DuPont Electronic Materials

Flexible Circuit Materials

Pyralux® LF™ Coverlay

Flexible Composites

Description

Pyralux® coverlay composites are constructed of DuPont Kapton® polyimide film, coated on one side with a proprietary B-staged modified acrylic adhesive. Coverlay is used to encapsulate etched details in flexible and rigid-flex multilayer constructions for environmental and electrical insulation.

Construction

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

Table 1
Coverlay Product Codes

Product Code	Adhesive Mil (µm)	Kapton Mil (µm)	IPC Certification*
LF0110	1 (25)	1 (25)	Yes
LF0120	1 (25)	2 (51)	Yes
LF0130	1 (25)	3 (76)	Yes
LF0150	1 (25)	5 (127)	Yes
LF0210	2 (51)	1 (25)	Yes
LF0220	2 (51)	2 (51)	Yes
LF0230	2 (51)	3 (76)	Yes
LF0250	2 (51)	5 (127)	Yes
LF0310	3 (76)	1 (25)	Yes
LF7001	½ (13)	½ (13)	No
LF7013	1 (25)	½ (13)	No
LF7082	2 (51)	½ (13)	No
LF1510	½ (13)	1 (25)	Yes
LF7034	1½ (38)	1 (25)	Yes

*Certified to IPC-FC-232C/1: "Adhesive Coated Dielectric Films for Use as Cover Sheets for Flexible Printed Circuits"

Packaging

Pyralux coverlay composites are 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.

Typical Data

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

Table 2
Coverlay Properties versus IPC Specifications

Property	IPC Spec	Typical Coverlay Value
Peel Strength, min. lb/in (kg/cm)		
After lamination	8 (1.4)	10 (1.8)
After solder	7 (1.3)	10 (1.8)
Dimensional Stability, max., percent	0.10	+0.07
Adhesive Flow, max. mil/mil adhesive (µm/µm)	5.0 (127)	4.2 (107)
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

A Certificate of Compliance (COC) 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 refer to DuPont publication H-09706, "Pyralux Processing Guide."

Storage

Pyralux flexible composites will retain their original properties for a minimum of one year when stored in the original packaging at temperatures of 4–29°C (40–85°F) and below 70% humidity. The products do not need refrigeration and should not be frozen. Keep the material clean and well protected.

Coverlay should not be automatically discarded if storage conditions have deviated from these limits. We recommend that material which has been stored outside these conditions be examined in a practical test before being committed to production.

Safe Handling

Pyralux coverlay 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.

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