

DuPont™ Pyralux® LF Sheet Adhesive

flexible composites

Technical Information

Description

Sheet adhesive in the DuPont™ Pyralux® product line is a proprietary B-staged modified acrylic adhesive coated on release paper. Sheet adhesive is used primarily to bond flexible innerlayers or rigid cap layers in multilayer lamination. It is also widely used to bond flexible circuits to rigid boards during the fabrication of rigid-flex circuits, as well as to bond stiffeners and heat sinks.

Construction

Sheet adhesive is available in a variety of thicknesses; see **Table 1**. The product code must be used when ordering sheet adhesive from DuPont.

Table 1
Bond Ply Product Codes

Product Code*	Adhesive	IPC
	Mil (µm)	Certification*
LF0100	1 (25)	Yes
LF0200	2 (51)	Yes
LF0300	3 (76)	Yes
LF0400	4 (102)	Yes
LF1500	1/2 (13)	Yes
LF1700	.7 (18)	Yes

*Certified to IPC-4203/18: "Adhesive Coated Dielectric Films for Use as Cover Sheets for Flexible Printed Circuitry and Flexible Adhesive Bonding Films."

Packaging

Sheet adhesive is 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 of sheet adhesive is certified to IPC specifications and tested according to IPC Test Method TM-650. See **Table 2**.

Table 2
Sheet Adhesive Properties vs IPC Specifications

Adhesive Property	IPC Spec	Typical Sheet Value
Peel Strength*, min., lb/in (kg/cm) As received After solder	8 (1.4) 7 (1.3)	10 (1.8) 9 (1.6)
Solder Resistance 10 sec at 288°C (550°F)	Pass	Pass
Adhesive Flow, max. mil/mil adhesive (µm/µm)	5.0 (127)	2–4 (51–102)
Dielectric Constant, max. (at 1 MHz)	4.0	3.6–4.0
Dissipation Factor, max. (at 1 MHz)	0.05	0.02–0.03
Dielectric Strength volts/mil (kV/mm)	1,000 40	2,000–3,000 80–120
Insulation Resistance megohm	10 ⁴	10 ⁵
Volume Resistivity, min., megohm-cm (ambient)	10 ⁷	10 ⁹
Surface Resistivity, min., megohm-cm (ambient)	10 ⁶	10 ⁹

*Laminating Conditions: 14kg/cm² (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® sheet adhesive contains 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 below¹ 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-46862, "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.

¹Values 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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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.

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