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N/E = Not Established. All values in ( ) are U.S. ACGIH (American Conf. of Gov. Indust. Hygienists) - TLV; All others are OSHA - PEL.

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**SECTION 3 - HEALTH HAZARDS**  
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**EMERGENCY OVERVIEW**

HMS HEALTH RATING 3 FLAMMABILITY 1 REACTIVITY 1

White waxy solid at room temperature. Straw yellow / Amber liquid at processing temperature. Slight pungent odor.

Severe eye irritant, Moderate skin irritant, Severe respiratory tract irritant.

Sensitizer of skin; Sensitizer of respiratory tract.

Ignition will give rise to a Class B fire.

In case of fire use: Carbon Dioxide (CO2), Dry Chemical, Alcohol Foam.

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**ROUTES OF EXPOSURE**

Eye Contact  
Skin Contact  
Ingestion  
Inhalation

**EXPOSURE STANDARDS**

No standards established for the product. See Section 2 for exposure standards on ingredients.

**HEALTH HAZARDS**

Severe eye irritant, Moderate skin irritant, Severe respiratory tract irritant. Sensitizer of skin. Sensitizer of respiratory tract. 584-84-9 2,4-TOLUENEDIISOCYANATE listed as a carcinogen by NTP.

**TARGET ORGANS**

Respiratory system, Skin, Eye.

**SIGNS AND SYMPTOMS OF EXPOSURE (Acute effects)**

Contact with eyes causes severe irritation and pain. Inhalation of vapors causes irritation of the respiratory tract and may cause adverse systemic effects.

Contact with skin causes irritation, redness and discomfort which is transient.

May cause sensitization by inhalation and skin contact (R42/43).

**SIGNS AND SYMPTOMS OF EXPOSURE (Possible Longer Term Effects)**

Repeated and/or prolonged contact with the skin may cause allergic reaction/sensitization. Repeated and/or prolonged exposure to vapors may cause allergic respiratory reaction/sensitization.

#### MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

Asthma, Chronic respiratory disease (e.g. Bronchitis, Emphysema),  
Skin disorders and Allergies.

#### IRRITATION EFFECTS DATA

Severe irritant to the eyes of a rabbit.

#### ACUTE TOXICITY EFFECTS DATA

Oral LD50 (rat): >5000 mg/kg (estimate)  
Dermal LD50 (rabbit): >2000 mg/kg (estimate)  
Inhalation LC50 (rat): No Data

#### OTHER ACUTE EFFECTS

No Data

#### CHRONIC/SUBCHRONIC DATA

In recent National Toxicology Program toxicity studies, toluene diisocyanate (TDI), when given orally by stomach tube as a concentrated mixture in corn oil, produced tumors in male and female rats and female mice but not male mice. A lifetime inhalation study of TDI in male and female rats and mice produced no tumors. Based on the oral study cited above, NTP has included TDI in its 1986 carcinogen list. NTP has not considered the inhalation study as evidence that it is not a carcinogen. The International Agency for Research on Cancer (IARC) has concluded that "there is inadequate evidence for the carcinogenicity of toluene diisocyanate to humans, but sufficient evidence for its carcinogenicity to experimental animals."

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#### SECTION 4 - FIRST AID

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##### EYE CONTACT

Immediately flush eyes with water for at least 15 minutes. Call a physician.

##### SKIN CONTACT

Wash affected area with soap and water.  
Remove contaminated clothing and shoes. Wash before reuse.  
Call a physician.

##### INHALATION

Move patient to fresh air. If breathing has stopped or is labored give assisted respiration (e.g. mouth-to-mouth). Supplemental oxygen may be indicated. Call a physician.

##### INGESTION

If swallowed, call a physician immediately. Remove stomach contents by gastric suction or induce vomiting only as directed by medical personnel. Never give anything by mouth to an unconscious person.

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**SECTION 5 - FIRE AND EXPLOSION DATA**  
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**CHARACTERISTICS:**

Flash Point	>160C (>320F)
Flash Point Method(s)	Closed cup
Upper Explosion Limit (UEL)	No Data
Lower Explosion Limit (LEL)	No Data
Autoignition Temperature	No Data
Fire Hazard Classification (OSHA/NFPA)	No Data

**EXTINGUISHING MEDIA**

Ignition will give rise to a Class B fire.  
In case of fire use: Carbon Dioxide (CO<sub>2</sub>), Dry Chemical, Alcohol Foam.

**SPECIAL FIRE FIGHTING PROCEDURES**

Use flooding amounts of water in early stages of fire. If water pollution occurs, notify appropriate authorities. Firefighters should wear butyl rubber boots, gloves, and body suit and a self-contained breathing apparatus. Contain runoff water in dikes. Prevent stream contamination. Keep containers cool with water spray. Avoid skin contact.

**UNUSUAL FIRE AND EXPLOSION HAZARDS**

May generate toxic or irritating combustion products. May generate carbon monoxide gas. May generate toxic nitrogen oxide gases.

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**SECTION 6 - REACTIVITY HAZARD DATA**  
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**CHEMICAL STABILITY**

Stable

**CONDITIONS TO AVOID (if unstable)**

Product reacts slowly with water which results in the liberation of carbon dioxide. Reaction with water or contaminants or excessive heat may result in sufficient pressure to burst container

**INCOMPATIBILITY (Materials to Avoid)**

Water, steam, Amines, Alcohols, Mineral acids (i.e. sulfuric, phosphoric, etc.), Organic acids (i.e. acetic acid, citric acid etc.), Oxidizing Agents (i.e. perchlorates, nitrates etc.).

**HAZARDOUS DECOMPOSITION PRODUCTS (from burning, heating, or reaction with other materials)**

Carbon Monoxide in a fire, Carbon Dioxide in a fire, Nitrogen Oxides in a fire, Irritating and toxic fumes at elevated temperatures.

**HAZARDOUS POLYMERIZATION**

Will not occur

**CONDITIONS TO AVOID (if polymerization may occur)**

Not applicable

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**SECTION 7 - SPILL, LEAK AND WASTE DISPOSAL INFORMATION**  
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**CONTAINMENT TECHNIQUES (Removal of ignition sources, diking etc)**

Stop the leak, if possible. Ventilate the space involved.

Construct a dike to prevent spreading.

**CLEAN-UP PROCEDURES**

If recovery is not feasible, admix with dry soil, sand or non-reactive absorbent and place in a container or dumpster pending disposal.

Prepare a decontamination solution of 0.2-5% liquid detergent and 3-8% concentrated ammonium hydroxide in water. Treat spill area with decontamination solution, using about 10 parts of the solution for each part of the spill and allow it to react for at least 10 minutes for trace amounts and 48 hours for large spills.

Neutralize the waste. Carbon dioxide will evolve, leaving insoluble polyureas.

**OTHER EMERGENCY ADVICE**

Avoid skin contact. Wear protective clothing. Open enclosed spaces to outside atmosphere. Prevent spilled product from entering streams or drinking water supplies.

**WASTE DISPOSAL**

As manufactured, product is not a hazardous waste under USEPA regulation (40 CFR Part 261) Comply with all Federal, State and Local Regulations.

Stir the isocyanate waste into the decontamination solution as above. Neither the liquid nor the solid is a hazardous waste. Fill waste drum with above solution and let sit unsealed for 48 hours. Rinse an empty container three times and puncture or otherwise destroy before disposal.

**ENVIRONMENTAL EFFECTS**

No Data

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**SECTION 8 - PERSONAL PROTECTION/EXPOSURE CONTROLS**  
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**EYE PROTECTION**

Splash-proof eye goggles. In emergency situations, use eye goggles with a full face shield.

**HAND PROTECTION**

Impermeable gloves. In emergency situations, wear impermeable gloves with cuffs to prevent spread of material to area above the wrists.

#### RESPIRATORY PROTECTION

Not required under normal conditions. For emergency situations use self-contained breathing apparatus with pressure demand mode.

#### PROTECTIVE CLOTHING

Impervious clothing. Long sleeved clothing. Rubber apron. Rubber boots.

#### ENGINEERING CONTROLS

In case of insufficient ventilation, wear suitable respiratory equipment (S38).

Adequate general and local exhaust. Maintain air concentrations in work spaces in accord with standards outlined in Sections 2 and 3.

#### WORK AND HYGIENIC PRACTICES

Provide readily accessible eye wash stations. Safety shower. Wash at the end of each workshift and before eating, smoking or using the toilet. Change work clothing daily before leaving the work place. Promptly remove clothing that becomes contaminated. Wash promptly if skin becomes contaminated. Discard contaminated leather articles.

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### SECTION 9 - STORAGE AND HANDLING

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#### STORAGE

Keep in cool, dry, ventilated storage and in closed containers.  
Keep away from oxidizers, heat or flames.

#### HANDLING

Avoid contact with skin or eyes. Avoid breathing of vapors.

Handle in well ventilated work space.

To prepare for unloading, the drum with bung vent inserted should be placed in a warm room, drum warmer or meltdown oven for period of time sufficient to melt the desired amount of prepolymer.

Liquid prepolymer can then be removed from the drum by inserting a drum spigot or ball valve in the 2" bung, positioning on a drum tilter, tilting and pouring out the required amount.

Maintain a nitrogen atmosphere in the head space of the drum. Do not use air pressure to remove contents.

#### OTHER PRECAUTIONS

Carefully read instructions before handling this material. Be sure that all engineering and personal protective equipment is in working order. Work areas must be well ventilated to maintain vapor concentration below a level which is irritating. Emergency showers and eye wash stations should be readily accessible.

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**SECTION 10 - TYPICAL PHYSICAL AND CHEMICAL PROPERTIES**  
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PHYSICAL FORM	Semi-solid, White waxy solid at room temperature. Straw yellow / Amber liquid at processing temperature.
COLOR	White, Straw yellow / Amber
ODOR	Slight Pungent
PH	Not applicable
VAPOR PRESSURE (mm Hg)	0.5 @ 140C (284F)
VAPOR DENSITY (Air = 1)	Not available
BOILING POINT	Not available
FREEZING/MELTING POINT	40-60C (104-124F)
SOLUBILITY IN WATER	Reacts slightly with water
SPECIFIC GRAVITY (Water = 1)	1.18 @ 100C (212F)
EVAPORATION RATE (Butylacetate = 1)	Not available
VISCOSITY (CPS)	2700 @ 70C (158F) 490 @ 85C (185F)
MOLECULAR WEIGHT	1400

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**SECTION 11 - TRANSPORTATION INFORMATION**  
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DOT SHIPPING NAME	RESIN COMPOUND - NOT DOT REGULATED
DOT Bulk Shipping Name	RESIN COMPOUND - NOT DOT REGULATED
IMO SHIPPING DATA	Not regulated
ICAO/IATA SHIPPING DATA	Other regulated substances, (Toluene Diisocyanate); Class 9, ID8027

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**SECTION 12 - U.S. FEDERAL REGULATIONS**  
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**TOXIC SUBSTANCES CONTROL ACT (TSCA)-**

All components are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory

OSHA Hazard Communication Standard (29CFR1910.1200) hazard class(es)  
Carcinogen, Irritant

EPA SARA Title III Section 312 (40CFR370) hazard class  
Immediate Health Hazard, Delayed Health Hazard

EPA SARA Title III Section 313 (40CFR372) toxic chemicals above "de minimis" level are

2,4-TOLUEDIISOCYANATE at no more than 0.2%

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**SECTION 13 - STATE REGULATIONS**  
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Proposition 65 substance(s) listed by the state of California under the "Safe Drinking Water and Toxic Enforcement Act of 1986"  
584-84-9 2,4-TOLUENEDIISOCYANATE

New Jersey Trade Secret Registry Number(s)

None

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**SECTION 14 - INTERNATIONAL REGULATIONS**  
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**CANADA**

DSL

Included on Inventory

WHMIS Hazard Classification

Class D Division 2A, Class D Division 2B

WHMIS Trade Secret Registry Number(s)

None

WHMIS HAZARDOUS INGREDIENTS

Included in Section 2

WHMIS Symbol

Stylized T, Skull and Crossbones

**EUROPEAN ECONOMIC COMMUNITY (EEC)**

EINICS Master Inventory

Included on Inventory

EEC SYMBOL

Harmful

EEC Council Directives relating to the classification, packaging and labeling of dangerous substances and preparations Risk (R) and Safety (S) phrases

Contains Isocyanates. See information supplied by the manufacturer. Harmful by inhalation (R20). May cause sensitization by inhalation (R42).

Do not breathe fumes (S23). In case of contact with eyes, rinse immediately with plenty of water and seek medical advice (S26). After contact with skin, wash immediately with plenty of soap and water (S28). In case of insufficient ventilation, wear suitable respiratory equipment (S38). If you feel unwell, seek medical advice (show the label where possible) (S44).