

PRODUCT DESCRIPTION

MicroPrime HP Primer
 $(\text{CH}_3)_3\text{SiNHSi}(\text{CH}_3)_3$

Ultra- High Purity Grade HDMS
Photoresist Adhesion Promoter

Shin-Etsu is the world's largest supplier of semiconductor silicon and chemicals to the semiconductor industry, synthetic quartz glass and PVC. Adhesion promoters are used to enhance the bonding of photoresist to a silicon dioxide surface. Shin-Etsu MicroSi's MicroPrime™ line of adhesion promoters readily react with the substrate material removing absorbed water and reducing surface energy. The resulting water repellent hydrophobic interface prevents etchants from undercutting the photoresist. This product line is an important segment of our photolithography family of products.

PROPERTIES

MicroPrime HP Primer is a highly purified grade of hexamethyldisilazane (HMDS) produced for semiconductor process applications.

The risk associated with corrosion development in all semiconductor devices warrants the continual progression in development of higher purity materials. This is especially true for materials such as adhesion promoters which are used at all levels of device processing.

Residues and ionic impurities of MicroPrime HP Primer are at minimum levels, greatly reducing the risk of metal layer corrosion.

| Physical Properties | |
|------------------------------|---------------------------------------|
| Empirical Formula | $\text{C}_6\text{H}_{19}\text{NSi}_2$ |
| Molecular Weight | 161.4 |
| Density, 25°C | 0.769 |
| Boiling Point | 126°C |
| Flash Point | 10°C |
| Refractive Index | 1.4055 |
| UV Absorption max (270nm) | 0.25 |

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Application

MicroPrime HP Primer can be applied to oxide substrates by several techniques, including vapor prime, spinning and spraying. Environmentally stable primed substrates with uniform coverage are obtained by treatment in vapor depositor tracks and ovens (Typical application temperatures are from 100-150°C). Vapor prime application offers rapid and uniform reproducible priming of substrates with a minimum quantity of MicroPrime HP Primer.

Spinning is also a common form of application. A small amount of MicroPrime HP Primer is applied neat to a wafer spun at 3000-5000 rpm. This is followed by bake at 100-150 °C.

| Specification Data | |
|--------------------------------|----------------|
| Purity, min % | ≥ 99.7% |
| Residue, max | ≤ 3.0ppm |
| Chloride | ≤ 0.5ppm |
| Typical * Elemental Impurities | |
| Less that 5ppb each | |
| Ag | Silver |
| Al | Aluminum |
| As | Arsenic |
| Ca | Calcium |
| Cr | Chromium |
| Cu | Copper |
| Fe | Iron |
| K | Potassium |
| Mg | Magnesium |
| Ma | Maganese |
| Na | Sodium |
| Ni | Nickel |
| Pb | Lead |
| Sb | Antimony<10ppb |
| Zn | Zinc |

*Purity can be certified to these levels in high purity containers.

Reaction Mechanism

MicroPrime HP Prime reacts readily with silicon oxide surfaces removing adsorbed water and reducing surface silanols, thus preventing future adsorption of water and other polar materials. During this process, small amounts of ammonia are liberated. Photoresists wet HMDS-treated surfaces uniformly. The developers and etchants used in subsequent steps are unable to penetrate the HMDS treated SiO₂/resist interface. This prevents lifting and minimizes undercutting of the resist.

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Packaging

MicroPrime HP Primer is available in 1 pint, 1 quart and 1 gallon glass bottles and various Now Pak[®]* containers for efficient use. MicroPrime HP Primer is filtered to 0.1 micron for semiconductor process applications.

Contact your Shin-Etsu MicroSi representative regarding high purity package options including stainless steel canisters.

Shelf Life

MicroPrime HP is stable for over one year as 100% active material in unopened containers. Once opened, moisture will react with MicroPrime HP Primer, reducing purity.

Cautions in Handling

MicroPrime HP Primer can cause severe burns to eyes and irritation of the skin. In case of contact with the eyes, immediately flush with plenty of water for at least 15 minutes and get prompt medical attention. In case of skin contact, flush with plenty of water. The material should be handled in areas with adequate ventilation to avoid excessive exposure to solvent vapors.

MicroPrime HP Primer is not for food or drug use.

MicroPrime HP Primer is a flammable liquid. Fires may be extinguished with CO₂ or foam.

Please refer to Material Safety Data Sheets prior to using MicroPrime HP Primer.

* Now Pak[®] is a registered trademark of NOW Technologies, Inc.

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Shin-Etsu MicroSi

Shin-Etsu MicroSi, Inc. is a wholly owned subsidiary of Shin-Etsu Chemical Co., Ltd., a global leader in research, development and the manufacture of chemicals used in the semiconductor industry. From its headquarters in Phoenix, Arizona, Shin-Etsu MicroSi provides high performance products and materials including:

- Thermal Interface Materials
- KJR Liquid Coating Materials
- Contrast Enhancement Materials
- Mask Blanks
- PBN Crucibles
- Photoresists / Developers
- Quartz Substrates & Wafers
- Liquid Underfill Materials
- Barrier Coat
- Pellicles
- Flexible Copper Laminate
- Epoxy Molding Compounds
- Adhesion Promoters

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