

## Photo Imageable Etch Resist Data Sheet

### PRODUCT DESCRIPTION

**Photrak ETAP240** is a contact exposure, negative working photoimageable etch and plate resist, formulated for use as a cost effective alternative to dry film-resist in the manufacture of high density multi-layer printed circuit boards.

It can be applied by air-spray or screen-printing and is suitable for use with alkali and acid etchant solutions and plating solutions. It can also be applied with a roller using some reducer, though the results will differ according to the surface of the roller used.

After etching or plating it is easily removed in a sodium hydroxide solution or proprietary resist strippers.

### FEATURES & ADVANTAGES

- **<25  $\mu$  m (1 mil) resolution capability.**
- **Fast exposure.** Approx. 5-15s using standard 5kW PC equipment. Avoids bottle necks at photoprinting stage and maintains fast throughput particularly with automatic exposure units.
- **Excellent adhesion and conformance to copper surfaces.** The liquid system flows into copper/laminate defects leading to increased fine line yields.
- **Single pack system.** No mixing or weighing.
- **High acid & alkali etch resistance.** High copper weights are easily processed without attack to the resist.
- **Reduced developer and stripper costs.** Reduced resist thickness leads to less waste treatment.
- **Low cost. No waste.** 100% material utilisation.

### PROCESSING

#### Surface preparation:

Copper surfaces should be mechanically (brush or pumice) or chemically (NaPS) cleaned to give a waterbreakfree surface.

#### SCREEN-PRINT

ETAP240 is supplied press ready. If viscosity adjustment is required prior to, or during printing, then this may be achieved using Photo Emulsion Reducer **ERI2**. Where **ERI2** is not available, an equivalent from an approved source may be used. The use of non-approved solvents is not recommended as they can cause contamination and other processing problems. No more than 5% reducer should be added or deterioration of the printing and drying properties may occur.

Mesh count: 43-77T (110-195) polyester. (Intaglio Printmaker fabric screens are 43 microns.)

Squeegee: 80 shore.

Wet thicknesses: For acid etch 15  $\mu$  m ( $\pm 3 \mu$  m)

For alkali etch 25  $\mu$  m ( $\pm 3 \mu$  m)

For plating 25  $\mu$  m ( $\pm 3 \mu$  m)

### **AIR-SPRAY**

ETAP240/2968 should be reduced with our **Photo Emulsion Reducer ERI0**. Where **ERI0** is not available, an equivalent from an approved source may be used. The use of non-approved solvents is not recommended as they can cause contamination and other processing problems.

Dilution level required: 30-40% by weight

Atomisation pressure: 35-45 PSI (during spray activation)

Wet thicknesses: For acid etch 25  $\mu$  m ( $\pm 3 \mu$  m)

For alkali etch 35  $\mu$  m ( $\pm 3 \mu$  m)

For plating 35  $\mu$  m ( $\pm 3 \mu$  m)

### **TACK-DRY**

The aim of the tack-drying stage is solely to remove the solvents. It is important for the drying chamber (static or conveyerized) to have good air circulation with clean-air supply and adequate extraction facilities.

**ETAP240** has a proven wide drying window allowing the use of higher temperatures.

Convection Dry:

Temperature range: 80 to 85°C (175 to 185°F)

Time range: 10-20 minutes

Infra-red Dry:

Peak temperature: 110-120°C (230 to 248°F) – substrate temperature.

Time: 60-90 seconds above 100°C (212°F), depending on ink thickness

Typical line speed: 1.2 to 1.6m/min (3.9 to 5.2 ft/min), depending on thickness and substrate heat capacity.

After drying it is recommended that boards should be processed within 24 hrs to avoid increasing the risk of dust collection on the resist surface.

Boards must be at room temperature before exposure.

### **EXPOSURE**

Exposure: Spectral output: 310-420 nm.

Energy requirement: 50 – 150 mJ/cm<sup>2</sup>

Step wedge: For acid etch 5-6 clear (Stouffer 21 step)

For alkali etch 12-13 clear (Stouffer 21 step)

For plating 12-13 clear (Stouffer 21 step)

Determination of the correct exposure should be carried out after setting the developing speed since this will affect the step wedge reading obtained.

Step wedge determination should be carried out on pre-cleaned copper and the step-wedge reading taken through the phototool.

It is important to recognize that the energy level should only be used as a guide for setting the correct exposure and the step wedge should be used for determining the actual exposure setting.

After determining the correct setting, the energy level can be measured and monitored, using an industry recognised light-bug, as a means of checking for any decrease in output from the lamp with age.

**DEVELOPING:** Solution: 1.0% soln sodium or potassium carbonate.

Spray pressure: 1.0 kg/cm<sup>2</sup>, 15psi.

Spray time: 30-45s (in developing chambers).

Temperature: 30°C (90°F)

Important: Boards should be well rinsed with fresh water and fully dried after developing.

The optimum developing speed is set when an unexposed board develops off completely, 75% of the way through the machine. This speed should be ascertained by preliminary tests prior to making exposure tests.



**STRIPPING:** 5% NaOH solution at 40 to 50°C (100-120°F)

**CLEANING:** Screens and equipment should be cleaned using Universal Cleaner SW100 or ER10.

**STORAGE:** Store between 10 to 25°C (50-75°F) in a dry store.

Avoid subjecting containers to temperatures below 5°C (40°F) because of risk of splitting.

**SHELF LIFE:** Minimum 9 months from date of manufacture when stored in cool dry conditions.