

# Praxair Material Safety Data Sheet

## 1. Chemical Product and Company Identification

<b>Product Name:</b> Toluene (MSDS No. P-6240-B)	<b>Trade Names:</b> Toluene
<b>Chemical Name:</b> Toluene	<b>Synonyms:</b> Methylbenzene, methylbenzol, phenylmethane, toluol
<b>Chemical Family:</b> Aromatic	<b>Product Grades:</b> Not assigned.
<b>Telephone:</b> <b>Emergencies:</b> 1-800-645-4633* <b>CHEMTREC:</b> 1-800-424-9300* <b>Routine:</b> 1-800-PRAXAIR	<b>Company Name:</b> Praxair, Inc. 39 Old Ridgebury Road Danbury, CT 06810-5113

*\*Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier, Praxair sales representative, or call 1-800-PRAXAIR (1-800-772-9247).*

## 2. Hazards Identification

### EMERGENCY OVERVIEW

**DANGER! Flammable liquid and vapor.  
May form explosive mixtures with air.  
Harmful or fatal if inhaled or swallowed.  
Harmful if absorbed through the skin.  
May cause eye, skin, and respiratory tract burns.  
May cause dizziness and drowsiness.  
Self-contained breathing apparatus and protective clothing must be worn by  
rescue workers.  
Under ambient conditions, this is a colorless liquid with a  
pungent, benzene-like odor.**

**OSHA REGULATORY STATUS:** This material is considered hazardous by the OSHA Hazard Communications Standard (29 CFR 1910.1200).

### POTENTIAL HEALTH EFFECTS:

#### Effects of a Single (Acute) Overexposure

**Inhalation.** Vapors irritate or burn the respiratory tract. High concentrations may act as an anesthetic, first stimulating the central nervous system (CNS), then depressing it to varying degrees. CNS depression is marked by dizziness, drowsiness, and possibly unconsciousness.

**Skin Contact.** Liquid or vapor may irritate or burn the skin. With prolonged or repeated exposure, harmful amounts may be absorbed through the skin.

**Swallowing.** Unavailable for toluene. When children ingest petroleum distillates such as toluene, the effects are similar to those of inhalation: CNS depression and tissue

irritation. Lung damage due primarily to inhalation of vomited material has lead to coma and death from pulmonary edema (fluid on the lungs).

**Eye Contact.** Liquid or vapor may irritate or burn the eyes.

**Effects of Repeated (Chronic) Overexposure.** Repeated or prolonged exposure of the skin may cause cracking and drying due to defatting of tissues.

**Other Effects of Overexposure.** None known.

**Medical Conditions Aggravated by Overexposure.** The skin irritating properties of toluene may aggravate an existing dermatitis. Respiratory irritation may aggravate an existing asthma or other upper respiratory or pulmonary disease.

**CARCINOGENICITY:** Toluene is not listed by NTP or OSHA. The IARC lists it as Group 3, not classifiable as to carcinogenicity to humans.

**POTENTIAL ENVIRONMENTAL EFFECTS:** None known. For further information, see section 12, Ecological Information.

### 3. Composition/Information on Ingredients

See section 16 for important information about mixtures.

COMPONENT	CAS NUMBER	CONCENTRATION
Toluene	108-88-3	>99%*
<i>*The symbol &gt; means "greater than."</i>		

### 4. First Aid Measures

**INHALATION:** Immediately remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

**SKIN CONTACT:** Remove contaminated clothing and shoes, and wash exposed areas with soap and plenty of water. Seek medical attention if discomfort persists.

**SWALLOWING:** Do not induce vomiting. Get immediate medical aid.

**EYE CONTACT:** Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are thoroughly flushed. See a physician, preferably an ophthalmologist, immediately

**NOTES TO PHYSICIAN:** *There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.*

### 5. Fire Fighting Measures

**FLAMMABLE PROPERTIES:** Vapor forms explosive mixtures with air and oxidizing agents.

**SUITABLE EXTINGUISHING MEDIA:** CO<sub>2</sub>, dry chemicals, water spray, or fog.

**PRODUCTS OF COMBUSTION:** CO, CO<sub>2</sub>

**PROTECTION OF FIREFIGHTERS: DANGER! Flammable liquid and vapor.** Evacuate all personnel from danger area. Use self-contained breathing apparatus and protective clothing. Immediately cool surrounding containers with water spray from maximum distance, taking care not to extinguish flames. Avoid spreading burning liquid with water. Remove ignition sources if without risk. If flames are accidentally extinguished, explosive reignition may occur. Reduce

vapors with water spray or fog. Stop flow of liquid if without risk, while continuing cooling water spray. Remove all containers from area of fire if without risk. Allow fire to burn out. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

**Specific Physical and Chemical Hazards.** If leaking gas catches fire, do not extinguish flames. Flammable and toxic vapors may spread from leak and could explode if reignited by sparks or flames. Vapors are heavier than air and may collect in low spots. Explosive atmospheres may linger. Before entering area, especially confined areas, check with an appropriate device.

**Protective Equipment and Precautions for Firefighters.** Firefighters should wear self-contained breathing apparatus and full fire-fighting turnout gear.

## 6. Accidental Release Measures

### STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

#### **DANGER! Flammable liquid and vapor.**

**Personal Precautions.** Vapor forms explosive mixtures with air. Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus and protective clothing. Remove all sources of ignition if without risk. Reduce vapors with fog or fine water spray, taking care not to spread liquid with water. Shut off flow if without risk. Ventilate area or move container to a well-ventilated area. Flammable vapors may spread from leak and could explode if reignited by sparks or flames. Vapors are heavier than air and may collect in low spots. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with an appropriate device.

**Environmental Precautions.** Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

## 7. Handling and Storage

**PRECAUTIONS TO BE TAKEN IN HANDLING:** Harmful or fatal if inhaled or swallowed. Harmful if absorbed through the skin. May form explosive mixtures with air. May irritate skin, eyes, and respiratory tract. Use only with adequate ventilation or respiratory protection. Do not get liquid or vapor in eyes, on skin, or on clothing. Have safety showers and eyewash fountains immediately available. Keep away from heat, sparks, and open flame. Keep away from oxidizing agents and other flammables. Use only spark-proof tools and explosion-proof equipment. Protect containers from damage. Use a suitable hand truck to move containers; do not drag, roll, slide, or drop. Electrical equipment must be non-sparking or explosion-proof. For other precautions in using this product, see section 16.

**PRECAUTIONS TO BE TAKEN IN STORAGE:** Store and use with adequate ventilation. Store in a cool, dry area only in the DOT-approved container in which product was received. Separate cylinders containing this product from oxygen, chlorine, and other oxidizers by at least 20 ft (6.1 m), or use a barricade of noncombustible material. This barricade should be at least 5 ft (1.53 m) high and have a fire resistance rating of at least ½ hour. Post "No Smoking or Open Flames" signs in storage and use areas. There must be no sources of ignition. All electrical equipment in storage areas must be explosion-proof. Storage areas must meet national electric codes for Class 1 hazardous areas. Keep containers closed. Store only where temperature will not exceed 125°F (52°C). Store full and empty containers separately. Use a first-in, first-out

inventory system to prevent storing full containers for long periods. For full details and requirements, see NFPA 50A, published by the National Fire Protection Association.

**RECOMMENDED PUBLICATIONS:** For further information on storage, handling, and use, see NFPA 30, *Flammable and Combustible Liquids Code*, published by the National Fire Protection Association, 1 Batterymarch Park, PO Box 9101, Quincy, MA 02269-9101; 1-800-344-3555; www.nfpa.org.

## 8. Exposure Controls/Personal Protection

COMPONENT	OSHA PEL	ACGIH TLV-TWA (2009)
Toluene	200 ppm; 300 ppm ceiling*; 500 ppm, 10 min STEL **	20 ppm

\*(c) – ceiling. Ceiling values are not Time-Weighted-Average (TWA).

\*\*Acceptable maximum peak above ceiling concentration for an 8-hour shift.

TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

IDLH = 500 ppm

### ENGINEERING CONTROLS:

**Local Exhaust.** Use an explosion-proof local exhaust system with sufficient air flow velocity to prevent oxygen deficiency and keep hazardous vapors below all applicable exposure limits in the worker's breathing zone.

**Mechanical (General).** Under certain conditions, general exhaust ventilation may be acceptable if it can maintain an adequate supply of air and keep hazardous vapors below all applicable exposure limits in the worker's breathing zone.

**Special.** None

**Other.** None

### PERSONAL PROTECTIVE EQUIPMENT:

**Skin Protection.** Wear work gloves when handling containers; rubber where contact with product may occur. Use metatarsal shoes for cylinder handling. Protective clothing where needed. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133. Regardless of protective equipment, never touch live electrical parts.

**Eye/Face Protection.** Wear safety glasses when handling containers; safety goggles or a full face shield where contact with product may occur. Select eye protection in accordance with OSHA 29 CFR 1910.133.

**Respiratory Protection.** A respiratory protection program that meet OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable) requirements must be followed whenever workplace conditions warrant respirator use. Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure (e.g., an organic vapor cartridge). For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus.

### 9. Physical and Chemical Properties

<b>APPEARANCE:</b>	Colorless liquid
<b>ODOR:</b>	Pungent, benzene-like odor
<b>ODOR THRESHOLD:</b>	Not available.
<b>PHYSICAL STATE:</b>	Liquid at normal temperature and pressure
<b>pH:</b>	Not applicable.
<b>MELTING POINT</b> at 1 atm:	Not available.
<b>BOILING POINT</b> at 1 atm:	231.8°F (111°C)
<b>FLASH POINT</b> (test method):	39.2°F (4°C) TCC
<b>EVAPORATION RATE</b> (Ether = 1):	4.5
<b>FLAMMABILITY:</b>	Flammable
<b>FLAMMABLE LIMITS IN AIR</b> , % by volume:	<b>LOWER:</b> 1.3% <b>UPPER:</b> 7.0%
<b>VAPOR PRESSURE</b> at 70°F (21.1°C):	0.4 psia (2.76 kPa)
<b>VAPOR DENSITY</b> at 70°F (21.1°C) and 1 atm:	0.232 lb/ft <sup>3</sup> (3.716 kg/m <sup>3</sup> ) (Calculated)
<b>SPECIFIC GRAVITY</b> (H <sub>2</sub> O = 1) at 39.2°/68°F (4°/20°C):	0.87
<b>SPECIFIC GRAVITY</b> (Air = 1):	3.1
<b>SOLUBILITY IN WATER:</b>	Negligible
<b>PARTITION COEFFICIENT: n-octanol/water:</b>	Not available.
<b>AUTOIGNITION TEMPERATURE:</b>	896°F (480°C)
<b>DECOMPOSITION TEMPERATURE:</b>	Not available.
<b>PERCENT VOLATILES BY VOLUME:</b>	100
<b>MOLECULAR WEIGHT:</b>	92.14
<b>MOLECULAR FORMULA:</b>	C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub>

### 10. Stability and Reactivity

**CHEMICAL STABILITY:**     Unstable     Stable

**CONDITIONS TO AVOID:** Heat, sparks, and flame

**INCOMPATIBLE MATERIALS:** Oxidizers, such as oxygen, chlorine, and fluorine

**HAZARDOUS DECOMPOSITION PRODUCTS:** CO, CO<sub>2</sub>

**POSSIBILITY OF HAZARDOUS REACTIONS:**     May Occur     Will Not Occur

Vapor forms explosive mixtures with air and oxidizing agents.

## 11. Toxicological Information

**ACUTE DOSE EFFECTS:** LC<sub>50</sub>, 1 hr, rat = 56,976 ppm

**STUDY RESULTS:** It has been reported that extreme fatigue, mental confusion, exhilaration, nausea, headache, and dizziness resulted from exposures to 600 ppm by the end of 3 hours. In addition, the following observations have been made: some workers will tolerate concentrations ranging up to 200 ppm for 6 to 8 hours daily with no demonstrable ill effects, 200 to 500 ppm for 6 to 8 hours will cause tiredness and lassitude in most workers, and concentrations over 500 ppm for 1 to 3 hours are definitely dangerous and will cause symptoms attributable to depression of the CNS and the bone marrow. It has also been reported that exposure to concentrations greater than 4,000 ppm for more than 5 minutes might limit self-rescue ability. After 20 minutes, exposures to concentrations at 300, 500, or 700 ppm resulted in significant increases in reaction times; a significant decrease in perceptual speed resulted after a 20-minute exposure to 700 ppm.

## 12. Ecological Information

**ECOTOXICITY:** No adverse ecological effects expected.

**OTHER ADVERSE EFFECTS:** This product does not contain any Class I or Class II ozone-depleting chemicals.

## 13. Disposal Considerations

**WASTE DISPOSAL METHOD:** Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier. For emergency disposal, may be burned in a suitable flare or burner if permitted by federal, state, and local regulations.

## 14. Transport Information

**DOT/IMO SHIPPING NAME:** Toluene

HAZARD CLASS:	PACKING GROUP/Zone:	IDENTIFICATION NUMBER:	PRODUCT RQ:
3	II	UN1294	1000 lb (454 kg)

**SHIPPING LABEL(s):** FLAMMABLE LIQUID

**PLACARD (when required):** FLAMMABLE LIQUID

**SPECIAL SHIPPING INFORMATION:** Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of a vehicle can present serious safety hazards.

**Additional Marking Requirement:** INHALATION HAZARD

Shipment of compressed gas cylinders that have been filled without the owner's consent is a violation of federal law [49 CFR 173.301(b)].

**MARINE POLLUTANTS:** Toluene is not listed as a marine pollutant by DOT.

## 15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

**U.S. FEDERAL REGULATIONS:**

EPA (ENVIRONMENTAL PROTECTION AGENCY)

CERCLA: COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (40 CFR Parts 117 and 302):

**Reportable Quantity (RQ):** 1000 lb (454 kg)

SARA: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT:

**SECTIONS 302/304:** Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of Extremely Hazardous Substances (EHS) (40 CFR Part 355):**TPQ:** None**EHS RQ (40 CFR 355):** None**SECTIONS 311/312:** Require submission of MSDSs and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows:**IMMEDIATE:** Yes**PRESSURE:** No**DELAYED:** No**REACTIVITY:** No**FIRE:** Yes**SECTION 313:** Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Toluene is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40CFR Part 372.

**40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION:** Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Toluene is not listed as a regulated substance.

**TSCA: TOXIC SUBSTANCES CONTROL ACT:** Toluene is listed on the TSCA inventory.**OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:**

29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Toluene is not listed in Appendix A as a highly hazardous chemical. However, any process that involves a flammable liquid on site in one location in quantities of 10,000 lb (4536 kg) or greater is covered under this regulation unless the liquid is used as a fuel.

**STATE REGULATIONS:****CALIFORNIA:** Toluene is listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).**WARNING:** Toluene is a chemical known to the State of California to cause developmental reproductive toxicity)*(California Health and Safety Code §25249.5 et seq.)***PENNSYLVANIA:** Toluene is subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

## 16. Other Information

Read and understand all labels and instructions supplied with all containers of this product.

**OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE: *Flammable liquid and vapor.*** Use piping and equipment adequately designed to withstand pressures to be encountered. Use a backflow device in any piping. Use only with compatible materials and equipment. Ground all equipment. Store and use with adequate ventilation at all times. Never work on a pressurized system. If there is a leak, close the cylinder valve. Blow down the system in a safe and environmentally sound manner in compliance with all federal, state, and local laws; then repair the leak. Never place a compressed gas cylinder where it may become part of an electrical circuit.

**Mixtures.** When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Remember, chemicals have properties that can cause serious injury or death.

### HAZARD RATING SYSTEMS:

#### NFPA RATINGS:

HEALTH = 2  
FLAMMABILITY = 3  
INSTABILITY = 0  
SPECIAL = None

#### HMIS RATINGS:

HEALTH = 2  
FLAMMABILITY = 3  
PHYSICAL HAZARD = 1

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information can be found in the following materials published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5<sup>th</sup> Floor, Chantilly, VA 20151-2923, Telephone (703) 788-2700, <http://www.cganet.com/Publication.asp>.

AV-1 *Safe Handling and Storage of Compressed Gases*  
P-1 *Safe Handling of Compressed Gases in Containers*  
— *Handbook of Compressed Gases, Fourth Edition*



Praxair asks users of this product to study this MSDS and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

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The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

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