MATERIAL SAFETY DATA SHEET
This MSDS is compatible with ISO 11014 – 1:2002 and conforms to ANSI standard Z400.1 – 2004.

SAFETY DATA SHEET
This SDS complies with REACH 1907/2006 and 2001/58/EC

Section 1: Chemical Product and Company Identification
CHEMICAL SUPPLIER COMPANY NAME
Shin-Etsu MicroSi, Inc.
10028 South 51st Street
Phoenix, AZ 85044
Safety Data Sheet Competent Person:

EMERGENCY TELEPHONE
Chemetec 24 hrs: (800) 424-9300
Information: (480) 893-8898
Fax: (480) 893-8637
Customer Service cstech@microsi.com

MANUFACTURER’S NAME: Shin-Etsu Chemical Co., Ltd.
ADDRESS: 6-1, 2-Chome, Ohtemachi, Chiyodaku, Tokyo, 100-0004, Japan
TELEPHONE NUMBER: 81-3-3246-5345 Tokyo, Japan
81-255-45-5811 Niigata, Japan
31-20-662-1359 Shin Etsu International Europe B.V., Amsterdam, The Netherlands

DATE PREPARED: January 16, 2007 DATE REVIEWED: June 24, 2008

PRODUCT NAMES: SIPR-7126M-20
CHEMICAL NAME: Resist Component
CHEMICAL FAMILY: Modified Silicone Resin Solution
FORMULA: Mixture
PRODUCT USE: This product is limited to use as a Photoresist in semiconductor photomicro lithography.

Section 2: Hazards Identification
HAZARD CLASSIFICATION: Flammable Liquid (based on IMO and DOT)
FIRE AND EXPLOSION: Flammable and Explosive Hazard

<table>
<thead>
<tr>
<th>Component</th>
<th>Health (Blue)</th>
<th>Flammability (Red)</th>
<th>Reactivity (Yellow)</th>
<th>Special (White)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene glycol mono-methyltheracetate (PGMEA)</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>--</td>
</tr>
<tr>
<td>Cyclopentanone</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>--</td>
</tr>
</tbody>
</table>

POTENTIAL HEALTH EFFECTS
INGESTION: Large oral doses may produce gastro-intestinal disturbances. Material is moderately toxic.

INHALATION: Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath. High concentrations have a narcotic effect. Can cause dizziness and lightheadedness. May cause central nervous system depression and unconsciousness.

SKIN CONTACT: May cause skin irritation, prolonged skin contact may cause dermatitis.

EYE CONTACT: Causes severe eye irritation.
Section 3: Composition, Information on Ingredients

<table>
<thead>
<tr>
<th>PRODUCT COMPOSITION</th>
<th>APPROX %</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH REL</th>
<th>CAS NO.</th>
<th>EINECS</th>
<th>DANGER SYMBOL</th>
<th>R-RISK PHRASE</th>
<th>DSL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene glycol mono-methyl ether acetate (PGMEA)</td>
<td>&gt;30</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>108-65-6</td>
<td>203-603-9</td>
<td>Xi</td>
<td>R: 10, 36</td>
<td>Y</td>
</tr>
<tr>
<td>Cyclopentanone</td>
<td>&lt;15</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>120-92-3</td>
<td>204-435-9</td>
<td>Xi</td>
<td>R: 10-36/38</td>
<td>Y</td>
</tr>
<tr>
<td>PolyHydroxyStyrene derivatives</td>
<td>&lt;40</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>Y/Y</td>
<td>-----</td>
<td>-----</td>
<td>Y</td>
</tr>
<tr>
<td>Additive 2</td>
<td>&lt;5</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>Y/Y</td>
<td>-----</td>
<td>-----</td>
<td>Y</td>
</tr>
<tr>
<td>Additive 4</td>
<td>&lt;10</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>N/N</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>Y</td>
</tr>
</tbody>
</table>

Some items on this MSDS may be designated as trade secrets (TS). Bonafide requests for disclosure of trade secret information to medical personnel must be made in accordance with the provisions contained in 29 CFR 1910.1200 I 1-13. The Full List for all R phrases is shown in Section 16.

Section 4: First Aid Measures

INHALATION: Remove to fresh air. If not breathing, provide CPR (cardio pulmonary resuscitation) get immediate medical attention.

SKIN CONTACT: Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing.

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation persists.

INGESTION: If swallowed do not induce vomiting, give large quantities of water to drink. Never give anything to an unconscious person. Get immediate medical attention.

Section 5: Fire-fighting Measures

FLASH POINT: 30°C, 86°F (Closed-Cup Method) [Mixture]

FLAMMABLE LIMITS IN AIR (% by vol): Lower: 1.5%, Upper: 7.0%, [PGMEA]

EXTINGUISHING MEDIA: Foam, Dry Chemical, or Carbon Dioxide

SPECIAL FIREFIGHTING PROCEDURES: Product is flammable due to solvent content. Wear supplied breathing air and other protective equipment. Work from the upwind side of the fire. Use suitable extinguishing agents. If possible, move the container to a safe area. If it cannot be removed from fire danger, protect it from destruction then cool container and vicinity by spraying with water. If ignited and it cannot be extinguished easily, evacuate the area and call your emergency responders.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Solvent vapors may create explosive mixtures with air. Vapors can travel a considerable distance to source of ignition and flash back. Prevent build-up of explosive atmospheres by using adequate ventilation. Disperse explosive vapor mixtures by ventilating with air. Under fire conditions, may emit corrosive Nitrogen Oxide vapors and other toxic fumes. [PGMEA]

Section 6: Accidental Release Measures

ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Wear proper protective equipment as specified in the protective equipment section.
Warn other workers of spill.
In case of small spills, absorb with inert materials such as earth or dry sand. Place in a chemical waste container.
In case of large spills, dilute the spill, if possible. Call emergency services. Absorb the chemical. Place in a chemical waste container.
Eliminate all sources of ignition and ventilate area.
Prevent spills or contaminated rinse water from entering sewers or watercourses.

DISPOSAL METHOD: Disposal of this container: Reference Section 13 of this MSDS.
Section 9: Physical and Chemical Properties

Handling:
Avoid breathing vapors. Avoid contact with eyes, skin, and衣服 material. Wear appropriate personal protective equipment. Wash hands and face after handling.

Physical State:
Appearance: Color:

Section 8: Exposure Controls/Personal Protective Equipment

Specific-use: Do not work on or near this container.
Do not uncap or use this container.
Do not multiply or use this container.
Do not use this container. This container may be hazardous when opened.
Dissolve this container according to local, state, and federal laws in your county.

Information on Exposed Container:
Utilize standard precautions. Use Standard Precautions for handling and storage.
Keep out of reach of children.
Avoid contact with skin, eyes, and clothing.
Avoid aerosol exposure and aspiration of the material.

Precautions to be taken in Handling and Storage:

Shinestyrimolos!
Section 10: Stability and Reactivity

STABILITY: UV unstable and decompose in UV light.
CONDITIONS TO AVOID: Heating, direct sunshine and contact with acids, metallic oxides, amines or combustible materials.
INCOMPATIBILITY (MATERIALS TO AVOID): Acids, metallic oxides, amines, combustible materials.
HAZARDOUS DECOMPOSITION PRODUCTS: Decomposition products include carbon monoxide, carbon dioxide, and fumes of aromatic and aliphatic hydrocarbons.
HAZARDOUS POLYMERIZATION: Will not occur under normal temperatures and pressures.

Section 11: Toxicological Information

There is no toxicological information available for the product mixture.

<table>
<thead>
<tr>
<th>GHS Required Criteria</th>
<th>Toxicity Criteria</th>
<th>Toxicity Information</th>
<th>Comments</th>
<th>Chemical Constituent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Toxicity</td>
<td>LD50 (Oral/Rat):</td>
<td>8532 mg/kg</td>
<td></td>
<td>PGMEA</td>
</tr>
<tr>
<td></td>
<td>LD50 (Abdominal Cavity/Mouse):</td>
<td>750 mg/kg</td>
<td></td>
<td>PGMEA</td>
</tr>
<tr>
<td></td>
<td>LD50 (Dermal/Rabbit):</td>
<td>&gt;5 g/kg</td>
<td></td>
<td>PGMEA</td>
</tr>
<tr>
<td></td>
<td>LD50 (Inhalation/Rat):</td>
<td>&gt;4350 ppm</td>
<td></td>
<td>PGMEA</td>
</tr>
<tr>
<td></td>
<td>LD50 (Intraperitoneal/Mouse):</td>
<td>1950 mg/kg</td>
<td></td>
<td>CycloPentane</td>
</tr>
<tr>
<td></td>
<td>LD50 (Intraperitoneal/Mouse):</td>
<td>&gt;19500 mg/m3</td>
<td></td>
<td>CycloPentane</td>
</tr>
<tr>
<td></td>
<td>LD50 (Intraperitoneal/Mouse):</td>
<td>2950 mg/kg</td>
<td></td>
<td>Additive 4</td>
</tr>
<tr>
<td>Skin Corrosion/Irritation</td>
<td>SKIN-RABBIT:</td>
<td>500mg</td>
<td>Mild</td>
<td>CycloPentane</td>
</tr>
<tr>
<td>Serious Eye Damage / Eye Irritation</td>
<td>EYE-RABBIT:</td>
<td>No information is available</td>
<td></td>
<td>PGMEA</td>
</tr>
<tr>
<td></td>
<td>EYE-HUMAN:</td>
<td>No information is available</td>
<td></td>
<td>PGMEA</td>
</tr>
<tr>
<td></td>
<td>EYE-RABBIT:</td>
<td>100mg</td>
<td>SEVERE</td>
<td>CycloPentane</td>
</tr>
<tr>
<td></td>
<td>EYE-Human</td>
<td>No information is available</td>
<td>Irritant</td>
<td>CycloPentane</td>
</tr>
<tr>
<td>Respiratory or Skin Sensitization</td>
<td>SKIN-RABBIT:</td>
<td>No information is available</td>
<td></td>
<td>PGMEA</td>
</tr>
<tr>
<td></td>
<td>SKIN-HUMAN</td>
<td>No information is available</td>
<td></td>
<td>PGMEA</td>
</tr>
<tr>
<td>Germ Cell Mutagenicity</td>
<td>IARC</td>
<td>Not listed</td>
<td></td>
<td>PGMEA</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>NTP</td>
<td>Not listed</td>
<td></td>
<td>PGMEA</td>
</tr>
<tr>
<td></td>
<td>OSHA</td>
<td>Not listed</td>
<td></td>
<td>PGMEA</td>
</tr>
<tr>
<td>Reproductive Toxicity</td>
<td>STOT – Single Exposure</td>
<td>No information is available</td>
<td></td>
<td>PGMEA</td>
</tr>
<tr>
<td></td>
<td>STOT – Repeated Exposure</td>
<td>No information is available</td>
<td></td>
<td>PGMEA</td>
</tr>
<tr>
<td></td>
<td>Aspiration Hazard</td>
<td>No information is available</td>
<td></td>
<td>PGMEA</td>
</tr>
</tbody>
</table>

STOT = Specific Target Organ Systemic Toxicity

Printed in the USA
Section 12: Ecological Information

Biodegradation: Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/TDOD ≥ 40%) 10-day biological oxygen chemical demand is 1.04 P/P. 20-day biochemical oxygen demand is 1.12 P/P.

Bioaccumulation: No information is available.

Eco toxicity:  
- Acute LC50 for Fathead Minnow (Pimephales promelas) is 161 mg/l
- Acute LC50 for Water flea (Daphnia magna) is 408 mg/l to >500 mg/l
- Acute LC50 for Rainbow trout (Oncorhynchus mykiss) is 100-180 mg/l

Section 13: Disposal Considerations

Waste from residues / unused products: Waste material should be disposed of by incineration. The incineration temperature should meet or exceed 1250°C (2282°F) for a minimum residence time of 2 seconds.

Contaminated packaging: Contaminated packaging material should be disposed of by incineration as stated above for residues and unused product.

Rinsate: Do not dispose of rinse water containing product in a sanitary sewer system, stormwater drainage system, or wastewater treatment system. Rinsate should be disposed of by incineration as stated above for residues and unused product.

Section 14: Transport Information

UN number: UN 1866

Resin solution (contains Propylene Glycol Mono Methyl Ether Acetate) Flammable
- Class 3
- Flammable, class 3
- III
- UN1866

Resin solution (contains Propylene Glycol Mono Methyl Ether Acetate) D001
- None

DOT reportable quantity (49 CFR 172.101, APP) and CERCLA reportable quantity (40 CFR part 302, table 302.4) Hazardous Substance(s) Name / (CAS No.), content(s), and RQ: D001 (Ignitable = 100 lbs) FLAMMABLE

Rail transport: RID
- Class No.: UN 1866
- RID packing group: FLAMMABLE

Sea transport: IMDG
- Proper shipping name: Resin solution (contains Propylene Glycol Mono Methyl Ether Acetate)
- UN number: UN 1866
- Class: 3
- Packing group: III
- EmS No.: F-E, S-E
- Marine pollutant: No
Section 15: Regulatory Information

LABEL FOR SUPPLY:

RISK PHRASES:

R: 10 Flammable
R: 36/38 Irritant to eyes and skin
S: (2-) Keep out of the reach of children.
S: 25 Avoid contact with eyes
S: 23 Do not breathe gas/fumes/vapor/spray

TOXIC SUBSTANCES CONTROL ACT (TSCA) STATUS:
This product is in compliance with rules, regulations, and/or orders of TSCA and should be used in accordance with the LVE (low volume exemptions) regulations of TSCA.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA) TITLE III SECTION 313 SUPPLIER NOTIFICATION:
This regulation requires submission of annual reports of toxic chemical(s) that appear in section 313 of the Emergency Planning and Community Right To Know Act of 1986 and 40 CFR 372. This information must be included in all MSDS’s that are copied and distributed for the material.
The toxic chemicals contained in this product are: None

CANADA: This MSDS/SDS will be non compliant 3 years after the issue date.
WHMIS-INFORMATION:
The chemical components of this product are in compliance with the WHMIS regulations.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

CALIFORNIA PROPOSITION 65:
This regulation requires a warning for California Proposition 65 chemical(s) under the statute.
The California proposition 65 chemical(s) contained in this product are: None

STATE TOXIC SUBSTANCE OR HAZARDOUS SUBSTANCE LIST (State Right-to-Know):
Florida Toxic Substance(s): None
Massachusetts hazardous substance: Cyclopentanone
Pennsylvania hazardous substance: Cyclopentanone
New Jersey: Cyclopentanone
Illinois: None

EUROPEAN UNION:
This product has been reviewed for compliance with the following European Community Directives: REACH 1907/2006; Directive 67/548/EEC, Directive 2001/59/EC, Directive 91/155/EC, and Directive 2001/58/EC.

WGK: 0
EINECS: European Inventory of Existing Commercial Chemical Products.
ELINCS: European List of Notified Chemical Substances

WEEE CERTIFICATION: Waste Electrical and Electronic Equipment (WEEE), European Union Directive 2002/96/EC. Shin Etsu MicroSi does not consider SIPR-7126M-20 a product that qualifies as one of the 10 categories of electrical and electronic equipment listed in Annex 1A of Directive 2002/96/EC. Also, the products manufactured by Shin Etsu MicroSi do not intentionally contain any of the regulated substances, preparations, or components listed in Annex II of Directive 2002/96/EC. This certification is valid only for this product: S10-7126M-20. Packaging materials were not considered for this certification.

Printed in the USA
RoHS CERTIFICATION: The Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS), EU Directive (2002/95/EC). We hereby certify that the hazardous substances regulated by the RoHS Directive 2002/95/EC are not used intentionally as ingredient(s) for SIPR-7126M-20 which is manufactured by Shin-Etsu Chemical Co. Ltd. This certification is valid only for this product, SIPR-7126M-20. Packaging materials were not considered for this certification.

Section 16: Other Information

Full Text:
European Community Hazards Identification:

<table>
<thead>
<tr>
<th>R</th>
<th>S</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>I</td>
<td>Flammable</td>
</tr>
<tr>
<td>36</td>
<td>I</td>
<td>Irritating to the eyes</td>
</tr>
<tr>
<td>36/38</td>
<td>I</td>
<td>Irritant to eyes and skin</td>
</tr>
<tr>
<td>(2-)</td>
<td>I</td>
<td>Keep out of the reach of children.</td>
</tr>
<tr>
<td>25</td>
<td>I</td>
<td>Avoid contact with eyes</td>
</tr>
<tr>
<td>23</td>
<td>I</td>
<td>Do not breath gas/fumes/vapor/spray</td>
</tr>
</tbody>
</table>

Danger Symbol(s): Xi Irritant
F Flammable

Revision Comments: Updated from: January 16, 2007 to comply with REACH and GHS.

Revision Number: 1

Information Sources: RTECS, REACH

FOR INDUSTRIAL USE ONLY

THIS MATERIAL SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION, AND INVESTIGATION. THE DATA DESCRIBED IN THIS MSDS CONSIST OF DATA ON LITERATURE, OUR ACQUISITIONAL DATA, AND ANALOGICAL INference BY DATA OF SIMILAR CHEMICAL SUBSTANCES OR PRODUCTS. SHIN-ETSU CHEMICAL CO. LTD. PROVIDES NO WARRANTIES, EITHER EXPRESSED OR IMPLIED, AND ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE DATA CONTAINED HEREIN.

ADDITIONAL INFORMATION

THIS DATA IS OFFERED IN GOOD FAITH AS TYPICAL VALUES AND NOT AS A PRODUCT SPECIFICATION. NO WARRANTY, EITHER EXPRESSED OR IMPLIED, IS MADE. THE RECOMMENDED HANDLING PROCEDURES ARE BELIEVED TO BE GENERALLY APPLICABLE.