



# TCI AMERICA

## SAFETY DATA SHEET

Revision number: 5  
Revision date: 08/15/2016

### 1. IDENTIFICATION

**Product name:** Toluene-2,4-diisocyanate  
**Product code:** T0263

**Product use:** For laboratory research purposes.  
**Restrictions on use:** Not for drug or household use.

**Company:**  
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**Emergency telephone number:**  
Chemical Emergencies:  
TCI America (8:00am - 5:00pm) PST  
+1-503-286-7624  
Transportation Emergencies:  
Chemtrec 24-Hour  
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**Responsible department:**  
TCI America  
Environmental Health Safety and Security  
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### 2. HAZARD(S) IDENTIFICATION

**OSHA Haz Com: CFR 1910.1200:** Acute Toxicity - Inhalation [Category 2]  
Skin Corrosion/Irritation [Category 2]  
Eye Damage/Irritation [Category 2A]  
Sensitization - Respiratory [Category 1]  
Sensitization - Skin [Category 1]  
Carcinogenicity [Category 2]  
Specific Target Organ Toxicity (Single Exposure) [Category 2]  
Specific Target Organ Toxicity (Repeated Exposure) [Category 1]

**Signal word:** Danger!

**Hazard Statement(s):** Causes serious eye irritation  
Causes skin irritation  
Fatal if inhaled  
May cause allergy or asthma symptoms or breathing difficulties if inhaled  
May cause an allergic skin reaction  
Suspected of causing cancer  
May cause damage to organs: Respiratory System  
Causes damage to organs: Blood (System) Respiratory System through prolonged or repeated exposure.

**Pictogram(s) or Symbol(s):**



**Precautionary Statement(s):**  
[Prevention]

Do not breathe dusts or mists. Use only outdoors or in a well-ventilated area. In case of inadequate ventilation wear respiratory protection. Wash hands and face thoroughly after handling. Wear protective gloves. Wear eye and face protection. Avoid breathing dusts or mists. Contaminated work clothing must not be allowed out of the workplace. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves, protective clothing, eye protection and face protection. Wash all exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product.

**2. HAZARD(S) IDENTIFICATION****[Response]**

If inhaled: Remove person to fresh air and keep comfortable for breathing. Immediately call a poison center or doctor. If on skin: Wash with plenty of water. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice or attention. If inhaled: If breathing is difficult, remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a poison center or doctor. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse. If exposed or concerned: Get medical advice or attention. If exposed or concerned: Call a poison center or doctor. Get medical advice or attention if you feel unwell.

**[Storage]**

Store in a well-ventilated place. Keep container tightly closed. Store locked up.

**[Disposal]**

Dispose of contents and container in accordance with US EPA guidelines for the classification and determination of hazardous waste listed in 40 CFR 261.3. (See Section 13)

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

<b>Substance/Mixture:</b>	Substance
<b>Components:</b>	Tolylene-2,4-diisocyanate
<b>Percent:</b>	>98.0%(GC)
<b>CAS Number:</b>	584-84-9
<b>Molecular Weight:</b>	174.16
<b>Chemical Formula:</b>	C <sub>9</sub> H <sub>6</sub> N <sub>2</sub> O <sub>2</sub>
<b>Synonyms:</b>	4-Methyl-m-phenylene Diisocyanate , Toluene-2,4-diisocyanate , 4-Methyl-1,3-phenylene Diisocyanate , 2,4-Diisocyanatotoluene , TDI

**4. FIRST-AID MEASURES****Inhalation:**

May cause coughing, difficult breathing and nausea. Immediately call a poison center or doctor. Effects of exposure (inhalation) to substance may be delayed. Inhalation of vapors or contact with substance will result in contamination and potential harmful effects. Move victim to fresh air. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult. Keep victim warm and quiet. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

**Skin contact:**

Immediately call a poison center or doctor. Effects of exposure (skin contact) to substance may be delayed. Remove and wash contaminated clothing before re-use. In case of contact with substance, immediately flush skin with running water for at least 20 minutes. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

**Eye contact:**

IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Contact with material may irritate or burn eyes. Call emergency medical service. Move victim to fresh air. Check for and remove any contact lenses. Keep victim warm and quiet. Treat symptomatically and supportively. Effects of exposure to substance may be delayed. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

**Ingestion:**

Do not induce vomiting with out medical advice. Effects of exposure (ingestion) to substance may be delayed. Call a physician or Poison Control Center immediately. Do not use mouth-to-mouth method if victim ingested the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Loosen tight clothing such as a collar, tie, belt or waistband. If a person vomits place them in the recovery position so that vomit will not reenter the mouth and throat. Rinse mouth. Keep victim warm and quiet. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

**Symptoms/effects:****Acute:**

Redness.

**Delayed:**

May cause skin sensitization. Possibly carcinogenic to humans.

**Immediate medical attention:**

WARNING: It might be dangerous to the person providing aid to give mouth-to-mouth respiration, because the inhaled material is toxic. CAUTION: Victim may be a source of contamination. If breathing has stopped, perform artificial respiration. Use first aid treatment according to the nature of the injury. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

**5. FIRE-FIGHTING MEASURES****Suitable extinguishing media:**

Dry chemical, CO<sub>2</sub> or water spray. Consult with local fire authorities before attempting large scale fire fighting operations.

**5. FIRE-FIGHTING MEASURES****Specific hazards arising from the chemical****Hazardous combustion products:**

These products include: Carbon oxides Nitrogen oxides

**Other specific hazards:**

Closed containers may explode from heat of a fire.

**Special precautions for fire-fighters:**

Use water spray or fog; do not use straight streams. Dike fire-control water for later disposal; do not scatter the material. Containers may explode when heated. Move containers from fire area if you can do it without risk.

**Special protective equipment for fire-fighters:**

Wear positive pressure self-contained breathing apparatus (SCBA). Structural fire fighters' protective clothing provides limited protection in fire situations ONLY; it may not be effective in spill situations. Wear chemical protective clothing which is specifically recommended by the manufacturer. It may provide little or no thermal protection.

**6. ACCIDENTAL RELEASE MEASURES****Personal precautions:**

Avoid contact with skin, eyes, and clothing. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing (Section 8). Warn unnecessary personnel to move away. Stop leak if you can do it without risk. Ensure adequate ventilation. Isolate the hazard area and deny entry to unnecessary and unprotected personnel.

**Personal protective equipment:**

Wear eye protection (splash goggles) and face protection (full length face shield). Wear protective clothing (chemical resistant suit and chemical resistant boots). Dust respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Wear protective gloves (nitrile).

**Emergency procedures:**

Prevent dust cloud. Do not clean-up or dispose except under supervision of a specialist. In case of a spill and/or a leak, always shut off any sources of ignition, ventilate the area, and exercise caution. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Warn personnel to move away. Prevent entry into sewers, basements or confined areas; dike if needed.

**Methods and materials for containment and cleaning up:**

ELIMINATE all ignition sources (no smoking, flares, sparks, or flames in immediate area). Stop leak if without risk. Ventilate the area. Absorb with an inert material and put the spilled material in an appropriate waste disposal container. Use clean non-sparking tools to collect absorbed material.

**Environmental precautions:**

Keep away from living quarters. Do not let product enter drains. Prevent further leakage or spillage if safe to do so. Water runoff can cause environmental damage. Prevent entry into sewers, basements or confined areas; dike if needed.

**7. HANDLING AND STORAGE****Precautions for safe handling:**

Avoid inhalation of vapor or mist. Manipulate under an adequate fume hood. Avoid contact with skin and eyes. Avoid exposure - obtain special instructions before use. Avoid prolonged or repeated exposure. Normal measures for preventive fire protection. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. Keep container dry. Handle and open container with care. Wear suitable protective clothing, gloves and eye/face protection. When using do not eat, drink, or smoke. Keep away from sources of ignition.

**Conditions for safe storage:**

Store locked up. Keep containers tightly closed in a cool, well-ventilated place. Keep away from incompatibles. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Avoid prolonged storage periods. Store under inert gas (e.g. Argon). Moisture sensitive. Store in refrigerator.

**Storage incompatibilities:**

Store away from oxidizing agents

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION****Exposure limits:**

ACGIH TLV (TWA): 0.001 ppm (skin)

ACGIH TLV (STEL): 0.005 ppm (skin)

OSHA PEL (CEIL): 0.02 ppm

**Appropriate engineering controls:**

Handle only in a fully enclosed system and equipment. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. Ventilation is normally required when handling or using this product. Eyewash fountains should be provided in areas where there is any possibility that workers could be exposed to the substance. Follow safe industrial engineering/laboratory practices when handling any chemical.

**Personal protective equipment****Respiratory protection:**

Dust respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent.

**Hand protection:**

Wear protective gloves.

**Eye protection:**

Safety glasses.

**Skin and body protection:**

Wear protective clothing (chemical resistant suit and chemical resistant boots).

**9. PHYSICAL AND CHEMICAL PROPERTIES**

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<b>Physical state (20°C):</b>	Solid	<b>pH:</b>	No data available
<b>Form:</b>	Crystal - Lump	<b>Vapor pressure:</b>	1.3Pa/20°C
<b>Color:</b>	White	<b>Vapor density:</b>	6.0
<b>Odor:</b>	Pungent	<b>Dynamic Viscosity:</b>	No data available
<b>Odor threshold:</b>	No data available		
<b>Melting point/freezing point:</b>	20°C (Freezing point) (68°F)		
<b>Boiling point/range:</b>	251°C (484°F)		
<b>Decomposition temperature:</b>	No data available		
<b>Relative density:</b>	No data available		
<b>Kinematic Viscosity:</b>	No data available		
<b>Partition coefficient: n-octanol/water (log P<sub>ow</sub>)</b>	0.21	<b>Evaporation rate: (Butyl Acetate = 1)</b>	No data available
<b>Flash point:</b>	127°C (261°F)	<b>Autoignition temperature:</b>	620°C (1148°F)
<b>Flammability (solid, gas):</b>	No data available	<b>Flammability or explosive limits:</b>	
		<b>Lower:</b>	0.9%
		<b>Upper:</b>	9.5%
<b>Solubility(ies):</b>			
<b>Miscible:</b>	Ether, Benzene, Acetone, Carbon tetrachloride, Chlorobenzene, Kerosene		
<b>Soluble:</b>	Ethyl acetate		

**10. STABILITY AND REACTIVITY**

<b>Reactivity:</b>	Not Available.
<b>Chemical Stability:</b>	Heat sensitive. Moisture sensitive. Light sensitive.
<b>Possibility of Hazardous Reactions:</b>	No hazardous reactivity has been reported.
<b>Conditions to avoid:</b>	Exposure to light. Exposure to moisture. Heat sensitive. Moisture sensitive.
<b>Incompatible materials:</b>	Oxidizing agents
<b>Hazardous Decomposition Products:</b>	No data available

**11. TOXICOLOGICAL INFORMATION**

**RTECS Number:** CZ6300000

**Acute Toxicity:**

ivn-mus LD50:5800 mg/kg

ihl-rat LC50:14 ppm/4H

orl-rat LD50:5800 mg/kg

skn-rbt LD50:>16 mL/kg

**Skin corrosion/irritation:**

skn-rat 500 mg/24H MOD

skn-rbt 500 mg open SEV

**Serious eye damage/irritation:**

eye-rbt 100 mg SEV

**Respiratory or skin sensitization:**

No data available

**Germ cell mutagenicity:**

mno-sat 0.033 mg/plate (+S9)

mno-sat 100 ug/plate (-S9)

**Carcinogenicity:**

No data available

**IARC:** Group 2B (Possibly carcinogenic to humans).

**NTP:** No data available

**OSHA:** No data available

**Reproductive toxicity:**

No data available

**Routes of Exposure:** Inhalation, Eye contact, Ingestion, Skin contact.

**Symptoms related to exposure:**

Overexposure may result in serious illness or death. Skin contact may result in inflammation; characterized by itching, scaling, reddening, or occasionally blistering. Skin contact may result in redness, pain or dry skin. Eye contact may result in redness or pain. Inhalation causes irritation of the lungs and respiratory system. Skin contact may result in sensitization. Readily absorbed through skin.

**Potential Health Effects:**

Skin and eye contact may result in irritation.

**Target organ(s):**

May cause damage to organs: Respiratory System

Causes damage to organs: Blood (System) Respiratory System through prolonged or repeated exposure.

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

<b>Fish:</b>	48h LC50:>0.100 mg/L (Oryzias latipes) 96h LC50:>0.100 mg/L
<b>Crustacea:</b>	No data available
<b>Algae:</b>	No data available

<b>Persistence and degradability:</b>	0 % (by BOD), 100 % (by GC)
<b>Bioaccumulative potential (BCF):</b>	180 (conc. 0.8 ug/L), 130 (conc. 0.08 ug/L)
<b>Mobility in soil:</b>	No data available
<b>Partition coefficient:</b>	0.21
<b>n-octanol/water (log P<sub>ow</sub>)</b>	
<b>Soil adsorption (K<sub>oc</sub>):</b>	No data available
<b>Henry's Law:</b>	No data available
<b>constant (PaM<sup>3</sup>/mol)</b>	

## 13. DISPOSAL CONSIDERATIONS

<b>Disposal of product:</b>	Recycle to process if possible. It is the generator's responsibility to comply with Federal, State and Local rules and regulations. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. This section is intended to provide assistance but does not replace these laws, nor does compliance in accordance with this section ensure regulatory compliance according to the law. US EPA guidelines for Identification and Listing of Hazardous Waste are listed in 40 CFR Parts 261. The product should not be allowed to enter the environment, drains, water ways, or the soil.
<b>Disposal of container:</b>	Dispose of as unused product. Do not re-use empty containers.
<b>Other considerations:</b>	Observe all federal, state and local regulations when disposing of the substance.

## 14. TRANSPORT INFORMATION

**DOT (US)**

<b>UN number:</b>	<b>Proper Shipping Name:</b>	<b>Class or Division:</b>	<b>Packing Group:</b>
UN2078	Toluene diisocyanate	6.1 Toxic material.	II

**IATA**

<b>UN number:</b>	<b>Proper Shipping Name:</b>	<b>Class or Division:</b>	<b>Packing Group:</b>
UN2078	Toluene diisocyanate	6.1 Toxic material.	II

**IMDG**

<b>UN number:</b>	<b>Proper Shipping Name:</b>	<b>Class or Division:</b>	<b>Packing Group:</b>
UN2078	Toluene diisocyanate	6.1 Toxic material.	II

<b>EmS number:</b>	F-A, S-A
<b>Reportable Quantity:</b>	100 Pounds (45.4 Kilograms)

## 15. REGULATORY INFORMATION

**Toxic Substance Control Act (TSCA 8b.):**

This product is ON the EPA Toxic Substances Control Act (TSCA) inventory.

**US Federal Regulations**

**CERCLA Hazardous substance and Reportable Quantity:**

<b>SARA 313:</b>	Listed
<b>SARA 302:</b>	Listed

**15. REGULATORY INFORMATION****State Regulations****State Right-to-Know**

Massachusetts	Listed
New Jersey	Not Listed
Pennsylvania	Listed
California Proposition 65:	Not Listed

**Other Information****NFPA Rating:**

Health:	4
Flammability:	1
Instability:	0

**HMIS Classification:**

Health:	4
Flammability:	1
Physical:	0

**International Inventories****WHMIS hazard class:**

D1A: Materials causing immediate and serious toxic effects. (Very Toxic)  
D2B: Materials causing other toxic effects. (Toxic)

**EC-No:**

209-544-5

**16. OTHER INFORMATION**

**Revision date:** 08/15/2016

**Revision number:** 5

TCI chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its affiliates or subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our SDS are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated SDS for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, face mask, fume hood). For proper handling and disposal, always comply with federal, state and local regulations.