



MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

067
ADHESION PROMOTER

North America:
NOR-COTE INTERNATIONAL, INC.
506 Lafayette Avenue
Crawfordsville, Indiana 47933 USA
Phone: 765-362-9180 (day phone)
MSDS Issuer: EHS Department
Emergency Phone (United States):
800-424-9300
CHEMTREC

Europe:
NOR-COTE INTERNATIONAL LTD.
Unit 8 Warrior Park
Eagle Close
Chandlers Ford Industrial Estate
Eastleigh, Hampshire
SO53 4NF England
Tel: +44 (0) 23 80270542 (day phone)
Emergency Phone (Outside U.S.):
703-527-3887 CHEMTREC

Asia:
NOR-COTE INTERNATIONAL PTE. LTD.
Blk 4012 Ang Mo Kio Ave 10
#05-08 Techplace 1,
Singapore 569628
Tel: +65 6291-0898 (day phone)
Emergency Phone (Outside U.S.):
703-527-3887 CHEMTREC

SECTION 2 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: WARNING! Product is Clear/Pale Yellow liquid with negligible-nearly odorless odor that may cause allergic respiratory reaction; harmful if inhaled or swallowed; may cause respiratory tract irritation, allergic skin reaction, eye irritation; and may cause lung damage. Closed container of product may explode under extreme heat or when contaminated with water. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Toxic gases/fumes are given off during burning or thermal decomposition.

ROUTES OF ENTRY: Dermal, Inhalation, Eye contact, Ingestion

GENERAL HEALTH EFFECTS:

ACUTE:

- **Skin Contact:** Can cause irritation. Symptoms include reddening, swelling, rash, scaling, or blistering. Some persons may develop skin sensitization from skin contact.
- **Eye Contact:** Liquid, aerosols, and vapors are irritating and can cause pain, tearing, reddening and swelling accompanied by a stinging sensation and/or a feeling like that of fine dust in the eyes. Prolonged contact may result in corneal opacity (clouding of the eye surface).
- **Inhalation:** Inhalation of vapors or mist at concentrations above the TLV or manufacturers recommendations can irritate the mucous membranes in the respiratory tract (nose, throat, lungs) causing burning sensation, runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function. Exposures well above the TLV may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in the lungs). These effects are usually reversible. Chemical hypersensitive pneumonitis, with flu-like symptoms has also been reported.
- **Ingestion:** May be harmful if swallowed.

CHRONIC:

- **Skin Contact:** Prolonged contact can cause skin sensitization from contact with very small amounts of liquid material or vapor-only exposure.
- **Eye Contact:** Prolonged contact may result in corneal opacity (clouding of the eye surface).
- **Inhalation:** Repeated overexposures or a single large dose may result in isocyanate sensitization (chemical asthma) which will cause a later reaction to exposure of isocyanate at levels well below the exposure limits or guidelines. The symptoms include chest tightness, wheezing, cough, shortness of breath or asthmatic attack and could be immediate or delayed up to several hours after exposure. Extreme asthmatic reactions can be life threatening. Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air, or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Chronic overexposure can also cause lung damage, including decrease in lung function, which may be permanent. Sensitization can be permanent.
- **Ingestion:** May be harmful if swallowed.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or MGL with similar symptoms as well as an asthma attack. Asthma and other respiratory disorders (bronchitis, emphysema, hyperreactivity), skin allergies, eczema and existing eye conditions may be aggravated by exposure.

HMIS ® RATING: Health – 2* Flammability - 1 Physical Hazard – 1 PPE – H



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SECTION 3 COMPOSITION

CHEMICAL NAME	PERCENT BY WEIGHT	CAS#	EC#	Symbol	R Phrase
Photopolymer of Hexamethylene Diisocyanate	Essentially 100%	28182-81-2	Not available	Xn	R20, R36/37/38, R43
Hexamethylene Diisocyanate*	0.7-1.6%	822-06-0	212-485-8	Xi, T	R23, R36/37/38, R42/43

*Monomer content is less than 0.7% based on resin solids at the time of manufacture. However, after 3-6 months storage, the free monomer content may rise to a maximum of 1.6%.

SECTION 4 FIRST AID MEASURES

SKIN CONTACT: Remove and isolate contaminated clothing and shoes. Remove excess material from skin with clean cloth. Flush skin with running lukewarm water. Wash affected areas using mild soap. For severe exposures, get under safety shower after removing clothing, then get medical attention. For lesser exposures, see medical attention if irritation develops or persists.

EYE CONTACT: Flush the eye and under lids with warm water for 15 minutes. Remove any contact lenses during the flushing. Refer individual to physician or ophthalmologist for immediate follow-up.

INHALATION: Move subject to fresh air and keep warm. If subject is not breathing, administer artificial respiration. If breathing is difficult, have qualified personnel administer oxygen and get medical attention immediately. Asthmatic-type symptoms may develop and may be immediate or delayed up to several hours. Treatment is essentially symptomatic. Consult physician.

INGESTION: Do NOT induce vomiting. Give 1 to 2 cups of mil or water to drink for dilution. Never give anything by mouth to an unconscious person. Consult physician immediately. Should vomiting occur, keep head lower than hip level to prevent aspiration of fluid into the lungs.

NOTE TO PHYSICIAN: EYES – Stain for evidence of corneal injury. If cornea is burned, instill antibiotic/steroid preparation frequently. Workplace vapors could produce reversible corneal epithelial edema impairing vision. **SKIN** – This product is a known skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burn. **INGESTION** – Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of the product. **INHALATION** – This product is a known pulmonary sensitizer. Treatment is essentially symptomatic. An individual having a dermal or pulmonary sensitization reaction to this material must be removed from any further exposure to any isocyanate.

SECTION 5 FIRE FIGHTING MEASURES

FLASHPOINT: 385°F (196.1°C)

METHOD: Setaflash (ASTM D-3243, D-3278, D3828)

FLAMMABLE/EXPLOSIVE LIMITS (Volume % in air): Not established

AUTO-IGNITION TEMPERATURE: 914°F (490°C) (DIN 51794)

EXTINGUISHING METHOD: Dry chemical, carbon dioxide, foam; water spray for large fires.

FIRE FIGHTING MEASURES: Evacuate area of all non-emergency personnel. Fire fighters must wear full emergency equipment with self-contained breathing apparatus. At elevated temperatures hazardous polymerization may occur causing container rupture and in extreme cases, explosion. Vapors and other irritating, highly toxic gases may be generated. Fight fires from upwind and cool intact containers with water spray or stream at maximum range.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Evacuate nonessential personnel. Remove all sources of ignition. Ventilate area. Avoid skin and eye contact. Use respiratory protection. Notify appropriate authorities if necessary. Dike or impound spilled material and control further spillage if feasible. Prevent from entering ground water supply, sewers and soil. Absorb with inert materials such as sawdust, vermiculite, Fuller's earth other absorbent material. Pour decontaminant solution over spill area and allow to react for at least 10 minutes. Collect material in loosely covered container and allow to stand for 24 hours. Wash down spill area with decontamination solutions.

Decontaminant Solutions: Non-ionic surfactant Union Carbides Tergitol TMN-10 (20%) and water (80%); concentrated ammonia (3-8%), detergent (2%) and water (90-95%).

SECTION 7 HANDLING AND STORAGE

HANDLING: Avoid any unnecessary contact with skin, eyes and clothing. Ideal temperature range for ease of handling is 50-81 °F (10-27 °C). Use protective clothing specified in Section 8.

STORAGE: Store in a cool, dry area in original or similar container. Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected. At maximum storage temperatures noted, material may slowly polymerize without hazard. Minimum storage temperatures is -30 °F (-34 °C). Maximum storage temperature is 122 °F (50 °C).



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SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS: None established for product.

CHEMICAL NAME	CAS#	EXPOSURE LIMITS
Photopolymer of Hexamethylene Diisocyanate	28182-81-2	Mfg. recommendation 0.5 mg/m ³ 8hr.TWA 1.0 mg/m ³ STEL Averaged over 15 minutes
Hexamethylene Diisocyanate*	822-06-0	ACGIH TLV 0.005 ppm TWA Mfg. recommended Ceiling Level of 0.02 ppm

HAND PROTECTION: Use impervious gloves to minimize contact such as nitrile or butyl rubber. Replace immediately if punctured or torn or when a change of appearance (color, elasticity, shape) occurs.

EYE PROTECTION: Use safety goggles that are ANSI approved to prevent eye contact at a minimum. Vapor resistant goggles should be worn when contact lenses are in use. Face shield should be worn for splash hazards. Eyewash availability is also recommended.

SKIN PROTECTION: Protective or disposable outer clothing is recommended. Cover exposed skin as much as possible. Safety showers should be available.

VENTILATION: Good industrial hygiene practice dictates that worker protection should be achieved through engineering controls, such as ventilation, whenever feasible. When such controls are not feasible to achieve full protection, the use of respirators and other personal protective equipment is mandated.

RESPIRATORY PROTECTION: Use of a NIOSH approved air-purifying respirator with organic vapor and particulate combination cartridge/filter is recommended where the exposure may be exceeded up to 10 times the exposure limits.

MEDICAL SURVEILLANCE: Medical supervision of all employees who handle or come in contact with this product is recommended. This should include preemployment and periodic medical examinations with respiratory function tests (FEV₁, FVC as minimum). Persons with asthma-type conditions, chronic bronchitis, other chronic respiratory diseases or recurrent skin eczema or sensitization should be excluded from working with this product. Once a person is diagnosed as sensitized to an isocyanate, no further exposure can be permitted.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Clear/Pale Yellow liquid with negligible-nearly odorless odor.

BOILING POINT (°F): Not available

FREEZING POINT: Not established

SPECIFIC GRAVITY: 1.11-1.13 @ 77°F (25°C)

VISCOSITY (at 25°): 500 cps (Brookfield RVF)

VAPOR DENSITY: Not established

VOC: Approx. 0.7-1.6%

SOLUBILITY IN WATER: Insoluble, reacts slowly with water to product CO₂ gas

pH: Not applicable

ODOR THRESHOLD: Not established

MOLECULAR WEIGHT: Approx. 500 (polyisocyanate)

BULK DENSITY: 9.25-9.41 lbs/gal

VISCOSITY: Approx. 2500 mPa.s @ 73.4°F (23°C) DIN EN ISO 3219/A.3

VAPOR PRESSURE: HDI Polyisocyanate 4.7-10-7mmHG @ 68°F (20°C)

SECTION 10 REACTIVITY / STABILITY HAZARD DATA

STABILITY: This material is stable when used under normal conditions.

HAZARDOUS POLYMERIZATION: May occur; Contact with moisture or other materials which react with isocyanates or temperatures above 400°F (204°C) may cause polymerization

CONDITIONS TO AVOID: None known.

INCOMPATIBILITY: Water, amines, strong bases, alcohols, metal compounds and surface active materials.

HAZARDOUS DECOMPOSITION PRODUCTS: By fire and thermal decomposition: Carbon dioxide, carbon monoxide, oxides of nitrogen, HCN, HDI, and other undetermined aliphatic fragments.



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SECTION 11 TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA:

Oral LD50: Estimated to be greater than 10,000 mg/kg (rats).

Dermal LD50 - Estimated to be > 5000 mg/kg (Rabbits)

Inhalation LC50 - Range from 137-1150 mg/m³ (rats) Lower respiratory (pulmonary) irritant.

Eye effects: Severe irritant capable of inducing corneal injury (rabbit); maximum primary eye irritation score: 54.6/110 (24 hrs)

Skin effects: Moderate irritant; primary dermal irritation score: 3.4/8.0 (rabbit)

Sensitization: Pulmonary and dermal sensitizer in animals and humans. Evidence exists that cross-sensitization between HDI and other isocyanates, particularly hydrogenated MDI and TDI, can occur.

Ames Test: Negative for product (100% solids material)

REPRODUCTIVE TOXICITY: Not determined

TERATOGENICITY: Not determined

MUTAGENICITY: Not determined

CARCINOGENICITY: IARC? No

NTP? No

OSHA? No

SECTION 12 ECOLOGICAL INFORMATION

No data available for this product.

SECTION 13 DISPOSAL CONSIDERATIONS

This product is not considered a hazardous waste under Federal Hazardous Waste Regulation 21 CFR 261. Incineration is the preferred method. If incinerated, toxic and corrosive combustion gases must be properly handled. Empty containers retain liquid and vapor residue and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. All containers should be disposed of in an environmentally safe manner and in accordance with all applicable local laws and regulations.

SECTION 14 TRANSPORTATION INFORMATION

DEPARTMENT OF TRANSPORTATION (DOT):

Hazard class 9 UN/NA: NA3082 Packing Group: III DOT RQ: 6250 lbs. Hazard Label: Class 9
When shipped at less than reportable quantity, this product ships as non-regulated.

IMO/IMDG CODE (OCEAN): Hazard Class Division Number: Non-Regulated

ICAO/IATA (AIR): Hazard Class Division Number: Non-Regulated

SECTION 15 REGULATORY INFORMATION

This Material Safety Data Sheet has been formatted to the best of our ability in accordance with American National Standards Institute (ANSI), and contains hazard criteria and all information required by the Canadian Controlled Products Regulation (CPR) in regard to this product.

Australian Inventory Status: All components of this product are currently listed in the Australian Inventory of Chemical Substances (AICS).

Canadian Inventory Status: All components of this product are currently listed on the Canadian Domestic Substance List (DSL).

California Proposition 65 RTK: This product contains the following components that are regulated by the state of California as a known carcinogen or reproductive toxin: None known

Comprehensive, Environmental Response, Compensation and Liability Act (CERCLA) of 1980: The following components of this product are regulated for notification of the release of hazardous quantities greater than the reportable quantities under 40 CFR 302.4: Hexamethylene-1,6-Diisocyanate (CAS# 822-06-0) RQ: 100 lbs.

European Inventory Status: All components of this product are NOT listed on the European Inventory of Existing Commercial Substances (EINICS).

Japanese Inventory Status: of Existing and New Chemical Substances (ENCS): All components of this product are NOT listed on the Ministry of International Trade and Industry (MITI) Existing and New Chemical Substances (ENCS) Inventory.

Occupational Safety and Health Act (OSHA): This product is classified as hazardous according to 29 CFR 1910.1200.

Resource Conservation and Recovery Act (RCRA): This product is not regulated as a hazardous substance under 40 CFR 261.



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Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III:

Section 302 – Extremely Hazardous Substances (EHS): This product is not regulated as an EHS.

Section 311/312 – Hazard Communication Standard (HCS): This product is classified as an immediate health hazard, delayed health hazard, and reactive hazard.

Section 313 – Toxic Chemical List (TCL): This following component(s) of this product are regulated under the Toxic Chemical Release Reporting requirements under 40 CFR 372: Hexamethylene-1,6-Diisocyanate (CAS# 822-06-0) 0.70 to 1.6%

Toxic Substances Control Act (TSCA)

Section 5(e): This product is not regulated under the Consent Order/Significant New Use Rule.

Section 8(b) – Inventory Status: All chemicals in this product are TSCA listed.

SECTION 16 OTHER INFORMATION

HMIS® ratings are a registered trade and service mark of the National Paint and Coatings Association with the following scale:

* = Chronic health effect

PPE Index

4 = Severe Hazard

A = Safety Glasses

3 = Serious Hazard

B = Safety Glasses and Gloves

2 = Moderate Hazard

C = Safety Glasses, Gloves and Protective Apron

1 = Slight Hazard

D = Face Shield, Gloves and Protective Apron

0 = Minimal Hazard

H = Safety goggles, Gloves, Protective Apron and Air-purifying Respirator

Definitions

TWA – Time Weighted Average

TLV – Threshold Limit Value

STEL – Short Term Exposure Limit

CAS# - Chemical Abstract Service Number

NTP – National Toxicology Program

PEL – Permissible Exposure Limit

IARC - International Agency for Research on Cancer

ANSI – American National Standards Institute

EU Risk Phrases

R20 = Harmful by inhalation

R23 = Toxic by Inhalation

R36/37/38 = Irritating to eyes, respiratory system and skin.

R42/43 = May cause sensitization by skin contact.

Revision History: March-12-2007

Disclaimer: To the best of our knowledge, the product information contained herein is based upon data believed to be reliable, however Nor-Cote makes no warranty and disclaims any liability whatsoever for its accuracy or completeness. Since the actual use of the product is beyond our control, no guarantee expressed or implied, is made by Nor-Cote as to the effects of such uses nor does Nor-Cote assume liability arising out of the use of this product by others. It remains the responsibility of the user to ensure that the use of the product herein is in accordance with all applicable laws and regulations.