

Vancouver Energy  
Operations Facility Oil Handling Manual  
EFSEC Application for Site Certification No. 2013-01  
Docket No. EF131590



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Appendix C  
Material Safety Data Sheets



# Material Safety Data Sheet



## 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

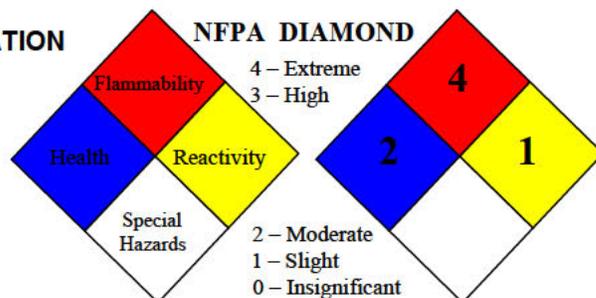
Manufacturer/Supplier: Enbridge Pipelines Inc.  
10201- Jasper Avenue  
Edmonton, Alberta T5J 3N7  
CANADA

Product Name: Bakken Crude Oil  
Synonyms: Hydrocarbons of Petroleum

General Information: 780-420-5306

Emergency Telephone Number (24 hrs): CHEMTREC 800-424-9300 USA  
CANUTEC 613-996-6666 Canada

Date Prepared: 06/08/2011



## 2 – PRODUCT COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Number	Normal % * by Wt./Vol.	Occupational Exposure Limits (ppm)		
			OSHA	ACGIH	NIOSH
Petroleum Hydrocarbons	68919-39-1	100	N/A	N/A	N/A
1t,2-dimethylcyclopentane	28729-52-4	1.8	None	None	None
2-methylhexane	591-76-4	1.0	None	None	None
2-methylpentane	107-83-5	1.8	None	500	100
3-methylhexane	589-34-4	1.6	None	None	None
3-methylpentane	96-14-0	1.3	None	500	100
2-methylheptane	592-27-8	1.4	None	300	None
Benzene	71-43-2	0.4	1	0.5	0.1
cyclohexane	110-82-7	1.0	300	100	300
i-pentane	109-66-0	1.8	1000	600	120
methylcyclohexane	108-87-2	2.3	500	400	400
methylcyclopentane	96-37-7	2.2	None	None	None
n-butane	106-97-8	1.9	800	1000	800
n-heptane	142-82-5	3.4	500	400	85
n-Hexane	110-54-3	3.4	50	50	50
n-Pentane	109-66-0	3.4	600	600	120
n-octane	111-65-9	3.0	500	300	75

n-nonane	111-84-2	2.2	None	200	200
n-decane	124-18-5	2.0	None	None	None
n-undecane	1120-21-4	1.7	None	None	None
n-dodecane	112-40-3	1.5	None	None	None
n-tridecane	629-50-5	1.3	None	None	None
Toluene	108-88-3	0.9	100	20	100
Hydrogen sulfide	7783-06-4	<0.00001	20 <sup>Ceiling</sup>	1	10 <sup>Ceiling</sup>
Ethylbenzene	100-41-4	0.6	100	20	100
Xylenes	1330-20-7	0-5	100	100	100

\* Values do not reflect absolute minimums and maximums; those values may vary from time to time.

N/A - Not Available

### 3 – HAZARDS IDENTIFICATION

**Flammability:** Flammable liquid and vapor. Keep away from heat, sparks, flames or other sources of ignition (such as static electricity, pilot lights, mechanical/electrical equipment).  
HMIS Classification for Flammability: 4

**Stability:** Stable under normal conditions. Avoid all sources of ignition.  
HMIS Classification for Reactivity: 1

#### Potential Health Effects from Overexposure

##### Acute Effects:

**Ingestion:** Ingestion may result in nausea, vomiting, diarrhea and central nervous system depression. Aspiration of liquid into the lungs must be avoided as even small quantities in the lungs can produce chemical pneumonitis, pulmonary edema/hemorrhage and even death.

**Skin Contact:** Prolonged and repeated contact may cause defatting and drying of the skin and can lead to irritation and/or dermatitis.

**Eye Contact:** Liquid or vapor contact may cause mild eye irritation, including stinging, watering, redness and swelling. Hydrogen sulfide (H<sub>2</sub>S) may cause burning or tearing and visual disturbances at repeated exposures above the TLV.

**Inhalation:** Prolonged or excessive exposure may cause irritation to the nose, throat, lungs and respiratory tract and may lead to headache, nausea, drowsiness, fatigue, pneumonitis, pulmonary edema, CNS depression, coma and respiratory arrest.

##### Chronic Health Effects from Overexposures:

Skin and eye irritation. May affect the respiratory and central nervous systems.

##### Special Toxic Effects:

n-Hexane (CAS 110-54-3)

Target Organs – Excess exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesia of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone. Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) has resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

#### Benzene (CAS 71-43-2)

Carcinogenicity: Benzene is a known animal carcinogen and is known to produce leukemia in humans. Benzene has been identified as a human carcinogen by NTP, IARC and OSHA.

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### 4 – FIRST AID MEASURES

- Ingestion:** Aspiration hazard. Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe damage. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration.
- Skin Contact:** Wipe material from skin and remove contaminated clothing. Cleanse affected areas thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. If irritation or redness develops, seek medical attention.
- Eye Contact:** If irritation or redness develops, move victim away from exposure and into fresh air. Flush eyes with clean water for 15 minutes, with eyelids held open. If symptoms persist, seek medical attention.
- Inhalation:** If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, qualified personnel should administer oxygen. Seek immediate medical attention.

**Notes to Physician:** Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of this material (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for development of cardiac arrhythmias.

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### 5 – Exposure Controls/ Personal Protection

- Eye Protection:** Safety glasses or goggles are recommended when there is a possibility of splashing or spraying.
- Skin Protection:** The use of gloves (nitrile or neoprene) is advised to prevent skin contact and possible irritation. Depending on conditions, the use of an apron or chemical protective clothing may be necessary.
- Respiratory Protection:** A NIOSH certified air purifying respirator with an organic vapor cartridge may be used under conditions where airborne concentrations of hydrocarbons are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is a potential for an uncontrolled release, exposure levels are not known or any other circumstances where air purifying respirators

may not provide adequate protection. A respiratory protection program that meets US OSHA's 29 CFR 1910.134, Canadian Labour Code Part II and ANSI Z88.2 requirements must be followed when workplace conditions warrant a respirator's use.

Engineering Controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional ventilation or exhaust systems may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

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## 6 – FIRE FIGHTING MEASURES

Flash Point:	< 40 °C	Lower Explosive Limit:	Not Established
Auto Ignition Temperature:	Not data available	Upper Explosive Limit:	Not Established

*Basic Fire Fighting Procedures:* Long-duration fires involving diluent stored in tanks may result in a boilover. The contents of the tank may be expelled beyond the containment dikes or ditches. All personnel should be kept back a safe distance when a boilover is anticipated (reference NFPA 11). For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces or when explicitly required by DOT, a self-contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant. Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk. Water spray may be useful in minimizing or dispersing vapors. Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

*Extinguishing Media:* Any extinguisher capable of handling Class B fires is recommended, including extinguishing media such as CO<sub>2</sub>, dry chemical or foam. Water spray is recommended to cool or protect exposed materials or structures. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Firefighting should be attempted only by those who are adequately trained and equipped with proper personal protective equipment.

*Unusual Fire and Explosion Hazards:* This material is flammable and may be ignited by heat, sparks, flames or other sources of ignition (such as static electricity, pilot lights, or mechanical/electrical equipment). Vapors may travel considerable distances to a source of ignition where they can ignite, flashback or explode. May create vapor/air explosion hazard indoors, outdoors or in sewers. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

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## 7 – ACCIDENTAL RELEASE MEASURES

Personal precautions: Keep public away. Isolate and evacuate area. Shut off source if safe to do so. Eliminate all ignition sources.

Spill management: Wear appropriate breathing apparatus (if applicable) and protective clothing. A vapor suppressing foam may be used to reduce vapors. Try to work upwind of spill. Dike and contain land spills; contain water spills by booming. For large spills remove by mechanical means such as vacuuming or pumping and place in containers. All equipment used when

handling the product must be grounded. Recover and return free product to proper containers. Use suitable absorbent materials such as vermiculite, sands, soil, or clay to clean up residual liquids. Do not wash spills into sewers or other public water systems.

Reporting: Report spills to local or federal authorities as appropriate or required.

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## 8 – HANDLING AND STORAGE

The use of explosion-proof equipment is recommended and may be required (see appropriate fire codes). Do not enter confined spaces such as tanks or pits without following proper entry procedures. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits.

Use appropriate grounding and bonding practices. Stores in properly closed containers that are appropriately labeled and in a cool well-ventilated area. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. Do not cut, drill, grind or weld on empty containers since they may contain explosive residues.

Harmful concentrations of hydrogen sulfide (H<sub>2</sub>S) gas can accumulate in excavations and low-lying areas as well as the vapor space of storage and bulk transport compartments. Stay upwind and vent open hatches before uploading.

Avoid skin contact. Exercise good personal hygiene including removal of soiled clothing and prompt washing with soap and water.

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## 9 – PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	Clear to brown liquid
<b>Physical Form:</b>	Liquid
<b>Substance type (Pure/Mixture):</b>	Mixture
<b>Boiling Temperature:</b>	94 to 1330 °F
<b>Melting Temperature:</b>	Not determined
<b>Vapor Pressure:</b>	about 7.47 psi
<b>Vapor Density:</b>	1.0 - 3.9
<b>Evaporation Rate:</b>	(Ethyl ether =1) >1
<b>Specific Gravity:</b>	0.82
<b>Water Solubility:</b>	Negligible
<b>pH:</b>	Not determined
<b>Viscosity:</b>	5.43 mm <sup>2</sup> /s
<b>Color:</b>	Clear to brown
<b>Odor:</b>	Rotten egg, petroleum like odor

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## 10 – STABILITY AND REACTIVITY

<b>CONDITIONS TO AVOID:</b>	Excessive heat, sources of ignition, sparks, open flames, and buildup of static electricity.
<b>CHEMICAL STABILITY:</b>	Stable at 70 °F, 760 mmHg pressure.
<b>HAZARDOUS DECOMPOSITION PRODUCTS:</b>	Combustion produces carbon monoxide, aldehydes, aromatic and other hydrocarbons.
<b>HAZARDOUS POLYMERIZATION:</b>	Will not occur
<b>INCOMPATIBILITY:</b>	Strong oxidizers such as nitrates, chlorates, peroxides.

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## 11 – TOXICOLOGICAL INFORMATION– CHRONIC AND ACUTE HEALTH HAZARDS

This product contains aliphatic naphthas at a level of >0.1%. Lifetime skin painting studies in mice with similar naphthas have shown wither negative or very weak dermal carcinogenic activity following prolonged and repeated skin contact. Some other petroleum fractions that show carcinogenic activity when tested at nonirritating dose levels did not show any significant carcinogenic activity indicating that this tumorigenic response is likely related to chronic irritation and not dose. Some components of aliphatic naphthas, i.e., paraffins and olefins, have been shown to produce a species specific, sex hormonal dependent kidney damage develops via the formation of alpha-2u-globulin, a mechanism unique to the male rat. Humans do not for alpha-2u-globulin; therefore, the kidney effects resulting from this mechanism are not relevant in humans.

This product contains benzene at a level of 0.1%. Repeated or prolonged exposure to benzene at concentrations in excess of the TLV may cause serious injury to blood-forming organs. Significant chronic exposure to benzene vapor has been reported to produce various blood disorders ranging from anemia to certain forms of leukemia (cancer) in man. Benzene produced tumors in rats and mice in lifetime chronic toxicity studies, but the response has not been consistent across species, strain, sex or route of exposure. Animal studies on benzene have demonstrated immune toxicity, chromosomal aberrations, testicular effects and alterations in reproductive cycles and embryo/fetotoxicity, but not teratogenicity.

Hydrogen sulfide gas (H<sub>2</sub>S) is toxic by inhalation. Prolonged breathing of 50-100 ppm H<sub>2</sub>S vapors can produce eye and respiratory tract irritation. Higher concentration (250-600 ppm) for 15-30 minutes can produce headache, dizziness, nervousness, nausea and pulmonary edema or bronchial pneumonia. Concentrations of >1000 ppm will cause immediate unconsciousness and death through respiratory paralysis. Rats and mice exposed to 80 ppm H<sub>2</sub>S, 6 hrs/day, 5 days/week for 10 weeks, did not produce any toxicity except for irritation of nasal passages. H<sub>2</sub>S did not affect reproduction and development (birth defects or neurotoxicity) in rats exposed to concentrations of 75-80 ppm or 150 ppm H<sub>2</sub>S, respectively. Over the years a number of acute cases of H<sub>2</sub>S poisoning have been reported. Complete and rapid recovery is the general rule. However, if the exposure was sufficiently intense and sustained causing cerebral hypoxia (lack of oxygen to the brain), neurologic effects such as amnesia, intention tremors or brain damage are possible.

This product may contain hexane at a level of >1.0%. Studies in laboratory animals have produced systemic toxicity in blood, spleen and lungs. Fetotoxicity has been observed at hexane concentrations that produced maternal toxicity. Long term exposure to high concentrations of hexane has been shown to cause testicular effects and nervous system damage.

This product may contain xylenes at a level of >1.0%. Gross overexposure or severe poisoning incidents in humans to xylenes has been reported to cause lung, liver, kidney, heart and brain damage as well as neurologic disturbances. Laboratory animals exposed to high dose of xylenes showed evidence of effects in the liver, kidneys, lungs, spleen, heart and adrenals. Exposure of pregnant rats, mice and rabbits during gestation to significant concentrations of xylenes produced maternal, fetal and developmental toxicity (skeletal retardation, cleft palate, and wavy ribs) generally at maternally toxic doses. These types of fetotoxic effects have been associated with maternal toxicity. Repeated inhalation of high xylene concentrations has shown impairment of performance abilities (behavioral tests) in animals and man. Xylenes produced a mild frequency hearing loss in rats subchronically exposed to high concentrations of xylenes.

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## 12 – DISPOSAL INFORMATION

Container contents should be completely used and containers should be emptied prior to discard. Container could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum re-conditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities. This product, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA RCRA (40 CFR 261), Environment Canada, or other State, Provincial, and local regulations. If this product is classified as a hazardous waste, federal law

requires disposal at a licensed hazardous waste disposal facility. This product could also contain benzene at >0.5 ppm and could exhibit the characteristic of "toxicity" (D018) as determined by the toxicity characteristic leaching procedure (TCLP). This material could become a hazardous waste if mixed or contaminated with a hazardous waste or other substance(s). It is the responsibility of the user to consult federal, state and local waste regulations to determine appropriate disposal options.

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### 13 – ENVIRONMENTAL INFORMATION

**Spill or Release to the Environment:** Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof equipment is recommended. Stay upwind and away from spill/release. Notify persons downwind of spill/release, isolate immediate hazard area and keep unauthorized personnel out. Product may release large amounts of flammable vapors (e.g., methane, ethane and propane) at or below ambient temperature depending on source and process conditions. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory equipment as conditions warrant. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment drainage systems and natural waterways. Dike far ahead of spill for later recovery or disposal. Use foam on spills to minimize vapors. Spilled material may be absorbed into an appropriate absorbent material.

Notify fire authorities and appropriate federal, state (provincial) and local agencies. Immediate cleanup of any spill is recommended. If spill of any amount into navigable waters, notify appropriate federal, state (provincial) and local agencies.

Sara Title III Information: This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:

Toluene	CAS – 108-88-3	Weight % - 0 – 2%
n-Hexane	CAS – 110-54-3	Weight % - up to 11%
Benzene	CAS – 71-43-2	Weight % - 0 – 2%

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### 14 – REGULATORY INFORMATION

USA: All of the components of this product are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

Canada: All the components of this product are on the Canadian Domestic Substances List (DSL), or have been notified under the New Substances Notification Regulations, but have not yet been published in the Canada Gazette.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Classification:           Class B2 Flammable Liquids  
  Class D2B Other Toxic Effects - Skin Irritant  
  Class D2A Other Toxic Effects – Embryotoxic/Fetotoxic

US EPA Reportable Quantity: The estimated reportable quantity (RQ) for this material is based on the weight % shown below:

RQ based on benzene – The RQ for benzene is 10 pounds, which equals 3,333 pounds of natural gas condensate (556 gallons). The RQ is based on 0.3 wt. % benzene.

RQ based on n-Hexane – The RQ for n-Hexane is 5000 pounds, which equals 50,000 pounds of natural gas condensate (8,333 gallons). The RQ is based on 10 wt. % n-Hexane.

RQ based on toluene – The RQ for toluene is 1000 pounds, which equals 50,000 pounds of natural gas condensate (8,333 gallons). The RQ is based on 2 wt. % toluene.

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## 15 – SPECIAL PRECAUTIONS / SUPPLEMENTAL INFORMATION

Keep containers tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces and all sources of ignition. Post area “No Smoking or Open Flame”. Store only in approved containers. Keep away from any incompatible material. Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet US OSHA standards, Canadian Labour Codes and other appropriate fire codes.

Depending on the source of natural gas condensate, there could be some amount of NORM (naturally occurring radioactive materials) in the scale, deposit and sludge associated with this material. Proper measurements should be taken prior to handling this material or any equipment contaminated with this material. If NORM is indicated, refer to API Bulletin E2, “Bulletin on Management of Naturally Occurring Radioactive Materials in Oil and Gas Production,” for additional information.

Empty Containers: “Empty” containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks or other sources of ignition. They may explode and cause injury or death. “Empty” drums should be completely drained, properly bunged and promptly shipped to the supplier or a drum re-conditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1 and other governmental and industrial references pertaining to cleaning, repairing, welding or other contemplated operations.

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## 16 – TRANSPORTATION REQUIREMENTS

General Transportation Information:

DOT Proper Shipping Name (49 CFR 172.101):	Petroleum Crude Oil
DOT Hazard Classes (49 CFR 172.101):	3
UN/NA Code (49 CFR 172.101):	UN1267
Packing Group (49 CFR 172.101):	II
Bill of Lading Description (49 CFR 172.202):	Petroleum Crude Oil
DOT Labels Required (49 CFR 172.101):	Flammable Liquid

Please note that the actual shipping name and associated data can vary due to the properties of the product. Other acceptable shipping names may include Petroleum Distillate n.o.s. 1268, Gasoline UN1203, Flammable liquids, n.o.s. (pentane) UN1993 or Hydrocarbons, Liquid n.o.s. (condensate) UN3295.

PREPARED BY: Enbridge Pipelines Inc.

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### Disclaimer

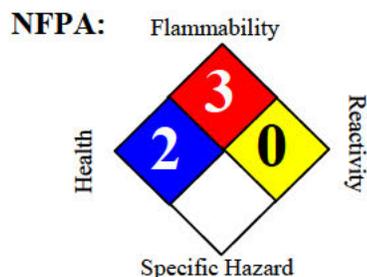
The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet (MSDS). However, MSDS's may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices or from any hazards inherent in the nature of the product.

## ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
ASTM	American Society for Testing and Materials
CAS	Chemical Abstract Service
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
HMIS	Hazardous Materials Identification System
IARC	International Agency for Research on Cancer
m <sup>3</sup>	Cubic meter
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program
n.o.s.	Not Otherwise Specified
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
REL	Recommended Exposure Limit
SARA	Superfund Amendments and Reauthorization Act
TLV	Threshold Limit Value
TSCA	Toxic Substance Control Act
TWA	Time Weighted Average

# Safety Data Sheet

## Crude Oil



### SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

<b>Product name</b>	:	Crude Oil			
<b>Synonyms</b>	:	Sour Crude Oil, Sweet Crude Oil, Light Crude Oil, Heavy Crude Oil, Generic Crude Oil, 888100008800			
<b>SDS Number</b>	:	888100008800	<b>Version</b>	:	1.7
<b>Product Use Description</b>	:	Refining feedstock			
<b>Company</b>	:	For: Tesoro Refining & Marketing Co. 19100 Ridgewood Parkway, San Antonio, TX 78259			
<b>Tesoro Call Center</b>	:	(877) 783-7676	<b>Chemtrec</b>	:	(800) 424-9300
			<b>(Emergency Contact)</b>		

### SECTION 2. HAZARDS IDENTIFICATION

<b>Classifications</b>	<p>Flammable Liquid – Category 2 or 3 depending on variable composition.          Aspiration Hazard – Category 1.          Carcinogenicity – Category 2          Specific Target Organ Toxicity (Repeated Exposure) – Category 2          Specific Target Organ Toxicity (Single Exposure) – Category 3          Eye Irritant – Category 2B          Chronic Aquatic Toxicity – Category 2</p>
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**Pictograms**



**Signal Word**

**Danger**

**Hazard Statements**

Highly flammable liquid and vapor.  
 May be fatal if swallowed and enters airways – do not siphon gasoline by mouth.  
 Suspected of causing cancer if repeated over-exposure by inhalation and/or skin contact occurs.  
 May cause damage to liver, kidneys and nervous system by prolonged and repeated inhalation or skin contact.  
 Causes eye irritation. Can be absorbed through skin.

Repeated or prolonged skin contact can cause irritation and dermatitis.  
 May cause drowsiness or dizziness.  
 Harmful to aquatic life.  
 May release hydrogen sulfide (H<sub>2</sub>S) gas, a toxic-by-inhalation material. See Section 11.

### Precautionary statements

#### Prevention

Obtain special instructions before use.  
 Do not handle until all safety precautions have been read and understood.  
 Keep away from heat, sparks, open flames, welding and hot surfaces.  
 No smoking.  
 Keep container tightly closed.  
 Ground and/or bond container and receiving equipment.  
 Use explosion-proof electrical equipment.  
 Use only non-sparking tools (if tools are used in flammable atmosphere).  
 Take precautionary measures against static discharge.  
 Wear gloves, eye protection and face protection (as needed to prevent skin and eye contact with liquid).  
 Wash hands or liquid-contacted skin thoroughly after handling.  
 Do not eat, drink or smoke when using this product.  
 Do not breathe vapors.  
 Use only outdoors or in a well-ventilated area.

#### Response

In case of fire: Use dry chemical, CO<sub>2</sub>, water spray or fire-fighting foam to extinguish.  
 If swallowed: Immediately call a poison center, doctor, hospital emergency room, medical clinic or 911. Do NOT induce vomiting. Rinse mouth.  
 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
 If in eye: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 If skin or eye irritation persists, get medical attention.  
 If inhaled: Remove person to fresh air and keep comfortable for breathing. Get medical attention if you feel unwell.

#### Storage

Store in a well-ventilated place. Keep cool. Store locked up. Keep container tightly closed. Use only approved containers.

#### Disposal

Dispose of contents/containers to approved disposal site in accordance with local, regional, national, and/or international regulations.

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Weight %
Petroleum; Crude oil	8002-05-9	100%
N-hexane	110-54-3	0 - 1.5%
Hydrogen Sulfide	7783-06-4	Variable

Sulfur	7704-34-9	Trace - 5%
Benzene	71-43-2	0.1 - 3%
Cumene	98-82-8	Variable Trace < 1%
Naphthalene	91-20-3	Variable Trace < 1%
Xylene	1330-20-7	Variable Trace < 1%
Ethylbenzene	100-41-4	Variable Trace < 1%
Polycyclic Aromatic Compounds		Variable
Toluene	108-88-3	Variable Trace < 1%

#### SECTION 4. FIRST AID MEASURES

<b>Inhalation</b>	: Move to fresh air. Administer oxygen or artificial respiration if needed. Seek medical attention immediately.
<b>Skin contact</b>	: Take off all contaminated clothing immediately. Wash off immediately with soap and plenty of water. Seek medical attention if irritation or skin thermal burns occur.
<b>Eye contact</b>	: In case of eye contact, immediately flush with low pressure, cool water for at least 15 minutes, opening eyelids to ensure flushing. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Seek medical attention immediately.
<b>Ingestion</b>	: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Seek medical attention immediately. If vomiting does occur naturally, keep head below the hips to reduce the risks of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

#### SECTION 5. FIRE-FIGHTING MEASURES

<b>Suitable extinguishing media</b>	: SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO <sub>2</sub> , water spray, fire fighting foam. LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.
<b>Specific hazards during fire fighting</b>	: Vapors are heavier than air and may travel long distances to a point of ignition and flash back. Do not allow liquid runoff to enter sewers or public waters. Gas may form explosive mixture with air.
<b>Special protective equipment for fire-fighters</b>	: Use NIOSH/MSHA approved positive pressure self-contained breathing apparatus and fully protective clothing such as bunker gear if needed to prevent exposure.
<b>Further information</b>	: Isolate area, particularly around ends of storage vessels. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

- Personal precautions** : Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to contain spill areas.
- Environmental precautions** : Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors.
- Methods for cleaning up** : Take up with sand or oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

**SECTION 7. HANDLING AND STORAGE**

- Precautions for safe handling** : Handle as a combustible liquid. Keep product and empty containers away from fire, sparks and heated surfaces. Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.
- Conditions for safe storage, including incompatibilities** : Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose containers to sources of ignition. Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

**SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION****Exposure Guidelines**

List	Components	CAS-No.	Type:	Value
OSHA	Benzene	71-43-2	TWA	1 ppm
		71-43-2	STEL	5 ppm
		71-43-2	OSHA_AL	0.5 ppm
	N-hexane	110-54-3	PEL	500 ppm 1,800 mg/m3
	Hydrogen sulfide	7783-06-4	STEL	20 ppm
	Cumene	98-82-8	TWA	50 ppm
	Ethylbenzene	100-4-4	TWA	100 ppm
	Naphthalene	91-20-3	TWA	10 ppm
	Toluene	108-88-3	TWA	200 ppm
	Xylenes	1330-20-7	TWA	100 ppm

			Ceiling	300 ppm
	Polycyclic Aromatic Compound (Benzene Soluble)		TWA	0.2 mg/m <sup>3</sup>
ACGIH	N-hexane	110-54-3	TWA	50 ppm
	Hydrogen Sulfide	7783-06-4	TWA	1 ppm
		7783-06-4	STEL	5 ppm
	Benzene	71-43-2	TWA	0.5 ppm
		71-43-2	STEL	2.5 ppm
	Cumene	98-82-8	TWA	50 ppm
	Ethylbenzene	100-4-4	TWA	50 ppm
		100-4-4	STEL	125 ppm
	Naphthalene	91-20-3	TWA	10 ppm
		91-20-3	STEL	15 ppm
	Toluene	108-88-3	TWA	20 ppm
	Xylenes	1330-20-7	TWA	100 ppm
		1330-20-7	STEL	150 ppm
	Polycyclic Aromatic Compound (Benzene Soluble)		TWA	0.2 mg/m <sup>3</sup>

<b>Engineering measures</b>	: Use adequate ventilation to keep gas and vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.
<b>Eye protection</b>	: Ensure that eyewash stations and safety showers are close to the workstation location. Goggles, and face shield or full facepiece pressure-demand supplied air respirator as needed to prevent eye and face contact.
<b>Hand protection</b>	: Gloves constructed of nitrile, neoprene, or PVC are recommended. The resistance of specific material may vary from product to product as well as with degree of exposure.
<b>Skin and body protection</b>	: Chemical protective clothing such as DuPont TyChem®, Barricade or equivalent, recommended based on degree of exposure.
<b>Respiratory protection</b>	: A NIOSH/ MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection. Use a NIOSH/ MSHA-approved positive-pressure supplied-air respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

**Hygiene measures** : Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. DO NOT use gasoline, kerosene, solvents, or harsh abrasive skin cleaners to clean skin. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Consider the need to discard contaminated leather shoes and gloves. Use good personal hygiene practices.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance</b>	: Typical is a thick, dark yellow to brown or greenish black liquid
<b>Odor</b>	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.
<b>Odor threshold</b>	Odor threshold varies with the composition of the crude oil
<b>pH</b>	Not applicable
<b>Melting point/freezing point</b>	-30° to 30°C has been reported as a pour point
<b>Initial boiling point &amp; range</b>	Distillation is typically not performed above 300°C at atmospheric pressure
<b>Flash point</b>	-7 to 75°C
<b>Evaporation rate</b>	Higher initially and declines if lighter components evaporate
<b>Flammability (solid, gas)</b>	Flammable gas or vapors released by liquid
<b>Upper explosive limit</b>	Varies with composition but typical is approximately 7%
<b>Lower explosive limit</b>	Varies with composition but typical is approximately 0.7%
<b>Vapor pressure</b>	6 to 45 kPa
<b>Vapor density (air = 1)</b>	No data available
<b>Relative density (water = 1)</b>	0.8 to 1.0 g/mL is typical at 15°C
<b>Solubility (in water)</b>	1 to 2% by weight is maximum reported for soluble components of crude oil
<b>Partition coefficient (n-octanol/water)</b>	2 to > 6 as log Pow
<b>Auto-ignition temperature</b>	Varies with composition
<b>Decomposition temperature</b>	Will evaporate or boil and possibly ignite before decomposition occurs
<b>Kinematic viscosity</b>	5 to > 1300 mm <sup>2</sup> /s at 38°C

## SECTION 10. STABILITY AND REACTIVITY

<b>Reactivity</b>	Vapors may form explosive mixture with air. Hazardous polymerization does not occur.
<b>Chemical stability</b>	Stable under normal conditions.
<b>Possibility of hazardous reactions</b>	Can react with strong oxidizing agents, peroxides, acids and alkalis.

<b>Conditions to avoid</b>	Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Avoid static charge accumulation and discharge (see Section 7).
<b>Hazardous decomposition products</b>	Ignition and burning can release carbon monoxide, carbon dioxide, non-combusted hydrocarbons (smoke) and sulfur dioxide.

## SECTION 11. TOXICOLOGICAL INFORMATION

<b>Inhalation</b>	: May cause respiratory tract irritation. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death. Irritating and toxic hydrogen sulfide gas may be present. Greater than 15 - 20 ppm continuous exposure can cause mucous membrane and respiratory tract irritation. 50 - 500 ppm can cause headache, nausea, and dizziness. Continued exposure at these levels can lead to loss of reasoning and balance, difficulty in breathing, fluid in the lungs, and possible loss of consciousness. Greater than 500 ppm can cause rapid unconsciousness due to respiratory paralysis and death by suffocation unless the victim is removed from exposure and successfully resuscitated. Greater than 1000 ppm can cause immediate unconsciousness and death if not promptly revived. After-effects from overexposure are not anticipated except what would be expected if the victim was without oxygen for more than 3 to 5 minutes (asphyxiation). The "rotten egg" odor of hydrogen sulfide is not a reliable indicator for warning of exposure, since olfactory fatigue (loss of smell) readily occurs, especially at concentrations above 50 ppm. At high concentrations, the victim may not even recognize the odor before becoming unconscious.
<b>Ingestion</b>	Aspiration hazard if liquid is inhaled into lungs, particularly from vomiting after ingestion. Aspiration may result in chemical pneumonia, severe lung damage, respiratory failure and even death. Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death may occur.
<b>Skin irritation</b>	Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed. Rare, precancerous warts on the forearms, backs of hands and scrotum have been reported from prolonged or repeated skin contact.
<b>Eye irritation</b>	Irritating to eyes.
<b>Chronic exposure</b>	This material contains polynuclear aromatic hydrocarbons (PNAs), some of which are animal carcinogens. Similar products produced skin cancer and systemic toxicity in laboratory animals following repeated applications. The significance of these results to human exposures has not been determined - see Section 11 Toxicological Information. Contains benzene, which can cause blood disease, including anemia and leukemia. Suspect reproductive hazard - contains material which may injure unborn child.
<b>Target organs</b>	Skin, Eyes, Central nervous system, Respiratory system, Kidney, Liver

### Component:

Petroleum; Crude oil

8002-05-9

Acute oral toxicity: LD50 rat  
Dose: 5,001 mg/kg

		<p><u>Acute dermal toxicity:</u> LD50 rabbit Dose: 2,001 mg/kg</p> <p><u>Skin irritation:</u> Result: Mild skin irritation</p> <p><u>Eye irritation:</u> Result: Mild eye irritation</p>
Toluene	108-88-3	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 636 mg/kg</p> <p><u>Acute dermal toxicity:</u> LD50 rabbit Dose: 12,124 mg/kg <u>Acute inhalation toxicity:</u> LC50 rat Dose: 49 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation Prolonged skin contact may defat the skin and produce dermatitis.</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
Xylene	1330-20-7	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 2,840 mg/kg</p> <p><u>Acute dermal toxicity:</u> LD50 rabbit Dose: ca. 4,500 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 6,350 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
Naphthalene	91-20-3	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 2,001 mg/kg</p> <p><u>Acute dermal toxicity:</u> LD50 rat Dose: 2,501 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 101 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
Benzene	71-43-2	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 930 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 44 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.</p>

Pentane	109-66-0	<p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Risk of serious damage to eyes.</p> <p><u>Acute oral toxicity:</u> LD50 rat Dose: 2,001 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 364 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
Cyclohexane	110-82-7	<p><u>Acute dermal toxicity:</u> LD50 rabbit Dose: 2,001 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 14 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Skin irritation</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
Ethylbenzene	100-41-4	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 3,500 mg/kg</p> <p><u>Acute dermal toxicity:</u> LD50 rabbit Dose: 15,500 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 18 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Risk of serious damage to eyes</p>
Heptane [and isomers]	142-82-5	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 15,001 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 103 g/m<sup>3</sup> Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Skin irritation Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
N-hexane	110-54-3	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 25,000 mg/kg</p> <p><u>Acute dermal toxicity:</u> LD50 rabbit Dose: 2,001 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 171.6 mg/l Exposure time: 4 h</p>

Skin irritation: Classification: Irritating to skin.  
Result: Skin irritation

Eye irritation: Classification: Irritating to eyes.  
Result: Mild eye irritation

Teratogenicity: N11.00418960

### Carcinogenicity

<b>NTP</b>	: Naphthalene (CAS-No.: 91-20-3) Benzene (CAS-No.: 71-43-2)
<b>IARC</b>	Gasoline, natural; Low boiling point naphtha (CAS-No.: 8006-61-9) Naphthalene (CAS-No.: 91-20-3) Benzene (CAS-No.: 71-43-2) Ethylbenzene (CAS-No.: 100-41-4)
<b>OSHA</b>	Benzene (CAS-No.: 71-43-2)
<b>CA Prop 65</b>	WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Toluene (CAS-No.: 108-88-3) Benzene (CAS-No.: 71-43-2)

## SECTION 12. ECOLOGICAL INFORMATION

**Additional ecological information** : Keep out of sewers, drainage areas, and waterways. Report spills and releases, as applicable, under Federal and State regulations.

### Component:

<b>N-hexane</b>	110-54-3	<u>Toxicity to fish:</u> LC50 Species: Pimephales promelas (fathead minnow) Dose: 2.5 mg/l Exposure time: 96 h
		<u>Acute and prolonged toxicity for aquatic invertebrates:</u> EC50 Species: Daphnia magna (Water flea) Dose: 2.1 mg/l Exposure time: 48 h
<b>Sulfur</b>	7704-34-9	<u>Acute and prolonged toxicity for aquatic invertebrates:</u> EC0 Species: Daphnia magna (Water flea) Dose: > 10,000 mg/l Exposure time: 24 h

## SECTION 13. DISPOSAL CONSIDERATIONS

**Disposal** : Consult federal, state and local waste regulations to determine appropriate waste characterization of material and allowable disposal methods.

## SECTION 14. TRANSPORT INFORMATION

CFR

Proper shipping name : PETROLEUM CRUDE OIL  
 UN-No. : 1267  
 Class : 3  
 Packing group : II

**TDG**

Proper shipping name : PETROLEUM CRUDE OIL  
 UN-No. : UN1267  
 Class : 3  
 Packing group : II

**IATA Cargo Transport**

UN UN-No. : UN1267  
 Description of the goods : PETROLEUM CRUDE OIL  
 Class : 3  
 Packaging group : II  
 ICAO-Labels : 3  
 Packing instruction (cargo aircraft) : 364  
 Packing instruction (cargo aircraft) : Y341

**IATA Passenger Transport**

UN UN-No. : UN1267  
 Description of the goods : PETROLEUM CRUDE OIL  
 Class : 3  
 Packaging group : II  
 ICAO-Labels : 3  
 Packing instruction (passenger aircraft) : 353  
 Packing instruction (passenger aircraft) : Y341

**IMDG-Code**

UN-No. : UN 1267  
 Description of the goods : PETROLEUM CRUDE OIL  
 Class : 3  
 Packaging group : II  
 IMDG-Labels : 3  
 EmS Number : F-E S-E  
 Marine pollutant : No

**SECTION 15. REGULATORY INFORMATION**

TSCA Status : On TSCA Inventory  
 DSL Status : All components of this product are on the Canadian DSL list.  
 SARA 311/312 Hazards : Fire Hazard  
 Acute Health Hazard  
 Chronic Health Hazard

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

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.

MASS RTK US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

<u>Components</u>	<u>CAS-No.</u>
Benzene	71-43-2
Hydrogen Sulfide	7783-06-4
Sulfur	7704-34-9
N-hexane	110-54-3
Petroleum; Crude oil	8002-05-9
Toluene	108-88-3
Xylene	1330-20-7

<u>Components</u>	<u>CAS-No.</u>
hydrogen sulfide	7783-06-4

PENN RTK US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

<u>Components</u>	<u>CAS-No.</u>
Benzene	71-43-2
Hydrogen Sulfide	7783-06-4
Sulfur	7704-34-9
N-hexane	110-54-3
Petroleum; Crude oil	8002-05-9
Toluene	108-88-3
Xylene	1330-20-7

NJ RTK US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

<u>Components</u>	<u>CAS-No.</u>
Benzene	71-43-2
Hydrogen Sulfide	7783-06-4
Sulfur	7704-34-9
N-hexane	110-54-3
Petroleum; Crude oil	8002-05-9
Toluene	
Xylene	

California Prop. 65 : WARNING! This product contains a chemical known to the State of California to cause cancer.

Benzene 71-43-2

WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Benzene 71-43-2  
Toluene 108-88-3

## SECTION 16. OTHER INFORMATION

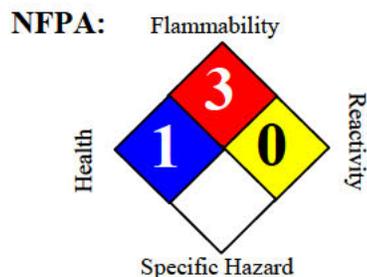
### Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Revision Date : 12/07/2012

# Safety Data Sheet

## Crude oil, sour heavy



### SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

<b>Product name</b>	:	Crude oil, sour heavy
<b>Synonyms</b>	:	Sour Crude, Crude Oil Sour, RS294, 0000002670, 888100005182
<b>SDS Number</b>	:	888100005182
<b>Version</b>	:	1.8
<b>Product Use Description</b>	:	Industrial feedstock
<b>Company</b>	:	For: Tesoro Refining & Marketing Co. 19100 Ridgewood Parkway, San Antonio, TX 78259
<b>Tesoro Call Center</b>	:	(877) 783-7676
<b>Chemtrec (Emergency Contact)</b>	:	(800) 424-9300

### SECTION 2. HAZARDS IDENTIFICATION

**Classifications** : Flammable Liquid – Category 2 or 3 depending on variable composition.  
Aspiration Hazard – Category 1.  
Carcinogenicity – Category 2  
Specific Target Organ Toxicity (Repeated Exposure) – Category 2  
Specific Target Organ Toxicity (Single Exposure) – Category 3  
Eye Irritant – Category 2B  
Chronic Aquatic Toxicity – Category 2

**Pictograms**



**Signal Word** : DANGER

**Hazard Statements** : Highly flammable liquid and vapor.  
May be fatal if swallowed and enters airways – do not siphon gasoline by mouth.  
Suspected of causing cancer if repeated over-exposure by inhalation and/or skin contact occurs.  
May cause damage to liver, kidneys and nervous system by prolonged and repeated inhalation or skin contact.  
Causes eye irritation. Can be absorbed through skin.  
Repeated or prolonged skin contact can cause irritation and dermatitis.  
May cause drowsiness or dizziness.  
Harmful to aquatic life.

May release hydrogen sulfide (H<sub>2</sub>S) gas, a toxic-by-inhalation material. See Section 11.

### Precautionary statements

#### Prevention

Obtain special instructions before use.  
 Do not handle until all safety precautions have been read and understood.  
 Keep away from heat, sparks, open flames, welding and hot surfaces.  
 No smoking.  
 Keep container tightly closed.  
 Ground and/or bond container and receiving equipment.  
 Use explosion-proof electrical equipment.  
 Use only non-sparking tools (if tools are used in flammable atmosphere).  
 Take precautionary measures against static discharge.  
 Wear gloves, eye protection and face protection (as needed to prevent skin and eye contact with liquid).  
 Wash hands or liquid-contacted skin thoroughly after handling.  
 Do not eat, drink or smoke when using this product.  
 Do not breathe vapors.  
 Use only outdoors or in a well-ventilated area.

#### Response

In case of fire: Use dry chemical, CO<sub>2</sub>, water spray or fire-fighting foam to extinguish.  
 If swallowed: Immediately call a poison center, doctor, hospital emergency room, medical clinic or 911. Do NOT induce vomiting. Rinse mouth.  
 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
 If in eye: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 If skin or eye irritation persists, get medical attention.  
 If inhaled: Remove person to fresh air and keep comfortable for breathing. Get medical attention if you feel unwell.

#### Storage

Store in a well-ventilated place. Keep cool. Store locked up. Keep container tightly closed. Use only approved containers.

#### Disposal

Dispose of contents/containers to approved disposal site in accordance with local, regional, national, and/or international regulations.

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Weight %
Petroleum; Crude oil	8002-05-9	80 - 85%
Benzene	71-43-2	5 - 7%
Toluene	108-88-3	5 - 7%
Ethylbenzene	100-41-4	5 - 7%
Xylene	1330-20-7	5 - 7%

Hydrogen Sulfide	7783-06-4	< 0.5%
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#### SECTION 4. FIRST AID MEASURES

<b>Inhalation</b>	: Move to fresh air. If not breathing, give artificial respiration. Administer oxygen or artificial respiration if needed. Seek medical attention immediately.
<b>Skin contact</b>	: Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Seek medical advice if symptoms persist or develop. Seek medical attention if irritation or skin thermal burns occur.
<b>Eye contact</b>	: In case of eye contact, immediately flush with low pressure, cool water for at least 15 minutes, opening eyelids to ensure flushing. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Seek medical advice if symptoms persist or develop.
<b>Ingestion</b>	: Do NOT induce vomiting. Do not give liquids. Seek medical attention immediately. If vomiting does occur naturally, keep head below the hips to reduce the risks of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

#### SECTION 5. FIRE-FIGHTING MEASURES

<b>Suitable extinguishing media</b>	: SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO <sub>2</sub> , water spray, or fire-fighting foam. LARGE FIRES: Water spray, fog or fire-fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.
<b>Specific hazards during fire fighting</b>	: Above the flash point, explosive vapor-air mixtures may be formed. Vapors can flow along surfaces to distant ignition source and flash back. Dangerous fire and explosion hazard when exposed to heat, sparks or flame. Do not allow liquid runoff to enter sewers or public waters.
<b>Special protective equipment for fire-fighters</b>	: Firefighters should wear self-contained breathing apparatus and full protective clothing as need for protection from heat and airborne combustion products. Withdraw immediately from the area if there is a rising sound from a venting safety device or discoloration of vessels, tanks, or pipelines.
<b>Further information</b>	: Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

#### SECTION 6. ACCIDENTAL RELEASE MEASURES

<b>Personal precautions</b>	: Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to contain spill areas.
<b>Environmental precautions</b>	: Carefully contain and stop the source of the spill, if safe to do so. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. WASTE DISPOSAL METHOD: Dispose of in accordance with Local, State, and Federal Regulations.

- Methods for cleaning up** : Take up with sand or oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).
- Additional advice** : Inform the responsible authorities in case of leakage, or of entry into waterways, soil or drains.

## SECTION 7. HANDLING AND STORAGE

- Precautions for safe handling** : Handle as a combustible liquid. Keep product and empty containers away from fire, sparks and heated surfaces. Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.
- Conditions for safe storage, including incompatibilities** : Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose containers to sources of ignition. Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks". The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks". Hydrogen sulfide may accumulate in tanks and bulk transport compartments. Consider appropriate respiratory protection (see Section 8). Stand upwind. Avoid vapors when opening hatches and dome covers. Confined spaces should be ventilated and gas tested prior to entry.

## SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Exposure Guidelines

List	Components	CAS-No.	Type:	Value
OSHA	Benzene	71-43-2	TWA	1 ppm
		71-43-2	STEL	5 ppm
		71-43-2	OSHA_ACT	0.5 ppm
OSHA Z1	Ethylbenzene	100-41-4	PEL	100 ppm 435 mg/m3
	Xylene	1330-20-7	PEL	100 ppm 435 mg/m3
	Hydrogen sulfide	7783-06-4	STEL	20 ppm
ACGIH	Benzene	71-43-2	TWA	0.5 ppm
		71-43-2	STEL	2.5 ppm
	Toluene	108-88-3	TWA	50 ppm
	Ethylbenzene	100-41-4	TWA	100 ppm
		100-41-4	STEL	125 ppm
	Xylene	1330-20-7	TWA	100 ppm

		1330-20-7	STEL	150 ppm
	Hydrogen Sulfide	7783-06-4	TWA	1 ppm
		7783-06-4	STEL	5 ppm
<b>Engineering measures</b>	:	Use adequate ventilation to keep gas and vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.		
<b>Eye protection</b>	:	Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.		
<b>Hand protection</b>	:	Gloves constructed of nitrile, neoprene, or PVC are recommended.		
<b>Skin and body protection</b>	:	Chemical protective clothing such as DuPont Tyvek QC, TyChem® or equivalent, recommended based on degree of exposure. The resistance of specific material may vary from product to product as well as with degree of exposure.		
<b>Respiratory protection</b>	:	If hydrogen sulfide concentration may exceed permissible exposure limit, a positive-pressure SCBA or Type C supplied air respirator with escape bottle is required as respiratory protection. If hydrogen sulfide concentration is below H2S permissible exposure limit a NIOSH/ MSHA-approved air-purifying respirator with acid gas cartridges may be acceptable for odor control, but continuous air monitoring for H2S is recommended. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection. Use a NIOSH/ MSHA-approved positive-pressure supplied-air respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.		
<b>Hygiene measures</b>	:	Emergency eye wash capability should be available in the vicinity of any potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. DO NOT use gasoline, kerosene, solvents, or harsh abrasive skin cleaners to clean skin. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Consider the need to discard contaminated leather shoes and gloves. Consider disposal of contaminated clothing rather than laundering to prevent the formation of flammable vapors which could ignite via washer or dryer.		

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance</b>	Typical is a thick, dark yellow to brown or greenish black liquid
<b>Odor</b>	Petroleum asphalt odor. Hydrogen sulfide (H2S) 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 H2S can deaden the sense of smell. H2S concentrations can be measured with an H2S meter or colorimetric indicating tubes.
<b>Odor threshold</b>	Odor threshold varies with the composition of the crude oil
<b>pH</b>	Not applicable
<b>Melting point/freezing point</b>	-30° to 30 °C has been reported as a pour point
<b>Initial boiling point &amp; range</b>	Distillation is typically not performed above 300°C at atmospheric pressure

Flash point	-7 to 75°C
Evaporation rate:	Higher initially and declines if lighter components evaporate
Flammability (solid, gas)	Flammable gas or vapors released by liquid
Upper explosive limit	Varies with composition but typical is approximately 7%
Lower explosive limit	Varies with composition but typical is approximately 0.7%
Vapor pressure	6 to 45 kPa
Vapor density (air = 1)	No data available 0.8 to 1.0 g/mL is typical at 15°C
Relative density (water = 1)	1 to 2% by weight is maximum reported for soluble components of crude oil
Solubility (in water)	2 to > 6 as log Pow
Partition coefficient (n-octanol/water)	Varies with composition
Auto-ignition temperature	Will evaporate or boil and possibly ignite before decomposition occurs.
Decomposition temperature	5 to > 1300 mm <sup>2</sup> /s at 38°C
Kinematic viscosity	

## SECTION 10. STABILITY AND REACTIVITY

Reactivity	Vapors may form explosive mixture with air. Hazardous polymerization does not occur.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	Can react with strong oxidizing agents, peroxides, acids and alkalies.
Conditions to avoid	Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Avoid static charge accumulation and discharge (see Section 7).
Hazardous decomposition products	Ignition and burning can release carbon monoxide, carbon dioxide, non-combusted hydrocarbons (smoke) and sulfur dioxide.

## SECTION 11. TOXICOLOGICAL INFORMATION

Inhalation	May cause respiratory tract irritation. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death. Irritating and toxic hydrogen sulfide gas may be present. Greater than 15 - 20 ppm continuous exposure can cause mucous membrane and respiratory tract irritation. 50 - 500 ppm can cause headache, nausea, and dizziness. Continued exposure at these levels can lead to loss of reasoning and balance, difficulty in breathing, fluid in the lungs, and possible loss of consciousness. Greater than 500 ppm can cause rapid unconsciousness due to respiratory paralysis and death by suffocation unless the victim is removed from exposure and successfully resuscitated. Greater than 1000 ppm can cause immediate unconsciousness and death if not promptly revived. After-effects from overexposure are not anticipated except what would be expected if the victim was without oxygen for more than 3 to 5
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minutes (asphyxiation). The "rotten egg" odor of hydrogen sulfide is not a reliable indicator for warning of exposure, since olfactory fatigue (loss of smell) readily occurs, especially at concentrations above 50 ppm. At high concentrations, the victim may not even recognize the odor before becoming unconscious.

**Ingestion**

Aspiration hazard if liquid is inhaled into lungs, particularly from vomiting after ingestion. Aspiration may result in chemical pneumonia, severe lung damage, respiratory failure and even death. Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death may occur.

**Skin irritation**

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed. Rare, precancerous warts on the forearms, backs of hands and scrotum have been reported from prolonged or repeated skin contact

**Eye irritation**

Irritating to eyes.

**Chronic exposure**

This material contains polynuclear aromatic hydrocarbons (PNAs), some of which are animal carcinogens. Similar products produced skin cancer and systemic toxicity in laboratory animals following repeated applications. The significance of these results to human exposures has not been determined - see Section 11 Toxicological Information. Contains benzene, which can cause blood disease, including anemia and leukemia. Suspect reproductive hazard - contains material which may injure unborn child.

**Target organs**

Skin, Eyes, Central nervous system, Respiratory system, Kidney, Liver

**Component**

Petroleum; Crude oil

8002-05-9

Acute oral toxicity: LD50 rat  
Dose: 5,001 mg/kg  
Acute dermal toxicity: LD50 rabbit  
Dose: 2,001 mg/kg  
Skin irritation: Result: Mild skin irritation  
Eye irritation: Result: Mild eye irritation  
Carcinogenicity: N11.00418605

Toluene

108-88-3

Acute oral toxicity: LD50 rat  
Dose: 636 mg/kg  
Acute dermal toxicity: LD50 rabbit  
Dose: 12,124 mg/kg  
Acute inhalation toxicity: LC50 rat  
Dose: 49 mg/l  
Exposure time: 4 h  
Skin irritation: Classification: Irritating to skin.  
Result: Mild skin irritation  
Prolonged skin contact may defat the skin and produce dermatitis.  
Eye irritation: Classification: Irritating to eyes.  
Result: Mild eye irritation

Xylene

1330-20-7

Acute oral toxicity: LD50 rat  
Dose: 2,840 mg/kg  
Acute dermal toxicity: LD50 rabbit  
Dose: ca. 4,500 mg/kg  
Acute inhalation toxicity: LC50 rat  
Dose: 6,350 mg/l  
Exposure time: 4 h  
Skin irritation: Classification: Irritating to skin.  
Result: Mild skin irritation  
Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.  
Eye irritation: Classification: Irritating to eyes.  
Result: Mild eye irritation

Naphthalene	91-20-3	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 2,001 mg/kg</p> <p><u>Acute dermal toxicity:</u> LD50 rat Dose: 2,501 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 101 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p> <p><u>Carcinogenicity:</u> N11.00422130</p>
Benzene	71-43-2	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 930 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 44 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Risk of serious damage to eyes</p>
Pentane	109-66-0	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 2,001 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 364 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
Cyclohexane	110-82-7	<p><u>Acute dermal toxicity:</u> LD50 rabbit Dose: 2,001 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 14 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Skin irritation</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
Ethylbenzene	100-41-4	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 3,500 mg/kg</p> <p><u>Acute dermal toxicity:</u> LD50 rabbit Dose: 15,500 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 18 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Risk of serious damage to eyes.</p>
Heptane [and isomers]	142-82-5	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 15,001 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 103 g/m3 Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Skin irritation Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
N-hexane	110-54-3	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 25,000 mg/kg</p> <p><u>Acute dermal toxicity:</u> LD50 rabbit</p>

Dose: 2,001 mg/kg  
Acute inhalation toxicity: LC50 rat  
 Dose: 171.6 mg/l  
 Exposure time: 4 h  
Skin irritation: Classification: Irritating to skin.  
 Result: Skin irritation  
Eye irritation: Classification: Irritating to eyes.  
 Result: Mild eye irritation  
Teratogenicity: N11.00418960

**Carcinogenicity** :

<b>NTP</b>	Naphthalene (CAS-No.: 91-20-3) Benzene (CAS-No.: 71-43-2)
<b>IARC</b>	Gasoline, natural; Low boiling point naphtha (CAS-No.: 8006-61-9) Naphthalene (CAS-No.: 91-20-3) Benzene (CAS-No.: 71-43-2) Ethylbenzene (CAS-No.: 100-41-4)
<b>OSHA</b>	Benzene (CAS-No.: 71-43-2)
<b>CA Prop 65</b>	WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Toluene (CAS-No.: 108-88-3) Benzene (CAS-No.: 71-43-2)

**SECTION 12. ECOLOGICAL INFORMATION**

**Additional ecological information** : Keep out of sewers, drainage areas, and waterways. Report spills and releases, as applicable, under Federal and State regulations.

**Component:**

<b>Toluene</b>	108-88-3	<u>Toxicity to fish:</u> LC50 Species: Carassius auratus (goldfish) Dose: 13 mg/l Exposure time: 96 h  <u>Acute and prolonged toxicity for aquatic invertebrates:</u> EC50 Species: Daphnia magna (Water flea) Dose: 11.5 mg/l Exposure time: 48 h  <u>Toxicity to algae:</u> IC50 Species: Selenastrum capricornutum (green algae) Dose: 12 mg/l Exposure time: 72 h
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**SECTION 13. DISPOSAL CONSIDERATIONS**

**Disposal** : Consult federal, state and local waste regulations to determine appropriate waste characterization of material and allowable disposal methods.

**SECTION 14. TRANSPORT INFORMATION**

**CFR**

Proper shipping name : PETROLEUM CRUDE OIL  
 UN-No. : 1267  
 Class : 3  
 Packing group : II

**TDG**

Proper shipping name : PETROLEUM CRUDE OIL  
 UN-No. : UN1267  
 Class : 3  
 Packing group : II

**IATA Cargo Transport**

UN UN-No. : UN1267  
 Description of the goods : PETROLEUM CRUDE OIL  
 Class : 3  
 Packaging group : II  
 ICAO-Labels : 3  
 Packing instruction (cargo aircraft) : 366  
 Packing instruction (cargo aircraft) : Y344

**IATA Passenger Transport**

UN UN-No. : UN1267  
 Description of the goods : PETROLEUM CRUDE OIL  
 Class : 3  
 Packaging group : II  
 ICAO-Labels : 3  
 Packing instruction (passenger aircraft) : 355  
 Packing instruction (passenger aircraft) : Y344

**IMDG-Code**

UN-No. : UN 1267  
 Description of the goods : PETROLEUM CRUDE OIL  
 Class : 3  
 Packaging group : II  
 IMDG-Labels : 3  
 EmS Number : F-E S-E  
 Marine pollutant : No

**SECTION 15. REGULATORY INFORMATION**

TSCA Status : On TSCA Inventory  
 DSL Status : All components of this product are on the Canadian DSL list.  
 SARA 311/312 Hazards : Acute Health Hazard  
 Chronic Health Hazard

**CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)**

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.

CERCLA Reportable Quantity : 118 lbs

SARA III US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

<u>Components</u>	<u>CAS-No.</u>
Xylene	1330-20-7
Ethylbenzene	100-41-4
Toluene	108-88-3
Benzene	71-43-2

SARA III US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR355, Appendix A)

<u>Components</u>	<u>CAS-No.</u>
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PENN RTK US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

<u>Components</u>	<u>CAS-No.</u>
Benzene	71-43-2
Toluene	108-88-3
Ethylbenzene	100-41-4
Xylene	1330-20-7
Petroleum; Crude oil	8002-05-9

MASS RTK US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

<u>Components</u>	<u>CAS-No.</u>
Benzene	71-43-2
Toluene	108-88-3
Ethylbenzene	100-41-4
Xylene	1330-20-7
Petroleum; Crude oil	8002-05-9

NJ RTK US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

<u>Components</u>	<u>CAS-No.</u>
Benzene	71-43-2
Toluene	108-88-3
Ethylbenzene	100-41-4
Xylene	1330-20-7
Petroleum; Crude oil	8002-05-9

California Prop. 65 : WARNING! This product contains a chemical known in the State of California to cause cancer.

Ethylbenzene 100-41-4

Benzene 71-43-2

WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Toluene 108-88-3

Benzene 71-43-2

## SECTION 16. OTHER INFORMATION

### Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Revision Date : 02/02/2013

# Safety Data Sheet

## Crude oil, sour light

NFPA: Flammability



### SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

<b>Product name</b>	: Crude oil, sour light
<b>Synonyms</b>	: Hydrogen sulfide crude; hydrogen sulfide oil; crude oil; sealed oil; separator crude; sour crude; sour oil, petroleum, RS294, 0000002670, 888100005161
<b>SDS Number</b>	: 888100005161 <b>Version</b> : 1.3
<b>Product Use Description</b>	: Refining feedstock
<b>Company</b>	: For: Tesoro Refining & Marketing Co. 19100 Ridgewood Parkway, San Antonio, TX 78259
<b>Tesoro Call Center</b>	: (877) 783-7676 <b>Chemtrec (Emergency Contact)</b> : (800) 424-9300

### SECTION 2. HAZARDS IDENTIFICATION

**Classifications** : Flammable Liquid – Category 2 or 3 depending on variable composition.  
Aspiration Hazard – Category 1.  
Carcinogenicity – Category 2  
Specific Target Organ Toxicity (Repeated Exposure) – Category 2  
Specific Target Organ Toxicity (Single Exposure) – Category 3  
Eye Irritant – Category 2B  
Chronic Aquatic Toxicity – Category 2

**Pictograms**



**Signal Word** : DANGER

**Hazard Statements** : Highly flammable liquid and vapor.  
May be fatal if swallowed and enters airways – do not siphon gasoline by mouth.  
Suspected of causing cancer if repeated over-exposure by inhalation and/or skin contact occurs.  
May cause damage to liver, kidneys and nervous system by prolonged and repeated inhalation or skin contact.  
Causes eye irritation. Can be absorbed through skin.

Repeated or prolonged skin contact can cause irritation and dermatitis.  
 May cause drowsiness or dizziness.  
 Harmful to aquatic life.  
 May release hydrogen sulfide (H<sub>2</sub>S) gas, a toxic-by-inhalation material. See Section 11.

### Precautionary statements

#### Prevention

Obtain special instructions before use.  
 Do not handle until all safety precautions have been read and understood.  
 Keep away from heat, sparks, open flames, welding and hot surfaces.  
 No smoking.  
 Keep container tightly closed.  
 Ground and/or bond container and receiving equipment.  
 Use explosion-proof electrical equipment.  
 Use only non-sparking tools (if tools are used in flammable atmosphere).  
 Take precautionary measures against static discharge.  
 Wear gloves, eye protection and face protection (as needed to prevent skin and eye contact with liquid).  
 Wash hands or liquid-contacted skin thoroughly after handling.  
 Do not eat, drink or smoke when using this product.  
 Do not breathe vapors.  
 Use only outdoors or in a well-ventilated area.

#### Response

In case of fire: Use dry chemical, CO<sub>2</sub>, water spray or fire-fighting foam to extinguish.  
 If swallowed: Immediately call a poison center, doctor, hospital emergency room, medical clinic or 911. Do NOT induce vomiting. Rinse mouth.  
 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
 If in eye: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 If skin or eye irritation persists, get medical attention.  
 If inhaled: Remove person to fresh air and keep comfortable for breathing. Get medical attention if you feel unwell.

#### Storage

Store in a well-ventilated place. Keep cool. Store locked up. Keep container tightly closed. Use only approved containers.

#### Disposal

Dispose of contents/containers to approved disposal site in accordance with local, regional, national, and/or international regulations.

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Weight %
Petroleum; Crude oil	8002-05-9	100%
N-hexane	110-54-3	0 - 1.5%
Hydrogen Sulfide	7783-06-4	Highly Variable

Sulfur	7704-34-9	1 - 1.5%
Benzene	71-43-2	0.1 - 3%

#### SECTION 4. FIRST AID MEASURES

<b>Inhalation</b>	: Move to fresh air. Administer oxygen or artificial respiration if needed. Seek medical attention immediately.
<b>Skin contact</b>	: Take off all contaminated clothing immediately. Wash off immediately with soap and plenty of water. Seek medical attention if irritation or skin thermal burns occur.
<b>Eye contact</b>	: In case of eye contact, immediately flush with low pressure, cool water for at least 15 minutes, opening eyelids to ensure flushing. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Seek medical attention immediately.
<b>Ingestion</b>	: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Seek medical attention immediately. If vomiting does occur naturally, keep head below the hips to reduce the risks of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

#### SECTION 5. FIRE-FIGHTING MEASURES

<b>Suitable extinguishing media</b>	: SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO <sub>2</sub> , water spray, or fire-fighting foam. LARGE FIRES: Water spray, fog or fire-fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.
<b>Specific hazards during fire fighting</b>	: Vapors are heavier than air and may travel long distances to a point of ignition and flash back. Do not allow liquid runoff to enter sewers or public waters. Gas may form explosive mixture with air.
<b>Special protective equipment for fire-fighters</b>	: Use NIOSH/MSHA approved positive pressure self-contained breathing apparatus and fully protective clothing such as bunker gear if needed to prevent exposure.
<b>Further information</b>	: Isolate area, particularly around ends of storage vessels. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

#### SECTION 6. ACCIDENTAL RELEASE MEASURES

<b>Personal precautions</b>	: Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to contain spill areas.
<b>Environmental precautions</b>	: Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors.

**Methods for cleaning up** : Take up with sand or oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

## SECTION 7. HANDLING AND STORAGE

**Precautions for safe handling** : Handle as a combustible liquid. Keep product and empty containers away from fire, sparks and heated surfaces. Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

**Conditions for safe storage, including incompatibilities** : Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose containers to sources of ignition. Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

## SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Exposure Guidelines

List	Components	CAS-No.	Type:	Value
OSHA	Benzene	71-43-2	TWA	1 ppm
		71-43-2	STEL	5 ppm
		71-43-2	OSHA_AL	0.5 ppm
OSHA Z1	N-hexane	110-54-3	PEL	500 ppm 1,800 mg/m3
OSHA Z1	Hydrogen sulfide	7783-06-4	STEL	20 ppm
ACGIH	N-hexane	110-54-3	TWA	50 ppm
	Hydrogen Sulfide	7783-06-4	TWA	1ppm
		7783-06-4	STEL	5 ppm
	Benzene	71-43-2	TWA	0.5 ppm
		71-43-2	STEL	2.5 ppm

**Engineering measures** : Use adequate ventilation to keep gas and vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

**Eye protection** : Ensure that eyewash stations and safety showers are close to the workstation location. Goggles, and face shield or full facepiece pressure-demand supplied air respirator as needed to prevent eye and face contact.

**Hand protection** : Gloves constructed of nitrile, neoprene, or PVC are recommended. The resistance of specific material may vary from product to product as well as with degree of exposure.

<b>Skin and body protection</b>	: Chemical protective clothing such as DuPont TyChem ®, Barricade or equivalent, recommended based on degree of exposure.
<b>Respiratory protection</b>	: A NIOSH/ MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection. Use a NIOSH/ MSHA-approved positive-pressure supplied-air respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.
<b>Hygiene measures</b>	: Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. DO NOT use gasoline, kerosene, solvents, or harsh abrasive skin cleaners to clean skin. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Consider the need to discard contaminated leather shoes and gloves. Use good personal hygiene practices.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance</b>	Typical is a thick, dark yellow to brown or greenish black liquid
<b>Odor</b>	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.
<b>Odor threshold</b>	Odor threshold varies with the composition of the crude oil
<b>pH</b>	Not applicable
<b>Melting point/freezing point</b>	-30° to 30°C has been reported as a pour point
<b>Initial boiling point &amp; range</b>	Distillation is typically not performed above 300°C at atmospheric pressure
<b>Flash point</b>	-7 to 75°C
<b>Evaporation rate:</b>	Higher initially and declines if lighter components evaporate
<b>Flammability (solid, gas)</b>	Flammable gas or vapors released by liquid
<b>Upper explosive limit</b>	Varies with composition but typical is approximately 7%
<b>Lower explosive limit</b>	Varies with composition but typical is approximately 0.7%
<b>Vapor pressure</b>	6 to 45 kPa
<b>Vapor density (air = 1)</b>	No data available 0.8 to 1.0 g/mL is typical at 15°C
<b>Relative density (water = 1)</b>	1 to 2% by weight is maximum reported for soluble components of crude oil
<b>Solubility (in water)</b>	2 to > 6 as log Pow

Partition coefficient (n-octanol/water)	Varies with composition
Auto-ignition temperature	Will evaporate or boil and possibly ignite before decomposition occurs.
Decomposition temperature	5 to > 1300 mm <sup>2</sup> /s at 38 °C
Kinematic viscosity	

## SECTION 10. STABILITY AND REACTIVITY

Reactivity	Vapors may form explosive mixture with air. Hazardous polymerization does not occur.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	Can react with strong oxidizing agents, peroxides, acids and alkalies.
Conditions to avoid	Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Avoid static charge accumulation and discharge (see Section 7).
Hazardous decomposition products	Ignition and burning can release carbon monoxide, carbon dioxide, non-combusted hydrocarbons (smoke) and sulfur dioxide.

## SECTION 11. TOXICOLOGICAL INFORMATION

Inhalation	May cause respiratory tract irritation. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death. Irritating and toxic hydrogen sulfide gas may be present. Greater than 15 - 20 ppm continuous exposure can cause mucous membrane and respiratory tract irritation. 50 - 500 ppm can cause headache, nausea, and dizziness. Continued exposure at these levels can lead to loss of reasoning and balance, difficulty in breathing, fluid in the lungs, and possible loss of consciousness. Greater than 500 ppm can cause rapid unconsciousness due to respiratory paralysis and death by suffocation unless the victim is removed from exposure and successfully resuscitated. Greater than 1000 ppm can cause immediate unconsciousness and death if not promptly revived. After-effects from overexposure are not anticipated except what would be expected if the victim was without oxygen for more than 3 to 5 minutes (asphyxiation). The "rotten egg" odor of hydrogen sulfide is not a reliable indicator for warning of exposure, since olfactory fatigue (loss of smell) readily occurs, especially at concentrations above 50 ppm. At high concentrations, the victim may not even recognize the odor before becoming unconscious.
Ingestion	Aspiration hazard if liquid is inhaled into lungs, particularly from vomiting after ingestion. Aspiration may result in chemical pneumonia, severe lung damage, respiratory failure and even death. Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death may occur.
Skin irritation	Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed. Rare, precancerous warts on the forearms, backs of hands and scrotum have been

reported from prolonged or repeated skin contact.

**Eye irritation**

Irritating to eyes.

**Chronic exposure**

This material contains polynuclear aromatic hydrocarbons (PNAs), some of which are animal carcinogens. Similar products produced skin cancer and systemic toxicity in laboratory animals following repeated applications. The significance of these results to human exposures has not been determined - see Section 11 Toxicological Information. Contains benzene, which can cause blood disease, including anemia and leukemia. Suspect reproductive hazard - contains material which may injure unborn child.

**Target organs**

Skin, Eyes, Central nervous system, Respiratory system, Kidney, Liver

**Component:**

**Petroleum; Crude oil**

8002-05-9

Acute oral toxicity: LD50 rat  
Dose: 5,001 mg/kg

Acute dermal toxicity: LD50 rabbit  
Dose: 2,001 mg/kg

Skin irritation: Result: Mild skin irritation

Eye irritation: Result: Mild eye irritation

Carcinogenicity: N11.00418605

**Toluene**

108-88-3

Acute oral toxicity: LD50 rat  
Dose: 636 mg/kg

Acute dermal toxicity: LD50 rabbit  
Dose: 12,124 mg/kg

Acute inhalation toxicity: LC50 rat  
Dose: 49 mg/l

Exposure time: 4 h

Skin irritation: Classification: Irritating to skin.

Result: Mild skin irritation

Prolonged skin contact may defat the skin and produce dermatitis.

Eye irritation: Classification: Irritating to eyes.

Result: Mild eye irritation

**Xylene**

1330-20-7

Acute oral toxicity: LD50 rat  
Dose: 2,840 mg/kg

Acute dermal toxicity: LD50 rabbit  
Dose: ca. 4,500 mg/kg

Acute inhalation toxicity: LC50 rat  
Dose: 6,350 mg/l

Exposure time: 4 h

Skin irritation: Classification: Irritating to skin.

Result: Mild skin irritation

Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.

Eye irritation: Classification: Irritating to eyes.

Result: Mild eye irritation

**Naphthalene**

91-20-3

Acute oral toxicity: LD50 rat  
Dose: 2,001 mg/kg

Acute dermal toxicity: LD50 rat  
Dose: 2,501 mg/kg

Acute inhalation toxicity: LC50 rat  
Dose: 101 mg/l

Exposure time: 4 h

Skin irritation: Classification: Irritating to skin.

Result: Mild skin irritation

Eye irritation: Classification: Irritating to eyes.

Result: Mild eye irritation

		<u>Carcinogenicity:</u> N11.00422130
<b>Benzene</b>	71-43-2	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 930 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 44 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation</p> <p>Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Risk of serious damage to eyes.</p>
<b>Pentane</b>	109-66-0	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 2,001 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 364 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
<b>Cyclohexane</b>	110-82-7	<p><u>Acute dermal toxicity:</u> LD50 rabbit Dose: 2,001 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 14 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Skin irritation</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
<b>Ethylbenzene</b>	100-41-4	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 3,500 mg/kg</p> <p><u>Acute dermal toxicity:</u> LD50 rabbit Dose: 15,500 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 18 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Risk of serious damage to eyes.</p>
<b>Heptane [and isomers]</b>	142-82-5	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 15,001 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 103 g/m3 Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Skin irritation</p> <p>Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
<b>N-hexane</b>	110-54-3	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 25,000 mg/kg</p> <p><u>Acute dermal toxicity:</u> LD50 rabbit Dose: 2,001 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 171.6 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Skin irritation</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p> <p><u>Teratogenicity:</u> N11.00418960</p>

**Carcinogenicity**

<b>NTP</b>	Naphthalene (CAS-No.: 91-20-3) Benzene (CAS-No.: 71-43-2)
<b>IARC</b>	Gasoline, natural; Low boiling point naphtha (CAS-No.: 8006-61-9) Naphthalene (CAS-No.: 91-20-3) Benzene (CAS-No.: 71-43-2) Ethylbenzene (CAS-No.: 100-41-4)
<b>OSHA</b>	Benzene (CAS-No.: 71-43-2)
<b>CA Prop 65</b>	WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Toluene (CAS-No.: 108-88-3) Benzene (CAS-No.: 71-43-2)

**SECTION 12. ECOLOGICAL INFORMATION**

**Additional ecological information** : Keep out of sewers, drainage areas, and waterways. Report spills and releases, as applicable, under Federal and State regulations.

**Component:**

<b>N-hexane</b>	110-54-3	<u>Toxicity to fish:</u> LC50 Species: Pimephales promelas (fathead minnow) Dose: 2.5 mg/l Exposure time: 96 h
		<u>Acute and prolonged toxicity for aquatic invertebrates:</u> EC50 Species: Daphnia magna (Water flea) Dose: 2.1 mg/l Exposure time: 48 h
<b>Sulfur</b>	7704-34-9	<u>Acute and prolonged toxicity for aquatic invertebrates:</u> EC0 Species: Daphnia magna (Water flea) Dose: > 10,000 mg/l Exposure time: 24 h

**SECTION 13. DISPOSAL CONSIDERATIONS**

**Disposal** : Consult federal, state and local waste regulations to determine appropriate waste characterization of material and allowable disposal methods.

**SECTION 14. TRANSPORT INFORMATION****CFR**

Proper shipping name : PETROLEUM CRUDE OIL  
UN-No. : 1267  
Class : 3  
Packing group : II

**TDG**

Proper shipping name : PETROLEUM CRUDE OIL  
 UN-No. : UN1267  
 Class : 3  
 Packing group : II

**IATA Cargo Transport**

UN UN-No. : UN1267  
 Description of the goods : PETROLEUM CRUDE OIL  
 Class : 3  
 Packaging group : II  
 ICAO-Labels : 3  
 Packing instruction (cargo aircraft) : 364  
 Packing instruction (cargo aircraft) : Y341

**IATA Passenger Transport**

UN UN-No. : UN1267  
 Description of the goods : PETROLEUM CRUDE OIL  
 Class : 3  
 Packaging group : II  
 ICAO-Labels : 3  
 Packing instruction (passenger aircraft) : 353  
 Packing instruction (passenger aircraft) : Y341

**IMDG-Code**

UN-No. : UN 1267  
 Description of the goods : PETROLEUM CRUDE OIL  
 Class : 3  
 Packaging group : II  
 IMDG-Labels : 3  
 EmS Number : F-E S-E  
 Marine pollutant : No

**SECTION 15. REGULATORY INFORMATION**

TSCA Status : On TSCA Inventory  
 DSL Status : All components of this product are on the Canadian DSL list.  
 SARA 311/312 Hazards : Fire Hazard  
 Acute Health Hazard  
 Chronic Health Hazard

**CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIROMENT)**

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.

CERCLA Reportable Quantity : 104 lbs

MASS RTK US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

<u>Components</u>	<u>CAS-No.</u>
Benzene	71-43-2
Hydrogen Sulfide	7783-06-4
Sulfur	7704-34-9
N-hexane	110-54-3
Petroleum; Crude oil	8002-05-9

SARA III US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

<u>Components</u>	<u>CAS-No.</u>
N-hexane	110-54-3
Benzene	71-43-2

SARA III US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR355, Appendix A)

<u>Components</u>	<u>CAS-No.</u>
hydrogen sulfide	7783-06-4

PENN RTK US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

<u>Components</u>	<u>CAS-No.</u>
Benzene	71-43-2
Hydrogen Sulfide	7783-06-4
Sulfur	7704-34-9
N-hexane	110-54-3
Petroleum; Crude oil	8002-05-9

NJ RTK US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

<u>Components</u>	<u>CAS-No.</u>
Benzene	71-43-2
Hydrogen Sulfide	7783-06-4
Sulfur	7704-34-9
N-hexane	110-54-3
Petroleum; Crude oil	8002-05-9

California Prop. 65 : WARNING! This product contains a chemical known to the State of California to cause cancer.

Benzene 71-43-2

WARNING! This product contains a chemical known to the State of California to

cause birth defects or other reproductive harm.

Benzene

71-43-2

## SECTION 16. OTHER INFORMATION

### Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Revision Date : 02/02/2013

# Safety Data Sheet

## Crude Oil, Sweet Heavy

**NFPA:** Flammability



### SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

<b>Product name</b>	:	Crude Oil, Sweet Heavy			
<b>Synonyms</b>	:	Sweet Heavy Crude Oil, RS295, 888100005156			
<b>SDS Number</b>	:	888100005156	<b>Version</b>	:	1.3
<b>Product Use Description</b>	:	Industrial feedstock			
<b>Company</b>	:	For: Tesoro Refining & Marketing Co. 19100 Ridgewood Parkway Drive, San Antonio, TX 78259			
<b>Tesoro Call Center</b>	:	(877) 783-7676	<b>Chemtrec (Emergency Contact)</b>	:	(800) 424-9300

### SECTION 2. HAZARDS IDENTIFICATION

<b>Classifications</b>	:	Flammable Liquid – Category 2 or 3 depending on variable composition. Aspiration Hazard – Category 1. Carcinogenicity – Category 2 Specific Target Organ Toxicity (Repeated Exposure) – Category 2 Specific Target Organ Toxicity (Single Exposure) – Category 3 Eye Irritant – Category 2B Chronic Aquatic Toxicity – Category 2
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**Pictograms**



**Signal Word** : DANGER

**Hazard Statements**

- : Highly flammable liquid and vapor.
- May be fatal if swallowed and enters airways – do not siphon gasoline by mouth.
- Suspected of causing cancer if repeated over-exposure by inhalation and/or skin contact occurs.
- May cause damage to liver, kidneys and nervous system by prolonged and repeated inhalation or skin contact.
- Causes eye irritation. Can be absorbed through skin.
- Repeated or prolonged skin contact can cause irritation and dermatitis.
- May cause drowsiness or dizziness.
- Harmful to aquatic life.
- May release hydrogen sulfide (H<sub>2</sub>S) gas, a toxic-by-inhalation material. See

## Section 11.

**Precautionary statements****Prevention**

- : Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.
- Keep away from heat, sparks, open flames, welding and hot surfaces.
- No smoking.
- Keep container tightly closed.
- Ground and/or bond container and receiving equipment.
- Use explosion-proof electrical equipment.
- Use only non-sparking tools (if tools are used in flammable atmosphere).
- Take precautionary measures against static discharge.
- Wear gloves, eye protection and face protection (as needed to prevent skin and eye contact with liquid).
- Wash hands or liquid-contacted skin thoroughly after handling.
- Do not eat, drink or smoke when using this product.
- Do not breathe vapors.
- Use only outdoors or in a well-ventilated area.

**Response**

- In case of fire: Use dry chemical, CO<sub>2</sub>, water spray or fire-fighting foam to extinguish.
- If swallowed: Immediately call a poison center, doctor, hospital emergency room, medical clinic or 911. Do NOT induce vomiting. Rinse mouth.
- If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
- If in eye: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- If skin or eye irritation persists, get medical attention.
- If inhaled: Remove person to fresh air and keep comfortable for breathing. Get medical attention if you feel unwell.

**Storage**

Store in a well-ventilated place. Keep cool. Store locked up. Keep container tightly closed. Use only approved containers.

**Disposal**

Dispose of contents/containers to approved disposal site in accordance with local, regional, national, and/or international regulations.

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Component	CAS-No.	Weight %
Petroleum; Crude oil	8002-05-9	100%
Toluene	108-88-3	0 - 7%
N-hexane	110-54-3	0 - 5%
Benzene	71-43-2	0.1 - 3%

**SECTION 4. FIRST AID MEASURES**

<b>Inhalation</b>	: Move to fresh air. Administer oxygen or artificial respiration if needed. Seek medical attention immediately.
<b>Skin contact</b>	: Take off all contaminated clothing immediately. Wash off immediately with soap and plenty of water. Seek medical attention if irritation or skin thermal burns occur.
<b>Eye contact</b>	: In case of eye contact, immediately flush with low pressure, cool water for at least 15 minutes, opening eyelids to ensure flushing. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. If symptoms persist, seek medical attention immediately.
<b>Ingestion</b>	: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Seek medical attention immediately. If vomiting does occur naturally, keep head below the hips to reduce the risks of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

**SECTION 5. FIRE-FIGHTING MEASURES**

<b>Suitable extinguishing media</b>	: SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO <sub>2</sub> , water spray, or fire-fighting foam. LARGE FIRES: Water spray, fog or fire-fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers..
<b>Specific hazards during fire fighting</b>	: Vapors are heavier than air and may travel long distances to a point of ignition and flash back. Do not allow liquid runoff to enter sewers or public waters. Gas may form explosive mixture with air.
<b>Special protective equipment for fire-fighters</b>	: Use NIOSH/MSHA approved positive pressure self-contained breathing apparatus and fully protective clothing such as bunker gear if needed to prevent exposure.
<b>Further information</b>	: Isolate area, particularly around ends of storage vessels. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

<b>Personal precautions</b>	: Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to contain spill areas.
<b>Environmental precautions</b>	: Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors.
<b>Methods for cleaning up</b>	: Take up with sand or oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

**SECTION 7. HANDLING AND STORAGE**

- Precautions for safe handling** : Handle as a combustible liquid. Keep product and empty containers away from fire, sparks and heated surfaces. Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.
- Conditions for safe storage, including incompatibilities** : Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose containers to sources of ignition. Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

**SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION****Exposure Guidelines**

List	Components	CAS-No.	Type:	Value
OSHA	Benzene	71-43-2	TWA	1 ppm
		71-43-2	STEL	5 ppm
		71-43-2	OSHA_ACT	0.5 ppm
OSHA Z1	N-hexane	110-54-3	PEL	500 ppm 1,800 mg/m3
	Hydrogen sulfide	7783-06-4	STEL	20 ppm
ACGIH	Toluene	108-88-3	TWA	50 ppm
	N-hexane	110-54-3	TWA	50 ppm
	Benzene	71-43-2	TWA	0.5 ppm
		71-43-2	STEL	2.5 ppm
	Hydrogen Sulfide	7783-06-4	PEL	1 ppm
				STEL

- Engineering measures** : Use adequate ventilation to keep gas and vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.
- Eye protection** : Ensure that eyewash stations and safety showers are close to the workstation location. Goggles, and face shield or full facepiece pressure-demand supplied air respirator as needed to prevent eye and face contact.
- Hand protection** : Gloves constructed of nitrile, neoprene, or PVC are recommended. The resistance of specific material may vary from product to product as well as with degree of exposure.
- Skin and body protection** : Chemical protective clothing such as DuPont TyChem®, Barricade or equivalent, recommended based on degree of exposure.
- Respiratory protection** : A NIOSH/ MSHA-approved air-purifying respirator with organic vapor cartridges or

canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection. Use a NIOSH/MSHA-approved positive-pressure supplied-air respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

**Hygiene measures** : Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. DO NOT use gasoline, kerosene, solvents, or harsh abrasive skin cleaners to clean skin. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Consider the need to discard contaminated leather shoes and gloves. Use good personal hygiene practices.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance</b>	: Typical is a thick, dark yellow to brown or greenish black liquid
<b>Odor</b>	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.
<b>Odor threshold</b>	Odor threshold varies with the composition of the crude oil
<b>pH</b>	Not applicable
<b>Melting point/freezing point</b>	-30° to 30°C has been reported as a pour point
<b>Initial boiling point &amp; range</b>	Distillation is typically not performed above 300°C at atmospheric pressure
<b>Flash point</b>	-7 to 75°C
<b>Evaporation rate</b>	Higher initially and declines if lighter components evaporate
<b>Flammability (solid, gas)</b>	Flammable gas or vapors released by liquid
<b>Upper explosive limit</b>	Varies with composition but typical is approximately 7%
<b>Lower explosive limit</b>	Varies with composition but typical is approximately 0.7%
<b>Vapor pressure</b>	6 to 45 kPa
<b>Vapor density (air = 1)</b>	No data available
<b>Relative density (water = 1)</b>	0.9 to 1.0 g/mL is typical at 15°C
<b>Solubility (in water)</b>	1 to 2% by weight is maximum reported for soluble components of crude oil
<b>Partition coefficient (n-octanol/water)</b>	2 to > 6 as log Pow
<b>Auto-ignition temperature</b>	Varies with composition
<b>Decomposition temperature</b>	Will evaporate or boil and possibly ignite before decomposition occurs.
<b>Kinematic viscosity</b>	5 to > 1300 mm <sup>2</sup> /s at 38°C

**SECTION 10. STABILITY AND REACTIVITY**

<b>Reactivity</b>	: Vapors may form explosive mixture with air. Hazardous polymerization does not occur.
<b>Chemical stability</b>	Stable under normal conditions.
<b>Possibility of hazardous reactions</b>	Can react with strong oxidizing agents, peroxides, acids and alkalies.
<b>Conditions to avoid</b>	Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Avoid static charge accumulation and discharge (see Section 7).
<b>Hazardous decomposition products</b>	Ignition and burning can release carbon monoxide, carbon dioxide, non-combusted hydrocarbons (smoke) and sulfur dioxide.

**SECTION 11. TOXICOLOGICAL INFORMATION**

<b>Inhalation</b>	: May cause respiratory tract irritation. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death. Irritating and toxic hydrogen sulfide gas may be present. Greater than 15 - 20 ppm continuous exposure can cause mucous membrane and respiratory tract irritation. 50 - 500 ppm can cause headache, nausea, and dizziness. Continued exposure at these levels can lead to loss of reasoning and balance, difficulty in breathing, fluid in the lungs, and possible loss of consciousness. Greater than 500 ppm can cause rapid unconsciousness due to respiratory paralysis and death by suffocation unless the victim is removed from exposure and successfully resuscitated. Greater than 1000 ppm can cause immediate unconsciousness and death if not promptly revived. After-effects from overexposure are not anticipated except what would be expected if the victim was without oxygen for more than 3 to 5 minutes (asphyxiation). The "rotten egg" odor of hydrogen sulfide is not a reliable indicator for warning of exposure, since olfactory fatigue (loss of smell) readily occurs, especially at concentrations above 50 ppm. At high concentrations, the victim may not even recognize the odor before becoming unconscious.
<b>Ingestion</b>	Aspiration hazard if liquid is inhaled into lungs, particularly from vomiting after ingestion. Aspiration may result in chemical pneumonia, severe lung damage, respiratory failure and even death. Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death may occur.
<b>Skin irritation</b>	Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed. Rare, precancerous warts on the forearms, backs of hands and scrotum have been reported from prolonged or repeated skin contact.
<b>Eye irritation</b>	Irritating to eyes.
<b>Chronic exposure</b>	This material contains polynuclear aromatic hydrocarbons (PNAs), some of which are animal carcinogens. Similar products produced skin cancer and systemic toxicity in laboratory animals following repeated applications. The significance of these results to human exposures has not been determined - see Section 11 Toxicological Information. Contains benzene, which can cause blood disease, including anemia and leukemia. Suspect reproductive hazard - contains material which may injure unborn child.

## Target organs

Skin, Eyes, Central nervous system, Respiratory system, Kidney, Liver

Component

Petroleum; Crude oil	8002-05-9	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 5,001 mg/kg</p> <p><u>Acute dermal toxicity:</u> LD50 rabbit Dose: 2,001 mg/kg</p> <p><u>Skin irritation:</u> Result: Mild skin irritation</p> <p><u>Eye irritation:</u> Result: Mild eye irritation</p> <p><u>Carcinogenicity:</u> N11.00418605</p>
Toluene	108-88-3	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 636 mg/kg</p> <p><u>Acute dermal toxicity:</u> LD50 rabbit Dose: 12,124 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 49 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation Prolonged skin contact may defat the skin and produce dermatitis.</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
Xylene	1330-20-7	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 2,840 mg/kg</p> <p><u>Acute dermal toxicity:</u> LD50 rabbit Dose: ca. 4,500 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 6,350 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
Naphthalene	91-20-3	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 2,001 mg/kg</p> <p><u>Acute dermal toxicity:</u> LD50 rat Dose: 2,501 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 101 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p> <p><u>Carcinogenicity:</u> N11.00422130</p>
Benzene	71-43-2	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 930 mg/kg</p> <p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 44 mg/l Exposure time: 4 h</p> <p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Risk of serious damage to eyes.</p>

Pentane	109-66-0	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 2,001 mg/kg <u>Acute inhalation toxicity:</u> LC50 rat Dose: 364 mg/l Exposure time: 4 h <u>Skin irritation:</u> Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product. <u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
Cyclohexane	110-82-7	<p><u>Acute dermal toxicity:</u> LD50 rabbit Dose: 2,001 mg/kg <u>Acute inhalation toxicity:</u> LC50 rat Dose: 14 mg/l Exposure time: 4 h <u>Skin irritation:</u> Classification: Irritating to skin. Result: Skin irritation <u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
Ethylbenzene	100-41-4	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 3,500 mg/kg <u>Acute dermal toxicity:</u> LD50 rabbit Dose: 15,500 mg/kg <u>Acute inhalation toxicity:</u> LC50 rat Dose: 18 mg/l Exposure time: 4 h <u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation <u>Eye irritation:</u> Classification: Irritating to eyes. Result: Risk of serious damage to eyes</p>
Heptane [and isomers]	142-82-5	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 15,001 mg/kg <u>Acute inhalation toxicity:</u> LC50 rat Dose: 103 g/m3 Exposure time: 4 h <u>Skin irritation:</u> Classification: Irritating to skin. Result: Skin irritation Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product. <u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
N-hexane	110-54-3	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 25,000 mg/kg <u>Acute dermal toxicity:</u> LD50 rabbit Dose: 2,001 mg/kg <u>Acute inhalation toxicity:</u> LC50 rat Dose: 171.6 mg/l Exposure time: 4 h <u>Skin irritation:</u> Classification: Irritating to skin. Result: Skin irritation <u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation <u>Teratogenicity:</u> N11.00418960</p>

**Carcinogenicity**

<b>NTP</b>	Naphthalene (CAS-No.: 91-20-3) Benzene (CAS-No.: 71-43-2)
<b>IARC</b>	Gasoline, natural; Low boiling point naphtha (CAS-No.: 8006-61-9) Naphthalene (CAS-No.: 91-20-3) Benzene (CAS-No.: 71-43-2) Ethylbenzene (CAS-No.: 100-41-4)
<b>OSHA</b>	Benzene (CAS-No.: 71-43-2)
<b>CA Prop 65</b>	WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Toluene (CAS-No.: 108-88-3) Benzene (CAS-No.: 71-43-2)

**SECTION 12. ECOLOGICAL INFORMATION**

**Additional ecological information** : Keep out of sewers, drainage areas, and waterways. Report spills and releases, as applicable, under Federal and State regulations.

**Component:**

<b>Toluene</b>	108-88-3	<u>Toxicity to fish:</u> LC50 Species: Carassius auratus (goldfish) Dose: 13 mg/l Exposure time: 96 h  <u>Acute and prolonged toxicity for aquatic invertebrates:</u> EC50 Species: Daphnia magna (Water flea) Dose: 11.5 mg/l Exposure time: 48 h  <u>Toxicity to algae:</u> IC50 Species: Selenastrum capricornutum (green algae) Dose: 12 mg/l Exposure time: 72 h
<b>N-hexane</b>	110-54-3	<u>Toxicity to fish:</u> LC50 Species: Pimephales promelas (fathead minnow) Dose: 2.5 mg/l Exposure time: 96 h  <u>Acute and prolonged toxicity for aquatic invertebrates:</u> EC50 Species: Daphnia magna (Water flea) Dose: 2.1 mg/l Exposure time: 48 h

**SECTION 13. DISPOSAL CONSIDERATIONS**

**Disposal** : Consult federal, state and local waste regulations to determine appropriate waste characterization of material and allowable disposal methods.

**SECTION 14. TRANSPORT INFORMATION**

CFR

Proper shipping name : PETROLEUM CRUDE OIL  
 UN-No. : 1267  
 Class : 3  
 Packing group : III

**TDG**

Proper shipping name : PETROLEUM CRUDE OIL  
 UN-No. : UN1267  
 Class : 3  
 Packing group : III

**IATA Cargo Transport**

UN UN-No. : UN1267  
 Description of the goods : PETROLEUM CRUDE OIL  
 Class : 3  
 Packaging group : I11  
 ICAO-Labels : 3  
 Packing instruction (cargo aircraft) : 366  
 Packing instruction (cargo aircraft) : Y344

**IATA Passenger Transport**

UN UN-No. : UN1267  
 Description of the goods : PETROLEUM CRUDE OIL  
 Class : 3  
 Packaging group : III  
 ICAO-Labels : 3  
 Packing instruction (passenger aircraft) : 355  
 Packing instruction (passenger aircraft) : Y344

**IMDG-Code**

UN-No. : UN 1267  
 Description of the goods : PETROLEUM CRUDE OIL  
 Class : 3  
 Packaging group : III  
 IMDG-Labels : 3  
 EmS Number : F-E S-E  
 Marine pollutant : No

**SECTION 15. REGULATORY INFORMATION**

TSCA Status : On TSCA Inventory  
 DSL Status : All components of this product are on the Canadian DSL list.  
 SARA 311/312 Hazards : Fire Hazard  
                                   Acute Health Hazard  
                                   Chronic Health Hazard

**CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)**

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.

CERCLA Reportable Quantity : 111 lbs

MASS RTK US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

<u>Components</u>	<u>CAS-No.</u>
Petroleum; Crude oil	8002-05-9
Toluene	108-88-3
N-hexane	110-54-3
Benzene	71-43-2

SARA III US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

<u>Components</u>	<u>CAS-No.</u>
Toluene	108-88-3
N-hexane	110-54-3
Benzene	71-43-2

SARA III US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR355, Appendix A)

<u>Components</u>	<u>CAS-No.</u>
Petroleum; Crude oil	8002-05-9
Toluene	108-88-3
N-hexane	110-54-3
Benzene	71-43-2

PENN RTK US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

<u>Components</u>	<u>CAS-No.</u>
Petroleum; Crude oil	8002-05-9
Toluene	108-88-3
N-hexane	110-54-3
Benzene	71-43-2

NJ RTK US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

<u>Components</u>	<u>CAS-No.</u>
Petroleum; Crude oil	8002-05-9
Toluene	108-88-3
N-hexane	110-54-3
Benzene	71-43-2

California Prop. 65 : WARNING! This product contains a chemical known to the State of California to cause cancer.

benzene 71-43-2

WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Toluene 108-88-3

Benzene 71-43-2

## SECTION 16. OTHER INFORMATION

### Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Revision Date : 02/02/2013

# Safety Data Sheet

## Crude oil, light sweet

**NFPA:** Flammability



### SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

<b>Product name</b>	:	Crude oil, light sweet			
<b>Synonyms</b>	:	Petroleum Crude Oil, Crude Sweet, 888100005188			
<b>SDS Number</b>	:	888100005188	<b>Version</b>	:	1.3
<b>Product Use Description</b>	:	Industrial feedstock			
<b>Company</b>	:	For: Tesoro Refining & Marketing Co. 19100 Ridgewood Parkway, San Antonio, TX 78259			
<b>Tesoro Call Center</b>	:	(877) 783-7676	<b>Chemtrec (Emergency Contact)</b>	:	(800) 424-9300

### SECTION 2. HAZARDS IDENTIFICATION

**Classifications** : Flammable Liquid – Category 2 or 3 depending on variable composition.  
 Aspiration Hazard – Category 1.  
 Carcinogenicity – Category 2  
 Specific Target Organ Toxicity (Repeated Exposure) – Category 2  
 Specific Target Organ Toxicity (Single Exposure) – Category 3  
 Eye Irritant – Category 2B  
 Chronic Aquatic Toxicity – Category 2

**Pictograms**



**Signal Word** : DANGER

**Hazard Statements** : Highly flammable liquid and vapor.  
 May be fatal if swallowed and enters airways – do not siphon gasoline by mouth.  
 Suspected of causing cancer if repeated over-exposure by inhalation and/or skin contact occurs.  
 May cause damage to liver, kidneys and nervous system by prolonged and repeated inhalation or skin contact.  
 Causes eye irritation. Can be absorbed through skin.  
 Repeated or prolonged skin contact can cause irritation and dermatitis.  
 May cause drowsiness or dizziness.  
 Harmful to aquatic life.  
 May release hydrogen sulfide (H<sub>2</sub>S) gas, a toxic-by-inhalation material. See

Section 11.

### Precautionary statements

#### Prevention

Obtain special instructions before use.  
 Do not handle until all safety precautions have been read and understood.  
 Keep away from heat, sparks, open flames, welding and hot surfaces.  
 No smoking.  
 Keep container tightly closed.  
 Ground and/or bond container and receiving equipment.  
 Use explosion-proof electrical equipment.  
 Use only non-sparking tools (if tools are used in flammable atmosphere).  
 Take precautionary measures against static discharge.  
 Wear gloves, eye protection and face protection (as needed to prevent skin and eye contact with liquid).  
 Wash hands or liquid-contacted skin thoroughly after handling.  
 Do not eat, drink or smoke when using this product.  
 Do not breathe vapors.  
 Use only outdoors or in a well-ventilated area.

#### Response

In case of fire: Use dry chemical, CO<sub>2</sub>, water spray or fire-fighting foam to extinguish.  
 If swallowed: Immediately call a poison center, doctor, hospital emergency room, medical clinic or 911. Do NOT induce vomiting. Rinse mouth.  
 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
 If in eye: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 If skin or eye irritation persists, get medical attention.  
 If inhaled: Remove person to fresh air and keep comfortable for breathing.  
 Get medical attention if you feel unwell.

#### Storage

Store in a well-ventilated place. Keep cool. Store locked up. Keep container tightly closed. Use only approved containers.

#### Disposal

Dispose of contents/containers to approved disposal site in accordance with local, regional, national, and/or international regulations

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Weight %
Petroleum; Crude oil	8002-05-9	80 - 85%
Benzene	71-43-2	5 - 7%
Toluene	108-88-3	5 - 7%
Ethylbenzene	100-41-4	5 - 7%

Xylene	1330-20-7	5 - 7%
Hydrogen Sulfide	7783-06-4	< 0.5%

#### SECTION 4. FIRST AID MEASURES

<b>Inhalation</b>	: Move to fresh air. If not breathing, give artificial respiration. Administer oxygen or artificial respiration if needed. Seek medical attention immediately.
<b>Skin contact</b>	: Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Seek medical advice if symptoms persist or develop. Seek medical attention if irritation or skin thermal burns occur.
<b>Eye contact</b>	: In case of eye contact, immediately flush with low pressure, cool water for at least 15 minutes, opening eyelids to ensure flushing. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Seek medical advice if symptoms persist or develop.
<b>Ingestion</b>	: Do NOT induce vomiting. Do not give liquids. Seek medical attention immediately. If vomiting does occur naturally, keep head below the hips to reduce the risks of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

#### SECTION 5. FIRE-FIGHTING MEASURES

<b>Suitable extinguishing media</b>	: SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO <sub>2</sub> , water spray, fire-fighting foam. LARGE FIRES: Water spray, fog or fire-fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.
<b>Specific hazards during fire fighting</b>	: Above the flash point, explosive vapor-air mixtures may be formed. Vapors can flow along surfaces to distant ignition source and flash back. Dangerous fire and explosion hazard when exposed to heat, sparks or flame. Do not allow liquid runoff to enter sewers or public waters.
<b>Special protective equipment for fire-fighters</b>	: Firefighters should wear self-contained breathing apparatus and full protective clothing as need for protection from heat and airborne combustion products. Withdraw immediately from the area if there is a rising sound from a venting safety device or discoloration of vessels, tanks, or pipelines.
<b>Further information</b>	: Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

#### SECTION 6. ACCIDENTAL RELEASE MEASURES

<b>Personal precautions</b>	: Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to contain spill areas.
<b>Environmental precautions</b>	: Carefully contain and stop the source of the spill, if safe to do so. Do not flush down sewer or drainage systems, unless system is designed and permitted to

handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. WASTE DISPOSAL METHOD: Dispose of in accordance with Local, State, and Federal Regulations.

- Methods for cleaning up** : Take up with sand or oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).
- Additional advice** : Inform the responsible authorities in case of leakage, or of entry into waterways, soil or drains.

## SECTION 7. HANDLING AND STORAGE

- Precautions for safe handling** : Handle as a combustible liquid. Keep product and empty containers away from fire, sparks and heated surfaces. Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.
- Conditions for safe storage, including incompatibilities** : Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose containers to sources of ignition. Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks". The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks". Hydrogen sulfide may accumulate in tanks and bulk transport compartments. Consider appropriate respiratory protection (see Section 8). Stand upwind. Avoid vapors when opening hatches and dome covers. Confined spaces should be ventilated and gas tested prior to entry.

## SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Exposure Guidelines

List	Components	CAS-No.	Type:	Value
OSHA	Benzene	71-43-2	TWA	1 ppm
		71-43-2	STEL	5 ppm
		71-43-2	OSHA_ACT	0.5 ppm
OSHA Z1	Ethylbenzene	100-41-4	PEL	100 ppm 435 mg/m3
	Xylene	1330-20-7	PEL	100 ppm 435 mg/m3
	Hydrogen sulfide	7783-06-4	STEL	20 ppm
ACGIH	Benzene	71-43-2	TWA	0.5 ppm
		71-43-2	STEL	2.5 ppm
	Toluene	108-88-3	TWA	50 ppm

	Ethylbenzene	100-41-4	TWA	100 ppm
		100-41-4	STEL	125 ppm
	Xylene	1330-20-7	TWA	100 ppm
		1330-20-7	STEL	150 ppm
	Hydrogen Sulfide	7783-06-4	TWA	1 ppm
		7783-06-4	STEL	5 ppm

<b>Engineering measures</b>	: Use adequate ventilation to keep gas and vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.
<b>Eye protection</b>	: Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.
<b>Hand protection</b>	: Gloves constructed of nitrile, neoprene, or PVC are recommended.
<b>Skin and body protection</b>	: Chemical protective clothing such as DuPont Tyvek QC, TyChem® or equivalent, recommended based on degree of exposure. The resistance of specific material may vary from product to product as well as with degree of exposure.
<b>Respiratory protection</b>	: If hydrogen sulfide concentration may exceed permissible exposure limit, a positive-pressure SCBA or Type C supplied air respirator with escape bottle is required as respiratory protection. If hydrogen sulfide concentration is below H <sub>2</sub> S permissible exposure limit a NIOSH/ MSHA-approved air-purifying respirator with acid gas cartridges may be acceptable for odor control, but continuous air monitoring for H <sub>2</sub> S is recommended. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection. Use a NIOSH/ MSHA-approved positive-pressure supplied-air respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.
<b>Hygiene measures</b>	: Emergency eye wash capability should be available in the vicinity of any potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. DO NOT use gasoline, kerosene, solvents, or harsh abrasive skin cleaners to clean skin. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Consider the need to discard contaminated leather shoes and gloves. Consider disposal of contaminated clothing rather than laundering to prevent the formation of flammable vapors which could ignite via washer or dryer.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance</b>	: Typical is a thick, dark yellow to brown or greenish black liquid
<b>Odor</b>	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.
<b>Odor threshold</b>	Odor threshold varies with the composition of the crude oil
<b>pH</b>	Not applicable

<b>Melting point/freezing point</b>	-30° to 30°C has been reported as a pour point
<b>Initial boiling point &amp; range</b>	Distillation is typically not performed above 300°C at atmospheric pressure
<b>Flash point</b>	-7 to 75°C
<b>Evaporation rate:</b>	Higher initially and declines if lighter components evaporate
<b>Flammability (solid, gas)</b>	Flammable gas or vapors released by liquid
<b>Upper explosive limit</b>	Varies with composition but typical is approximately 7%
<b>Lower explosive limit</b>	Varies with composition but typical is approximately 0.7%
<b>Vapor pressure</b>	6 to 45 kPa
<b>Vapor density (air = 1)</b>	No data available
<b>Relative density (water = 1)</b>	0.8 to 1.0 g/mL is typical at 15°C
<b>Solubility (in water)</b>	1 to 2% by weight is maximum reported for soluble components of crude oil
<b>Partition coefficient (n-octanol/water)</b>	2 to > 6 as log Pow
<b>Auto-ignition temperature</b>	Varies with composition
<b>Decomposition temperature</b>	Will evaporate or boil and possibly ignite before decomposition occurs.
<b>Kinematic viscosity</b>	5 to > 1300 mm <sup>2</sup> /s at 38°C

## SECTION 10. STABILITY AND REACTIVITY

<b>Reactivity</b>	Vapors may form explosive mixture with air. Hazardous polymerization does not occur.
<b>Chemical stability</b>	Stable under normal conditions.
<b>Possibility of hazardous reactions</b>	Can react with strong oxidizing agents, peroxides, acids and alkalies.
<b>Conditions to avoid</b>	Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Avoid static charge accumulation and discharge (see Section 7).
<b>Hazardous decomposition products</b>	Ignition and burning can release carbon monoxide, carbon dioxide, non-combusted hydrocarbons (smoke) and sulfur dioxide.

## SECTION 11. TOXICOLOGICAL INFORMATION

<b>Inhalation</b>	May cause respiratory tract irritation. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death. Irritating and toxic hydrogen sulfide gas may be present. Greater than 15 - 20 ppm continuous exposure can cause mucous membrane and respiratory tract irritation. 50 - 500 ppm can cause headache, nausea, and dizziness. Continued exposure at these levels can lead to loss of
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reasoning and balance, difficulty in breathing, fluid in the lungs, and possible loss of consciousness. Greater than 500 ppm can cause rapid unconsciousness due to respiratory paralysis and death by suffocation unless the victim is removed from exposure and successfully resuscitated. Greater than 1000 ppm can cause immediate unconsciousness and death if not promptly revived. After-effects from overexposure are not anticipated except what would be expected if the victim was without oxygen for more than 3 to 5 minutes (asphyxiation). The "rotten egg" odor of hydrogen sulfide is not a reliable indicator for warning of exposure, since olfactory fatigue (loss of smell) readily occurs, especially at concentrations above 50 ppm. At high concentrations, the victim may not even recognize the odor before becoming unconscious.

**Ingestion**

Aspiration hazard if liquid is inhaled into lungs, particularly from vomiting after ingestion. Aspiration may result in chemical pneumonia, severe lung damage, respiratory failure and even death. Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death may occur.

**Skin irritation**

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed. Rare, precancerous warts on the forearms, backs of hands and scrotum have been reported from prolonged or repeated skin contact.

**Eye irritation**

Irritating to eyes.

**Chronic exposure**

This material contains polynuclear aromatic hydrocarbons (PNAs), some of which are animal carcinogens. Similar products produced skin cancer and systemic toxicity in laboratory animals following repeated applications. The significance of these results to human exposures has not been determined - see Section 11 Toxicological Information. Contains benzene, which can cause blood disease, including anemia and leukemia. Suspect reproductive hazard - contains material which may injure unborn child.

**Target organs**

Skin, Eyes, Central nervous system, Respiratory system, Kidney, Liver

**Component**

<b>Petroleum; Crude oil</b>	8002-05-9	<u>Acute oral toxicity:</u> LD50 rat Dose: 5,001 mg/kg  <u>Acute dermal toxicity:</u> LD50 rabbit Dose: 2,001 mg/kg  <u>Skin irritation:</u> Result: Mild skin irritation  <u>Eye irritation:</u> Result: Mild eye irritation  <u>Carcinogenicity:</u> N11.00418605
<b>Toluene</b>	108-88-3	<u>Acute oral toxicity:</u> LD50 rat Dose: 636 mg/kg <u>Acute dermal toxicity:</u> LD50 rabbit Dose: 12,124 mg/kg <u>Acute inhalation toxicity:</u> LC50 rat Dose: 49 mg/l Exposure time: 4 h <u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation

Prolonged skin contact may defat the skin and produce dermatitis.

Eye irritation: Classification: Irritating to eyes.

Result: Mild eye irritation

**Xylene**

1330-20-7

Acute oral toxicity: LD50 rat

Dose: 2,840 mg/kg

Acute dermal toxicity: LD50 rabbit

Dose: ca. 4,500 mg/kg

Acute inhalation toxicity: LC50 rat

Dose: 6,350 mg/l

Exposure time: 4 h

Skin irritation: Classification: Irritating to skin.

Result: Mild skin irritation

Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.

Eye irritation: Classification: Irritating to eyes.

Result: Mild eye irritation

**Naphthalene**

91-20-3

Acute oral toxicity: LD50 rat

Dose: 2,001 mg/kg

Acute dermal toxicity: LD50 rat

Dose: 2,501 mg/kg

Acute inhalation toxicity: LC50 rat

Dose: 101 mg/l

Exposure time: 4 h

Skin irritation: Classification: Irritating to skin.

Result: Mild skin irritation

Eye irritation: Classification: Irritating to eyes.

Result: Mild eye irritation

Carcinogenicity: N11.00422130

**Benzene**

71-43-2

Acute oral toxicity: LD50 rat

Dose: 930 mg/kg

Acute inhalation toxicity: LC50 rat

Dose: 44 mg/l

Exposure time: 4 h

Skin irritation: Classification: Irritating to skin.

Result: Mild skin irritation

Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.

Eye irritation: Classification: Irritating to eyes.

Result: Risk of serious damage to eyes.

**Pentane**

109-66-0

Acute oral toxicity: LD50 rat

Dose: 2,001 mg/kg

Acute inhalation toxicity: LC50 rat

Dose: 364 mg/l

Exposure time: 4 h

Skin irritation: Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.

Eye irritation: Classification: Irritating to eyes.

Result: Mild eye irritation

Cyclohexane	110-82-7	<p><u>Acute dermal toxicity:</u> LD50 rabbit Dose: 2,001 mg/kg <u>Acute inhalation toxicity:</u> LC50 rat Dose: 14 mg/l Exposure time: 4 h <u>Skin irritation:</u> Classification: Irritating to skin. Result: Skin irritation <u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
Ethylbenzene	100-41-4	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 3,500 mg/kg <u>Acute dermal toxicity:</u> LD50 rabbit Dose: 15,500 mg/kg <u>Acute inhalation toxicity:</u> LC50 rat Dose: 18 mg/l Exposure time: 4 h <u>Skin irritation:</u> Classification: Irritating to skin. Result: Mild skin irritation <u>Eye irritation:</u> Classification: Irritating to eyes. Result: Risk of serious damage to eyes.</p>
Heptane [and isomers]	142-82-5	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 15,001 mg/kg <u>Acute inhalation toxicity:</u> LC50 rat Dose: 103 g/m3 Exposure time: 4 h <u>Skin irritation:</u> Classification: Irritating to skin. Result: Skin irritation Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product. <u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
N-hexane	110-54-3	<p><u>Acute oral toxicity:</u> LD50 rat Dose: 25,000 mg/kg <u>Acute dermal toxicity:</u> LD50 rabbit Dose: 2,001 mg/kg <u>Acute inhalation toxicity:</u> LC50 rat Dose: 171.6 mg/l Exposure time: 4 h <u>Skin irritation:</u> Classification: Irritating to skin. Result: Skin irritation <u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation <u>Teratogenicity:</u> N11.00418960</p>

Carcinogenicity

NTP	Naphthalene (CAS-No.: 91-20-3) Benzene (CAS-No.: 71-43-2)
IARC	Gasoline, natural; Low boiling point naphtha (CAS-No.: 8006-61-9) Naphthalene (CAS-No.: 91-20-3) Benzene (CAS-No.: 71-43-2) Ethylbenzene (CAS-No.: 100-41-4)
OSHA	Benzene (CAS-No.: 71-43-2)
CA Prop 65	WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Toluene (CAS-No.: 108-88-3) Benzene (CAS-No.: 71-43-2)

## SECTION 12. ECOLOGICAL INFORMATION

**Additional ecological information** : Keep out of sewers, drainage areas, and waterways. Report spills and releases, as applicable, under Federal and State regulations.

### Component:

Toluene	108-88-3	<u>Toxicity to fish:</u> LC50 Species: Carassius auratus (goldfish) Dose: 13 mg/l Exposure time: 96 h  <u>Acute and prolonged toxicity for aquatic invertebrates:</u> EC50 Species: Daphnia magna (Water flea) Dose: 11.5 mg/l Exposure time: 48 h  <u>Toxicity to algae:</u> IC50 Species: Selenastrum capricornutum (green algae) Dose: 12 mg/l Exposure time: 72 h
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## SECTION 13. DISPOSAL CONSIDERATIONS

**Disposal** : Consult federal, state and local waste regulations to determine appropriate waste characterization of material and allowable disposal methods.

## SECTION 14. TRANSPORT INFORMATION

CFR	Proper shipping name	: PETROLEUM CRUDE OIL
	UN-No.	: 1267
	Class	: 3
	Packing group	: II

**TDG**

Proper shipping name : PETROLEUM CRUDE OIL  
 UN-No. : UN1267  
 Class : 3  
 Packing group : II

**IATA Cargo Transport**

UN UN-No. : UN1267  
 Description of the goods : PETROLEUM CRUDE OIL  
 Class : 3  
 Packaging group : II  
 ICAO-Labels : 3  
 Packing instruction (cargo aircraft) : 364  
 Packing instruction (cargo aircraft) : Y341

**IATA Passenger Transport**

UN UN-No. : UN1267  
 Description of the goods : PETROLEUM CRUDE OIL  
 Class : 3  
 Packaging group : II  
 ICAO-Labels : 3  
 Packing instruction (passenger aircraft) : 353  
 Packing instruction (passenger aircraft) : Y341

**IMDG-Code**

UN-No. : UN 1267  
 Description of the goods : PETROLEUM CRUDE OIL  
 Class : 3  
 Packaging group : II  
 IMDG-Labels : 3  
 EmS Number : F-E S-E  
 Marine pollutant : No

**SECTION 15. REGULATORY INFORMATION**

TSCA Status : On TSCA Inventory  
 DSL Status : All components of this product are on the Canadian DSL list.  
 SARA 311/312 Hazards : Acute Health Hazard  
 Chronic Health Hazard

**CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)**

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.

CERCLA Reportable Quantity : 118 lbs

SARA III US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

<u>Components</u>	<u>CAS-No.</u>
Xylene	1330-20-7
Ethylbenzene	100-41-4
Toluene	108-88-3
Benzene	71-43-2

SARA III US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR355, Appendix A)

<u>Components</u>	<u>CAS-No.</u>
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PENN RTK US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

<u>Components</u>	<u>CAS-No.</u>
Benzene	71-43-2
Toluene	108-88-3
Ethylbenzene	100-41-4
Xylene	1330-20-7
Petroleum; Crude oil	8002-05-9

MASS RTK US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

<u>Components</u>	<u>CAS-No.</u>
Benzene	71-43-2
Toluene	108-88-3
Ethylbenzene	100-41-4
Xylene	1330-20-7
Petroleum; Crude oil	8002-05-9

NJ RTK US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

<u>Components</u>	<u>CAS-No.</u>
Benzene	71-43-2
Toluene	108-88-3
Ethylbenzene	100-41-4
Xylene	1330-20-7
Petroleum; Crude oil	8002-05-9

California Prop. 65 : WARNING! This product contains a chemical known in the State of California to cause cancer.

Ethylbenzene 100-41-4

Benzene 71-43-2

WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Toluene 108-88-3

Benzene 71-43-2

## SECTION 16. OTHER INFORMATION

### Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Revision Date : 02/02/2013



**POTENTIAL HAZARDS****FIRE OR EXPLOSION**

- **HIGHLY FLAMMABLE:** Will be easily ignited by heat, sparks or flames.
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapor explosion hazard indoors, outdoors or in sewers.
- Those substances designated with a (P) may polymerize explosively when heated or involved in a fire.
- Runoff to sewer may create fire or explosion hazard.
- Containers may explode when heated.
- Many liquids are lighter than water.
- Substance may be transported hot.
- For UN3166, if Lithium ion batteries are involved, also consult GUIDE 147.
- **If molten aluminum is involved, refer to GUIDE 169.**

**HEALTH**

- Inhalation or contact with material may irritate or burn skin and eyes.
- Fire may produce irritating, corrosive and/or toxic gases.
- Vapors may cause dizziness or suffocation.
- Runoff from fire control or dilution water may cause pollution.

**PUBLIC SAFETY**

- **CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind.
- Keep out of low areas.
- Ventilate closed spaces before entering.

**PROTECTIVE CLOTHING**

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

**EVACUATION****Large Spill**

- Consider initial downwind evacuation for at least 300 meters (1000 feet).

**Fire**

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

**EMERGENCY RESPONSE****FIRE**

**CAUTION:** All these products have a very low flash point: Use of water spray when fighting fire may be inefficient.

**CAUTION:** For mixtures containing alcohol or polar solvent, alcohol-resistant foam may be more effective.

**Small Fire**

- Dry chemical, CO<sub>2</sub>, water spray or regular foam.

**Large Fire**

- Water spray, fog or regular foam.
- **Do not use straight streams.**
- Move containers from fire area if you can do it without risk.

**Fire involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

**SPILL OR LEAK**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- A vapor suppressing foam may be used to reduce vapors.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- Use clean non-sparking tools to collect absorbed material.

**Large Spill**

- Dike far ahead of liquid spill for later disposal.
- Water spray may reduce vapor; but may not prevent ignition in closed spaces.

**FIRST AID**

- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Wash skin with soap and water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim warm and quiet.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.