DuPont™ Pyralux® LF Bond Ply

flexible composites

Technical Information

Description

DuPont™ Pyralux® bond ply composites are constructed of DuPont™ Kapton® polyimide film coated on both sides with a proprietary B-staged modified acrylic adhesive. Bond ply is used to encapsulate two etched details for environmental and electrical insulation. Using bond ply can eliminate a layer of Kapton® and a layer of adhesive in low count multilayer constructions.

Construction

Bond ply is available in a variety of film and adhesive thicknesses. **Table 1** lists typical constructions. The product code must be used when ordering bond ply from DuPont.

Table 1
Bond Ply Product Codes

Product Code*	Adhesive	Kapton®	Adhesive	IPC
	Mil (µm)	Mil (µm)	Mil (µm)	Certification*
LF0111	1 (25)	1 (25)	1 (25)	Yes
LF0121	1 (25)	2 (51)	1 (25)	Yes
LF0131	1 (25)	3 (76)	1 (25)	Yes
LF0212	2 (51)	1 (25)	2 (51)	Yes
LF7021	1/2 (13)	1/2 (13)	1/2 (13)	No
LF7016	1 (25)	1/2 (13)	1 (25)	No
LF7081	2 (76)	1/2 (13)	2 (51)	No
LF1515	1/2 (13)	1 (25)	1/2 (13)	Yes

*Certified to IPC-4203/1: "Adhesive Coated Dielectic Films for Use as Cover Sheets for Flexible Printed Circuitry and Flexible Adhesive Bonding Films."

Packaging

Pyralux® bond ply composites are supplied on 24 inch (610 mm) wide by 250 feet (76 m) long rolls, on nominal 3 inch (76 mm) cores. Narrower widths or cut sheets are also available by special order.

Typical Data

Each manufactured lot, except the three bond ply constructions noted in **Table 1**, is certified to IPC specifications and tested according to IPC Test Method TM-650. See **Table 2**.

Table 2
Bond Ply Properties vs IPC Specifications

IPC Property	Coverlay Spec	Typical Value
Peel Strength, min., lb/in (kg/cm)		
As received	8 (1.4)	10 (1.8)
After solder	7 (1.3)	9 (1.6)
Dimensional Stability, max., percent	0.10	+0.03
Adhesive Flow, max. mil/mil adhesive (µm/µm)	5.0 (127)	2–4 (51–102)
Dielectric Constant, max. (at 1 MHz)	4.0	3.6
Dissipation Factor, max. (at 1 MHz)	0.03	0.02
Volume Resistivity, min., megohm-cm (ambient)	10^7	10^9
Surface Resistivity, min., megohm-cm (ambient)	10^6	10^8

*Laminating Conditions: 14kg/cm^2 (200 psi), 182°C (360°F), 1 hour to treated side of 1 oz RA copper foil. The values in Table 2 represent a typical 1 oz copper foil, 1 mil adhesive and 1 mil Kapton® construction.

A Certificate of Analysis is available with every batch. Complete material and manufacturing records for each lot, with samples of finished laminate, are retained for reference purpose. The roll labels contain the lot number, DuPont order number, customer order number, IPC specification, customer specification, and customer part number; save these labels for reference in case of inquiries.

Processing

Laminating conditions for Pyralux® flexible composites are typically in the following ranges:

Part Temperature:	182–199°C (360–390°F)
Pressure:	14–28 kg/cm^2 (200–400 psi)
Time:	1–2 hours, at temperature

For further processing information contact your DuPont representative to receive a Pyralux® Technical Manual.

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Storage Conditions and Warranty

DuPont™ Pyralux® LF flexible laminates should be stored in the original packaging at temperatures of 4–29°C (40–85°F) and below 70% 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 of shipment.

Safe Handling

Pyralux® bond ply composites contain a B-staged adhesive. Because B-staged adhesive contains trace quantities (parts per million) of unreacted monomers, precautions and recommendations should be taken to minimize contact.

DuPont is not aware of anyone developing contact dermatitis, or suffering any other medical discomforts, when using Pyralux® products. The uncured acrylic monomers in the bond ply adhesive may impart a mild odor. However, these products have been extensively tested under operating conditions (drilling and lamination conditions) and found to liberate measurable volatiles only well below[1] accepted safe limits (e.g., PEL).

To eliminate contact between the skin and the adhesive, wear lint-free gloves or fingerpads. Anyone handling Pyralux® should wash their hands with soap before eating, smoking, or using restroom facilities. Gloves and fingerpads should be changed daily, and wash other protective clothing frequently.

Adequate ventilation and exhaust is recommended in press rooms to prevent the buildup of potentially harmful vapors, to remove disagreeable odors, and to dissipate heat. Drill rooms should be furnished with standard equipment recommended by drill vendors and required by OSHA standards.

For further information on safe handling, refer to DuPont publication H-46873, "Pyralux® LF and FR Safe Handling;" and refer to "Industrial Ventilation," 18th Edition or latest available from the American Conference of Governmental Industrial Hygienists, 6500 Glenway, Building D-5, Cincinnati, OH 45211.

[1]Values for all materials monitored were well below 10% of their accepted limits (PEL or TLV). In only one case, did the concentration reach approximately 40% of its limit. This was an oven used to dry the uncured acrylic material. This oven drying is not normally used in the process and during the exposure the oven was unventilated. Adequate ventilation is normally recommended for any heating process.

For more information on DuPont™ Pyralux® flexible circuit materials , please contact your local representative, or visit our website:

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