

**Material Safety Data Sheet**

Revision Issued: 5/30/2008    Supersedes: 2/05/2001    First Issued: 6/17/87

**Section I - Chemical Product And Company Identification**

**Product Name: Toluene**

CAS Number: 108-88-3

HBCC MSDS No. CT02000



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**Section II - Composition/Information On Ingredients**

			Exposure Limits (TWAs) in Air		
Chemical Name	CAS Number	%	ACGIH TLV	OSHA PEL	STEL
Toluene	108-88-3	100	50 ppm	200 ppm	150 ppm

**Section III - Hazard Identification**

**Routes of Exposure:** Toluene may affect the body either through ingestion, inhalation, or contact with the eyes and/or skin. It may enter the body through the skin.

**Summary of Acute Health Hazards**

**Ingestion:** May result in vomiting. Breathing of vomitus into the lungs must be avoided as even small quantities may result in aspiration pneumonitis. Small amounts of this product aspirated into the respiratory system during ingestion or vomiting may cause mild to severe pulmonary injury, possibly progressing to death.

**Inhalation:** May cause irritation of the respiratory tract. Inhalation may also cause difficulty in seeing in bright light. High vapor/aerosol concentrations (greater than approximately 1000 ppm) are irritating to the eyes and the respiratory tract, may cause headaches, dizziness anesthesia, drowsiness, unconsciousness, central nervous system effects, brain damage and possibly death.

**Skin:** May cause irritation of the skin. Peculiar skin sensations may be produced such as a "pins and needles feeling" or numbness. Occasional brief contact with the liquid will not result in significant irritation unless evaporation is impeded. Skin contact may aggravate an existing dermatitis condition. It is likely that some components of this material are able to pass into the body through the skin and may cause similar effects as from breathing or swallowing it.

**Eyes:** May This material can cause eye irritation with tearing, redness, or a stinging or burning feeling. Further, it can cause swelling of the eyes with blurred vision. Effects may become more serious with repeated or prolonged contact.

**Summary of Chronic Health Hazards:** Toluene vapor causes narcosis. Early to moderate central nervous system depression may be evidenced by giddiness, headache, dizziness and nausea; in extreme cases, unconsciousness and death may occur. Aspiration pneumonitis may be evidenced by coughing, labored breathing and

cyanosis (bluish skin); in severe cases death may result. Repeated or prolonged exposure to liquid toluene may cause drying and cracking of the skin. Prolonged intentional Toluene abuse may lead to brain damage characterized by disturbances in gait, personality changes and loss of memory. Comparable central nervous system effects have not been shown to result from occupational exposure to Toluene. Toluene may be harmful to the human fetus based on positive test results with laboratory animals. Case studies reveal that prolonged intentional abuse of Toluene during pregnancy may cause birth defects in humans.

**Medical Conditions Generally Aggravated by Exposure:** Persons with pre-existing skin disorders or impaired liver or kidney function may be more susceptible to the effects of this substance. Alcoholic beverage consumption can enhance the toxic effects of this substance.

**Note to Physicians:** Most of the toluene absorbed from inhalation is metabolized to benzoic acid, conjugated with glycine in the liver to form hippuric acid, and excreted in the urine. Hippuric acid level in urine may be an indicator of the level of toluene exposure. If more than 2.0 ml per kg has been ingested and vomiting has not occurred, emesis should be induced with supervision.

#### Section IV - First Aid Measures

**Ingestion:** DO NOT induce vomiting. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. If victim is drowsy or unconscious, place on the left side with head down. GET MEDICAL ATTENTION IMMEDIATELY.

**Inhalation:** Move the exposed person to fresh air at once. If breathing is difficult, 100 percent humidified oxygen should be administered by a qualified individual. If breathing has stopped, perform artificial respiration. Keep the affected person warm and at rest. GET MEDICAL ATTENTION IMMEDIATELY.

**Skin:** Promptly wash the contaminated skin with soap and water. If liquid Toluene soaks through the clothing, remove the clothing immediately and wash the skin using soap or mild detergent and water. If irritation persists after washing, GET MEDICAL ATTENTION.

**Eyes:** Wash eyes immediately with large amounts of water for at least 15 minutes, lifting the lower and upper lids occasionally. If irritation is present after washing, GET MEDICAL ATTENTION. Contact lenses should not be worn when working with this chemical.

**Note to Physicians:**

**Inhalation:** Inhalation overexposure can produce toxic effects. Monitor for respiratory distress. If cough or difficulty in breathing develops, evaluate for upper respiratory tract inflammation, bronchitis, and pneumonitis. Administer supplemental oxygen with assisted ventilation, as required.

This material (or a component) sensitizes the heart to the effects of sympathomimetic amines. Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in individuals exposed to this material. Administration of sympathomimetic drugs should be avoided.

**Ingestion:** If ingested, this material presents a significant aspiration and chemical pneumonitis hazard. Induction of emesis is not recommended. Consider activated charcoal and/or gastric lavage. If patient obtunded, protect the airway by cuffed endotracheal intubation or by placement of the body in a Trendelenburg and left lateral decubitus position.

## Section V - Fire Fighting Measures

**Flash Point:** 40°F; 4.44°C C.C.;  
55°F O.C.

**Autoignition Temperature:** 997°F; 536°C

**Lower Explosive Limit:** 3.3

**Upper Explosive Limit:** 19

**Unusual Fire and Explosion Hazards:** Containers exposed to intense heat from fire should be cooled with water to prevent vapor pressure buildup which could result in container rupture. Container areas exposed to direct flame contact should be cooled with large quantities of water to prevent weakening of container structure. Flammable liquid, can release vapors that form flammable mixtures at temperatures at or above the flashpoint. Static discharge, material can accumulate static charges which can cause an incendiary electrical discharge. "Empty" containers retain product residue (liquid and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition; They may explode and cause injury or death. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner, or properly disposed of.

**Extinguishing Media:** Use water fog, foam, dry chemical or CO<sub>2</sub>. Product will float and can be reignited on surface of water.

**Special Firefighting Procedures:** Clear fire area of unprotected personnel. Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves and rubber boots), including a positive pressure NIOSH/MSHA-approved self-contained breathing apparatus. Use water spray to cool fire exposed surfaces and to protect personnel. Shut off "fuel" to fire. If a leak or spill has not ignited, use water spray to disperse the vapors. Either allow fire to burn under controlled conditions or extinguish with foam or dry chemical. Try to cover liquid spills with foam. Respiratory and eye protection required for fire fighting personnel. Avoid spraying water directly into storage containers due to danger of boilover. This liquid is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they might ignite or explode.

**Hazardous Combustion Products:** Carbon dioxide, carbon monoxide, smoke, fumes, unburned hydrocarbons, aldehydes and other products of incomplete combustion.

## Section VI - Accidental Release Measures

**[Spills may need to be reported to the National Response Center (800/424-8802) DOT Reportable Quantity (RQ) is 1000 pounds]** Release causes an immediate fire or explosion hazard. Eliminate and remove all ignition sources. Handling equipment must be grounded to prevent sparking. Ventilate the area of the spill or leak. Prevent spilled material from entering waterways, sewers, basements, or confined areas. For large spills, evacuate the hazard area of unprotected personnel. Wear appropriate respirator and protective clothing. Shut off source of leak only if safe to do so. Dike and contain. If vapor cloud forms, water fog may be used to suppress; contain runoff. Remove with vacuum trucks or pump to storage vessels. Soak up residue with an absorbent such as clay, sand or other suitable material; place in non-leaking containers for proper disposal. Flush area with water to remove trace residue; dispose of flush solutions as above. For small spills, take up with an absorbent material and place in non-leaking containers; seal tightly for proper disposal.

## Section VII - Handling and Storage

**Handling:** A spill or leak can cause an immediate fire or explosion hazard. Keep containers closed and do not handle or store near heat, sparks, or any other potential ignition sources. Do not contact with oxidizable materials. Do not breathe vapor. Use only with adequate ventilation and personal protection. Never siphon by mouth. Avoid contact with eyes, skin, and clothing. Prevent contact with food and tobacco products. Do not take internally.

When performing repairs and maintenance on contaminated equipment, keep unnecessary persons away from the area. Eliminate all potential ignition sources. Drain and purge equipment, as necessary, to remove material residues. Follow proper entry procedures, including compliance with 29 CFR 1910.146 prior to entering confined spaces such as tanks or pits. Use gloves constructed of impervious materials and protective clothing if direct contact is anticipated. Provide ventilation or maintain exposure potential below applicable exposure limits. Use appropriate protection when concentrations exceed any established occupational exposure level. Promptly remove contaminated clothing. Wash exposed skin thoroughly with soap and water after handling.

A static electrical charge can accumulate when this material is flowing through pipes, nozzles or filters and when it is agitated. A static spark discharge can ignite accumulated vapors particularly during dry weather conditions. Always bond receiving containers to the fill pipe before and during loading. Always keep nozzle in contact with the container throughout the loading process. Do not fill any portable container in or on a vehicle. Do NOT use compressed air for filling, discharging or other handling operations.

Product container is not designed for elevated pressure. Do not pressurize, cut, weld, braze solder, drill, or grind on containers. Do not expose product containers to flames, sparks, heat or other potential ignition sources. Empty containers may contain product residues that can ignite with explosive force. Consult appropriate federal, state or local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers and/or waste residues of this product.

**Storage:** Store and transport in accordance with all applicable laws. Keep containers tightly closed and store in a cool, dry well-ventilated place, plainly labeled, and out of closed vehicles. Keep away from all ignition sources. Ground all equipment containing this material. Containers should be able to withstand pressures expected from warming and cooling in storage. This flammable liquid should be stored in a separate safety cabinet or room. A refrigerated room is preferable for material with a flash point temperature lower than 70°F (21°C). All electrical equipment in areas where this material is stored or handled should be installed in accordance with applicable regulatory requirements and the National Electrical Code.

## Section VIII - Exposure Controls/Personal Protection

**Respiratory Protection:** Use only a MSHA/NIOSH-approved respirator to prevent overexposure if vapor levels may or do exceed the exposure limits. See SUPPLEMENTAL INFORMATION.

**Respiratory Selection:**

500 ppm: CCROV/SA/SCBA\*

1000 ppm: CCROVF\*

2000 ppm: GMOV/SAF/SCBAF\*

Escape: GMOV/SCBA\* \*(see below)

\* CCROV=Chemical cartridge respirator with organic vapor cartridge(s)

SA=Supplied-air respirator  
SCBA=Self-contained breathing apparatus  
CCROVF=Chemical cartridge respirator with organic vapor cartridge(s) and full facepiece  
GMOV=Gas mask with organic vapor cartridge(s)  
SAF=Supplied-air respirator with full facepiece  
SCBAF=Self-contained breathing apparatus with full facepiece

**Ventilation:** This product should be confined within closed equipment, in which case general (mechanical) room ventilation should be suitable. Special, local ventilation is needed at points where vapors are expected to be vented to the workplace air.

**Protective Clothing:** Avoid contact with the eyes. Wear chemical goggles if there is the likelihood of contact with the eyes. Avoid prolonged or repeated contact with the skin. Wear chemical-resistant gloves and other clothing as required to minimize contact such as impervious clothing and boots.

**Other Protective Clothing or Equipment:** An eye bath and safety shower should be available.

**Work/Hygienic Practices:** Wash hands thoroughly with soap and water before eating, drinking, smoking or using toilet facilities. Do NOT place food, coffee or other drinks in the area where dusting or splashing of solutions is possible."

### Section IX - Physical and Chemical Properties

**Physical State:** Liquid

**pH:** N/A

**Melting Point/Range:** -139°F; -95°C

**Boiling Point/Range:** 109°C  
(228°F)

**Appearance/Color/Odor:** Clear, colorless watery liquid with a sweet, pungent benzene like odor

**Solubility in Water:** Very slightly soluble in cold water (< 0.1 w/w)

**Vapor Pressure (mmHg):** 22 @ 20°C (68°F)

**Specific Gravity (Water=1):** 0.87

**Molecular Weight:** 92.1

**Density (Air=1):** 3.20 Calculated

**% Volatiles:** 100

**Evaporation Rate, (Bu-Ac=1):** 2.24

**Viscosity of Liquid, CST@ °F:**  
1@77 Approximate

**How to detect this compound:** In air, adsorption on charcoal, workup with CS<sub>2</sub>, analysis by gas chromatography. In water, inert gas purge followed by gas chromatography and photoionization detection or gas chromatography plus mass spectrometry.

### Section X - Stability and Reactivity

**Stability:** Stable

**Hazardous Polymerization:** Will Not Occur

**Conditions to Avoid:** Avoid heat, sparks and flame.

**Materials to Avoid:** Strong oxidizing agents, concentrated nitric or sulfuric acid, halogens, or molten sulphur, nitrogen tetraoxide; will attack some forms of plastics, rubber, coatings. Hydrogen peroxide and oxygen.

**Hazardous Decomposition Products:** Carbon monoxide and unidentified organic compounds may be formed during combustion.

## Section XI - Toxicological Information

### Toxicity Data:

By ingestion, Grade 2; LD<sub>50</sub>=0.5 to 5 g/kg

Aquatic: 1180 mg/l/96 hr/sunfish/TLm/fresh water IDLH Value: 2000 ppm

**Summary of Toxicology:** Toluene vapor causes narcosis. Controlled exposure of human subjects to 200 ppm for 8 hours produced mild fatigue, weakness, confusion, lacrimation, and paresthesia; at 600 ppm for 8 hours there were also euphoria, headache, dizziness, dilated pupils and nausea; at 800 ppm for 8 hours, symptoms were more pronounced, and after-effects included nervousness, muscular fatigue, and insomnia persisting for several days. Severe but reversible liver and kidney injury occurred in a person who was a glue-sniffer for 3 years; the chief component of the inhaled solvent was toluene (80% V/V); other ingredients were not listed. In workers exposed for many years to concentrations in the range of 80 to 300 ppm, there was no clinical or laboratory evidence of altered liver function. Toluene exposure does not result in the hematopoietic effects caused by benzene; the myelotoxic effects previously attributed to toluene are judged by more recent investigations to be the result of concurrent exposure to benzene present as a contaminant in the commercial toluene used. Most of the toluene absorbed from inhalation is metabolized to benzoic acid, conjugated with glycine in the liver to form hippuric acid, and excreted in the urine; the average amount of hippuric acid excreted in the urine by individuals not exposed to toluene is approximately 0.7 to 1.0 g/l of urine. The liquid splashed in the eyes of two workers caused transient corneal damage and conjunctival irritation; complete recovery occurred within 48 hours. Repeated or prolonged skin contact with liquid toluene has a defatting action, causing drying, fissuring, and dermatitis.

## Section XII - Ecological Information

When released into the soil, this material is expected to leach into the groundwater, and may biodegrade to a moderate extent. When released into the air, this material may be moderately degraded with reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life of less than one day. This material is not expected to significantly bioaccumulate. This material has a log octanol-water partition coefficient of less than 3.0. Bioconcentration factor = 13.2 (eels). This material is expected to be toxic to aquatic life. The LC50/96-hour values for fish are between 10 and 100 mg/l.

## Section XIII - Disposal Considerations

Dispose of in accordance with all local, county, state and federal regulations.

## Section XIV - Transport Information

**DOT Proper Shipping Name:** Toluene

**DOT Hazard Class/ I.D. No.:** 3, UN1294, II

## Section XV - Regulatory Information

### CALIFORNIA PROPOSITION 65: WARNING

**This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.**

**Uniform Fire Code Rating:** Class IB Flammable Liquid

**Reportable Quantity:** 1000 Pounds (454 Kilograms) (138.50 Gals)

**NFPA Rating:** Health - 2; Flammability - 3; Instability - 0

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

**Carcinogenicity Lists:** No **NTP:** No **IARC Monograph:** No **OSHA Regulated:** No

This product and/or its components are listed on the Toxic Substances Control Act (TSCA) inventory.

SARA 311/312: This material would be classified under the following hazard categories: fire, Acute (Immediate) Health Hazard, Chronic (Delayed) Health Hazard

**Section 313 Supplier Notification:** This product contains the following toxic chemical(s) subject to the reporting requirements of SARA TITLE III Section 313 of the Emergency Planning and Community Right-To Know Act of 1986 and of 40 CFR 372:

<u>CAS #</u>	<u>Chemical Name</u>	<u>% By Weight</u>
108-88-3	Toluene	> 99

#### Section XVI - Other Information

**Synonyms/Common Names:** Toluol, Methylbenzene, Methylbenzol, Phenylmethane

**Chemical Family/Type:** Aromatic Hydrocarbon

**Sections changed since last revision:** II – X, XIII, XV

**IMPORTANT!** Read this MSDS before use or disposal of this product. Pass along the information to employees and any other persons who could be exposed to the product to be sure that they are aware of the information before use or other exposure. This MSDS has been prepared according to the OSHA Hazard Communication Standard [29 CFR 1910.1200]. The MSDS information is based on sources believed to be reliable. However, since data, safety standards, and government regulations are subject to change and the conditions of handling and use, or misuse are beyond our control, **Hill Brothers Chemical Company** makes no warranty, either expressed or implied, with respect to the completeness or continuing accuracy of the information contained herein and disclaims all liability for reliance thereon. Also, additional information may be necessary or helpful for specific conditions and circumstances of use. It is the user's responsibility to determine the suitability of this product and to evaluate risks prior to use, and then to exercise appropriate precautions for protection of employees and others.