

containers to heat, flame, sparks, static electricity, or other sources of ignition; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner, or properly disposed of.

===== SECTION V - REACTIVITY DATA =====

STABILITY:

Stable at room temperatures. Contact with moisture, other materials that react with isocyanates, or temperatures above 350F (177C), may cause polymerization.

CONDITIONS TO AVOID

Avoid high temperatures. Avoid freezing.

INCOMPATIBILITY (MATERIALS TO AVOID)

Avoid copper alloys. This product will react with any material containing active hydrogens such as water, alcohol, amines, bases, acids and any other compounds meant to react with isocyanates. The reaction with water is very slow under 50 degrees C (122 degrees F) but is accelerated at higher temperatures. Some reactions may be violent.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS

By Fire and High Heat: Carbon dioxide (CO2), carbon monoxide (CO), oxides of nitrogen (NOx), dense black smoke, Hydrogen cyanide, Isocyanate, Isocyanic Acid, Other undetermined compounds.

HAZARDOUS POLYMERIZATION:

Polymerization may occur at elevated temperatures in the presence of water, alkalies, tertiary amines and metal compounds.

===== SECTION VI - HEALTH HAZARD DATA =====

WARNING: This product is intended to be used as a two-component system. The mixing of these two components (part A and part B) will have hazards associated with both part A and part B. Refer to the MSDS of each for complete hazard information when working with the mixture.

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

Inhalation at levels above the occupational exposure limit could cause respiratory sensitization and risk of serious damage to the respiratory system. The onset of respiratory symptoms may be delayed for several hours after exposure. A hypersensitive response to even minimal concentrations of diisocyanates may develop in sensitized persons.

Inhalation symptoms: Diisocyanate vapors or mist at concentrations above the TLV or PEL can irritate (burning sensation) the mucus membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung functions (breathing obstruction). Persons with a preexisting, nonspecific bronchial hypersensitivity can respond to concentrations below the TLV or PEL with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure above the TLV or PEL may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in the lungs), chemical or hypersensitivity pneumonia, with flu-like symptoms (e.g., fever, chills) has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible.

Chronic inhalation: As a result of previous repeated overexposure or a single large dose, certain individuals may develop sensitization to diisocyanates (asthma or asthma-like symptoms) that may cause them to react to a later exposure to diisocyanates at levels well below the TLV or PEL. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath and asthma attack, could be immediate or displayed up to several hours after exposure, Extreme asthmatic reactions can be life threatening. Similar to many nonspecific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air or other irritants.

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This increased lung sensitivity can persist for weeks and in severe cases for several years. Sensitization can be permanent. Chronic overexposure to diisocyanates has also been reported to cause lung damage (including fibrosis, decrease in lung function) that may be permanent.

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE

Skin: Acute Skin: Causes irritations with symptoms of reddening, itching and swelling. Persons previously sensitized can experience allergic reactions and symptoms of reddening, itching, and rash. Cured material is difficult to remove. Contact with isocyanates can cause discoloration.

Skin: Chronic Skin: Prolonged irritation can cause reddening, swelling, rash, and in some cases, sensitization. Animal tests on isocyanates indicate that skin contact alone may lead to an allergic respiratory reaction.

Eye: Acute Eye: Causes irritation and symptoms of reddening, tearing, stinging, and swelling. May cause temporary corneal injury. Vapor or aerosol may cause irritation with symptoms of burning and tearing.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

Animal tests have indicated that respiratory sensitization may result from skin contact with isocyanates. Experience indicates that direct skin contact is the route of exposure most likely to cause sensitization.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

May cause irritation; symptoms may include abdominal pain, nausea, vomiting, and diarrhea.

HEALTH HAZARDS (ACUTE AND CHRONIC)

Inhalation (acute): Irritation of respiratory tract, sensitization, lung damage.

Inhalation (chronic): Sensitization, lung damage.

CARCINOGENICITY: NTP CARCINOGEN: No IARC MONOGRAPHS: No OSHA REGULATED: No

SPECIFIC HEALTH RISKS

Respiratory sensitizer.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

Skin Allergies, Eczema, Asthma, Respiratory disorders. All applicants who are assigned to an isocyanate work area should undergo a pre-placement medical evaluation. A history of eczema or respiratory allergies such as hay fever, are possible reasons for medical exclusion from isocyanate areas. Applicants who have a history of adult asthma should be restricted from work with isocyanates. Applicants with a history of prior isocyanate sensitization should be excluded from further work with isocyanates. A comprehensive annual medical surveillance program should be instituted for all employees who are potentially exposed to diisocyanates. Once a worker has been diagnosed as sensitized to any isocyanate, no further exposure can be permitted.

EMERGENCY AND FIRST AID PROCEDURES

Eye Contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Use lukewarm water if possible. Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Get medical attention.

Skin Contact: Immediately remove contaminated clothing and shoes. Wash off with soap and water. Use lukewarm water if possible. Wash contaminated clothing before reuse. For severe exposure, immediately get under safety shower and begin rinsing. Get medical attention if irritation develops. After washing, cover affected skin with polyethylene glycol (300-500 molecular weight) and wash again immediately with soap and water to thoroughly remove polyethylene glycol and residual isocyanate. Repeat if necessary.

Inhalation: Move to an area free from further exposure. Get medical attention immediately. Administer oxygen or artificial respiration as needed. Asthmatic symptoms may develop and may be immediate or delayed up to several hours. Extreme asthmatic reaction can be life threatening.

Ingestion: Do not induce vomiting. Wash mouth out with water. Do not give anything by mouth to an unconscious person. Get medical attention.

NOTE TO A PHYSICIAN:

Eyes: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic/steroid preparation as needed. Workplace vapors could produce reversible corneal epithelial edema impairing vision.

Skin: This compound is a skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burn.

Ingestion: Treat symptomatically. There is no specific antidote. Induced vomiting is contraindicated because of the irritating nature of the compound.

Inhalation: Treatment is essentially symptomatic. An individual having a derma or pulmonary sensitization reaction to this material should be removed from further exposure to any diisocyanate.

===== SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE =====

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Evacuate non-emergency personnel. Isolate the area and prevent access. Remove ignition sources. Notify management. Put on protective equipment. Control source of the leak. Ventilate. Contain the spill to prevent spread into drains, sewers, water supplies, or soil.

Minor Spill or Leak (Wet Surface): Cover spill area with suitable absorbent material (Kitty Litter, Oil-dri™, etc.). Saturate absorbent material with neutralization solution (see formulas below) and mix. Wait 15 minutes. Collect material in open-head metal containers. Repeat application of decontamination solution (see formulas below), with scrubbing, followed by absorbent until the surface is decontaminated. Check for residual surface contamination. Swipe® tests have been used for this purpose. Apply lid loosely and allow containers to vent for 72 hours to let carbon dioxide (CO2) escape.

Additional Spill Procedures/Neutralization/Decontamination
Neutralization/Decontamination Solutions:

- (1) Colorimetric Laboratories Inc. (CLI) decontamination solution.
- (2) A mixture of 75% water, 20% non-ionic surfactant (e.g. Poly-Tergent SL-62, Tergitol TMN-10) and 5% n-propanol.
- (3) A mixture of 80% water, and 20% non-ionic surfactant (e.g. Poly-Tergent SL-62, Tergitol TMN-10).
- (4) A mixture of 90% water, 3-8% ammonium hydroxide or concentrated ammonia, and 2% liquid detergent.
- (5) Mix equal amounts of the following to total two times the estimated spill volume: (1) mineral spirits 80%, VM&P naphtha 15% and household detergent 5%; and (2) a 50/50 mixture of monoethanolamine and water.

WASTE DISPOSAL METHOD

Waste disposal should be in accordance with existing federal, state and local environmental control laws. Incineration is the preferred method.

Empty Container Precautions:

Empty containers retain product residue; observe all precautions for product. Do not heat or cut empty container with electric or gas torch because highly toxic vapors and gases are formed. Do not reuse without thorough commercial cleaning and reconditioning. If container is to be disposed, ensure all product residues are removed prior to disposal.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Recommended Storage Temperature:

Minimum: 25C (77F)

Maximum: 30C (86F)

Recommended Storage Period: 12 months maximum

Handling/Storage Precautions:

Do not breathe vapors, mists, or dusts. Use adequate ventilation to keep isocyanates levels below the exposure limits. Wear respiratory protection if material is heated, sprayed, used in a confined space, or if the exposure limit is exceeded. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent overexposure from inhalation. This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposures to lower concentrations. Individuals with lung or breathing problems or prior allergic reactions to isocyanates must not be exposed to vapor or spray mist. Avoid contact with skin and eyes. Wear appropriate eye and skin protection. Wash thoroughly after handling. Do not breathe smoke and

gases created by overheating or burning this material. Decomposition products can be highly toxic and irritating. Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected. Further Information on Storage Conditions:

Ideal storage temperature range is dependent on the specific polymer due to viscosity and melting point differences between the polymers. Use 25C (77F) to 30C (86F) as a guideline to most isocyanates for optimum storage temperature. If some isocyanates are stored at or below a temperature of 25C (77F), crystallization and settling of the isocyanate may occur. Storage in a cold warehouse can cause crystals to form. These crystals can settle to the bottom of the container. If crystals do form, they can be melted easily with moderate heat. It is suggested that a container the size of a drum be warmed for 16-24 hours at sufficient temperature to melt the crystals. When the crystals are melted, the container should be agitated by rolling or stirring, until the contents are homogenous. Since heated isocyanate will generate vapors more rapidly than product stored at 25C (77F), be sure to follow the precautions under the Personal Protection section of the MSDS whenever opening a heated isocyanate container.

OTHER PRECAUTIONS

Employee education and training in the safe use and handling of this product are required under the OSHA Hazard Communication Standard found in 29 CFR 1910.1200.

Smoking in areas where this material is used should be strictly prohibited.

When applying this product around air intake vents of buildings, take steps to assure that occupants do not get exposed to vapors or spray of product.

===== **SECTION VIII - CONTROL MEASURES**=====

RESPIRATORY PROTECTION

Airborne isocyanate concentrations greater than the ACGIH TLV-TWA or OSHA PEL-C (PEL) can occur in inadequately ventilated environments when isocyanate is sprayed, aerosolized, or heated. In such cases, respiratory protection must be worn. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The type of respiratory protection available includes (1) an atmosphere-supplying respirator such as a self-contained breathing apparatus (SCBA) or supplied air respirator (SAR in the positive pressure or continuous flow mode, or (2) an air-purifying respirator (APR). If an APR is selected then (a) the cartridge must be equipped with an end-of-service life indicator (ESLI) certified by NIOSH, or (b) a change out schedule, based on objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program. Further, if an APR is selected, the airborne diisocyanate concentration must be no greater than 10 times the TLV or PEL. The recommended APR cartridge is an organic vapor/particle filter combination cartridge (OV/P100).

VENTILATION

Local exhaust should be used to maintain levels below TLV whenever isocyanate is heated, sprayed, or aerosolized. Standard reference sources regarding industrial ventilation (e.g. ACGIH Industrial Ventilation Manual) should be consulted for guidance about adequate ventilation. To ensure that published exposure limits have not been exceeded, monitoring for airborne diisocyanate should become part of the overall employee exposure characterization program. NIOSH, OSHA and others have developed sampling and analytical methods.

PROTECTIVE GLOVES

Gloves should be worn. Nitrile rubber shows excellent resistance. Butyl rubber, neoprene and PVC are also effective.

EYE PROTECTION

When directly handling liquid product, eye protection is required. Examples of eye protection include a chemical safety goggle, or chemical goggle in combination with a full face shield when there is a greater risk of splash.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT

Avoid all skin contact. Depending on the conditions of use, cover as much of the exposed skin area as possible with

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appropriate clothing to prevent skin contact. Use skin barrier cream on exposed skin.

WORK/HYGIENIC PRACTICES

Employees should wash their hands and face before eating, drinking or using tobacco products. Educate and train employees in the safe use and handling of this product.

===== **SECTION IX - DISCLAIMER** =====

THIS INFORMATION IS FURNISHED WITHOUT WARRANTY, EXPRESS OR IMPLIED. THIS INFORMATION IS BELIEVED TO BE ACCURATE TO THE BEST KNOWLEDGE OF HI TECH SYSTEMS. THE INFORMATION IN THIS MSDS RELATES ONLY TO THE SPECIFIC MATERIAL DESIGNATED HEREIN. HI TECH SYSTEMS. ASSUMES NO LEGAL RESPONSIBILITY FOR USE OF OR RELIANCE UPON THE INFORMATION IN THIS MSDS.

ABBREVIATIONS USED IN THIS MSDS ARE AS FOLLOWS, BUT ARE NOT INTENDED TO BE AN EXHAUSTIVE LISTING. FOR MORE INFORMATION USE AN INTERNET SEARCH ENGINE AND/OR CONTACT AN ENVIRONMENTAL HEALTH AND SAFETY REGULATORY CONSULTANT.

ACGIH=American Conference of Governmental Industrial Hygienists.

TLV=Threshold Limit Value.

OSHA=Occupational Safety and Health Administration.

NIOSH=National Institute for Occupational Safety and Health.

TWA=8-hour Time Weighted Average.

STEL=Short Term Exposure Limit.

NE=None Established.

F=Fahrenheit.

C=Celcius or Centigrade.

PMCC=Pensky Martins Closed Cup.

TCC=Tag Closed Cup.

TOC=Tag Open Cup.

PPM=parts per million.

MG/M3=Milligrams per cubic meter.

LB/GL=pounds per gallon.

N/A=Not Applicable.

NF=Not Found.

NL=None Listed.