

SD Flex Pyralux AC Copper-Clad Laminate

A II-Polyimide Flexible Laminate

Description

Pyralux AC single-sided copper-clad laminate is an all-polyimide composite of polyimide film on copper foil. Pyralux AC single-sided copper-clad laminate are ideal for use in single-sided application such as: display driver, multilayer digital camera or rigidflex camcorder circuits that require thin, light and high density circuitry along with chip on flex attachment. Techniques commonly used in the manufacture of flexible circuits can be used to process Pyralux AC composite.

Specifications

- Excellent dimensional stability (Figure 1)
- Low moisture absorption
- High modulus
- Excellent thermal resistance
- Excellent long term thermal aging (Figure 2 and 3)
- Thermal/humidity resistance (Figure 4)
- Low CTE
- UL 94 recognition : V-0

Typical physical and electrical properties along with applicable test methods are shown in Table 2.

Constructions

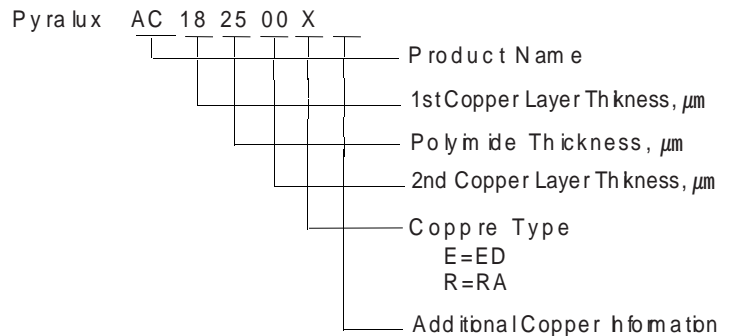
Standard Pyralux AC copper-clad products are listed in Table 1. Polyimide base substrate thicknesses are available from 0.5 mil (12µm) to 1.8 mil (45µm), rolled-annealed (RA) copper foil weights from 1/2 to 1oz/ft² (18 to 35µm) and electro-deposited (ED) copper foil weights from 1/3 to 1 oz/ft² (12 to 35µm)

Table 1
Single-Sided Pyralux AC Product Offerings

Product Codes	Copper µm (oz/ft ²)	Copper Type	Polyimide µm (mil)
AC181200R	18 (1/2)	RA	12 (0.5)
AC182000R	18 (1/2)	RA	20 (0.8)
AC182500R	18 (1/2)	RA	25 (1)
AC121200E	12 (1/3)	ED	12 (0.5)
AC122000E	12 (1/3)	ED	20 (0.8)
AC122500E	12 (1/3)	ED	25 (1)

Certified to PC-FC-241/11: "Flexible Metal-Clad Dielectrics (Polyimide-Adhesiveless)."

Product Code Description



Packaging

Pyralux AC copper-clad laminate is supplied in standard widths of 9.84 in (250mm) and 19.68 in (500mm). Roll length is 164ft (50m) or 328ft (100m) on a nominal 9.5 cm core. Other sizes are available by special order. All packing materials are 100% recyclable.

Table 2
Pyralux AC Material Properties

Property	Typical Value	Test Method
Adhesion to cu (Peel Strength ¹)		IPC - TM - 650, Method 2.4.9
AS Received, N/mm (lb/in)	1.19 (6-7)	Method B
After soldering, N/mm (lb/in)	1.19 (6-7)	Method D
Solder Floot		IPC - TM - 652, Method 2.4.13
10sec at 288 (550)	Pass	Method B
Dimensional stability, %		IPC - TM - 650, Method 2.2.4
	- 0.02	Method B, %
	- 0.04	Method C, %
Dielectric constant (at 1 MHz)	3.7	IPC - TM - 650, Method 2.5.5.3
Dissipation Factor (at 1 MHz)	0.0014	IPC - TM - 650, Method 2.5.5.3
Dielectric Strength, kV/mm (KV/mil)	200 (4.9)	ASTMD - 149
Volume Resistivity (damp heat), megohm	10	IPC - TM - 650, Method 2.5.17.1
Surface Resistance (damp heat). megohm	10	IPC - TM - 650, Method 2.5.17.1
Moisture Absorption, %	0.94	IPC - TM - 650, Method 2.6.2
CTE, ppm /	19	ASTMD - 696 - 91
CHE, ppm /% RH	8.0	
Propagation Tear Strength ² , g	3.0	IPC - TM - 650, Method 2.4.17.1
Initation Tear Strength ³ , g	400 - 700	IPC - TM - 650, Method 2.4.16
Tensile Strength, Mpa (kpsi)	193 (28)	IPC - TM - 650, Method 2.4.19
Tensile Modulus, Mpa (kpsi)	7580 (1100)	ASTMD - 882 - 91
Elongation, %	21	IPC - TM - 650, Method 2.4.19
Flammability	V - 0	UL - 94

Peel strength method is 180° instead of 90°

† With exception to IPC - TM - 650, Method 2.4.17.17.1, Propagation Tear Strength

† With exception to IPC - TM - 650, Method 2.4.16, Initation Tear Strength

Processing

In general a surface treatment of the polyimide surface will improve the adhesion with bonding film. Your bond strength results will vary depending on circuit processing and material selection. Additional treatment is required for those applications requiring pre-pregs. Please specify our "Plus" version for additional bond strength. Pyralux AC is not recommended for applications requiring

Anyone handling Pyralux AC should wash their hands with soap before eating, smoking or using restroom facilities. Gloves, finger cots and finger pads should be changed daily.

As with all thin, copper-clad laminate, sharp edges present a potential hazard during handling. All personnel involved in handling Pyralux AC copper-clads should be cautioned and provided with suitable gloves to minimize potential cuts.

Storage Condition/ Shelf Life

Pyralux AC flexible laminate are warranted for one year when stored in the original packaging at temperatures of 4-29 (40-85) and below 70% relative humidity. The product do not require refrigeration and should not be frozen. The material should be kept clean and well protected from physical damage.

Pyralux AC is fully cured when delivered. However, lamination areas should be well ventilated with a fresh air supply to avoid build-up from trace quantities of residual solvent (typical of polyimides) that may volatilize during press lamination. When drilling or routing parts with Pyralux AC flexible composites, provide adequate vacuum around the drill head to minimize worker exposure to dust.

Safe Handling

Although DuPont is not aware of anyone developing contact dermatitis when using Pyralux AC products, some individuals may be more sensitive than others.

Pyralux AC flexible composites do not contain polybrominated biphenyls (PBBs) or polybrominated biphenyl oxides (PBBOs).

Figure 1. Typical Dimensional Stability at 200 (392)
(25µm dielectric, 18µm Cu)

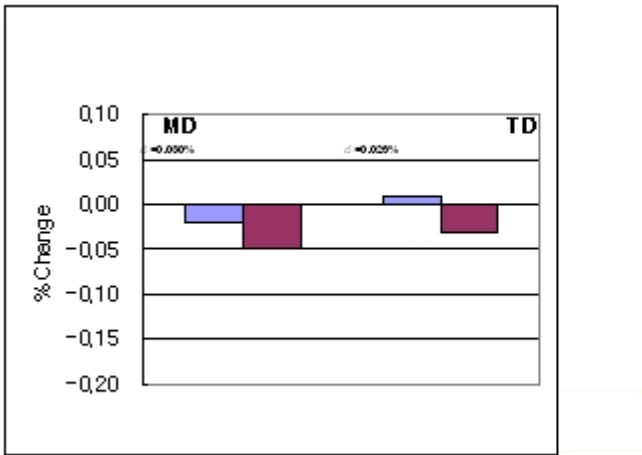


Figure 2. Typical Bond Strength - Pyralux AC182500R

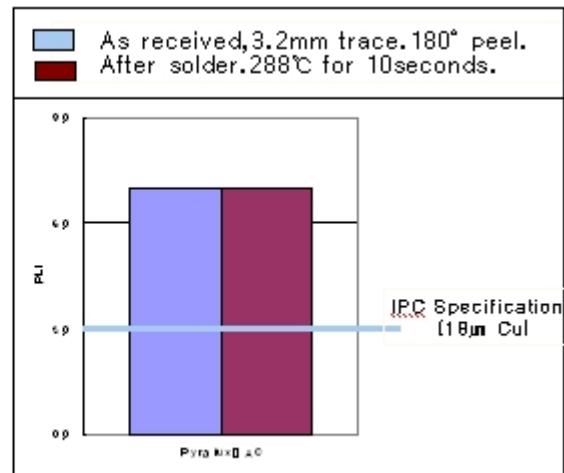


Figure 3. Temperature/Humidity Aging at 85 (185)/85%RH
for 2,000 hours

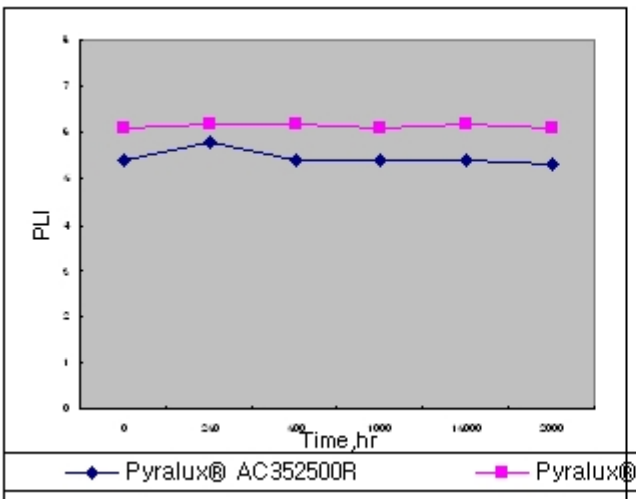
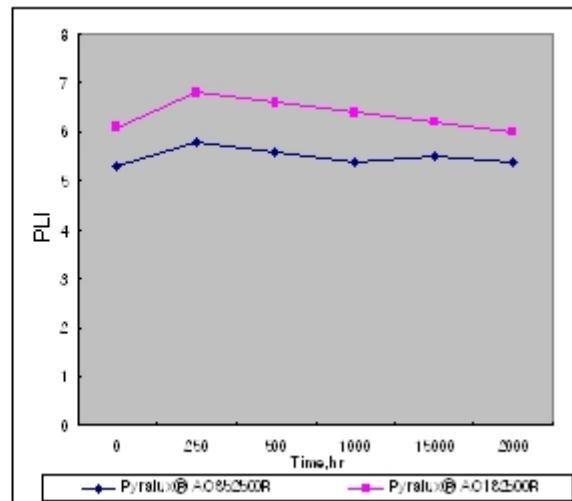


Figure 4. Temperature/Humidity Aging at 150 (302)
for 2,000 hours



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