


**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 : 4
 REVISION DATE : 8/25/94
 PRODUCT CODE : JPE839175
 FILE NUMBER : JPE00501.0008
 PRODUCT NAME : **WNRD**

Distributed by



HUBBARD-HALL INC.

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SYNONYMS: Waycoat Negative Resist Developer
 CHEMICAL FAMILY: Mixture of C10, C11 and C12 branched, aliphatic hydrocarbons
 FORMULA: Not Applicable/Mixture
 USE DESCRIPTION: Developing solvent for negative Photoresists.
 OSHA HAZARD CLASSIFICATION: Skin, eye and mucous membrane irritant, aspiration hazard, lung toxin; combustible liquid

II. COMPONENT DATA
PRODUCT COMPOSITION

CAS or CHEMICAL NAME: Isoparaffinic hydrocarbon
 CAS NUMBER: 64742-48-9
 PERCENTAGE RANGE: 100%
 HAZARDOUS PER 29 CFR 1910.1200: Yes
 EXPOSURE STANDARDS: 300 ppm, 8 hr. TWA - recommended by the manufacturer

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: 29 Deg.C (85 Deg.F)

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PRODUCT STABILITY AND COMPATIBILITY

SHELF LIFE LIMITATIONS: 2 years

INCOMPATIBLE MATERIALS FOR PACKAGING: Product may be adversely affected by storing in plastic containers containing hydrocarbon-leachable plasticizers.

INCOMPATIBLE MATERIALS FOR STORAGE OR TRANSPORT: See Incompatible Materials, Section VII.

IV. PHYSICAL DATA

APPEARANCE: Clear liquid

FREEZING POINT: No Data

BOILING POINT: 156-193 Deg.C (313-380 Deg.F)

DECOMPOSITION TEMPERATURE: No Data

SPECIFIC GRAVITY: 0.74-0.76

DENSITY: 0.74-0.76 (g/cc)

pH @ 25 DEG.C: Not Applicable

VAPOR PRESSURE @ 25 DEG.C: < 10 mm Hg

SOLUBILITY IN WATER: Negligible

VOLATILES, PERCENT BY VOLUME: 100%

EVAPORATION RATE: 0.3 (Butyl acetate = 1)

VAPOR DENSITY: 5 (air = 1)

MOLECULAR WEIGHT: 149

ODOR: Faint hydrocarbon

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 exposures above the recommended exposure level are possible.

VENTILATION:

Use Local exhaust ventilation to maintain levels to below the recommended exposure level.

SKIN AND EYE PROTECTIVE EQUIPMENT:

Use chemical goggles and neoprene gloves.

EQUIPMENT SPECIFICATIONS (WHEN APPLICABLE):

RESPIRATOR TYPE: NIOSH/MSHA approved organic vapor respirator

PROTECTIVE CLOTHING TYPE (This includes: gloves, boots, apron, protective suit): Neoprene


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VI. FIRE AND EXPLOSION HAZARD INFORMATION
FLAMMABILITY DATA:

FLAMMABLE: No
COMBUSTIBLE: Yes
PYROPHORIC: No

FLASH POINT: 39-53 Deg.C (102-128 Deg.F) Test Method: Tag Closed Cup
AUTOIGNITION TEMPERATURE: Approx. 293 Deg.C Test Method: ASTM D 2155
FLAMMABLE LIMITS AT NORMAL ATMOSPHERIC TEMPERATURE AND PRESSURE (PERCENT VOLUME IN AIR): LEL - 0.7 UEL - 7

NFPA RATINGS: Not Established

HMIS RATINGS:

Health: 1
Flammability: 2
Reactivity: 0

EXTINGUISHING MEDIA: Alcohol foam, carbon dioxide, dry chemical

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 stable at normal temperatures.
MECHANICAL SHOCK OR IMPACT: No
ELECTRICAL (STATIC) DISCHARGE: Static discharge may cause combustion at temperatures above the flash point.
HAZARDOUS POLYMERIZATION: Will not occur
INCOMPATIBLE MATERIALS: Strong oxidizers
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide
OTHER CONDITIONS TO AVOID: Sparks, open flames, sources of ignition

SUMMARY OF REACTIVITY:

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

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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 large quantities of water. DO NOT induce vomiting. Call a physician at once. DO NOT give anything by mouth if the person is unconscious or if having convulsions.
- 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 vapor 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

Skin and eye contact, inhalation, ingestion

WARNING STATEMENTS AND WARNING PROPERTIES

SKIN, EYE AND MUCOUS MEMBRANE IRRITANT. OVEREXPOSURE TO VAPORS MAY CAUSE DIZZINESS, LIGHT-HEADEDNESS AND NAUSEA. REPEATED CONTACT MAY DEBAT THE SKIN LEADING TO DERMATITIS. REPEATED INHALATION EXPOSURES OF A SIMILAR HYDROCARBON AT CONCENTRATIONS GREATER THAN OR EQUAL TO 300 PPM IN AIR CAUSED MILD KIDNEY EFFECTS AND A LOW GRADE (MILD) ANEMIA. THE SIGNIFICANCE OF THESE EFFECTS FOR HUMAN HEALTH IS QUESTIONABLE.

HUMAN THRESHOLD RESPONSE DATA

ODOR THRESHOLD: Based on several studies of human volunteers and on experience, the odor threshold appears to be approximately 50 ppm in air.

IRRITATION THRESHOLD: The irritation threshold for isoparaffinic hydrocarbons is at or near the odor threshold of 50 ppm in air.

IMMEDIATELY DANGEROUS TO LIFE OR HEALTH: No IDLH concentration has been established for this compound.

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SIGNS, SYMPTOMS, AND EFFECTS OF EXPOSURE:

INHALATION

ACUTE:

Exposure at concentrations greater than 100 ppm in air may cause slight mucous membrane irritation. At higher concentrations, inhalation may cause headache, dizziness, and nausea.

CHRONIC:

Repeated exposure has not been known or reported to cause significant effects other than those of acute exposure. Repeated inhalation exposures in rats of a similar hydrocarbon at concentrations greater than or equal to 300 ppm in air caused mild kidney effects and a low grade (mild) anemia. The significance of these effects for human health is questionable.

SKIN

ACUTE:

Contact may cause slight to moderate irritation with redness and drying of the contacted area.

CHRONIC:

Prolonged or repeated contact may result in defatting of the skin leading to dermatitis.

EYE:

Direct contact or high vapor concentrations may cause slight reversible irritation with symptoms of tearing and itching.

INGESTION

ACUTE:

Ingestion may cause gastroenteritis with any or all of the following symptoms: nausea, light-headedness, diarrhea, and vomiting. Aspiration of isoparaffinic hydrocarbons into the lungs should be avoided. Aspiration may cause pulmonary (lung) edema, congestion, pneumonitis, and may be fatal.

CHRONIC:

There are no data available on repeated ingestion of this product. Based on the potential acute effects from aspiration of the product, repeated ingestion should be avoided.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Psoriasis and other skin disorders

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INTERACTIONS WITH OTHER CHEMICALS WHICH ENHANCE TOXICITY

None known or reported.

ANIMAL TOXICOLOGY

ACUTE TOXICITY:

INHALATION LC 50: No LC 50 data available, however the LC 50 value for isoparaffinic hydrocarbons generally exceed 500 ppm in air for a 4 hour exposure in rats.

DERMAL LD 50: Believed to be > 2 g/kg (rabbits)

ORAL LD 50: Believed to be > 5 g/kg (rat)

IRRITATION: Slight conjunctival irritation (rabbits); mild irritant (slight erythema) to skin (rabbits); not considered a sensitizer in guinea pigs; not a mouse sensory irritant by inhalation at concentrations up to 300 ppm in air.

ACUTE TARGET ORGAN TOXICITY:

Isoparaffinic hydrocarbons have caused slight effects on the skin and eyes (mild irritation) in laboratory animals. At very high vapor concentrations, these compounds have shown effects similar to central nervous system depression.

CHRONIC TARGET ORGAN TOXICITY:

Repeated inhalation exposures to rats of a similar hydrocarbon at concentrations greater than or equal to 300 ppm in air caused mild kidney effects and a low grade (mild) anemia. The significance of these effects for humans is questionable.

REPRODUCTIVE AND DEVELOPMENTAL TOXICITY:

Inhalation of isoparaffinic hydrocarbons by pregnant rats at concentrations up to 900 ppm in air showed these compounds not to be teratogenic (cause birth defects) nor fetotoxic.

CARCINOGENICITY:

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

MUTAGENICITY:

Isoparaffinic hydrocarbons have been tested in many mutagenicity systems including the Ames Salmonella gene mutation assay, mouse micronucleus test for chromosomal effects and a dominant lethal assay in rats. All studies have shown isoparaffinic hydrocarbons not to be mutagenic under the test conditions.

AQUATIC TOXICITY:

No data are available on the aquatic toxicity of isoparaffinic hydrocarbons.

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X. TRANSPORTATION INFORMATION

THIS MATERIAL IS REGULATED AS A DOT HAZARDOUS MATERIAL.

DOT DESCRIPTION FROM THE HAZARDOUS MATERIALS TABLE 49 CFR 172.101:

LAND (U.S. DOT): COMBUSTIBLE LIQUID N.O.S. (ISOPARAFFINIC HYDROCARBONS)
NA1993, PG III

WATER (IMO): FLAMMABLE LIQUIDS N.O.S., (ISOPARAFFINIC HYDROCARBONS)
3.3. UN1993, PG III

AIR (IATA/ICAO): FLAMMABLE LIQUIDS N.O.S., (ISOPARAFFINIC HYDROCARBONS)
3, UN1993, PG III

HAZARD LABEL/PLACARD: LAND - NONE

WATER/AIR - FLAMMABLE LIQUID

REPORTABLE QUANTITY: None (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: Not Applicable

SPILL MITIGATION PROCEDURES:

Evacuate all non-essential personnel. Utilize emergency response personal protective equipment prior to the start of any response. 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. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste.

WATER RELEASE: This material is lighter than and not soluble in water. Notify all downstream water users of possible contamination. Divert water flow around spill if possible and safe to do so. If unable to divert, create an underflow dam to contain material. Remove with a vacuum system or pumping device for treatment and/or disposal. Continue to handle as described in land spill.

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LAND SPILL: Create a dike or trench to contain materials. Spill materials may be absorbed using clay, sand or non-flammable commercial absorbent. Do not place spill materials back in their original container. Containerize and label all spill materials properly. Decontaminate all clothing and the spill area using a detergent and flush with large amounts of water. Material may be removed using a vacuum system or network of pumps.

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 respiratory protection is necessary when a spill or fire involving this product occurs. You are recommended to use a NIOSH/MSHA approved positive pressure supplied air respirator.

Additional protective clothing must be worn to prevent personal contact with this material. Those items include but are not limited to boots, impervious gloves, splash-proof goggles and 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:

This substance is listed on the Toxic Substances Control Act inventory.

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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: Revisions to Sections I (OSHA Hazard Classification), II (Exposure standards added), III (Shelf life changed), V (Personal protective equipment updated), X (HM181 revision) and XV (references updated).

XV. MAJOR REFERENCES

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22. Threshold Limit Values and Biological Exposure Indices for 1993-94. Cincinnati, OH: American Conference of Government Industrial Hygienists, 1993.
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THE INFORMATION IN THIS MATERIAL SAFETY SHEET DATA 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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