

SURPASS 4000

CATIONIC PRIMING AGENT

DOCUMENT ID: SP4T9906

SurPass 4000 is an advance aqueous based priming agent which provides maximum photoresist adhesion to a wide range of substrate materials. SurPass 4000 achieves its exceptional bond strength through use of a patented organic polymer system, coupling the photoresist with the substrate without the use of often hazardous organic solvents. SurPass 4000 is completely non-hazardous, non-toxic, is odor free and contains no volatile solvents.

SurPass 4000 typically provides several times the adhesion strength of traditional solvent based adhesion promoters, often eliminating adhesion failures resulting from nitrogen out-gassing of the photoresist during exposure. Still, SurPass 4000 will not cross-link with the substrate, significantly reducing polishing requirements where substrates are recycled. SurPass 4000 is equally effective on both hydrophobic and hydrophilic substrates, often eliminating the need for pre-treatment of new substrates.

Because SurPass 4000 is water based it is easily adapted to current processing technology, requiring no retooling or other expensive upgrades in order to take advantage of its enhanced functional, ecological and health advantages.

SurPass 4000 contains no ozone depleting substances or hazardous water pollutants and usually requires no special waste treatment prior to disposal¹. In addition, SurPass 4000 is completely non-regulated for shipping purposes.

The SurPass 4000 Advantage:

- *Exceptional adhesion over a wide range of substrate materials.*
- *Easy spin coat application.*
- *Easily adapts to current process configurations.*
- *Does not cross-link with the substrate, significantly reducing recycling requirements.*
- *Safe: non-hazardous, non-toxic formulation.*
- *Ecologically sound: contains no ozone depleting substance, hazardous air pollutants or water pollutants.*

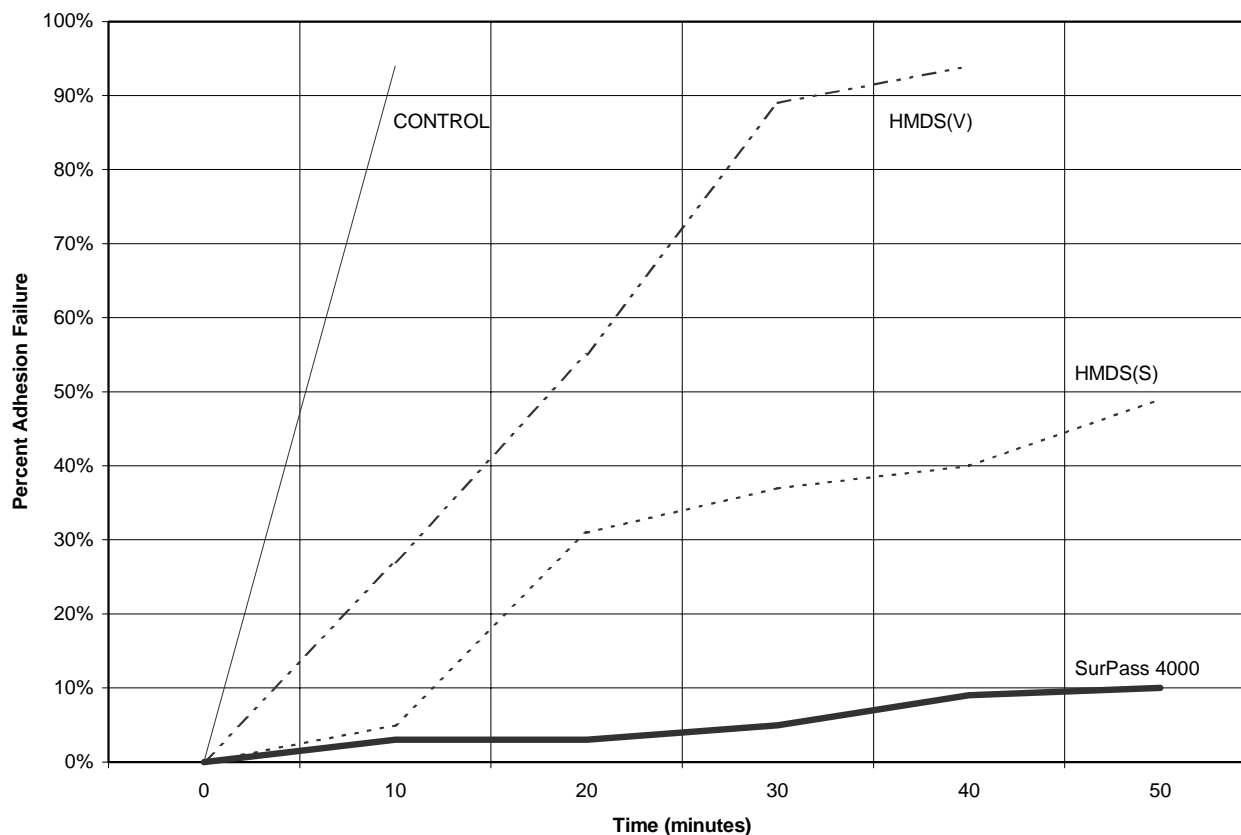
Cost per quality, SurPass 4000 is the most technologically advanced, safe, ecologically sound, and economical photoresist primer available.

¹ Because Federal, State, Local and International laws may vary, the user of this product must always determine the requirements for proper disposal.

Performance Data:

SurPass 4000 provides an increase in photoresist to substrate adhesion of up to 80% over traditional solvent based primers such as HMDS, amino silanes, and TTA. SurPass 4000 forms a web-like matrix over the substrate so that adhesion is unaffected by substrate surface imperfections which might otherwise mean failure. Furthermore, because SurPass 4000 is water-based, priming failures associated moisture and humidity are eliminated.

**Photoresist Adhesion Characteristics on Glass:
DisChem SurPass 4000 vs. HMDS(Vapor), HMDS (Spin coat) and Control**



The graph above is a comparative illustration of photoresist adhesion to glass as provided by SurPass 4000 versus 100% HMDS applied by spin coating and vapor deposition. The results were obtained through testing by ultrasonic agitation, 50°C in DI water. The percent failure is graphed against the duration (time) of exposure to the delaminating force. A complete description of the test method is provided in the DisChem technical release TECSP4A1

SPECIFICATION DATA

Substrates and Photoresist:

SurPass 4000 is highly effective on most substrates, including float glass, ceramics, silicon, indium tin oxide (ITO₂), gallium arsenate (GaAs), germanium (Ge), nickel (Ni)

and other metallic and non-metallic substrates. SurPass 4000 is highly effective when used with most positive or negative cresol-formaldehyde, phenol-formaldehyde, or novolak class photoresist. SurPass 4000 may also be used with some epoxy type resins.

Rate of Use:

SurPass 4000 can usually be directly substituted for the current primer being used. Typical usage rates range from 0.5 – 1.0 mL per cm² of substrate to be coated. SurPass 4000 is used at 100% concentration. No dilution or measuring is required.

Equipment Requirements:

- Tanks: Polypropylene or high-density polyethylene is preferred. SurPass 3000 may be mildly corrosive to steel and its alloys. For this reason only very high grades of stainless steel or PTFE coated stainless steel should be used.
- Filters: Use hydrophilic high-density polyethylene or equivalent. Most filters designed for use with D.I. water will meet the requirements of SurPass 4000. Never with use anionic or cationic conditioned filters.

Substrate Preparation:

Substrates should be properly cleaned prior to use. For effective residue-free alkaline cleaning, DisChem's mediaPrep LS is recommended. Only non-ionic surfactants should be used. SurPass 4000 is effective of both hydrophilic and hydrophobic substrates, often eliminating polishing requirements, where applicable. For maximum adhesion on new float glass substrate, pre-rinse the substrate with a solution of 0.5 – 1.0 % / volume sulfuric acid to remove any high tin concentrations that may be present.

OPERATING PARAMETERS

- SurPass 4000: 100% by volume
- Filtration: SurPass 4000 is provided filtered to 1.0 µm. Staged filtration recommended where a greater filtration depth is desired². Pre-filter to 0.6 microns, 0.45 µm medium filtration, and 0.2 µm final filtration.
- Temperature: 20 - 45°C.

APPLICATION

SurPass 4000 is best applied by a spin coating process. The following cycles are suggested for a typical optical media substrate:

² SurPass contains polymer chains of varying molecular weights. Though molecular weight has no effect on functionality, pre-filtration is recommended to prevent rapid filter loading with the high-end molecular weight chains.

Dispense / Spin Coat Application:

1. Clean substrate, normal cycle.
2. To DI water wetted substrate, dispense 1 mL / second of SurPass 4000 for 30 - 100 seconds, 100 - 500 RPM. Where a final rinse is available, rinse with DI water, 30 - 60 seconds.
3. Spin dry. Note that higher drying speeds may be required where a final rinse is not used
4. Process with photoresist.

Brush Cleaning:

1. DI water rinse substrate for 30 - 100 seconds with lowered brushes.
2. Dispense SurPass 4000 at 1 mL / second for 120 - 180 seconds.
3. Rinse with brushes lowered for 30 - 60 seconds.
4. Final rinse, if necessary, with raised brushes.
5. Normal drying cycle.
6. Process with photoresist.

Immersion Tank:

1. Clean substrates, normal cycle.
2. Soak substrates in SurPass 4000 filled tank for 30 seconds in tank
3. Rinse 30 - 60 seconds with DI water.
4. Normal drying cycle.
5. Process with photoresist.

Ultra Sonic Cleaning:

1. Immerse substrate in ultra sonic tank filled with SurPass 4000 for 30 - 60 seconds.
2. Rinse with DI water for 30 - 60 seconds.
3. Normal drying cycle.
4. Process with photoresist

Application cycles may vary. Your DisChem representative can evaluate your current process to provide the optimum application cycle to fit your needs.

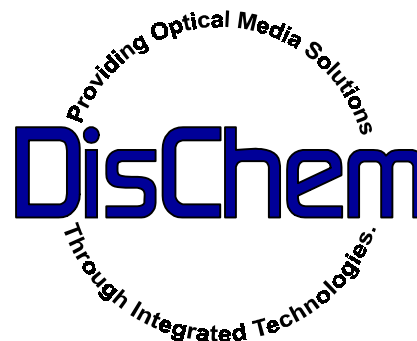
PRODUCT AVAILABILITY

Part Number	Description
SP401	SurPass 4000, 1 X 1 gallon bottle (3.79L)
SP402	SurPass 4000, 2 X 1 gallon bottle (7.57L)
SP404	SurPass 4000, 4 X 1 gallon bottle (15.14 L)
SP405	SurPass 4000, 1 X 5 gallon carboy (19 L)

ORDER INFORMATION

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Providing Optical Media Solutions for Your Success!

DisChem Mission Statement

DisChem is dedicated to serving the needs of the optical media industry through providing innovative solutions for success. We provide the highest quality products and services available, unmatched cost per quality.

SURPASS CATIONIC PRIMING AGENTS

SurPass 1000	Cationic agent for removing water stains and electrostatic contaminants from substrates.
SurPass 2000	Cationic priming agent. Excellent for priming substrates with heavy oxide layers.
SurPass 3000	Cationic priming agent. Provides the ability to combine the final stage of glass cleaning and priming into a single process step.
SurPass 4000	Cationic priming agent. Exceptional adhesion on a wide range of substrate materials. May be applied by spin coating without the use of a final water rinse.

For more information on selecting the right SurPass agent for a specific application, please contact your DisChem representative or distributor.

SurPass cationic agents are protected to US and International patents.

OTHER DISCHEM PRODUCTS:

- ◆ SurPass Cationic Priming Agents
- ◆ OptiCoat Aqueous Based Peelable Coating for Optical Media
- ◆ discPrep LS/E Optical Media Liquid Soak / Electrocleaner
- ◆ mediaPrep LS Optical Media Substrate Cleaner
- ◆ E-FORM Electronic Grade Sulfamate Nickel Concentrate (180 g/L)
- ◆ E-Line pH High Purity Sulfamic Acid
- ◆ E-eliminate Pit Optical Media Wetting Agent, 100% photoresist compatible formaldehyde free.
- ◆ E-fficiency Aid Anode Agent
- ◆ Boric Acid, Technical Grade
- ◆ DisChem Analytical Services
- ◆ Electroforming peripherals and supplies
- ◆ ENcode Electroless Nickel Premetallization Process
- ◆ E-Cupric Electronic Grade Acid Copper Electroforming Chemistries.