

# PRELIMINARY TECHNICAL DATA

DuPont Electronic Technologies  
High Performance Materials  
P. O. Box 13999  
14 T.W. Alexander Drive  
Research Triangle Park, NC 27709  
Telephone (919) 248-5000

## ULTRATEMP\*\* Composite Laminate

### Description

Ultratemp\*\* composite laminates offer superior thermal performance in a thin, durable laminate that can withstand the higher temperature processing conditions of lead-free solder.

### Construction / Packaging

Ultratemp\*\* composite laminates are constructed of copper foil and anodized aluminum bonded together with DuPont's Pyralux\* LF modified acrylic adhesive. The product is available in 1oz RA copper bonded to 0.062 in. (1.6 mm) anodized aluminum with 0.5 mils (12.7 micron) of DuPont's Pyralux\* LF modified acrylic adhesive. Finished panel sizes are noted below:

24 in. (610 mm) x 36 in. (914 mm)  
24 in. (610 mm) x 18 in. (457 mm)  
12 in. (305 mm) x 18 in. (457 mm)

### Typical Properties

Labels on each box contain the lot number, DuPont order number, customer order number, IPC specification.

## Preliminary Data

### Ultratemp\*\* Composite Laminate Properties

Property	Typical Value	Test Method
Adhesion (lb.in,[kg/cm]) As Received After Solder	10 [1.8] 10 [1.8]	IPC-TM-650 2.4.9
Thermal Resistance ( °Cin <sup>2</sup> /W)	0.05	ASTM 5470
Dielectric Withstanding Voltage (VDC)	1200	300 VAC/sec ramp 10 sec hold 0.5 mil thick dielectric
Dielectric Strength (VAC/Mil)	4000	ASTM D-149 330v/sec ramp
Dielectric Constant @ 1 MHz	9.2	ASTM D-149
MOT (maximum operating temperature), degrees C	140 to 150 (1)	MOT tested by DuPont according to UL 746E for metal clad laminates. UL certification pending.
Solder Reflow @ 300 degree C, secs	>60	Tested according to UL 746 for metal clad laminates

(1) Internal Testing indicates that this product may have an MOT as high as 150 deg C pending UL test results

## Processing

Ultratemp\*\* composite laminates are compatible with most PCB processes and equipment. However prior to using a Ultratemp\*\* composite laminate, DuPont recommends that you first contact your DuPont Technical Representative, regarding any special handling requirements that might be necessary.

## Storage

Ultratemp\*\* composite laminate 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.

## Safe Handling

Ultratemp\*\* composite laminates are supplied in sheets and are fully cured (C-staged).

Although DuPont is not aware of any medical concerns relating to the use of Pyralux\* LF modified acrylic adhesive, appropriate chemical handling protocols must be followed.

After etching, appropriate lint-free gloves or fingerpads are required to prevent contact between skin and exposed adhesive. Anyone handling Pyralux\* adhesive should follow appropriate safety protocols, including washing hands with soap before eating, smoking, or using restroom facilities, changing gloves and fingerpads daily, and washing protective clothing frequently.

Drill rooms should be furnished with proper ventilation and exhaust, including equipment recommended by drill vendors or required by OSHA standards.

For further information on safe handling, refer to Du Pont publication H-46873, "Pyralux\* LF and FR Safe Handling;" and refer to "Industrial Ventilation," 18<sup>th</sup> 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% off their accepted limits (PEL or TLV). In only one case, did the concentration reach approximately 40% of it's 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.

## Disclaimer

**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.

This information corresponds to DuPont's current knowledge on this subject and relates only to Pyralux\* flexible composites. It may not be valid for this material in all manufacturing processes or when the material is used in combination with other materials. It is offered solely to provide possible suggestions for your own testing and is not intended as a substitute for testing you may need to conduct to determine the suitability of Pyralux\* flexible composites for your particular application. This information may be subject to revision as new knowledge and experience become available. The conditions of your use of the material are outside DuPont's control, and DuPont cannot anticipate all variations in actual end-use conditions. Therefore, it makes no warranties and assumes no liability in connection with any use of this information.

\* DuPont Registered Trademark

\*\* Ultratemp is a Trademark of Heat Technology Inc