DuPont™ Pyralux® TK

Kapton® & Fluoropolymer Double-Sided Copper-Clad Laminate

Flexible Circuit Materials

Product Description

DuPont™ Pyralux® TK is a double-sided copper-clad laminate featuring a proprietary layered dielectric, featuring Kapton® polyimide and fluoropolymer films. This unique composition affords the lowest loss performance for a Pyralux® copper-clad laminate, enabling remarkable signal integrity in high speed digital and high frequency circuit applications. Offered with both rolled annealed (RA) and electrodeposited (ED) copper foil, Pyralux® TK can address your highest performance flex and rigid-flex applications where dielectric constant must fall below 3.0.

Key Features and Benefits

- Fluoropolymer film provides low-loss dielectric constant loss tangent
- Low moisture absorption for consistent performance
- Balanced and unbalanced constructions available
- Certified to IPC-4203/13
- UL 94V-0, UL File E124294
- RoHS Compliant

Packaging

Pyralux® TK double-side clad is supplied in sheet form, with standard dimensions of 24 x 36 inches (610 x 914 mm), 24 x 18 inches (610 x 457 mm), and 12 x 18 inches (305 x 457 mm). Other dimensions are available upon request.

Storage

DuPont™ Pyralux® TK double-side clad 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 refrigerated or frozen and should be kept dry, clean, and well-protected. Subject to compliance with the foregoing handling and storage recommendations, DuPont's warranties shall remain in effect for the period provided in the DuPont Standard Conditions of Sale.

Safe Handling

Prior to handling, DuPont recommends referencing the Pyralux® Safe Handling Guide available at pyralux.dupont.com.

Table 1 - Standard Pyralux® TK Offerings

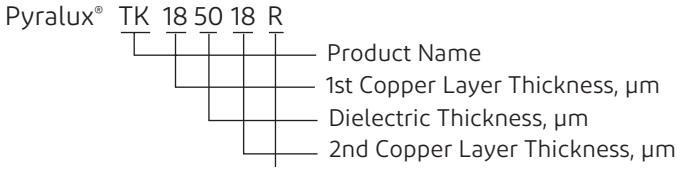
Product Code*	Copper Thickness µm (oz/ft²)	Dielectric Thickness µm (mil)
TK125012R	12 (0.33)	50 (2.0)
TK185018R	18 (0.5)	50 (2.0)
TK365036R	36 (1.0)	50 (2.0)
TK127512R	12 (0.33)	75 (3.0)
TK187518R	18 (0.5)	75 (3.0)
TK367536R	36 (1.0)	75 (3.0)
TK1210012R	12 (0.33)	100 (4.0)
TK1810018R	18 (0.5)	100 (4.0)
TK3610036R	36 (1.0)	100 (4.0)

*At the end of the product code, "R" designates rolled-annealed copper (e.g., TK1250R) and "E" designates electro-deposited copper (e.g., TK125012E).

Table 2 - Layered Dielectric Construction

Total Dielectric Thickness µm (mil)	Fluoropolymer Outer Layers µm (mil)	Kapton® Core Layer µm (mil)
50	12.5 (0.5)	25 (1.0)
75	19 (0.75)	36 (1.5)
100	25 (1.0)	50 (2.0)

Product Code Key



Processing

DuPont™ Pyralux® TK double-side clads will shrink more than typical Pyralux® clads after etching, baking, and lamination. The fluoropolymer in Pyralux® TK is chemically similar to the PTFE fluoropolymer utilized in rigid high speed laminates and standard procedures to drill and activate such boards should be applicable. Pyralux® TK processing guide available from your DuPont sales representative

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Product Performance

Table 2 - DuPont™ Pyralux® TK Double-sided Copper-clad Laminate Properties

Property	TK185018 Typical Value	Test Method
Dielectric Constant (Dk)		
10 GHz, Normal	2.5	ASTM D2520
10 GHz, In-plane	2.8	IPC-TM-650 2.5.5.5
Loss Tangent (Df)		
10 GHz	0.002	ASTM D2520
Peel Strength (Adhesion to Copper)		
As Received, N/mm (lb/in)	1.2 (7.0)	IPC-TM-650 2.4.9
After Solder, N/mm (lb/in)	1.2 (7.0)	
After HAST*, N/mm (lb/in)	0.2 (7.0)	
Dimensional Stability (MD/TD)		
After Etching, %	± 0.05 / 0.07 %	IPC-TM-650 2.2.4
After Thermal (150 °C for 30 min), %	± 0.07 / 0.13 %	
Coefficient of Thermal Expansion		
XY-Axis, ppm/°C	27	IPC-TM-650 2.4.41
Solder Float, 288 °C for 10 s	Pass	IPC-TM-650 2.4.13
Moisture Absorption, %	0.6	IPC-TM-650 2.6.2
Dielectric Strength, V/µm	200	ASTM D149
Tensile Modulus, GPa	> 3.2	IPC-TM-650 2.4.19
Tensile Strength, MPa	> 175	IPC-TM-650 2.4.19
Elongation, %	60	IPC-TM-650 2.4.19
Flexural Endurance, cycles	> 700	JIS C6471 (MIT)
Decomposition Temperature (2 % / 5 %), °C	531 / 548	DuPont Method, TMA

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

*HAST conditions were 120 °C and 90% RH at 2 atm for 96 hours.

Quality and Traceability

DuPont™ Pyralux® double-side clad 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.

DUPONT™

For more information on Pyralux® TK double-side clad or other DuPont products, please visit our website.

pyralux.dupont.com

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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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