

StamperPrep

OPTICAL ELECTROFORM
SOAK / ELECTROCLEANER / ELECTRO-PASSIVATION COMPOUND

Document No: STPT1705

StamperPrep is a high alkalinity, low foaming, detergent rich cleaning agent for nickel electroforms used in optical media, holographic, and related optoelectronic manufacturing.

StamperPrep is formulated to serve as a multifunctional soak / electrocleaner, eliminating the need to inventory additional cleaning chemicals and hazardous solvents used for photoresist removal, passivation, and electroform cleaning.

StamperPrep provides high detergency and conductivity for electrolytic removal of photoresist, organic processing residuals, and for electrolytic stamper passivation. Unlike traditional trisodium phosphate baths, **StamperPrep** does not decompose with electrolysis, virtually eliminating stamper rejects resulting from burning during electrolytic passivation.

StamperPrep operates over a broad range of temperatures and concentrations for easy adaptability

to existing electroform cleaning operations.

THE StamperPrep ADVANTAGE:

- **A single versatile formulation for photoresist removal, stamper cleaning & electrolytic passivation in mastering and polycarbonate removal in replication.**
- **Low foaming, high conductivity.**
- **Free-flowing powder concentrate is economical and easy to handle.**
- **Rinses residue-free.**
- **No degradation by electrolysis.**
- **Inhibits scale formation on heater coils and tank walls.**
- **Phosphate-free and biodegradable formulation simplifies waste treatment.**

PHOTORESIST, POLYCARBONATE AND POLYESTER REMOVAL AND GENERAL CLEANING APPLICATION CYCLES:

Soak Cleaning / Ultrasonic Cleaning¹:

Photoresist: Novalak and Other Modified Resins

<u>Parameter</u>	<u>Range</u>
Concentration:	75 - 120 g/L (10-16 oz/gal)
Temperature:	50-65 °C (120-160°F)
Immersion Time:	1 - 10 Minutes

Dye-Polymer and Epoxy Resins:

<u>Parameter</u>	<u>Range</u>
Concentration:	75-90 g/L (10-16 oz/gal)
Temperature:	60-65 °C (140-160°F)
Immersion Time:	1 - 10 Minutes

Electrolytic Cleaning²:

Photoresist: Novalak and Other Modified Resins

<u>Parameter</u>	<u>Range</u>
Concentration:	75-90 g/L (10-12 oz/gal)
Temperature:	50-65 °C (120-160°F)
Cycle:	<ol style="list-style-type: none">1. Soak 90 seconds.2. Cathodic current, 6 amps / 3.5 volts, 60 seconds.3. Anodic current, 6 amps / 3.5 volts, 15 seconds.4. Rinse 60 seconds with DI water and dry.

Dye-Polymer and Epoxy Resins:

<u>Parameter</u>	<u>Range</u>
Concentration:	75-90 g/L (10-12 oz/gal)
Temperature:	60-65 °C (140-160°F)
Cycle:	<ol style="list-style-type: none">1. Soak 90 seconds.2. Cathodic current, 5 amps / 3 volts, 45 – 60 seconds.3. Anodic current, 5 amps / 3 volts, 10-12 seconds4. Rinse 60 seconds with DI water and dry.

ELECTROLYTIC PASSIVATION OF NICKEL ELECTROFORMS:

Remove all resist compounds from the surface of the electroform using one of the methods described in the previous section. Bath make-up is the same as is used for soak and electrocleaning cycles.

1. Mount electroform for anodic current (i.e. the electroform serves as the [+]
anode).
2. Soak the electroform for 30-90 seconds, depending on contamination such as finger prints.
3. Apply anodic current 20-40 ASF (2.2-4.3 A / D²), 12-15 seconds.
4. Soak for 30 seconds and remove.
5. Rinse with DI water and dry.

WATER STAIN AND SOLVENT HAZE REMOVAL:

To remove ionized water stains and haze left by processing solvents, **Disclean** is preferred over StamperPrep as DisClean contains cationic compounds to prevent re-deposition of electrostatic contaminants. Disclean may also be used to restore the electrical signal on optical stampers

SOLUTION MAKEUP:

Always refer to the product material safety data sheet (MSDS) before handling or using this product. **CAUTION:** StamperPrep is highly alkaline and may generate large quantities of heat when dissolving in water. Localize boiling and spurting may occur if product is added too quickly during make-up. To reduce the effects of this reaction, carefully sprinkle small additions of StamperPrep over the entire surface of the bath instead on making larger additions to a limited area.

1. Fill tank to ½ final volume with DI water.
2. Slowly add the required amount of **StamperPrep** to the tank.
3. Add DI to bring solution to final volume. Mix well before heating solution to operating temperature.
- 4.

¹ Soak processing may be enhanced through use of ultrasonic agitation.

² Typical electrolytic cleaning current density is 25-45 ASF (2.7-5.9 A/D²)

SOLUTION MAINTENANCE:

The active **StamperPrep** concentration may be determined by simple titration analysis. Maintain the working solution within the recommended parameters through maintenance additions of **StamperPrep**. Frequent small additions are preferred to large additions for optimum results.

StamperPrep does not break down in electrolytic applications, providing extended bath life with consistent performance. Formulated to suspend dissolved organic compounds, StamperPrep contains superior wetting agents for excellent rinsing properties

ANALYTICAL CONTROL:

Reagents

1.0 N Sulfuric Acid (H₂SO₄)
Azo Violet Indicator

Procedure

1. Pipette 20 mL of cooled working solution to a 250 mL Erlenmeyer flask.
2. Dilute to approximately 50 mL total volume with DI water.
3. Add 5 - 10 drops of phenolphthalein indicator.
4. While agitating, slowly titrate with 1.0 N sulfuric acid. The end point is determined by a color change from pink to clear (colorless).

Calculation

StamperPrep Concentration (g/L) =
mL 1.0 N sulfuric acid titrated x 3.0

StamperPrep Concentration (oz/gal) =
mL 1.0 N sulfuric acid titrated x 0.4

EQUIPMENT:

StamperPrep may be used safely with mild steel, polypropylene, polyethylene, PVC and CPVC equipment. This product is highly alkaline and should not be used with incompatible materials such as aluminum.

STORAGE:

Store **StamperPrep** in tightly closed original container. Keep away from heat and oxidizing materials. Store at ambient temperature. **Shelf Life:** StamperPrep shelf life is indefinite as long as the product is stored in its sealed original container protected from heat and moisture.

HANDLING:

Read Material Safety Data Sheet (MSDS) before handling or using this product.

Always wear appropriate protective equipment when handling product concentrate, including face shield, rubber apron, chemical resistant gloves and boots. Use with adequate ventilation. If mist or vapors are present, wear NIOSHA approved respirator. Always wash hands thoroughly after handling.

SAFETY PROFILE:

Warning: **StamperPrep** is a highly alkaline material containing sodium hydroxide and is intended for industrial use by personnel trained in chemical handling only.

Caution should be taken when handling this product, wearing appropriate protective equipment. Contact with skin or eyes may cause severe burns. Avoid breathing mist or vapor. Use with adequate ventilation. Ingestion may be harmful or fatal.

GENERAL FIRST AID:

Skin contact: Remove any contaminated clothing. Discard contaminated shoes.

Wash immediately with soap and water. Flush skin with large amounts of water for 15 minutes. If irritation, rash or burn occurs, seek medical attention immediately.

Eye contact: Flush eyes immediately with large amounts of flowing water for 20 - 30 minutes while holding eyes open. Call physician immediately. Keep flushing eyes for up to an hour during transport to emergency facility. **Ingestion:** Seek immediate medical attention. Do NOT induce vomiting. If conscious, FIRST rinse mouth, THEN drink large quantities of water. Never administer liquids to an unconscious victim. **Inhalation:** remove victim to fresh air and call physician.

SPILL OR LEAK:

Always wear appropriate protective equipment when isolating and cleaning spills or leaks. Isolate and contain spill with inert material such as sand or vermiculite. Absorb with same material. Do not allow spill to enter waterways. Dispose of all residues in manner consistent with Federal, State and local regulations.

Document ID: STPT1705
Revision Level: May 2017

PRODUCT INQUIRIES / ORDERING INFORMATION:

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PRODUCT AVAILABILITY

StamperPrep is provided as a high purity granular concentrate for easy dilution and handling.

<i>Description</i>	<i>Item Number (P/N)</i>
50 lb pail (23 Kg)	STP50

DisChem OPTICAL MANUFACTURING PRODUCTS:

- ◆ **SurPass Cationic Priming Agents**
- ◆ **Optec Blue Solvent Based Peelable Protective Coating**
- ◆ **DisClean Cationic Stamper Cleaner**
- ◆ **discPrep LS/E Optical Media Liquid Soak / Electrocleaner**
- ◆ **StamperPrep Optical Media Soak Clean / Electrocleaner**
- ◆ **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**
- ◆ **E-Line Refiner Sulfamate Nickel Hardening Agent / Grain Refiner**
- ◆ **DisChem Analytical Service**