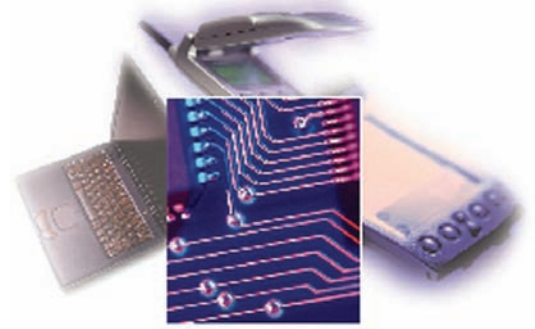


# **65GT, 55ST, 55NT and 55RT**

## **Arlon Epoxy Nonwoven Aramid Products**

### **Electronic Substrates**



Arlon 65GT, 55ST, 55NT and 55RT laminate and prepreg systems are based on DuPont's Thermount®, a nonwoven aramid (NWA) reinforcement, and are engineered to provide a unique combination of properties to the designer of HDI and SMT printed circuit boards. Arlon's epoxy NWA products are ideal for such diverse applications as MCM-L, Fine Pitch SMT, BGA and Micro-BGA, and LCCC and offer design and performance advantages in a wide range of end uses such as handheld phone boards and burn-in boards for IC testing.

#### **Arlon 65GT**

Halogen-Free “Green” UL-94 V0 NWA-Epoxy System is Environmentally Friendly for Conscientious Consumers

#### **Arlon 55ST**

IPN (Interpenetrating Polymer Network) Resin Technology Delivers High Peel Values and Internal Cohesive Strength For Enhanced Reliability and Resistance to Mechanical Shock

#### **Arlon 55NT**

Lowest X-Y CTE Values for Surface Mount Technology

#### **Arlon 55RT**

Multifunctional Epoxy Resin on NWA Substrate

#### **Features**

- 100% Organic Random Fiber Reinforcement
- Outstanding CAF Resistance
- Minimal Etch Shrinkage
- Smooth Surface
- High Tg Resin Systems
- Low In-Plane CTE
- UL Flammability Rating
- Lightweight

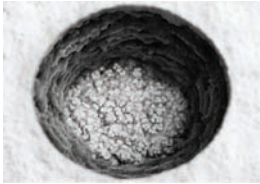
#### **Benefits**

- Laser Microvias as small as 25-50 microns Resists Resin Microcracking in Handheld PCD's
- Reduced Risk of Electrical Failure in Service
- Excellent layer to layer registration
- Ultrafine line definition with thin copper foil
- Improved PTH Reliability
- Improved Reliability through Thermal Cycling of Numerous SMT Package Configurations
- UL-94 V0
- 25% lighter than standard FR-4

# Why Use Arlon's Epoxy Nonwoven Aramid Products?

## When HDI Requirements Necessitate Surface Microvias

- Convenient Cost Effective Laser Microvia Formation
- Random Fiber Reinforcement Resists Resin Cracking
- Controlled Flow of Resin for Parallel Planar Surfaces



Arlon's epoxy NWA products allow the formation of cleaner (vs. FR-4) laser microvias in surface layers while permitting the use of buried FR-4 signal bus layers in the center. In many cases this results in greatly improved interconnect density at reduced total cost, a key objective in many applications, and particularly in mobile electronic devices.

## When Performance Criteria Demand CAF Resistance

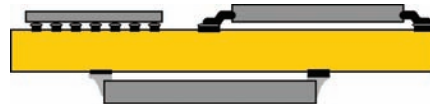
- When Hole Spacing is Sized for sub 0.5 mm Pitch
- Random Fiber Aramid Reduces the Available Path for CAF



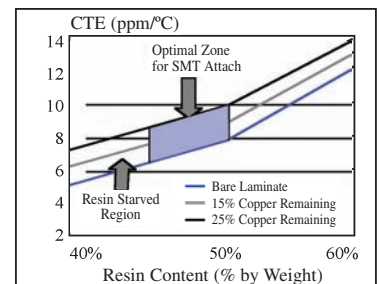
CAF (Conductive Anodic Filament) formation requires voltage bias, ionic residue and a physical pathway. Nonwoven aramid laminates (picture above, right) do not provide the fiberglass "freeway" (picture above, left) that is typical of woven glass constructions. In addition, Arlon has engineered the 65GT and 55ST resin systems using interpenetrating polymer network (IPN) technology to optimally "saturate" the fibers, further limiting the possibility of conductive path growth along the fiber.

## When SMT Requires Controlled Substrate CTE

- Tailorable CTE from near 6 ppm/°C
- Smooth Surface Permits Fine Pitch SMT Designs



The ability to tailor CTE values of nonwoven aramid systems to values as low as 6-9 ppm/°C allows attachment of a variety of SMT configurations with minimal risk of solder joint failure caused by device/substrate CTE mismatch.



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## Arlon Nonwoven Aramid Selector Guide

Product	CAF	XY CTE	Green*	Peel	UL-94
65GT (epoxy)	++	+	Yes	8	V0
55ST (epoxy)	++	+	No	10	V0
55NT (epoxy)	+	++	No	4	V0
55RT (epoxy)	++	+	No	5.5	V0
85NT (polyimide) <sup>1</sup>	+	++	n/a	3.5	HB
85RT (polyimide) <sup>1</sup>	++	+	n/a	4	n/a

++ = "Best"

+ = "Good"

\* Green = Halogen/Antimony-Free

<sup>1</sup>Note: For additional information on Arlon Polyimide NWA Products visit our Website at [www.arlon-med.com](http://www.arlon-med.com)

## Typical Laminate Properties

Property / IPC4101 Slash Number	Test Method / Condition	55ST / 55	55NT / 55	55RT / 55	65GT / 55*
Peel Strength after solder N/mm (lb/in)	IPC-TM-650 2.4.8 A23	1.75 (10)	0.7 (4.0)	0.96 (5.5)	1.4 (8)
Tg °C	IPC-TM-650 2.4.24 TMA	175	170	170	150
CTE - Z axis (ppm/°C) (TMA)	IPC-TM-650 2.4.24 25 to 125oC	120	110	110-120	120
CTE - X,Y axis (ppm/°C) (TMA)	IPC-TM-650 2.4.24 25 to 125oC	10-12	6-9	10-12	10-12
Permittivity (1 MHz)	IPC-TM-650 2.5.5.3 C23/50	3.63	3.85	3.63	3.45
Loss Tangent (1 MHz)	IPC-TM-650 2.5.5.3 C23/50	0.022	0.015	0.015	0.02
Flammability	UL 94 C48/23/50 E24/125	V-0	V-0	V-0	V-0
Volume Resistivity (megohm-cm)	IPC-TM-650 2.5.17.1 C23/50	1x10 <sup>10</sup>	1x10 <sup>10</sup>	1x10 <sup>10</sup>	1x10 <sup>10</sup>
Surface Resistivity (megohms)	IPC-TM-650 2.5.17.1 C23/50	1x10 <sup>9</sup>	1x10 <sup>9</sup>	1x10 <sup>9</sup>	1x10 <sup>9</sup>
Flexural Strength Mpa (Kpsi)	ASTM-D-790 A 23OC	260 (37.7)	260 (37.7)	289 (42)	TBD
Flexural Modulus Gpa (Mpsi)	ASTM-D-790 A 23OC	13 (1.89)	13 (1.89)	14.5 (2.1)	13 (1.89)
Tensile Strength Mpa (Kpsi)	ASTM-D-3039 A 23OC	250 (36.3)	250 (36.3)	220 (32)	TBD
Tensile Modulus Gpa (Mpsi)	ASTM-D-3039 A 23OC	14 (2.03)	14 (2.03)	14.5 (2.1)	TBD
Laminate Smoothness Å	2200	2200	2200	2200	
Density g/cc	ASTM D-792	1.3	1.3	1.3	1.3
Electrical Strength (V/mil)	IPC-TM-650 2.5.6.2	1500	1500	1500	1500
Water Absorption (%)	IPC-TM-650 2.6.2.1 E1/105 + D24/23	0.28	0.3	0.3	0.27

\*65GT Meets all provisions of IPC 4101/55 but utilizes a halogen-free FR system.

## Prepreg Styles Available

Grade	Arlon Part Number	Reinforcement	RC%	Mils/Ply*	Flow %
65GT	65GT7253	2N710	53	1.9	15
IPC 4101 /55	65GT7353	3N710	53	3	15
	65GT7453	4N710	53	4	15
	65GT7265	2N710	65	2.3	25
	65GT7365	3N710	65	3.6	25
	65GT7463	4N710	63	5	25
55ST	55ST7253	2N710	53	1.9	15
IPC 4101 /55	55ST7353	3N710	53	3	15
	55ST7453	4N710	53	4	15
	55ST7265	2N710	65	2.3	25
	55ST7363	3N710	63	3.6	25
	55ST7463	4N710	63	5	25
55NT	55NT147	E210	49	1.7	12
IPC 4101 /55	55NT247	E220	49	3	12
	55NT347	E230	49	3.8	12
55RT	55RT7253	2N710	53	1.9	15
IPC 4101 /55	55RT7353	3N710	53	3	15
	55RT7453	4N710	53	4	15
	55RT7266	2N710	66	2.3	25
	55RT7363	3N710	63	3.6	25
	55RT7463	4N710	63	5	25

Note: 63% Resin Content Prepregs are optimized for filling inner layer via holes

\* Typical Pressed Thickness

Thermount® is a registered trademark of E.I. du Pont de Nemours and Company

### Laminate Availability

Arlon 65GT, 55ST, 55NT and 55RT epoxy nonwoven aramid products are available in thicknesses from 0.002" to 0.125" with 1/2 1 and 2 ounce copper foil standard. Other laminate thicknesses and special copper cladding (such as 1/4 ounce) may be available. Standard sheet size is 36" x 48" which yields standard 12 x 18 or 18 x 24 panels. Contact Arlon Customer Service for nonstandard or custom materials.

*Data provided herein is provided for reference purposes only and are not intended to be sales specifications. Determination of the suitability of any of these materials for a particular application is the sole responsibility of the user. Furthermore, no suggestion for use, or material supplied shall be construed as a recommendation or inducement to violate any law or infringe on any patent. Product specifications may be subject to change.*

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