

## PTFE/Woven Fiberglass/Ceramic Filled Laminate for Microwave Printed Circuit Boards

### Features:

- Ideal for Microwave Components and Chip Packaging Applications
- High Thermal Conductivity
- Panel Sizes up to 18" x 24"
- Thin Dielectric Material

### Benefits:

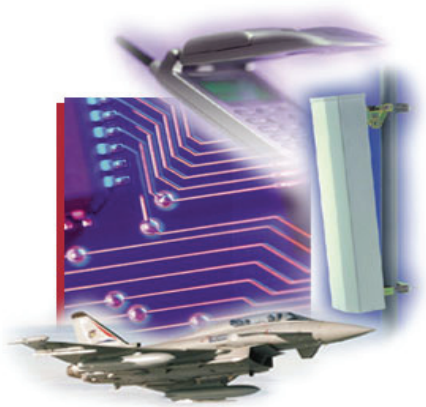
- Efficient, High Yield Fabrication
- Image, Print and Etch Both Sides Simultaneously (Eliminates the Need for Sequential Lamination)
- Circuit Miniaturization
- Heat Dissipation and Management
- Replaces Ceramic in Some Applications

### Typical Applications:

- Miniaturized Couplers and Feed Networks
- LNAs, LNBs, Pas
- Robust Alternative to Ceramic

At 0.0024" and 10.2 Er, AD10 is ARLON's new ultra thin high dielectric constant product comprised of a ceramic filled PTFE on lightweight woven glass reinforcement. AD10's high Er and thin dielectric permits various degrees of circuit miniaturization and is ideal for microwave components, In particular; miniaturized couplers and in-situ PCB-based discrete capacitors.

AD10 is a "soft" substrate and is relatively insensitive to stress from vibration. This allows miniaturized circuitry without requiring complicated processing or fragile handling associated with brittle, pure ceramic substrate materials. Because it is based on woven glass reinforcement, AD10 offers improved efficiency and yield versus other thin high Er soft substrate materials.



## Typical Properties: AD10

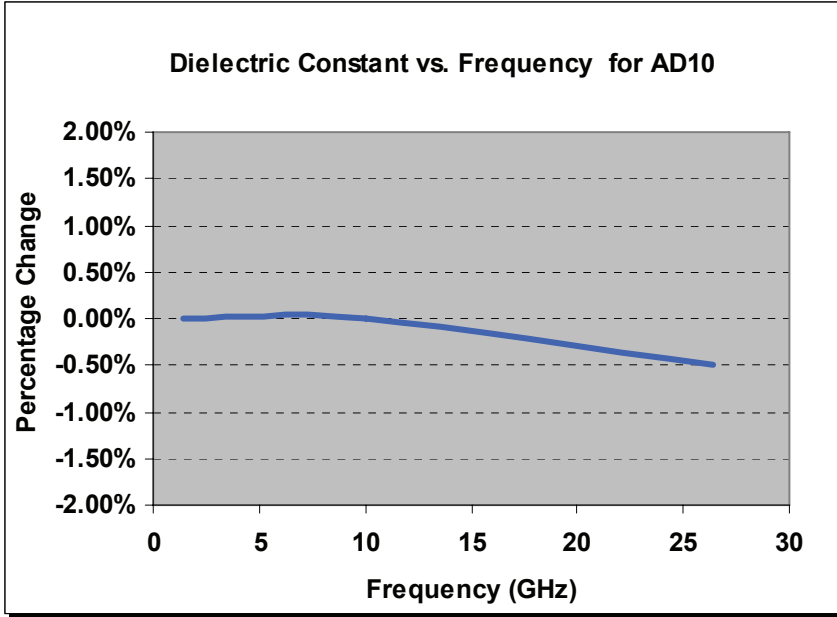
Property	Test Method	Condition	Result
Dielectric Constant @ 10 GHz	IPC TM-650 2.5.5.5	C23/50	10.2
Dissipation Factor @ 10 GHz	IPC TM-650 2.5.5.5	C23/50	0.0078
Thermal Coefficient of Er (ppm/°C)	IPC TM-650 2.5.5.5	-10°C to +140°C	-422.7
Copper Peel Strength (½ oz, 1 oz) (lb/in)	IPC TM-650 2.4.8	A, TS	4
Volume Resistivity (MΩ-cm)	IPC TM-650 2.5.17.1	C96/35/90	>10 <sup>9</sup>
Surface Resistivity (MΩ)	IPC TM-650 2.5.17.1	C96/35/90	>10 <sup>9</sup>
Arc Resistance (seconds)	IPC TM-650 2.5.1B	D48/50	>180
Tensile Modulus (kpsi)	ASTM D-638	A, 23°C	>600
Tensile Strength (kpsi)	IPC TM-650 2.4.18	A, 23°C	>4.0
Compressive Modulus (kpsi)	ASTM D-695	A, 23°C	>400
Flexural Modulus (kpsi)	ASTM D-790	A, 23°C	>600
Dielectric Breakdown (kV)	ASTM D-149	D48/50	>45
Density (g/cm <sup>3</sup> )	ASTM D-792 Method A	A, 23°C	2.80
Water Absorption (%)	IPC TM-650 2.6.2.2	E1/105 + D24/23	0.03
Coefficient of Thermal Expansion (ppm/°C) x Axis y Axis z Axis	IPC TM-650 2.4.24 TMA	0°C to 100°C	5.6 5.8 8.2
Thermal Conductivity (W/mK)	ASTM E-1225	100°C	0.55
Flammability	UL 94 Vertical Burn	C48/23/50, E24/125	UL94-V0

### **Material Availability:**

AD10 laminate is supplied with ½ ounce or one ounce, reverse treat, electrodeposited copper on both sides. Available in 0.0024 thicknesses.

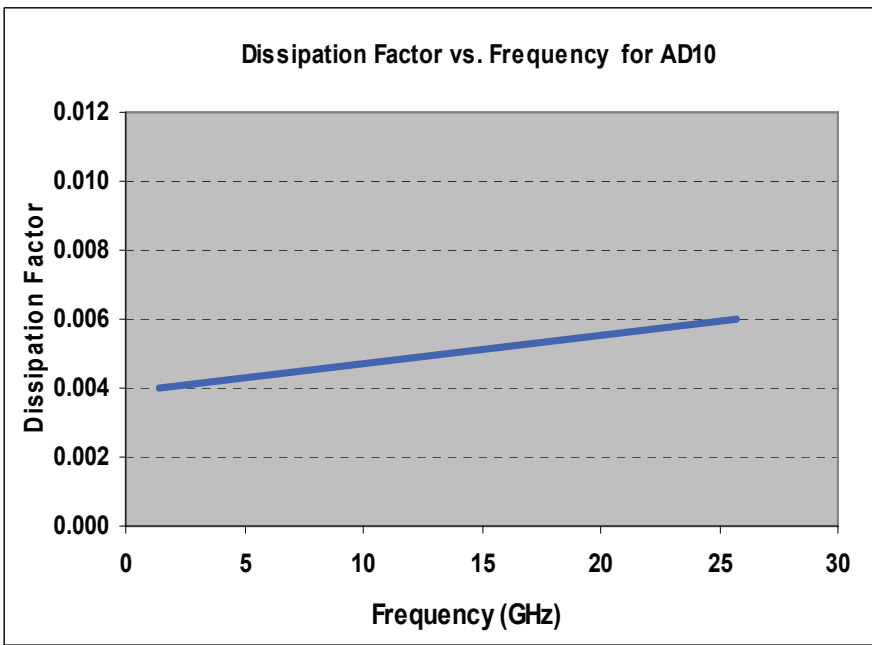
When ordering AD10 product, please specify cladding, panel size, and any other special considerations. Available in 18" x 24" panel size.

# AD10 Laminate



**Figure 1**

Demonstrates the Stability of Dielectric Constant across Frequency. This information was correlated from data generated by using a free space and circular resonator cavity. This characteristic demonstrates the inherent robustness of Arlon Laminates across Frequency, thus simplifying the final design process when working across EM spectrum. The stability of the Dielectric Constant of AD10 over frequency ensures easy design transition and scalability of design.



**Figure 2**

Demonstrates the Stability of Dissipation Factor across Frequency. This characteristic demonstrates the inherent robustness of Arlon Laminates across Frequency, providing a stable platform for high frequency applications where signal integrity is critical to the overall performance of the application.



**MATERIALS FOR ELECTRONICS**

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