DuPont™ Pyralux® LF-B

black flexible circuit material

Data Sheet

Description

DuPont™ Pyralux® LF-B black flexible circuit material is a coverlay made with the leading DuPont™ Kapton® brand black polyimide film for high performance applications where matte-black material enhances design aesthetics. It is coated on one side with a proprietary B-staged modified acrylic adhesive. Coverlay is traditionally used to encapsulate etched details in flexible and rigid-flex multi-layer constructions for environmental and electrical insulation. Black coverlay is used to enhance circuit aesthetics and improve LED lighting controls in specialty applications.

Construction

Pyralux® LF-B black coverlay is available in the following film and adhesive thicknesses. Additional constructions are available upon request.

Table 1
Black Coverlay Product Codes

Product Code	Adhesive	Kapton®	IPC
	Mil (µm)	Mil (µm)	Certification*
LF-B 0110	1 (25)	1 (25)	Yes
LF-B 0210	2 (51)	1 (25)	Yes
LF-B 7013	1 (25)	1/2 (13)	No

*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® coverlay 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 available by special order.

Typical Data

Pyralux® LF-B was specially developed to enhance optical/aesthetic circuit parameters in addition to environmental and electrical requirements. The following tables provide an overview comparison of Kapton® and coverlay properties for 25µm product.

Table 2
Standard LF Kapton® vs. LF-B (black) Kapton®

Property	Typical Value (25 µm)	
	Kapton® LF	Kapton® LF-B
Color	Orange	Black
Dielectric Strength	7700 v/mil	2900 v/mil
Ultimate Tensile Strength (@ 23°C)	33,500 psi (231 MPa)	39,000 psi (269 MPa)
Ultimate Elongation (@ 23°C)	72%	78%
Tensile Modulus (@ 23°C)	370,000 psi (2.5 GPa)	457,000 psi (3.1 GPa)
Tear Strength, Initial (Graves)	7.2 N (1.6 lbf)	7.2 N (1.6 lbf)

Table 3
Coverlay Property Comparison

IPC Property	Coverlay Spec	Typical LF Value	Typical LF-B Value
Peel Strength, min., lb/in (kg/cm)			
As received	8 (1.4)	10 (1.8)	12 (2.2)
After solder	7 (1.3)	10 (1.8)	12 (2.2)
Dimensional Stability, max., percent	0.10	+0.07	+0.04
Solder Float at 288°C (550°F)	IPC TM-650, Method 2.4.13	Pass	Pass

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 circuit materials 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-B black flexible circuit material 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, the DuPont warranty, 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® 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 exposed adhesive after etching, 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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K-15834-2 06/12

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