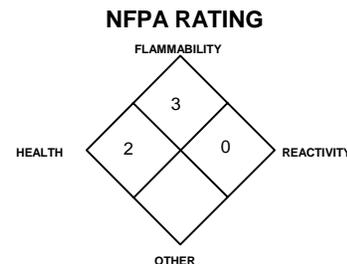




MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards



PART I What is the material and what do I need to know in an emergency?

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: **XYLENES - C₈H₁₀**
Document Number: P-0064

PRODUCT USE: For general analytical/synthetic chemical uses.

SUPPLIER/MANUFACTURER'S NAME: MESA Specialty Gases & Equipment
ADDRESS: 3619 Pendleton Avenue, Suite C
 Santa Ana, CA 92704

BUSINESS PHONE: 1-714-434-7102
EMERGENCY PHONE: INFOTRAC: 1-800-535-5053
DATE OF PREPARATION: June 6, 1997
SECOND REVISION: January 16, 1998

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA		IDLH ppm	OTHER
			TLV ppm	STEL ppm	PEL ppm	STEL ppm		
Xylene Three chemical forms (isomers) of Xylene exist: ortho-Xylene, meta-Xylene and para-Xylene. The information presented in this MSDS is given for mixed Xylenes.	1330-20-7	99.9%	100, A4	150	100	150 (Vacated 1989 PEL)	900	NIOSH: 100 TWA; 150 STEL DFG MAK: 100 Carcinogen: IARC-3; TLV-A4; EPA-D
Maximum Impurities		< 0.1	None of the trace impurities in this mixture contribute significantly to the hazards associated with the product. All hazard information pertinent to this product has been provided in this Material Safety Data Sheet, per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200) and State equivalent standards.					

NE = Not Established C = Ceiling Limit See Section 16 for Definitions of Terms Used
 NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: Xylene is a colorless, flammable, toxic liquid, with a characteristic aromatic odor. Inhalation of vapors of Xylene can affect the central nervous system. Symptoms of central nervous system overexposure can include headache, drowsiness, dizziness, fatigue, nausea and weakness. Skin and eye contact can be irritating. This liquid is very flammable; vapors are heavier than air and may travel long distances to source of ignition and flashback. If involved in a fire Xylene will decompose to produce toxic gases (e.g. carbon monoxide, carbon dioxide, reactive hydrocarbons and aldehydes). Persons responding to releases of this product must have adequate fire protection for the specific emergency situation.

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The most significant routes of occupational overexposure for Xylene are by inhalation, and contact with skin or eyes. The symptoms of overexposure to Xylene by route of exposure are as follows:

INHALATION: Possible symptoms of acute overexposure to vapors of Xylene can include flushing of the face, a feeling of increased heat due to dilation of superficial blood vessels, disturbed vision, tremors, salivation, drowsiness, incoordination and staggering gate, confusion and cardiac stress. Exposures to high concentrations of vapors of Xylene can cause central nervous system effects. Symptoms of central nervous system effects are related to exposure concentrations. The effects associated with various levels of Xylene vapors are as follows:

<u>CONCENTRATION</u>	<u>SYMPTOM OF EXPOSURE</u>
Above 100 ppm:	Headache, dizziness.
~ 200 ppm (3-5 min):	Irritation of the nose, throat and respiratory tract.
~ 700 ppm:	Nausea and vomiting.
~ 10,000 ppm	At this concentration Xylene causes incoordination, loss of consciousness, respiratory failure and death.

Other health effects which have been reported for human inhalation overexposure to Xylene include neuro-behavioral effects (e.g., impaired short term memory and reaction time) and alterations in body balance. In an industrial setting, the most serious overexposures have occurred when vapors of Xylene have accumulated in small, confined spaces. Reversible liver and kidney damage has been reported in cases of severe overexposure to Xylene.

CONTACT WITH SKIN or EYES: Contact with the skin can cause irritation, redness and a burning sensation. Such symptoms are reversible if contact ceases. Repeated or prolonged contact can cause dermatitis, resulting in dry, itchy, cracked skin, as Xylene is a defatting agent, removing oils from the skin. Exposure to the eyes at levels of vapor as low as 200 ppm will cause irritation. Direct contact of the liquid with the eyes can cause irritation, conjunctivitis and corneal burns.

SKIN ABSORPTION: Xylene can be absorbed through intact skin, but is not as significant a route of exposure as via inhalation or ingestion. Mild irritation may occur at the site of skin absorption.

INGESTION: Ingestion of Xylene may produce symptoms of central nervous system depression similar to those described in "Inhalation". The estimated lethal dose via ingestion for humans is 15-30 mL. If ingested, Xylene presents a potential aspiration hazard. The aspiration of Xylene into the lungs can result in severe lung irritation, leading to damage to the lungs, chemical pneumonitis, pulmonary edema and hemorrhage.

INJECTION: Injection is not anticipated to be a significant route of overexposure for this product. If Xylene is "injected" (as may occur through punctures by contaminated, sharp objects), symptoms described in "Inhalation" can occur.

OTHER HEALTH EFFECTS: Additional symptoms of chronic overexposure can include paresthesia (morbid sensations), apprehension, tremors, impaired memory, weakness, nervous irritation, vertigo, headache, anorexia, nausea, flatulence, anemia and mucosal hemorrhage.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Overexposure to may cause the health effects described on the following page.

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH		(BLUE)	2
FLAMMABILITY		(RED)	3
REACTIVITY		(YELLOW)	0
PROTECTIVE EQUIPMENT			C
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8
For routine industrial applications			

See Section 16 for Definition of Ratings

3. HAZARD IDENTIFICATION (Continued)

ACUTE: Acute inhalation overexposure to Xylene will initially act as a narcotic, possibly leading to coma in extreme cases. Following exposure to high concentrations, victims may be unconscious, and if exposure continues, death can follow from respiratory failure. Contact with the skin can cause irritation and dermatitis. Contact with the eyes is irritating, causing burning and watering of the eyes. Ingestion of Xylene will cause gastric distress and possible severe depression of the central nervous system. Aspiration of Xylene into the lungs, following ingestion, can result in severe damage to the lungs; death may result.

CHRONIC: Symptoms of chronic inhalation can include respiratory irritation, central nervous system excitation, followed by depression. Xylene is a suspect carcinogen. See Section 11 (Toxicological Information) for further information.

TARGET ORGANS: Respiratory system, central nervous systems, heart, kidneys, skin, eyes and liver.

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO XYLENE WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. If necessary, a Self-Contained Breathing Apparatus should be worn.

INHALATION: If vapors, mists, or sprays of Xylene are inhaled, remove victim to fresh air. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation if necessary. Remove or cover gross contamination to avoid exposure to rescuers.

SKIN EXPOSURE: If Xylene contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek medical attention if any adverse reaction occurs.

EYE EXPOSURE: If Xylene or its vapors enter the eyes, open victim's eyes while under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek immediate medical attention.

INGESTION: If Xylene is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, do not induce vomiting. Victim should drink milk, egg whites, or large quantities of water. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or who cannot swallow.

Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Physicians should refer to "Recommendations to Physicians" in Section 11 (Toxicological Information). Take copy of label and MSDS to health professional with victim.

5. FIRE-FIGHTING MEASURES

FLASH POINT, (Closed Cup): 17-25°C (62.6-77°F)

AUTOIGNITION TEMPERATURE: 464°C (867°F)

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): 1.0%
Upper (UEL): 7.0%

FIRE EXTINGUISHING MATERIALS:

Water Spray: YES (for cooling only)

Foam: YES

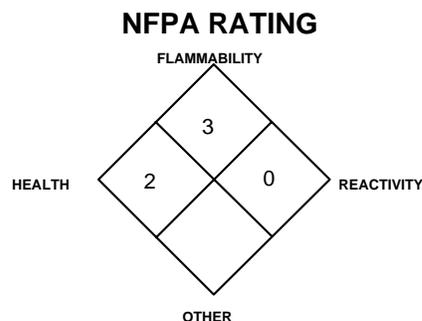
Halon: YES

Carbon Dioxide: YES

Dry Chemical: YES

Other: Any "B" Class.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Xylene is a Class IB flammable liquid and presents a serious fire hazard to firefighters. Due to the low flash point, vapors can form explosive mixtures with air, at or above 17°C (63°F). When involved in a fire, this material may decompose and produce toxic gases (e.g., carbon monoxide, carbon dioxide, reactive hydrocarbons and aldehydes). The vapors of Xylene are heavier than air and may spread long distances; distant ignition and flash-back are possible. Xylene can float on water; therefore, water contaminated with this product can spread the flammable liquid and can spread fire. Containers of Xylene, when involved in fire, may rupture or burst in the heat of the fire.



See Section 16 for Definition of Ratings

5. FIRE-FIGHTING MEASURES (Continued)

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Xylene can accumulate static charge by flow or agitation; vapors can be ignited by static discharge.

SPECIAL FIRE-FIGHTING PROCEDURES: In the event of fire, cool containers of this product with water to prevent failure. Use a water spray or fog to reduce or direct vapors. Water may not be effective in actually extinguishing a fire involving Xylene, due to its low flash point. Stop the leak or discharge, if possible. For small releases, if it is not possible to stop the leak, and it does not endanger personnel, let the fire burn itself out. Incipient fire responders should wear eye protection. Structural fire fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Large fires should be fought from a distance with an unmanned hose holder or monitor nozzles. If this product is involved in a fire, fire run-off water should be contained to prevent possible environmental damage. If necessary, decontaminate fire-response equipment with soap and water solution. For large releases, consider evacuation. Refer to the North American Emergency Response Guidebook (Guide #130) for additional guidance.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Evacuate immediate area. Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a release, clear the affected area, protect people, and respond with trained personnel.

Minimum Personal Protective Equipment should be **Level B: triple-gloves (rubber gloves and nitrile gloves, over latex gloves), chemically resistant suit and boots, hard-hat, and Self-Contained Breathing Apparatus.** Monitor the surrounding area for combustible vapor levels. Combustible vapor levels must be below 10% of the LEL for Xylene (LEL = 1.0%) before personnel are permitted to enter the area. If necessary, ventilate area.

Monitoring should be done for the levels of Xylene and oxygen. Colorimetric tubes are available to detect the presence of Xylene. Levels of Xylene should be below levels listed in Section 2 (Composition and Information on Ingredients) and the atmosphere must have at least 19.5 percent oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus.

Eliminate all sources of ignition before clean-up operations begin. Use non-sparking tools. Absorb spilled liquid with activated carbon, polypads or other suitable absorbent materials. Prevent material from entering sewer or confined spaces.

Decontaminate the area thoroughly. Place all spill residue in an appropriate container and seal. If necessary, decontaminate spill-response equipment with soap and water solution. Dispose of in accordance with Federal, State, and local hazardous waste disposal regulations (see Section 13, Disposal Considerations).

THIS IS A TOXIC, FLAMMABLE LIQUID: Protection of all personnel and the area must be maintained. All responders must be adequately protected from exposure.

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash hands after handling chemicals. Do not eat or drink while handling this material. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Avoid breathing vapors or mists generated by this product. Use in a well-ventilated location. Cylinders of this product must be properly labeled. If this product is used in other types of containers, only use portable containers and dispensing equipment (faucet, pump, drip can) approved for flammable liquids. Post "NO SMOKING" signs, where appropriate in storage and use areas.

Store cylinders of this product in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Do not allow area where cylinders are stored to exceed 52°C (125°F). Material should be stored in secondary containers, or in a diked area, as appropriate. Store containers away from incompatible chemicals. Keep container tightly closed when not in use. Storage areas should be made of fire-resistant materials. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Refer to NFPA 30, Flammable and Combustible Liquids Code for additional information on storage.

Empty containers may contain residual flammable liquid or vapors. Therefore, empty containers should be handled with care. Do not expose "empty" containers to welding touches, or any other source of ignition.

7. HANDLING and STORAGE (Continued)

SPECIAL PRECAUTIONS FOR HANDLING CYLINDERS: Protect cylinders of this product against physical damage. If appropriate, cylinders should be stored in an up-right position. Cylinders should be firmly secured to prevent falling or being knocked over. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting. Never tamper with pressure relief devices in valves and cylinders. Electrical equipment should be non-sparking or explosion proof. The following rules are applicable to situations in which cylinders are being used:

Before Use: If appropriate, move cylinders with a suitable hand truck. Do not drag, slide, or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap in-place until cylinder is ready for use.

During Use: Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Use check valve or trap in discharge line to prevent hazardous backflow into the cylinder. Do not use oils or grease on gas-handling fittings or equipment.

After Use: Close main cylinder valve. Replace valve protection cap. Mark empty cylinders "EMPTY".

NOTE: Use only DOT or ASME code containers. Earth-ground and bond all lines and equipment associated with this product. Close valve after each use and when empty. Cylinders must not be recharged except by or with the consent of owner. For additional information refer to the Compressed Gas Association Bulletin SB-2 "Oxygen Deficient Atmospheres".

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely. Always use this product in areas where adequate ventilation is provided. Decontaminate equipment using soapy water before maintenance begins. Collect all rinsates and dispose of according to applicable Federal, State, or local procedures.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Use a mechanical fan or vent area to outside. Where appropriate, use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Ensure eyewash/safety shower stations are available near areas where this product is used.

RESPIRATORY PROTECTION: Maintain exposure levels of Xylene below the levels listed in Section 2 (Composition and Information on Ingredients) and oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection if Xylene levels exceed exposure limits and if oxygen level is below 19.5% or during emergency response to a release of this product. If respiratory protection is required, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent State standards. The following NIOSH respiratory protection recommendations are for o-Xylene, (applicable to the mixture of o-Xylene, m-Xylene, and p-Xylene).

CONCENTRATION

RESPIRATORY EQUIPMENT

Up to 900 ppm

Chemical cartridge respirator with organic vapor cartridges; or gas mask with organic vapor canister, or powered, air-purifying respirator with organic vapor cartridges, or Supplied Air Respirator (SAR), or full-facepiece SCBA.

Emergency or Planned Entry into Unknown Concentration or IDLH Conditions: Positive-pressure, full facepiece SCBA or positive pressure, full-facepiece Supplied Air Respirator (SAR) with an auxiliary positive pressure SCBA.

Escape

Gas mask with organic vapor cartridge or escape-type SCBA should be used.

The IDLH concentration for Xylene (o-Xylene, m-Xylene or p-Xylene) is 900 ppm.

EYE PROTECTION: Splash goggles or safety glasses. Face-shields should be worn if contact with the liquid is anticipated.

HAND PROTECTION: Wear leather gloves for handling of cylinders of this product. Wear chemically resistant gloves appropriate for Xylene for industrial use. Gloves should have a resistance to breakthrough greater than 8 hours, such as Teflon™ or Viton™. Butyl rubber, natural rubber, neoprene, nitrile rubber, or polyethylene are not recommended. Use triple gloves for spill response (see Section 6, Accidental Release Measures).

BODY PROTECTION: Use body protection appropriate for task. Transfer of large quantities under pressure may require protective equipment appropriate to protect employees from splashes of liquefied product. Safety shoes are recommended when handling cylinders.

9. PHYSICAL and CHEMICAL PROPERTIES

RELATIVE VAPOR DENSITY (air = 1): 3.7

SPECIFIC GRAVITY (@ 20°C (68°F) (water = 1): 0.86

SOLUBILITY IN WATER @ 25°C (77°F): 1 30 mg/L

EVAPORATION RATE (nBuAc = 1): 0.7

EXPANSION RATIO: Not applicable.

LOG COEFFICIENT WATER/OIL DISTRIBUTION: Log P (oct) = 3.12-3.33

VAPOR PRESSURE @ 20°C(68°F): 6-6.5 mm Hg (0.8-0.867 kPa)

APPEARANCE AND COLOR: Colorless, flammable liquid, with a strong, gasoline-like odor.

HOW TO DETECT THIS SUBSTANCE (warning properties): The odor of Xylene is a good warning property as the TLV is more than 10 times the odor threshold. Some olfactory fatigue can occur at low ppm concentrations.

pH: Not applicable.

FREEZING/MELTING POINT: Variable, depending on isomer blend.

BOILING POINT: 264-302°F (137.2-140°C)

ODOR THRESHOLD: 1 ppm and 20 ppm (detection);
40 ppm (recognition)

SPECIFIC VOLUME: 5.5

10. STABILITY and REACTIVITY

STABILITY: Normally stable.

DECOMPOSITION PRODUCTS: If Xylene is involved in a fire, it may decompose yielding toxic fumes of carbon monoxide, carbon dioxide, reactive hydrocarbons and aldehydes.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Xylene is incompatible with strong oxidizers, increasing the risk of fire and explosion. Xylene reacts violently to nitric acid and dichlorohydrantoin. Xylene can attack some forms of plastics, rubber and coatings.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Avoid contact with incompatible materials, sparks, flame static discharge and other sources of ignition. Avoid exposing cylinders to extremely high temperatures, which could cause the cylinders to rupture or burst.

PART III *How can I prevent hazardous situations from occurring?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following information is available for Xylene.

Eye effects-Human 200 ppm

Skin-Rabbit, adult 100% Moderate irritation effects

Skin-Rabbit, adult 500 mg/24 hours Moderate irritation effects

Eye effects-Rabbit, adult 87 mg Mild irritation effects

Eye effects-Rabbit, adult 5 mg/24 hours Severe irritation effects

Cytogenetic Analysis-Saccharomyces cerevisiae 1 mmol/tube

Inhalation-Rat TClO :50 mg/m³/6 hours (female 1-21 days post):Reproductive effects

Inhalation-Rat TClO: 50 mg/m³/6 hours (female 1-21 days post):Teratogenic effects

Oral-Human LDLo: 50 mg/kg

Inhalation-Man LCLo: 10,000 ppm/6 hours

Inhalation-Human TClO :200 ppm: Nose , Eye effects, Pulmonary system effects

Oral-Rat LD50: 4300 mg/kg

Inhalation-Rat LC50: 5000 ppm/4 hours

Intraperitoneal-Rat LD50: 2459 mg/kg

Oral-Unspecified effects LD50: 4300 mg/kg

Inhalation-Unspecified effects LC50: 30 g/m³

SUSPECTED CANCER AGENT: Xylene is listed as follows: EPA-D (No Evidence for Carcinogenicity in Humans); IARC - 3 (Not Classifiable as to Human Carcinogenicity).

Xylene is not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA; therefore is neither considered to be nor suspected to be a cancer-causing agent by these agencies.

IRRITANCY OF PRODUCT: Xylene is irritating to the skin, eyes, and other contaminated tissue.

SENSITIZATION OF PRODUCT: Xylene is not known to cause respiratory system or skin sensitization in humans. Cardiac sensitization to stimulants (e.g., epinephrine, ephedrine) is a possible result of severe or chronic overexposure.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of Xylene on the human reproductive system.

Mutagenicity: Mutagenic data are available from clinical studies involving test animals exposed to relatively high doses of Xylene.

11. TOXICOLOGICAL INFORMATION (Continued)

REPRODUCTIVE TOXICITY INFORMATION (continued):

Embryotoxicity: Xylene is not reported to cause embryotoxic effects in humans.

Teratogenicity: Xylene is not reported to cause embryotoxic effects in humans. There have been numerous teratogenicity studies on test animals for mixed xylenes and individual xylene isomers. In general, the results indicate that while xylenes may cause fetotoxic effects at high exposure levels, they are not teratogenic at exposure levels which are not toxic to the mother.

Reproductive Toxicity: Data on reproductive effects are available from clinical studies involving test animals exposed to relatively high doses of Xylene.

*A **mutagen** is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An **embryotoxin** is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A **teratogen** is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A **reproductive toxin** is any substance which interferes in any way with the reproductive process.*

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing respiratory conditions, central nervous system, liver, kidney, and cardio-vascular conditions may be aggravated by severe or chronic overexposure to this product. Skin disorders may also be aggravated by exposures to Xylene.

RECOMMENDATIONS TO PHYSICIANS: The following guidelines are derived from "Clinical Toxicology of Commercial Chemical Products" (5th edition, 1984).

- Check for signs of impending pulmonary edema.
- Because of the aspiration hazard, avoid emetic drugs, whenever practical.
- For ingestion overexposures in which Xylene contains another toxic component and induction of emesis is advisable: If the patient is not drowsy, comatose, or in respiratory difficulty, induce vomiting. If necessary, as an alternative treatment, remove Xylene from the stomach via gastric lavage. One or two ounces of mineral oil may be instilled and left in the stomach at the completion of lavage.
- Avoid epinephrine because of its possible adverse effect on the sensitized myocardium. Avoid all digestible fats, oils and alcohol, which may promote the absorption of Xylene in the intestinal system.
- If eyes or skin are affected, wash thoroughly and apply a bland analgesic ointment.
- Because of the possibility of ventricular fibrillation, monitor the ECG continuously and be prepared to administer external cardiac massage.
- In chronic solvent abusers, correct dehydration, acidosis, hypokalemia and hypophosphatemia. Usually toxic signs and symptoms (except those due to neuropathies and to cerebellar lesions) disappear within a few days after fluid and electrolyte abnormalities are corrected.

BIOLOGICAL EXPOSURE INDICES (BEIs): The following Biological Exposure Indices (BEIs) are currently applicable for Xylene.

BIOLOGICAL EXPOSURE INDICES (BEIs) for Xylene are as follows:		
CHEMICAL DETERMINANT	SAMPLING TIME	BEI
XYLENES • Methylhippuric acids in urine	• End of shift	• 1.5 g/g creatinine

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: Xylene will be degraded over time into other organic compounds. The following environmental data are available for Xylene.

Log K_{ow} = 3.5-6.8. Water Solubility = 146-175 mg/L. Bioconcentration Factors = 3.1-3.2 (Estimated); 2.14-2.20 (fish); 1.3 (eels). Xylenes will photochemically degrade; however, xylenes tend to persist in the environment and seem to be very slowly biodegraded. Bioconcentration is not expected to be significant.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: Xylene may be harmful or fatal to contaminated plant and animal-life (especially if large quantities of this product are released). Refer to Section 11 (Toxicology Information) for further information of the effects of this product on test animals.

EFFECT OF CHEMICAL ON AQUATIC LIFE: Xylene can be harmful or fatal to contaminated aquatic plant and animal life. Xylene floats on water, and can potentially form slicks which are capable of creating oxygen-deprived waterways which can contaminate coastal and shore life. Aquatic toxicity data are available for Xylene as follows on the next page:

12. ECOLOGICAL INFORMATION (Continued)

EFFECT OF CHEMICAL ON AQUATIC LIFE (continued):

LC₅₀ (goldfish) = 13 mg/L; 24 hr
LC₅₀ (rainbow trout) = 13.5 mg/L; 96 hr
LC₅₀ (*Pimephales promelas*, fathead minnow) = 46 mg/L/ 1 hour; 42 mg/L (24-96 hours)
LC₅₀ (*Carassium auratus*, goldfish) = 16.9 ppm; 96 hr
LC₅₀ (zebra fish; *Brachydanio rerio*) = 20 mg/L, 48 hours, flow-through tests
LC₅₀ (rainbow trout; *Salmo gairdneri*) = 8.05-8.2 mg/L, 96 hours, flow-through and static tests
LC₅₀ (fathead minnow; *Pimephales promelas*) = 16.1 mg/L, 96 hours, flow-through tests
LC₅₀ (bluegill; *Lepomis macrochirus*) = 16.1 mg/L, 96 hours, flow-through tests

LC₅₀ (goldfish; *Carassius auratus*) = 16.1 mg/L, 96 hours, flow-through tests
LC₅₀ (white sucker; *Castostomus commersoni*) = 16.1 mg/L, 96 hours, flow-through tests
LC₅₀ (fathead minnow; *Pimephales promelas*) = 28.77-26.7 mg/L, 24, 48, 96 hours, static tests
LC₅₀ (bluegill; *Lepomis macrochirus*) = 24.0-20.87 mg/L, 24, 48, 96 hours, static tests
LC₅₀ (goldfish; *Carassius auratus*) = 36.81 mg/L, 24, 48, 96 hours, static tests
EC₅₀ (water flea; *Daphnia magna*) = 3.82 mg/L, 48 hours, flow-through tests, sensitive to exposure
EC₅₀ (snail (*Aplexa hypnorum*)) = 22.4 mg/L, 96 hours, resistant to exposure

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Return cylinders with residual product to MESA. Do not dispose of locally.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Xylenes
HAZARD CLASS NUMBER and DESCRIPTION: 3 (Flammable Liquid)
UN IDENTIFICATION NUMBER: UN 1307
PACKING GROUP: PG II
DOT LABEL(S) REQUIRED: Flammable Liquid
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996): 130

MARINE POLLUTANT: Xylene is not classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B).

TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. Use the above information for the preparation of Canadian Shipments. In addition, there is an additional Hazard Class: 9.2 (Substance Hazardous to the Environment).

15. REGULATORY INFORMATION

U.S. SARA REPORTING REQUIREMENTS: Xylene is subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

COMPONENT	SARA 302 (40 CFR 355, Appendix A)	SARA 304 (40 CFR Table 302.4)	SARA 313 (40 CFR 372.65)
Xylene	NO	YES	YES

U.S. SARA THRESHOLD PLANNING QUANTITY: Not applicable.

U.S. CERCLA REPORTABLE QUANTITIES (RQ): 100 lb.

CANADIAN DSL/NDSL INVENTORY STATUS: Xylene is on the DSL Inventory.

U.S. TSCA INVENTORY STATUS: Xylene is listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Xylene is a hazardous substance under Section 311(b)(2A) of the Federal Water Pollution Control Act. Xylene is not listed in Appendix A as a highly hazardous chemical, per 29 CFR 1910.119: Process Safety Management of Highly Hazardous Chemicals. Under this regulation, however, any process that involves a flammable liquid on-site, in one location, in quantities of 10,000 lbs (4,553 kg) or greater is covered under this regulation unless it is used as a fuel.

15. REGULATORY INFORMATION (Continued)

U.S. STATE REGULATORY INFORMATION: Xylene is covered under the following specific State regulations:

Alaska - Designated Toxic and Hazardous Substances: Xylenes.

California - Permissible Exposure Limits for Chemical Contaminants: Xylenes.

Florida - Substance List: Xylenes.

Illinois - Toxic Substance List: Xylenes.

Kansas - Section 302/313 List: Xylenes.

Massachusetts - Substance List: Xylenes.

Michigan Critical Materials Register: Xylenes.

Minnesota - List of Hazardous Substances: Xylenes.

Missouri - Employer Information/Toxic Substance List: Xylenes.

New Jersey - Right to Know Hazardous Substance List: Xylenes.

North Dakota - List of Hazardous Chemicals, Reportable Quantities: Xylenes.

Pennsylvania - Hazardous Substance List: Xylenes.

Rhode Island - Hazardous Substance List: Xylenes.

Texas - Hazardous Substance List: Xylene.

West Virginia - Hazardous Substance List: Xylenes.

Wisconsin - Toxic and Hazardous Substances: Xylenes.

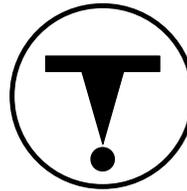
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): Xylene is not on the California Proposition 65 Lists.

LABELING: **WARNING!** FLAMMABLE LIQUID AND VAPOR. FLASH POINT = 17-25°C (62.6-77°F). HARMFUL IF INHALED. PROLONGED OR REPEATED SKIN CONTACT MAY DRY SKIN AND CAUSE IRRITATION. CAN CAUSE CENTRAL NERVOUS SYSTEM EFFECTS. CAN CAUSE ADVERSE EFFECTS ON THE BLOOD SYSTEM. LIVER, KIDNEYS. CAN CAUSE DEATH IF TOO MUCH IS BREATHED. ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE. Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. Avoid contact with skin and clothing. Avoid exposure to vapor. Wash thoroughly after handling. FIRST-AID: In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if irritation develops or persists. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of fire, use water fog, foam, dry chemical, or CO₂. In case of spill: Absorb spill with inert materials (e.g. activated carbon, dry sand). Flush residual spill with water. Consult Material Safety Data Sheet for additional information.

CANADIAN WHMIS SYMBOLS:

Class B2: Flammable Liquid.

Class D2B: Material Causing Other Toxic Effects



16. OTHER INFORMATION

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. MESA assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, MESA assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching.

EXPOSURE LIMITS IN AIR:

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. **TLV** - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (**TWA**), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level (**C**). Skin absorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration. **PEL** - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

IDLH - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (**OSHA**). NIOSH issues exposure guidelines called **Recommended Exposure Levels (RELs)**. When no exposure guidelines are established, an entry of **NE** is made for reference.

HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); **3** (Class IB and IC flammable liquids with flash points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]). Reactivity Hazard: **0** (normally stable); **1** (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).

NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure causes death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD₅₀** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC₅₀** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m³** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. Ecological Information: EC is the effect concentration in water.

REGULATORY INFORMATION:

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act (**SARA**); the Canadian Domestic/Non-Domestic Substances List (**DSL/NDL**); the U.S. Toxic Substance Control Act (**TSCA**); Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act (**CERCLA** or **Superfund**); and various state regulations.