

**Technical Data Sheet**  
**CRAMOLIN POSITIV RESIST**  
**Art.-No. 126**

Colour:	deep violet
Specific gravity: [g /cm <sup>3</sup> ]	0,85
Drying time:	at room temp. 10 – 20 h or 10 - 20 min and room temp. and 15 -20 min at 70 - 80°
Light sensitivity:	between 310 and 440 nm max. between 330 and 420 nm

**POSITIV RESIST** is a light-sensitive coating allowing to transfer lines, shapes and contours. It offers a relatively simple procedure to accurately copy any illustration onto a great variety of materials. **POSITIV RESIST** ensures ease of work, quick drying, good contrasts, and a high sharpness.

## **Application**

Manufacture of single printed circuits or small series. Production of front panels, signboards, graduations as well as mould etching or etching work on copper, brass and other materials.

### *1.) Positiv original*

The original must be entirely impervious to light, without bends or creases and must lie absolutely flat on the plan to eliminate any danger of side lighting.

### *2.) Cleaning*

The plate sprayed must be absolutely greasefree. After cleaning it is most important that the washed plate is completely dried as residues of humidity will affect the adhesive strength of the photo resist varnish.

### *3.) Application of the layer*

Spraying of the suitable cleaned and degreased plates can be done in attenuated daylight. A darkroom is not required, but sunshine or bright daylight must be avoided as the varnish is sensitive to UV light.

To guarantee a perfect and discharge resisting copy, it is very important to work in a dustfree and stable atmosphere.

Place the plate in a horizontal or slightly inclined position and apply the spray from a distance of approximately 20 cm. It is best to make the application continuous i.e. not intermittently, in serpentine lines beginning at the upper left. This will give an even coverage. A beaten effect of orange peel appearance results and spraying could cease. After a short time a thin, light sensitive uniform layer will be formed. If too much spray is applied edges and coats of varying and undesirable thickness will form requiring a longer exposure time.

The spray can should not be held in an extremely inclined position when progressively emptying. Holding the can in such a position will result in a spluttering ejection of the resist varnish when the spraycan becomes half empty.

Until exposure, store prepared plates in a completely dark and cool place. The photoresist varnish must be at room temperature before application.

### *4.) Drying*

The plates must be dried in the dark before exposure to reach good characteristics of reproduction and adhesion. This can be done in a drying cabinet, a thermostatically controlled oven or by an infrared radiation. We recommend a drying temperature not exceeding +70 to +80° C. Please do not immediately expose your plates to these temperatures. Heat slowly to the final temperature. Superficial skin formation and incomplete solvent removal from the varnish layer would be the result of quick drying.

Pre-dry at lower temperatures, then raise the temperature gradually to not more than 70 - 80° C, drying within that temperature range for about 15 to 20 minutes.

Insufficient drying causes pin-holes and a loss of adhesive strength.

### *5.) Exposure*

Best results can be reached by UV lamps, e.g. a quartz-lamp (Philips HPR 125) or a mercury vapour lamp. A sufficiently high amount of effective ultraviolet light ranging from 310 to 440 nm is in an easy case required. Good results have been obtained by using a 200 W bulb, at a distance of 30 - 40 cm and with an exposure time of 10 min. It is the wave length and not the wattage of the rays that determines the exposure time. The most favourable spectral sensitivity of the photoresist varnish lies between 330 and 420 nm. Glass plates used for covering can absorb up to 65% of the UV rays. In such cases expose longer or use crystal glass or plexiglass.

Use only perfect positive originals on highly transparent carriers.

### 6.) *Developing*

The dried and exposed photoresist varnish layer is developed in normal daylight (without direct sunrays entering the room). Prepare the developer with a solution of

7 gram of caustic soda (NaOH) in 1 litre water.

The developer should have a temperature between +20 and 25° C. Low temperatures will delay the development, higher temperatures will accelerate it, but reduce the sharpness of the image. After developing, rinse the plate in running water.

For correctly exposed layers, development time ranges from 30 to 60 sec with a new developer.

Never add new developer to used one. Always use new developer.

### 7.) *Etching*

The photoresist varnish **POSITIV RESIST** is resistant to acid baths of ferric chloride, ammonium persulphate, chromic acid, hydrochloric and hydrofluoric acid when used on glass. Today etching is done in most cases by using ammonium persulphate and hydrochloric acid. Here is a brief description of these two processes:

#### *Ammonium persulphate process (NH<sub>4</sub>)<sub>2</sub>S<sub>2</sub>O<sub>8</sub>*

Mixing ratio: 35 g ammonium persulphate in 65 ml of water. Etching takes about 10 min, this is depending on the area of the copper layer to be etched. A warm (40° C) solution is required. Then rinse in flowing water.

#### *Hydrochloric acid process*

Mixing ratio: 200 ml hydrochloric acid (HCl 35%)  
30 ml hydrogen peroxid (H<sub>2</sub>O<sub>2</sub> 30%)  
770 ml water.

The mixture must be used with special care. Any contact with the skin must be avoided but if it does occur, the affected area must be washed of immediately. It is also essential to protect the eyes.

The etching time greatly depends on agitation and temperature of the bath and lasts approx. 10 minutes with strongly agitated fresh solution at room temperature. Plates must be rinsed in flowing water.

### 8.) *Clearing*

Sections of the tracks must be removed from the remaining layer after the etching process. This can be done by organic solvents, as by acetone, for example.

### 9.) *Temperatures and storing properties*

**POSITIV RESIST** can be safely stored for up to one year at temperatures from +8 to +12° C. The photoresist varnish should have room temperature before application.

*Note:* Although the information and recommendations set forth herein are presented in good faith and believed to be correct as of the date hereof, **I T W** makes no representation as to the completeness or accuracy thereof. Information is supplied upon the conditions that the persons receiving the same will make their own as to its safety and suitability for their purpose prior to use. In no event will **I T W** be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information.

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