

**Safety Data Sheet**  
**Toluene Diisocyanate**

**SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION**

**1.1 Product identifier**

**Product name:** Toluene Diisocyanate  
**Synonym(s):** TDI; Toluene diisocyanate (mixed isomers)

**1.2 Relevant identified uses of the substance or mixture and uses advised against**

**General use:** Industrial and laboratory applications  
**Uses advised against:** No data available

**1.3 Details of the supplier and of the safety data sheet**

**Manufacturer/Distributor**  
Silver Fern Chemical, Inc.  
2226 Queen Anne Avenue North, Suite C  
Seattle, WA 98109 USA  
1-866-282-3384  
Website - www.silverfernchemical.com; email address - info@silverfernchemical.com

**1.4 Emergency telephone number**

+1-800-535-5053; Outside USA & Canada +1-352-323-3500

**SECTION 2 - HAZARDS IDENTIFICATION**

**2.1 Classification of substance or mixture**

**Product definition:** Mixture  
**Classification in accordance with 29 CFR 1910 (OSHA HCS) and Regulation EC No. 1272/2008**  
Skin Irritation - Category 2 [H315]  
Sensitization, Skin - Category 1 [H317]  
Eye Damage - Category 2A [H319]  
Acute Toxicity, Inhalation - Category 1 [H330]  
Sensitization, Inhalation - Category 1 [H334]  
Single Target Organ Toxicity, Single Exposure - Category 3; STOT SE 3 [H335]  
Carcinogenicity - Category 2 [H351]  
Aquatic Toxicity, Chronic - Category 3 [H412]

**2.2 Label elements**

**Hazard symbol(s):**



GHS06



GHS07



GHS08

**Signal word:** Danger

**Hazard statement(s):** H315 - Causes skin irritation  
H317 - May cause an allergic skin reaction  
H319 - Causes serious eye irritation  
H330 - Fatal if inhaled  
H334 - May cause allergy or asthma symptoms or breathing difficulty if inhaled  
H335 - May cause respiratory irritation  
H351 - Suspected of causing cancer  
H412 - Harmful to aquatic life with long lasting effects

**Precautionary statements:**

**[Prevention]**

P201 - Obtain special instructions before use.  
P202 - Do not handle until all safety precautions have been read and understood.  
P260 - Do not breathe mist or vapor.  
P264 - Wash hands and other exposed skin areas thoroughly after handling.  
P271 - Use only outdoors or in a well-ventilated area.  
P272 - Contaminated work clothing should not be allowed out of the workplace.  
P273 - Avoid release to the environment.  
P280 + P284 - Wear protective gloves, protective clothing, eye protection and respiratory protection.  
**[Response]** P302 + P352 - IF ON SKIN: Wash with plenty of soap and water.  
P304 + P340 + P310 - IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor.  
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present

and easy to do. Continue rinsing.

P308 + P313 - If exposed or concerned: Get medical attention.

P320 - Specific treatment is urgent: Immediately call a POISON CENTER or doctor. Refer to Section 4 of this SDS.

P333 + P337 + P313 - If skin irritation or rash occurs or if eye irritation persists: Get medical attention.

P362 - Take off contaminated clothing and wash before reuse.

P405 + P403 + P410 - Store locked up in a well-ventilated place. Protect from sunlight.

P501 - Dispose of contents and containers in accordance with national and local regulations.

[Storage]

[Disposal]

## 2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

This material is a lachrymator.

## SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substances

Not applicable

### 3.2 Mixtures

% by Weight	Ingredient	CAS Number	EC Number	Index Number	GHS Classification
60 - 100	2,4-Toluene diisocyanate	584-84-9	209-544-5	605-006-00-4	H315, H317, H319, H330, H334, H335, H351, H412
10 - 30	2,6-Toluene diisocyanate	91-08-7	202-039-0	615-006-00-4	H315, H317, H319, H330, H334, H335, H351, H412

There are no additional ingredients present in this product which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

## SECTION 4 – FIRST AID MEASURES

### 4.1 Description of first aid measures

**Inhalation:** If product mist or vapor causes respiratory irritation or distress, move the exposed person to fresh air immediately. If breathing is difficult or irregular, administer oxygen; if respiratory arrest occurs, start artificial respiration by trained personnel. Do not use mouth-to-mouth method if victim inhaled this substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If unconscious, maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. If symptoms persist or you feel unwell, seek medical attention.

**Eyes:** Immediately flush eyes with large amounts of water or saline solution for at least 15 minutes, occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do after first 2 minutes and continue rinsing. If irritation persists seek medical attention, preferably from an ophthalmologist.

**Skin:** Flush skin with large amounts of water while removing contaminated clothing. Remove contaminated clothes while washing. Wash the affected area with soap and water followed by thorough rinsing. Wash contaminated clothing before reuse. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands. If irritation persists or if rash occurs, seek medical attention.

**Ingestion:** Rinse mouth with water if the victim is conscious. Remove dentures if present. DO NOT induce vomiting unless directed to do so by medical personnel. Vomiting may occur spontaneously. To prevent aspiration of vomit into the lungs, lay the victim on one side with the head lower than the waist. Never give anything by mouth to an unconscious or convulsing person. Do not leave the victim unattended. Seek immediate medical attention.

### 4.2 Most important symptoms and effects, both acute and delayed

#### Potential health symptoms and effects

**Eyes:** Causes serious eye irritation with symptoms of redness, swelling, stinging and tearing. May cause temporary corneal injury. Product vapor can cause eye irritation with symptoms of burning and tearing. Prolonged exposure to vapor can cause conjunctivitis.

**Skin:** Causes skin irritation with symptoms of redness, itching and swelling. Can cause an allergic skin reaction and subsequent sensitization in susceptible individuals with redness, itching and rash. Persons previously sensitized can experience allergic skin reactions with symptoms of redness, itching, swelling and rash upon re-exposure to diisocyanates and polyisocyanates.

**Inhalation:** Harmful if inhaled. At room temperature, vapors are minimal due to low volatility. However, certain operations, including heating or spraying, may generate vapor or mist concentrations sufficient to cause respiratory irritation and other adverse effects. Diisocyanate mist or vapor at concentrations above the exposure limits or guidelines can irritate the mucous membranes in the respiratory tract with symptoms of burning sensation, runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function (difficulty breathing). Persons with a pre-existing, nonspecific bronchial hyperreactivity can respond to concentrations below the exposure limits or guidelines with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the exposure limits or guidelines may lead to bronchitis, bronchial spasm and pulmonary edema. Chemical or hypersensitivity pneumonitis, with flu-like symptoms has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible; however, increased lung sensitivity may persist for a longer period of time.

**Ingestion:** May cause irritation of the mouth, throat and gastrointestinal tract with nausea, abdominal pain, vomiting and diarrhea. May be harmful if swallowed.

**Chronic:** Individuals with pre-existing skin, eye and respiratory disorders may be more susceptible to the effects of this product. Prolonged and

repeated skin contact with unprotected skin may cause sensitization (hives, dermatitis, eczema) or aggravate existing skin conditions. Chronic exposure to mist or vapor may cause respiratory sensitization (bronchitis and asthma). May cause chronic eye irritation. Prolonged and repeated skin contact can cause redness, swelling, rash and possible skin sensitization. Animal tests and other research indicate that skin contact with diisocyanates can play a role in causing isocyanate sensitization and respiratory reaction. This data reinforces the need to prevent direct skin contact with isocyanates.

As a result of previous repeated overexposures or a single large dose, certain individuals may develop sensitization (asthma or asthma-like symptoms) to diisocyanates that may cause them to react to a later exposure to these materials at levels well below the exposure limits or guidelines. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthmatic attack, could be 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, several years. Sensitization can be permanent. Chronic over-exposure to diisocyanates has also been reported to cause lung damage (including fibrosis, decrease in lung function) that may be permanent. Toluene diisocyanate (TDI) is suspected of causing cancer. Refer to Section 11.2.

#### 4.3 Indication of any immediate medical attention and special treatment needed

##### Advice to doctor and hospital personnel

Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Excessive exposure may aggravate pre-existing asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).

Maintain adequate ventilation and oxygenation of the patient. May cause respiratory sensitization or asthma-like symptoms. Bronchodilators, expectorants and antitussives may be of help. Treat bronchospasm with inhaled  $\beta_2$  agonist and oral or parenteral corticosteroids. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24 - 48 hours for signs of respiratory distress. If you are sensitized to diisocyanates, consult your physician regarding working with other respiratory irritants or sensitizers.

### SECTION 5 – FIRE FIGHTING MEASURES

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#### 5.1 Extinguishing media

**Suitable methods of extinction:** Use extinguishing media such as water spray or fog, carbon dioxide, foam and dry chemical.

**Unsuitable methods of extinction:** No data available

#### 5.2 Special hazards arising from the substance or mixture

Closed containers may explode due to the buildup of pressure when exposed to extreme heat. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent or may be delayed. Obtain medical attention.

**Explosion hazards:** This material is not considered to be an explosion hazard.

#### 5.3 Advice to firefighters

Full protective equipment including self-contained breathing apparatus should be used. Water may be used to cool closed containers to prevent pressure buildup and possible autoignition or explosion when exposed to extreme heat. Water contaminated by this material must be contained from being discharged to any waterway, sewer or drain to prevent environmental contamination.

### SECTION 6 – ACCIDENTAL RELEASE MEASURES

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#### 6.1 Personal precautions, protective equipment and emergency procedures

Evacuate non-essential personnel. Wear appropriate protective clothing and respiratory protection designated in Section 8.2. Ventilate the area. Remove all sources of ignition. NO SMOKING. Clean up spills immediately. Spill creates a slip hazard.

#### 6.2 Environmental precautions

Avoid dispersal of spilled material or runoff and prevent contact with soil and entry into drains, sewers or waterways. Use water sparingly to minimize environmental contamination and reduce disposal requirements.

#### 6.3 Methods and materials for containment and cleaning up

Approach spill from upwind direction. DO NOT flush spills down the drain. Cover drains and contain spill. Cover spill with a large quantity of inert absorbent. Do not use combustible material such as sawdust. Collect material and place into an approved container for proper disposal. Observe possible material restrictions (Sections 7.2 and 10.5). Do not allow material or runoff from rinsing contaminated areas to enter floor drains or storm drains and ditches that lead to waterways. Dispose of via a licensed waste disposal contractor.

#### 6.4 Reference to other sections

For indications about waste treatment, see Section 13.

### SECTION 7 – STORAGE AND HANDLING

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#### 7.1 Precautions for safe handling

Wear all appropriate personal protective equipment specified in Section 8.2. Do not get in eyes or on skin or clothing. Do not inhale mist or vapor. NO SMOKING. If normal use of material presents a respiratory hazard, use only adequate ventilation or wear an appropriate respirator. Wash contaminated clothing and shoes thoroughly before reuse.

##### Advice on protection against fire and explosion

This material is not considered a fire or explosion hazard.

## 7.2 Conditions for safe storage, including any incompatibilities

Store in dry, cool, well-ventilated areas away from incompatible materials (see Section 10.5), food and drink. Do not store in direct sunlight. Transfer only to approved containers having correct labeling. Keep containers tightly closed when not in use. Protect containers against physical damage. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Containers are hazardous when empty as they contain product residue. Use appropriate containment to avoid environmental contamination. Ventilate closed areas. Keep out of reach of children.

## 7.3 Specific end uses

Apart from the uses mentioned in Section 1.2, no other specific uses are stipulated.

## SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

### 8.1 Control parameters

#### Occupational exposure limit values

CAS Number	Ingredient	OSHA PEL	ACGIH TLV	NIOSH
584-84-9	2,4-Toluene diisocyanate	0.012 ppm; 0.04 mg/m <sup>3</sup> TWA*	0.01 ppm, 8 h TWA* (IFV)**	-----
		0.02 ppm; 0.15 mg/m <sup>3</sup> STEL*	0.005 ppm STEL (IFV)** Skin, Dermal Sensitizer	
91-08-7	2,6-Toluene diisocyanate	-----	0.01 ppm, 8 h TWA* (IFV)**	-----
			0.005 ppm STEL (IFV)** Skin, Dermal Sensitizer	

\*Respiratory sensitization

\*\*Inhalable Fraction and Vapor

A "skin" notation following the inhalation exposure guideline refers to the potential for dermal absorption of the material, including eyes and mucous membranes, either by direct contact with vapors or by direct skin contact. It is intended to alert the reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposure should be considered.

### 8.2 Exposure controls

**Engineering measures:** Technical measures and appropriate working operations should be given priority over the use of personal protective equipment. Use adequate ventilation. Local exhaust is preferable to control airborne levels below the exposure guidelines. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and workers. **The odor and irritancy of this material are inadequate to warn of excessive exposure.** This material should only be used under a hood or with proper respiratory protection in the laboratory. Refer to Section 7.1.

**Individual protection measures:** Wear protective clothing to prevent repeated or prolonged contact with product. Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the representative supplier.

**Hygiene measures:** Facilities storing or using this material should be equipped with an eyewash station and safety shower. Change contaminated clothing. Preventive skin protection is recommended. Wash hands thoroughly after use, before eating, drinking, smoking or using the lavatory.

**Eye/face protection:** Wear safety glasses with unperforated side shields or protective splash goggles during use.

**Hand protection:** Wear gloves made of butyl or Nitrile rubber or those recommended by glove supplier for protection against materials in Section 3. Gloves should be impermeable to chemicals and oil. Breakthrough time of selected gloves must be greater than the intended use period.

**Skin protection:** Wear protective clothing. Wear protective boots if the situation requires.

**Respiratory protection:** At normal room temperatures, airborne TDI can exceed the ACGIH TLV-TWA; therefore, in inadequately ventilated environments, respiratory protection must be worn. Always use an approved respirator when vapor/aerosols exceed permissible exposure limits. Where risk assessment shows air-purifying respirators are appropriate use a half-mask respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Follow OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149.

**Environmental exposure controls:** Do not empty into drains.

**Medical surveillance:** All employees 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. Employees who have a history of adult asthma should be restricted from work with isocyanates. Employees 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.

*PPE must not be considered a long-term solution to exposure control. PPE usage must be accompanied by employer programs to properly select, maintain, clean fit and use. Consult a competent industrial hygiene resource to determine hazard potential and/or the PPE manufacturers to ensure adequate protection*



Safety Glasses



Gloves



Protective Apron



Vapor Respirator

## SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

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### 9.1 Information on basic physical and chemical properties

<b>Appearance</b>	Clear, colorless to yellow liquid
<b>Odor</b>	Strong, pungent
<b>Odor Threshold</b>	No data available
<b>Molecular Weight</b>	Not applicable
<b>Chemical Formula</b>	Not applicable
<b>pH</b>	Not applicable
<b>Freezing/Melting Point</b>	10 °C (50 °F)
<b>Boiling Point Range</b>	252 - 254 °C (485.6 - 489.2 °F)
<b>Evaporation Rate</b>	No data available
<b>Flammability (solid, gas)</b>	Not applicable
<b>Flash Point</b>	126.67 °C (260 °F) PMCC [ASTM D-93]
<b>Autoignition Temperature</b>	No data available
<b>Decomposition Temperature</b>	No data available
<b>Lower Explosive Limit (LEL)</b>	No data available
<b>Upper Explosive Limit (UEL)</b>	No data available
<b>Vapor Pressure</b>	0.25 mm Hg @ 25 °C
<b>Vapor Density</b>	No data available
<b>Specific Gravity</b>	1.22 @ 20 °C
<b>Viscosity</b>	No data available
<b>Solubility in Water</b>	Insoluble
<b>Partition Coefficient (n-octanol/water)</b>	log P <sub>ow</sub> = 3.4 - 3.74
<b>Oxidizing Properties</b>	Not applicable
<b>Explosive Properties</b>	Not applicable
<b>Volatiles by Weight @ 21 °C</b>	No data available

### 9.2 Other Data

No data available

## SECTION 10 – STABILITY AND REACTIVITY

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### 10.1 Reactivity

This material is stable under normal handling conditions and use. Diisocyanates react with many materials and the rate of reaction increases with temperature as well as increased contact; these reactions can become violent. Contact is increased by stirring or if the other material mixes with the diisocyanate. Diisocyanates are not soluble in water and sink to the bottom but react slowly at the interface. The reaction forms carbon dioxide gas and a layer of solid polyurea. Reaction with water will generate carbon dioxide and heat. The reaction of polyols and isocyanates generate heat.

### 10.2 Chemical Stability

This material is stable under recommended storage conditions.

### 10.3 Possibility of hazardous reactions

Exposure to elevated temperatures can cause product to decompose and generate gas. Polymerization can be catalyzed by contact with strong bases or water.

### 10.4 Conditions to avoid

Avoid temperature extremes, hot surfaces, contact with incompatible materials, exposure to sunlight and moisture. This material reacts slowly with water, releasing carbon dioxide which can cause pressure buildup and rupture of closed containers. Elevated temperatures accelerate this reaction.

### 10.5 Incompatible materials

Water, amines, strong bases, alcohols, copper alloys.

### 10.6 Hazardous decomposition products

Thermal decomposition products include carbon oxides, nitrogen oxides, hydrogen cyanide, isocyanate, isocyanic acid, dense black smoke.

## SECTION 11 – TOXICOLOGICAL INFORMATION

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### 11.1 Information on toxicological effects

#### Acute oral toxicity

LD<sub>50</sub>, rat: 4,130 - 5,110 mg/kg

#### Acute inhalation toxicity

LC<sub>50</sub>, rat: 0.107 mg/l - 4 h

#### Acute dermal toxicity

LD<sub>50</sub>, rabbit: > 9,400 mg/kg

**Skin irritation**

Causes skin irritation.

**Eye irritation**

Causes serious eye irritation.

**Sensitization**

May cause an allergic skin reaction. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

**Carcinogenicity**

Suspected of causing cancer.

**Genotoxicity in vitro**

No data available

**Germ cell mutagenicity**

No data available

**Specific organ toxicity - single exposure**

May cause respiratory irritation.

**Specific organ toxicity - repeated exposure**

No data available

**Aspiration hazard**

No data available

**11.2 Further information**

**Toluene Diisocyanate** (mixed isomers): IARC, Group 2B carcinogen - *Possibly carcinogenic to humans*; ACGIH, A3 - *Confirmed animal carcinogen with unknown relevance to humans*. Not listed as a carcinogen by NTP and OSHA.

To the best of our knowledge this product contains no substances present at levels greater than or equal to the 0.1% threshold (de minimis) that are identified as a probable, possible, potential or confirmed carcinogens by ACGIH, IARC, NTP or OSHA.

Handle in accordance with good industrial hygiene and safety practice.

**SECTION 12 - ECOLOGICAL INFORMATION**

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**12.1 Toxicity**

This material is harmful to aquatic life with long lasting effects.

**Toxicity to fish:**

LC<sub>50</sub> - Danio rerio (Zebra fish), 96 h: 100 mg/l

LC<sub>50</sub> - Oncorhynchus mykiss (Rainbow trout), 96 h: 133 mg/l

**Toxicity to aquatic invertebrates:**

EC<sub>50</sub> - Daphnia magna (Water flea), 48 h: 12.5 mg/l

**Toxicity to aquatic plants:**

EC<sub>50</sub> - Skeletonema costatum (Marine diatom), 96 h: 3,230 mg/l

**Toxicity to bacteria:**

EC<sub>50</sub> - Activated sludge (Bacteria), static test, 3 h: 100 mg/l

**12.2 Persistence and degradability**

This product is not biodegradable.

**12.3 Bioaccumulation potential**

The bioaccumulation potential for this product is low.

**12.4 Mobility in soil**

No data available

**12.5 Results of PBT and vPvB assessment**

This substance is not persistent, bioaccumulative and toxic (PBT) and not very persistent and very bioaccumulative (vPvB).

**12.6 Other effects****Additional ecological information**

Do not allow material to run into surface waters, wastewater or soil.

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

**SECTION 13 – DISPOSAL CONSIDERATIONS**

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**13.1 Waste treatment methods**

Methods of disposal: The generation of waste should be avoided or minimized whenever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

**RCRA F-Series:** No listings above the reportable threshold (de minimis)

**RCRA U-Series:** No listings above the reportable threshold (de minimis)

## SECTION 14 – TRANSPORTATION INFORMATION

**Note:** Transportation information provided is for reference only. Customer is urged to consult 49 CFR 100 - 177, IMDG, IATA, EC, United Nations TDG and WHMIS (Canada) TDG information manuals for detailed regulations and exceptions covering specific container sizes, packaging materials and methods of shipping.

Limited quantity for poisonous materials Packing Group II when inner packagings are not over 1.0 liter (0.3 gallon) net capacity each, packed in a strong outer packaging.

### USA DOT (Ground Transportation) - Bulk

**Proper Shipping Name** Toluene Diisocyanate  
**Hazard Class** 6.1  
**UN** UN2078  
**Packing Group** II  
**NAREG** Guide #156  
**Packaging Authorization** Non-Bulk: 49 CFR 173.202; Bulk: 173.243  
**Packaging Exceptions** 49 CFR 173.153

Drum Label(s)



### IMO/IMDG (Water Transportation)

**Proper Shipping Name** Toluene Diisocyanate  
**Hazard Class** 6.1  
**UN** UN2078  
**Packing Group** II  
**Marine Pollutant** No  
**EMS Number** F-A, S-A

### ICAO/IATA (Air Transportation)

**Proper Shipping Name** Toluene Diisocyanate  
**Hazard Class** 6.1  
**UN** UN2078  
**Packing Group** II  
**Quantity Limitations** 49 CFR 175.27 and 175.75 - Cargo Aircraft Only: 60 l; Passenger Aircraft: 5 l

### RID/ADR (Rail Transportation)

**Proper Shipping Name** Toluene Diisocyanate  
**Hazard Class** 6.1  
**UN** UN2078  
**Packing Group** II

## SECTION 15 - REGULATORY INFORMATION

### 15.1 Safety, health and environmental regulations/legislation specific for substance or mixture

#### U. S. Federal Regulations

**OSHA Hazard Communication Standard:** This material is classified as hazardous in accordance with OSHA 29 CFR 1910-1200.

**OSHA Process Safety Management Standard:** This product is not regulated under OSHA PSM Standard 29 CFR 1910.119.

**EPA Risk Management Planning Standard:** Toluene Diisocyanates are regulated under EPA RMP Standard (RMP) 40 CFR Part 68.  
EPA RMP Threshold quantity (TQ) = 10,000 lb Toxic Endpoint = 0.0070 mg/l

**EPA Federal Insecticide, Fungicide and Rodenticide Act:** This product is not a registered Pesticide under the FIFRA, 40 CFR Part 150.

**Toxic Substance Control Act (TSCA) Inventory:** All substances in this product are listed on the TSCA Inventory. *Toluene Diisocyanates* are subject to TSCA 12(b) Export Notification.

**Drug Enforcement Administration (DEA) List 2, Essential Chemicals (21 CFR 1310.02(b)) and 1310.4(f)(2)) and Chemical Code Number**  
No listings

**Drug Enforcement Administration (DEA) Lists 1 & 2, Exempt Chemical Mixtures (21 CFR 1310.12(c)) and Code Number:** No listings

**Department of Homeland Security (DHS) Chemical Facility Anti-Terrorism Standards (CFATS) Chemicals:** No listings

#### **Superfund Amendments and Reauthorization Act (SARA)**

##### **SARA Section 311/312 Hazard Categories**

Causes skin irritation and serious eye irritation	May cause allergy or asthma symptoms or breathing difficulty if inhaled.
May cause an allergic skin reaction	May cause respiratory irritation
Fatal if inhaled	Suspected of causing cancer

**SARA 313 Information:** Toluene Diisocyanate (mixed isomers) is subject to the reporting levels of Section 313 of the Emergency Planning and Community Right-to Know Act of 1986.

**SARA 302/304 Extremely Hazardous Substance:** None of the components of this product are subject to the reporting levels of established by these sections of Title III of SARA.

**SARA 302/304 Emergency Planning & Notification:** None of the components of this product are subject to the reporting levels established by

of these sections of Title III of SARA.

**Comprehensive Response Compensation and Liability Act (CERCLA):** This product contains the following CERCLA reportable substances:  
2,4-Toluene diisocyanate (CAS #584-84-9): RQ = 4.54 kg (100 lb)      2,6-Toluene diisocyanate (CAS #91-08-7): RQ = 4.54 kg (100 lb)

#### Clean Air Act (CAA)

Toluene diisocyanates are Hazardous Air Pollutants (HAPs) designated in CAA Section 112 (b).  
This product does not contain Class 1 Ozone depleters.  
This product does not contain Class 2 Ozone depleters.

#### Clean Water Act (CWA)

Toluene diisocyanates are Hazardous Substances.  
This product does not contain Priority Pollutants.  
This product does not contain Toxic Pollutants.

#### U.S. State Regulations

##### California Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986

**⚠ WARNING:** This product will expose you to Toluene Diisocyanates, which are known to the state of California to cause cancer. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

#### Other U.S. State Inventories

*Toluene Diisocyanates* are listed on the following State Hazardous Substance Inventories, Right-to-Know lists and/or Air Quality/Air Pollutants lists: CA, DE, ME, MA, MN, NJ, NY, PA, RI, WV, WI.

#### Canada

##### WHMIS Hazard Classification

Causes skin irritation and serious eye irritation	May cause allergy or asthma symptoms or breathing difficulty if inhaled.
May cause an allergic skin reaction	May cause respiratory irritation
Fatal if inhaled	Suspected of causing cancer

**Canadian National Pollutant Release Inventory (NPRI):** Toluene diisocyanate (mixed isomers) is listed on the NPRI.

#### European Economic Community

**WGK, Germany (Water danger/protection):** 2 (obviously hazardous to water)

#### Global Chemical Inventory Lists

Country	Inventory Name	Listed
Canada	Domestic Substance List (DSL)	Yes
Canada	Non-Domestic Substance List (NDSL)	No
Europe	Inventory of New and Existing Chemicals (EINECS)	Yes
United States	Toxic Substance Control Act (TSCA)	Yes
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
New Zealand	New Zealand Inventory of Chemicals (NZIoC)	Yes
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (KECI)	Yes
Philippines	Philippines Inventory of Chemicals and Chemical Substances (PICCS)	Yes

\*Yes - All components of this product comply with the inventory requirements administered by the governing country.

No - One or more components of this product are not on the inventory or are exempt from listing.

## 15.2 Chemical safety assessment

For this product a chemical safety assessment was not carried out.

## SECTION 16 - OTHER INFORMATION

### Hazardous Material Information System (HMIS)

HEALTH	*	3
FLAMMABILITY		1
PHYSICAL HAZARD		2
PERSONAL PROTECTION		H

H = safety glasses, gloves, apron & vapor respirator

#### HMIS Hazard Rating Legend

0 = Minimal 1 = Slight 2 = Moderate

3 = Serious 4 = Severe

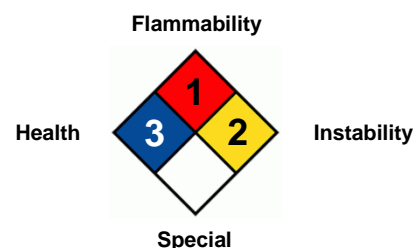
\* = Chronic Health Hazard

#### NFPA Hazard Rating Legend

0 = Insignificant 1 = Slight 2 = Moderate

3 = High 4 = Extreme

### National Fire Protection Association (NFPA)



#### Abbreviation Key

**ACGIH** American Conference of Governmental Industrial Hygienists

**ADR** Accord Dangereux Routier (European regulations concerning the international transport of dangerous goods by road)

**LD<sub>50</sub>** Lowest Lethal Dose

**mppcf** Millions of Particles Per Cubic Foot

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Supersedes: 22 August 2012

Safety Data Sheet  
Toluene Diisocyanate

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<b>CAS</b>	Chemical Abstract Services	<b>NA</b>	North America
<b>CFR</b>	Code of Federal Regulations	<b>NAERG</b>	North American Emergency Response Guide Book
<b>COC</b>	Cleveland Open Cup	<b>NIOSH</b>	National Institute for Occupational Safety & Health
<b>DOT</b>	Department of Transportation	<b>NTP</b>	National Toxicology Program
<b>EC<sub>50</sub></b>	Half maximal effective concentration	<b>OSHA</b>	Occupational Safety and Health Administration
<b>EMS</b>	Emergency Response Procedures for Ships Carrying	<b>PBT</b>	Persistent, Bioaccumulating and Toxic
<b>EPA</b>	Environmental Protection Agency	<b>PEL</b>	Permissible exposure limit
<b>ErC<sub>50</sub></b>	Reduction of Growth Rate	<b>PMCC</b>	Pensky-Martens Closed Cup
<b>ERG</b>	Emergency Response Guide Book	<b>ppm</b>	Parts Per Million
<b>FDA</b>	Food and Drug Administration	<b>RCRA</b>	Resource Conservation and Recovery Act
<b>GHS</b>	Globally Harmonized System of Classification and Labelling of Chemicals (GHS)	<b>RID</b>	Dangerous Goods by Rail
<b>HCS</b>	Hazard Communication Standard	<b>RQ</b>	Reportable Quantity
<b>IARC</b>	International Agency for Research on Cancer	<b>TCC/Tag</b>	Tagliabue Closed Cup
<b>IATA</b>	International Air Transport Association	<b>TLV</b>	Threshold Limit Value
<b>IC<sub>50</sub></b>	Half Maximal Inhibitory Concentration	<b>TSCA</b>	Toxic Substance Control Act
<b>ICAO</b>	International Civil Aviation Organization	<b>TWA</b>	Time-weighted Average
<b>IDLH</b>	Immediately Dangerous to Life and Health	<b>UN</b>	United Nations
<b>IMDG</b>	International Maritime Dangerous Goods	<b>VOC</b>	Volatile Organic Compounds
<b>IMO</b>	International Maritime Organization	<b>vPvB</b>	Very Persistent and Very Bioaccumulating
<b>LC<sub>50</sub></b>	50% Lethal Concentration	<b>WHMIS</b>	Workplace Hazardous Materials Information System
<b>LD<sub>50</sub></b>	50% Lethal Dose		

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