

## PTFE/Woven Fiberglass/Micro-Dispersed Ceramic Filled Laminate for RF & Microwave Printed Circuit Boards

### Features:

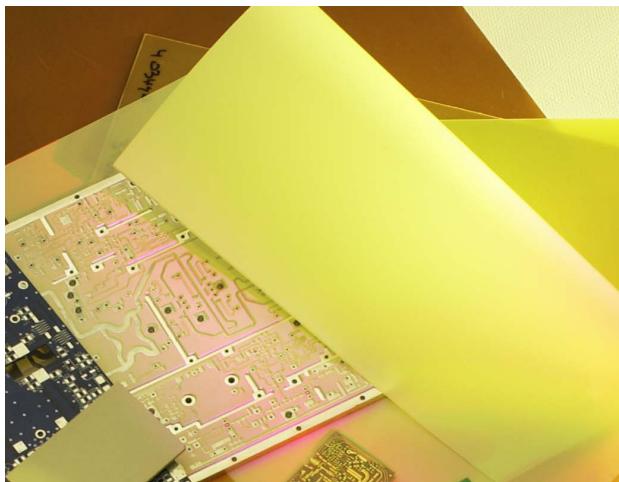
- Low Loss Ceramic Filled PTFE
- Dielectric Constant (4.30)
- Mechanically Robust
- High Thermal Conductivity
- Very Low Z-Direction CTE
- Large Panel Sizes Available
- Low Thermal Coefficient of Er

### Benefits:

- Excellent Heat Dissipation and Heat Management
- Multiple boards per panel (reduced edge trim waste)
- Large antenna formats

### Typical Applications:

- Digital Audio Broadcasting (DAB) Antennas (Satellite Radio)
- GPS Antennas
- RFID Reader Antennas
- Electronic Surveillance, SIGINT and other RF Applications
- Applications Requiring Low Loss and Some Degree of Miniaturization
- Replacement for lossier (*and frequency limited*) FR-4, ceramic/epoxy thermoset and ceramic filled hydrocarbons
- Multimedia Transmission Systems



Arlon's AD430 is a woven fiberglass reinforced, ceramic filled, PTFE-based composite material for use as a printed circuit board substrate. It has been developed to provide low loss, low thermal expansion and strong interlaminar and copper bond integrity while maintaining a high degree of affordability.

The electrical properties of AD430 are highly desired in applications where higher frequency and expectations for increased fidelity with broadband signals are beyond the performance capabilities offered by FR-4, ceramic/epoxy thermosets and ceramic filled hydrocarbons.

The robust AD430 overcomes the brittleness of ceramics (such as alumina or LTCC) through the suspension of micro-dispersed ceramics in a relatively soft PTFE based substrate. This gives RF designers the advantages of low loss without sacrificing the mechanical robustness required to fulfill the needs of today's shock, drop and impact testing requirements of today's electronics.

AD430 higher thermal conductivity and low CTE promote its use in higher power designs, where temperature extremes are normal and heat rejection is a primary consideration. Its lower CTE offers better component attachment reliability as well.

AD430 is compatible with the processing used for standard PTFE based printed circuit board substrates. Its low Z-axis thermal expansion improves plated through hole reliability compared to typical PTFE based laminates. Low X-Y expansion improves BGA solder-joint reliability.

AD430's Low Thermal Coefficient of Er is also ideal for applications that experience diverse temperature changes and are sensitive to Phase Stability.

## Typical Properties: AD430

Property	Test Method	Condition	Result
Dielectric Constant @10GHz	IPC TM-650 2.5.5.6	C23/50	4.30
Loss Tangent @10 GHz	IPC TM-650 2.5.5.6	C23/50	0.003
Thermal Coefficient of $\epsilon_r$	IPC TM-650 2.5.5.5	-10°C to +140°C	- 55
Copper peel Strength (1oz) lbs (lbs. per linear inch)	IPC TM-650 2.4.8	A, TS	17
Volume Resistivity (MΩ-cm)	IPC TM-650 2.5.17.1	C96/35/90	$1.2 \times 10^9$
Surface Resistivity (MΩ)	IPC TM-650 2.5.17.1	C96/35/90	$4.5 \times 10^7$
Arc Resistance (seconds)	ASTM D-495	D48/50	>180
Tensile Modulus (kpsi)	ASTM D-638	A, 23°C	> 700
Tensile Strength (kpsi)	IPC TM-650 2.4.18	A, 23°C	> 20
Compressive Modulus (kpsi)	ASTM D-695	A, 23°C	> 350
Flexural Modulus (kpsi)	ASTM D-790	A, 23°C	> 540
Dielectric Breakdown (kV)	ASTM D-149	D48/50	> 45
Specific Gravity (g/cm <sup>3</sup> )	ASTM D-792 Method A	A, 23°C	2.10
Water Absorption (%)	IPC TM-650 2.6.2.2	E1/105 + D24/23	0.06
Coefficient of Thermal Expansion (ppm/°C) X Axis Y Axis Z Axis	IPC TM-650 2.4.24 TMA	0°C to 100°C	9 9 40
Thermal Conductivity (W/mK)	ASTM E-1225	100°C	0.46
Flammability	UL 94 Vertical Burn	C48/23/50, E24/125	UL94-V0

### Material Availability:

Current Standard Production is based on a 0.125" thickness design. Other thicknesses, may be available upon request. Please contact Arlon Customer Service to discuss your application.

AD430 is supplied with 1/2, 1 or 2 ounce electrodeposited copper on both sides. Other copper weights and rolled copper foil are available. AD430 is also available bonded to heavy metal ground planes. Aluminum, brass or copper plate can provide an integral heat sink and mechanical support to the substrate.

When ordering AD430, specify dielectric thickness, cladding, panel size and any other special considerations. Typical Panels are cut from a Master Sheet. The master sheet is limited to 36" x 48" and 36" x 72". Typical panel sizes cut from a master sheet include: 12" x 18", 18" X 24", 16" X 18". Custom sizes are available.