

Primary Imaging

LAMINAR LP

LAMINAR LP Film Photopolymer is an aqueous processable dry film photoresist designed for acid print and etch and all acid plating applications. It has been formulated for excellent fine line reproduction and high productivity through the manufacturing process. LAMINAR LP is designed for dry lamination only, with excellent hold time capabilities and broad process latitude.

Product Use

Print and Etch
Acid Plating

Acid
Copper, Tin/Lead and Methylsulphonic
Tin/Lead Plating baths

Product Data

Nominal Thickness:

Mils	1.5	2.0
Microns	37	50

Phototropic Image:

Unexposed	Light blue
Exposed	Dark purple blue

Applications

LAMINAR LP has been formulated for high productivity plating and print and etch applications. It has excellent adhesion, high resolution, and is compatible with high acid content plating solutions and high normality acid etchants.

Lamination

The surface on which LAMINAR LP is to be laminated must be free of dirt, oils, oxidation and other contaminants. The surface should be neutral to slightly acidic and free of moisture.

Table I shows the recommended processing conditions with Shipley recommended laminators.

Table I - Lamination

Model 300/360 Hot Roll Laminators*

Roll Temperature	113-118°C
Speed	(1-2 m/min)
Exit Temperature	O/L 49-54°C I/L 60-71°C

1600 SPC Cut Sheet Laminator

Roll Temperature	110-130°C
Roll Speed	(1.8-2.6 m/min)
Roll Pressure	3-6 BAR
Tack Bar Temperature	50-60°C
Tack Time	2-4 sec
Panel Entrance Temp	20-49°C
Panel Exit Temperature	O/L 49-60°C I/L 60-71°C

Exposure

Table II gives the recommended exposure parameters for LAMINAR LP Dry Film Photopolymer. Because of differences in equipment and lamps, the correct exposure in mJ/cm^2 must be determined for each unit.

Table II - Exposure

	<u>LP15</u>	<u>LP20</u>	<u>LP30</u>
Radiometer mJ/cm^2	20-60	20-66	20-70
	Resist	Copper	
Stouffer 21 Step Density Tablet	7-9	8-10	
Stouffer 41 Step Density Tablet	19-25	22-28	

Development

Remove the polyester cover sheet with a developer solution as described in Table III. Developing time will be affected by temperature, spray pattern, spray pressure and pH of the developer.

Table III - Developing

Solution	Temperature	Breakpoint
Sodium carbonate 0.75-1.0% (monohydrate)	24-29°C	50-60%
Potassium carbonate 0.75-1.0%	24-29°C	50-60%
REsolve 211 0.75-1.0%	24-29°C	50-60%

Do not use antifoams containing water miscible solvents such as butyl Cellosolve. Use FOAMklear AF 2750 at 0.1-0.5ml/L as required.

Etching

Boards can be processed immediately after development to etching. Etching can be achieved by acid etchants up to 3N.

Plating

LAMINAR LP can be processed through acid plating solutions in a pattern plating operation. A typical preplate cleaning process is given in Table IV.

Table IV - Plating

Preplate Cleaning	Time
ADVANTAGE 2000 CLEANER LAC-81	2-3 min
Rinse Counterflow	1-2 min
Spray Counterflow (Optional)	1-2 min
Microetch	As required
Spray Rinse	1-2 min
Sulphuric Acid (10% by volume)	1-2 min
Spray Rinse (Optional)	1-2 min

Pattern Plating: Copper sulphate and tin/lead fluobate or tin/lead methysulphonic solutions.

Stripping

Stripping of LAMINAR LP can be achieved in conventional immersion or conveyORIZED equipment using either potassium hydroxide (KOH) or sodium hydroxide (NaOH) as shown in Table V. Stripping should be followed by an immediate water rinse to reduce oxidation.

Table V - Stripping

KOH	1-3%	54-60°C
NaOH	1-3%	54-60°C

SURFACEstrip SQI will more readily strip LAMINAR LP without attacking or oxidizing copper and solder plate surfaces. FOAMklear AF80 is the recommended antifoam.

Figure 2 shows the typical effect of resist loading on solution pH and active carbonate concentration in a sodium carbonate developer solution.

Figure 3 shows stripping times of LAMINAR LP20 when stripped with ALKASTRIP AQI.

Storage

Please read and understand this product's current Material Safety Data Sheet before use.

It is the customer's responsibility to ensure that the disposal of this product complies with national and local guidelines.

Flush empty containers thoroughly with water before discarding.

For optimum performance and shelflife. LAMINAR LP Dry Film Photopolymer should be stored in a limited access area between 5-15°C.

LAMINAR LP Dry Film Photopolymer is sensitive to sunlight and indirect white light. Gold or yellow fluorescent "Safe lights" are required in the immediate work area.

Disposal Information

Utilize Shipley 2000 waste treatment chemistry 1240. The Shipley 2000 System will automatically compensate for the alkalinity of the waste material and add the Shipley 2000 chemistry to the stripper/developer waste in the correct proportion. After the treatment is completed, the solution is pumped to a filter press.

Waste material disposal will vary with local requirements. It is suggested that inquiries be made to local, state and federal authorities.

Handling Precautions

Before using this product, refer to the current Material Safety Data Sheet and the Laminar Safe Handling Guide for detailed safety, handling and storage information.

LAMINAR LP Dry Film Photopolymer should be applied in a well ventilated area. Commercial lamination equipment may cause vapours to be generated from the dry film, and these vapours should be removed by conventional exhaust techniques. Wash thoroughly after handling. Contact of the unexposed resist with the skin may cause irritation and should be avoided. Sensitization may occur in some individuals. If contact occurs, wash thoroughly with soap and water. If irritation occurs or persists, consult a physician.

Avoid reuse of or contact with the dry film release sheets and cover sheets, since they may retain small amounts of unpolymerized photoresist components.

During cleaning, developing, stripping, and etching operation, follow the safety precautions pertaining to the particular solution(s) being used.

For Industrial Use Only

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