

SAFETY DATA SHEET

This SDS complies with REACH 1907/2006 and 2001/58/EC, GHS, OSHA 29CFR 1910.1200

Section 1: Chemical Product and Company Identification

CHEMICAL SUPPLIER COMPANY NAME

Shin-Etsu MicroSi, Inc.
10028 South 51st Street
Phoenix, AZ 85044

EMERGENCY TELEPHONE

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DATE PREPARED:

May 4, 2008

DATE REVIEWED:

November 4, 2013

PRODUCT NAMES:

MICROPRIMER P-20

FORMULA:

Mixture

PRODUCT USE:

This product is intended for use in Semiconductor photolithography processes.

Section 2: Hazards Identification

Regulation (EC) No 1272/2008



Symbol:

Highly Flammable liquid and vapor – Category 2
Skin Irritation – Category 2
Acute Toxicity Oral—Category 4
Acute Toxicity Inhalation—Category 4
Acute Toxicity Skin—Category 4
Aquatic Hazard (Long term)—Category 3

Signal word:

Danger

Hazard Statement:

Highly Flammable liquid and vapor
Causes skin irritation
Harmful in contact with skin
Harmful if inhaled
May be Harmful if swallowed
Harmful to aquatic life with long lasting effects

Precautionary Statements:

Prevention

Ground/Bond container and receiving equipment.
Keep away from heat/sparks/open flames/hot surfaces. NO smoking.
Wear protective gloves/eye protection/face protection
Use explosion-proof electrical/ventilation/lighting equipment
Use only non-sparking tools
Take precautionary measures against static discharge.
Wash hands thoroughly after handling.
Avoid breathing mist/vapors/spray.
Use only outdoors or in a well-ventilated area.

Response

IF SWALLOWED: Immediately call a doctor/physician or Poison Control center if you feel unwell
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF INHALED: Remove victim to fresh air and keep comfortable for breathing.

In case of fire, use Foam, dry chemical, or carbon dioxide. Do NOT use Water. Avoid release to the environment

Storage

Store upright in a well -ventilated place. Keep container tightly closed.
Store locked up.

Disposal

Dispose of contents/container in accordance with the waste disposal requirements of your country, state, or local authorities. Recommend waste material be disposed of by using incineration.

HAZARD CLASSIFICATION:

Flammable Liquid (based on IMO and DOT)

FIRE AND EXPLOSION:

Flammable and Explosive Hazard

NFPA RATINGS:

Component	Health (Blue)	Flammability (Red)	Reactivity (Yellow)	Special (White)
MP-P20	2	4	1	--

POTENTIAL HEALTH EFFECTS

INGESTION: May produce abdominal pain and nausea. Aspiration into lungs may produce severe lung damage and is a medical emergency. Other symptoms expected to parallel inhalation.

INHALATION: Causes irritation to the respiratory tract. Symptoms may include coughing and shortness of breath. Irritation effects normally prevent exposure high enough to cause systemic effect.

SKIN CONTACT: Causes severe irritation. Prolonged skin contact may cause dermatitis.

EYE CONTACT: Causes severe irritation. Vapors may cause eye irritation. Contact may cause corneal injury.

Section 3: Hazards Identification

PRODUCT COMPOSITION	APPROX %	ACGIH TLV	OSHA PEL	NIOSH REL	CAS NO.	EINECS/ELINCS	DANGER SYMBOL	R-RISK PHRASE	DSL
Propyleneglycolmono-methyletheracetate (PGMEA)	<80	----	----	----	108-65-6	203-603-9	Xi	R: 10, 36	Y
Hexamethyldisilazane (HMDS)	<20	----	----	----	999-97-3	213-668-5	----	----	Y

Some items on this MSDS may be designated as trade secrets. Bona Fide 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 immediate medical attention.

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: 18°C, 64°F [Mixture]

FLAMMABLE LIMITS IN AIR (% by vol): Lower: 1.3%, Upper: 13.1%, [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. 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 and disperse of explosive atmospheres by using adequate ventilation. Under fire conditions, may emit corrosive Nitrogen Oxide vapors and other toxic fumes. [PGMEA] Ammonia will be generated from reaction with water [HMDS]

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, dike 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 should be made in accordance with federal, state, and local regulations.
- Incineration is recommended.

Section 7: Handling and Storage

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

- Store upright in a cool, dry place, < 30° C (85 °F)
- Keep container closed when not in use.
- Prevent build-up of electro-static charges (e.g. by grounding).
- Keep away from heat, sparks, flame, direct sunlight, and other possible sources of ignition.
- Do not store with peroxides and oxidizing materials.
- Use only with adequate ventilation.
- Do not inhale vapors.
- Avoid spilling and releasing vapor.
- Wear proper protective equipment when handling this material.
- Avoid contact with skin, eyes, or clothing.
- Wash hands and face after handling this material.
- Keep out of reach of children.
- Follow all applicable local regulations for handling and storage.
- Utilize chemical segregation.

INFORMATION ON EMPTIED CONTAINER

- Dispose of this container according to local, state, and federal laws in your country.
- Do not reuse this container. This container may be hazardous when emptied.
- Residues will be explosive or flammable.
- Do not puncture or cut this container.
- Do not weld on or near this container.

SPECIFIC USES:

- This product is intended for use in Semiconductor photolithography processes.

Section 8: Exposure Controls/Personal Protection

VENTILATION:

Always provide good general, mechanical room ventilation where this chemical is used.

SPECIAL VENTILATION CONTROLS:

Use this material inside totally enclosed equipment, or use it with local exhaust ventilation at points where vapors can be released into the workspace air.

RESPIRATORY PROTECTION:

Use NIOSH approved air-purifying respirator with Ammonia cartridge if ammonia fumes exceed TLV.

PROTECTIVE GLOVES:

Wear chemical impervious gloves at all times while working with this product. Recommended glove types include: Laminate Film, Nitrile, or Tri-polymer. Check with your company's glove supplier to ensure chemical resistance.

EYE PROTECTION:

Safety Glasses, Chemical goggles, face shield

PROTECTIVE CLOTHING:

Wear suitable protective clothing to prevent skin contact. Use of anti-static type aprons is recommended.

OTHER EQUIPMENT:

Make safety shower, eyewash stations, and hand washing equipment available in the work area.

WORK/HYGIENE PRACTICES:

Avoid breathing vapor. Avoid contact with eyes. Wash hands and face after handling.

Section 9: Physical and Chemical Properties

APPEARANCE - COLOR: Clear colorless
 PHYSICAL STATE: Liquid
 ODOR: Strong Solvent Odor

	Propylene Glycol mono methyl ether acetate (PGMEA)	HMDS
Boiling point	146 °C	126 °C
Melting point	-80 °C	NA °C
Vapor Pressure	5.07 kpa (@25°C)	20 mmHg (@25°C)
Vapor Density (air=1)	4.6	4.6
Specific Gravity (@25 °C)	1.03	0.773
Viscosity	2-15 mPa [Mixture]	NA
% VOLATILE by VOLUME	More than 75% [Mixture]	100
EVAPORATION RATE (Butyl Acetate = 1):	<1 [Mixture]	Slower Than Ether
SOLUBILITY IN WATER:	18.5 wt.% at 20 °C	Not Soluble, Reacts With Water to Emit Ammonia. PH value 13 when reacting with water.

	PRODUCT CRITERIA
ODOR THRESHOLD	Not Available for product
PH	Not Available for product
FLASH POINT:	18 °C, 64 °F [Mixture] (tested by TAG closed-cup method)
LOWER EXPLOSIVE LIMIT; UPPER EXPLOSIVE LIMIT	Not Available for product
FLAMMABILITY (Solid, gas)	Not Available for product
EXPLOSIVE PROPERTIES	Not Available for product
OXIDIZING PROPERTIES	Not Available for product
SPECIFIC GRAVITY (@25 °C):	0.95
EVAPORATION RATE. (Butyl Acetate=1)	Not Available for product
% VOLATILE by VOLUME	More than 75%
PARTITION COEFFICIENT	Not Available for product
AUTO IGNITION TEMPERATURE	Not Available for product
DECOMPOSITION TEMPERATURE	Not Available for product
BOILING POINT:	134°C
MELTING POINT:	Not Available for product
VAPOR PRESSURE	79mmHg
VAPOR DENSITY (AIR = 1)	Not Available for product
SOLUBILITY IN WATER:	Forms 2 layers
WATER SOLUBILITY IN THE SOLVENT	Not Available for product
FREEZING POINT:	Not Available for product
VISCOSITY	Not Available for product

Section 10: Stability and Reactivity

STABILITY: Stable
 INCOMPATIBILITY (MATERIALS TO AVOID): Oxidizing agents, strong acids, alkaline materials, water, and alcohol. HMDS may react quickly with alcohols and water under some conditions with release of moderate amounts of heat. HMDS, a component in this product, reacts with water to emit ammonia gas.
 HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition products: Carbon Monoxide, Carbon dioxide
 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.

GHS Required Criteria	Toxicity Criteria	Toxicity Information	Comments	Chemical Constituent
Acute Toxicity	LD50 (Oral/Rat):	8532 mg/kg		PGMEA
	LD50 (Abdominal Cavity/Mouse):	750 mg/kg		PGMEA
	LD50 (Dermal/Rabbit):	>5 g/kg		PGMEA
	LC50 (Inhalation/Rat):	>4350 ppm		PGMEA
Acute Toxicity	LD50 (Oral/Rat):	850 mg/kg		HMDS
	LC50 (Inhalation/Rat):	10 mg/l 6 hour		HMDS
	LC50 (Inhalation/Rat):	8.7 mg/l 4 hour		HMDS
	LC50 (Inhalation/Rat):	1516 ppm 6 hour		HMDS
	LC50 (Inhalation/Mouse):	12 g/m ³ 2Hours		HMDS
	LD50 (Oral/Rabbit):	100 mg/kg		HMDS
	LD50 (Skin/Rabbit):	0.710 ml/kg = 549.5 mg/kg		HMDS
	TCLo (Inhalation/Rat)	98 mg/m ³ / 4Hour 17 W-I		HMDS
Skin Corrosion/Irritation	Skin Rabbit	500 µL	Severe irritant	HMDS
Serious Eye Damage / Eye Irritation		No information is available		PGMEA
		No information is available		PGMEA
Respiratory or Skin Sensitization		No information is available		PGMEA
		No information is available		PGMEA
Germ Cell Mutagenicity		No information is available		
Carcinogenicity	IARC	Not listed		
	NTP	Not listed		
	OSHA	Not listed		
Reproductive Toxicity		No information is available		
STOST -- Single Exposure		No information is available		
STOST -- Repeated Exposure		No information is available		
Aspiration Hazard		No information is available		
Tumorigenic	TDLo (Intraperitoneal/Mouse)	1 g/kg	Tumorigenic agent per RTECS	HMDS

STOST = Specific Target Organ Systemic Toxicity

OTHER DATA:

PGMEA

OEL-AUSTRIA: MAK 20 ppm (110 mg/m³), JAN1999
 OEL-DENMARK: TWA 20 ppm (110 mg/m³), JAN1999
 OEL-GERMANY: MAK 20 ppm (110 mg/m³), JAN1999
 OEL-AUSTRIA: MAK 50 ppm (275 mg/m³), JAN1999
 OEL-DENMARK: TWA 50 ppm (270 mg/m³), JAN1999
 OEL-SWEDEN: NGV 50 ppm (230 mg/m³), KTV 75 ppm (350 mg/m³, Skin, JAN1999
 OEL-UNITED KINGDOM: TWA 50 ppm (274 mg/m³), STEL 150 ppm (822 mg/m³), SEP2000
 OEL-THE NETHERLANDS: MAC-TGG 550 mg/m³, 2003

Section 12: Ecological Information

BIODEGRADATION:	Biodegradation under aerobic static laboratory conditions is high (BOD20 OR BOD28/THOD IS GREATER THAN 40%) 10-day biological oxygen chemical demand is 1.04 P/P. 20-day biochemical oxygen demand is 1.12 P/P.	PGMEA
	15.3% - Not readily biodegradable OECD Test 301	HMDS
BIOACCUMULATION:	No information is available.	PGMEA
ECO TOXICITY:	Acute LC50 for Fathead Minnow (Pimephales Promelas) is 161 mg/l	PGMEA
	Acute LC50 for Water Flea (Daphnia Magna) is 408 mg/l to >500 mg/l	PGMEA
	Acute LC50 for Rainbow trout (Oncorhynchus Mykiss) is 100-180 mg/l	PGMEA
	LC50 – Danio rerio (zebra fish) – 88 mg/l – 96.0 hour	HMDS
	EC50 – Daphnia magna (Water flea) – 80.0 mg/l – 48 hour	HMDS
	EC50 – Desmodesmus subspicatus (green algae) – 19.0 mg/l – 72 hour	HMDS
MOBILITY:	No information is available.	

Section 13: Disposal Considerations

WASTE FROM RESIDUES / UNUSED PRODUCTS: Recommend waste material be disposed of by using incineration. Follow the waste disposal requirements of your country, state, or local authorities.

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

ROAD TRANSPORT:

ADR = International Carriage of Dangerous Goods by Road

UN NUMBER:	UN 2924
DOT PROPER SHIPPING NAME	Flammable Liquid, Corrosive N.O.S., (CONTAINS Propylene Glycol Mono Ether Acetate and Hexamethyldisilazane)
DOT / ADR HAZARD CLASS:	3, 8
DOT / ADR PACKAGING GROUP:	III
PLACARD:	Flammable, 3, Corrosive 8
HAZARD NUMBER – ADR:	UN 2924
ADR PROPER SHIPPING NAME:	Flammable Liquid, Corrosive N.O.S., (CONTAINS Propylene Glycol Mono Ether Acetate and Hexamethyldisilazane)

RAIL TRANSPORT:

UN NUMBER:	UN 2924
CLASS No.:	Flammable Liquid, Corrosive N.O.S., (CONTAINS Propylene Glycol Mono Ether Acetate and Hexamethyldisilazane)
RID PACKING GROUP:	III
LABELS:	3, 8

SEA TRANSPORT: IMDG

PROPER SHIPPING NAME	Flammable Liquid, Corrosive N.O.S., (CONTAINS Propylene Glycol Mono Ether Acetate and Hexamethyldisilazane)
UN NUMBER SEA	UN 2924
IMDG CLASS:	3
IMDG PACKING GROUP:	III
EmS No.:	F-E, S-C
MARINE POLLUTANT:	No
SEA TRANSPORT NOTES:	Causes burns to skin, eyes, and mucous membranes

AIR TRANSPORT: IATA/ICAO

UN NUMBER:	UN2924
PROPER SHIPPING NAME	Flammable Liquid, Corrosive N.O.S., (CONTAINS Propylene Glycol Mono Ether Acetate and Hexamethyldisilazane)
HAZARD CLASS:	3
PACKAGING GROUP:	III

Section 15: Regulatory Information

Directive 67/548/EEC

LABEL FOR SUPPLY:



IRRITANT



F
FLAMMABLE

RISK PHRASES:

R: 10	Flammable
R: 36	Irritant to eyes.
S: 2	Keep out of the reach of children
S: 25	Avoid contact with eyes

TOXIC SUBSTANCES CONTROL ACT (TSCA) STATUS:

This product is in compliance with rules, regulations, and/or orders 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.
The toxic chemicals contained in this product are: None

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 RIGHT-TO-KNOW TOXIC SUBSTANCE OR HAZARDOUS SUBSTANCE LIST:

Florida Toxic Substance(s):	None
Massachusetts's hazardous substance(s):	None
Pennsylvania hazardous substance code(s):	HMDS
New Jersey	HMDS
Illinois	None
Michigan:	None

CANADA:

This MSDS/SDS will be non compliant 3 years after the issue date. This MSDS contains all of the information required by the Controlled Products Regulations (CPR).

WHMIS-INFORMATION:

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR), SOR/88-66, current to February 20, 2012. The classes of controlled products listed in the CPR, Section 32, Part IV, have been reviewed. This product meets the definition of a Division 2 of Class B - Flammable and Combustible material. PGMEA: B3 - Flammable and combustible material - Combustible liquid

EUROPEAN UNION:

This product has been reviewed for compliance with the following European Community Directives: REACH 1907/2006; Directive 67/548/EEC, Regulation (EC) No 1272/2008 on classification, labeling and packaging (CLP) of substances and mixture.

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 MP-P20 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: MP-P20. Packaging materials were not considered for this certification.

RoHS CERTIFICATION: The Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS), EU Directive (2002/95/EC-rescinded) and 2011/65/EU. We hereby certify that the hazardous substances regulated by the RoHS Directive 2011/65/EU are not used intentionally as ingredient(s) for MP-P20 which is manufactured by Shin-Etsu Chemical Co. Ltd. This certification is valid only for this product, MP-P20. Packaging materials were not considered for this certification.

WGK: 1
EINECS: European Inventory of Existing Commercial Chemical Products.
ELINCS: European List of Notified Chemical Substances

Section 16: Other Information

Full Text:

European Community Hazards Identification:

R: 10	Flammable
R: 36	Irritant to eyes.
S: 2	Keep out of the reach of children
S: 25	Avoid contact with eyes

Danger Symbol(s): Xi Irritant
F Flammable
Revision Comments: Updated from August 15, 2012

Revision Number: 5

Information Sources: RTECS, REACH, OSHA 29CFR 1910.1200

FOR INDUSTRIAL USE ONLY

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