



InterTrade(Singapore)Chemicals Pte Ltd

MATERIAL SAFETY DATA SHEET

1. PRODUCT IDENTIFICATION

Material Name : TOLUENE
Chemical Family : Aromatic Hydrocarbon
Formula : C₆H₅CH₃
Uses : Raw material for use in the chemical industry. Solvent.

2. COMPOSITION/INFORMATION ON INGREDIENTS

CAS No. : 108-88-3

3. HAZARDS IDENTIFICATION

Health Hazards : Vapours may cause drowsiness and dizziness. Irritating to eyes.
Harmful: may cause lung damage if swallowed.

Appearance and Odour : Colourless. Liquid. Aromatic.

Safety Hazards : Flammable. Vapours are heavier than air. Vapours may travel across the ground and reach remote ignition sources causing a flashback fire danger. Electrostatic discharge may cause fire.

Environmental Hazards : Toxic to aquatic organisms.

4. FIRST AID MEASURES

General Information : Keep victim calm. Obtain medical treatment immediately.

Inhalation : DO NOT DELAY. Remove to fresh air. If rapid recovery does not occur, transport to nearest medical facility for additional treatment.

Skin Contact : Remove contaminated clothing. Immediately flush skin with large amount of water for at least 15 minutes, and follow by washing with soap and water if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.

Eye Contact : Immediately flush eyes with large amounts of water for at least 15 minutes while holding eyelids open. Transport to the nearest medical facility for additional treatment.

Ingestion : If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.

Advice to Physician : Potential for chemical pneumonitis. Consider: gastric lavage with protected airway, administration of activated charcoal. Potential for cardiac sensitization, particularly in abuse situations. Hypoxia or negative inotropes may enhance these effects. Consider: oxygen therapy. Call a doctor or poison control centre for guidance.



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5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

Flash point : 5°C (TCC ASTM D56)

Auto ignition temp : > 530°C

- Specific Hazards** : The vapour is heavier than air, spreads along the ground and distant ignition is possible. Will float and can be reignited on surface water. Carbon monoxide may be evolved if incomplete combustion occurs.
- Extinguishing Media** : Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
- Unsuitable Extinguishing Media** : Do not use water in a jet.
- Protective Equipment for Firefighters** : Wear full protective clothing and self-contained breathing apparatus.
- Additional Advice** : Keep adjacent containers cool by spraying with water.

6. ACCIDENTAL RELEASE MEASURES

Observe all relevant local and international regulations. Avoid contact with spilled or released material. For guidance on selection of personnel protective equipment see Chapter 8 of this MSDS. See Chapter 13 for information on disposal.

- Protective measures** : Isolate hazard area and deny entry to unnecessary or unprotected personnel. Stay upwind and keep out of low areas. Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area. Use appropriate containment (of product and fire fighting water) to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Attempt to disperse the vapour or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Ventilate contaminated area thoroughly.
- Clean Up Methods** : For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely. For small liquid spills (< 1 drum), transfer by mechanical means to a labelled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.
- Additional Advice** : See Chapter 13 for information on disposal. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Local authorities should be advised if significant spillages cannot be contained. The vapour is heavier



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than air, spreads along the ground and distant ignition is possible. Vapour may form an explosive mixture with air.

7. HANDLING AND STORAGE

- General Precautions** : Avoid breathing of or contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
- Handling** : Avoid contact with skin, eyes, and clothing. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (≤ 1 m/sec until fill pipe submerged to twice its diameter, then ≤ 7 m/sec). Avoid splash filling. Do NOT use compressed air for filling, discharging, or handling operations. Handle and open container with care in a well ventilated area.
- Storage** : Vapours from tanks should not be released to atmosphere. Breathing losses during storage should be controlled by a suitable vapour treatment system. Bulk storage tanks should be diked (bunded). Must be stored in a diked (bunded) well-ventilated area, away from sunlight, ignition sources and other sources of heat. Keep away from aerosols, flammables, oxidizing agents, corrosives and from other flammable products which are not harmful or toxic to man or to the environment. The vapour is heavier than air. Beware of accumulation in pits and confined spaces.
- Product Transfer** : Keep containers closed when not in use. Do not use compressed air for filling, discharging or handling.
- Recommended Materials** : For containers, or container linings use mild steel, stainless steel.
- Unsuitable Materials** : Natural, butyl, neoprene or nitrile rubbers.
- Container Advice** : Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.
- Additional Information** : Ensure that all local regulations regarding handling and storage facilities are followed.
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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Material	Source	Type	ppm	mg/m3	Notation
Toluene	ACGIH	TWA	50 ppm	188 mg/m3	
	OSHA Z1A	TWA	100 ppm	375 mg/m3	
	OSHA Z1A	STEL	150 ppm	560 mg/m3	

- Additional Information** : Skin notation means that significant exposure can also occur by absorption of liquid through the skin and of vapour through the eyes or mucous membranes.
- Exposure Controls** : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances.
Appropriate measures include: Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Local exhaust ventilation is recommended. Firewater monitors and deluge systems are recommended. Eye washes and showers for emergency use.
- Personal Protective Equipment** : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
- Respiratory Protection** : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for organic gases and vapours [boiling point >65 °C (149 °F)] meeting EN141. Where air-filtering respirators are unsuitable (e.g., airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus.
- Hand Protection** : When handling this product, it is recommended to wear chemical resistant gloves. The choice of suitable protective gloves depends on work conditions and what chemicals are handled, but we have positive experience with gloves made of PVA. Note that PVA degrades when in contact with water. Gloves should be replaced immediately if sign of degradation is observed. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
- Eye Protection** : Chemical splash goggles (chemical monogoggles).
Monogoggles (EN166)
- Protective Clothing** : Chemical resistant gloves/gauntlets. Where risk of splashing or in spillage clean up, use chemical resistant one-piece overall with integral hood.
- Environmental Exposure Controls** : Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.



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9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: Colourless. Liquid
Odour	: Aromatic hydrocarbon odour
Boiling point	: 110 - 111 °C
Melting / freezing point	: -95 °C
Flash point	: 5 °C (TCC ASTM D56)
Explosive limits (in air)	: 1.3 – 6.7 %(Vol)
Auto-ignition temperature	: > 530 °C
Vapour pressure (38° C)	: 7 kPa
Specific gravity (15° C/ 15° C)	: 0.865 kg/dm ³ (ASTM D4502)
Solubility in water (25° C)	: 0.05 wt%
Viscosity (25° C)	: 0.64 cSt (ASTM D445)
Vapour density (air=1)	: > 1.00
Molecular Weight	: 92 g/mol
Evaporation Rate (n-Bu Acetate=1)	: 2.400
Is Material Hygroscopic	: No

10. STABILITY AND REACTIVITY

Stability	: Stable under normal conditions of use. Reacts violently with strong oxidising agents.
Conditions to Avoid	: Avoid heat, sparks, open flames and other ignition sources. Prevent vapour accumulation.
Materials to Avoid	: Strong oxidising agents.
Hazardous Decomposition Products	: Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases, including carbon monoxide, carbon dioxide and other organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment	: Information given is based on product data.
Acute Oral Toxicity	: Low toxicity: LD ₅₀ >2000 mg/kg , Rat Aspiration into lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.
Acute Dermal Toxicity	: Low toxicity: LD ₅₀ >2000 mg/kg , Rabbit
Acute Inhalation Toxicity	: Low toxicity: LC ₅₀ >5000 ppm/1 hours, Rat High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.
Skin Irritation	: Irritating to skin.
Eye Irritation	: Moderately irritating to eyes (but insufficient to classify).
Respiratory Irritation	: Inhalation of vapours or mists may cause irritation to the respiratory system.



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Sensitisation	: Not a skin sensitiser.
Mutagenicity	: Not mutagenic.
Carcinogenicity	: Not carcinogenic in animal studies.
Repeated Dose Toxicity	: Central nervous system: repeated exposure affects the nervous system. Effects were seen at high doses only. Respiratory system: repeated exposure affects the respiratory system. Effects were seen at high doses only. Visual system: may cause decreased colour perception. These subtle changes have not been found to lead to functional colour vision deficits. Auditory system: prolonged and repeated exposures to high concentrations have resulted in hearing loss in rats. Solvent abuse and noise interaction in the work environment may cause hearing loss.

12. ECOLOGICAL INFORMATION

Acute Toxicity	
Fish	: Toxic: $1 < LC/EC/IC50 \leq 10$ mg/l
Aquatic Invertebrates	: Harmful: $10 < LC/EC/IC50 \leq 100$ mg/l
Algae	: Low toxicity: $LC/EC/IC50 > 100$ mg/l
Mobility	: Floats on water. If product enters soil, it will be highly mobile and may contaminate groundwater.
Persistence/degradability	: Readily biodegradable meeting the 10 day window criterion. Oxidises rapidly by photo-chemical reactions in air.
Bioaccumulation	: Does not bioaccumulate significantly.
Other Adverse Effects	: In view of the high rate of loss from solution, the product is unlikely to pose a significant hazard to aquatic life.

13. DISPOSAL CONSIDERATIONS

Material Disposal	: Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses. Waste product should not be allowed to contaminate soil or water.
Container Disposal	: Drain container thoroughly. After draining, vent in a safe place away from sparks and fire. Residues may cause an explosion hazard. Do not puncture, cut or weld uncleaned drums. Send to drum recoverer or metal reclaimer.
Local Legislation	: Disposal should be in accordance with applicable regional, national, and local laws and regulations.



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14. TRANSPORT INFORMATION

IMDG

Identification number	UN 1294
Proper shipping name	TOLUENE
Class / Division	3
Packing group	II
Marine pollutant	No

IATA (Country variations may apply)

UN No.	: UN 1294
Proper shipping name	: TOLUENE
Class / Division	: 3
Packing group	: II
Marine pollutant	: No

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

EC Label Name	: TOLUENE
EC Classification	: Highly flammable. Harmful.
EC Symbols	: F Highly flammable. Xn Harmful.
EC Risk Phrases	: R11 Highly flammable. R20 Harmful by inhalation
EC Safety Phrases	: S7 Keep container tightly closed and in a well ventilated place. S16 Keep away from sources of ignition - No smoking. S25 Avoid contact with eyes. S29 Do not empty into drains. S33 Take precautionary measures against static discharges. S43A In case of fire use sand, earth, chemical powder or foam.

16. OTHER INFORMATION

Uses and Restrictions	: Raw material for use in the chemical industry. Use as solvent only in industrial manufacturing processes.
MSDS Distribution	: The information in this document should be made available to all who may handle the product
Disclaimer	: This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.