SECTION 1. CHEMICAL IDENTIFICATION

CHEMICAL NAME: Organic Polymer Solution
TRADE NAME: PMGi SF Series Resists
Positive Radiation Sensitive Resists
PRODUCT #: See Table 1 – Section 9

SECTION 2. COMPOSITION

HAZARDOUS INGREDIENTS: Cyclopentanone (CAS: 120-92-3); 65-85%.
Tetrahydrofurfuryl alcohol (CAS: 97-99-4); 10-15%
OTHER INGREDIENTS: Polyaliphatic imide copolymer (CAS: 102322-80-5); 1-25%
Proprietary Surfactant, <1%

SECTION 3. HAZARD DATA

INFLAMMABILITY: Flammable liquid.
SKIN CONTACT: Irritant.
EYE CONTACT: Severe eye irritant.
INGESTION: Harmful if ingested.
INHALATION: Harmful if inhaled.
MUTAGENICITY: Data not available.
OTHER: Repeated or prolonged contact or exposure to vapors of tetrahydrofurfuryl alcohol may cause decreased male fertility.
TARGET ORGANS: Eyes, Epidermis, Nervous System.

SECTION 4. FIRST AID MEASURES

INHALATION: Inhalation is not an expected route of exposure. If respiratory irritation or distress occurs remove victim to fresh air. Seek medical attention if respiratory irritation or distress continues.

INGESTION: If victim is conscious and alert, give 2-3 glasses of water to drink and induce vomiting by touching back of throat with a finger. Do not induce vomiting or give anything by mouth to an unconscious person. Seek immediate medical attention. Do not leave victim unattended. Vomiting may occur spontaneously. To prevent aspiration of swallowed product, lay victim on side with head lower than waist. If vomiting occurs and the victim is conscious, give water to further dilute the chemical.

SKIN CONTACT: In case of contact, immediately wash with plenty of soap and water for at least 5 minutes. Seek medical attention. Remove contaminated clothing and shoes. Clean contaminated clothing and shoes before re-use.
CHEMICAL NAME: Organic Polymer Solution
TRADE NAME: PMGI SF Series Resist
Positive Radiation Sensitive Resist
PRODUCT #: See Table 1 - Section 9

EYE CONTACT: Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. Seek medical attention.

SECTION 5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA:
Dry chemical, carbon dioxide, alcohol foam, and universal foam.

SPECIAL FIRE FIGHTING PRECAUTIONS:
Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing. Remove all ignition sources if it can be done safely.

UNUSUAL FIRE OR EXPLOSION HAZARDS:
Product will burn under fire conditions. Containers may explode (due to build-up of pressure) when exposed to extreme heat. Vapors may travel a considerable distance to a source of ignition and flash back along vapor trail.

SECTION 6. ACCIDENTAL RELEASE PROCEDURES

EVACUATION PROCEDURES & SAFETY:
Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.

CLEANUP & DISPOSAL OF SPILL:
Absorb with an inert absorbent. Sweep up and place in an appropriate closed container (see Section 7). Clean up residual material by washing area with water. Collect washings for disposal.

ENVIRONMENTAL & REGULATORY REPORTING:
Do not flush to drain. If required proper authorities should be notified.

SECTION 7. STORAGE AND HANDLING PRECAUTIONS

STORAGE:
Store in tightly closed container in a cool, dry, well-ventilated environment away from ignition sources. Recommended container materials are polyethylene or glass.

HANDLING:
Use only under yellow light. Keep away from heat, sparks, and flames. Use only with mechanical exhaust. Do not contact with skin, eyes, and clothing. Severe eye irritant. Avoid prolonged or repeated contact with skin. Do not breathe vapors or mist. Wash with soap and water after handling. Have safety shower and eye wash available. Store and transfer under a blanket of dry inert gas.
CHEMICAL NAME: Organic Polymer Solution
TRADE NAME: PMGI SF Series Resist
              Positive Radiation Sensitive Resist
PRODUCT #: See Table 1 - Section 9

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

RESPIRATORY PROTECTION: Under normal conditions, use of air-purifying (half-mask/full-face) respirator with cartridges/canisters approved for use against organic vapors, dust, mists and fumes is recommended.
VENTILATION: General area dilution/exhaust ventilation.
SKIN PROTECTION: Skin contact should be minimized through the use of gloves and suitable long-sleeved clothing.
EYE PROTECTION: Eye contact should be prevented through use of chemical safety glasses with side shields or splash proof goggles.

SECTION 9. PHYSICAL AND CHEMICAL DATA

APPEARANCE: Clear, colorless to yellow liquid
ODOR: Slightly sweet
BOILING POINT: 120-130 °C (248-266 °F)
SPECIFIC GRAVITY: See Table 1 below
VAPOR PRESSURE: 8.7 mm @ 20 °C (68 °F)
VAPOR DENSITY: 2.3 (air=1)
H₂O SOLUBILITY: 10-15% @ 20 °C, by wt.
% VOLATILES: See Table 1 below
EVAPORATION RATE: 1 (BuAc=1)
FLASH POINT: 30 °C (86 °F) TCC
AUTOIGNITION TEMP: 282 °C (540 °F)
EXPLOSION LIMITS: 1.3 lower
                      unk. upper

Table 1

<table>
<thead>
<tr>
<th>Name</th>
<th>Product #</th>
<th>Specific Gravity</th>
<th>Volatiles (% by wt.)</th>
<th>VOC (g/L)</th>
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CHEMICAL NAME:  Organic Polymer Solution  
TRADE NAME:  PMGI SF Series Resist  
Positive Radiation Sensitive Resist  
PRODUCT #:  See Table 1 - Section 9

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<thead>
<tr>
<th>Name</th>
<th>Product #</th>
<th>Specific Gravity</th>
<th>Volatiles (% by wt.)</th>
<th>VOC (g/L)</th>
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</tbody>
</table>

SECTION 10. REACTIVITY DATA
---------------------------------
STABILITY: Stable  
INCOMPATIBILITY: Strong Oxidizing Agents, Strong Bases, Strong Acids, Strong Reducing Agents, Iron, Hydrazine  
HAZARDOUS POLYMERIZATION: May occur. Avoid extreme pH.  
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS: Oxides of carbon.

SECTION 11. TOXICITY HAZARDS
---------------------------------
As cyclopentanone:

Acute Eye Irritation: eye irritation, 100mg, rabbit. Severely irritating.
Acute Skin Irritation: skin irritation, 500mg, rabbit. Mildly irritating.
Acute Dermal Toxicity: LD50 – lethal dose 50% of test species, >5000 mg/kg, rabbit.
Acute Respiratory Irritation: no test data found for product.
Acute Inhalation Toxicity: no test data found for product.
Acute Oral Toxicity: LD50 – lethal dose 50% of test species, 1180 mg/kg, rat.

As Tetrahydrofurfuryl alcohol:

<table>
<thead>
<tr>
<th>Acute Test</th>
<th>Value</th>
<th>Species</th>
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</thead>
<tbody>
<tr>
<td>Oral LD50</td>
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<td>Rat</td>
</tr>
<tr>
<td>Intraperitoneal LD50</td>
<td>400 mg/kg</td>
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<tr>
<td>Oral LD50</td>
<td>2300 mg/kg</td>
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<td>Intravenous LD50</td>
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<tr>
<td>Dermal LD50</td>
<td>5 mg/kg</td>
<td>Guinea Pig</td>
</tr>
<tr>
<td>Intraperitoneal LD50</td>
<td>400 mg/kg</td>
<td>Guinea Pig</td>
</tr>
</tbody>
</table>

Subchronic exposures (oral, dermal and inhalation) at relatively high levels have demonstrated systemic toxicity, reproductive toxicity, and central nervous system depression in either rats, rabbits or dogs.

As Polyaliphatic imide copolymer:

No data available.
CHEMICAL NAME: Organic Polymer Solution
TRADE NAME: PMGI SF Series Resist
Positive Radiation Sensitive Resist
PRODUCT #: See Table 1 - Section 9

SECTION 12. ECOLOGICAL DATA
No data available at this time

SECTION 13. DISPOSAL CONSIDERATIONS
Comply with applicable local, state or international regulations regarding the proper disposal of this material and/or containers.

SECTION 14. TRANSPORTATION INFORMATION
HAZARD CLASSIFICATION: Flammable Liquid
SHIPPING NAME: Resin Solution
UN NUMBER: UN 1866
PACKING GROUP III

SECTION 15. REGULATORY INFORMATION
EUROPEAN INFORMATION
EINECS LISTED
EC Nos: Cyclopentanone 204-435-9; Tetrahydrofurfuryl alcohol 202-625-6
RISK & SAFETY PHRASES
R10 Flammable
R36/38 Irritating to eyes and skin
S23.2 Do not breathe vapour
S39 Wear eye/face protection
INDICATIONS OF DANGER
Xi Irritant

US AND INTERNATIONAL INFORMATION
HAZARDOUS LISTINGS: All ingredients appear on the TSCA Inventory of Chemical Substances and the Japan Hazardous Chemical Listing.
SARA Title III: This product IS NOT subject to SARA Title III, Section 313 Reporting Requirements.
Calif. SCAQMD Rule 443.1 VOC's: See Table 1 – Section 9
CHEMICAL NAME: Organic Polymer Solution
TRADE NAME: PMGI SF Series Resist
Positive Radiation Sensitive Resist
PRODUCT #: See Table 1 - Section 9

SECTION 16. ADDITIONAL PRECAUTIONS AND COMMENTS-------------------------------

National Fire Protection Association Hazard Ratings – NFPA:

2 Health Hazard Rating
3 Flammability Rating
0 Reactivity Rating

To the best of our knowledge, the above information is believed to be accurate but does not claim to be all-inclusive and is intended to be used only as a guide. The supplier makes no warranty of any kind, expressed or implied, concerning the use of this product and shall not be held liable for any damage resulting from handling or from contact with the above product. User assumes all risks incident to its use.

MSDS Revision Information:

A) Removed “NANO” name from trade name.