

85HP

High Performance Polyimide Laminate and Prepreg



Arlon 85HP's unique blend of pure polyimide resin and micro-fine proprietary fillers results in superior performance for demanding applications. Compared to conventional polyimide systems, 85HP has a lower Z-axis expansion and twice the thermal conductivity. 85HP reduces resin cracking and wicking in designs with high density plated through holes and vias. 85HP prepreg has resin flow characteristics and pressed thickness matching standard polyimides.



Features:

- Minimizes cracking and wicking
- $T_c = 0.5 \text{ W/mK}$, 2x thermal conductivity
- High T_g (250°C) pure polyimide
- Thermal Decomposition Temperature (T_d , 5%) of 430°C
- T-300 greater than 60 minutes
- Reduced Z-axis expansion
- Meets IPC-4101 /40 and /41
- Balanced glass weave
- X/Y CTE of 17 ppm/°C (typical) improved flatness

Typical Applications:

- High process or assembly temperatures (lead-free soldering)
- Designs with high layer counts and MLB complexity
- Equipment exposed to extreme temperatures:
 - Defense systems
 - Aircraft engine instrumentation
 - Semiconductor testing (burn-in boards)
 - Petroleum exploration (down-hole drilling)
 - Under-hood automotive
 - Industrial sensor systems
 - Space and satellites

Typical Properties:

Property	Units	Value	Test Method
1. Electrical Properties			
Dielectric Constant			
@ 1 MHz	Prepreg @ 69% RC	4.0	IPC TM-650 2.5.5.3
@ 1 GHz	-		IPC TM-650 2.5.5.9
Dissipation Factor			
@ 1 MHz	-	0.008	IPC TM-650 2.5.5.3
@ 1 GHz	-		IPC TM-650 2.5.5.9
Volume Resistivity			
C96/35/90	MΩ-cm	1.5 x 10 ⁸	IPC TM-650 2.5.17.1
E24/125	MΩ-cm	3.0 x 10 ⁸	IPC TM-650 2.5.17.1
Surface Resistivity			
C96/35/90	MΩ	1.6 x 10 ⁹	IPC TM-650 2.5.17.1
E24/125	MΩ	1.6 x 10 ⁸	IPC TM-650 2.5.17.1
Electrical Strength	Volts/mil (kV/mm)	1500 (59)	IPC TM-650 2.5.6.2
Dielectric Breakdown	kV		IPC TM-650 2.5.6
Arc Resistance	sec	143	IPC TM-650 2.5.1
2. Thermal Properties			
Glass Transition Temperature (Tg)			
TMA	°C	250	IPC TM-650 2.4.24
DSC	°C		IPC TM-650 2.4.25
Decomposition Temperature (Td)			
Initial	°C	380	IPC TM-650 2.3.41
5%	°C	430	IPC TM-650 2.3.41
T260	min	>60	IPC TM-650 2.4.24.1
T288	min	>60	IPC TM-650 2.4.24.1
T300	min	>60	IPC TM-650 2.4.24.1
CTE (X,Y)	ppm/°C	17	IPC TM-650 2.4.41
CTE (Z)			
< Tg	ppm/°C	45	IPC TM-650 2.4.24
> Tg	ppm/°C	150	IPC TM-650 2.4.24
z-axis Expansion (50-260°C)	%	1.0	IPC TM-650 2.4.24
3. Mechanical Properties			
Peel Strength to Copper (1 oz/35 micron)			
After Thermal Stress	lb/in (N/mm)	6.5 (1.1)	IPC TM-650 2.4.8
At Elevated Temperatures	lb/in (N/mm)	6.5 (1.1)	IPC TM-650 2.4.8.2
After Process Solutions	lb/in (N/mm)	6.5 (1.1)	IPC TM-650 2.4.8
Young's Modulus	Mpsi (GPa)	3.0	IPC TM-650 2.4.18.3
Tensile Strength (MD/CD)	Kpsi (MPa)	35 (241)	
Poisson's Ratio	-	0.15	ASTM D-3039
4. Physical Properties			
Water Absorption (0.062")	%	0.32	IPC TM-650 2.6.2.1
Specific Gravity	g/cm ³	1.7	ASTM D792 Method A
Thermal Conductivity	W/mK	0.5	ASTM E1461
Flammability	Class	HB	UL-94

Availability:

Arlon Part Number	Glass Style	Ho (mils)	Hf (mils)	ΔH (mils)
85H6770	1067	2.40	2.00	0.40
85H8663	1086	3.25	2.80	0.45
85H3358	3313	4.40	3.90	0.50
85H2654	2116	5.00	4.45	0.55

Recommended Process Conditions: *

Vacuum desiccate the prepreg for 8 - 12 hours prior to lamination.

Process inner-layers through develop, etch, and strip using standard industry practices. Use brown oxide or alternatives on inner layers. Adjust dwell time in the oxide bath to ensure uniform coating. Bake inner layers in a rack for 60 minutes at 225°F - 250°F (107°C - 121°C) immediately prior to lay-up.

Lamination Cycle (steps 1-6):

- 1) Pre-vacuum for 30-45 minutes
- 2) Control the heat rise to 4°C - 6°C (8°F - 12°F) per minute between 65°C and 121°C (150°F and 250°F)
- 3) Vacuum lamination is preferred.

Panel Size		Lamination Pressures			
		Pressure		Pressures/29" Vacuum	
in	cm	psi	kg/cm ²	psi	kg/cm ²
12 x 18	30 x 46	275	19	200	14.0
16 x 18	40 x 46	350	25	250	17.5
24 x 18	61 x 46	400	28	300	21.0

- 4) Product temperature at start of cure = 218°C (425°F).
- 5) Cure time at temperature = 2.0 hours
- 6) Cool down under pressure at ≤ 5°C/min (10°F/min)

Drill at 350-400 SFM. Undercut bits are recommended for vias 0.018" (0.45cm) and smaller

De-smear using plasma with settings appropriate for polyimide; plasma is preferred for positive etchback

Conventional plating processes are compatible with 85HP

Standard profiling parameters may be used;

Bake for 1 - 2 hours at 250°F (121°C) prior to solder reflow or HASL

Arlon Electronic Materials...
CHALLENGE US!

For samples, technical assistance and customer service, please contact Arlon Electronic Materials Division at the following locations:

NORTH AMERICA:

Arlon EMD, 9433 Hyssop Drive, Rancho Cucamonga, CA
Tel: (909) 987-9533 • Fax: (909) 987-8541

FRANCE:

CCI Eurolam
9, rue Marcelin Bertholet
92160 Antony, France
Phone: (33) 146744747
Fax: (33) 146666313

ISRAEL:

Tech Knowledge, Ltd.
159 Yigal Alon Street,
Tel Aviv 6744367, Israel
Phone: (972) 36958117
Fax: (972) 36917117

CHINA:

Zack Peng
Room 6A, Unit 2, Bldg 2
Jin Cheng Shi Dai, Tian Road
Shenzhen, China 518103
Phone: (86) 75528236491
Fax: (86) 75528236463

GERMANY:

CCI Eurolam
Otto-Hahn-Str. 46
63303 Dreiech Germany
Phone: (49) 610339920
Fax: (49) 6103399229

ITALY:

Dralmi, SAS
Via Cellini 5
20129 Milano Italy
Phone: (39) 025460507
Fax: (39) 0255013199

JAPAN:

Nakao Corp.
12-8 Nihonbashi Hisamatsu-Cho
Tokyo 103-0005 Japan
Phone: (81) 336623201
Fax: (81) 336617118

UK & SCANDINAVIA:

CCI Eurolam – UK
Ulness Walton Lane
Leyland, PR26 8NB, UK
Phone: (44) 1772452236
Fax: (44) 1772456859