



Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

MICROPOSIT™ S1805™ POSITIVE PHOTORESIST

Supplier ROHM AND HAAS ELECTRONIC MATERIALS LLC
A Subsidiary of The Dow Chemical Company
455 FOREST STREET
MARLBOROUGH, MA 01752 United States

For non-emergency information contact: 215-592-3000

For non-emergency information contact: 508-481-7950

Emergency telephone number 1 800 424 9300

Local emergency telephone number 989-636-4400

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
Electronic grade propylene glycol monomethyl ether acetate	108-65-6	70.0 - 80.0 %
Mixed cresol novolak resin		10.0 - 20.0 %
Diazo Photoactive Compound		1.0 - 10.0 %
Cresol	1319-77-3	< 1.0 %
Fluoroaliphatic Polymer Esters	11114-17-3	< 1.0 %

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance

Form liquid
Colour Red Amber

Odour ester-like

Hazard Summary**CAUTION!**

Combustible liquid and vapor. Causes irritation to eyes, nose, and respiratory tract.
Prolonged, repeated contact, inhalation, ingestion, or absorption through the skin, may cause adverse effects to internal organ systems.

Potential Health Effects

Primary Routes of Entry: Inhalation, ingestion, eye and skin contact, absorption.

Eyes: May cause pain, transient irritation and superficial corneal effects.

Skin: Material may cause irritation.

Prolonged or repeated exposure may have the following effects:

drowsiness

defatting and drying of the skin which can lead to irritation and dermatitis

central nervous system depression

kidney damage

liver damage

Ingestion: Swallowing may have the following effects:

irritation of mouth, throat and digestive tract

headache

nausea

Vomiting

Repeated doses may have the following effects:

central nervous system depression

liver damage

kidney damage

Inhalation: Inhalation may have the following effects:

irritation of nose, throat and respiratory tract

Higher concentrations may have the following effects:

systemic effects similar to those resulting from ingestion

Target Organs: Eye

Respiratory System

nervous system

Liver

Kidney

Skin

Carcinogenicity

Not considered carcinogenic by NTP, IARC, and OSHA

4. FIRST AID MEASURES

Inhalation: Remove from exposure. If there is difficulty in breathing, give oxygen. Seek medical attention if symptoms persist.

Skin contact: Wash skin with water. Continue washing for at least 15 minutes. Obtain medical attention if blistering occurs or redness persists.

Eye contact: Immediately flush the eye with plenty of water for at least 15 minutes, holding the eye open. Obtain medical attention if soreness or redness persists.

Ingestion: Wash out mouth with water. Have victim drink 1-3 glasses of water to dilute stomach contents. Induce vomiting if person is conscious. Immediate medical attention is required. Never administer anything by mouth if a victim is losing consciousness, is unconscious or is convulsing.

Notes to physician: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Flash point 40 - 46 °C (104 - 115 °F)

Suitable extinguishing media: Use water spray, foam, dry chemical or carbon dioxide. Keep containers and surroundings cool with water spray.

Specific hazards during fire fighting: This product may give rise to hazardous vapors in a fire. Vapors can travel a considerable distance to a source of ignition and result in flashback.

Special protective equipment for fire-fighters: Wear full protective clothing and self-contained breathing apparatus.

Further information: Pressure may build up in closed containers with possible liberation of combustible vapors.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Wear suitable protective clothing.

Wear respiratory protection.

Eliminate all ignition sources.

Environmental precautions

Prevent the material from entering drains or water courses.

Do not discharge directly to a water source.

Advise Authorities if spillage has entered watercourse or sewer or has contaminated soil or vegetation.

Methods for cleaning up

Contain spills immediately with inert materials (e.g., sand, earth).

Transfer into suitable containers for recovery or disposal.

Finally flush area with plenty of water.

7. HANDLING AND STORAGE

Handling

Use local exhaust ventilation. Avoid contact with eyes, skin and clothing. Keep container tightly closed.

Storage

Storage conditions: Store in original container. Keep away from heat and sources of ignition. Storage area should be: cool dry well ventilated out of direct sunlight

Further information on storage conditions: Proprietary photoresist film contains approximately 2-4% of 2,3,4-trihydroxybenzophenone (THBP), which may sublime during soft-bake or hard-bake processing. THBP has low acute toxicity (LD50>5g/kg). Contact with eyes, skin or mucous membranes cause irritation. To prevent accumulation of THBP on equipment surfaces and ventilation ducts, preventative maintenance program including regular cleaning should be implemented. Wipe surfaces using an appropriate cleaning solvent when possible. Provide adequate general or local exhaust ventilation during the cleaning process. In situations where this is not possible or where solvent or dust concentrations become excessive, use an air purifying respirator with an organic vapor/ toxic particulate cartridge. When cleaning residual THBP, wear protective gloves and adequate protective clothing to prevent skin contact. Practice good personal hygiene to prevent accidental exposure. Clean all protective clothing and equipment thoroughly after each use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit(s)

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value
Electronic grade propylene glycol monomethyl ether acetate	Rohm and Haas	TWA	30 ppm
	Rohm and Haas	STEL	90 ppm
	Rohm and Haas WEEL	Absorbed via skin TWA	50 ppm

Component	Regulation	Type of listing	Value
Cresol	ACGIH	TWA	5 ppm
	ACGIH	SKIN_DES	
	OSHA_TRANS	PEL	22 mg/m3 5 ppm
	OSHA_TRANS	SKIN_DES	
	Z1A	TWA	22 mg/m3 5 ppm
	Z1A	SKIN_FINAL	
	ACGIHLIS_P	TWA Inhalable fraction and vapor.	20 mg/m3
	ACGIHLIS_P	SKIN_DES Inhalable fraction and vapor.	
	ACGIH	TWA Inhalable fraction and vapor.	20 mg/m3
	ACGIH	SKIN_DES Inhalable fraction and vapor.	

Exposure controls

Engineering measures: Engineering methods to prevent or control exposure are preferred.

Methods include process or personnel enclosure, mechanical ventilation (local exhaust), and control of process conditions.

Individual protection measures

Eyeface protection: Goggles

Skin protection

Hand protection: Butyl rubber gloves. Other chemical resistant gloves may be recommended by your safety professional.

Other protection: Normal work wear.

Respiratory protection: Respiratory protection if there is a risk of exposure to high vapor concentrations. The specific respirator selected must be based on the airborne concentration found in the workplace and must not exceed the working limits of the respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	liquid
Colour	Red Amber
Odour	ester-like
pH	neutral
Boiling point/boiling range	ca.146 °C (295 °F)
Flash point	40 - 46 °C (104 - 115 °F)
Evaporation rate	Slower than ether

Component: Electronic grade propylene glycol monomethyl ether acetate

Vapour pressure 3.7 mmHg at 20 °C (68 °F)

Relative vapour density	Heavier than air.
Relative density	0.80 - 1.00
Water solubility	insoluble
VOC's	727 - 950 g/l

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Hazardous reactions	Stable under normal conditions.
Conditions to avoid	High temperatures Static discharge
Materials to avoid	Oxidizing agents
Hazardous decomposition products	Combustion will generate:, Carbon monoxide, carbon dioxide, phenols, nitrogen oxides (NOx), Aldehydes, acrid smoke and irritating fumes,
Polymerisation	Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Component: Electronic grade propylene glycol monomethyl ether acetate
Acute oral toxicity LD50 rat > 5,000 mg/kg

Component: Cresol
Acute oral toxicity LD50 rat 1,454 mg/kg

Component: Electronic grade propylene glycol monomethyl ether acetate
Acute inhalation toxicity LC50 rat 6 h > 24 mg/l

Component: Cresol
Acute inhalation toxicity LC50 rat 8 h 35.38 mg/l

Component: Electronic grade propylene glycol monomethyl ether acetate
Acute dermal toxicity LD50 rat > 5,000 mg/kg

Component: Electronic grade propylene glycol monomethyl ether acetate
Acute dermal toxicity LD50 rabbit > 5,000 mg/kg

Component: Cresol
Acute dermal toxicity LD50 rabbit 2,000 mg/kg

Component: Fluoroaliphatic Polymer Esters
Acute dermal toxicity > 5,000 mg/kg

Component: Cresol
Skin irritation rabbit Corrosive

Component: Cresol
Eye irritation rabbit Corrosive

Component: Electronic grade propylene glycol monomethyl ether acetate
Reproductive toxicity

Dermal teratology testing of this solvent (with less than 3% beta isomer) revealed no maternally toxic, teratogenic or fetotoxic responses in rats or rabbits exposed to concentrations of 1,000 and 2,000 mg/kg per day.

Component: Electronic grade propylene glycol monomethyl ether acetate
Mutagenicity

No significant mutagenic response was observed and the carcinogenic potential of the material is therefore considered to be low.

Component: Cresol
Teratogenicity

Developmental effects were seen in laboratory animals only at dose levels that were maternally toxic.

Component: Cresol
Mutagenicity

Not mutagenic in Ames Test. In vitro tests showed mutagenic effects

12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

Electronic grade propylene glycol monomethyl ether acetate

Elimination information (persistence and degradability)

Biodegradability OECD Test Guideline 302B or Equivalent
100 %
10-day Window: Pass

Bioaccumulation No applicable data.

Ecotoxicity effects

Toxicity to fish LC50 Fathead minnow (*Pimephales promelas*) 96 h Method Not Specified
161 mg/l

Toxicity to algae Growth inhibition EC50 Algae (*Selenastrum capricornutum*) 72 h Method Not Specified
>1,000 mg/l

Toxicity to aquatic invertebrates EC50 *Daphnia magna* (Water flea) 48 h Method Not Specified
>500 mg/l

Cresol

Ecotoxicity effects

Toxicity to fish LC50 Zebra fish (*Danio/Brachydanio rerio*) 96 h Method Not Specified
9 mg/l

Toxicity to fish LC50 Bluegill sunfish (*Lepomis macrochirus*) 96 h Method Not Specified
10 mg/l

Toxicity to fish LC50 *Pimephales promelas* (fathead minnow) 96 h Method Not Specified
12.8 mg/l

Toxicity to bacteria EC0 *Pseudomonas putida* 0.5 h
250 mg/l

Toxicity to aquatic invertebrates LC50 *Daphnia* 48 h Method Not Specified
33 - 100 mg/l

13. DISPOSAL CONSIDERATIONS

Environmental precautions: Prevent the material from entering drains or water courses.

Do not discharge directly to a water source.

Advise Authorities if spillage has entered watercourse or sewer or has contaminated soil or vegetation.

Disposal

Dispose in accordance with all local, state (provincial), and federal regulations. Incineration is the recommended method of disposal for containers. Under RCRA, it is the responsibility of the product's user to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste.

This is because the product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Do not remove label until container is thoroughly cleaned. Empty containers may contain hazardous residues. This material and its container must be disposed of in a safe way.

14. TRANSPORT INFORMATION

DOT

Not regulated per 49CFR 173.150(f)(2)

IMO/IMDG

Proper shipping name	RESIN SOLUTION
UN number	UN 1866
Class	3
Packing group	III

Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations

15. REGULATORY INFORMATION

Workplace Classification

OSHA: Combustible
Irritant

WHMIS: This product is a 'controlled product' under the Canadian Workplace Hazardous Materials Information System (WHMIS).

SARA TITLE III: Section 311/312 Categorizations (40CFR370): Immediate, delayed, flammability hazard

SARA TITLE III: Section 313 Information (40CFR372)

This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations.

US. Toxic Substances Control Act (TSCA): All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

California (Proposition 65)

This product does not contain materials which the State of California has found to cause cancer, birth defects or other reproductive harm.

16. OTHER INFORMATION

NFPA Hazard Rating

Health	Fire	Reactivity
2	2	0

Legend

ACGIH	American Conference of Governmental Industrial Hygienists
BAC	Butyl acetate
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
STEL	Short Term Exposure Limit (STEL):
TLV	Threshold Limit Value
TWA	Time Weighted Average (TWA):
	Bar denotes a revision from prior MSDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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