Section 1. Chemical Product and Company Identification

Common / Trade name: Naphtha
Synonym:
- Full Boiling Range Naphtha
- Heavy Naphtha
- Light Naphtha
- Paraffinic Naphtha
- Petroleum Distillate-Naphtha
- Untreated Process Streams, such as the following may contain Hydrogen Sulfide:
  - Raw Naphtha
  - Sour Naphtha
  - Wild Naphtha
  - Heartcut Naphtha
  - Crude Naphtha
  - Coker Naphtha
  - LSR Naphtha
  - Light Straight Run Naphtha
  - Unstabilized Naphtha
  - Combined Naphtha
  - MSLCU Gasoline
  - GDU Gasoline

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).

MSDS #: 406
CAS #: 64741-41-9

Section 2. Composition, information on ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS number</th>
<th>Concentration ( % )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naphtha, full range</td>
<td>64741-41-9</td>
<td>0 - 100</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>110-54-3</td>
<td>0 - 15</td>
</tr>
<tr>
<td>n-Heptane</td>
<td>142-82-5</td>
<td>0 - 12</td>
</tr>
<tr>
<td>Octane (All Isomers)</td>
<td>111-65-9</td>
<td>0 - 10</td>
</tr>
<tr>
<td>Methylcyclohexane</td>
<td>108-87-2</td>
<td>0 - 10</td>
</tr>
<tr>
<td>Cyclohexane</td>
<td>110-82-7</td>
<td>0 - 8</td>
</tr>
<tr>
<td>Xylene (o,m,p isomers)</td>
<td>1330-20-7</td>
<td>0 - 8</td>
</tr>
<tr>
<td>n-Nonane</td>
<td>111-84-2</td>
<td>0 - 7</td>
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<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>0 - 5</td>
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<td>Cyclopentane</td>
<td>287-92-3</td>
<td>0 - 4</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>100-41-4</td>
<td>0 - 4</td>
</tr>
<tr>
<td>Hexane (Other Isomers)</td>
<td>mixture</td>
<td>0 - 4</td>
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<tr>
<td>Benzene</td>
<td>71-43-2</td>
<td>0 - 3</td>
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<tr>
<td>Pentane</td>
<td>109-66-0</td>
<td>0 - 3</td>
</tr>
<tr>
<td>Hydrogen Sulfide</td>
<td>7783-06-4</td>
<td>0 - 1</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>91-20-3</td>
<td>0 - 0.5</td>
</tr>
</tbody>
</table>

Continued on next page
Naphtha

Section 3. 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. Danger! Product May Contain or Release Hydrogen Sulfide. H2S is a highly toxic, highly flammable gas which can be fatal if inhaled at certain concentrations.

Physical state

<table>
<thead>
<tr>
<th>Emergency overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid.</td>
</tr>
</tbody>
</table>

Emergency overview

Warning!

MAY BE FATAL IF INHALED.
CANCER HAZARD.
CONTAINS MATERIAL WHICH CAN CAUSE CANCER.
HARMFUL IF SWALLOWED.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: BLOOD, KIDNEYS, LUNGS, LIVER, PERIPHERAL NERVOUS SYSTEM, GASTROINTESTINAL TRACT, RESPIRATORY TRACT, SKIN, BONE MARROW, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
MAY BE HARMFUL IF ABSORBED THROUGH SKIN.

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

<table>
<thead>
<tr>
<th>Potential acute health effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dermal contact. Eye contact. Inhalation. Ingestion.</td>
</tr>
</tbody>
</table>

Eyes

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

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

Repeted 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)

Continued on next page
### 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.

**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**
In case of ingestion, gastric lavage with activated charcoal can be used promptly to prevent absorption. Consideration should be given to the use of an intratracheal tube, to prevent aspiration. Irregular heart beat may occur, use of adrenalin is not advisable. Individuals intoxicated by the product should be hospitalized immediately, with acute and continuing attention to neurological and cardiopulmonary function. Positive pressure ventilation may be necessary. After the initial episode, individuals should be monitored for changes in blood variables and the delayed appearance of pulmonary edema and chemical pneumonitis. Such patients should be monitored for several days or weeks for delayed effects, including bone marrow toxicity, hepatic and renal impairment. Individuals with chronic pulmonary disease will be more seriously impaired, and recovery from inhalation exposure may be complicated. In case of skin injection, prompt debridement of the wound is necessary to minimize necrosis and tissue loss.

### Section 5. Fire Fighting Measures

**Flammability of the product**
Flammable.

**Auto-ignition temperature**
>454°C (849.2°F)

**Flash point**
The lowest known value is Closed cup: -50.15°C (-58.3°F). (Pentane)

**Flammable limits**
Lower: 1% Upper: 7%

**Products of combustion**
These products are carbon oxides (CO, CO₂), nitrogen and sulfur oxides (NOₓ, SOₓ), particulate matter, VOC's.

**Fire hazards in the presence of various substances**
Extremely flammable in the presence of open flames, sparks and static discharge.

**Explosion hazards in the presence of various substances**
Explosive in the presence of open flames, sparks and static discharge.

**Fire-fighting media and instructions**
Flammable Liquid. Use dry chemical, foam or carbon dioxide to extinguish the fire. Consult foam manufacturer for appropriate media, application rates and water/foam ratio. Water can be used to cool fire-exposed containers, structures and to protect personnel. If a leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak. Use water to flush spills away from sources of ignition. Do not flush down public sewers. 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.

*Continued on next page*
**Special protective equipment for fire-fighters**

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 should 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.

**Special remarks on explosion hazards**

No additional remark.

**Section 6. Accidental Release Measures**

**Personal precautions**

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

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 should 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.

**Environmental 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.

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. 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**

If emergency personnel are unavailable, contain spilled material. 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. 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.

*Continued on next page*
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 controls

- Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits. Ensure that eyewash stations and safety showers are close to the workstation location.

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.

Continued on next page
**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.

### Component

**Naphtha, full range**

**Exposure limits**

- **ACGIH TLV (United States, 5/2004).**
  TWA: 300 ppm 8 hour/hours.

- **n-Hexane**
  - **OSHA PEL (United States, 6/1993).**
    TWA: 500 ppm 8 hour/hours. Form: All forms
  - **ACGIH TLV (United States, 9/2004). Skin**
    TWA: 50 ppm 8 hour/hours. Form: All forms
  - **NIOSH REL (United States, 6/2001).**
    TWA: 50 ppm 10 hour/hours. Form: All forms

- **n-Heptane**
  - **ACGIH TLV (United States, 9/2004).**
    STEL: 500 ppm 15 minute/minutes. Form: All forms
    TWA: 400 ppm 8 hour/hours. Form: All forms
  - **NIOSH REL (United States, 6/2001).**
    TWA: 350 mg/m³ 10 hour/hours. Form: All forms
  - **OSHA PEL (United States, 6/1993).**
    TWA: 500 ppm 8 hour/hours. Form: All forms

- **Octane (All Isomers)**
  - **NIOSH REL (United States, 6/2001).**
    CEIL: 385 ppm 15 minute/minutes. Form: All forms
    TWA: 75 ppm 10 hour/hours. Form: All forms
  - **OSHA PEL (United States, 6/1993).**
    TWA: 500 ppm 8 hour/hours. Form: All forms
  - **ACGIH TLV (United States, 3/2004). Notes: 1999 Adoption.**
    TWA: 300 ppm 8 hour/hours. Form: All forms

- **Methylcyclohexane**
  - **ACGIH TLV (United States, 1/2005).**
    TWA: 400 ppm 8 hour/hours. Form: All forms
  - **NIOSH REL (United States, 12/2001).**
    TWA: 400 ppm 10 hour/hours. Form: All forms
  - **OSHA PEL (United States, 8/1997).**
    TWA: 500 ppm 8 hour/hours. Form: All forms

- **Cyclohexane**
  - **ACGIH TLV (United States, 1/2004).**
    TWA: 100 ppm 8 hour/hours. Form: All forms
  - **NIOSH REL (United States, 6/2001).**
    TWA: 300 ppm 10 hour/hours. Form: All forms
  - **OSHA PEL (United States, 6/1993).**
    TWA: 300 ppm 8 hour/hours. Form: All forms

- **Xylene (o,m,p isomers)**
  - **ACGIH TLV (United States, 5/2004).**
    STEL: 150 ppm 15 minute/minutes. Form: All forms
    TWA: 100 ppm 8 hour/hours. Form: All forms
  - **OSHA PEL (United States, 6/1993).**
    TWA: 100 ppm 8 hour/hours. Form: All forms
  - **NIOSH REL (United States, 6/2001).**
    STEL: 150 ppm 15 minute/minutes. Form: All forms
    TWA: 100 ppm 10 hour/hours. Form: All forms

- **Toluene**
  - **ACGIH TLV (United States, 5/2004). Skin Notes: 1996 Adoption Refers to Appendix A -- Carcinogens.**
    TWA: 50 ppm 8 hour/hours. Form: All forms
  - **NIOSH REL (United States, 6/2001).**
    STEL: 150 ppm 15 minute/minutes. Form: All forms
    TWA: 100 ppm 10 hour/hours. Form: All forms

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**Continued on next page**
Consult local authorities for acceptable exposure limits.
Section 9. Physical and Chemical Properties

Physical state: Liquid.
Color: Colorless to light yellow.
Odor: Hydrocarbon. Characteristic Gasoline Odor (Strong.)
Boiling point: The lowest known value is 36.12°C (97°F) (Pentane). Weighted average: 98.75°C (209.8°F)
Melting/freezing point: May start to solidify at 6.67°C (44°F) based on data for: Cyclohexane. Weighted average: -82.18°C (-115.9°F)
Specific gravity: 0.77 (Water = 1) (@ 60 °F)
Vapor density: The highest known value is 4.4 (Air = 1) (n-Nonane). Weighted average: 3.35 (Air = 1)
Volatility: Essentially 100%
Evaporation rate: The highest known value is 10.46 (Pentane) Weighted average: 3.61 compared with Butyl acetate.
Solubility: Very slightly soluble in cold water, hot water.

Section 10. Stability and reactivity data

Stability and reactivity: The product is stable.
Incompatibility with various substances: Reactive with oxidizing agents, reducing agents, acids, alkalis.
Hazardous decomposition products: These products are carbon oxides (CO, CO₂), nitrogen and sulfur oxides (NOₓ, SOₓ), particulate matter, VOC's.
Hazardous polymerization: Will not occur.

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. Effects include aplastic anemia and leukemia. Animal studies have demonstrated testicular effects, alterations in reproductive cycles, chromosomal aberrations, and embryo/fetotoxicity. No birth defects have been shown to occur in pregnant laboratory animals exposed to doses not toxic to the mother.

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.

CYCLOPENTANE is a central nervous system depressant. Symptoms involving a high level acute exposure are excitement, loss of equilibrium, stupor, coma, and rarely, respiratory failure. Toxicological data is limited, and available documentation is based on the effects of n-pentane demonstrated in animal studies.

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.

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, hirality, 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 affects have not been attributed to heptane, polyneuritis has been reported...
following prolonged exposure to a petroleum fraction 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. Polynuropathy (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 3,000 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 8,000 ppm produced no anesthesia. In human subjects, 2,000 ppm for 10 minutes produced no effects, but 5,000 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 1,000 ppm, but not below 500 ppm.

METHYLCYCLOHEXANE may cause light-headedness and drowsiness. It may also cause a slight irritation of the eyes, nose, and throat. At high concentrations, it may cause unconsciousness and death. Prolonged exposure to the liquid may cause skin irritation. Vapors produce a mild narcotic effect. Concentrations of 10,000 to 12,500 ppm were fatal to mice. Rabbits exposed to 3,300 ppm for 300 hours showed mild evidence of liver and kidney injury, while 1,200 ppm was innocuous for rabbits, and prolonged exposure at 370 ppm was harmless to monkeys. No toxic effects from industrial exposure have been reported. Prolonged or repeated skin contact may produce drying and irritation due to defatting action.

NONANE causes a four hour LC50 in rats at concentrations of 3,200 ppm, or at about the same level as VM&P Naphtha. This level is markedly lower than the lethal concentrations reported in earlier mice studies involving octane (13,500 ppm) and heptane (16,000 ppm), supporting the lower limit for nonane.

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 6,600 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 polynuropathy (peripheral nerve damage), characterized by progressive weakness and numbness in the extremities, loss of deep tendon reflexes and reduction of motor nerve conduction velocity.

PETROLEUM DISTILLATES (naphtha, C6H14, C6H16, C8H18 aliphatics) can affect the body if they are inhaled, come in contact with the eyes or skin, or are swallowed. The vapors of petroleum distillates are mild narcotics and mucous membrane irritants. There have been few toxicologic studies, either on animals or man. While 4,000 to 7,000 ppm are tolerated for 1 hour by human subjects, symptoms of narcosis, such as dizziness and drowsiness, occur at these concentrations. Continuing exposure may produce signs of inebriation, followed by headache or nausea. Exposure at 10,000 to 20,000 ppm is regarded as immediately hazardous to life. The higher boiling fractions may produce irritation of the eyes, nose, and throat in addition to symptoms of mild narcosis. No chronic systemic effects have been reported from widespread industrial use. If benzene is present in the distillate; however, the hazard of both acute and chronic poisoning is increased.

Limited studies on oils that are very active carcinogens have shown that washing the animals’ skin with soap and water between applications greatly reduces tumor formation. These studies demonstrate the effectiveness of cleansing the skin after contact.

RUBBER SOLVENTS can affect the body if they are inhaled, come in contact with the eyes or skin, or are swallowed. The vapors of petroleum distillates are mild narcotics and mucous membrane irritants. Rats exposed to rubber solvents naphtha exhibited motor incoordination at 5,300 ppm and convulsions and death at 24,200 ppm. There were no toxic effects produced at 2,800 ppm.

VM&P NAPHTHA (typically 55% paraffins, 30% naphthenes, 12% alkyl benzene, 2% dicyclopentadiene, <0.1% benzene) can affect the body if they are inhaled, come in contact with the eyes or skin or are swallowed. The vapors of petroleum distillates are mild narcotics and mucous membrane irritants. Human subjects had upper respiratory tract irritation in 15 minutes at 880 ppm. Eye irritation and transient olfactory fatigue also occurred. VM&P naphtha is reported to have an acute toxicity greater than rubber solvent.

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.

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

Continued on next page
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.

**HYDROGEN SULFIDE** can affect the body if it is inhaled or if it comes into contact with the eyes, skin, nose or throat. It can also affect the body if it is swallowed. It is colorless and has the odor of rotten eggs. However, its odor cannot be used as an indication of its presence since one of the first effects of H2S exposure is the loss of the sense of smell. Inhalation of high concentrations of hydrogen sulfide, 1000 to 2000 ppm, may cause coma after a single breath and may be rapidly fatal, convulsions can also occur. Hydrogen sulfide gas is a rapidly acting systemic poison which causes respiratory paralysis with consequent asphyxia at high concentrations (500 to 1000 ppm). A case of polyneuritis and encephalopathy from one day’s exposure to a concentration insufficient to cause loss of consciousness has been reported. It irritates the eyes and respiratory tract at lower concentrations (50 to 500 ppm). Pulmonary edema and bronchial pneumonia may follow prolonged exposure at concentrations exceeding 250 ppm. Exposure to concentrations of hydrogen sulfide around 50 ppm for one hour may produce rhinitis, pharyngitis, bronchitis, pneumonitis, acute conjunctivitis with pain, lacrimation and photophobia, in severe form this may progress to keratoconjunctivitis and vesiculation of the corneal epithelium. In lower concentrations, hydrogen sulfide may cause headache, fatigue, irritability, insomnia, and gastrointestinal disturbances, as well as central nervous system disturbances, causing excitement and dizziness. Repeated exposure to hydrogen sulfide results in increased susceptibility, so that eye irritation, cough and systemic effects may result from concentrations previously tolerated without any effect.

**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.

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Test</th>
<th>Result</th>
<th>Route</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methylcyclohexane</td>
<td>LD50</td>
<td>&gt;3200 mg/kg</td>
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<td>Rat</td>
</tr>
<tr>
<td></td>
<td>LD50</td>
<td>2250 mg/kg</td>
<td>Oral</td>
<td>Mouse</td>
</tr>
<tr>
<td>Cyclohexane</td>
<td>LD50</td>
<td>12705 mg/kg</td>
<td>Oral</td>
<td>Rat</td>
</tr>
<tr>
<td></td>
<td>LD50</td>
<td>813 mg/kg</td>
<td>Oral</td>
<td>Mouse</td>
</tr>
<tr>
<td></td>
<td>LDLo</td>
<td>5500 mg/kg</td>
<td>Oral</td>
<td>Rabbit</td>
</tr>
<tr>
<td>Xylene (o,m,p isomers)</td>
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<td>4300 mg/kg</td>
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<td>Rat</td>
</tr>
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<td></td>
<td>LD50</td>
<td>2119 mg/kg</td>
<td>Oral</td>
<td>Mouse</td>
</tr>
<tr>
<td></td>
<td>LD50</td>
<td>4300 mg/kg</td>
<td>Oral</td>
<td>Mammal</td>
</tr>
<tr>
<td></td>
<td>LD50</td>
<td>&gt;1700 mg/kg</td>
<td>Dermal</td>
<td>Rabbit</td>
</tr>
<tr>
<td></td>
<td>LDLo</td>
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<td>Oral</td>
<td>human</td>
</tr>
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<td>Toluene</td>
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<td>636 mg/kg</td>
<td>Oral</td>
<td>Rat</td>
</tr>
<tr>
<td></td>
<td>LDLo</td>
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<td>Oral</td>
<td>human</td>
</tr>
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<td>Cyclopentane</td>
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<td>11400 mg/kg</td>
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<td>Rat</td>
</tr>
<tr>
<td></td>
<td>LD50</td>
<td>12800 mg/kg</td>
<td>Oral</td>
<td>Mouse</td>
</tr>
<tr>
<td>Ethylbenzene</td>
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<td>3500 mg/kg</td>
<td>Oral</td>
<td>Rat</td>
</tr>
<tr>
<td>Benzene</td>
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<td>Mouse</td>
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<td></td>
<td>LD50</td>
<td>5700 mg/kg</td>
<td>Oral</td>
<td>Mammal</td>
</tr>
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<td></td>
<td>LD50</td>
<td>48 mg/kg</td>
<td>Dermal</td>
<td>Mouse</td>
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<td>Oral</td>
<td>man</td>
</tr>
<tr>
<td>Pentane</td>
<td>LD50</td>
<td>400 mg/kg</td>
<td>Oral</td>
<td>Rat</td>
</tr>
<tr>
<td>Hydrogen Sulfide</td>
<td>LC50</td>
<td>444 ppm</td>
<td>Inhalation</td>
<td>Rat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1 hour/hours)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LC50</td>
<td>673 ppm</td>
<td>Inhalation</td>
<td>Mouse</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1 hour/hours)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Naphthalene</td>
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<td>490 mg/kg</td>
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<td>Rat</td>
</tr>
<tr>
<td></td>
<td>LD50</td>
<td>316 mg/kg</td>
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<td>Mouse</td>
</tr>
<tr>
<td></td>
<td>LD50</td>
<td>1200 mg/kg</td>
<td>Oral</td>
<td>Guinea pig</td>
</tr>
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<td>&gt;2500 mg/kg</td>
<td>Dermal</td>
<td>Rat</td>
</tr>
<tr>
<td></td>
<td>LDLo</td>
<td>100 mg/kg</td>
<td>Oral</td>
<td>child</td>
</tr>
<tr>
<td></td>
<td>LDLo</td>
<td>400 mg/kg</td>
<td>Oral</td>
<td>Dog</td>
</tr>
</tbody>
</table>
Chronic effects on humans: CARCINOGENIC EFFECTS: Classified + (Proven.) by OSHA+ (Proven.) by NIOSH [Naphtha, full range]. Classified 2A (Probable for human.) by IARC, 2 (Suspected for humans.) by European Union [Naphtha, full range]. Classified A4 (Not classifiable for humans or animals.) by ACGIH [Naphtha, full range]. 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, 3 (Not classifiable for humans.) by IARC [Toluene]. 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 [Benzene].

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

Other toxic effects on humans: Extremely hazardous in case of ingestion. Very hazardous in case of eye contact (irritant). Hazardous in case of skin contact (irritant). Slightly hazardous in case of inhalation (lung irritant).

Special remarks on toxicity to animals: No additional remark.

Special remarks on chronic effects on humans: No additional remark.

Special remarks on other toxic effects on humans: No additional remark.

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: blood, kidneys, lungs, liver, peripheral nervous system, gastrointestinal tract, upper respiratory tract, skin, bone marrow, central nervous system (CNS), eye, lens or cornea.

Section 12. Ecological Information

Ecotoxicity data

<table>
<thead>
<tr>
<th>Ingredient name</th>
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<th>Period</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>n-Hexane</td>
<td>Pimephales promelas (LC50)</td>
<td>96 hour/hours</td>
<td>2.5 mg/l</td>
</tr>
<tr>
<td>Cyclohexane</td>
<td>Pimephales promelas (LC50)</td>
<td>96 hour/hours</td>
<td>4.53 mg/l</td>
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<tr>
<td></td>
<td>Pimephales promelas (LC50)</td>
<td>96 hour/hours</td>
<td>32.71 mg/l</td>
</tr>
<tr>
<td></td>
<td>Lepomis macrochirus (LC50)</td>
<td>96 hour/hours</td>
<td>34.72 mg/l</td>
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<tr>
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<td>Pimephales promelas (LC50)</td>
<td>96 hour/hours</td>
<td>42.33 mg/l</td>
</tr>
<tr>
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<td>Poecilia reticulata (LC50)</td>
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<td>57.68 mg/l</td>
</tr>
<tr>
<td></td>
<td>Pimephales promelas (LC50)</td>
<td>96 hour/hours</td>
<td>93 mg/l</td>
</tr>
<tr>
<td>Xylene (o,m,p isomers)</td>
<td>Oncorhynchus mykiss (LC50)</td>
<td>96 hour/hours</td>
<td>3.3 mg/l</td>
</tr>
<tr>
<td></td>
<td>Oncorhynchus mykiss (LC50)</td>
<td>96 hour/hours</td>
<td>8.2 mg/l</td>
</tr>
<tr>
<td></td>
<td>Lepomis macrochirus (LC50)</td>
<td>96 hour/hours</td>
<td>8.6 mg/l</td>
</tr>
<tr>
<td></td>
<td>Lepomis macrochirus (LC50)</td>
<td>96 hour/hours</td>
<td>12 mg/l</td>
</tr>
<tr>
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<td>96 hour/hours</td>
<td>13.3 mg/l</td>
</tr>
<tr>
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<td>Pimephales promelas (LC50)</td>
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<td>13.4 mg/l</td>
</tr>
<tr>
<td>Toluene</td>
<td>Daphnia magna (EC50)</td>
<td>48 hour/hours</td>
<td>6 mg/l</td>
</tr>
<tr>
<td></td>
<td>Daphnia magna (EC50)</td>
<td>48 hour/hours</td>
<td>6.56 mg/l</td>
</tr>
<tr>
<td></td>
<td>Oncorhynchus mykiss (EC50)</td>
<td>48 hour/hours</td>
<td>6.78 mg/l</td>
</tr>
<tr>
<td></td>
<td>Oncorhynchus mykiss (LC50)</td>
<td>96 hour/hours</td>
<td>5.8 mg/l</td>
</tr>
<tr>
<td></td>
<td>Oncorhynchus mykiss (LC50)</td>
<td>96 hour/hours</td>
<td>6.78 mg/l</td>
</tr>
</tbody>
</table>

Continued on next page
These products are carbon oxides (CO, CO$_2$) and water.

The products of biodegradation are as toxic as the original product.

No additional remark.

### Products of degradation

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Duration</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylbenzene</td>
<td>Pimephales promelas (LC50)</td>
<td>96 hours</td>
<td>12.6 mg/l</td>
</tr>
<tr>
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<td>Daphnia magna (EC50)</td>
<td>48 hours</td>
<td>2.93 mg/l</td>
</tr>
<tr>
<td></td>
<td>Daphnia magna (EC50)</td>
<td>48 hours</td>
<td>2.97 mg/l</td>
</tr>
<tr>
<td></td>
<td>Selenastrum capricornutum (EC50)</td>
<td>48 hours</td>
<td>7.2 mg/l</td>
</tr>
<tr>
<td></td>
<td>Oncorhynchus mykiss (LC50)</td>
<td>96 hours</td>
<td>4.2 mg/l</td>
</tr>
<tr>
<td></td>
<td>Pimephales promelas (LC50)</td>
<td>96 hours</td>
<td>9.09 mg/l</td>
</tr>
<tr>
<td></td>
<td>Poecilia reticulata (LC50)</td>
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<td>9.6 mg/l</td>
</tr>
<tr>
<td>Benzene</td>
<td>Daphnia magna (EC50)</td>
<td>48 hours</td>
<td>9.23 mg/l</td>
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<td>Daphnia magna (EC50)</td>
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<td>10 mg/l</td>
</tr>
<tr>
<td></td>
<td>Daphnia magna (EC50)</td>
<td>48 hours</td>
<td>11.73 mg/l</td>
</tr>
<tr>
<td></td>
<td>Oncorhynchus mykiss (LC50)</td>
<td>96 hours</td>
<td>5.3 mg/l</td>
</tr>
<tr>
<td></td>
<td>Oncorhynchus mykiss (LC50)</td>
<td>96 hours</td>
<td>5.9 mg/l</td>
</tr>
<tr>
<td></td>
<td>Oncorhynchus mykiss (LC50)</td>
<td>96 hours</td>
<td>9.2 mg/l</td>
</tr>
<tr>
<td>Hydrogen Sulfide</td>
<td>Pimephales promelas (LC50)</td>
<td>96 hours</td>
<td>0.007 mg/l</td>
</tr>
<tr>
<td></td>
<td>Oncorhynchus mykiss (LC50)</td>
<td>96 hours</td>
<td>0.007 mg/l</td>
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<td>Pimephales promelas (LC50)</td>
<td>96 hours</td>
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</tr>
<tr>
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<td>Lepomis macrochirus (LC50)</td>
<td>96 hours</td>
<td>0.009 mg/l</td>
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<tr>
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<td>Pimephales promelas (LC50)</td>
<td>96 hours</td>
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<td>Oncorhynchus mykiss (LC50)</td>
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<td>Naphthalene</td>
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<td>1.6 mg/l</td>
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<td>Daphnia pulex (LC50)</td>
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<td></td>
<td>Oncorhynchus mykiss (LC50)</td>
<td>96 hours</td>
<td>1.6 mg/l</td>
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<tr>
<td></td>
<td>Oncorhynchus mykiss (LC50)</td>
<td>96 hours</td>
<td>1.8 mg/l</td>
</tr>
</tbody>
</table>

**Products of degradation**: These products are carbon oxides (CO, CO$_2$) and water.

**Toxicity of the products of biodegradation**: The products of biodegradation are as toxic as the original product.

**Special remarks on the products of biodegradation**: No additional remark.

### Section 13. Disposal Considerations

**Waste disposal**: The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. 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.

Consult your local or regional authorities.

### Section 14. Transport Information

<table>
<thead>
<tr>
<th>Regulatory information</th>
<th>UN number</th>
<th>Proper shipping name</th>
<th>Class</th>
<th>Packing group</th>
<th>Label</th>
<th>Additional information</th>
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<tr>
<td>DOT Classification</td>
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<td>PETROLEUM DISTILLATES, N.O.S.</td>
<td>3</td>
<td>I</td>
<td>![Flammable Symbol]</td>
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<td>3</td>
<td>I</td>
<td>![Flammable Symbol]</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

Continued on next page
Section 15. Regulatory Information

United States

U.S. Federal regulations

- TSCA 4(a) final test rules: n-Hexane; Hexane (Other Isomers)
- TSCA 8(a) PAIR: n-Nonane; n-Heptane; Methylcyclohexane; Cyclopentane; Pentane; Naphthalene
- TSCA 8(b) inventory: Naphtha, full range; Cyclohexane; n-Nonane; n-Hexane; n-Heptane; Octane (All Isomers); Methylcyclohexane; Benzene; Xylene (o,m,p isomers); Toluene; Cyclopentane; Ethylbenzene; Hexane (Other Isomers); Pentane; Hydrogen Sulfide; Naphthalene
- SARA 302/304/311/312 extremely hazardous substances: Hydrogen Sulfide
- SARA 302/304 emergency planning and notification: Hydrogen Sulfide
- SARA 302/304/311/312 hazardous chemicals: Cyclohexane; n-Nonane; n-Hexane; n-Heptane; Octane (All Isomers); Methylcyclohexane; Benzene; Xylene (o,m,p isomers); Toluene; Cyclopentane; Ethylbenzene; Hexane (Other Isomers); Pentane; Hydrogen Sulfide
- SARA 311/312 MSDS distribution - chemical inventory - hazard identification:
  - Cyclohexane: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; n-Nonane: Fire hazard, Immediate (acute) health hazard; n-Hexane: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; n-Heptane: Fire hazard; Octane (All Isomers): Fire hazard; Methylcyclohexane: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; Benzene: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard, Xylene (o,m,p isomers): Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; Toluene: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard, Cyclopentane: Fire hazard; Ethylbenzene: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; Hexane (Other Isomers): Fire hazard, Immediate (acute) health hazard; Pentane: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard, Hydrogen Sulfide: Fire hazard, Sudden release of pressure, Immediate (acute) health hazard, Delayed (chronic) health hazard
- Clean Water Act (CWA) 307: Benzene; Toluene; Ethylbenzene; Naphthalene
- Clean Water Act (CWA) 311: Cyclohexane; Benzene; Xylene (o,m,p isomers); Toluene; Ethylbenzene; Naphthalene
- Clean Air Act (CAA) 112 accidental release prevention: Pentane; Hydrogen Sulfide
- Clean Air Act (CAA) 112 regulated flammable substances: Pentane
- Clean Air Act (CAA) 112 regulated toxic substances: Hydrogen Sulfide

SARA 313

Form R - Reporting requirements

<table>
<thead>
<tr>
<th>Product name</th>
<th>CAS number</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>n-Hexane</td>
<td>110-54-3</td>
<td>0 - 15</td>
</tr>
<tr>
<td>Cyclohexane</td>
<td>110-82-7</td>
<td>0 - 8</td>
</tr>
<tr>
<td>Xylene (o,m,p isomers)</td>
<td>1330-20-7</td>
<td>0 - 8</td>
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<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>0 - 5</td>
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<tr>
<td>Ethylbenzene</td>
<td>100-41-4</td>
<td>0 - 4</td>
</tr>
<tr>
<td>Benzene</td>
<td>71-43-2</td>
<td>0 - 3</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>91-20-3</td>
<td>0 - 0.5</td>
</tr>
</tbody>
</table>

Supplier notification

<table>
<thead>
<tr>
<th>Product name</th>
<th>CAS number</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>n-Hexane</td>
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<td>Naphthalene</td>
<td>91-20-3</td>
<td>0 - 0.5</td>
</tr>
</tbody>
</table>

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.
State regulations:
- Connecticut carcinogen reporting list: Benzene
- Connecticut hazardous material survey: n-Hexane; Benzene; Xylene (o,m,p isomers); Toluene; Ethylbenzene; Naphthalene
- Illinois toxic substances disclosure to employee act: n-Hexane; Benzene; Xylene (o,m,p isomers); Toluene; Ethylbenzene; Naphthalene
- Rhode Island RTK hazardous substances: n-Hexane; Benzene; Xylene (o,m,p isomers); Toluene; Ethylbenzene; Naphthalene
- Pennsylvania RTK: Cyclohexane: (environmental hazard, generic environmental hazard); n-Nonane: (generic environmental hazard); n-Hexane: (generic environmental hazard); n-Heptane: (generic environmental hazard); Octane (All Isomers): (generic environmental hazard); Methylcyclohexane: (generic environmental hazard); Benzene: (special hazard, environmental hazard, generic environmental hazard); Xylene (o,m,p isomers): (environmental hazard, generic environmental hazard); Toluene: (environmental hazard, generic environmental hazard); Ethylbenzene: (environmental hazard, generic environmental hazard); Cyclopentane: (generic environmental hazard); Hexane (Other Isomers): (generic environmental hazard); Pentane: (generic environmental hazard); Hydrogen Sulfide: (environmental hazard, generic environmental hazard); Naphthalene: (environmental hazard, generic environmental hazard)
- Florida: n-Hexane; Benzene; Xylene (o,m,p isomers); Toluene; Ethylbenzene; Naphthalene
- Michigan critical material: Benzene; Xylene (o,m,p isomers); Toluene
- Massachusetts RTK: Cyclohexane; n-Nonane; n-Hexane; n-Heptane; Octane (All Isomers); Methylcyclohexane; Benzene; Xylene (o,m,p isomers); Toluene; Cyclopentane; Ethylbenzene; Hexane (Other Isomers); Pentane; Hydrogen Sulfide; Naphthalene
- New Jersey: Cyclohexane; n-Nonane; n-Hexane; n-Heptane; Octane (All Isomers); Methylcyclohexane; Benzene; Xylene (o,m,p isomers); Toluene; Cyclopentane; Ethylbenzene; Pentane; Hydrogen Sulfide; Naphthalene

**WARNING:** This product contains chemical/chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.: Benzene; Toluene; Naphthalene

**WARNING:** This product contains chemical/chemicals known to the state of California to cause reproductive harm (male).: Benzene

California prop. 65 (no significant risk level): Benzene

California prop. 65 (Maximum Acceptable Dosage Level): Benzene; Toluene

**WARNING:** This product contains chemical/chemicals known to the state of California to cause birth defects or other reproductive harm.: Benzene; Toluene

**WARNING:** This product contains chemical/chemicals known to the state of California to cause cancer.: Benzene; Naphthalene

**Canada**

**WHMIS (Canada)**:
- Class B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).
- Class D-1A: Material causing immediate and serious toxic effects (Very toxic).
- Class D-2A: Material causing other toxic effects (Very toxic).
- Class D-2B: Material causing other toxic effects (Toxic).
- CEPA DSL: Naphtha, full range; Cyclohexane; n-Nonane; n-Hexane; n-Heptane; Octane (All Isomers); Methylcyclohexane; Benzene; Xylene (o,m,p isomers); Toluene; Cyclopentane; Ethylbenzene; Hexane (Other Isomers); Pentane; Hydrogen Sulfide; Naphthalene

Section 16. Other Information

**Label requirements**:
- MAY BE FATAL IF INHALED.
- CANCER HAZARD.
- CONTAINS MATERIAL WHICH CAN CAUSE CANCER.
- HARMFUL IF SWALLOWED.
- CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: BLOOD, KIDNEYS, LUNGS, LIVER, PERIPHERAL NERVOUS SYSTEM, GASTROINTESTINAL TRACT, RESPIRATORY TRACT, SKIN, BONE MARROW, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
- MAY BE HARMFUL IF ABSORBED THROUGH SKIN.

*Continued on next page*
Hazardous Material Information System (U.S.A.)

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

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Version : 2

Disclaimer

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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

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, phyrophoric 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/m³** - 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.