

# SAFETY DATA SHEET



Revision Date 14-Jun-2017

SDS Number 888100008800

Revision Number 1.01

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

**Product Name** Crude Oil

**Synonyms** Sour Crude Oil, Sweet Crude Oil, Light Crude Oil, Heavy Crude Oil, Generic Crude Oil

**Recommended Use** Refining feedstock  
**Uses advised against** All others

**Manufacturer**  
Tesoro Refining & Marketing Co.  
19100 Ridgewood Parkway  
San Antonio, TX 78259

**Emergency Telephone** Chemtrec: 1-800-424-9300  
Tesoro Call Center: 1-877-783-7676

**E-mail address** ProductStewardship@TSOCORP.com

## 2. HAZARDS IDENTIFICATION

### Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 2
Acute dermal toxicity	Category 4
Skin Corrosion/Irritation Category	Category 2
Germ cell mutagenicity	Category 1B
Carcinogenicity	Category 1A
Reproductive toxicity	Category 2
Specific target organ toxicity (repeated exposure)	Category 1
Acute Aquatic Toxicity	Category 1
Chronic Aquatic Toxicity	Category 1

### Label elements

#### **Danger**

Highly flammable liquid and vapor  
Harmful in contact with skin  
Causes skin irritation  
May cause genetic defects  
May cause cancer  
Suspected of damaging fertility or the unborn child  
Causes damage to organs through prolonged or repeated exposure  
Very toxic to aquatic life with long lasting effects



**Appearance** Liquid

**Physical State @20°C** Liquid

**Odor** Petroleum asphalt odor. Hydrogen sulfide (H<sub>2</sub>S) has a characteristic rotten egg odor with an odor threshold as low as 10 parts per billion or even less. However, this odor should not be used as a warning property because H<sub>2</sub>S can deaden the sense of smell. H<sub>2</sub>S concentrations can be measured with an H<sub>2</sub>S meter or colorimetric indicating tubes.

**Precautionary Statements - Prevention**

- Obtain special instructions before use
- Do not handle until all safety precautions have been read and understood
- Wear protective gloves/protective clothing/eye protection/face protection
- Wash face, hands and any exposed skin thoroughly after handling
- Do not breathe dust/fume/gas/mist/vapors/spray
- Do not eat, drink or smoke when using this product
- Keep away from heat/sparks/open flames/hot surfaces. - No smoking
- Keep container tightly closed
- Ground/or bond container and receiving equipment
- Use explosion-proof electrical/ ventilating / lighting / equipment
- Use only non-sparking tools
- Take precautionary measures against static discharge

**Precautionary Statements - Response**

- IF exposed or concerned: Get medical advice/attention
- Call a POISON CENTER or doctor if you feel unwell
- If skin irritation occurs: Get medical advice/attention
- IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower
- Wash contaminated clothing before reuse
- In case of fire: Use CO<sub>2</sub>, dry chemical, or foam to extinguish

**Precautionary Statements - Storage**

Store in a well-ventilated place. Keep cool

**Precautionary Statements - Disposal**

Dispose of contents/container to an approved waste disposal plant

**Hazards not otherwise classified (HNOC)**

Not applicable

**Other Information**

May be harmful if swallowed.

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Chemical Name	CAS-No	Percent
Petroleum; Crude oil	8002-05-9	0-100
Sulfur	7704-34-9	0-5
Benzene	71-43-2	0.1-3
N-hexane	110-54-3	0-1.5
Xylene	1330-20-7	0-<1

Toluene	108-88-3	0-<1
Polycyclic Aromatic Hydrocarbons	130498-29-2	0-<1
Naphthalene	91-20-3	0-<1
Ethylbenzene	100-41-4	0-<1
Cumene	98-82-8	0-<1
Hydrogen Sulfide	7783-06-4	0-0.5

## 4. FIRST AID MEASURES

### Description of first aid measures

<b>General advice</b>	Show this safety data sheet to the doctor in attendance. Remove from exposure, lie down. In case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt, seek medical advice. Never give anything by mouth to an unconscious person. Take off all contaminated clothing immediately and thoroughly wash material from skin.
<b>Inhalation</b>	Remove to fresh air. Get medical attention immediately if symptoms occur.
<b>Eye contact</b>	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
<b>Skin contact</b>	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. If symptoms persist, call a physician.
<b>Ingestion</b>	Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Call a physician.
<b>Self-protection of the first aider</b>	Remove all sources of ignition. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Use personal protective equipment as required. See section 8 for more information. Wear personal protective clothing (see section 8). Avoid contact with skin, eyes or clothing.

### Most important symptoms and effects, both acute and delayed

### Indication of any immediate medical attention and special treatment needed

**Note to physicians**                      Treat symptomatically.

## 5. FIRE-FIGHTING MEASURES

<b>Suitable Extinguishing Media</b>	Dry chemical. Carbon dioxide (CO <sub>2</sub> ). Water spray. Alcohol resistant foam.
<b>Small Fire</b>	Any extinguisher suitable for Class B fires, dry chemical, CO <sub>2</sub> , foam (AFFF/ATC), or water spray can be used.
<b>Large Fire</b>	Water spray, fog or alcohol-resistant foam. CAUTION: Use of water spray when fighting fire may be inefficient. Cool containers with flooding quantities of water until well after fire is out.
<b>Unsuitable extinguishing media</b>	CAUTION: Use of water spray when fighting fire may be inefficient.
<b>Specific hazards arising from the chemical</b>	Risk of ignition. Keep product and empty container away from heat and sources of ignition. In the event of fire, cool tanks with water spray. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
<b>Hazardous combustion products</b>	Smoke, CO, and other products of incomplete combustion.
<b>Explosion data</b>	
<b>Sensitivity to Mechanical Impact</b>	None.

**Sensitivity to Static Discharge** Yes.

**Special protective equipment for fire-fighters** Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible withdraw from area and let fire burn.

**Further information** ALWAYS stay away from tanks engulfed in fire. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. Do not direct water at source of leak or safety devices; icing may occur. Cool containers with flooding quantities of water until well after fire is out. Do not allow run-off from fire-fighting to enter drains or water courses.

**NFPA** Health hazards 2 Flammability 3 Stability 0 Physical and chemical properties -

## 6. ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

**Personal precautions** Evacuate personnel to safe areas. Use personal protective equipment as required. See section 8 for more information. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Pay attention to flashback. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material.

**Other Information** Ventilate the area. Refer to protective measures listed in Sections 7 and 8.

### Environmental precautions

**Environmental precautions** Refer to protective measures listed in Sections 7 and 8. Prevent further leakage or spillage if safe to do so. Prevent product from entering drains.

### Methods and material for containment and cleaning up

**Methods for containment** Stop leak if you can do it without risk. Do not touch or walk through spilled material. A vapor suppressing foam may be used to reduce vapors. Dike far ahead of spill to collect runoff water. Keep out of drains, sewers, ditches and waterways. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.

**Methods for cleaning up** Take precautionary measures against static discharges. Dam up. Soak up with inert absorbent material. Pick up and transfer to properly labeled containers.

**Prevention of secondary hazards** Clean contaminated objects and areas thoroughly observing environmental regulations.

## 7. HANDLING AND STORAGE

### Precautions for safe handling

**Advice on safe handling** Use personal protection equipment. Avoid contact with skin and eyes. Avoid breathing vapors or mists. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Use grounding and bonding connection when transferring this material to prevent static discharge, fire or explosion. Use with local exhaust ventilation. Use spark-proof tools and explosion-proof equipment. Keep in an area equipped with sprinklers. Use according to package label instructions. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Remove contaminated clothing and shoes. Take off contaminated clothing and wash before reuse.

### Conditions for safe storage, including any incompatibilities

**Storage Conditions**

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity). Keep in properly labeled containers. Do not store near combustible materials. Keep in an area equipped with sprinklers. Store in accordance with the particular national regulations. Store in accordance with local regulations. Store locked up.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical Name	ACGIH TLV	OSHA PEL
Petroleum; Crude oil 8002-05-9	-	TWA: 500 ppm TWA: 2000 mg/m <sup>3</sup> (vacated) TWA: 400 ppm (vacated) TWA: 1600 mg/m <sup>3</sup>
Benzene 71-43-2	STEL: 2.5 ppm TWA: 0.5 ppm S*	TWA: 10 ppm applies to industry segments exempt from the benzene standard at 29 CFR 1910.1028 TWA: 1 ppm (vacated) TWA: 10 ppm unless specified in 1910.1028 (vacated) STEL: 50 ppm 10 min unless specified in 1910.1028 (vacated) Ceiling: 25 ppm unless specified in 1910.1028 Ceiling: 25 ppm STEL: 5 ppm see 29 CFR 1910.1028
N-hexane 110-54-3	TWA: 50 ppm S*	TWA: 500 ppm TWA: 1800 mg/m <sup>3</sup> (vacated) TWA: 50 ppm (vacated) TWA: 180 mg/m <sup>3</sup>
Xylene 1330-20-7	STEL: 150 ppm TWA: 100 ppm	TWA: 100 ppm TWA: 435 mg/m <sup>3</sup> (vacated) TWA: 100 ppm (vacated) TWA: 435 mg/m <sup>3</sup> (vacated) STEL: 150 ppm (vacated) STEL: 655 mg/m <sup>3</sup>
Toluene 108-88-3	TWA: 20 ppm	TWA: 200 ppm (vacated) TWA: 100 ppm (vacated) TWA: 375 mg/m <sup>3</sup> (vacated) STEL: 150 ppm (vacated) STEL: 560 mg/m <sup>3</sup> Ceiling: 300 ppm
Naphthalene 91-20-3	TWA: 10 ppm S*	TWA: 10 ppm TWA: 50 mg/m <sup>3</sup> (vacated) TWA: 10 ppm (vacated) TWA: 50 mg/m <sup>3</sup> (vacated) STEL: 15 ppm (vacated) STEL: 75 mg/m <sup>3</sup>
Ethylbenzene 100-41-4	TWA: 20 ppm	TWA: 100 ppm TWA: 435 mg/m <sup>3</sup> (vacated) TWA: 100 ppm (vacated) TWA: 435 mg/m <sup>3</sup> (vacated) STEL: 125 ppm (vacated) STEL: 545 mg/m <sup>3</sup>
Cumene 98-82-8	TWA: 50 ppm	TWA: 50 ppm TWA: 245 mg/m <sup>3</sup> (vacated) TWA: 50 ppm (vacated) TWA: 245 mg/m <sup>3</sup> (vacated) S* S*
Hydrogen Sulfide	STEL: 5 ppm	(vacated) TWA: 10 ppm

7783-06-4	TWA: 1 ppm	(vacated) TWA: 14 mg/m <sup>3</sup> (vacated) STEL: 15 ppm (vacated) STEL: 21 mg/m <sup>3</sup> Ceiling: 20 ppm
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S\* - Potential exposure by cutaneous route

NOTE: Limits shown for guidance only. For additional information, OSHA's 1989 air contaminants standard exposure limits provided even though the limits were vacated in 1992. State, local or other agencies or advisory groups may have established more stringent limits. Follow applicable regulations.

**Appropriate engineering controls**

**Engineering controls**                      Showers  
    Eyewash stations  
    Ventilation systems.

**Individual protection measures, such as personal protective equipment**

**Eye/face protection**                      Tight sealing safety goggles.

**Hand Protection**                              Wear suitable gloves. Impervious gloves.

**Skin and body protection**                      Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.  
    Antistatic boots.

**Respiratory protection**                      When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Use a NIOSH approved respirator when there is a potential for airborne concentrations to exceed occupational exposure limits. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2, NIOSH Respirator Decision Logic, and the respirator manufacturer for additional guidance on respiratory protection selection. A Self-Contained Breathing Apparatus (SCBA) should be used for fire fighting. Use a NIOSH approved positive-pressure supplied air respirator if there is a potential for uncontrolled release, exposure levels are unknown, in oxygen deficient (less than 19.5% oxygen), or any other circumstance where an air-purifying respirator may not provide adequate protection.

**General hygiene considerations**                      Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Information on basic physical and chemical properties**

**Physical State @20°C**                      Liquid  
**Appearance**                                      Liquid  
**Odor**    Petroleum asphalt odor. Hydrogen sulfide (H<sub>2</sub>S) has a characteristic rotten egg odor with an odor threshold as low as 10 parts per billion or even less. However, this odor should not be used as a warning property because H<sub>2</sub>S can deaden the sense of smell. H<sub>2</sub>S concentrations can be measured with an H<sub>2</sub>S meter or colorimetric indicating tubes.  
**Color**    Dark yellow to brown or greenish black  
**Odor threshold**                                      Odor threshold varies with the composition of the crude oil

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
<b>pH</b>	Not applicable	
<b>Melting point / freezing point</b>	-30 °C / -22 °F	
<b>Boiling range</b>	300 °C	
<b>Flash point</b>	-7 °C / 19 °F	
<b>Evaporation rate</b>	No data available	
<b>Flammability (solid, gas)</b>	Flammable gas or vapor may be released by liquid	
<b>Flammability Limit in Air %</b>		

<b>Upper flammability limit:</b>	7
<b>Lower flammability limit:</b>	0.7
<b>Vapor pressure</b>	6 to 45
<b>Vapor density</b>	No data available
<b>Relative density</b>	0.8 to 1.0
<b>Water solubility</b>	1 to 2% by weight is maximum reported for soluble components of crude oil
<b>Solubility in other solvents</b>	No data available
<b>Partition coefficient</b>	2 to > 6
<b>Autoignition temperature</b>	No data available °C / °F
<b>Decomposition temperature</b>	No data available
<b>Kinematic viscosity</b>	5 to > 1300 mm <sup>2</sup> /s
<b>Dynamic viscosity</b>	No data available
<b>Explosive properties</b>	No data available
<b>Oxidizing properties</b>	No data available
<b>Minimum Ignition Energy (mJ)</b>	No data available
<b>K<sub>st</sub> (bar.m/s)</b>	No data available
<b>Softening point</b>	No data available
<b>VOC Content (%)</b>	No data available
<b>Density</b>	No data available
<b>Bulk density</b>	Not applicable
<b>Conductivity</b>	No data available

## 10. STABILITY AND REACTIVITY

<b>Reactivity</b>	This product is non-reactive under normal conditions.
<b>Chemical stability</b>	Stable under recommended storage conditions.
<b>Possibility of hazardous reactions</b>	None under normal processing.
<b>Conditions to avoid</b>	Heat, flames and sparks.
<b>Incompatible materials</b>	Strong acids. Strong bases. Strong oxidizing agents.
<b>Hazardous decomposition products</b>	None under normal use conditions.

## 11. TOXICOLOGICAL INFORMATION

### Information on likely routes of exposure

<b>Inhalation</b>	Specific test data for the substance or mixture is not available. May cause irritation of respiratory tract.
<b>Eye contact</b>	Specific test data for the substance or mixture is not available. Irritating to eyes. (based on components).
<b>Skin contact</b>	Specific test data for the substance or mixture is not available. Causes skin irritation. (based on components).
<b>Ingestion</b>	Specific test data for the substance or mixture is not available. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

### Information on toxicological effects

<b>Symptoms</b>	Redness. May cause redness and tearing of the eyes.
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### Numerical measures of toxicity

**Acute toxicity**

The following values are calculated based on chapter 3.1 of the GHS document .

ATEmix (oral)	3,093.00 mg/kg
ATEmix (dermal)	1,836.00 mg/kg
ATEmix (inhalation-dust/mist)	8.00 mg/l
ATEmix (inhalation-vapor)	1,809.77 mg/l

Chemical Name	Oral LD50	LD50/dermal/rat - NO UNITS (Wizards mg/kg)	Inhalation LC50
Petroleum; Crude oil 8002-05-9	> 4300 mg/kg ( Rat )	> 2000 mg/kg ( Rabbit )	-
Sulfur 7704-34-9	> 3000 mg/kg ( Rat )	> 2000 mg/kg ( Rabbit )	> 9.23 mg/L ( Rat ) 4 h
Benzene 71-43-2	= 1800 mg/kg ( Rat ) = 810 mg/kg ( Rat )	> 8200 mg/kg ( Rabbit )	= 44.66 mg/L ( Rat ) 4 h
N-hexane 110-54-3	= 25 g/kg ( Rat )	= 3000 mg/kg ( Rabbit )	= 48000 ppm ( Rat ) 4 h
Xylene 1330-20-7	= 3500 mg/kg ( Rat )	> 1700 mg/kg ( Rabbit ) > 4350 mg/kg ( Rabbit )	= 29.08 mg/L ( Rat ) 4 h = 5000 ppm ( Rat ) 4 h
Toluene 108-88-3	= 2600 mg/kg ( Rat )	= 12000 mg/kg ( Rabbit )	= 12.5 mg/L ( Rat ) 4 h
Naphthalene 91-20-3	= 1110 mg/kg ( Rat ) = 490 mg/kg ( Rat )	= 1120 mg/kg ( Rabbit ) > 20 g/kg ( Rabbit )	> 340 mg/m <sup>3</sup> ( Rat ) 1 h
Ethylbenzene 100-41-4	= 3500 mg/kg ( Rat )	= 15400 mg/kg ( Rabbit )	= 17.4 mg/L ( Rat ) 4 h
Cumene 98-82-8	= 1400 mg/kg ( Rat )	= 12300 µL/kg ( Rabbit )	= 39000 mg/m <sup>3</sup> ( Rat ) 4 h > 3577 ppm ( Rat ) 6 h
Hydrogen Sulfide 7783-06-4	-	-	= 700 mg/m <sup>3</sup> ( Rat ) 4 h

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

**Chemical Name**

**Benzene**

Benzene exposure may occur through inhalation, ingestion, skin absorption or eye contact. Benzene exposure can cause skin, eye and respiratory irritation. The most characteristic systemic effect resulting from high enough intermediate and chronic benzene exposure is arrested development of blood cells. Studies have linked overexposure to benzene to many hematological effects including aplastic anemia, pancytopenia, leukopenia, and myelodysplastic syndrome. In vivo and in vitro data from both humans and animals show that benzene and/or its metabolites are genotoxic. Studies in animals provide supporting evidence for the carcinogenicity of inhaled benzene. Epidemiological studies have reported a causal relationship between occupational benzene exposures and acute myelogenous leukemia. Some studies suggest associations between benzene exposure and non-Hodgkin's lymphoma, multiple myeloma, and other cancers. Benzene has been classified as carcinogenic to humans (Group 1) by IARC, and the ECHA C&L Inventory states it may cause cancer (Carc. 1B). IARC concluded that benzene causes acute myeloid leukemia and a positive association has been observed for acute lymphatic leukemia, chronic lymphatic leukemia, non-hodgkin lymphoma, and multiple myeloma. Human studies suggest that female fertility and menstrual cycles were effected by benzene exposure; however, due to uncertainties in exposure and limited data the studies were considered inconclusive. Developmental effects have been observed in animals including persistent hematopoietic anomalies. It has been suggested that the reported benzene fetotoxicity of decreased weight and skeletal variants is a function of maternal toxicity.

**N-hexane**

N-Hexane may be fatal if it is swallowed and enters the airways. Acute (short-term) dermal overexposure can cause skin and eye irritation in humans. Acute inhalation and oral exposures have caused systemic effects such as decreased body weight and respiratory effects, as well as reproductive and developmental effects in animals. Respiratory effects may include nose, throat, and lung irritation, coughing, wheezing, and shortness of breath. Acute overexposures may also cause headache, nausea, vomiting, dizziness, lightheadedness, loss of consciousness, coma, and death in human. Intermediate duration inhalation and oral exposures to relatively high concentrations (400-3,000 ppm) of n-hexane have led to nerve damage, paralysis, and/or deaths in rats. N-hexane may damage male



reproductive glands. Intermediate-duration inhalation and oral exposure to high levels (1,000-10,000 ppm; 4,000 mg/kg/day) of n-hexane damages sperm-forming cells and testicles in rats. Chronic (long-term) inhalation of large amounts of n-hexane causes nerve damage and paralysis of the arms and legs in humans. Dermal effects, such as a skin rash, dryness, or redness can also occur following chronic overexposure. Chronic duration inhalation exposures in animals are not available.

### **Xylene**

Mixed xylenes can cause skin, eye, and respiratory irritation. Both short- and long-term repeated exposures to high enough levels in humans have resulted in a variety of adverse nervous system effects that include headache, mental confusion, narcosis, equilibrium, impaired short-term memory, dizziness and tremors. Studies in laboratory animals indicate that xylene can cause changes in the liver and harmful effects on the kidneys, lungs, heart, and nervous system as well as hearing loss. The relevance of these observations to humans is not clear at this time. In general, developmental studies in animals reported adverse fetal effects only at concentrations that caused maternal toxicity. The relevance of these observations to humans is unclear at this time. The available data from in vitro and in vivo studies suggest that xylenes are not mutagenic and do not produce chromosomal abnormalities. Furthermore, rats exposed up to 500 mg/kg bw and mice exposed up to 1000 mg/kg bw mixed xylenes for 103 weeks showed no treatment-related increases in any tumor type. IARC has determined that the carcinogenicity of xylenes is not classifiable (Group 3).

### **Naphthalene**

Acute (short term) exposure to large amounts of naphthalene may damage or destroy red blood cells, a condition termed hemolytic anemia. Symptoms of hemolytic anemia include fatigue, lack of appetite, restlessness, and pale skin. Acute inhalation or oral exposure to large amounts of naphthalene may also cause nausea, vomiting, diarrhea, blood in the urine, and a yellow color to the skin. Ingestion may result in death. Chronic (long term) exposure in rats and mice can lead to irritation and inflammation of their nose and lungs; nasal hyperplasia and metaplasia in respiratory and olfactory epithelium has been reported in studies in mice. Exposure to high enough levels may have effects on the blood, resulting in chronic hemolytic anemia, and effects on the eyes, resulting in the development of cataracts. Cancer from naphthalene exposure has been observed in animals, but not humans. IARC has classified naphthalene as possibly carcinogenic to humans (Group 2B), and the ECHA C&L Inventory reports that naphthalene is suspected of causing cancer (Carc. 2).

### **Ethylbenzene**

Ethylbenzene may be fatal if it is swallowed and enters the airways. Short term (acute) exposure to ethylbenzene can cause eye, skin, and throat irritation. It may have effects on the central nervous system including dizziness, and at very high exposure, lowering on consciousness. Long-term exposures orally and by inhalation have been shown to cause damage to the inner ear and hearing in animals. Long term or repeated exposure to high enough levels of ethylbenzene may have effects on the kidneys and liver, resulting in impaired functions, and repeated contact with skin may cause dryness and cracking. Animal studies indicate some evidence of adverse effects on the liver, kidney, thyroid, and pituitary gland. In a 2-year inhalation study in mice and rats, the animals were exposed to 0, 75, 250, and 750 ppm ethylbenzene 6 hours/day, 5 days/week. Renal effects were observed in male rats (renal tubule hyperplasia) and female rats (renal tubule adenoma and adenoma or carcinoma) exposed to 750 ppm. The incidence of adenoma in the testes of males was significantly greater than in the control group and exceeded the historical control range for inhalation studies. The incidences of alveolar/bronchiolar adenoma was increased in males and the incidence of hepatocellular adenoma was increased in females. IARC has classified ethylbenzene as possibly carcinogenic to humans (Group 2B). Studies do not provide conclusive evidence of reproductive effects. In one study, developmental effects were reported in animals but only at very high doses ( $\geq 1000$  ppm) that are likely to be toxic to the mother. The relevance of these findings to humans is not clear at this time.

### **Cumene**

Cumene may be fatal if it is swallowed and enters the airways. Cumene targets the eyes, skin, respiratory system, and central nervous system. Short term (acute) exposure may result in irritation of the eyes, skin and mucous membranes, headache, narcosis, and coma. At high enough levels, repeated or prolonged contact with skin may cause dermatitis. Acute exposures to cumene in animal studies has been shown to result in neurotoxicological effects at concentrations  $> 500$  ppm. A cumene concentration of 2,058 ppm has been shown to result in a 50% reduction in the respiratory rate of mice. In animals, an increase in organ weights, primarily the kidneys, are the most prominent effects observed in rodents

repeatedly exposed to cumene by either the oral or inhalation route. No adverse effects were observed in rat or rabbit fetuses whose mothers had been exposed to cumene during fetal development. Cumene is classified as possibly carcinogenic to humans by IARC (Group 2B).

**Hydrogen Sulfide**

Hydrogen Sulfide may be fatal if inhaled. The nervous system and respiratory tract are the main targets of hydrogen sulfide toxicity. Short term (acute) overexposure may cause irritation to the eyes, nose or throat. At high enough levels, effects on the nervous system include headaches, poor concentration, poor memory, unconsciousness, and death. Hydrogen sulfide has a strong odor that is characteristic of rotten eggs; however, the odor is not a reliable warning property as olfactory fatigue occurs at high levels. Respiratory distress or arrest can occur at high concentrations. Direct contact of the liquid with skin can cause frostbite; contact with the eyes can cause redness or severe burns. Cardiovascular effects have also been observed. NIOSH has determined that 100 ppm is immediately dangerous to life and health.

**Health hazard and classification information**

**Skin Corrosion/Irritation Category** Classification based on data available for ingredients. Irritating to skin.

**Serious eye damage/eye irritation** No information available.  
No information available.

**Germ cell mutagenicity** Classification based on data available for ingredients. Contains a known or suspected mutagen. The table below indicates ingredients above the cut-off threshold considered as relevant which are listed as mutagenic.

**Carcinogenicity** Classification based on data available for ingredients. Contains a known or suspected carcinogen.

The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Petroleum; Crude oil 8002-05-9	A2	Group 3	Known	X
Benzene 71-43-2	A1	Group 1	Known	X
Xylene 1330-20-7	-	Group 3	-	-
Toluene 108-88-3	-	Group 3	-	-
Naphthalene 91-20-3	A3	Group 2B	Reasonably Anticipated	X
Ethylbenzene 100-41-4	A3	Group 2B	-	X
Cumene 98-82-8	-	Group 2B	Reasonably Anticipated	X

**Reproductive toxicity** Classification based on data available for ingredients. Contains a known or suspected reproductive toxin. The table below indicates ingredients above the cut-off threshold considered as relevant which are listed as reproductive toxins.

**Target Organ Systemic Toxicant - Single Exposure** No information available.

**Target Organ Systemic Toxicant - Repeated Exposure** Causes damage to organs through prolonged or repeated exposure.

**Target organ effects** liver, kidney, Respiratory system, Eyes, Skin, Central nervous system, blood, Peripheral Nervous System (PNS), bone marrow.

**Aspiration hazard** No information available.

## 12. ECOLOGICAL INFORMATION

**Additional Ecological Information** Release of this product should be prevented from contaminating soil and water and from entering drainage and sewer systems. U.S.A. regulations require reporting spills of this material that could reach any surface waters. The toll free number to the U.S. Coast Guard National Response Center is (800) 424-8802

**Ecotoxicity** Very toxic to aquatic life with long lasting effects.

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Petroleum; Crude oil 8002-05-9	-	258: 96 h Salmo gairdneri mg/L LC50 static	-	36: 24 h Daphnia magna mg/L EC50 0.26: 48 h Daphnia magna mg/L EC50 Static
Sulfur 7704-34-9	-	14: 96 h Lepomis macrochirus mg/L LC50 static 866: 96 h Brachydanio rerio mg/L LC50 static 180: 96 h Oncorhynchus mykiss mg/L LC50 static	-	-
Benzene 71-43-2	29: 72 h Pseudokirchneriella subcapitata mg/L EC50	10.7 - 14.7: 96 h Pimephales promelas mg/L LC50 flow-through 5.3: 96 h Oncorhynchus mykiss mg/L LC50 flow-through 22.49: 96 h Lepomis macrochirus mg/L LC50 static 28.6: 96 h Poecilia reticulata mg/L LC50 static 22330 - 41160: 96 h Pimephales promelas µg/L LC50 static 70000 - 142000: 96 h Lepomis macrochirus µg/L LC50 static	-	10: 48 h Daphnia magna mg/L EC50 8.76 - 15.6: 48 h Daphnia magna mg/L EC50 Static
N-hexane 110-54-3	-	2.1 - 2.98: 96 h Pimephales promelas mg/L LC50 flow-through	-	1000: 24 h Daphnia magna mg/L EC50
Xylene 1330-20-7	-	13.4: 96 h Pimephales promelas mg/L LC50 flow-through 780: 96 h Cyprinus carpio mg/L LC50 semi-static 780: 96 h Cyprinus carpio mg/L LC50 13.5 - 17.3: 96 h Oncorhynchus mykiss mg/L LC50 19: 96 h Lepomis macrochirus mg/L LC50 13.1 - 16.5: 96 h Lepomis macrochirus mg/L LC50 flow-through 23.53 - 29.97: 96 h Pimephales promelas mg/L LC50 static 30.26 - 40.75: 96 h Poecilia reticulata mg/L LC50 static 2.661 - 4.093: 96 h Oncorhynchus mykiss mg/L LC50 static 7.711 -	-	0.6: 48 h Gammarus lacustris mg/L LC50 3.82: 48 h water flea mg/L EC50

		9.591: 96 h <i>Lepomis macrochirus</i> mg/L LC50 static		
Toluene 108-88-3	12.5: 72 h <i>Pseudokirchneriella subcapitata</i> mg/L EC50 static 433: 96 h <i>Pseudokirchneriella subcapitata</i> mg/L EC50	12.6: 96 h <i>Pimephales promelas</i> mg/L LC50 static 5.89 - 7.81: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 flow-through 15.22 - 19.05: 96 h <i>Pimephales promelas</i> mg/L LC50 flow-through 5.8: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 semi-static 11.0 - 15.0: 96 h <i>Lepomis macrochirus</i> mg/L LC50 static 50.87 - 70.34: 96 h <i>Poecilia reticulata</i> mg/L LC50 static 14.1 - 17.16: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 static 28.2: 96 h <i>Poecilia reticulata</i> mg/L LC50 semi-static 54: 96 h <i>Oryzias latipes</i> mg/L LC50 static	-	11.5: 48 h <i>Daphnia magna</i> mg/L EC50 5.46 - 9.83: 48 h <i>Daphnia magna</i> mg/L EC50 Static
Naphthalene 91-20-3	0.4: 72 h <i>Skeletonema costatum</i> mg/L EC50	5.74 - 6.44: 96 h <i>Pimephales promelas</i> mg/L LC50 flow-through 31.0265: 96 h <i>Lepomis macrochirus</i> mg/L LC50 static 0.91 - 2.82: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 static 1.6: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 flow-through 1.99: 96 h <i>Pimephales promelas</i> mg/L LC50 static	-	1.96: 48 h <i>Daphnia magna</i> mg/L EC50 Flow through 1.09 - 3.4: 48 h <i>Daphnia magna</i> mg/L EC50 Static 2.16: 48 h <i>Daphnia magna</i> mg/L LC50
Ethylbenzene 100-41-4	438: 96 h <i>Pseudokirchneriella subcapitata</i> mg/L EC50 4.6: 72 h <i>Pseudokirchneriella subcapitata</i> mg/L EC50 1.7 - 7.6: 96 h <i>Pseudokirchneriella subcapitata</i> mg/L EC50 static 2.6 - 11.3: 72 h <i>Pseudokirchneriella subcapitata</i> mg/L EC50 static	4.2: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 semi-static 7.55 - 11: 96 h <i>Pimephales promelas</i> mg/L LC50 flow-through 9.6: 96 h <i>Poecilia reticulata</i> mg/L LC50 static 9.1 - 15.6: 96 h <i>Pimephales promelas</i> mg/L LC50 static 11.0 - 18.0: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 static 32: 96 h <i>Lepomis macrochirus</i> mg/L LC50 static	-	1.8 - 2.4: 48 h <i>Daphnia magna</i> mg/L EC50
Cumene 98-82-8	2.6: 72 h <i>Pseudokirchneriella subcapitata</i> mg/L EC50	6.04 - 6.61: 96 h <i>Pimephales promelas</i> mg/L LC50 flow-through 4.8: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 flow-through 5.1: 96 h <i>Poecilia reticulata</i> mg/L LC50 semi-static 2.7: 96 h <i>Oncorhynchus mykiss</i>	-	0.6: 48 h <i>Daphnia magna</i> mg/L EC50 7.9 - 14.1: 48 h <i>Daphnia magna</i> mg/L EC50 Static

		mg/L LC50 semi-static		
Hydrogen Sulfide 7783-06-4	-	0.016: 96 h Pimephales promelas mg/L LC50 flow-through 0.0448: 96 h Lepomis macrochirus mg/L LC50 flow-through	-	0.022: 96 h Gammarus pseudolimnaeus mg/L LC50

**Persistence and degradability** No information available.

**Bioaccumulation** There is no data for this product.

**Component Information**

Chemical Name	Partition coefficient
Benzene 71-43-2	2.1
Xylene 1330-20-7	2.77 - 3.15
Toluene 108-88-3	2.7
Naphthalene 91-20-3	3.6
Ethylbenzene 100-41-4	3.2
Cumene 98-82-8	3.7
Hydrogen Sulfide 7783-06-4	0.45

**Other adverse effects** No information available.

### 13. DISPOSAL CONSIDERATIONS

**Waste treatment methods**

**Waste from residues/unused products** Should not be released into the environment. Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

**Contaminated packaging** Empty containers pose a potential fire and explosion hazard. Do not cut, puncture or weld containers.

**US EPA Waste Number** U019 U055 U135 U165 U220 U239 D001.

Chemical Name	RCRA	RCRA - Basis for Listing	RCRA - D Series Wastes	RCRA - U Series Wastes
Benzene 71-43-2	U019	Included in waste streams: F005, F024, F025, F037, F038, F039, K085, K104, K105, K141, K142, K143, K144, K145, K147, K151, K159, K169, K171, K172	0.5 mg/L regulatory level	U019
Xylene 1330-20-7	-	Included in waste stream: F039	-	U239
Toluene 108-88-3	U220	Included in waste streams: F005, F024, F025, F039, K015, K036, K037, K149, K151	-	U220
Polycyclic Aromatic Hydrocarbons 130498-29-2	-	Included in waste stream: K022	-	-
Naphthalene	U165	Included in waste	-	U165

91-20-3		streams: F024, F025, F034, F039, K001, K035, K060, K087, K145		
Ethylbenzene 100-41-4	-	Included in waste stream: F039	-	-
Cumene 98-82-8	-	-	-	U055
Hydrogen Sulfide 7783-06-4	U135	-	-	U135

Chemical Name	RCRA - Halogenated Organic Compounds	RCRA - P Series Wastes	RCRA - F Series Wastes	RCRA - K Series Wastes
Toluene 108-88-3	-	-	Toxic waste waste number F025 Waste description: Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution.	-
Naphthalene 91-20-3	-	-	Toxic waste waste number F025 Waste description: Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution.	-

**California Hazardous Waste Status** This product contains one or more substances that are listed with the State of California as a hazardous waste.

Chemical Name	California Hazardous Waste Status
Benzene 71-43-2	Toxic Ignitable
N-hexane 110-54-3	Toxic Ignitable
Xylene 1330-20-7	Toxic Ignitable

Toluene 108-88-3	Toxic Ignitable
Naphthalene 91-20-3	Toxic
Ethylbenzene 100-41-4	Toxic Ignitable
Cumene 98-82-8	Toxic Ignitable

## 14. TRANSPORT INFORMATION

### DOT

**UN/ID no** UN1267  
**Proper Shipping Name** PETROLEUM CRUDE OIL  
**Hazard Class** 3  
**Packing group** I  
**Reportable Quantity (RQ)** Hydrogen sulfide H2S: RQ kg= 9080.00, Benzene: RQ kg= 151.33, Naphthalene: RQ kg= 4540.00, Xylenes mixed isomers: RQ kg= 4540.00  
**Special Provisions** 357, T11, TP1, TP8, 144  
**Description** UN1267, Petroleum crude oil, 3, I, RQ  
**Emergency Response Guide Number** 128

### TDG

**UN/ID no** UN1267  
**Proper Shipping Name** PETROLEUM CRUDE OIL  
**Hazard Class** 3  
**Packing group** I  
**Description** UN1267, Petroleum crude oil, 3, I

### MEX

**UN/ID no** UN1267  
**Proper Shipping Name** PETROLEUM CRUDE OIL  
**Hazard Class** 3  
**Special Provisions** 357  
**Packing group** I  
**Description** UN1267, Petroleum crude oil, 3, I

### IATA

**UN/ID no** UN1267  
**Proper Shipping Name** PETROLEUM CRUDE OIL  
**Hazard Class** 3  
**Packing group** I or II, depending on composition  
**Description** UN1267, Petroleum crude oil, 3, I

### IMDG

**UN/ID no** UN1267  
**Proper Shipping Name** PETROLEUM CRUDE OIL  
**Hazard Class** 3  
**Packing group** I  
**EmS No.** F-E, S-E  
**Special Provisions** 357  
**Description** UN1267, Petroleum crude oil, 3, I, (-7°C c.c.)

## 15. REGULATORY INFORMATION

### International Inventories

**TSCA** Not Listed  
**DSL/NDSL** Not Listed  
**ENCS** Not Listed  
**IECSC** Not Listed

**KECL** Not Listed  
**PICCS** Not Listed  
**AICS** Not Listed

**Legend:**

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory  
**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List  
**ENCS** - Japan Existing and New Chemical Substances  
**IECSC** - China Inventory of Existing Chemical Substances  
**KECL** - Korean Existing and Evaluated Chemical Substances  
**PICCS** - Philippines Inventory of Chemicals and Chemical Substances  
**AICS** - Australian Inventory of Chemical Substances

**US Federal Regulations**

**SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

**SARA 311/312 Hazard Categories**

**Acute health hazard** Yes  
**Chronic Health Hazard** Yes  
**Fire hazard** Yes  
**Sudden release of pressure hazard** No  
**Reactive Hazard** No

**CWA (Clean Water Act)**

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Benzene 71-43-2	10 lb	X	X	X
Xylene 1330-20-7	100 lb	-	-	X
Toluene 108-88-3	1000 lb	X	X	X
Polycyclic Aromatic Hydrocarbons 130498-29-2	-	X	-	-
Naphthalene 91-20-3	100 lb	X	X	X
Ethylbenzene 100-41-4	1000 lb	X	X	X
Hydrogen Sulfide 7783-06-4	100 lb	-	-	X

**CERCLA**

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, fractions of crude oil, and products (both finished and intermediate) from the crude oil refining process and any indigenous components of such from the CERCLA Section 103 reporting requirements. However, other federal reporting requirements, including SARA Section 304, as well as the Clean Water Act may still apply.

**US State Regulations**

**California Proposition 65**

This product contains the following Proposition 65 chemicals.

Chemical Name	California Proposition 65
Benzene - 71-43-2	Carcinogen Developmental



	Male Reproductive
Naphthalene - 91-20-3	Carcinogen
Cumene - 98-82-8	Carcinogen
Ethylbenzene - 100-41-4	Carcinogen
Toluene - 108-88-3	Developmental

### U.S. State Right-to-Know Regulations

#### US State Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Petroleum; Crude oil 8002-05-9	X	X	X
Sulfur 7704-34-9	X	X	X
Benzene 71-43-2	X	X	X
N-hexane 110-54-3	X	X	X
Polycyclic Aromatic Hydrocarbons 130498-29-2	X	-	X
Xylene 1330-20-7	X	X	X
Ethylbenzene 100-41-4	X	X	X
Toluene 108-88-3	X	X	X
Naphthalene 91-20-3	X	X	X
Cumene 98-82-8	X	X	X
Hydrogen Sulfide 7783-06-4	X	X	X

## 16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Revision Date 14-Jun-2017

Revision Note No information available.

#### Disclaimer

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End of Safety Data Sheet