



**MATERIAL SAFETY DATA SHEET**  
**MICROPOSIT S1813 PHOTO RESIST**  
41280 4.00 US US 11.06.1998 MSDS\_US

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**1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

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**Product Code** 41280  
**Trade Name** MICROPOSIT S1813 PHOTO RESIST  
**Manufacturer/Supplier** Shipley Company  
**Address** 455 Forest St.  
Marlborough, Massachusetts 01752

**Phone Number** (508) 481-7950  
**Emergency Phone Number** (508) 481-7950  
**Chemtrec #** (800) 424-9300  
**MSDS first issued** 2 July 1996  
**MSDS data revised** 11 June 1998  
**Prepared By:** Amy C. Nichols  
**Local Sales Company** Shipley Company, 455 Forest Street, Marlboro, MA 01752  
(508-481-7950)

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**2. COMPOSITION/INFORMATION ON THE INGREDIENTS**

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Components in Product		
Component Name	CAS# / Codes	Concentration
Electronic grade propylene glycol monomethyl ether acetate	108-65-6	71.00 - 76.00
Mixed cresol novolak resin		10.00 - 20.00
Fluoroaliphatic Polymer Esters		0.01 - 1.00
Diazo Photoactive Compound		1.00 - 10.00
cresol	1319-77-3	0.01 - 0.99

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**3. HAZARD IDENTIFICATION**

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**Main Hazards** - Irritant - Combustible - Nervous System - Skin - Eye - Kidney - Liver

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

**Carcinogenic Status** Not considered carcinogenic by NTP, IARC and OSHA

**Target Organs** - Nervous System - Skin - Eye - Liver - Kidney

**Health Effects - Eyes** Liquid or vapor may cause pain, transient irritation and superficial corneal effects.

**Health Effects - Skin** Material may cause slight irritation on prolonged or repeated contact. Repeated and/or prolonged contact may lead to: -

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**3. HAZARD IDENTIFICATION**

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	drowsiness - liver damage - kidney damage
<b>Health Effects - Ingestion</b>	A large dose may have the following effects: - drowsiness - liver damage - kidney damage
<b>Health Effects - Inhalation</b>	Exposure to vapor at high concentrations may have the following effects: - irritation of nose, throat and respiratory tract - liver damage - kidney damage

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**4. FIRST AID MEASURES**

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<b>First Aid - Eyes</b>	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.
<b>First Aid - Skin</b>	Wash skin with water. Obtain medical attention if blistering occurs or redness persists.
<b>First Aid - Ingestion</b>	Wash out mouth with water. Obtain medical attention.
<b>First Aid - Inhalation</b>	Remove from exposure. If there is difficulty in breathing, give oxygen. Seek medical attention if symptoms persist.
<b>Advice to Physicians</b>	Treat symptomatically.

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**5. FIRE FIGHTING MEASURES**

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<b>Extinguishing Media</b>	Use water spray, foam, dry chemical or carbon dioxide. Keep containers and surroundings cool with water spray.
<b>Special Fire-Fighting Procedures</b>	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.
<b>Unusual Fire &amp; Explosion Hazards</b>	Pressure may build up in closed containers with possible liberation of combustible vapors.
<b>Protective Equipment for Fire-Fighting</b>	Wear full protective clothing and self-contained breathing apparatus.

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**6. ACCIDENTAL RELEASE MEASURES**

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<b>Spill Procedures</b>	Contain and absorb using earth, sand or other inert material. Transfer into suitable containers for recovery or disposal. Finally flush area with plenty of water.
<b>Personal Precautions</b>	Wear appropriate protective clothing. Wear respiratory protection. Eliminate all sources of ignition.
<b>Environmental Precautions</b>	Prevent the material from entering drains or water courses.

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**7. HANDLING AND STORAGE**

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**Handling** Use local exhaust ventilation. Avoid contact with eyes, skin and clothing. Keep container tightly closed when not in use.

**Storage** Store in original containers. Store away from sources of heat or ignition. Storage area should be:  
- cool - dry - well ventilated - out of direct sunlight

**Other**  
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.

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**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

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**Occupational Exposure Standards**

<b>Electronic grade propylene glycol monomethyl ether acetate</b>	Manufacturer recommends 30ppm 8h TWA and 90ppm 15 min STEL.
<b>cresol</b>	ACGIH: TLV 5ppm (22mg/m <sup>3</sup> ) 8h TWA. OSHA: PEL 5ppm (22mg/m <sup>3</sup> ) 8h TWA. UK EH40: OES 5ppm (22mg/m <sup>3</sup> ) 8h TWA. Can be absorbed through skin.

**Engineering Control 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.

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**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

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<b>Respiratory Protection</b>	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.
<b>Hand Protection</b>	Butyl rubber gloves.
<b>Eye Protection</b>	Chemical goggles.
<b>Body Protection</b>	Normal work wear.

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**9. PHYSICAL AND CHEMICAL PROPERTIES**

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<b>Physical State</b>	Viscous liquid
<b>Color</b>	Red
<b>Odor</b>	Sweet
<b>VOC (g/l)</b>	764.7
<b>Specific Gravity</b>	1.04
<b>pH</b>	Neutral
<b>Boiling Range/Point (°C/F)</b>	145.8/295
<b>Flash Point (PMCC) (°C/F)</b>	40.5-46.1 / 105-115
<b>Explosion Limits (%)</b>	Lower limit 1.5 at 20 °C. Upper limit 7.0 at 20 C..
<b>Solubility in Water</b>	Insoluble.
<b>Vapor Density (Air = 1)</b>	Heavier than air.
<b>Evaporation Rate</b>	Slower than ether
<b>Vapor Pressure</b>	Propylene Glycol Monomethyl Ether Acetate: 3.7 mmHg at 20 °C.

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**10. STABILITY AND REACTIVITY**

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<b>Stability</b>	Stable under normal conditions.
<b>Conditions to Avoid</b>	- High temperatures - Static discharge
<b>Incompatibilities</b>	- Oxidizing agents
<b>Hazardous Polymerization</b>	Will not occur.
<b>Hazardous Decomposition Products</b>	- oxides of carbon - oxides of nitrogen - acrid smoke and irritating fumes - phenols - carbon monoxide - toxic fluorine compounds

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**10. STABILITY AND REACTIVITY**

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**11. TOXICOLOGICAL INFORMATION**

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<b>Acute Data</b>	Propylene Glycol Monomethyl Ether Acetate: Oral LD50 (rat) 8532mg/kg. Dermal LD50 (rabbit) 5000mg/kg.
<b>Chronic/Subchronic Data</b>	No data.
<b>Genotoxicity</b>	It was not mutagenic when tested in bacterial or mammalian systems.
<b>Reproductive/Developmental Toxicity</b>	Developmental effects were seen in laboratory animals only at dose levels that were maternally toxic.
<b>Additional Data</b>	None known.

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**12. ECOLOGICAL INFORMATION**

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<b>Mobility</b>	Propylene Glycol Monomethyl Ether Acetate: Koc is 0 - 50.
<b>Persistence/Degradability</b>	The product is partially or slowly biodegradable. BOD20 greater than 40%
<b>Bio-accumulation</b>	No data.
<b>Ecotoxicity</b>	The product is rated as practically non-toxic to aquatic species. Tests on the following species gave a LC50 of 161mg/litre: - fathead minnows Tests on the following species gave a LC50 of 408mg/litre: - daphnia

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**13. DISPOSAL CONSIDERATIONS**

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<b>Product Disposal</b>	Incineration is the recommended method of disposal. Dispose of in accordance with all applicable local and national regulations.
<b>Container Disposal</b>	Labels should not be removed from containers until they have been cleaned. Empty containers may contain hazardous residues. Dispose of containers with care.

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**14. TRANSPORT INFORMATION**

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DOT Ground:	Not Regulated per 49 CFR 173.150(f)(2)
UN Proper Shipping Name	Flammable liquid, n.o.s.
UN Class	(3) Flammable Liquid
UN Number	UN1993
UN Packaging Group	III
N.O.S. 1:	Propylene Glycol Monomethyl Ether Acetate
N.O.S. 2:	
Subsidiary Risks	None.
ADR/RID Substance Identification Number	CLASS 3 - 31(c)
CERCLA RQ	Cresol (100#)
Marine Pollutant	No.

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**15. REGULATORY INFORMATION**

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TSCA Listed	Yes
TSCA Exemptions	
WHMIS Classification	D.2.B B.3
MA Right To Know Law	All components have been checked for inclusion on the Massachusetts Substance List (MSL). Those components present at the de minimus concentration have been identified in the hazardous ingredients section of the MSDS.
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.
SARA TITLE III-Section 311/312 Categorization (40 CFR 370)	Immediate, delayed, flammability hazard
SARA TITLE III-Section 313 (40 CFR 372)	This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations.

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**16. OTHER INFORMATION**

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NFPA Rating- FIRE	2
NFPA Rating- HEALTH	2
NFPA Rating- REACTIVITY	0
NFPA Rating- SPECIAL	None.
Revisions Highlighted	Flash Point (PMCC) (°C/F)

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## 16. OTHER INFORMATION

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### Abbreviations

CAS#: Chemical Abstract Services Number  
ACGIH: American Conference of Governmental Industrial Hygienists  
OSHA: Occupational Safety and Health Administration  
TLV: Threshold Limit Value  
PEL: Permissible Exposure Limit  
STEL: Short Term Exposure Limit  
NTP: National Toxicology Program  
IARC: International Agency for Research on Cancer  
R: Risk  
S: Safety  
LD50: Lethal Dose 50%  
LC50: Lethal Concentration 50%  
BOD: Biological Oxygen Demand  
Koc: Soil Organic Carbon Partition Coefficient.  
TLm: Median Tolerance Limit

### Disclaimer

The data contained herein is based on information that Shipley Company believes to be reliable, but no expressed or implied warranty is made with regard to the accuracy of such data or its suitability for a given situation. Such data relates only to the specific product described and not to such products in combination with any other product and no agent of Shipley Company is authorized to vary any of such data. Shipley Company and its agents disclaim all liability for any action taken or foregone on reliance upon such data.

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