

# Shin-Etsu MicroSi<sup>®</sup>

## MicroPrime MS8011 Adhesion Promoter

### PRODUCT DESCRIPTION

MicroPrime MS8011 Adhesion Promoter  
(CH<sub>2</sub>)<sub>3</sub>SIN(C<sub>2</sub>H<sub>5</sub>)<sub>2</sub>

High Efficiency  
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

N,N-diethylaminotrimethylsilane (DEATS) is a superior adhesion promoter for treatment of silicon dioxide surfaces prior to photoresist application. It is formulated as high purity, low residue material specifically designed for VLSI applications.

Physical Properties	
Empirical Formula	C <sub>7</sub> H <sub>19</sub> NSi
Molecular Weight	145.3
Boiling Point	126.7°C
Flash Point	10°C
Density, 25°C	0.763
Refractive Index	1.4110
Specification Data	
Purity, min %	98.0%
Residue, max	<5.0 ppm
Chloride	<1.0 ppm

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## Application

MicroPrime MS8011 Adhesion Promoter can be applied using several techniques, including vapor prime, spinning and spraying. Environmentally stable primed substrates with uniform coverage are obtained by treatment in vapor deposition tracks and ovens. This efficient method of application

offers rapid and uniform reproducible priming of substrates with a minimum quantity of MicroPrime MS8011 Adhesion Promoter.

Spinning is also a common form of application. A small amount of MS8011 Adhesion Promoter is applied neat or in a solution of xylene to a wafer spun at 3000-5000 rpm at ambient temperature. This is followed by a pre-bake at 70-150°C. Post-exposure bake at 70-150°C.

This aminofunctional, low viscosity organosilane is more reactive with the

hydroxyl radicals on silicon dioxide than hexamethyldisilazane (HMDS).

Therefore, use of MS8011 Adhesion Promoter results in greater coverage and more efficient surface treatment in a shorter time.

Typical * Elemental Impurities		
Al	Aluminum	<0.50ppm
As	Arsenic	<0.01ppm
Ca	Calcium	<0.05ppm
Cu	Copper	<0.04ppm
Fe	Iron	<0.05ppm
K	Potassium	<0.01ppm
Mg	Magnesium	<0.03ppm
Mo	Molybdenum	<0.30ppm
Na	Sodium	<0.01ppm
Ni	Nickel	<0.07ppm
Sb	Antimony	<0.01ppm

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

## Reaction Mechanism

MS8011 Adhesion Promoter reacts readily with silicon oxide surfaces (metal oxides, silicon dioxide, etc.) removing adsorbed water and reducing substrate surface energy. Further reaction then occurs between MicroPrime MS8011 Adhesion Promoter and surface hydroxyls (silanols, metalhydroxides) resulting in a trimethylsiloxylated surface and prevention of future adsorption of water and other polar materials. During this process, small amounts of diethylamine and ammonia are produced. MS8011 Adhesion Promoter functions as a surface modifying agent. Photoresist will then coat these surfaces more uniformly; problems of photoresist lifting and subsequent undercutting are reduced.

# ***MicroPrime MS8011 Adhesion Promoter***

## **Packaging**

MS8011 Adhesion Promoter is available in 1 pint, 1 quart and 1 gallon glass bottles and various Now Pak<sup>®</sup>\* containers for efficient use. MS8011 Adhesion Promoter is filtered to 0.2 micron for VLSI and other demanding applications.

## **Shelf Life**

MicroPrime MS8011 Adhesion Promoter is stable for over one year in an unopened container. Once opened, atmospheric moisture will react with MicroPrime MS8011 Adhesion Promoter, slowly reducing purity. Resealing opened containers under dry nitrogen will lengthen shelf life.

## **Cautions in Handling**

MS8011 Adhesion Promoter can cause severe burns to eyes and skin. In case of contact with the eyes, immediately flush with water for at least 15 minutes and get prompt medical attention. In case of skin contact, flush with water, wash with soap and water, and contact a physician. The material should be handled only in areas with adequate ventilation to avoid excessive exposure to solvent vapors.

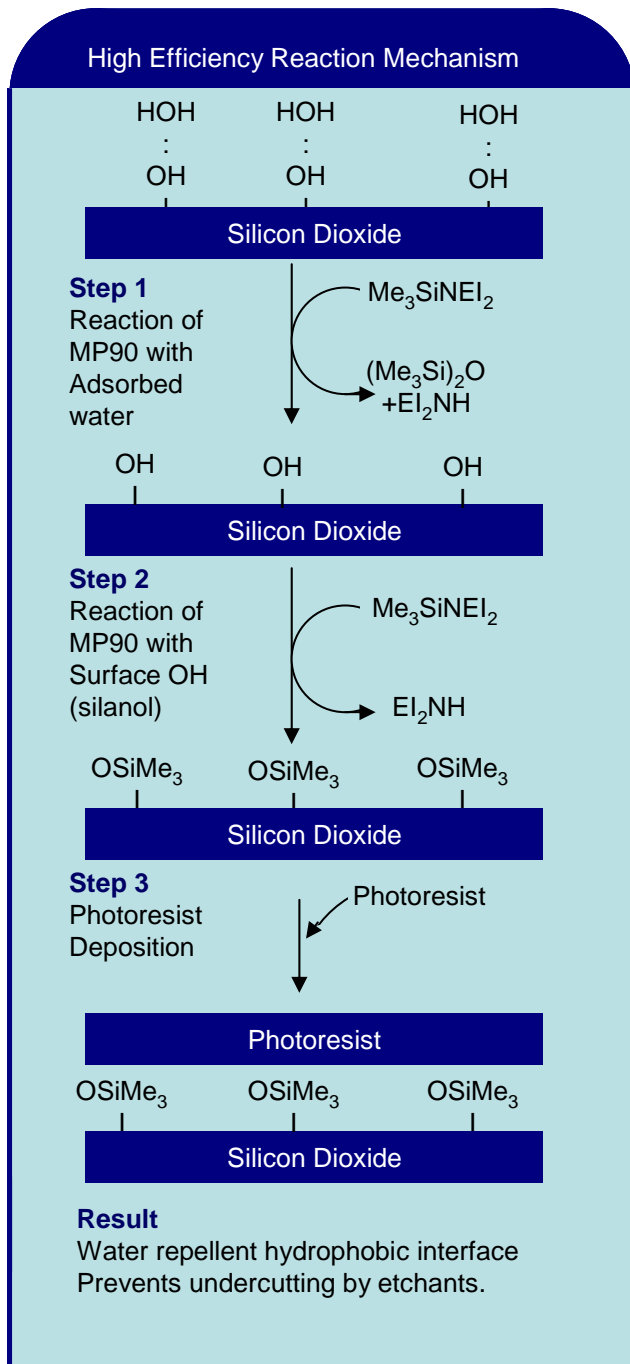
Contact with moisture will produce hexamethyldisiloxane, ammonia and diethylamine.

MS8011 Adhesion Promoter is a flammable, corrosive liquid. In the event of fire, use dry powder or CO<sub>2</sub> for small fires, foam for large fires. Avoid direct streams of water.

Please refer to Material Safety Data Sheets prior to using MicroPrime MS8011 Adhesion Promoter.

\*Now Pak<sup>®</sup> is a registered trademark of NOW Technologies, Inc.

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## **Shin-Etsu MicroSi**

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

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