

## PHOTORESIST APR-1G

### DESCRIPTION:

Photoresist APR-1G is a solvent based, aqueous developed, negative working photoresist which has a built-in blue pigment. It uses Alpha Assembly RT Developer Concentrate solution and RT Stripper solution. It is formulated to replace 930 photoresist. It is used on copper, steel, stainless steel, magnesium and zinc. This product is not recommended to be used on aluminum. It is compatible with acidic etchants.

### PROPERTIES:

Parameters	Typical Values
Appearance	Blue Liquid
Surface	Gloss
Specific Gravity	1.04
Pounds per Gallon	8.64
Viscosity	450 cps.
Flash Point	114 °F
Solids Content	40%

### APPLICATIONS:

#### Safelight Recommendation:

This is a light sensitive product and it must be handled in yellow light.

#### Surface Preparation:

To ensure ultimate resist adhesion, chemically or mechanically clean the surface followed by a high-quality water rinse. Sufficiently dry to remove all moisture prior to resist application.

#### Coating:

This can be dip coated or roll coated. Diluting the resist with LPR-1 thinner is normally required for dip coat application. Variability in the resist thickness can affect the drying, exposure and development times.

#### Pre-baking:

Prebake the resist in 6-8 minutes at 80° – 85 °C (176° – 185 °F). If the resist is not dried properly, the response to the material to the UV radiation would be low. The image will either be degraded or will wash off the surface when it is developed.

Exposing:

Exposure of the coating varies with the light source. A trial exposure will be necessary to establish exposure time on the light source. Proper exposure should be predetermined using a Kodak T-14 or Stauffer T2115 photographic step tablet. Retention of a step 7-8 after development is recommended. The peak sensitivity of this resist is between 300 and 400 nanometers. Typical light sources include carbon-arc lamps, mercury-vapor lamps and metals halide diazo lamps. A 0.4 mil (400 micro-inches) coating should require approximately 400 mJ/cm<sup>2</sup> of exposure energy.

Development:

Develop the exposed coating using Alpha Assembly RT Developer Concentrate solution. Mix five parts water to one part developer concentrate to make a working solution. Development time is approximately one minute in a new solution. As the solution gets used it may be necessary to increase the time.

Etching:

Compatible with acidic etchants such as cupric chloride, ferric chloride and nitric acid.

Stripping:

Strip the coating using Alpha Assembly RT Stripper solution or a 3% caustic soda solution at 120 °F.

**Tips for Achieving Optimum Performance:**

1. APR-1G is a lower viscosity product which contains pigment. Lower viscosity is required for proper flow and leveling of the film. During storage or on its standing, due to the lower viscosity, the pigment will soft settle, allowing liquid at higher viscosity on the bottom and lighter on the top. Therefore, the pigment should re-dispersed before making any viscosity measurement or applying to a metal plate. The pigment can be re-dispersed either by using a paint mixer or rolling the container on a drum roller. You would be able to get consistent viscosity from can to can when mixed properly.
2. Color density of the dried coating – In order to achieve uniform color density of the dried coating throughout the day, do the following.
  - 2.1 Re-disperse pigment by using a paint mixer or drum roller.
  - 2.2 Make sure that the liquid in the can is continuously agitated while the coater is running.
3. Coating thickness – 400-450 microinches (10-12 microns). Lower thickness will cause pinholes, lifting or breakdown of coating especially on Mg metal during etching. Higher thickness will produce less line resolution and increase development time. (1 mil = 25 microns = 1000 microinches).
4. Drying – 8-10 minutes at 80° – 85 °C (176° – 185 °F) in a convection oven. If the coating is under-dried, the retention of solvent can reduce photosensitivity and adequate exposure

## TECHNICAL REPORT

can not take place. The image will either be degraded or will wash off the surface when it is developed. If the coating is over-dried, it will begin to polymerize, making it difficult to image and develop.

5. Exposing – Exposure of the coating varies with the light source. Proper exposure should be predetermined using a Stauffer T2115 photographic step tablet. Retention of a step 9-12 after development is recommended. The peak sensitivity of APR-1G is between 300 and 400 nanometers. If the coating is under exposed, the material will not crosslink sufficiently. The image will either be degraded or will wash off the surface when it is developed. If the coating is over exposed, it will make the material brittle, and this can lead to under cutting during etching. Too much light exposure will also produce less line resolution.

### **STORAGE:**

APR-1G Photoresist should be stored in a cool (50° – 70 °F) and dry place away from direct sunlight.

### **IMPORTANT NOTICE TO PURCHASER**

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