Primary Imaging

LAMINAR HG

LAMINAR HG Dry film Photopolymer is an aqueous processable dry film photoresist designed for pattern plating, tenting, and print and etch applications. It has been formulated for excellent fine line reproduction, surface conformity and high productivity through the manufacturing process.

LAMINAR HG is formulated for high yields and increased productivity of fine line patterm plated boards, with excellent reactivation characteristics. It performs well with line and space technology in the 125 - 100µm range.

Product Use

Print and Etch	Acid Etchant only <3.0N
Acid Plating	Copper,tin/lead

Product Data

Nominal Thickness			
Mils	1.0	1.5	2.0
Microns	2.5	37	50

Photofugative image

Product Preparation and Operation

Lamination

The surface on which LAMINAR HG is to be laminated must be free of dirt, oils, oxidation and other contaminates. 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
Laminating Speed	0.9-1.5 m/min
1600 SPC Automatic Cut Sheet Laminators*	
Roll Temperature	113-118˚C
Roll Speed	1.8-2.6 m/min
Roll Pressure	3-6 bar (59 - 84 psi)
Tack Bar Temperature	50-60˚C
Tack Time	2-5 sec
Panel Entrance Temp	20-49˚C)
Panel Exit Temperature	O/L 43-60˚C I/L 63-71˚C

Table II - Vacuum Lamination

Platten Temp	70-100˚C
Cycle Time	15-55 sec
Slap Down Time	8-15 sec

Table II provides typical process conditions for vacuum lamination.

Vacuum lamination can be used with HG 20 for special applications. Parameters will vary with the size and thickness of panels being laminated.

Exposure

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

Table III - EXPOSURE

	HG15	HG20
Radiometer mJ/cm^2	20-70	25-85
	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 and spray with a developer solution as described in Table IV. Developing time will be affected by temperature, spray pattern, spray pressure and pH of the developer.

Table IV - DEVELOPING

Solution	**Temperature**	**Breakpoint**
Sodium carbonate		
0.75%-1.0% (monohydrate)	23-30˚C	50-65%
Potassium carbonate 0.75%-1.0%	23-30˚C	50-65%
0.75-1.0%	23-30˚C	50-65%
REsolve 211		
0.75% - 1.0%	23 - 30°C	50 - 65%

Warm water rinses at 21-25˚C are recommended. Use FOAMklear AF2750 at 0.1-0.5ml/gal. **DO NOT** use antifoams containing water miscible solvents, such as butyl cellosolve.

Etching

Boards can be processed immediately after development to etching. Etching can be achieved by either acid or alkaline etchant up to 3N.

Plating

LAMINAR HG can be processed through acid plating solutions in a pattern plating operation. A typical preplated cleaning process is given in table V.

Table V - PLATING

Preplate Cleaning	**Time**
ADVANTAGE 2000 CLEANER LAC-81	2-3 min
Rinse Counterflow	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

Stripping

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

Table VI - STRIPPING

KOH	1-3%	54-60°C
NaOH	1-3%	54-60°C

Shipley SURFACEstrip SQI will more readily strip Laminar HG without stripping or oxidising copper and solder plate surfaces. FOAMklear AF80 is the recommended antifoam.

Storage

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

For optimum performance, and shelflife 7, LAMINAR HG Dry Film Photopolymer should be stored in a limited access area between 5-15˚C.

LAMINAR HG 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. Shipley’s 2000 System will automatically compensate for the alkalinity of the waste material and add the ADVANTAGE 2000 chemistry to the stripper/developer waste in the correct proportion. After the treatment is completed, the solution is pumped to a filter press. See ADVANTAGE 2000 System technical data sheet for detailed procedure.

Handling Precautions

Please read and understand this Product's Current Material Safety Data Sheet before use.

LAMINAR HG 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 precaustions pertaining to the particular solution(s) being used.

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