

Probimer® 77 1075 / 1073 White

High Performance, Alkaline Developed, Photoimageable White Solder Mask

General

Probimer® 77 1075 / 1073 White is a high performance, Two-component, aqueous developing, photoimageable solder mask and protective coating with superior white surface appearance. The material works with conventional flood screen print equipment. Depending on the application and/or drying conditions the coating can exhibit a glossy or semi-matte finish after curing.

Typical Applications

Probimer 77® 1075 / 1073 White solder mask is especially useful over copper metal features for the protection of high density fine-line surface mount printed wiring boards and for use in double-sided and multilayer board applications. Other applications use this material as a photoimageable white legend ink with Probimer 77 solder mask systems. However, we strongly recommend that the customer perform their own testing in order to ensure compatibility with other materials and processes.

Product Features and Benefits

- Glossy/Semi-Matte surface finish
- Top of the Line white hiding power with no “Yellowing”
- Compatibility with multiple surface finishes (ENIG, Pd, OSPs etc.)
- Good resolution capability allows 4-mil solder dams
- Develops in standard aqueous chemistry and equipment.
- Two-component system with excellent stability and with a high solid content
- Wide process latitude means high productivity and yields (3 day pot-life, 3 day hold time and good drying window)
- UL 94 V-0 approved

Components

| | Probimer® 1075 White | Hardener 77 1073 White |
|------------|----------------------|------------------------|
| Form | Viscous liquid | Viscous liquid |
| Solids (%) | ~75 | ~83 |
| Solvent | DPGM | DPGM / PMA |
| Viscosity | 80,000 cps | 40,000 cps |

DPGM is dipropylene glycol methyl ether
PMA is glycol ether PM Acetate

Processing Parameters

Mixing Instructions

Probimer® 77 White is provided in pre-measured units in a ratio of 0.80 : 0.20 kg (Resin : Hardener). Thoroughly mix Probimer® 77 1075 White and Hardener 77 1073 White for 10-120 minutes to achieve a uniform paste. Mixing can be done by hand with a spatula or with mild mechanical stirring. High shear mixing must be avoided in order to prevent entrapment of large amounts of air, which can cause bubbles and poor leveling of the screen print coatings. A slight dilution may be needed to achieve desired viscosity though material is packaged for immediate use.

Precleaning

Pre-cleaning should be carried out in conventional pumice spray, chemical, or mechanical brushing equipment. The application of adhesion promoting coatings or oxide layers is not required or recommended. Hold times after pre-cleaning should be minimized to avoid oxidation of copper surfaces.

Screen Printing

Probimer® 77 White is applied to printed wiring boards using standard flood screen printing techniques.

Mesh Size Range: 86 – 140 (Typical 110)

Mesh Tension: 18 – 26 Newtons

Squeegee Hardness: 60 – 90 Durometer (Typical 70)

After screening, boards can be racked vertically to minimize contamination, taking care that the boards not touch each other. Any observed bubbles or surface roughness will level within 15 – 20 minutes.

Drying

A well-ventilated forced-air oven is required for drying Probimer® 77 White after printing and prior to exposure. The optimum drying condition for a gloss finish is 85°C for 40-50 minutes. If a single sided process is utilized, the first side printed should be tack dried for 15-20 minutes. After coming to room temperature, the first side will be tack-free and the second side can be printed. The completed board should then be dried for 30-40 minutes at 85°C.

In both cases, the total drying time should not exceed 70 minutes. This will prevent partial polymerization of the mask, which will inhibit complete development. Drying times can vary depending upon the efficiency and airflow of the oven. Test panels should be processed to optimize the drying cycle for the particular equipment.

Exposure

Probimer® 77 White is a bulk polymerizing material under UV exposure. The spectral sensitivity of Probimer® 77 White is in the range of 350 to 400 nm. Conventional exposure units having 7 kW lamps have been successfully used and are recommended. This type of unit will provide an exposure time between 15-30 seconds. Both diazo and silver halide films are suitable as working phototools. Silver Halide phototools will provide better resolution capabilities.

Exposure Energy
Stouffer Step 21 Gauge

500 - 800 mJ/cm²
clear copper 10-12

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| Development | Development is carried out in an aqueous sodium or potassium carbonate solution. A concentration of 1% is recommended. Conventional aqueous spray developing machines, both horizontal and vertical, are suitable for use with Probimer® 77 White. | |
| | Temperature | 85 - 90°F |
| | Spray Pressure | 25 - 50 psi |
| | Developing Time | 75 - 90 seconds |

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| Inspection/Stripping | Probimer® 77 White coated panels should be inspected after development. Should panels require recoating, Probimer® 77 White can be stripped after development in 3-5% sodium or potassium hydroxide solution at 120-140°F. |
|-----------------------------|--|

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| Final Cure | Thermal curing is required to insure optimal properties in the cured film. Thermal curing can take place in a standard convection oven. | |
| | | <u>Min : Max</u> <u>Standard</u> |
| | Thermal Curing Temperature <i>Recommended</i> | 145 - 155°C <i>150°C</i> |
| | Thermal Curing Time <i>Recommended</i> | 40 - 90 min. <i>60 min</i> |
| UV Curing is recommended for reducing ionic contamination values with either 500 – 1000 mJ/cm ² prior to thermal curing or 1000 – 2000 mJ/cm ² after thermal curing. | | |

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| Physical Properties | Soldering Resistance (IPC SM-840C) | Passed |
| | Flux Resistance (IPC SM-840C) | Passed |
| | Solvent Resistance (IPC SM-840C) | Passed |
| | Thermal Shock Resistance (IPC SM-840C) | Passed |
| | Adhesion (IPC SM-840C) | Passed |
| Note: Conforms in accordance to IPC-SM-840C class T & H & Bellcore GR-78-Core standards as verified by Huntsman (formerly Vantico) lab testing. Please refer to Trace Laboratories report #38245 for IPC-SM-840C base resin test results. | | |

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| | Dielectric Strength | Passed |
| | Insulation Resistance (IPC-SM-840C) | Passed |
| | Electromigration (IPC-SM-840C) | Passed |
| | Moisture & Insulation Resistance | Passed |
| | Bellcore GR-78-CORE | Passed |
| Note: Conforms in accordance to IPC-SM-840C class T & H & Bellcore GR-78-Core standards as verified by Huntsman (formerly Vantico) lab testing. Please refer to Trace Laboratories report #38245 for IPC-SM-840C base resin test results. | | |

Safety/Handling Precautions

Warning! Combustible liquid and Vapor. Can cause allergic skin reactions.

May cause irritation and dermatitis. Keep away from heat, sparks and open flame. Avoid contact with eyes, skin and clothing. Avoid breathing vapor, mist or spray. Use only good ventilation. Store in closed containers for liquid transfer to avoid static sparks. Wash hands after handling.

Read Material Safety Data Sheet Before Using these products. FOR INDUSTRIAL USE ONLY.

First Aid

In case of contact:

Eyes: Promptly flush with water for at least 15 minutes.

Skin: Promptly wash with mild soap and water.

Inhalation: Remove to fresh air. Give oxygen if breathing is difficult.

Ingestion: If conscious, give water. Get medical attention.

Important

The following supercedes Buyer's documents. **SELLER MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** No statements herein are to be construed as inducements to infringe any relevant patent. Under no circumstances shall Seller be liable for incidental, consequential or indirect damages for alleged negligence, breach of warranty, strict liability, tort or contract arising in connection with the product(s). Buyer's sole remedy and Seller's sole liability for any claims shall be Buyer's purchase price. Data and results are based on controlled or lab work and must be confirmed by Buyer by testing for its intended conditions of use. The product(s) has not been tested for, and is therefore not recommended for, uses for which prolonged contact with mucous membranes, abraded skin, or blood is intended; or for uses for which implantation within the human body is intended.

The test data and results set forth herein are based on laboratory work and do not necessarily indicate results that the buyer or user will attain. Full-scale testing and product performance is the responsibility of the buyer and user.

Vantico Inc.
PWB Technology
5121 San Fernando Road West
Los Angeles, CA 90039-1011
Tele: (888) 781-9193
Fax: (818) 543-5071
Infopwbt@huntsman.com
www.huntsman.com

Vantico AG
PWB Technology
Klybeckstrasse 200
CH-4002, Basel, Switzerland
Tele: 41-61-966-21-91
Fax: 41-61-966-32-51
Infopwbt@huntsman.com
www.huntsman.com

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