PRODUCT INFORMATION BULLETIN

FOR LAMINATION OF MULTILAYER AND FLEXIBLE CIRCUITS.

PACOLON™

ULTRA HIGH TEMPERATURE RELEASE FILM

OVERVIEW

PACOLON™ – is a line of ultra high performance Release Films with grades that withstand operating temperatures up to 500°F/260°C. PACOLON™ films are engineered to provide excellent, contamination-free release during the process of laminating Rigid Polyimide PCBs, all Flexible Circuit Boards, Teflon and other demanding applications. These films provide a super smooth surface for adhesive and resin flow control [Flex Circuits], with low deformation under pressure [i.e., controlled, repeatable shrinkage].

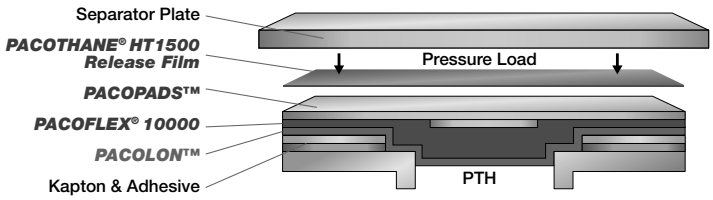
LAMINATION APPLICATIONS

- **Rigid Multilayer Panels:** to contain resin squeeze-out, protect copper from damaged plates, minimize X-Y axis stress from Aluminum plates, reduce plate cleaning, increase plate life. To prevent press pads from sticking to plates or bonding to tooling pins. (See lay-up recommendation)
- **Flex, Rigid-Flex Panels:** to contain adhesive bleed, completely conform to part topography, guarantee total separation of conformal hydraulics and driver pads from PCB surfaces. (See lay-up recommendation)
- **MICROWAVE CIRCUIT MATERIALS / TEFLON BOARD**

FEATURES

- **Easy release at temperatures up to 500°F / 260°C**
- **Excellent flexibility**
- **Low X-Y axis shrinkage**
- **Ultra smooth surface finish, with superior conformal properties**
- **Inert and homogenous**
- **No separator plate residue, prepreg or vacuum system contamination**
- **Available in 2 Mils thickness .002" or 50.8 microns**

RECOMENDED LAMINATION LAY-UP



PACOTHANE TECHNOLOGIES®

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DESCRIPTION OF STANDARDS

MECHANICAL PROPERTIES		Value	Units	Standard
Tensile Strength	(Molding Direction)	2175 - 5000	psi	ASTM D638
Elongation at Break	(Molding Direction)	150 - 350	%	ASTM D638
Density		2.13 - 2.19	g/cc	ASTM D792
Hardness		57 - 64	Shore D	ASTM D2240
Haze		80 - 85	%	ASTM D1003
Deformation under Load	@ 1Hr,73°F,2060psi @ 24Hrs,73°F,2060psi @ Permanent Deformation @ 1Hr,300°F,725psi	11.8 14.3 7.9 10.0	% % % %	ASTM D621
Compressive Modulus	@ 0.2% Offset, 73°F	87000 - 101500	psi	ASTM D621
Flexural Yield Strength	@ 0.2% Offset, 73°F	-	psi	ASTM D790
Flexural Modulus	@ 73°F	100000	psi	ASTM D790
Compressive Strength	@ 0.2% Offset, 73°F @ 0.2% Offset, 300°F	- -	psi psi	ASTM D695
ELECTRICAL PROPERTIES		**Value**	**Units**	**Standard**
Dielectric Strength	@ Air (Tape) @ Oil (Extrusion/Molding)	1525 - 2030 890/610	V/mil V/mil	ASTM D149
Proof Test	(Dielectric Strength)	610 (Pass)	V/mil	BS6564 (E)
Dielectric Constant	@ 60 Hz @ 10^6 Hz	2.1 2.1	- -	ASTM D150
Dissipation Factor	@ 60 Hz @ 10^6 Hz	<0.0003 <0.0003	- -	ASTM D150
Resistivity	@ Surface @ Volume	10^{17} 10^{18}	Ω Ω cm	ASTM D257
THERMAL PROPERTIES		**Value**	**Units**	**Standard**
Point of Fusion DSC		620	°F	ASTM D3417
Max. Working Temperature		500	°F	-
Max. Working Temperature	@ Short Periods	570	°F	-
Min. Working Temperature		- 390	°F	-
Thermal Conductivity	@ Molding Direction (MD)	1.66	Btu in/(ft² h °F)	ASTM C177
Coefficient of Linear Thermal Expansion TMA (73 - 390°F)	@ Molding Direction (MD) @ Right Angles to MD	288 306	10^{-6}/°F 10^{-6}/°F	ASTM E831
Flammability		Pass	-	UL94V(0)
Flash Point		986	°F	ASTM D1929
Limiting Oxygen Index		>95	%	ASTM D2863
WEAR PROPERTIES		**Value**	**Units**	**Standard**
Coefficient of Friction	@ Dry sliding Static Dynamic	 0.08 0.06	 - -	ASTM D1894

AVAILABILITY

PACOFLEX™ ULTRA is available in custom-made sheet sizes, tooled to customer specifications. The complete line of Pacothane Technologies products is available from leading local Distributors Worldwide who offer "Just in Time" delivery from locally-available stocks.

Also from Pacothane® Technologies:

RELEASE PRODUCTS

PACOTHANE — Release Film
PACO•VIA — Blind Via Hole Laminating Film
PACOLON — Ultra High Temperature Release Film
PACO-CLUTCH — All-in-One Conformable Release Film Package

PRESS PADS

PACOPADS — Pressure/Temperature Diffusers
PACOTHERM — Multi-Use Heat Lag Pac
PRESSPROBE — Pressure Testing Kit

CONFORMABLES

PACOFLEX ULTRA
PACOFLEX 10000
PACOTHANEPLUS — Conformable Release Sheet

CONTAMINATION CONTROL

PACOGARD — Inner Layer Separation Sheet

ULTRA HIGH TEMPERATURE

A Pacothane® Product THERMOFILM — Easy Release Film for Extreme Temperature Usage
A Pacothane® Product THERMOPADS — Conformable Press Pads for Extreme Temperature Usage
A Pacothane® Product Innovation THERMOLAM — For Extreme Temperature Bond-Ply Laminations