPC-TM-650 2.5.5.3
10 GHz	0.017	ASTM D2520
Peel Strength* (Adhesion to Copper)		
As Received, N/mm (lb/in)	1.6 (9.0)	IPC-TM-650 2.4.9
After Solder, N/mm (lb/in)	1.6 (9.0)	
Adhesive Flow, mm (mil)	0.10 - 0.15 (4 - 6)	IPC-TM-650 2.3.17.1
Dimensional Stability (MD/TD)	± 0.03 %	IPC-TM-650 2.2.4
Solder Float, 288 °C for 10 s	Pass	IPC-TM-650 2.4.13
Volume Resistivity, $\Omega \cdot \text{cm}$	$> 10^{15}$	IPC-TM-650 2.5.17
Surface Resistance, $\Omega$	$> 10^{13}$	IPC-TM-650 2.5.17

Data within this table are typical values for the listed product. Performance can vary depending on construction and processing.

\*Lamination Conditions: 14 kg/cm<sup>2</sup> (200 psi) at 182 °C (360 °F) for 1 hour to treated side of 1 oz RA copper foil.



[pyralux.dupont.com](http://pyralux.dupont.com)

For more information on DuPont™ FR Bond Ply or other DuPont products, please visit our website.

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CAUTION: Do not use in medical applications involving permanent implantation in the human body. For other medical applications, see "DuPont Medical Caution Statement," H-50102-5 and "DuPont Policy Regarding Medical Applications" H-50103-5.

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