Olin

MATERIAL SAFETY DATA

OCEAN NETWORK EMERGENCY PHONE 1-800-OLIN 911

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD,29 CFR 1910.1200.THIS PRODUCT MAY BE CONSIDERED TO BE A HAZARDOUS CHEMICAL UNDER THAT STANDARD.(REFER TO THE OSHA CLASSIFICATION IN SEC.I.)THIS INFORMATION IS REQUIRED TO BE DISCLOSED FOR SAFETY IN THE WORKPLACE.THE EXPOSURE TO THE COMMUNITY,IF ANY,IS QUITE DIFFERENT.

I. PRODUCT IDENTIFICATION

REVISION NO : 1
REVISION DATE : 5/10/96
PRODUCT CODE : HPE898590
FILE NUMBER : HPE01350.0178
PRODUCT NAME: OCG 8951 50 CS

photoresist

SYNONYMS: None
CHEMICAL FAMILY: Organic mixture
FORMULA: Not Applicable/Mixture
USE DESCRIPTION: Positive photoresist
OSHA HAZARD CLASSIFICATION: Combustible liquid; skin, eye and respiratory irritant

II. COMPONENT DATA

PRODUCT COMPOSITION

CAS or CHEMICAL NAME: 1-Methoxy-2-propanol acetate
CAS NUMBER: 108-65-6
PERCENTAGE RANGE: 45-70%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS: 100 ppm (8 hr. - TWA); 150 ppm (15 min. - STEL) - AIHA WEEL Guideline
This ingredient may contain 1-4% of 2-methoxy-1-propanol acetate (CAS Number 70657-70-4) as an impurity.

CAS or CHEMICAL NAME: Modified novolac resin
PMN NUMBER: P-89-1098
PERCENTAGE RANGE: 15-35%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS: None Established

CAS or CHEMICAL NAME: Trisubstitued benzenesulfonic acid derivative
CAS NUMBER: 143182-20-1
PERCENTAGE RANGE: 1-5%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS: None Established

III. PRECAUTIONS FOR SAFE HANDLING AND STORAGE

DO NOT TAKE INTERNALLY. AVOID CONTACT WITH SKIN, EYES AND CLOTHING. UPON CONTACT WITH SKIN OR EYES, WASH OFF WITH WATER.

STORAGE CONDITIONS:
STORE IN A COOL, DRY, WELL VENTILATED PLACE AWAY FROM ALL SOURCES OF IGNITION.
DO NOT STORE AT TEMPERATURES ABOVE: 25 Deg.C (77 Deg.F)
DO NOT EXPOSE TO DIRECT LIGHT.
OTHER: Outside or detached storage is preferable.

PRODUCT STABILITY AND COMPATIBILITY
SHELF LIFE LIMITATIONS: 1 Year
INCOMPATIBLE MATERIALS FOR STORAGE OR TRANSPORT: Strong oxidants

IV. PHYSICAL DATA

APPEARANCE: Dark brown liquid
FREEZING POINT: No Data
BOILING POINT: No Data
DECOMPOSITION TEMPERATURE: > 40 Deg.C (104 Deg.F)
SPECIFIC GRAVITY: 1.06 to 1.10
pH @ 25 DEG.C: Not Applicable
VAPOR PRESSURE @ 20 DEG.C: 3 mm Hg
SOLUBILITY IN WATER: Slight
VOLATILES, PERCENT BY VOLUME: 55-70%
EVAPORATION RATE: 0.39 (Butyl acetate = 1)
VAPOR DENSITY: 4.7
MOLECULAR WEIGHT: Not Applicable/Mixture
ODOR: Ester-like
COEFFICIENT OF OIL/WATER DISTRIBUTION: No Data

V. PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

PERSONAL PROTECTION FOR ROUTINE USE OF PRODUCT:
RESPIRATORY PROTECTION:
Wear a NIOSH/MSHA approved respirator if any exposures occurs.
VENTILATION:
Use explosion-proof local exhaust ventilation.
SKIN AND EYE PROTECTIVE EQUIPMENT:
Wear gloves, boots, apron and a face shield with safety glasses. A full impermeable suit is recommended if exposure is possible to large portion of body.

EQUIPMENT SPECIFICATIONS (WHEN APPLICABLE):
RESPIRATOR TYPE: NIOSH-approved positive-pressure supplied-air respirator
PROTECTIVE CLOTHING TYPE (This includes: gloves, boots, apron, protective suit): Impervious

VI. FIRE AND EXPLOSION HAZARD INFORMATION

FLAMMABILITY DATA:
EXPLOSIVE: No
FLAMMABLE: No
COMBUSTIBLE: Yes
PYROPHORIC: No
FLASH POINT: 49 Deg.C (120 Deg.F) Test Method: TCC
AUTOIGNITION TEMPERATURE: No Data
FLAMMABLE LIMITS AT NORMAL ATMOSPHERIC TEMPERATURE AND PRESSURE (PERCENT VOLUME IN AIR): LEL - No Data UEL - No Data

NFPA RATINGS:
Not Established
HMIS RATINGS:
Health: 2
Flammability: 2
Reactivity: 0

EXTINGUISHING MEDIA:
Alcohol foam, carbon dioxide, dry chemical, water spray

FIRE FIGHTING TECHNIQUES AND COMMENTS:
Use water to cool containers exposed to fire.
See Section XI for protective equipment for fire fighting.

VII. REACTIVITY INFORMATION

CONDITIONS UNDER WHICH THIS PRODUCT MAY BE UNSTABLE:
TEMPERATURES ABOVE: Product is normally stable at room temperature.
MECHANICAL SHOCK OR IMPACT: No
ELECTRICAL (STATIC) DISCHARGE: May cause ignition at or above the flash point
HAZARDOUS POLYMERIZATION: Will not occur
INCOMPATIBLE MATERIALS: Strong oxidants, alkali metal hydroxides

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon dioxide, carbon monoxide, nitrogen oxides, sulfur oxides
OTHER CONDITIONS TO AVOID: Ignition sources

SUMMARY OF REACTIVITY:

EXPLOSIVE:	No
OXIDIZER:	No
PYROPHORIC:	No
ORGANIC PEROXIDE:	No
WATER REACTIVE:	No

VIII. FIRST AID

EYES:
Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If eye irritation develops, call a physician.

SKIN:
Immediately flush with water for 15 minutes. Wash the contaminated skin with soap and water. If irritation develops, call a physician. If clothing comes in contact with the product, the clothing should be laundered before re-use.

INGESTION:
Immediately drink water to dilute. Consult a physician if symptoms develop.

INHALATION:
If person experiences nausea, headache or dizziness, person should stop work immediately and move to fresh air until these symptoms disappear. If breathing is difficult, administer oxygen, keep the person warm and at rest. Call a physician. In the event that an individual inhales enough product to lose consciousness, person should be moved to fresh air at once and a physician should be called immediately. If breathing has stopped, artificial respiration should be given immediately. In all cases, ensure adequate ventilation and provide respiratory protection before the person returns to work.

IX. TOXICOLOGY AND HEALTH INFORMATION

ROUTES OF ABSORPTION
Inhalation, skin and eye contact, ingestion

WARNING STATEMENTS AND WARNING PROPERTIES
DO NOT TAKE INTERNALLY. CAUSES SKIN, EYE AND MUCOUS MEMBRANE IRRITATION. CAUSES RESPIRATORY IRRITATION. CAUSES NARCOTIC EFFECT IF INHALED IN HIGH CONCENTRATIONS. PROLONGED OR REPEATED CONTACT WITH SKIN MAY CAUSE DERMATITIS.

HUMAN THRESHOLD RESPONSE DATA
ODOR THRESHOLD: No Data
IRRITATION THRESHOLD: No Data
IMMEDIATELY DANGEROUS TO LIFE OR HEALTH: The IDLH concentration has not been established for this product.

SIGNS, SYMPTOMS, AND EFFECTS OF EXPOSURE:

INHALATION
ACUTE:
Exposure would be expected to cause irritation to the throat, nose, mucous membranes, and lungs. Any irritation would be transient with no permanent damage expected. High concentrations in air may be narcotic and depress the central nervous system (CNS) with symptoms including headache, breathing difficulty, dizziness, drowsiness, loss of coordination, weakness, nausea, and vomiting.
CHRONIC:
Repeated exposure would cause similar effects to those observed from acute exposure.

SKIN
ACUTE:
Skin contact may cause an irritation consisting of transient redness. This irritant effect would not be expected to result in permanent damage.
CHRONIC:
Prolonged or repeated contact may cause defatting of the skin, leading to dermatitis.

EYE
Direct contact would be expected to cause an irritation consisting of redness, swelling, tearing, itching, and mucous discharge to the conjunctiva. No impairment of vision or corneal damage would be expected to occur.

INGESTION
ACUTE:
Ingestion may cause irritation to the throat, esophagus and mouth and gastrointestinal discomfort with any or all of the following symptoms: nausea, vomiting, lethargy, irritation, and diarrhea. Additional symptoms may include CNS depression.

CHRONIC:
This product would be expected to cause more serious CNS effects if repeatedly ingested. Additional effects would be similar to those observed from acute exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
Respiratory illness and skin disorders may be aggravated by exposure to this product.

INTERACTIONS WITH OTHER CHEMICALS WHICH ENHANCE TOXICITY:
None known or reported

ANIMAL TOXICOLOGY
ACUTE TOXICITY:
Inhalation LC 50: No Data
Dermal LD 50: Believed to be > 2 g/kg. (rabbit), based on constituents
Oral LD 50: Believed to be > 5 g/kg. (rat), based on constituents
Irritation: Irritant to skin, eyes, and respiratory tract

ACUTE TARGET ORGAN TOXICITY:
Irritation to the eyes, skin, lungs and mucous membranes. May cause CNS depression.

CHRONIC TARGET ORGAN TOXICITY:
Prolonged skin contact may cause dermatitis.

Intense exposure to propylene glycol monomethyl ether acetate via ingestion has been shown to cause kidney and liver damage in laboratory animals. Chronic overexposure to high concentrations of propylene glycol monomethyl ether acetate from inhalation has been found to cause lung, kidney and liver damage in laboratory animals. It is judged that these effects will not occur from industrial use of this product due to the sufficiently large quantities required to bring about these effects from the oral and inhalation routes of exposure.

REPRODUCTIVE AND DEVELOPMENTAL TOXICITY:
There are no known or reported effects on reproductive function or fetal development by oral, dermal, or inhalation exposure to this product.

This product contains 45-70% 1-methoxy-2-propanol acetate (PGMEA) (containing up to 4% 2-methoxy-1-propanol acetate as a contaminant) which has been tested in pregnant rats by the inhalation route of exposure. No developmental effects were seen in fetuses at air concentrations as high as 4,000 ppm, in spite of maternal toxicity being seen at lower concentrations. The 2-methoxy-1-propanol acetate contaminant was tested by itself in pregnant rats and rabbits. Developmental toxicity occurred in both species from the inhalation

route of exposure. In rabbits, this occurred in the highest dose group in the absence of significant maternal toxicity. In rats, this also occurred in the highest dose group, but in the presence of maternal toxicity. When tested from the dermal route of exposure, 2-methoxy-1-propanol acetate did not cause developmental toxicity in either species. Based upon the low percentage of 2-methoxy-1-propanol acetate found in this product, it is judged that exposure to this product will not pose a reproductive toxicity hazard.

CARCINOGENICITY:
This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP, or EPA.

MUTAGENICITY:
This product is not known or reported to be mutagenic.

Propylene glycol monomethyl ether acetate was determined to be non-mutagenic in the Salmonella/microsome mutagenesis assay (Ames assay).

AQUATIC TOXICITY:
There is no data available for this product.

X. TRANSPORTATION INFORMATION

THIS MATERIAL IS REGULATED AS A DOT HAZARDOUS MATERIAL.

DOT DESCRIPTION FROM THE HAZARDOUS MATERIALS TABLE 49 CFR 172.101:

LAND: COMBUSTIBLE LIQUIDS, N.O.S., (CONTAINS 1-METHOXY-2-PROPANOL ACETATE), NA 1993, PG III

WATER: FLAMMABLE LIQUIDS, N.O.S., (CONTAINS 1-METHOXY-2-PROPANOL ACETATE), 3.3, UN 1993, PG III

AIR: FLAMMABLE LIQUIDS, N.O.S., (CONTAINS 1-METHOXY-2-PROPANOL ACETATE), 3, UN 1993, PG III

HAZARD LABEL/PLACARD: LAND: NONE
AIR/WATER: FLAMMABLE LIQUID
REPORTABLE QUANTITY: Not Applicable (Per 49 CFR 172.101, Appendix)
EMERGENCY GUIDE NO: 27

XI. SPILL AND LEAKAGE PROCEDURES

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC AT 800-424-9300.

REPORTABLE QUANTITY: (Per 40 CFR 302.4) Not Applicable

SPILL MITIGATION PROCEDURES:
Evacuation procedures must be placed into effect. Evacuate all non-essential personnel. Hazardous concentrations in air may be found in local spill area and immediately downwind. Remove all sources of ignition. Stop source of spill as soon as possible and notify appropriate personnel.

AIR RELEASE: Vapors may be suppressed by the use of water fog or spray. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste.

WATER RELEASE: This material is heavier than and slightly soluble in water. Notify all downstream users of possible contamination. Divert water flow around spill if possible and safe to do so. Continue to handle as described in land spill.

LAND SPILL: Create a dike or trench to contain materials. Spill materials may be absorbed using sand, clay or commercial absorbent. Do not place spill materials back in their original containers. Containerize and label all spill materials properly. Decontaminate all clothing and the spill area using a soap solution and flush with large amounts of water.

SPILL RESIDUES:
Dispose of per guidelines under Section XII, WASTE DISPOSAL.

PERSONAL PROTECTION FOR EMERGENCY SPILL AND FIRE-FIGHTING SITUATIONS:
In case of fire, use normal fire fighting equipment.

Additional protective clothing must be worn to prevent personal contact with this material. Those items include but are not limited to: boots, gloves, impervious clothing, i.e., chemically impermeable suit.

XII. WASTE DISPOSAL

If this product becomes a waste, it meets the criteria of a hazardous waste as defined under 40 CFR 261 and would have the following EPA hazardous waste number: D001.

If this product becomes a waste, it will be a hazardous waste which is subject to the Land Disposal Restrictions under 40 CFR 268 and must be managed accordingly.

As a hazardous liquid waste, it must be disposed of in accordance with local, state and federal regulations in a permitted hazardous waste treatment, storage and disposal facility by incineration.

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THIS MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

XIII. ADDITIONAL REGULATORY STATUS INFORMATION

TOXIC SUBSTANCES CONTROL ACT:
The components of this product are listed on the Toxic Substance Control Act inventory.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT TITLE III:
HAZARD CATEGORIES, PER 40 CFR 370.2:
HEALTH:
Immediate (Acute)
PHYSICAL:
Fire

EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW, PER 40 CFR 355, APP.A:
EXTREMELY HAZARDOUS SUBSTANCE - THRESHOLD PLANNING QUANTITY:
None Established

SUPPLIER NOTIFICATION REQUIREMENTS, PER 40 CFR 372.45:
None Established

XIV. ADDITIONAL INFORMATION

MSDS REVISION STATUS: Revision to Toxicology Information Sections I and IX; also Sections II, X and XV

XV. MAJOR REFERENCES

1. Chemical Hazard Response Information System (CHRIS), Vol. II, U.S. Coast Guard, Washington, D.C., 1984.
2. Sittig, Marshall, Handbook of Toxic and Hazardous Chemicals and Carcinogens, 2nd Ed., Noyes Publications, Park Ridge, NJ, 1985.
3. Technical Report No. 17: The Toxicology of Glycol Ethers and its

Relevance to Man: an up-dating of ECETOC Technical Report No. 4. European Chemical Industry, Ecology and Toxicology Centre, Avenue, Louis, 250, Box 63, 6050 Bruxelles, Belgium, 19 Apr. 1985.
4. Miller, R.R., et al., 1984. Propylene Glycol Monomethyl Ether Acetate (PGMEA) Metabolism Disposition, and Short-Term Vapor Inhalation Studies. Toxicology and Applied Pharmacology 75, pp. 521-530.
5. Merkle, Jutta, et al, Prenatal Toxicity of 2-Methoxypropylacetate-1 in Rats and Rabbits. Fundamental and Applied Toxicology, Vol. 8, pp. 71-79, 1987.
6. Assessment of the Developmental Toxicity of Propylene Glycol Monomethyl Ether Acetate (PM Acetate) in Rats. Toxicological Study #75-51-0753-90, United States Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD, Dec. 1989.
7. Workplace Environmental Exposure Level Guide, Propylene Glycol Monomethyl Ether Acetate. American Industrial Hygiene Association, Fairfax, VA, 1992.
Other References are available upon request.

THE INFORMATION IN THIS MATERIAL SAFETY DATA SHEET SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. OLIN BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION, BUT MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS MATERIAL SAFETY DATA SHEET IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT OLIN AT THE PHONE NUMBER LISTED BELOW TO MAKE CERTAIN THAT THIS SHEET IS CURRENT.

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Norwalk, CT 06856-4500
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