

DuPont Pyralux® AG

All-Polyimide Flexible Laminate

A family of High-Performance Adhesiveless Laminates for Flexible Printed Circuit Applications

Product Description

Pyralux® AG double-sided, copper-clad laminate is an all-polyimide composite of polyimide film bonded to copper foil. This material system is ideal for low layer count flexible printed circuits which require advanced material performance, temperature resistance, and high reliability. Currently offered in various dielectric thicknesses, Pyralux® AG provides designers, fabricators, and assemblers a versatile option for a wide variety of flexible circuit constructions.

- Excellent thermal resistance due to all-polyimide composition
- High Cu-polyimide adhesion strength
- Good flex & bending performance
- Excellent dimensional stability
- Excellent dielectric thickness tolerance
- Low CTE for rigid flex multilayers
- UL 94 V-0, 130°C (266°F) MOT

Construction

Table 1 lists typical constructions. The product code must be used when ordering this material.

Table 1 Pyralux® AG product offering*

Product code	Dielectric Thickness, mil (µm)	Copper Thickness, oz/ft ² (µm)
AG121212RY	0.5 (12)	0.33 (12)
AG181218RY	0.5 (12)	0.5 (18)
AG122512RY	1 (25)	0.33 (12)
AG122512EM	1 (25)	0.33 (12)
AG182518RY	1 (25)	0.5 (18)
AG182518EM	1 (25)	0.5 (18)
AG125012EM	2 (50)	0.33 (12)
AG185018RY	2 (50)	0.5 (18)
AG185018EM	2 (50)	0.5 (18)
AG355035RHV	2 (50)	1 (35)
AG355035EZ	2 (50)	1 (35)

* "R" at the end of the code to specifies rolled-annealed copper (e.g. AG121212RY).

* "E" at the end of the code specifies electro-deposited copper (e.g. AG182518EM).

* For more constructions, contact your DuPont representative.

Specification

RoHS Compliant Pb-Free alloy compatible IPC-4204/11 (clad)

Typical Data

Typical data is shown in Table 2 & 3.

Table 2 Pyralux® AG Material Properties

Laminates Property	IPC-TM-650 (*or other)	Typical Data		
		AG181218RY	AG182518RY	AG185018RY
Adhesion to Cu (Peel Strength) As fabricated, N/mm (lb/in) After solder, N/mm (lb/in)	Method 2.4.9	> 1.0 (6) > 1.0 (6)	> 1.0 (6) > 1.0 (6)	> 1.0 (6) > 1.0 (6)
Dimensional Stability (MD/TD) After etching, % After 150°C/30min. aging, %	Method 2.2.4	+/- 0.07% +/- 0.07%	+/- 0.07% +/- 0.07%	+/- 0.07% +/- 0.07%
MIT Bending, cycles R=0.8mm	JIS C6471	>3500	>1500	>300
Solder Float at 288°C/10sec.	Method 2.4.13 With pre-bake at 135°C/60min	No blister No delamination	No blister No delamination	No blister No delamination

Table 3 Pyralux® AG Dielectric Property

Dielectric Property	IPC-TM-650 (*or other)	0.5 mil (12µm)	1 mil (25µm)	2 mil (50 µm)
Tensile strength, MPa (kpsi)	Method 2.4.19	225 (33)	265 (38)	300 (44)
Elongation (%)	Method 2.4.19	30	60	65
Modulus, GPa (kpsi)	Method 2.4.19	5.1 (740)	4.8 (700)	5.0 (725)
Propagation tear strength (gf)	Method 2.4.17.1	4.7	5.0	5.0
Dielectric strength (KV/mil)	ASTM D-149	7-8	7-8	7-8
Dk, 10 GHz	Cavity Resonator Method	3.2	3.2	3.2
Df, 10 GHz	Cavity Resonator Method	0.007	0.007	0.007
Surface resistance (Ω)	Method 2.5.17.1	>1*E+16	>1*E+16	>1*E+16
Volume resistance (Ω-cm)	Method 2.5.17.1	>1*E+14	>1*E+14	>1*E+14
CTE (ppm/°C)	TMA	17-20		
CHE, ppm/%RH	-	11-15		
Moisture absorption	Method 2.6.2	0.8%		
Glass Transition (Tg), C		230		

* The value given herein is not specification but typical value based on data believed to be reliable.

* The value in some of the properties may change with different test method and conditions.

Packaging

Pyralux® AG copper-clad laminate is supplied on 19.7/9.8 inch (500 mm/250mm) wide by 328 liner ft (100m) long rolls. Also available in 18" by 24" (TD by MD) sheets. Other sheet sizes available upon request.

For further product packing request contact your DuPont representative.

Processing

Pyralux® AG copper-clad laminate is fully compatible with all conventional flexible circuit fabrication processes including oxide treatment and chemical plated-through-hole with plasma via clean process. Fabricated circuits can be coated and laminated together to form multilayers using polyimide, acrylic, or epoxy adhesives.

Storage and Warranty

Pyralux® AG copper-clad laminate does not require refrigeration and recommend storing in the original packaging at temperatures of 4-29°C and below 70% relative humidity. The material should be kept clean and well protected from physical damage. 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

Anyone handling Pyralux® AG should wash their hands with soap before eating, smoking, or using restroom facilities. Although DuPont is not aware of anyone developing contract dermatitis when using Pyralux® AG products, some individuals may be more sensitive than others. Gloves, finger cots, and finger pads should be changed daily.

Pyralux® AG 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 made with Pyralux® AG, provide adequate vacuum around the drill to minimize worker exposure to generated dust.

As with all thin, copper-clad laminates, sharp edges present a potential hazard during handling. All personnel involved in handling Pyralux® AG clads should use suitable gloves to minimize potential cuts.

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