

High Performance Polyimide



84HP is a high-performance polyimide prepreg with micro-fine proprietary fillers designed for use in filling etched polyimide multilayers that contain thick copper layers and clearance holes in metal cores. 84HP's revolutionary filler system serves to reduce shrinkage and inhibit crack formation during through-hole drill in filled clearance areas. 84HP is matched to copper's CTE at 17 ppm X-Y for controlled expansion during large temperature variations reducing the potential of resin damage due to CTE mismatch.

Features:

- Meets IPC4101/40 and /41 description and specification
 - Pure polyimide, no secondary resin
 - No epoxy added, blended or reacted
- Best-in-Class thermal properties
 - T_g => 250°C
 - Decomposition temperature 430°C
 - T_c = 0.5 W/mK, 2x thermal conductivity
 - T₃₀₀ > 60 min.
- Reduced Z-axis expansion
- Minimizes cracking and wicking
- RoHS/WEEE compliant

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
Electrical Properties			
Dielectric Constant @ 1 MHz		4.0	IPC TM-650 2.5.5.3
Dissipation Factor @ 1 MHz		0.008	IPC TM-650 2.5.5.3
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
Arc Resistance	sec	143	IPC TM-650 2.5.1
Thermal Properties			
Glass Transition Temperature (Tg)			
TMA	°C	=>250	IPC TM-650 2.4.24C
Decomposition Temperature			
Initial	°C	380	IPC TM-650 2.4.24.6
5% weight loss	°C	430	IPC TM-650 2.4.24.6
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 2.4.24C
> Tg	ppm/°C	150	IPC TM-650 2.4.24C
z-axis Expansion (50-260°C)	%	1	IPC TM-650 2.4.24C
Mechanical Properties			
Peel Strength to Copper (1 oz/35 micron)			
After Thermal Stress	lb./in (N/mm)	6.5 (1.1)	IPC TM-650 2.4.8C
At Elevated Temperatures	lb./in (N/mm)	6.5 (1.1)	IPC TM-650 2.4.8.2A
After Process Solutions	lb./in (N/mm)	6.5 (1.1)	IPC TM-650 2.4.8C
Young's Modulus CD/MD	Mpsi (GPa)	3.0	ASTM E111
Tensile Strength CD/MD	kpsi (MPa)	35 (241)	ASTM D3039
Poisson's Ratio	-	0.15	ATM E13204
Physical Properties			
Water Absorption (0.062")	%	0.32	IPC TM-650 2.6.2.1A
Density	g/cm ³	1.7	ASTM D792 Method A
Thermal Conductivity	W/mK	0.5	ASTM E1461
Flammability	class	HB	UL-94
Results listed above are typical properties, provided without warranty, expressed or implied, and without liability. Properties may vary, depending on design and application. Arlon reserves the right to change or update these values.			

84HP

Availability:

Arlon Part Number	Glass Style	Ho (mils)	Scaled Flow Hf (mils)	Scaled Flow ΔH (mils)
84H0680	106	3.10	2.20	0.90

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 107°C - 121°C (225°F - 250°F) immediately prior to lay-up.

Lamination Cycle: (Steps 1-5)

- 1) Pre-vacuum for 30 - 45 minutes
- 2) Control the heat rise to 4.5°C - 6.5°C (8°F - 12°F) per minute between 100°C and 150°C (210°F and 300°F). Vacuum lamination is preferred. Start point vacuum lamination pressures are shown in the table below:

Panel Size		Pressure	
in.	mm	psi	kg/cm ²
12 x 18	305 x 457	275	19
16 x 18	406 x 457	350	25
18 x 24	457 x 610	400	28

- 3) Product temperature at start of cure = 218°C (425°F)
- 4) Cure time at temperature = 2.0 hours
- 5) Cool down under pressure at $\leq 5^\circ\text{C}/\text{min}$ ($10^\circ\text{F}/\text{min}$)

Drill at 350-400 SFM. Undercut bits are recommended for vias 0.018" (0.45mm) and smaller. De-smear using alkaline permanganate or 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 to reflow of HASL.

... *Challenge Us!*

For samples, technical assistance and customer service, please contact Arlon Electronic Materials 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

GERMANY:

CCI Eurolam
Otto-Hahn-Str. 46 63303
Dreiech Germany

Phone: (49) 610339920
Fax: (49) 610339929

UK & SCANDINAVIA:

CCI Eurolam – UK
Ulness Walton Lane
Leyland, PR26 8NB, UK

Phone: (44) 1772452236
Fax: (44) 1772456859

ISRAEL:

Tech Knowledge, Ltd. 159 Yigal
Alon Street,
Tel Aviv 6744367, Israel

Phone: (972) 36958117
Fax: (972) 36917117

ITALY:

Dralmi,SAS
Xaò^||ä zñ AAAAAAAAAAAAAAAAAA
20129 Milano Italy

Phone: (39) 025460507
Fax: (39) 0255013199

H5-K 5B. .

Qaça çÁ^&@ [| * ^ Á Q&ËCV/DÁ
9Ø p[È 193 Wen-zhong Á ã È Á
Væ ~ ^ à Á County Á H Ò È Á
Væ æ Á U È U È È È

Ú @ } ^ k ò ì î ð Á È Ñ € è ì Á
Ø æ k ò ì î ð Á È Ñ € è ì H

SINGAPORE:

C.T.S. Industries Pte Ltd
47 Kaki Bukit Place
Singapore 416225

Phone: (65) 6276 3328
Fax: (65) 6276 3336

JAPAN:

Nakao Corp.
12-8 Nihonbashi Hisamatsu-Cho Tokyo
103-0005 Japan

Phone: (81) 336623201
Fax: (81) 336617118

KOREA

UniMicrotek Co. Ltd.
478 Baekbeom-Ro, Bupyeong-Gu
Incheon, Korea

Phone: (82) 32-424-1776
Fax: (82) 505-720-1785

CHINA:

Zack Peng
Room 6A, Unit 2, Bldg 2
Jin Cheng Shi Dai, Tian Road
Shenzhen, China 518103

Phone: (86) 75528236491
Fax: (86) 75528236463

INDIA:

Synertec
301 Raheja Chambers, 12 Museum Rd
Bangalore, India 560001

Phone: (91) 80-25585432
Fax: (91) 80-25588565