ARLON
MICROWAVE MATERIALS

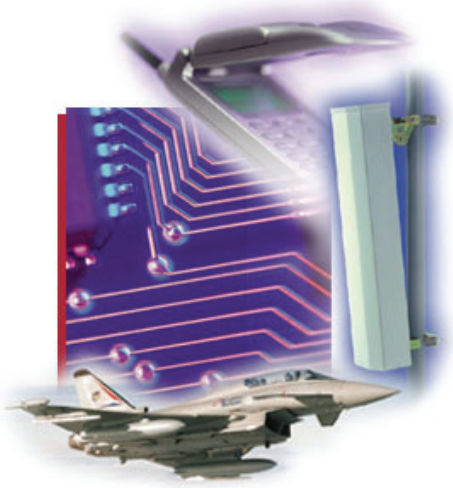
AR1000

PTFE/Woven Fiberglass
Ceramic Filled High Er Laminates

Features:
- Ceramic Filled High Er
- High Thermal Conductivity
- Larger Panel Size vs. Other Ceramics
- Fiberglass Reinforcement provides for Mechanical Robustness (less brittle)

Benefits:
- Circuit Miniaturization
- Greater Heat Dissipation and Thermal Management
- Larger Panels allow for Cost Effective Volume Manufacture of Components

Typical Applications:
- Miniaturized power amplifiers, filters, couplers and other components
- Miniaturized RF Manifolds



Arlon's AR1000 is woven fiberglass, reinforced ceramic filled PTFE based composite materials for use as printed circuit board substrates.

The higher dielectric constant of AR1000 permits various degrees of circuit miniaturization, especially for power amplifiers, filters, couplers and other components that use low impedance lines.

AR1000 is a "soft substrate" and is relatively insensitive to vibrational stress. This allows miniaturized circuitry without requiring the complicated processing or fragile handling associated with brittle pure ceramic materials.

AR1000 is compatible with the processing used for standard PTFE based printed circuit board substrates.

In addition, the low Z-axis thermal expansion provided by the ceramic loading will improve plated through hole reliability, compared to typical PTFE based laminates.

Typical Properties: AR1000			
Property	**Test Method**	**Condition**	**Results**
Dielectric Constant @ 10GHz	IPC TM-650 2.5.5.6	C23/50	10
Dissipation Factor @ 10GHz	IPC TM-650 2.5.5.6	C23/50	0.003
Thermal Coefficient of Er (ppm/°C)	IPC TM-650 2.5.5.5 Adapted	-10°C to +140°C	-233
Peel Strength (lbs.per inch)	IPC TM-650 2.4.8	After Thermal Stress	5
Volume Resistivity (MΩ-cm)	IPC TM-650 2.5.17.1	C96/35/90	1.4×10^{9}
Surface Resistivity (MΩ)	IPC TM-650 2.5.17.1	C96/35/90	1.8×10^{9}
Arc Resistance (sec)	ASTM D-495	D48/50	>180
Tensile Modulus (kpsi)	ASTM D-638	A, 23°C	830, 680
Tensile Strength (kpsi)	ASTM D-882	A, 23°C	5.1, 4.3
Compressive Modulus (kpsi)	ASTM D-695	A, 23°C	450
Flexural Modulus (kpsi)	ASTM D-790	A, 23°C	615
Dielectric Breakdown (kV)	ASTM D-149	D48/50	>45
Density (g/cm^3)	ASTM D-792 Method A	A, 23°C	2.84
Water Absorption (%)	MIL-S-13949H 3.7.7 IPC TM-650 2.6.2.2	E1/105 + D24/23	0.08
Coefficient of Thermal Expansion (ppm/°C) X Axis Y Axis Z Axis	IPC TM-650 2.4.24 TMA	0°C to 100°C	 14 16 37
Thermal Conductivity (W/mK)	ASTM E-1225	100°C	0.645
Outgassing Total Mass Loss (%) Collected Volatile Condensable Material (%) Water Vapor Regain (%) Visible Condensate (±)	NASA SP-R-0022A Maximum 1.00% Maximum 0.10%	125°C, $\leq 10^{-6}$ torr	 0.02 0.00 0.00 NO
Flammability	UL 94 Vertical Burn IPC TM-650 2.3.10	C48/23/50, E24/125	Meets requirements of UL94-V0

Material Availability

AR1000 laminates are available in a range of thicknesses from 0.005" to 0.125" and supplied with 1/2, 1 or 2 ounce electrodeposited copper on both sides. Other copper weights and rolled copper foil are available. AR1000 is available bonded to heavy metal ground planes. Aluminum, brass or copper plates also provide an integral heat sink and mechanical support to the substrate. Other combinations of thickness and cladding may be available. Contact Arlon with any requests for non-standard materials. When ordering AR1000 product, please specify thickness, cladding, panel size, and any other special considerations. Available master sheet sizes include 36" x 48" and 36" x 72".

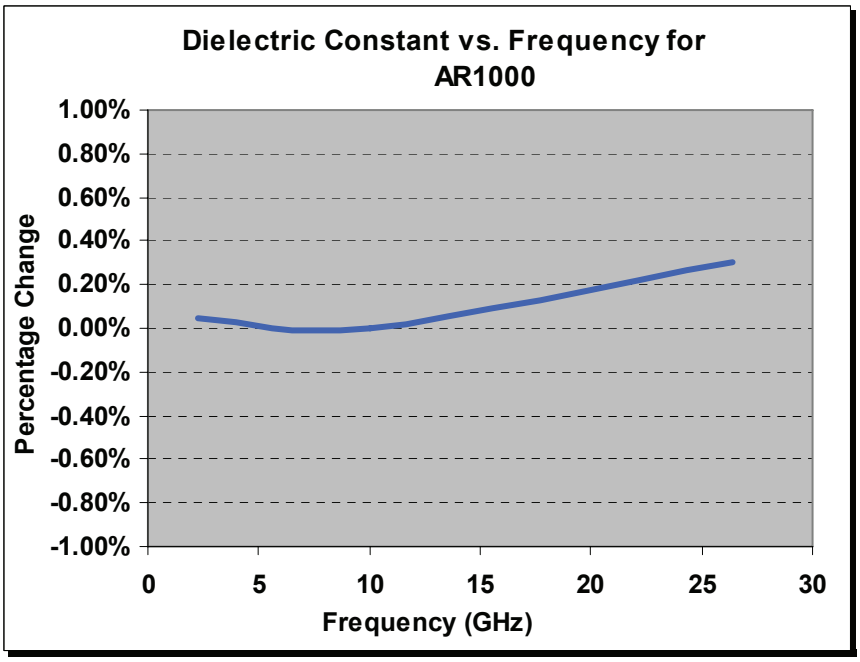


Figure 1

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 AR1000 over frequency ensures easy design transition and scalability of design.

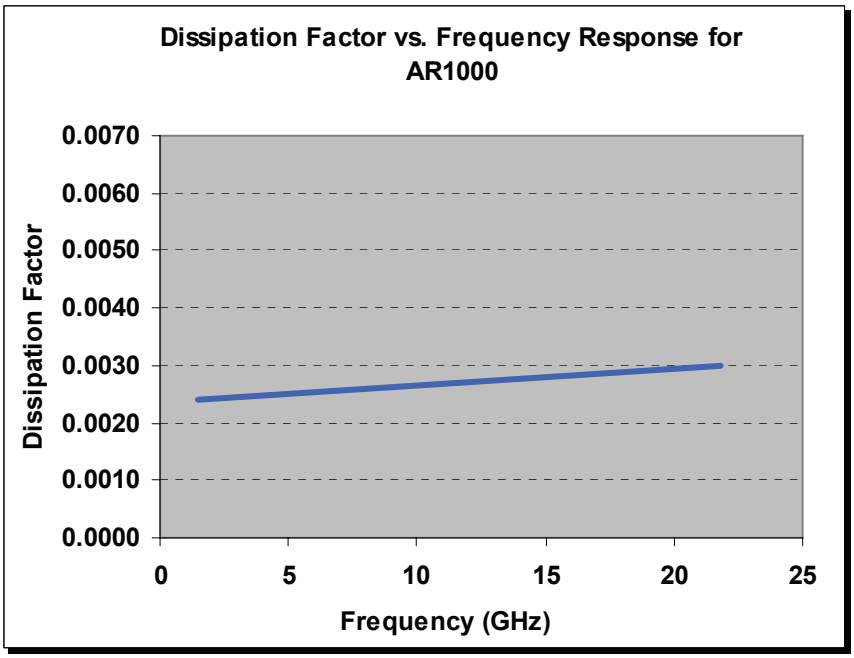


Figure 2

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.

ARLON
MATERIALS FOR ELECTRONICS

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