



# MATERIAL SAFETY DATA SHEET

## Unleaded Gasoline

VALERO MARKETING & SUPPLY COMPANY  
and Affiliates  
P.O. Box 696000  
San Antonio, TX 78269-6000

**Emergency Phone Numbers**

24 Hour Emergency: 866-565-5220

Chemtrec Emergency: 800-424-9300

**General Assistance**

General Assistance: 210-345-4593

**BRAND NAMES:** Valero, Diamond Shamrock, Shamrock, Ultramar, Beacon, Total

### Section 1. Chemical Product and Company Identification

**Common / Trade name** : Unleaded Gasoline

**Synonym** : Regular/Premium/Midgrade - Unleaded Gasoline, RFG - Reformulated Unleaded Gasoline, Conventional Unleaded Gasoline, Oxygenated Unleaded Gasoline, Non-Oxygenated Unleaded Gasoline, CARB (California Air Resource Board) Unleaded Gasoline, RBOB - Reformulated Blendstock for Oxygenate Blending, CBOB - Conventional Blendstock for Oxygenate Blending, Petrol, Motor Fuel,

**SYNONYMS/COMMON NAMES:** This Material Safety Data Sheet applies to the listed products and synonym descriptions for Hazard Communication purposes only. Technical specifications vary greatly depending on the product and are not reflected in this document. Consult specification sheets for technical information. This product contains ingredients that are considered to be hazardous as defined by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Material uses** : Motor Fuel

**MSDS #** : 002

**CAS #** : 86290-81-5

### Section 2. Hazards Identification

**Danger!** Contains Benzene. Cancer Hazard. Can cause kidney, liver and blood disorders. May cause irritation to eyes, skin and respiratory system. Avoid liquid, mist and vapor contact. Harmful or fatal if swallowed. Aspiration hazard; can enter lungs and cause damage. May cause irritation or be harmful if inhaled or absorbed through the skin. Extremely flammable liquid. Vapors may explode.

**Physical state** : Liquid.

**Emergency overview** : Danger!

EXTREMELY FLAMMABLE LIQUID AND VAPOR. FLAMMABLE. VAPOR MAY CAUSE FLASH FIRE. CAUSES SKIN IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN OR IF SWALLOWED. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE. CANCER HAZARD - CONTAINS MATERIAL WHICH CAN CAUSE CANCER.

Do not ingest. Avoid prolonged contact with eyes, skin and clothing. Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Risk of cancer depends on duration and level of exposure.

**Routes of entry** : Dermal contact. Eye contact. Inhalation. Ingestion.

**Potential acute health effects**

**Eyes** : May cause severe irritation, redness, tearing, blurred vision and conjunctivitis.

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- Skin** : Prolonged or repeated contact may cause moderate irritation, defatting (cracking), redness, itching, inflammation, dermatitis and possible secondary infection. High pressure skin injections are **SERIOUS MEDICAL EMERGENCIES**. Injury may not appear serious at first. Within a few hours, tissues will become swollen, discolored and extremely painful.
- Inhalation** : Nasal and respiratory tract irritation, central nervous system effects including excitation, euphoria, contracted eye pupils, dizziness, drowsiness, blurred vision, fatigue, nausea, headache, loss of reflexes, tremors, convulsions, seizures, loss of consciousness, coma, respiratory arrest and sudden death could occur as a result of long term and/or high concentration exposure to vapors. May also cause anemia and irregular heart rhythm. Repeated or prolonged exposure may cause behavioral changes.
- Ingestion** : Toxic if swallowed. This product may be harmful or fatal if swallowed. This product may cause nausea, vomiting, diarrhea and restlessness. **DO NOT INDUCE VOMITING**. Aspiration into the lungs can cause severe chemical pneumonitis or pulmonary edema/hemorrhage, which can be fatal. May cause gastrointestinal disturbances. Symptoms may include irritation, depression, vomiting and diarrhea. May cause harmful central nervous system effects, similar to those listed under "inhalation".
- Medical conditions aggravated by over-exposure** : Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs. Preexisting eye, skin, heart, central nervous system and respiratory disorders may be aggravated by exposure to this product. Impaired kidney, liver and blood disorders may be aggravated by exposure to this product.
- Over-exposure signs/symptoms** : Nasal and respiratory tract irritation, central nervous system effects including excitation, euphoria, contracted eye pupils, dizziness, drowsiness, blurred vision, fatigue, nausea, headache, loss of reflexes, tremors, convulsions, seizures, loss of consciousness, coma, respiratory arrest or sudden death could occur as a result of long term and/or high concentration exposure to vapors. May also cause anemia and irregular heart rhythm.

See toxicological information (section 11)

**Section 3. Composition, information on ingredients**

<u>Name</u>	<u>CAS number</u>	<u>Concentration ( % )</u>
Gasoline	86290-81-5	0 - 100
Toluene	108-88-3	0 - 30
Hexane (Other Isomers)	96-14-0	5 - 25
Xylene (o,m,p isomers)	1330-20-7	0 - 25
Octane (All Isomers)	111-65-9	0 - 18.5
Ethanol	64-17-5	0 - 10
1,2,4-Trimethylbenzene	95-63-6	0 - 6
n-Heptane	142-82-5	1 - 5
Pentane	109-66-0	1 - 5
Cumene	98-82-8	0 - 5
Ethylbenzene	100-41-4	0 - 5
Benzene	71-43-2	0 - 4.9
n-Hexane	110-54-3	0 - 3
Cyclohexane	110-82-7	0 - 3

**Section 4. First Aid Measures**

- Eye contact** : Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Seek medical advice if pain or redness continues.
- Skin contact** : Remove contaminated clothing and shoes. Wash exposed area thoroughly with soap and water. Remove contaminated clothing promptly and launder before reuse. Contaminated leather goods should be discarded. If irritation persists or symptoms described in the MSDS develop, seek medical attention. High pressure skin injections are **SERIOUS MEDICAL EMERGENCIES**. Get immediate medical attention.
- Inhalation** : If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

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- Ingestion** : This product may be harmful or fatal if swallowed. This product may cause nausea, vomiting, diarrhea and restlessness. DO NOT INDUCE VOMITING. Aspiration into the lungs can cause severe chemical pneumonitis or pulmonary edema/hemorrhage, which can be fatal. May cause gastrointestinal disturbances. Symptoms may include irritation, depression, vomiting and diarrhea. May cause harmful central nervous system effects, similar to those listed under "inhalation".
- Notes to physician** : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

**Section 5. Fire Fighting Measures**

- Flammability of the product** : Flammable.
- Auto-ignition temperature** : >260°C (500°F)
- Flash point** : Closed cup: -40°C (-40°F).
- Flammable limits** : Lower: 1.3% Upper: 7.1%
- Products of combustion** : These products are carbon oxides (CO, CO<sub>2</sub>), nitrogen and sulfur oxides (NO<sub>x</sub>, SO<sub>x</sub>), particulate matter, VOC's.
- Fire hazards in the presence of various substances** : Extremely flammable in the presence of the following materials or conditions: open flames, sparks and static discharge.
- Explosion hazards in the presence of various substances** : Explosive in the presence of the following materials or conditions: open flames, sparks and static discharge.
- Fire-fighting media and instructions**
- Extinguishing media**
- Suitable** : Use dry chemical, CO<sub>2</sub>, water spray (fog) or foam.
- Not suitable** : Do not use water jet.
- Collect contaminated fire-fighting water separately. It must not enter the sewage system. Dike area of fire to prevent runoff. Decontaminate emergency personnel and equipment with soap and water.
- Highly flammable liquid and vapor. Vapor may cause flash fire. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
- Special remarks on fire hazards** : Dangerous when exposed to heat or flame. Vapors form flammable or explosive mixtures with air at room temperature. Vapor or gas may spread to distant ignition sources (pilot lights, welding equipment, electrical equipment, etc.) and flash back. Vapors may accumulate in low areas. Vapors may concentrate in confined areas. Flowing product can be ignited by self generated static electricity. Use adequate bonding and grounding to prevent static buildup. Runoff to sewer may cause fire or explosion hazard. Containers may explode in heat of fire. Irritating or toxic substances may be emitted upon thermal decomposition. For fires involving this material, do not enter any enclosed or confined space without proper protective equipment, which may include NIOSH approved self-contained breathing apparatus with full face mask. Clothing, rags or similar organic material contaminated with this product and stored in a closed space may undergo spontaneous combustion. Transfer to and from commonly bonded and grounded containers.

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## Section 6. Accidental Release Measures

- Personal precautions** : Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment (section 8). Do not touch or walk through spilled material. Tanks, vessels or other confined spaces which have contained product should be freed of vapors before entering. The container should be checked to ensure a safe atmosphere before entry. Empty containers may contain toxic, flammable/combustible or explosive residues or vapors. Do not cut, grind, drill, weld or reuse empty containers that contained this product. Do not transfer this product to another container unless the container receiving the product is labeled with proper DOT shipping name, hazard class and other information that describes the product and its hazards.
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Gasoline may contain oxygenated blend products (Ethanol, etc.) that are soluble in water and therefore precautions should be taken to protect surface and groundwater sources from contamination. If facility or operation has an "oil or hazardous substance contingency plan", activate its procedures. Stay upwind and away from spill. Wear appropriate protective equipment including respiratory protection as conditions warrant. Do not enter or stay in area unless monitoring indicates that it is safe to do so. Isolate hazard area and restrict entry to emergency crew. Extremely flammable. Review Fire Fighting Measures section before proceeding with clean up. Keep all sources of ignition (flames, smoking, flares, etc.) and hot surfaces away from release. Contain spill in smallest possible area. Recover as much product as possible (e.g., by vacuuming). Stop leak if it can be done without risk. Use water spray to disperse vapors. Spilled material may be absorbed by an appropriate absorbent, and then handled in accordance with environmental regulations. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment or drainage systems and natural waterways. Contact fire authorities and appropriate federal, state and local agencies. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, contact the National Response Center at 800-424- 8802. For highway or railway spills, contact Chemtrec at 800-424-9300.
- Methods for cleaning up**
- Small spill** : For small spills, add absorbent (soil may be used in the absence of other suitable materials) and use a non-sparking or explosion-proof means to transfer material to a sealable, appropriate container for disposal. Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.
- Large spill** : If emergency personnel are unavailable, contain spilled material. For large spills, dike spilled material or otherwise contain it to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal.

## Section 7. Handling and Storage

- Handling** : Do not ingest. Avoid prolonged contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Keep away from heat, sparks and flame. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Wash thoroughly after handling. Use only in well ventilated locations. Keep away from heat, spark and flames. In case of fire, use water spray, foam, dry chemical or carbon dioxide as described in the Fire Fighting Measures section of the MSDS. Do not pressurize, cut, weld, braze, solder, drill on or near this container. "Empty" container contains residue (liquid and/or vapor) and may explode in heat of a fire. Use good personal hygiene practices. After handling this product, wash hands before eating, drinking, or using toilet facilities. Keep out of reach of children. Failure to use caution may cause serious injury or illness. Never siphon by mouth. For use as a motor fuel only. Do not use as a cleaning solvent or for other non-motor fuel uses. To prevent ingestion and exposure - Do not siphon by mouth to transfer product between containers. Use good personal hygiene practices. After handling this product, wash hands before eating, drinking, or using toilet facilities.

**Storage** : Store in tightly closed containers in cool, dry, isolated and well ventilated area away from heat, sources of ignition and incompatible materials. Use non-sparking tools and explosion proof equipment. Ground lines, containers, and other equipment used during product transfer to reduce the possibility of a static induced spark. Do not "switch load" because of possible accumulation of a static charge resulting in a source of ignition. Use good personal hygiene practices.

## Section 8. Exposure controls, personal protection

**Engineering measures** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

### Personal protection

**Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. Keep away from eyes. Eye contact can be avoided by wearing safety glasses or chemical splash goggles.

**Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Keep away from skin. Skin contact can be minimized by wearing protective gloves such as neoprene, nitrile-butadiene rubber, etc. and, where necessary, impervious clothing and boots. Leather goods contaminated with this product should be discarded. A source of clean water should be available in the work area for flushing eyes and skin. Flame Retardant Clothing is recommended.

**Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. If workplace exposure limits for product or components are exceeded, NIOSH approved equipment should be worn. Proper respirator selection should be determined by adequately trained personnel, based on the contaminants, the degree of potential exposure and published respiratory protection factors. This equipment should be available for nonroutine and emergency use.

**Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

**Personal protective equipment (Pictograms)** : Consult your Supervisor or S.O.P. for special handling directions.



**Personal protection in case of a large spill** : Splash goggles. Full suit. Vapor respirator. Boots. Gloves. Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product. Suggested protective clothing might not be adequate. Consult a specialist before handling this product.

**Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

### Component

### Exposure limits

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Gasoline	<b>ACGIH TLV (United States, 5/2004).</b> STEL: 500 ppm 15 minute(s). Form: All forms TWA: 300 ppm 8 hour(s). Form: All forms
Toluene	<b>ACGIH TLV (United States, 5/2004).</b> Skin Notes: 1996 Adoption Refers to Appendix A -- Carcinogens. TWA: 50 ppm 8 hour(s). Form: All forms <b>NIOSH REL (United States, 6/2001).</b> STEL: 150 ppm 15 minute(s). Form: All forms TWA: 100 ppm 10 hour(s). Form: All forms <b>OSHA PEL Z2 (United States, 6/2002).</b> AMP: 500 ppm 10 minute(s). Form: All forms CEIL: 300 ppm Form: All forms TWA: 200 ppm 8 hour(s). Form: All forms
Hexane (Other Isomers)	<b>ACGIH TLV (United States, 9/2004).</b> STEL: 1000 ppm 15 minute(s). Form: All forms TWA: 500 ppm 8 hour(s). Form: All forms <b>NIOSH REL (United States, 6/2001).</b> CEIL: 510 ppm 15 minute(s). Form: All forms
Xylene (o,m,p isomers)	<b>ACGIH TLV (United States, 5/2004).</b> STEL: 150 ppm 15 minute(s). Form: All forms TWA: 100 ppm 8 hour(s). Form: All forms <b>OSHA PEL (United States, 6/1993).</b> TWA: 100 ppm 8 hour(s). Form: All forms
Octane (All Isomers)	<b>NIOSH REL (United States, 6/2001).</b> CEIL: 385 ppm 15 minute(s). Form: All forms TWA: 75 ppm 10 hour(s). Form: All forms <b>OSHA PEL (United States, 6/1993).</b> TWA: 500 ppm 8 hour(s). Form: All forms
Ethanol	<b>ACGIH TLV (United States, 3/2004).</b> Notes: 1999 Adoption. TWA: 300 ppm 8 hour(s). Form: All forms <b>ACGIH TLV (United States, 5/2004).</b> Notes: 1996 Adoption Refers to Appendix A -- Carcinogens. TWA: 1000 ppm 8 hour(s). Form: All forms <b>NIOSH REL (United States, 6/2001).</b> TWA: 1000 ppm 10 hour(s). Form: All forms <b>OSHA PEL (United States, 6/1993).</b> TWA: 1000 ppm 8 hour(s). Form: All forms
1,2,4-Trimethylbenzene	<b>NIOSH REL (United States, 12/2001).</b> TWA: 25 ppm 10 hour(s). Form: All forms <b>ACGIH TLV (United States, 1/2005).</b> TWA: 25 ppm 8 hour(s). Form: All forms
n-Heptane	<b>ACGIH TLV (United States, 9/2004).</b> STEL: 500 ppm 15 minute(s). Form: All forms TWA: 400 ppm 8 hour(s). Form: All forms <b>NIOSH REL (United States, 6/2001).</b> TWA: 350 mg/m <sup>3</sup> 10 hour(s). Form: All forms <b>OSHA PEL (United States, 6/1993).</b> TWA: 500 ppm 8 hour(s). Form: All forms
Pentane	<b>ACGIH TLV (United States, 9/2004).</b> Notes: 1998 Adoption. TWA: 600 ppm 8 hour(s). Form: All forms
Cumene	<b>NIOSH REL (United States, 6/2001).</b> CEIL: 610 ppm 15 minute(s). Form: All forms TWA: 120 ppm 10 hour(s). Form: All forms <b>OSHA PEL (United States, 6/1993).</b> TWA: 1000 ppm 8 hour(s). Form: All forms <b>ACGIH TLV (United States, 3/2004).</b> Notes: 1999 Adoption. TWA: 50 ppm 8 hour(s). Form: All forms
Ethylbenzene	<b>NIOSH REL (United States, 6/2001).</b> Skin TWA: 50 ppm 10 hour(s). Form: All forms <b>OSHA PEL (United States, 6/1993).</b> Skin TWA: 50 ppm 8 hour(s). Form: All forms <b>ACGIH TLV (United States, 1/2004).</b> STEL: 125 ppm 15 minute(s). Form: All forms TWA: 100 ppm 8 hour(s). Form: All forms <b>NIOSH REL (United States, 6/2001).</b> STEL: 125 ppm 15 minute(s). Form: All forms TWA: 100 ppm 10 hour(s). Form: All forms <b>OSHA PEL (United States, 6/1993).</b> TWA: 100 ppm 8 hour(s). Form: All forms
Benzene	<b>NIOSH REL (United States, 6/2001).</b> Notes: See Appendix A - NIOSH Potential Occupational Carcinogen

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	STEL: 1 ppm 15 minute(s). Form: All forms TWA: 0.1 ppm 10 hour(s). Form: All forms <b>ACGIH TLV (United States, 1/2006). Skin</b> STEL: 2.5 ppm 15 minute(s). Form: All forms TWA: 0.5 ppm 8 hour(s). Form: All forms <b>OSHA PEL (United States, 6/1993).</b> STEL: 5 ppm 15 minute(s). Form: All forms TWA: 1 ppm 8 hour(s). Form: All forms
n-Hexane	<b>OSHA PEL (United States, 6/1993).</b> TWA: 500 ppm 8 hour(s). Form: All forms <b>ACGIH TLV (United States, 9/2004). Skin</b> TWA: 50 ppm 8 hour(s). Form: All forms <b>NIOSH REL (United States, 6/2001).</b> TWA: 50 ppm 10 hour(s). Form: All forms
Cyclohexane	<b>ACGIH TLV (United States, 1/2004).</b> TWA: 100 ppm 8 hour(s). Form: All forms <b>NIOSH REL (United States, 6/2001).</b> TWA: 300 ppm 10 hour(s). Form: All forms <b>OSHA PEL (United States, 6/1993).</b> TWA: 300 ppm 8 hour(s). Form: All forms

Consult local authorities for acceptable exposure limits.

**Section 9. Physical and Chemical Properties**

<b>Physical state</b>	: Liquid.
<b>Color</b>	: Light Straw to Red Clear Liquid
<b>Odor</b>	: Characteristic Gasoline Odor (Strong.)
<b>Boiling point</b>	: 26.7 to 226.7°C (80.1 to 440.1°F)
<b>Melting/freezing point</b>	: May start to solidify at the following temperature: 6.67°C (44°F) This is based on data for the following ingredient: Cyclohexane. Weighted average: -91.9°C (-133.4°F)
<b>Specific gravity</b>	: 0.66 to 0.75 (Water = 1) (@ 60 °F)
<b>Vapor pressure</b>	: 60.8 to 101.3 kPa (456 to 760 mm Hg) (at 20°C)
<b>Vapor density</b>	: 3 to 4 (Air = 1)
<b>Volatility</b>	: Essentially 100%
<b>Evaporation rate</b>	: 10 to 11 compared with Butyl acetate.
<b>Solubility</b>	: Very slightly soluble in the following materials: cold water and hot water.

**Section 10. Stability and reactivity data**

<b>Stability</b>	: The product is stable.
<b>Hazardous polymerization</b>	: Under normal conditions of storage and use, hazardous polymerization will not occur.
<b>Conditions to avoid</b>	: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas. Avoid exposure - obtain special instructions before use.
<b>Materials to avoid</b>	: Highly reactive or incompatible with the following materials: oxidizing materials
<b>Hazardous decomposition products</b>	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
<b>Conditions of reactivity</b>	: Extremely flammable in the presence of the following materials or conditions: open flames, sparks and static discharge.  Explosive in the presence of the following materials or conditions: open flames, sparks and static discharge.

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## Section 11. Toxicological Information

### Toxicity data

**BENZENE** is considered to be a carcinogen to humans, and may cause adverse health effects following exposure via inhalation, ingestion or dermal or eye contact. Acute inhalation of benzene by rats, mice or rabbits caused narcosis, spontaneous heart contractions (ventricular fibrillation) and death due to respiratory paralysis. Subchronic inhalation of benzene by rats produced decreased white blood cell counts, decreased bone marrow cell activity, increased red blood cell activity and cataracts. In rats, chronic inhalation or oral administration of benzene produced cancers of the liver, mouth and Zymbal gland. Acute inhalation exposure of benzene in humans has caused nerve inflammation (polyneuritis), central nervous system depression and cardiac sensitization. Chronic exposure to benzene has produced anorexia and irreversible injury to the blood forming organs. Potential effects include aplastic anemia and leukemia. It has caused fetal defects in tests on laboratory animals.

**CUMENE** can affect the body if it is inhaled, swallowed or comes in contact with the eyes or skin. The main toxic effect is irritation of the eyes, skin and upper respiratory tract. Narcosis has been reported to occur in animals on high exposure. There are no reports of systemic effects in man as a result of industrial exposure. Chronic exposure of rats above 500 ppm causes congestion of lungs, liver and kidneys, but no bone marrow changes.

**CYCLOHEXANE** can affect the body if it is inhaled, swallowed, or comes in contact with the eyes or skin. It is primarily a local irritant and central nervous system depressant. The depressant effect is from exposure to concentrations above 12,000 ppm, while prolonged or repeated exposure to concentrations above 300 ppm produces a mild irritation of the eyes and upper respiratory tract.

**ETHANOL** is rapidly absorbed through the gastrointestinal tract and normally metabolized and excreted in a relatively few hours. Only in very unusual work situations could the inhalation of ethanol vapors result in symptoms of alcohol intoxication. Can be fatal or cause blindness if swallowed in extreme quantities. Inhalation or ingestion can cause headache, nausea, dizziness or narcosis. Chronic overexposure (inhalation or ingestion) can cause damage to the gastrointestinal tract, liver, kidneys and cardiovascular system. Prolonged contact causes irritation to skin and eyes. Medical conditions aggravated by exposure include kidney, liver, heart and GI conditions. This material is not listed as a cancer causing agent but is suspected of being a promoter.

**ETHYLBENZENE** can affect the body if it is inhaled, swallowed or comes in contact with the eyes or skin. It is primarily an irritant of skin, and to some degree, of eyes and upper respiratory tract. Systemic absorption causes depression of the central nervous system with narcosis at very high concentrations. On the eyes and nose, the vapor at 5000 ppm causes intolerable irritation, eye irritation and lacrimation are immediate and severe at 2000 ppm, irritation and tearing occur at 1000 ppm although tolerance develops rapidly, and the vapor is a transient irritant on human eyes at 200 ppm. Aspiration of small amounts causes extensive edema and hemorrhage of lung tissue. A draft report on a study conducted by the National Toxicology program states that lifetime inhalation exposure of rats and mice to concentrations of ethylbenzene (750 ppm) resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations of ethylbenzene (75 ppm or 250 ppm). The draft report does not address the relevance of these results to humans.

**GASOLINE** contains benzene, as well as n-hexane, other aromatics and certain olefins. Gasoline generally acts as an anesthetic and mucous membrane irritant. Inhalation is the most important route of occupational entry. Eye and throat irritation occur in several hours at exposures of 160 to 270 ppm, eye, nose and throat irritation and dizziness occurs at exposures of 500 to 900 ppm in one hour, mild anesthesia occurs in 30 minutes at exposures of 2000 ppm. The threshold for immediate mild toxic effect is 900 to 1000 ppm. There are reports of toxic neuritis after exposure to gasoline. Repeated exposure of laboratory animals to high concentrations of gasoline vapors has caused kidney damage and cancer in rats and cancer in mice. Gasoline was evaluated for genetic activity in assays using microbial cells, cultured mammalian cells and rat bone marrow cells. The results were all negative so gasoline was considered nonmutagenic under these conditions. Overexposure to this product or its components has been suggested as a cause of liver abnormalities in laboratory animals and humans. Lifetime studies by the American Petroleum Institute have shown that kidney damage and kidney cancer can occur in male rats after prolonged inhalation exposures at elevated concentrations of total gasoline. Kidneys of mice and female rats were unaffected. The U.S. EPA Risk Assessment Forum has concluded that the male rat kidney tumor results are not relevant for humans. Total gasoline exposure also produced liver tumors in female mice only. The implication of these data for humans has not been determined.

**HEPTANE** can affect the body if it is inhaled, comes in contact with the eyes or skin, or is swallowed. Heptane vapor is a narcotic. Concentrations of 10,000 to 15,000 ppm produced narcosis in mice within 30 to 60 minutes, while 15,000 to 20,000 ppm caused convulsions and death. At 48,000 ppm, respiratory arrest was produced in mice in 3 to 4 minutes from the start of exposure. Human subjects exposed to 1,000 ppm for 6 minutes, or to 2,000 ppm for 4 minutes, reported slight vertigo. At 5,000 ppm for 4 minutes, there was marked vertigo, inability to walk a straight line, hilarity, and incoordination, but no complaints of eye and upper respiratory tract or mucous membrane irritation. A 15-minute exposure at 5,000 ppm produced in some subjects a state of stupor lasting for 30 minutes after exposure. These subjects also reported loss of appetite, slight nausea, and a taste resembling gasoline for several hours after exposure. Although chronic nervous system effects have not been attributed to heptane, polyneuritis has been reported following prolonged exposure to a petroleum fraction with boiling range between 70°C and 100°C, and this fraction would normally contain various isomers of heptane as major ingredients.

**n-HEXANE** can affect the body if it is inhaled, comes in contact with the eyes or skin, or is swallowed. Hexane vapor is a narcotic and a mild upper respiratory irritant. Polyneuropathy (peripheral nerve damage) has been reported to occur in workers exposed to hexane vapors, characterized by progressive weakness and numbness in the extremities, loss of deep tendon reflexes and reduction of motor nerve conduction velocity. Recovery ranges from no recovery to complete recovery depending upon the duration of exposure and severity of nerve damage. Concentrations of 30,000 ppm produced narcosis in mice within 30 to 60 minutes, convulsions and death occurred at 35,000 to 40,000 ppm, and at 64,000 ppm respiratory arrest was produced in 2.5 to 4.5 minutes from the start of exposure. Concentrations up to 8000 ppm produced no anesthesia. In human subjects, 2000 ppm for 10 minutes produced no effects, but 5000 ppm resulted in dizziness and a sensation of giddiness. Other investigators reported slight nausea, headache and irritation of the eyes and throat at 1400 to 1500 ppm. In industrial practice, mild narcotic symptoms such as dizziness have been observed when concentrations exceeded 1000 ppm, but not below 500 ppm.

**OCTANE** can affect the body if it is inhaled, comes in contact with the skin or eyes or is swallowed. Octane vapor is a mild narcotic and mucous membrane irritant. Concentrations of 6600 to 13,700 ppm produced narcosis in mice in 30 to 90 minutes, the fatal concentration for animals is near 13,500 ppm. No chronic systemic effects have been reported in humans.

**PENTANE** can affect the body if it is inhaled, comes in contact with the eyes or skin, or is swallowed. The chief effects of inhalation are narcosis and irritation of the respiratory passages. Exposures of 90,000 to 120,000 ppm resulted in narcosis in animals in 5 to 6 minutes, 130,000 ppm was fatal with respiratory arrest occurring within 5 minutes of exposure. Pentane injected subcutaneously in rats produced temporary impairment of liver function and moderate neutropenia. While other aliphatic hydrocarbons produce drowsiness and mild irritation of the eyes and nose in human subjects, no symptoms resulted from exposure to pentane vapor for 10 minutes at 5000 ppm. Chronic exposure to high concentrations may lead to polyneuropathy (peripheral nerve damage), characterized by progressive weakness and numbness in the extremities, loss of deep tendon reflexes and reduction of motor nerve conduction velocity.

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**TOLUENE** can affect the body if it is inhaled, comes in contact with the eyes or skin or it is swallowed. It may also enter the body through the skin. Toluene vapors cause narcosis. Controlled exposures of human subjects to 200 ppm for 8 hours produced mild fatigue, weakness, confusion, lacrimation and paresthesia. At 600 ppm for 8 hours, there was 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. 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 same chronic injury to bone marrow caused by benzene. Liquid splashed in the eyes of workers has caused transient corneal damage and conjunctival irritation, complete recovery occurred within 48 hours. Animal studies have shown that inhalation of high levels of toluene produced cardiac sensitization. Such sensitization may cause fatal changes in heart rhythms. This later effect was shown to be enhanced by hypoxia or the injection of adrenalin-like agents. Workers exposed at less than 200 ppm have complained of headache, lassitude and nausea, but physical findings were essentially negative. At concentrations between 200 and 500 ppm, impairment of coordination, momentary loss of memory and anorexia were present. Between 500 and 1500 ppm, palpitation, extreme weakness, pronounced loss of coordination and impairment of reaction time were noted. The red cell count fell in many instances and there were cases of aplastic anemia in which recovery followed intensive hospital treatment (although some of the effects may have been due to benzene impurity). Toluene has been reported to decrease immunological responses and cause recordable hearing loss in test animals. Damages genetic material in mammalian test systems. May cause adverse reproductive effects based on animal testing.

**TRIMETHYL BENZENE (PSEUDOCUMENE)** can affect the body if it is inhaled, comes in contact with the eyes or skin or it is swallowed. It may also enter the body through the skin. The liquid is a primary skin irritant, but system intoxication due to absorption through the skin is not probable. High concentrations of vapors (5000 to 9000 ppm) caused central nervous system depression. Pseudocumene may cause nervousness, tension, anxiety, and asthmatic bronchitis. In addition, the peripheral blood showed a tendency to hypochromic anemia and a deviation from the normal in the coagulability of the blood.

**XYLENE** can affect the body if it is inhaled, comes in contact with the eyes or skin or it is swallowed. It may also enter the body through the skin. Xylene vapor irritates the eyes, mucous membranes and skin. At high concentrations it causes narcosis. In animals, xylene causes blood changes reflecting mild toxicity to the hematopoietic system. Laboratory animals exposed by various routes to high doses of xylene showed evidence of effects in the liver, kidneys, lungs, spleen, heart and adrenals. Rats exposed to xylene vapor during pregnancy showed embryo/fetotoxic effects. Mice exposed orally to doses producing maternal toxicity also showed embryo or fetotoxic effects. Laboratory rats exposed to high concentrations of toluene experienced recordable hearing loss. In humans, exposure to high concentrations can cause dizziness, excitement, drowsiness, incoordination and a staggering gait. Workers exposed to concentrations above 200 ppm complain of anorexia, nausea, vomiting and abdominal pain. Brief exposures of humans to 200 ppm caused irritation of the eyes, nose and throat. There are reports of reversible corneal vacuolation in workers exposed to xylene, or to xylene plus other volatile solvents.

**HEXANE ISOMERS** are three times as toxic to mice as is pentane. Narcosis was produced in mice within 30-60 minutes at concentrations of 30,000 ppm. In man, concentrations for 10 minutes at 2000 ppm produced no effects, but 5000 ppm caused dizziness and a sense of giddiness. Concentrations of 1400-1500 ppm produced slight nausea, headache, eye, and throat irritation.

### Acute toxicity

Product/ingredient name	Result	Species	Dose
Gasoline	LD50 Oral	Rat	92 g/kg
	LD50 Oral	Rat	13.6 g/kg
Toluene	LD50 Dermal	Rabbit	14100 uL/kg
	LD50 Intraperitoneal	Rat	1332 mg/kg
	LD50 Intravenous	Rat	1960 mg/kg
	LD50 Oral	Rat	636 mg/kg
	LD50 Unreported	Rat	6900 mg/kg
	LDLo Intraperitoneal	Rat	2.5 mL/kg
	TDLo Intraperitoneal	Rat	900 mg/kg
	TDLo Intraperitoneal	Rat	1 g/kg
	TDLo Intraperitoneal	Rat	750 mg/kg
	TDLo Intraperitoneal	Rat	600 mg/kg
	TDLo Oral	Rat	400 mg/kg
	TDLo Oral	Rat	800 mg/kg
Xylene (o,m,p isomers)	LD50 Dermal	Rabbit	>1700 mg/kg
	LD50 Intraperitoneal	Rat	2459 mg/kg
	LD50 Oral	Rat	4300 mg/kg
Ethanol	LD50 Subcutaneous	Rat	1700 mg/kg
	LD50 Intra-arterial	Rat	11 mg/kg
	LD50 Intraperitoneal	Rat	3600 ug/kg
	LD50 Intravenous	Rat	1440 mg/kg
	LD50 Oral	Rat	7060 mg/kg
	LD50 Oral	Rat	7 g/kg
	LDLo Dermal	Rabbit	20 g/kg
	TDLo Intraperitoneal	Rat	2700 mg/kg
	TDLo Intraperitoneal	Rat	1.25 mg/kg
	TDLo Intraperitoneal	Rat	1000 mg/kg
	TDLo Intracerebral	Rat	363.6 ug/kg
	TDLo Intraperitoneal	Rat	500 mg/kg
	TDLo Intravenous	Rat	0.5 g/kg
	TDLo Intraperitoneal	Rat	0.5 g/kg
	TDLo Oral	Rat	6 g/kg
TDLo Oral	Rat	10 mL/kg	
TDLo Oral	Rat	6.67 mL/kg	
TDLo Oral	Rat	5 mL/kg	
TDLo Intraperitoneal	Rat	2.45 g/kg	
TDLo Oral	Rat	6000 mg/kg	
TDLo Oral	Rat	5250 mg/kg	

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	TDLo Oral	Rat	5000 mg/kg
	TDLo Oral	Rat	4800 mg/kg
	TDLo Oral	Rat	5.25 g/kg
	TDLo Oral	Rat	0.5 g/kg
	TDLo Oral	Rat	3 g/kg
	TDLo Oral	Rat	2.5 g/kg
	TDLo Intraperitoneal	Rat	0.25 g/kg
	TDLo Oral	Rat	0.72 g/kg
	TDLo Oral	Rat	1600 mg/kg
	TDLo Oral	Rat	1500 mg/kg
	TDLo Oral	Rat	5 g/kg
	TDLo Intraperitoneal	Rat	1.5 g/kg
	TDLo Oral	Rat	8000 mg/kg
	TDLo Intraperitoneal	Rat	2 g/kg
	TDLo Oral	Rat	6.4 g/kg
	TDLo Intraperitoneal	Rat	1 g/kg
	TDLo Intraperitoneal	Rat	3500 mg/kg
	TDLo intracerebral	Rat	106 ug/kg
	TDLo Intraperitoneal	Rat	2.4 mg/kg
	TDLo Intraperitoneal	Rat	3000 mg/kg
	TDLo Unreported	Rat	3 g/kg
1,2,4-Trimethylbenzene	LD50 Oral	Rat	5 g/kg
	LDLo intraperitoneal	Rat	1752 mg/kg
Pentane	LD50 Oral	Rat	>2000 mg/kg
Cumene	LD50 Dermal	Rabbit	12300 uL/kg
	LD50 Oral	Rat	1400 mg/kg
	LD50 Oral	Rat	2.9 g/kg
Ethylbenzene	LD50 Dermal	Rabbit	17800 uL/kg
	LD50 Oral	Rat	3500 mg/kg
	TDLo intraperitoneal	Rat	1062 mg/kg
Benzene	LD50 Dermal	Rabbit	>9400 uL/kg
	LD50 Intraperitoneal	Rat	1100 ug/kg
	LD50 Oral	Rat	1800 mg/kg
	LD50 Oral	Rat	930 mg/kg
	LD50 Oral	Rat	1 mL/kg
	LD50 Oral	Rat	6400 mg/kg
	LDLo Subcutaneous	Rat	5 mg/kg
	TDLo Dermal	Rat	0.92 mL/kg
	TDLo Oral	Rat	320 mg/kg
	TDLo Oral	Rat	1280 mg/kg
n-Hexane	LD50 Oral	Rat	25 g/kg
	LDLo Intraperitoneal	Rat	9100 mg/kg
	TDLo Oral	Rat	20000 mg/kg
Cyclohexane	LD Dermal	Rabbit	>180 g/kg
	LD50 Oral	Rat	12705 mg/kg

**Carcinogenicity****Classification**

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Gasoline	A3	-	-	-	-	-
Toluene	A4	3	-	-	-	-
Xylene (o,m,p isomers)	A4	3	-	-	-	-
Ethanol	A4	-	-	-	-	-
Ethylbenzene	A3	2B	-	-	-	-
Benzene	A1	1	-	+	Proven.	+

**Chronic effects on humans :** **CARCINOGENIC EFFECTS:** Classified A3 (Proven for animals.) by ACGIH [Gasoline]. Classified 2 (Suspected for humans.) by European Union [Gasoline]. Classified A4 (Not classifiable for humans or animals.) by ACGIH, 3 (Not classifiable for humans.) by IARC [Toluene]. Classified A4 (Not classifiable for humans or animals.) by ACGIH, 3 (Not classifiable for humans.) by IARC [Xylene (o,m,p isomers)]. Classified A4 (Not classifiable for humans or animals.) by ACGIH [Ethanol]. Classified A3 (Proven for animals.) by ACGIH, 2B (Possible for humans.) by IARC [Ethylbenzene]. Classified A1 (Confirmed for humans.) by ACGIH, 1 (Proven for humans.) by IARC, 1 (Known to be human carcinogens.) by NTP, + (Proven.) by OSHA, + (Proven.) by NIOSH, 1 (Proven for humans.) by European Union [Benzene].

**MUTAGENIC EFFECTS:** Classified 2 by European Union [Benzene].

Contains material which may cause damage to the following organs: blood, kidneys, lungs, the reproductive system, liver, peripheral nervous system, gastrointestinal tract, upper respiratory tract, skin, bone marrow, central nervous system (CNS), eye, lens or cornea.

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**Other toxic effects on humans** : Extremely hazardous by the following route of exposure: of ingestion.  
Very hazardous by the following route of exposure: of eye contact (irritant).  
Hazardous by the following route of exposure: of skin contact (irritant).  
Slightly hazardous by the following route of exposure: of inhalation (lung irritant).

**Specific effects**

**Carcinogenic effects** : Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.

**Target organs** : Contains material which causes damage to the following organs: skin.  
Contains material which may cause damage to the following organs: blood, kidneys, lungs, the reproductive system, liver, peripheral nervous system, gastrointestinal tract, upper respiratory tract, bone marrow, central nervous system (CNS), eye, lens or cornea.

**Section 12. Ecological Information****Ecotoxicity data**

Product/ingredient name	Result	Species	Exposure
Toluene	Acute EC50 6880 to 9830 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute EC50 6780 to 7810 ug/L Fresh water	Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss	96 hours
	Acute EC50 6000 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute EC50 19600 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 15.5 ppm Marine water	Crustaceans - Daggerblade grass shrimp - Palaemonetes pugio	48 hours
	Acute LC50 15500 ug/L Marine water	Crustaceans - Daggerblade grass shrimp - Palaemonetes pugio	48 hours
	Acute LC50 36.2 to 44.6 mg/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours
	Acute LC50 17.03 to 19.05 mg/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours
	Acute LC50 6780 to 7810 ug/L Fresh water	Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss	96 hours
	Acute LC50 6410 to 7180 ug/L Marine water	Fish - Pink salmon - Oncorhynchus gorbuscha	96 hours
	Acute LC50 15.53 to 17.16 mg/L Fresh water	Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss	96 hours
	Acute LC50 5800 ug/L Fresh water	Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss	96 hours
	Acute LC50 5500 ug/L Fresh water	Fish - Coho salmon, silver salmon - Oncorhynchus kisutch	96 hours
	Acute LC50 310000 to 420000 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 170000 ug/L Marine water	Crustaceans - Dungeness or edible crab - Cancer magister	48 hours
	Acute LC50 97700 to 174700 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 13 to 15 mg/L Fresh water	Fish - Bluegill - Lepomis macrochirus	96 hours
	Acute LC50 86300 to 174700 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Xylene (o,m,p isomers)	Acute LC50 7.3 ul/L Marine water	Fish - Striped bass - Morone saxatilis
Acute LC50 8.5 ppm Marine water		Crustaceans - Daggerblade grass shrimp - Palaemonetes pugio	48 hours
Acute LC50 13500 to 15034 ug/L Fresh water		Fish - Bluegill - Lepomis macrochirus	96 hours
Acute LC50 13500 to 19200 ug/L Fresh water		Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss	96 hours
Acute LC50 13400 ug/L Fresh water		Fish - Fathead minnow - Pimephales promelas	96 hours
Acute LC50 13300 to 16114 ug/L Fresh water		Fish - Bluegill - Lepomis macrochirus	96 hours
Acute LC50 12000 to 16114 ug/L Fresh water		Fish - Bluegill - Lepomis macrochirus	96 hours
Acute LC50 12000 to 13762 ug/L Fresh water		Fish - Bluegill - Lepomis macrochirus	96 hours
Acute LC50 8600 to 9591 ug/L Fresh water		Fish - Bluegill - Lepomis macrochirus	96 hours
Acute LC50 8500 ug/L Marine water		Crustaceans - Daggerblade grass shrimp - Palaemonetes pugio	48 hours
Acute LC50 8200 to 10032 ug/L Fresh water		Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss	96 hours
Acute LC50 3300 to 4093 ug/L Fresh water		Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss	96 hours
Acute LC50 13500 to 16100 ug/L Fresh water		Fish - Bluegill - Lepomis macrochirus	96 hours
Acute EC50 9.3 to 11.2 g/L Fresh water		Daphnia - Water flea - Daphnia magna	48 hours
Acute EC50 10600 to 11200 mg/L Fresh water		Daphnia - Water flea - Daphnia obtusa	48 hours
Acute EC50 >100 ppm Fresh water		Daphnia - Water flea - Daphnia magna	48 hours
Acute EC50 2000 ug/L Fresh water		Daphnia - Water flea - Daphnia magna	48 hours
Acute LC50 13 to 16 ml/L Fresh water		Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss	96 hours
Acute LC50 5577000 to 6557000 ug/L Fresh water		Daphnia - Water flea - Ceriodaphnia dubia	48 hours
Acute LC50 3715000 to 4432000 ug/L Fresh water	Daphnia - Water flea - Ceriodaphnia dubia	48 hours	
Acute LC50 >100000 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours	
Acute LC50 42000 ug/L Fresh water	Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss	4 days	
	Crustaceans - Brine shrimp - Artemia		

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	Acute LC50 11000000 ug/L Marine water	franchiscana	
	Acute LC50 10000000 to 11500000 ug/L Marine water	Fish - Bleak - Alburnus alburnus	96 hours
	Acute LC50 5680 to 7392 mg/L Fresh water	Fish - Bleak - Alburnus alburnus	96 hours
	Acute LC50 6076000 to 7115000 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 6325000 to 7413000 ug/L Fresh water	Daphnia - Water flea - Ceriodaphnia dubia	48 hours
	Acute LC50 14200000 to 15100000 ug/L Fresh water	Daphnia - Water flea - Ceriodaphnia dubia	48 hours
	Acute LC50 13480000 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours
	Chronic NOEC <6.3 g/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours
1,2,4-Trimethylbenzene	Acute LC50 17000 ug/L Marine water	Daphnia - Water flea - Daphnia magna	48 hours
		Crustaceans - Dungeness or edible crab - Cancer magister	48 hours
	Acute LC50 7720 to 8280 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours
n-Heptane	Acute LC50 4924000 ug/L Fresh water	Fish - Western mosquitofish - Gambusia affinis	96 hours
	Acute LC50 375000 ug/L Fresh water	Fish - Mozambique tilapia - Tilapia mossambica	96 hours
Cumene	Acute EC50 11200 to 14100 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute EC50 10600 to 14100 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute EC50 7500 to 11200 ug/L Fresh water	Crustaceans - Brine shrimp - Artemia sp.	48 hours
	Acute EC50 7400 to 11290 ug/L Fresh water	Crustaceans - Brine shrimp - Artemia sp.	48 hours
	Acute LC50 30500 to 39900 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 8000 to 12590 ug/L Fresh water	Crustaceans - Brine shrimp - Artemia sp.	48 hours
	Acute LC50 20300 to 45100 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 34300 to 46300 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 7400 to 11290 ug/L Fresh water	Crustaceans - Brine shrimp - Artemia sp.	48 hours
	Acute LC50 6320 to 6610 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours
	Acute LC50 5100 ug/L Fresh water	Fish - Guppy - Poecilia reticulata	96 hours
	Acute LC50 2700 ug/L Fresh water	Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss	96 hours
Ethylbenzene	Acute EC50 13300 to 18100 ug/L Fresh water	Crustaceans - Brine shrimp - Artemia sp.	48 hours
	Acute EC50 6530 to 9460 ug/L Fresh water	Crustaceans - Brine shrimp - Artemia sp.	48 hours
	Acute EC50 2970 to 4400 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute EC50 2930 to 4400 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 13300 to 18100 ug/L Fresh water	Crustaceans - Brine shrimp - Artemia sp.	48 hours
	Acute LC50 150 to 200 mg/L Fresh water	Fish - Bluegill - Lepomis macrochirus	96 hours
	Acute LC50 12100 to 12700 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours
	Acute LC50 11900 to 15600 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours
	Acute LC50 9600 ug/L Fresh water	Fish - Guppy - Poecilia reticulata	96 hours
	Acute LC50 9100 to 11000 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours
	Acute LC50 9090 to 11000 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours
	Acute LC50 8780 to 13700 ug/L Fresh water	Crustaceans - Brine shrimp - Artemia sp.	48 hours
	Acute LC50 40000 ug/L Marine water	Crustaceans - Dungeness or edible crab - Cancer magister	48 hours
	Acute LC50 >5200 ug/L Marine water	Crustaceans - Opossum shrimp - Americamysis bahia	48 hours
	Acute LC50 5100 to 5700 ug/L Marine water	Fish - Atlantic silverside - Menidia menidia	96 hours
	Acute LC50 4200 ug/L Fresh water	Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss	96 hours
	Acute LC50 18400 to 25400 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 13900 to 17200 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 75000 to 120000 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 4.3 to 4.7 u/L Marine water	Fish - Striped bass - Morone saxatilis	96 hours
	Chronic NOEC 3300 ug/L Marine water	Fish - Atlantic silverside - Menidia menidia	96 hours
Benzene	Acute EC50 22000 to 29500 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute EC50 11730 to 15600 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute EC50 10000 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute EC50 9230 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute EC50 58400 to 82300 ug/L Fresh water	Crustaceans - Brine shrimp - Artemia sp.	48 hours
	Acute LC50 35 to 43.8 ppm Marine water	Crustaceans - Daggerblade grass shrimp - Palaemonetes pugio	48 hours
	Acute LC50 33000 ug/L Marine water	Crustaceans - Daggerblade grass shrimp - Palaemonetes pugio	48 hours
	Acute LC50 9.2 to 11.7 mg/L Fresh water	Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss	96 hours
	Acute LC50 21000 ug/L Marine water	Crustaceans - Brine shrimp - Artemia salina	48 hours
	Acute LC50 11.38 mL Marine water	Crustaceans - Crab - Scylla serrata	48 hours
	Acute LC50 9.15 mL Marine water	Crustaceans - Crab - Scylla serrata	48 hours
	Acute LC50 6.59 mL Marine water	Crustaceans - Crab - Scylla serrata	48 hours
	Acute LC50 35000 ug/L Marine water	Crustaceans - Daggerblade grass shrimp - Palaemonetes pugio	48 hours
	Acute LC50 99200 to 122600 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 135700 to 168800 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 96200 to 134100 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 76900 to 114100 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 59600 to 80700 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 5.02 mL Marine water	Crustaceans - Crab - Scylla serrata	48 hours
	Acute LC50 11.73 to 13.63 u/L Fresh water	Fish - Chinook salmon - Oncorhynchus tshawytscha	96 hours
	Acute LC50 14.09 to 18.3 u/L Fresh water	Fish - Coho salmon, silver salmon - Oncorhynchus kisutch	96 hours
	Acute LC50 8.47 to 9.09 u/L Marine water	Fish - Pink salmon - Oncorhynchus gorbuscha	96 hours

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	Acute LC50 10.9 u/L Marine water	Fish - Striped bass - Morone saxatilis	96 hours
	Acute LC50 10.76 to 12.04 u/L Fresh water	Fish - Sockeye salmon - Oncorhynchus nerka	96 hours
	Acute LC50 5.8 u/L Marine water	Fish - Striped bass - Morone saxatilis	96 hours
	Acute LC50 5.55 to 8.21 u/L Marine water	Fish - Sockeye salmon - Oncorhynchus nerka	96 hours
	Acute LC50 5.28 u/L Fresh water	Fish - Pink salmon - Oncorhynchus gorbuscha	96 hours
	Acute LC50 9.8 u/L Fresh water	Fish - Coho salmon, silver salmon - Oncorhynchus kisutch	96 hours
n-Hexane	Acute LC50 113000 ug/L Fresh water	Fish - Mozambique tilapia - Tilapia mossambica	96 hours
	Acute LC50 2500 to 2980 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours
Cyclohexane	Acute LC50 610000 ug/L Marine water	Fish - Tigerfish, crescent perch - Terapon jarbua	96 hours
	Acute LC50 117000 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours
	Acute LC50 93000 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours
	Acute LC50 57680 to 68760 ug/L Fresh water	Fish - Guppy - Poecilia reticulata	96 hours
	Acute LC50 42330 to 53470 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours
	Acute LC50 34720 to 44690 ug/L Fresh water	Fish - Bluegill - Lepomis macrochirus	96 hours
	Acute LC50 32710 to 42070 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours
	Acute LC50 8300 ug/L Marine water	Fish - Striped bass - Morone saxatilis	96 hours
	Acute LC50 4530 to 5180 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours

**Biodegradability****Biodegradability**



**Products of degradation** : Products of degradation: carbon oxides (CO, CO<sub>2</sub>) and water.

**Section 13. Disposal Considerations**

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Consult your local or regional authorities.

**Section 14. Transport Information**

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	1203	Gasoline	3	II		Not available.
TDG Classification	1203	Gasoline	3	II		Not available.

**Section 15. Regulatory Information****United States**

**HCS Classification** : Flammable liquid  
Irritating material  
Carcinogen  
Target organ effects

**U.S. Federal regulations** : TSCA 4(a) final test rules: Hexane (Other Isomers); n-Heptane; Pentane; n-Hexane  
TSCA 8(a) PAIR: n-Heptane; Pentane  
**United States inventory (TSCA 8b)**: All materials are listed on the inventory  
TSCA 12(b) one-time export: n-Heptane; Pentane  
TSCA 12(b) annual export notification: Hexane (Other Isomers); n-Hexane

Continued on next page

**SARA 302/304/311/312 extremely hazardous substances:** No products were found.

**SARA 302/304 emergency planning and notification:** No products were found.

**SARA 302/304/311/312 hazardous chemicals:** Toluene; Hexane (Other Isomers); Xylene (o,m,p isomers); Octane (All Isomers); Ethanol; 1,2,4-Trimethylbenzene; n-Heptane; Pentane; Cumene; Ethylbenzene; Benzene; n-Hexane; Cyclohexane

**SARA 311/312 MSDS distribution - chemical inventory - hazard identification:**

Toluene: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; Hexane (Other Isomers): Fire hazard, Immediate (acute) health hazard; Xylene (o,m,p isomers): Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; Octane (All Isomers): Fire hazard; Ethanol: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; 1,2,4-Trimethylbenzene: Fire hazard, Delayed (chronic) health hazard; n-Heptane: Fire hazard; Pentane: Fire hazard, Immediate (acute) health hazard; Cumene: Fire hazard, Immediate (acute) health hazard; Ethylbenzene: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; Benzene: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; n-Hexane: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; Cyclohexane: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; Gasoline: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard

**Clean Water Act (CWA) 307:** Toluene; Ethylbenzene; Benzene

**Clean Water Act (CWA) 311:** Toluene; Xylene (o,m,p isomers); Ethylbenzene; Benzene; Cyclohexane

**Clean Air Act (CAA) 112 accidental release prevention:** Pentane

**Clean Air Act (CAA) 112 regulated flammable substances:** Pentane

**Clean Air Act (CAA) 112 regulated toxic substances:** No products were found.

### SARA 313

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration</u>
<b>Form R - Reporting requirements</b>	: Toluene	108-88-3	0 - 30
	Xylene (o,m,p isomers)	1330-20-7	0 - 25
	1,2,4-Trimethylbenzene	95-63-6	0 - 6
	Cumene	98-82-8	0 - 5
	Ethylbenzene	100-41-4	0 - 5
	Benzene	71-43-2	0 - 4.9
	n-Hexane	110-54-3	0 - 3
<b>Supplier notification</b>	: Toluene	108-88-3	0 - 30
	Xylene (o,m,p isomers)	1330-20-7	0 - 25
	1,2,4-Trimethylbenzene	95-63-6	0 - 6
	Cumene	98-82-8	0 - 5
	Ethylbenzene	100-41-4	0 - 5
	Benzene	71-43-2	0 - 4.9
	n-Hexane	110-54-3	0 - 3
	Cyclohexane	110-82-7	0 - 3

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

<b>State regulations</b>	: <b>Connecticut Carcinogen Reporting:</b> None of the components are listed.
	<b>Connecticut Hazardous Material Survey:</b> None of the components are listed.
	<b>Florida substances:</b> None of the components are listed.
	<b>Illinois Chemical Safety Act:</b> None of the components are listed.
	<b>Illinois Toxic Substances Disclosure to Employee Act:</b> None of the components are listed.
	<b>Louisiana Reporting:</b> None of the components are listed.
	<b>Louisiana Spill:</b> None of the components are listed.
	<b>Massachusetts Spill:</b> None of the components are listed.
	<b>Massachusetts Substances:</b> The following components are listed: TOLUENE; 3-METHYLPENTANE; XYLENE; OCTANE; ETHYL ALCOHOL; PSEUDOCUMENE; HEPTANE (N-HEPTANE); PENTANE; CUMENE; ETHYL BENZENE; BENZENE; HEXANE;CYCLOHEXANE
	<b>Michigan Critical Material:</b> None of the components are listed.

**Unleaded Gasoline****Page: 15/17****Minnesota Hazardous Substances:** None of the components are listed.**New Jersey Hazardous Substances:** The following components are listed: MOTOR FUEL, n.o.s.; TOLUENE; XYLENES; OCTANE; ETHYL ALCOHOL; PSEUDOCUMENE; n-HEPTANE; PENTANE; CUMENE; ETHYL BENZENE; BENZENE, n-HEXANE; CYCLOHEXANE**New Jersey Spill:** None of the components are listed.**New Jersey Toxic Catastrophe Prevention Act:** None of the components are listed.**New York Acutely Hazardous Substances:** The following components are listed: Toluene; Xylene (mixed); Benzene, 1-methylethyl-; Ethylbenzene; Benzene; Hexane; Benzene, hexahydro-**New York Toxic Chemical Release Reporting:** None of the components are listed.**Pennsylvania RTK Hazardous Substances:** The following components are listed: GASOLINE; BENZENE, METHYL-; PENTANE, 3-METHYL-; BENZENE, DIMETHYL-; OCTANE; DENATURED ALCOHOL; PSEUDOCUMENE; HEPTANE; PENTANE; BENZENE, (1-METHYLETHYL)-; BENZENE, ETHYL-; BENZENE; HEXANE; CYCLOHEXANE**Rhode Island Hazardous Substances:** None of the components are listed.**California Prop. 65****WARNING:** This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

<u>Ingredient name</u>	<u>Cancer</u>	<u>Reproductive</u>	<u>No significant risk level</u>	<u>Maximum acceptable dosage level</u>
Toluene	No.	Yes.	No.	7000 µg/day (ingestion) 13000 µg/day (inhalation)
Ethylbenzene	Yes.	No.	No.	No.
Benzene	Yes.	Yes.	6.4 µg/day (ingestion) 13 µg/day (inhalation)	24 µg/day (ingestion) 49 µg/day (inhalation)

**Canada****WHMIS (Canada)**

- : Class B-2: Flammable liquid
- Class D-2A: Material causing other toxic effects (Very toxic).
- Class D-2B: Material causing other toxic effects (Toxic).
- CEPA DSL & NDSL: All materials are either listed or exempt

**EU regulations****Hazard symbol or symbols****Risk phrases**

- : R12- Extremely flammable.
- R45- May cause cancer.
- R46- May cause heritable genetic damage.
- R63- Possible risk of harm to the unborn child.
- R20/21- Also harmful by inhalation and in contact with skin.
- R48/20/21/22- Also harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
- R38- Irritating to skin.
- R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**Safety phrases**

- : S53- Avoid exposure - obtain special instructions before use.
- S2- Keep out of the reach of children.
- S29- Do not empty into drains.
- S36/37- Wear suitable protective clothing and gloves.
- S46- If swallowed, seek medical advice immediately and show this container or label.
- S61- Avoid release to the environment. Refer to special instructions/safety data sheet.

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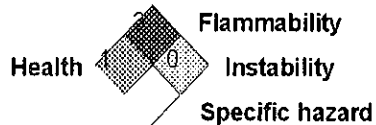
## Section 16. Other Information

**Label requirements** : EXTREMELY FLAMMABLE LIQUID AND VAPOR. FLAMMABLE. VAPOR MAY CAUSE FLASH FIRE. CAUSES SKIN IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN OR IF SWALLOWED. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE. CANCER HAZARD - CONTAINS MATERIAL WHICH CAN CAUSE CANCER.

**Hazardous Material Information System (U.S.A.)** :

Health	1
Fire hazard	3
Physical Hazard	0
Personal protection	

**National Fire Protection Association (U.S.A.)** :



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## Definitions of Material Safety Data Sheet Terminology

### GOVERNMENT AGENCIES AND PRIVATE ASSOCIATIONS

**ACGIH** - American Conference of Governmental Industrial Hygienists, (private association)

**DOT** - United States Department of Transportation

**EPA** - United States Environmental Protection Agency

**IARC** - International Agency for Research on Cancer, (private association)

**NFPA** - National Fire Protection Association, (private association)

**MSHA** - Mine Safety and Health Administration, U.S. Department of Labor

**NIOSH** - National Institute of Occupational Safety and Health, U.S. Department of Health and Human Services

**NTP** - National Toxicology Program, (private association)

**OSHA** - Occupational Safety and Health Administration, U.S. Department of Labor

**WHMIS** - Workplace Hazardous Material Information System

**CSA** - Canadian Standards Association

## HAZARD AND EXPOSURE INFORMATION

Continued on next page



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**Acute Hazard** - An adverse health effect which occurs rapidly as a result of short term exposure.

**CAS #** - American Chemical Society's Chemical Abstract service registry number which identifies the product and/or ingredients.

**Ceiling** - The concentration that should not be exceeded during any part of the working exposure

**Chronic Hazard** - An adverse health effect which generally occurs as a result of long term exposure or short term exposure with delayed health effects and is of long duration

**Fire Hazard** - A material that poses a physical hazard by being flammable, combustible, pyrophoric or an oxidizer as defined by 29 CFR 1910.1200

**Hazard Class** - DOT hazard classification

**Hazardous Ingredients** - Names of ingredients which have been identified as health hazards

**IDLH** - Immediately Dangerous to Life and Health, the airborne concentration below which a person can escape without respiratory protection and exposure up to 30 minutes, and not suffer debilitating or irreversible health effects. Established by NIOSH.

**mg/m<sup>3</sup>** - Milligrams of contaminant per cubic meter of air, a mass to volume ratio

**N/A** - Not available or no relevant information found

**NA** - Not applicable

**PEL** - OSHA permissible exposure limit; an action level of one half this value may be applicable

**ppm** - Part per million (one volume of vapor or gas in one million volumes of air)

**Pressure Hazard** - A material that poses a physical hazard due to the potential of a sudden release of pressure such as explosive or a compressed gas as defined by 29 CFR 1910.1200

**Reactive Hazard** - A material that poses a physical hazard due to the potential to become unstable reactive, water reactive or that is an organic peroxide as defined by 29 CFR 1910.1200.

**STEL** - The ACGIH Short-Term Exposure Limit, a 15-minute Time-Weighted Average exposure which should not be exceeded at any time during a workday, even if the 8-hour TWA is less than the TLV.

**TLV** - ACGIH Threshold Limit Value, represented herein as an 8-hour TWA concentration.

**8-hour TWA** - The time weighted average concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

**LD50** - Single dose of a substance that, when administered by a defined route in an animal assay, is expected to cause the death of 50% of the defined animal population.

**LC50** - The concentration of a substance in air that, when administered by means of inhalation over a specified length of time in an animal assay, is expected to cause the death of 50% of a defined animal population.