

Laminat Solder Mask

Instruction for Use

1. General

This data sheet contains extracts from the original manufacturer's information and is extended by experience that we have from using the product on our machines.

Laminat Solder Mask is an aqueous processible dry film solder mask with excellent electrical and physical properties, good dimensional stability and chemical resistance. It is applicable on rigid FR4 or polyamide base material, coated with copper, tin, lead, nickel or gold.

It comes as a transparent green film. We supply it preferably in 3 mil (75µm) thickness and 12" (305mm) width, at roll lengths of either 25, 76 or 152 m. As usual for dry resists, the photo polymer is sandwiched between a thin polyolefine foil and a 25 µm polyester protection foil.

Laminat Solder Mask responds to light wavelengths in the near UV, with peaks from 360 to 400 nm. It should be handled in rooms with yellow or gold (UV-safe) light only.

2. Processing

Processing Laminat Solder Mask consists of the steps: cleaning, lamination, exposure, development, and curing.

2.1 Cleaning

The optimum performance of Laminat Solder Mask depends on the condition and cleanliness of the copper surface prior to lamination. The surface must be free of contaminants such as residual water, dust, grease, oxide or other residues.

We recommend wet brushing of the boards (with a target roughness of 4 µm), extra fresh water rinse and drying with warm air. It is important to have the board cleaned shortly before lamination. If there was a hold time after cleaning of several hours it is recommended to repeat the cleaning before laminating the board.

If the board was tin/lead covered before solder mask application it is of highest importance to remove all rests of flux and flux cleaner, from the metal surface and from the board base. Have details from the flux supplier.

After cleaning it is recommended to dry the board in an oven at 80 °C for 30 min. Dryness of the board is essential for solder mask adhesion.

2.2 Lamination

Laminat Solder Mask is laminated under heat and pressure. We recommend our laminators RLM 419p for this purpose. They allow to adjust the lamination pressure, thus resulting in good vertical distribution of the mask, with no air inclusions between the tracks.

The laminator manual should be considered for details on the lamination conditions. For our RLM 419p we recommend temperatures of 110-115 °C and a conveyor speed of approx. 0.3 m/min. The pressure should be set to 3 to 5 on the scale. The above settings are meant as start-up information. Your own experience on these parameters will be required.

Lamination of Laminat Solder Mask must be performed in an environment that is free from dust and dirt. The condition and maintenance of the lamination equipment is very important for high yields. Panels may be processed immediately after lamination. Always stack the panels in vertical racks, never in horizontal position.

2.3 Exposure

It is recommended to let the panels stabilize to room temperature prior to exposure. Any standard UV exposure unit with light of 360 to 400 nm wavelength will be suitable for exposure. It is important to assure an intimate contact between the artwork and the laminate. For very fine line reproduction, a parallel beam exposure unit is recommended.

The exposure time on our HELLAS vacuum exposure unit is about 20 to 30 seconds. The exact exposure time depends on the properties of the light source, and precise determination of the exposure time requires using a 21 step Stouffer grey scale tablet. Steps 8 to 10 should be free after developing the board. This equates to about 250 to 500 mJ energy of light.

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2.4 Development

Between exposure and development a hold time of 5 to 30 minutes should be kept. The max. hold time is 24h. Laminat Solder Mask may be developed in aqueous alkaline solutions, in stationary or conveyor machines, but always under spray pressure. (For conveyor machines we recommend to add up to 1 ml/l of anti-foam agent to the solution.) We offer our so called special developer for negative boards, based on sodium carbonate, in portions for 1l or for 10 l of developer solution.

Prior to development the polyester protection must be peeled off the panel.

Development in our SPLASH machine takes up to 90s at 40 °C, depending on the load of dissolved material in the solution. The undeveloped parts of the resist have a white to grey, slimy aspect. With sufficient exposure, a prolonged development will not be critic. If the mask peels off during exposure the laminating conditions were poor or the exposure was significantly too short.

Rinsing the panels after development with lots of fresh water under spray pressure is vital, as well as a thorough drying with hot air.

2.5 Curing

Curing Dynamask can be done with UV light and/or heat. Best is a two step procedure. First comes a UV curing for about 30 minutes on our HELLAS or with 4 J of light energy in a UV curing machines. Second is a thermal hardening in an oven with fresh air input at

100 °C for 1 h. If the oven does not allow fresh air input the curing must be done only under UV, with the double time or energy. Heating in a closed oven will cause burning effects and vapour condensation on the pads will void solderability.

After sufficient curing the solder mask is ready for hot air levelling, wave soldering, IR soldering, and is resistant against most solvents, fluxes and flux cleaners.

3. Waste treatment

The developer itself does not contain heavy metals or reduction agents, but the organic load from the dissolved resist causes oxygen consumption in the water cleaning stations. One approach to treat the used liquid is to add acid until the organic parts fall out. The residual water could be drained. Handling this problem requires that you take advise from your local authorities.

4. Storage

The laminate shall not be stored at more than 15 °C. The shelf life under this condition is less than 6 months.

5. Safety / Warranty

Laminat Solder Mask should be used in rooms with good ventilation. The usual application of the resist in laminators will produce fumes that need extraction. After handling the resist please wash your hands. Further details on health and safety are given in the safety data sheet.

Conditions of storage and application of this product being out of our reach, we do not take any liability for the result of using this product, neither technically nor commercially. Our warranty covers solely the quality of the product at the time of shipment.

6. Copyright

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