

SAFETY DATA SHEET

1. Identification

Product identifier	p-Toluenesulfonyl Isocyanate
Other means of identification	
Synonyms	4-methylbenzenesulfonyl isocyanate * p-toluenesulphonyl isocyanate
Recommended use	Industrial chemical.
Recommended restrictions	None known.
Manufacturer/Importer/Supplier/Distributor information	
Manufacturer	VanDeMark Chemical Inc.
Address	1 North Transit Road, Lockport, NY 14094 USA
Telephone	716-433-6764
e-mail	sales@vdmchemical.com
Emergency telephone	CHEMTREC 1-800-424-9300 (North America) +1-703-527-3887 (International)

2. Hazard(s) identification

Physical hazards	Not classified.	
Health hazards	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2A
	Sensitization, respiratory	Category 1
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
OSHA defined hazards	Not classified.	
Label elements		



Signal word	Danger
Hazard statement	Causes skin irritation. Causes serious eye irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause respiratory irritation.
Precautionary statement	
Prevention	Avoid breathing mist or vapor. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves and eye/face protection. In case of inadequate ventilation wear respiratory protection.
Response	If on skin: Wash with plenty of water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash 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/attention. If inhaled: Remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a poison center/doctor.
Storage	Store in a well-ventilated place. Keep container tightly closed. Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)	Reacts violently with water.
Supplemental information	None.

3. Composition/information on ingredients

Substances

Chemical name	Common name and synonyms	CAS number	%
Tosyl isocyanate		4083-64-1	>98.7 - <99.4

Impurities

Chemical name	CAS number	%
Tosyl chloride	98-59-9	>0.57 - <1.14
Monochlorobenzene	108-90-7	>0.01 - <0.19

Composition comments Occupational Exposure Limits for impurities are listed in Section 8. All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Inhalation	Remove victim to fresh air. If breathing is difficult, give oxygen. Get medical attention.
Skin contact	Remove contaminated clothing. Wash with plenty of soap and water. Get medical attention if irritation develops or persists. Wash contaminated clothing before reuse.
Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Get medical attention if irritation develops or persists.
Ingestion	Have victim rinse mouth thoroughly with water. Never give anything by mouth to a victim who is unconscious or is having convulsions. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical attention if any discomfort occurs.
Most important symptoms/effects, acute and delayed	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause respiratory irritation. Shortness of breath. Skin irritation. May cause redness and pain. Irritation. Headaches, nausea and vomiting. Wheezing.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.
General information	If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Carbon dioxide or dry powder.
Unsuitable extinguishing media	Water. Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	In case of fire, toxic and corrosive gases may be formed. Reacts with water and emits carbon dioxide gas.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.
Fire fighting equipment/instructions	Move containers from fire area if you can do it without risk. Use water spray to cool unopened containers. Do not get water inside container or in contact with the material.
General fire hazards	No unusual fire or explosion hazards noted. Material may react violently with water.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Avoid inhalation of vapors and contact with skin and eyes. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. Wear appropriate personal protective equipment (See Section 8).
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Methods and materials for containment and cleaning up

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS. Ensure that waste and contaminated materials are collected and removed from the work area as soon as possible in a suitably labeled container. Do not close container tightly. Risk of excess pressure build-up. DO NOT GET WATER on spilled material or inside containers. Reacts with water and emits carbon dioxide gas.

Environmental precautions

Do not discharge into drains, water courses or onto the ground. Prevent further leakage or spillage if safe to do so. Environmental manager must be informed of all major spillages.

7. Handling and storage**Precautions for safe handling**

Keep away from heat and sources of ignition. Use only with adequate ventilation. Avoid inhalation of vapors and contact with skin and eyes. Avoid prolonged exposure. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. Keep the workplace clean. Technical aids: Use disposable equipment (rags, brushes, spatulas, putty knives, etc.), if possible. Material may react violently with water.

Conditions for safe storage, including any incompatibilities

Store locked up. Store away from incompatible materials (see Section 10 of the SDS). Store in tightly closed original container in a dry and cool place. Store in a cool place below 170°F (77°C).

8. Exposure controls/personal protection**Occupational exposure limits****US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**

Impurities	Type	Value
Monochlorobenzene (CAS 108-90-7)	PEL	350 mg/m ³
		75 ppm

US. ACGIH Threshold Limit Values

Impurities	Type	Value
Monochlorobenzene (CAS 108-90-7)	TWA	10 ppm

US. Workplace Environmental Exposure Level (WEEL) Guides

Impurities	Type	Value
Tosyl chloride (CAS 98-59-9)	Ceiling	5 mg/m ³

Biological limit values No biological exposure limits noted for the ingredient(s).

ACGIH Biological Exposure Indices

Impurities	Value	Determinant	Specimen	Sampling Time
Monochlorobenzene (CAS 108-90-7)	100 mg/g	4-Chlorocatechol, with hydrolysis	Creatinine in urine	*

* - For sampling details, please see the source document.

Appropriate engineering controls

Provide adequate ventilation. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station.

Individual protection measures, such as personal protective equipment**Eye/face protection**

Use chemical goggles / face shield. Eye wash station should be located in immediate work area.

Skin protection**Hand protection**

Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.

Neoprene - 0.6 mm coating thickness.

Neoprene rubber - 0.6 mm coating thickness.

Notice: The selection of a specific glove for an application and duration of use in a workplace should also take in to account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection) potential body reactions to the glove material as well as instructions/specifications provided by the glove manufacturer.

Skin protection**Other**

Wear appropriate chemical resistant clothing. Selection of specific items such as face shield, boots, apron, or full body suit will depend on task and potential for exposure. Polyethylene coatings of 10 mils provide a barrier for splash protection. Safety shower should be located in the immediate work area. Remove contaminated clothing immediately, wash skin area with soap and water. Launder clothing before reuse.

Respiratory protection

Respiratory protections should be worn when there is a potential to exceed the exposure limit requirements or guidelines. Chemical respirator with organic vapor cartridge and full facepiece. In higher concentrations or in case of insufficient data on concentration wear a positive-pressure supplied-air respirator.

Thermal hazards

When material is heated, wear gloves to protect against thermal burns.

General hygiene considerations

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Private clothes and working clothes should be kept separately.

9. Physical and chemical properties**Appearance****Physical state**

Liquid.

Form

Liquid.

Color

Colorless.

Odor

Acrid.

Odor threshold

Not available.

pH

Not available.

Melting point/freezing point

27.73 °F (-2.37 °C) (101.3 kPa) / 28.4 °F (-2 °C)

Initial boiling point and boiling range

291.2 °F (144 °C) (10 mmHg)

Flash point

294.8 °F (146.0 °C) (1013 hPa)

Evaporation rate

Not available.

Flammability (solid, gas)

Not applicable.

Upper/lower flammability or explosive limits**Flammability limit - lower (%)**

Not available.

Flammability limit - upper (%)

Not available.

Explosive limit - lower (%)

Not available.

Explosive limit - upper (%)

Not available.

Vapor pressure

0.025 Pa at 25 °C

Vapor density

Heavier than Air.

Relative density

1.295 (20°C/ 68°F)

Solubility(ies)**Solubility (water)**

Reacts with water.

Partition coefficient (n-octanol/water)

0.6 (30°C)

Auto-ignition temperature

1023.8 °F (551 °C) (744.9 mmHg)

Decomposition temperature

Not available.

Viscosity 5.16 mPa·s (20°C)

Other information

Dynamic viscosity 3.13 mPa.s (104 °F (40 °C))

Explosive properties Not explosive.

Molecular formula C8H7NO3S

Molecular weight 197.21

Oxidizing properties Not oxidizing.

10. Stability and reactivity

Reactivity The product is stable and non-reactive under normal conditions of use, storage and transport.

Chemical stability Stable in sealed containers.

Possibility of hazardous reactions Reacts with water and emits carbon dioxide gas.

Conditions to avoid Water, moisture. Heat may cause the containers to explode.

Incompatible materials Reacts violently with water. Acids. Strong oxidizing agents. Amines. Alcohols. Strong bases. Avoid contact with water and moisture.

Hazardous decomposition products Carbon oxides. Nitrogen oxides. Hydrogen cyanide. Sulfur oxides. p-Toluene sulfonamide.

11. Toxicological information

Information on likely routes of exposure

Inhalation May cause respiratory irritation. May cause allergic respiratory reaction.

Skin contact Causes skin irritation.

Eye contact Causes serious eye irritation.

Ingestion Ingestion may cause irritation and malaise.

Symptoms related to the physical, chemical and toxicological characteristics Severe eye irritation. Irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause respiratory irritation. Skin irritation. Shortness of breath. May cause redness and pain. Headaches, nausea and vomiting. Wheezing.

Information on toxicological effects

Acute toxicity Ingestion may cause irritation and malaise.

Components	Species	Test Results
Tosyl isocyanate (CAS 4083-64-1)		
Acute		
<i>Dermal</i>		
LD50	Rat	> 2000 mg/kg, (male/female)
<i>Oral</i>		
LD50	Rat	2330 mg/kg, (male/female)

Skin corrosion/irritation Causes skin irritation.

Serious eye damage/eye irritation Causes serious eye irritation.

Respiratory or skin sensitization

Respiratory sensitization May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Skin sensitization Based on available data, the classification criteria are not met.

Germ cell mutagenicity Test data conclusive but not sufficient for classification.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

NTP Report on Carcinogens

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Reproductive toxicity Based on available data, the classification criteria are not met.

Specific target organ toxicity - single exposure	May cause respiratory irritation.
Specific target organ toxicity - repeated exposure	Based on available data, the classification criteria are not met.
Aspiration hazard	Due to partial or complete lack of data the classification is not possible.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Components	Species	Test Results
Tosyl isocyanate (CAS 4083-64-1)		
Aquatic		
Fish	LC50	Fish > 45 mg/l, 96 hours
Persistence and degradability	The product reacts with water to form a solid insoluble reaction product which is non-degradable, according to information available.	
Bioaccumulative potential	The product is not expected to bioaccumulate.	
Partition coefficient n-octanol / water (log Kow)		
Tosyl isocyanate (CAS 4083-64-1)	0.6, (30°C)	
Mobility in soil	No data available.	
Mobility in general	Water reactive material.	
Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.	

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not discharge into drains, water courses or onto the ground. Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). Do not discharge into drains, water courses or onto the ground.
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers retain product residue, follow label warnings even after container is emptied. Do not get water inside containers.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not established.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Monochlorobenzene (CAS 108-90-7)

LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
 Delayed Hazard - Yes
 Fire Hazard - No
 Pressure Hazard - No
 Reactivity Hazard - Yes

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)
 Not regulated.

Other federal regulations**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Monochlorobenzene (CAS 108-90-7)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations**US. Massachusetts RTK - Substance List**

Monochlorobenzene (CAS 108-90-7)

US. New Jersey Worker and Community Right-to-Know Act

Monochlorobenzene (CAS 108-90-7)

US. Pennsylvania Worker and Community Right-to-Know Law

Monochlorobenzene (CAS 108-90-7)

US. Rhode Island RTK

Monochlorobenzene (CAS 108-90-7)

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 20-June-2016

Revision date -

Version # 01

Further information

HMIS® is a registered trade and service mark of the ACA.
H - Goggles, Gloves, Apron, Vapor Respirator

HMIS® ratings

Health: 2*
Flammability: 1
Physical hazard: 2
Personal protection: H

NFPA ratings**List of abbreviations****References**

ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices
EPA: AQUIRE database
HSDB® - Hazardous Substances Data Bank
IARC Monographs. Overall Evaluation of Carcinogenicity
National Toxicology Program (NTP) Report on Carcinogens
NLM: Hazardous Substances Data Base

Disclaimer

This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.