Carolina International Sales Co., Inc

2522 Plantation Center Drive
Matthews, NC 28105
(704) 845 9440

www.ciscochem.com

MATERIAL SAFETY DATA SHEET

1. PRODUCT NAME: Toluene

2. CHEMICAL NAME: Toluene

3. SYNOMYMS:

4. CAS NUMBER: 108-88-3

5. COMPOSITION Toluene - 100%

IN CASE OF
TRANSPORT EMERGENCY
CONTACT CHEMTREC
USA: 1-800-424-9300
INTERNATIONAL: 1-703-527-3887

6. PROPERTIES: PHYSICAL STATE: Liquid
COLOR: Transparent, colorless
ODOR: Sweet, pungent aromatic hydrocarbon.
SPECIFIC GRAVITY: 0.87 (Water = 1)
PH: Not applicable
VAPOR DENSITY: AP 3 (Air=1)
BOILING RANGE: 109 c – 111 c (228 - 231 F)
MELTING/FREEZING POINT: AP –95 c (AP – 139 F)
VAPOR PRESSURE: 3.2 kPa (24 mm Hg) (at 20 c)
VOLATILITY: 872 g/l VOC (w/v)
SOLUBILITY IN WATER: Very Slightly soluble in cold water (<0.1% w/w).
VISCOSITY (cSt@40 c): <3
FLASH POINT: Closed up: 4 c (40 F). (Tagliabue)
ADDITIONAL PROPERTIES: Paraffin, Isoparaffin and Cycloparaffin Hydrocarbons Content => <1 Wt. % (ASTM D-1319);
Aromatic Hydrocarbon Content = >99 Wt. % (ASTM D-1319): Average Density at 60 F = 7.26 lbs./gal. (Calculated via ASTM D-287); Aniline Cloud Point Temperature = 48 F (8.9 c) (ASTM D-611); Kauri-Butanol (KB) Value = 105 (ASTM D-1133); Dry Point Temperature = 231 F (111 c) (ASTM D-86, D-850 or D-1078); Evaporation Rate = 1.9 (n-butyl acetate = 1.0); Heat Value = 18,314 Btu. Per pound, Odor Threshold = 2 –5 ppm in air
STABILITY AND REACTIVITY
CHEMICAL STABILITY: Stable
HAZARDOUS POLYMERIZATION: Not expected to occur.
CONDITIONS TO AVOID: Keep away from heat, flame and other potential ignition sources. Keep away from strong oxidizing conditions and agents.
MATERIALS INCOMPATIBILITY: Strong acids, alkalies, and oxidizers such as liquid chlorine, other halogens, hudrogen peroxide and oxygen.
HAZARDOUS DECOMPOSITION PRODUCTS: No additional hazardous decomposition products were identified other than the combustion products identified in this MSDS.

7. HAZARDS: WARNING: Flammable liquid; vapor may cause flash fire. Harmful or fatal if swallowed – can enter lungs and cause damage. Mist or vapor can irritate the respiratory tract. Liquid contact can cause eye or skin irritation. Overexposure can cause central nervous system (CNS) depression and/or other target organ effects. Breathing high concentrations can cause irregular heartbeats which may be fatal.
Major routes of Entry: Skin contact. Inhalation
SIGNS and SYMPTOMS of ACUTE EXPOSURE:
INHALATION: Breathing high concentrations may be harmful. Mist or vapor can irritate the throat and lungs. Breathing this material may cause central nervous system depression with symptoms including nausea, headache, dizziness, fatigue, drowsiness, or unconsciousness. Breathing high concentrations of this material, for example, in an enclosed space or by intentional abuse, can cause irregular heartbeats which can cause death.
EYE CONTACT: 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.
SKIN CONTACT: May cause mild skin irritation with redness and/or an itching or burning feeling. Effects may become more serious with repeated or prolonged contact. 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.
INGESTION: Swallowing this material may be harmful. Swallowing this material may cause stomach or intestinal upset with pain, nausea, and/or diarrhea. This material can get into the lungs during swallowing or vomiting. Small

amounts in the lungs can cause lung damage, possibly leading the chronic lung dysfunction or death. Swallowing this material
may cause effects similar to those described in the inhalation section (see "inhalation" above).
CHRONIC HEALTH EFFECTS SUMMARY: Chronic effects of ingestion and subsequent aspiration into the lungs may cause pneumatocele (lung cavity) formation and chronic lung dysfunction. Reports have associated repeated and prolonged occupational overexposure to solvents with irreversible brain and nervous system damage (sometimes referred to as "Solvent or Painter's Syndrome"). International misuse by deliberately concentrating and inhaling this product may be harmful or fatal. This material (or a component) may cause harm to the human fetus based on tests with laboratory animals. Prolonged or repeated overexposure to toluene, a component of this product, has been associated with reproductive effect in experimental animals and in long-term chemical abuse situations. Long-term overexposure to toluene has been associated with impaired color vision. Also, long-term overexposure to toluene in occupational environments have been associated with hearing damage. (See Toxicological information.)
CONDITIONS AGGRAVATED BY EXPOSURE: Disorders of the following organs or organ systems that may be aggravated by significant exposure to this material or its components include: Skin, Respiratory System, Liver, Kidneys, Central Nervous System (CNS), Heart (Cardiac), auditory system.
TARGET ORGANS: May cause damage to the following organs: kidneys, lungs liver, mucous membranes, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.
CARCINOGENIC POTENTIAL: This product is not known to contain any components at concentrations above 0.1% which are considered carcinogenic by OSHA, IARC or NTP.
OSHA HEALTH HAZARD CLASSIFICATION: irritant
OSHA PHYSICAL HAZARD CLASSIFICATION: flammable

8. FIRE FIGHTING MEASURES:

NFPA FLAMMABILITY: NFPA Class-lB flammable liquid.
FLASH POINT: Closed cup: 4 c (40 F). (Tagliabue).
LOWER FLAMMABILITY LIMIT: AP 1.2 %
UPPER FLAMMABILITY LIMIT: AP 7 %
AUTIOGNITION TEMPERATURE: 536 c (997 F)
HAZARDOUS COMBUSTION PRODUCTS: Carbon dioxide, carbon monoxide, smoke, fumes, unburned hydrocarbons, aldehydes and other products of incomplete combustion.
SPECIAL PROPERTIES: Flammable liquid! This material releases vapors at or below ambient temperatures. When mixed with air in certain proportions and exposed to an ignition source, its vapor can cause a flash fire. Use only with adequate ventilation. Vapors are heavier than air and may travel long distance along the ground to an ignition source and flash back . A vapor and air mixture can create an explosion hazard in confined spaces such as sewers. If container is not properly cooled, it can rupture in the heat of fire.
EXTINGUISHING MEDIA: Small Fire: Use dry chemicals, carbon dioxide, foam, water fog, or inert gas (nitrogen). Large Fire: Use foam, water fog, or water spray. Water may Be Ineffective. Water may not extinguish the fire. Water fog and spray are effective in cooling containers and adjacent structures. However, water can be used to cool the external walls of vessels to prevent excessive pressure, autoignition or explosion. DO NOT use a solid stream of water directly on the fire as the water may spread the fire to larger area.
PROTECTION OF FIRE FIGHTERS: Fire fighter must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies. Evacuate area and fight the fire from a maximum distance or use unmanned hose holders or monitor nozzles. Cover pooling liquid with foam. Containers can build pressure if exposed to radiant heat; cool adjacent containers with flooding quantities of water until well after the fire is out. Withdraw immediately from the area if there is a rising sound from a venting safety device or discoloration of vessels, tanks, or pipelines. Be aware that burning liquid will float on water. Notify appropriate authorities of potential fire and explosion hazard if liquid enter sewers or waterways.

9. PERSONAL PROTECTION MEASURES:

ENGINEERING CONTROLS: Provide ventilation or other engineering controls to keep the airborne concentrations of vapor or mists below the applicable workplace exposure limits indicated below. All electrical equipment should comply with the National Electric Code. An emergency eye wash station and safety shower should be located near the work-station.
PERSONAL PROTECTIVE EQUIPMENT: Personal Protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted represent the minimum requirements of personal protective equipment. For certain operations, additional, PPE may be required.
EYE PROTECTION: Safety glasses equipped with side shields are recommended as minimum protection in industrial

settings. Chemical goggles should be worn during transfer operations or when there is a likelihood of misting, splashing, or spraying of this material. Suitable eye wash water should be readily available.
HAND PROTECTION: Avoid skin contact. Use heavy duty gloves constructed of chemical resistant materials such as Viton R. Wash hands with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities or leaving work. DO NOT use gasoline, kerosene or harsh abrasives as skin cleaners.
BODY PROTECTION: Avoid skin contact. Wear long-sleeved fire-retardant garments (e.g, Nomex R) while working with flammable and combustible liquids.
Additional chemical-resistant protective gear may be required if splashing or spraying conditions exist. This may include an apron, boots and additional facial protection. If product comes in contact with clothing, immediately remove soaked clothing and shower. Promptly remove and discarded contaminated leather goods.
RESPIRATORY PROTECTION: For known vapor concentrations above the occupational exposure guidelines (see below), use a NIOSH-approved organic vapor respirator if adequate protection is provided. Protection factors vary depending upon the type of respirator used. Respirators should be used in accordance with OSHA requirements (29CFR 1910.134). For airborne vapor concentrations the exceed the recommended protection factors of organic vapor respirators, use a full-face, protective-pressure, supplied air respirator. Due to fire and explosion hazards, do not enter atmospheres containing concentrations greater than 10% of the lower flammable limit of this product. Warning! Use of this material is spaces without adequate ventilation may result in generation of hazardous levels of combustion products and/or inadequate oxygen levels for breathing. Odor is an inadequate warning for hazardous conditions.

10. FIRST AID PROCEDURES:

Take proper precautions to ensure your own health and safety before attempting rescue or providing first aid.
INHALATION: Immediately move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR). If breathing is difficult, 100 percent humidified oxygen should be administered by a qualified individual. Seek medical attention immediately.
EYE CONTACT: Flush eye with cool, clean, low-pressure water for at least 15 minutes Hold eyelids apart to ensure complete irritation of eye and eyelid tissue. If easily accomplished, check for and remove contact lenses. If contact lenses cannot be removed, seek immediately medical attention. Do not use eye ointment. Seek medical attention.
SKIN CONTACT: Remove contaminated shoes and clothing. Flush affected area with large amounts of water. If skin surface is not damaged, apply a clean dressing and seek medical attention. Do not use ointments. If skin surface is damaged, clean effected area thoroughly with mild soap and water. Seek medical attention if tissue appears damaged or if pain or irritation persists.
INGESTION: Do not induce vomiting. If spontaneous vomiting is about to occur, place victim's head below knees. If victim is drowsy or unconscious, place on the left side with head down, Never give anything by mouth to a person who is not fully conscious. Do not leave victim unattended. Seek medical attention immediately.
NOTES TO PHYSICIAN: 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 effects of sympathomimetic amines. Epinephrine and other synpathomimetic drugs may irritate 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 is obtunded, protect the airway by cuffed endotracheal intubation or by placement of the body in a Trendelenburg and left lateral decubitus position.

11. EXPOSURE LIMITS:

TOLUENE: ACGIH (United States). Skin – TWA: 50 ppm 8 hours,
OSHA (United States). – TWA: 200 ppm 8 hours, -
CEIL: 300 ppm, -
PEAK: 500 ppm

12. TOXICOLOGICAL INFORMATION:

Effects from Acute Exposure: Deliberate inhalation of toluene at high concentrations (e.g., glue sniffing and solvent abuse) has been associated with adverse effects on the liver, kidney and nervous system and can cause CNS depression, cardiac arrhythmias and death. Case studies of persons abusing toluene suggest isolated incidences of adverse effects on the fetus including birth defects.
Effects from Repeated or Prolonged Exposure: Studies of workers indicate long-term exposure may be related to impaired color vision and hearing. Some studies of workers suggest long-term exposure may be related to neurobehavioral and cognitive changes. Some of these effects have been observed in laboratory animals following repeated exposure to high levels to toluene. Several studies. Several studies of workers suggest long-term exposure may be

related to small increases in spontaneous abortions and changes in some gonadotropic hormones. However, the weight of evidence does not indicate toluene is a reproductive hazard to humans. Studies in laboratory animals indicate some changes in reproductive organs following high levels of exposure, but no significant effects on mating performance or reproduction were observed. Case studies of persons abusing toluene suggest isolated incidence of adverse effects on the fetus including birth defects. Findings in laboratory animals were largely negative. Positive findings include small increases in minor skeletal and visceral malformations and developmental delay following very high levels of maternal exposure. Studies of workers indicate long-term exposure may be related of effects on the liver, kidney and blood, but these appear to be limited to changes in serum enzymes and decreased leukocyte counts. Studies in laboratory animals indicate some evidence of adverse effects on the liver, kidney, thyroid, and pituitary gland following very high levels of exposure. The relevance of these findings to humans is not clear at this time.

13. ECOLOGICAL INFORMATION:

ECOTOXICITY: Toxic to aquatic organisms, may cause long-term adverse effect in the aquatic environment.
ENVIRONMENTAL FATE: This mixture will normally float on water with its lighter components evaporation rapidly. In stagnant or slow-flowing waterways, a hydrocarbon layer can cover a large surface area. As a result, this covering layer might limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway might be enough to cause a fish a kill or create an anaerobic environment. This coating action can also be harmful or fatal to plankton, algae, aquatic life, and water birds.

14. DISPOSAL CONSIDERAIONS:

Hazard characteristic and regulatory waste stream classification can change with product use. Accordingly, it is the responsibility of user to determine the proper storage, transportation, treatment and/or disposal methodologies for spent materials and residues at the time of disposition.
Maximize material recovery for reuse or recycling. If discarded, Toluene is regulated by US EPA as listed hazardous waste (U220). It is the responsibility of the user to determine if the material is a RCRA “hazardous waste” at the time of disposal. Transportation, treatment, storage and disposal of waste material must be conducted in accordance with RCRA regulations (see 40 CFR 260 through 40 CFR 271). State and/or local regulations may be more restrictive. Contact your regional US EPA office for guidance concerning case specific disposal issues.

15. CARCINOGENIC PROPERTIES & NOTIFICATIONS:

CALIFORNIA PROPOSITION 65: The material may contain the following components which are known to the State of California to cause cancer, birth defects or other reproductive harm, and may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5): Toluene: >99%, Benzene: <0.1%, Ethylbenzene: <0.1%

16. TRANSPORT INFORMATION:

The shipping description below may not represent requirements for all modes of transportation, shipping methods or locations outside of the United States.
US DOT Status: A U.S. Department of Transportation (DOT) regulated material.
PROPER SHIPPING NAME: RQ, Toluene, 3, UN1294, PG II
HAZARD CLASS: 3
PACKING GROUPS: II
UN/NA NUMBER: UN1294
REPORTABLE QUANTITY: RQ 1000 lbs. [Based upon maximum Toluene concentration of 100% and an RQ of 1000lbs.]
PLACARDS: Flammable liquid
EMERGENCY RESPONSE GUIDE No.: 130
MARPOL III Status: Not a DOT “Marine Pollutant” per 49 CFR 171.8

17. HANDLING & STORAGE:

HANDLING: A spill or leak can cause an immediate fire or explosion hazard. Keep closed and do not handle or store near heat, sparks, or any other potential ignition sources. Do not contact with oxidizible 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 to maintain exposure potential below applicable exposure limits. Use appropriate respiratory protection when concentrations exceed any established occupational exposure level (See section 8). Promptly remove contaminated clothing. Wash exposed skin thoroughly with soap and water after handling.
A static electrical charge an accumulate when this material is flowing through pipes, nozzles or filters and when it is

agitated. A static spark discharge an 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. Observe label precautions. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing or 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 materials with a flash point temperature lower than 70 H (21 c). All electrical equipment in areas where this material
TSCA INVENTORY: This product and/or its components are listed on the Toxic Substance Control Act (TSCA) inventory.
SARA 302/304 EMERGENCY PLANNING AND NOTIFICATION: The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title lll requires facilities subject to Subparts 302 and 304 to submit emergency planning and notification information based on Threshold Planning Quantities (TPQs) and Reportable Quantities (RQ's) for "Extremely Hazardous Substance" listed in 40 CFR 302.4 and 40 CFR 355. No components were identified.
SARA 311/312 HAZARD IDENTIFICATION: The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title lll requires facilities subject to this subpart to submit aggregate information on chemicals by "Hazard Category" as defined in 40 CFR 370.2. This material would be classified under the following hazard categories: fire, Acute (Immediate) Health Hazard, Chronic (Delayed) Health Hazard
SARA 313 TOXIC CHEMICAL NOTIFICATION AND RELEASE REPORTING: This product contains the following components in concentrations above de minimis levels that are listed as toxic chemicals in 40 CFR Part 372 pursuant to the requirements of Section 313 of SARA: No components were identified.
CERCLA: The Comprehensive Environmental Response, compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center concerning release of quantities of "hazardous substances" equal to or greater than the reportable quantities (RQ's) listed in 40 CFR 302.4. As defined by CERCLA, the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically designated in 40 CFR 302.4. Chemical substances present in this product or refinery stream that may be subject to this statute are:
Toluene [CAS No: 108-88-3] RQ = 1000 lbs. (453.6 kg) Concentration: >99%
Benzene [CAS No: 71-43-2] RQ = 10 lbs. (4.536 kg) Concentration: <0.1%
Xylene, all isomers [CAS No: 1330-20-7] RQ = 100lbs. (45.36 kg) Concentration: <0.1%
CLEAN WATER ACT (CWA): This material is classified as an oil under section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.
HEATH HAZARD: HMIS – 2, NFPA – 2
FIRE HAZARD: HMIS – 3, NFPA – 3
REACTIVITY: HMIS – 0, NFPA – 0 = CHRONIC HEALTH HAZARD

18. ACCIDENTAL RELEASE MEASURES: Take proper precautions to ensure your own health and safety before attempting spill control or clean- up. Flammable liquid! Release causes an immediate fire or explosion hazard. Evacuate all non-essential personnel from immediate area and establish a "regulated zone" with site control and security. A vapor-suppressing foam may be use to reduce vapors. Eliminate all ignition sources. All equipment used when handling this material must be grounded. Stop the leak If it can done without risk. Do not touch or walk through spilled material. Remove spillage immediately from hard, smooth walking areas. Prevent spilled material from entering waterways, sewers, basements, or confined areas. Absorb or cover with dry earth, sand or other non-combustible material and transfer to appropriate waste containers. Use clean, non-sparking tools to collect absorbed material.
For large spills, secure the area and control areas. Prevent spilled material from entering sewers, storm drains, other drainage systems, and natural waterway. Dike far ahead a liquid spill to ensure complete collection. Water mist or spray may be used to reduce or disperse vapors; bit, it may not prevent ignition in closed spaces. This material will float on water and its run-off may create an explosion or fire hazard. Verify that responders are properly HAZWOPER-

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trained and wearing appropriate respiratory equipment and fire-resistant protective clothing during cleanup operations. In an urban area, cleanup spill as soon as possible; in natural environments, cleanup on advice from specialists. Pick up free liquid for recycle and/or disposal if it can be accomplished safety with explosion-proof equipment. Collect any excess material with absorbent pads, sand, or other inert non-combustible absorbent materials. Place into appropriate waste containers for later disposal. Comply with all applicable local, state and federal laws and regulations.