

Coker Light Gas Oil (CLGO)

Company

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Material Safety Data Sheet

MSDS No. AP1828
 Revision Date 11/01/06

IMPORTANT: Read this MSDS before handling or disposing of this product and pass this information on to employees, customers and users of this product.

Emergency Overview

Physical State Liquid.
Color Transparent to slightly opaque, slightly yellow to slightly amber. **Odor** Characteristic, kerosene-like.

WARNING! Combustible liquid; vapor may cause flash fire. Mist or vapor may irritate the eyes, mucous membranes, and respiratory tract.
 Liquid contact may cause minimal to mild eye irritation and/or mild to severe skin irritation and inflammation.
 May be harmful if inhaled or absorbed through the skin.
 Overexposures may cause central nervous system (CNS) depression and/or other target organ effects.
 May be harmful or fatal if ingested. Aspiration into the lungs can cause pulmonary edema and lipid or chemical pneumonia.
 Contains Naphthalene and Polynuclear Aromatic Hydrocarbons. Based upon laboratory animal studies, may cause skin cancer following extended contact or inhalation.
 Mutagenic hazard; may cause genetic damage.
 Based upon animal testing, may adversely affect reproduction.
 Spills may create a slipping hazard.
 If used as a fuel, its engine exhaust may cause upper respiratory tract irritation and reversible pulmonary effects.
 Long-term exposure to fuel exhaust particulates may cause cancer.

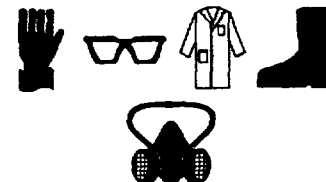
Hazard Rankings

	HMIS	NFPA
Health Hazard	* 2	2
Fire Hazard	2	2
Reactivity	0	0

* = Chronic Health Hazard

Protective Equipment

Minimum Requirements
 See Section 8 for Details



SECTION 1: IDENTIFICATION

Trade Name Coker Light Gas Oil (CLGO)

Product Number 1828018280

CAS Number 64741-82-8

Product Family Petroleum Hydrocarbon Middle Distillate

Synonyms CLGO; Coker LGO; Medium Distillate from a Delayed Coker Unit; Thermocracked Light Gas Oil; Light Thermocracked Distillate; Light Thermal Cracked Distillate (Petroleum); Thermal-cracked Middle Distillate; Cracked Middle Distillate Blending Stock; C9-C22 Petroleum Hydrocarbons.

Business Contact

Product Safety 800-700-0946

24 Hour Emergency Contact

CHEMTREC 800-424-9300
 CANUTEC-Canada 613-996-6666
 LYONDELL 800-245-4532

Coker Light Gas Oil (CLGO)

SECTION 2: COMPOSITION

Component Name(s)	CAS Registry No.	Concentration (%)
1) Light Thermal Cracked Distillate (Petroleum)	64741-82-8	100
2) Xylenes (Mixed Isomers)	1330-20-7	0-1.5
3) Trimethylbenzene (mixed isomers)	25551-13-7	0.5-1.5
4) Ethylmethylbenzenes (Ethyltoluenes)	25550-14-5	0.5-2
5) Naphthalene	91-20-3	1-3
6) C10-C11 Alkylbenzenes	70693-06-0	1-5
7) C11 Alkanes, Isoparaffins, Cycloalkanes, and Naphthenes	Mixture	15-25
8) C12 Alkanes, Isoparaffins, Cycloalkanes, and Naphthenes	Mixture	20-40
9) Biphenyl (Diphenyl)	92-52-4	1-5
10) C12-C21 Aromatic Hydrocarbons	Mixture	10-20
11) C13-C22 Alkanes, Isoparaffins, Cycloalkanes, and Naphthenes	Mixture	20-35
12) Polynuclear Aromatic Hydrocarbons (4- to 6-member condensed-ring type)	68487-58-6	0.1-1

SECTION 3: HAZARDS IDENTIFICATION

Also see Emergency Overview and Hazard Ratings on the top of Page 1 of this MSDS.

Major Route(s) of Entry Skin Contact. Eye Contact. Absorption. Inhalation.

Signs and Symptoms of Acute Exposure

Inhalation	Breathing mist or vapors may irritate the mucous membranes of the nose, throat, bronchi, and lungs, and may cause transient central nervous system (CNS) depression. CNS symptoms include headache, dizziness, nausea, intoxication, blurred vision, slurred speech, flushed face, confusion, weakness, fatigue, loss of consciousness, convulsions, coma, and death, depending on the concentration and/or duration of exposure.
Eye Contact	Animal test results on similar materials suggest that this product can cause minimal to mild eye irritation upon short-term exposure. Symptoms include stinging, watering, and redness.
Skin Contact	Animal test results on similar materials suggest that this product can cause mild to moderate skin irritation. Short-term contact symptoms include redness, itching, and burning of the skin. This material may also be absorbed through the skin and produce CNS depression effects (see "Inhalation" above). If the skin is damaged, absorption increases. Prolonged and/or repeated contact may cause moderate to severe dermatitis and/or more serious skin disorders. Chronic symptoms may include drying, swelling, scaling, blistering, cracking, and/or severe tissue damage.
Ingestion	If swallowed, this material may irritate the mucous membranes of the mouth, throat, esophagus, and stomach. It can be readily absorbed by the stomach and intestinal tract. Ingestion can produce a burning sensation of the mouth and esophagus and central nervous system depression. Symptoms of CNS depression may include nausea, vomiting, dizziness, staggering gait, drowsiness, shallow rapid pulse, diarrhea, restlessness, sedation, inadequate respiratory function, and heart irregularities. Higher doses may cause loss of consciousness and delirium prior to the onset of convulsions, coma, and death (see "Inhalation" above). A lethal dose may be as low as one-half ounce for a child and one ounce for an adult human.

Due to its light viscosity, there is a danger of aspiration into the lungs during vomiting. Aspiration of a small amount of liquid can result in severe lung damage or death. Progressive CNS depression, respiratory insufficiency, and ventricular fibrillation may also result in death.

Chronic Health Effects Summary This light thermal cracked distillate is a middle distillate similar to those shown to produce skin tumors on laboratory animals following repeated applications. All tumors appeared at the site of application during the latter part of the 2-year lifespan of the animals. Toxic effects are unlikely to occur if good personal hygiene is practiced.

Based upon animal testing, the C8 aromatic hydrocarbon components (xylene isomers) might be assumed to cause embryo and fetal toxicity, spontaneous abortions, and/or decreased fetal and newborn weights if overexposures occur during a woman's early gestation period. And, the C9 aromatic hydrocarbons (cumene, n-propylbenzene, trimethylbenzenes, indene, and ethylmethylbenzenes) are presumed to cause fetal toxicity and/or decreased fetal and newborn weights if overexposure occurs during a woman's early gestation period.

Chronic effects of ingestion and subsequent aspiration into the lungs may cause pneumatocele (lung cavity) formation and chronic lung dysfunction. Chronic occupational xylene exposures have caused auditory nerve degeneration.

Coker Light Gas Oil (CLGO)

Naphthalene is considered to be a toxic substance as defined by both human exposure and laboratory testing results. And, based upon animal testing, it might be considered carcinogenic.

Biphenyl (Diphenyl) may cause liver and/or nerve damage. (See Section 11.)

Conditions Aggravated by Exposure Personnel with pre-existing central nervous system (CNS) disease, neurological conditions, skin disorders, impaired liver or kidney function, or chronic respiratory diseases, and women attempting to conceive should avoid exposure.

Target Organs This substance is toxic to lungs, nervous systems, brain, mucous membranes, skin, eyes, and possibly, the blood, liver, kidneys, and reproductive system.

Carcinogenic Potential This material contains naphthalene and small concentrations 4- to 6-membered condensed-ring (polynuclear) aromatic hydrocarbons (PNA) at concentrations above 0.1%. Naphthalene is considered possibly carcinogenic to humans by IARC. Some PNA compounds has been determined to be carcinogenic by OSHA, IARC, and NTP. (See Section 11.)

OSHA Health Hazard Classification				OSHA Physical Hazard Classification			
Irritant	<input checked="" type="checkbox"/>	Toxic	<input checked="" type="checkbox"/>	Combustible	<input checked="" type="checkbox"/>	Explosive	<input type="checkbox"/>
Sensitizer	<input type="checkbox"/>	Highly Toxic	<input type="checkbox"/>	Flammable	<input type="checkbox"/>	Oxidizer	<input type="checkbox"/>
Corrosive	<input type="checkbox"/>	Carcinogenic	<input checked="" type="checkbox"/>	Compressed Gas	<input type="checkbox"/>	Organic Peroxide	<input type="checkbox"/>
						Pyrophoric	<input type="checkbox"/>
						Water-reactive	<input type="checkbox"/>
						Unstable	<input type="checkbox"/>

SECTION 4: FIRST AID MEASURES

Take proper precautions to ensure your own health and safety before attempting rescue or providing first aid. For more specific information, refer to Exposure Controls and Personal Protection in Section 8 of this MSDS.

- Inhalation** Immediately move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR). If breathing is difficult, 100 percent humidified oxygen should be administered by a qualified individual. Seek medical attention immediately.
- Eye Contact** Check for and remove contact lenses. If irritation or redness develops, flush eyes with cool, clean, low-pressure water for at least 15 minutes. Hold eyelids apart to ensure complete irrigation of the eye and eyelid tissue. Do not use eye ointment. Seek medical attention immediately.
- Skin Contact** Remove contaminated shoes and clothing. Flush affected area with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. Do not use ointments. If skin surface is not damaged, clean affected area thoroughly with mild soap and water. Seek medical attention if tissue appears damaged or if pain or irritation persists.
- Ingestion** Do not induce vomiting or give anything by mouth. If spontaneous vomiting is about to occur, place victim's head below knees. If victim is drowsy or unconscious, place on the left side with head down. Never give anything by mouth to a person who is not fully conscious. Do not leave victim unattended. Seek medical attention immediately.
- Notes to Physician** Inhalation overexposure can produce toxic effects. Monitor for respiratory distress. If cough or difficulty in breathing develops, evaluate for upper respiratory tract inflammation, bronchitis, and pneumonitis. Vigorous anti-inflammatory/steroid treatment may be required at first evidence of upper airway or pulmonary edema. Administer 100 percent humidified supplemental oxygen with assisted ventilation, as required.

If ingested, this material presents a significant aspiration/lipoid or chemical pneumonitis hazard. As a result, induction of emesis is not recommended. Administer an aqueous slurry of activated charcoal followed by a cathartic such as magnesium citrate or sorbitol. Also, treatment may involve careful gastric lavage if performed soon after ingestion or in patients who are comatose or at risk of convulsing. Protect the airway by cuffed endotracheal intubation or by placement of the body in a Trendelenburg and left lateral decubitus position. Obtain chest X-ray and liver function tests. Monitor for cardiac function, respiratory distress and arterial blood gases in severe exposure cases.

Coker Light Gas Oil (CLGO)

SECTION 5: FIRE FIGHTING MEASURES

NFPA Flammability Classification	OSHA/NFPA Class-II or IIIA Combustible Liquid. Highly or moderately combustible!		
Flash Point Method	CLOSED CUP: 52° to 82°C (125° to 180°F) (Pensky-Martens [ASTM D-93]).		
Lower Flammable Limit	AP 0.6%	Upper Flammable Limit	AP 7.5%
Autoignition Temperature	AP 257°C (495°F)		
Hazardous Combustion Products	Burning or excessive heating may produce carbon monoxide, carbon dioxide, and possibly smoke, fumes, unburned hydrocarbons, and oxides of sulfur.		
Special Properties	<p>Combustible Liquid! This material releases vapors at or approaching the flash point temperature. When mixed with air in certain proportions and exposed to an ignition source, its vapor can cause a flash fire. Mists or sprays may be flammable at temperatures below the flash point. Use only with adequate ventilation. Vapors are heavier than air and may travel long distances along the ground to an ignition source and flash back. May create vapor/air explosion hazard in confined spaces such as sewers. If container is not properly cooled, it can rupture in the heat of a fire.</p> <p>A static electrical charge can accumulate as a result of transfer flow or agitation. Discharge (static spark) can ignite vapors, especially in cold, dry weather conditions. Special slow load and monitoring procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when this material is loaded into tanks previously containing gasoline or other low flash point products. To reduce this hazard, receiving containers should always be grounded and the loading nozzle must be kept in contact with the container during the entire filling process. Do not fill any portable container in or on a vehicle without proper bonding.</p>		
Extinguishing Media	<p>SMALL FIRE: Use dry chemicals, carbon dioxide (CO₂), foam, water fog, or inert gas (nitrogen). LARGE FIRE: Use foam, water fog, or waterspray. Water fog and spray are effective in cooling containers and adjacent structures but might cause frothing and/or may not achieve extinguishment. A water jet may be used to cool the vessel's external walls to prevent pressure build-up, autoignition, or explosion. NEVER use a water jet directly on the fire because it may spread the fire to a larger area.</p>		
Protection of Fire Fighters	<p>Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies. Evacuate area and fight the fire from a maximum distance or use unmanned hose holders or monitor nozzles. Cover pooling liquid with foam. Containers can build pressure if exposed to radiant heat; cool adjacent containers with flooding quantities of water until well after the fire is out. Withdraw immediately from the area if there is a rising sound from venting safety devices or discoloration of vessels, tanks, or pipelines. Be aware that burning liquid will float on water. Notify appropriate authorities if liquid(s) enter sewers/waterways.</p>		

SECTION 6: ACCIDENTAL RELEASE MEASURES

Take proper precautions to ensure your own health and safety before attempting spill control or clean-up. For more specific information, refer to the Emergency Overview on Page 1, Exposure Controls and Personal Protection in Section 8 and Disposal Considerations in Section 13 of this MSDS.

Combustible Liquid! Release causes a potential fire or explosion hazard. Evacuate all non-essential personnel from immediate area and establish a "regulated zone" with site control and security. A vapor-suppressing foam may be used to reduce vapors. Eliminate all ignition sources. All equipment used when handling this material must be grounded. Stop the leak if it can be done without risk. Do not touch or walk through spilled material. Remove spillage immediately from hard, smooth walking areas. Prevent its entry into waterways, sewers, basements, or confined areas. Absorb or cover with dry earth, sand, or other non-combustible material and transfer to appropriate waste containers. Use clean, non-sparking tools to collect absorbed material.

For large spills, secure the area and control access. Dike far ahead of a liquid spill to ensure complete collection. Water mist or spray may be used to reduce or disperse vapors; but, it may not prevent ignition in closed spaces. This material will float on water and its run-off may create an explosion or fire hazard. Verify that responders are properly HAZWOPER-trained and wearing appropriate respiratory equipment and fire-resistant protective clothing during cleanup operations. In an urban area, cleanup spill as soon as possible; in natural environments, cleanup on advice from specialists. Pick up free liquid for recycle and/or disposal if it can be accomplished safely with explosion-proof equipment. Collect any excess material with absorbent pads, sand, or other inert non-combustible absorbent materials. Place into appropriate waste containers for later disposal. Comply with all laws and regulations.

Coker Light Gas Oil (CLGO)

SECTION 7: HANDLING AND STORAGE

Handling

A spill or leak can cause a potential fire/explosion hazard. Keep containers closed and do not handle or store near heat, sparks, or any other potential ignition sources. Bond and ground all equipment before transferring this material from one container to another. Do not contact with oxidizable materials. Do not breathe vapor. Use only with adequate ventilation/personal protection. Never siphon by mouth. Avoid contact with eyes, skin, and clothing. Prevent contact with food, chewing, or smoking materials. Do not take internally.

When performing repairs and maintenance on contaminated equipment, keep unnecessary persons away from the area. Eliminate all potential ignition sources. Drain and purge equipment, as necessary, to remove material residues. Use gloves constructed of impervious materials and protective clothing if direct contact is anticipated. Provide ventilation to maintain exposure potential below applicable exposure limits. Promptly remove contaminated clothing. Wash exposed skin thoroughly with soap and water after handling.

Empty containers may contain material residues which can ignite with explosive force. Misuse of empty containers can be dangerous if used to store toxic, flammable, or reactive materials. Cutting or welding of empty containers can cause fire, explosion, or release of toxic fumes from residues. Do not pressurize or expose empty containers to open flame, sparks, or heat. Keep container closed and drum bungs in place. All label warnings and precautions must be observed. Return empty drums to a qualified reconditioner. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling, or disposing of empty containers and/or waste residues of this material.

Storage

Store and transport in accordance with all applicable laws. Keep containers tightly closed and store in a cool, dry, well-ventilated place, plainly labeled, and out of closed vehicles. Keep away from all ignition sources! Ground all equipment containing this material. Containers should be able to withstand pressures expected from warming and cooling in storage. This combustible liquid should be stored in a separate safety cabinet or room. All electrical equipment in areas where this material is stored or handled should be installed in accordance with applicable requirements of the N.F.P.A.'s National Electrical Code (NEC).

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor and/or mists below the pertinent exposure limits (see below). All electrical equipment should comply with the NFPA NEC Standards. Ensure that an emergency eye wash station and safety shower are near the work-station location.

Personal Protective Equipment

Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to OSHA regulations. The following pictograms represent the minimum requirements for personal protective equipment. For certain operations, additional PPE may be required.



Eye Protection

Safety glasses with side shields are recommended as a minimum protection. During transfer operations or when there is a likelihood of misting, splashing, or spraying, chemical goggles and face shield should be worn. Suitable eye wash water should be readily available.

Hand Protection

Avoid skin contact and use gloves (disposable PVC, neoprene, nitrile, vinyl, or PVC/NBR). Before eating, drinking, smoking, use of toilet facilities, or leaving work, wash hands with plenty of mild soap and water. DO NOT use gasoline, kerosene, other solvents, or harsh abrasive skin cleaners.

Body Protection

Avoid skin contact. It is recommended that fire-retardant garments (e.g. Nomex™) be worn while working with flammable and combustible liquids. If splashing or spraying is expected, chemical-resistant protective clothing (Tyvek®, nitrile, or neoprene) should be worn. This might include long-sleeves, apron, slicker suit, boots, and additional facial protection. If general contact occurs, IMMEDIATELY remove soaked clothing and take a shower. Contaminated leather goods should be removed promptly and discarded.

Coker Light Gas Oil (CLGO)

Respiratory Protection For unknown vapor concentrations use a positive-pressure, pressure-demand, self-contained breathing apparatus (SCBA). For known vapor concentrations above the occupational exposure guidelines (see below), use a NIOSH-approved organic vapor respirator if adequate protection is provided. Protection factors vary depending upon the type of respirator used. Respirator use should follow OSHA requirements (29 CFR 1910.134) or equivalent standard (e.g. ANSI Z88.2).

General Comments Warning! Use of this hydrocarbon fuel in spaces without adequate ventilation may result in generation of hazardous levels of combustion products and inadequate oxygen levels for breathing. Odor is an inadequate warning for hazardous conditions.

Occupational Exposure Guidelines**Substance****Applicable Workplace Exposure Levels**

1) Diesel fuel/Kerosene ("A3" Animal Carcinogen)	TWA: 100 (mg/m ³) from ACGIH (TLV) [Proposed] - SKIN
2) Xylenes (mixed isomers)	TWA: 100 STEL: 150 (ppm) from ACGIH (TLV) TWA: 100 STEL: 150 (ppm) from OSHA (PEL) [Proposed]
3) Trimethylbenzene (mixed isomers)	TWA: 100 (ppm) from OSHA (PEL) TWA: 25 (ppm) from ACGIH (TLV)
4) Naphthalene	TWA: 25 (ppm) from OSHA (PEL) [Proposed] TWA: 10 STEL: 15 (ppm) from ACGIH (TLV) - SKIN TWA: 10 STEL: 15 (ppm) from OSHA (PEL) [Proposed]
5) Biphenyl (Diphenyl)	TWA: 10 (ppm) from OSHA (PEL) TWA: 0.2 (ppm) from ACGIH (TLV) TWA: 0.2 (ppm) from OSHA (PEL) [Proposed]
6) Coal tar pitch volatiles, as benzene solubles	TWA: 0.2 (mg/m ³) from ACGIH (TLV) TWA: 0.2 (mg/m ³) from OSHA (PEL) [Proposed]

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid.	Color	Transparent to slightly opaque, slightly yellow to slightly amber.	Odor	Characteristic, kerosene-like.
Specific Gravity	0.84 to 0.88 at 60°F (Water = 1)	pH	Not applicable.	Vapor Density	5.0 to 5.2 (Air = 1 at 70°F)
Boiling Point/Range	140° to 370°C (285° to 700°F) [ASTM D-2887]			Melting/Freezing Point	< -15°C (< 5°F) [ASTM D-97]
Vapor Pressure	< 0.1 psia at 38°C (100°F).			Viscosity (cSt @ 40°C)	3.65 to 7.35 [ASTM D-445]
Solubility in Water	Negligible to slightly soluble in cold water (0.005% to 0.04%).			Volatile Characteristics	Slight; some Volatile Organic Compounds (VOCs) present at 302°F (150°C).
Additional Properties	Alkane, isoparaffin, and Cycloalkane Hydrocarbons Content = 70 to 85 Wt.% [ASTM D-1319]; C8-C22 Aromatic Hydrocarbon Content = 15 to 30 Wt.% [ASTM D-1319]; Average Density at 60°F = 7.163 lbs./gal. [ASTM D-2161]; Cetane Number = 40 to 45 [ASTM D-613 or D-976]; Saybolt Viscosity = 38 to 50 SUS at 100°F [ASTM D-2161]; Sulfur Content = 1.3 to 1.9 Wt.% [ASTM D-2622]; Ash Content = < 0.05 Wt.% [ASTM D-482]; 90% Boiling Point Temperature = 600° to 625°F (315° to 330°C) [ASTM D-86]; Evaporation Rate = < 0.1 when n-Butyl acetate = 1.0.				

SECTION 10: STABILITY AND REACTIVITY

Chemical Stability	Stable.	Hazardous Polymerization	Not expected to occur.
Conditions to Avoid	Keep away from extreme heat, strong acids, and strong oxidizing conditions.		
Materials Incompatibility	Strong acids, alkalis, and oxidizers such as liquid chlorine, other halogens, hydrogen peroxide, and oxygen.		
Hazardous Decomposition Products	No substances are readily identified from composition; and, no degradation data is available.		

Coker Light Gas Oil (CLGO)

SECTION 11: TOXICOLOGICAL INFORMATION

For other health-related information, refer to the Emergency Overview on Page 1 and the Hazards Identification in Section 3 of this MSDS.

Toxicity Data

Straight-run Middle Distillate (Petroleum) [a similar material]:

GAS (LC₅₀): Acute: 1.72 mg/L for 4 hours [Male Rat] - Pulmonary edema.
 GAS (LC₅₀): Acute: 1.82 mg/L for 4 hours [Female Rat] - Pulmonary edema..
 ORAL (LD₅₀): Acute: > 5,000 mg/kg [Rat screen] - Diarrhea, hypoactivity, and somnolence.
 DERMAL (LD₅₀): Acute: > 2,000 mg/kg [Rabbit screen].
 BUEHLER DERMAL: Acute. Non-sensitizing [Guinea Pig].
 INTRAVENOUS (LD₅₀): Acute: 180 mg/kg [Rabbit] - Respiratory stimulation, tremors, and coma.
 28-Day DERMAL: Subchronic: Moderate to severe irritation at 200 to 2,000 mg/kg with no other treatment-related clinical effects observed.

Xylenes:

ORAL (LD₅₀): Acute: 4,300 mg/kg [Rat].
 GAS (LC₅₀): Acute: 4,550 ppm for 4 hours [Rat].
 DERMAL (LD₅₀): Acute: 14,100 uL/kg [Rabbit].
 SUBCUTANEOUS (LD₅₀): Acute: 1,700 mg/kg [Rat].
 INTRAPERITONEAL (LD₅₀): Acute: 2,459 mg/kg [Rat].
 INTRAPERITONEAL (LD₅₀): Acute: 1,548 mg/kg [Mouse].

Trimethylbenzenes:

ORAL (LD₅₀): Acute: 8,970 mg/kg [Rat].

1,2,4-Trimethylbenzene:

ORAL (LD₅₀): Acute: 5,000 mg/kg [Rat].
 GAS (LC₅₀): Acute: 18,000 mg/m³ for 4 hours [Rat].

Ethylmethylbenzenes (Ethyltoluenes):

GAS (LC₅₀): Acute: 50,000 mg/m³ for 2 hours [Cat].
 GAS (LC₅₀): Acute: 54,000 mg/m³ for 4 hours [Mouse].

Naphthalene:

ORAL (LD₅₀): Acute: 490 mg/kg [Rat].
 ORAL (LD₅₀): Acute: 533 mg/kg [Mouse].
 ORAL (LD₅₀): Acute: 1,200 mg/kg [Guinea Pig].
 SUBCUTANEOUS (LD₅₀): Acute: 969 mg/kg [Mouse].
 INTRAVENOUS (LD₅₀): Acute: 100 mg/kg [Mouse].
 INTRAPERITONEAL (LD₅₀): Acute: 150 mg/kg [Mouse].

Biphenyl (Diphenyl or 1,1'-Biphenyl):

GAS (TC₁₀): Acute: 4,400 ug/m³ for 4 hours [Human] - Flaccid paralysis of peripheral nerves without anesthesia and nausea or vomiting.
 ORAL (LD₅₀): Acute: > 2,600 mg/kg [Cat screen].
 ORAL (LD₅₀): Acute: 2,400 mg/kg [Rat and Rabbit].
 ORAL (LD₅₀): Acute: 1,900 mg/kg [Mouse] - Somnolence, hypermotility, and diarrhea.
 DERMAL (LD₅₀): Acute: > 5,010 mg/kg [Rabbit screen].
 INTRAVENOUS (LD₅₀): Acute: 56 mg/kg [Mouse].

Laboratory data associated some mixtures of petroleum hydrocarbons with boiling ranges between 300° and 700°F., commonly referred to as "middle distillates, including straight-run middle distillate" have caused increased incidence of skin tumors at the site of contact when applied repeatedly (twice per week) over the lifetime of the test animals (12 to 24 months). A few studies have shown that washing the animal's skin with soap and water between applications greatly reduces the carcinogenic effect of these middle distillates. Untreated, cracked, and vacuum distillates including straight-run middle distillate have been identified as skin carcinogens by IARC. These similar materials have also been associated with liver and kidney damage in subchronic (90-day) inhalation studies with male rats.

Untreated (straight-run, cracked, and vacuum) middle distillates produced negative mutagenic responses in the Salmonella/microsome (Ames) assay, the in-vitro Chinese hamster ovary (CHO) sister chromatid exchange (SCE) assay, the in-vivo mouse SCE assay, and the in-vivo rat bone marrow cell chromosome aberrations assay; however, the in-vitro mouse lymphoma assay with and without S9 activation produced both mixed positive and negative responses. The significance of these study results to human health is unclear.

Studies with mice and rats have shown that some petroleum middle distillate fuels similar to this material have caused liver tumors and kidney damage and/or tumors. However, the kidney effects were sex hormone dependent and not seen in similar studies involving Guinea pigs, dogs, or monkeys. Also, the significance of the liver tumors in rodents is highly speculative relative to humans.

Coker Light Gas Oil (CLGO)

Studies with mice and rats have also shown that chronic exposures (8 hours/day, 7 days/week, for 24 months) to **unfiltered diesel fuel exhaust** produced lung tumors and lymphomas. On the basis of these studies, NIOSH recommended that **complete diesel exhaust** be regarded as a "potential carcinogen"

Numerous epidemiology studies have been carried out to test the hypothesis that lung and/or bladder cancers are associated with chronic exposure to **diesel engine exhaust**. The most comprehensive case-control and retrospective cohort studies on U.S. railroad workers showed an increased risk for lung cancer and this risk significantly increased with extended duration exposures. There are some indications that an elevated frequency of bladder cancer amongst bus and truck drivers may be due to diesel engine exhaust exposure

Overexposure to **xylene isomers** may cause upper respiratory tract irritation, headache, cyanosis, blood serum changes, CNS damage, and narcosis. Effects may be increased by the consumption of ethanol (alcoholic beverages) which impairs clearance from adipose (fat) tissues. Also, ototoxicity has been associated with chronic overexposure to xylene. An inhalation study with laboratory rats also indicated an association between elevated mixed xylene exposures and hearing loss. Lung inflammation and liver damage were identified as health effects in chronic studies using guinea pigs

Several animal studies using pregnant rodents have shown that **mixed xylene isomers and ethylbenzene (dimethylbenzenes)** may all cause embryo and/or fetotoxicity. Inhalation and feeding studies involving pregnant laboratory animals have produced limited evidence of fetal toxicity including increased incidence of spontaneous abortions, decreased fetal weight, delayed bone development, non-lethal abnormalities such as musculoskeletal and craniofacial variations, and reduced litter sizes

Two-year rat and mouse gavage studies by the National Toxicology Program (NTP) on **mixed xylene isomers including 17% ethylbenzene (dimethylbenzenes)** showed "no evidence of carcinogenicity". Also, a two-year mixed xylenes skin-painting study on shaved rats and mice showed no incidence of non-neoplastic or neoplastic lesions. And, none of the components were mutagenic when tested in either the modified Ames, Chinese hamster ovary cell with and without metabolic activation, or sister-chromatid mutagenicity assays. Animal inhalation and feeding studies have also associated embryo and fetotoxicity with maternally toxic dose exposures of mixed xylene isomers and ethylbenzene. Fetal toxicity included increased incidence of spontaneous abortions, decreased fetal weight, delayed bone development, non-lethal abnormalities such as musculoskeletal and craniofacial variations, and reduced litter sizes. The significance of these animal study results to humans is not known.

Trimethylbenzenes are primary skin irritants and may cause asthmatic bronchitis and/or anemia. Levels of total hydrocarbon vapors present in the breathing atmosphere of these workers ranged from 10 to 60 ppm. Its TC_{10} for humans 10 ppm, with somnolence and respiratory tract irritation noted. In inhalation studies with rats, four of ten animals died after exposures of 2,400 ppm for 24 hours. An oral dose of 5 mL/kg resulted in death in one of ten rats. Minimum lethal intraperitoneal doses were 1.5 to 2.0 mL/kg in rats and 1.13 to 12 mL/kg in guinea pigs. **Mesitylene (1,3,5-Trimethylbenzene)** inhalation at concentrations of 1.5, 3.0, and 6.0 mg/L for six hours was associated with dose-related changes in white blood cell counts in rats. No significant effects on the complete blood count were noted with six hours per day exposure for five weeks, but elevations of alkaline phosphatase and SGOT were observed. Central nervous system depression and ataxia were noted in rats exposed to 5,100 to 9,180 ppm for two hours. Based upon animal reproductive/developmental studies, trimethylbenzenes may also cause fetal toxicity

Ethylmethylbenzenes are primary skin irritants. Overexposure has been associated with kidney damage and increased blood cholinesterase levels. In inhalation developmental studies, indene and other **C9 aromatic hydrocarbons** have been associated with decreased fetal and newborn pup weights

Naphthalene is a potential irritant to eyes, skin, and lungs. Following prolonged and/or repeated exposures, naphthalene has been shown to cause eye damage (cataracts and/or optical neuritis), premature destruction of red blood cells (hemolytic and aplastic anemia), and kidney damage (jaundice), and possibly neurotoxicity. Naphthalene-induced blood disorders in humans are characterized by variability in size, shape, and number of red blood cells, anemia, and decreased hemoglobin. Also, there have been reported anemia deaths amongst children exposed to moth ball (naphthalene) saturated blankets. Peripheral lens opacities occurred in eight of 21 workers exposed to elevated levels of naphthalene vapors for five years. Repeated ingestion of a naphthalene-isopropanol mixture caused tremors, restlessness, hallucinations, and extreme apprehension. Based upon animal studies, naphthalene may cause fetal toxicity or damage and decreased spleen weights in pregnant female mice

The National Toxicology Program (NTP) recently completed a 2-year inhalation bioassay of **naphthalene**. The study was conducted in male and female F344/N rats at exposure concentrations of 0, 10, 30, and 60 ppm. No significant effects were observed at the 10 ppm levels. However, compared to chamber controls, there was a dose-related increase in tumors generated at the 30 and 60 ppm levels in both males and females. Higher incidences of respiratory epithelial adenomas, olfactory epithelial neuroblastomas, and non-neoplastic lesions of the nose were observed when compared to chamber controls. Additionally, in

Coker Light Gas Oil (CLGO)

cytogenic tests with Chinese hamster ovary cells, naphthalene induced significant increases in sister chromatid exchanges with and without metabolic activation (S9) and chromosomal aberrations with S9. The relevance of these findings to human health is unclear; however, based upon this data, IARC has determined naphthalene to be possibly carcinogen to humans (Class 2B).

Biphenyl (Diphenyl) inhalation overexposures have caused poisoning characterized by liver atrophy and central and/or peripheral nerve damage. Biphenyl vapors have also caused transient nausea, vomiting, flaccid paralysis, and/or bronchitis.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Ecological effects testing has not been conducted on this material. If spilled, this kerosene, its storage tank water bottoms and sludge, and any contaminated soil or water may be hazardous to human, animal, and aquatic life. Volatile aromatic hydrocarbon components (trimethylbenzenes, ethylmethylbenzenes, naphthalene, and biphenyl) may be released and possibly contribute to the creation of atmospheric smog.

Using Rainbow Trout (*Oncorhynchus mykiss*), Dungeness Crab (*Cancer magister*), and juvenile American Shad (*Squalius cephalus*), similar middle distillates and some of this material's components showed a 96-hour TL_{Ms} (Median Toxic Limit) of from 10 ppm to 20 ppm in ambient saltwater. Also, 96-hour LC₅₀ testing produced results from 20 ppm to 320 ppm when using Bluegill Sunfish (*Lepomis macrochirus*), Banded Killifish (*Fundulus diaphanus*), American Eel (*Anguilla rostrata*), White Perch (*Perca fluviatilis*), and Striped Mullet (*Mugil cephalus*). Based upon actual spill incident investigations, similar middle distillates have been shown to bioaccumulate in tissues of various fish from less than 1 to 10 ppm levels.

Environmental Fate

This middle distillate is potentially toxic to freshwater and saltwater ecosystems. It will normally float on water with its lighter components evaporating rapidly. In stagnant or slow-flowing waterways, this hydrocarbon oil layer can cover a large surface area. As a result, this covering layer might limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway might be enough to cause a fish kill or create an anaerobic environment. This coating action can also be harmful or fatal to plankton, algae, aquatic life, and water birds. Additionally, potable water and boiler feed water systems should NEVER be allowed more than 5 ppm contamination from this material.

For additional ecological information concerning components of this product, users should refer to the Hazardous Substances Data Bank® and the Oil and Hazardous Materials/Technical Assistance Data System (OHM/TADS) maintained by the U.S. National Library of Medicine. (See Section 2 for components.)

SECTION 13: DISPOSAL CONSIDERATIONS



Hazard characteristic and regulatory waste stream classification can change with product use. Accordingly, it is the responsibility of the user to determine the proper storage, transportation, treatment and/or disposal methodologies for spent materials and residues at the time of disposition.

Maximize material recovery for reuse or recycling. If spilled material is introduced into a wastewater treatment system, chemical and biological oxygen demand (COD and BOD) will likely increase. This material is biodegradable if gradually exposed to microorganisms, preferably in an aerobic environment. In sewage-seeded wastewater, at or below concentrations of 0.2 vol.% of this material, there is little or no effect on bio-oxidation and/or digestion. However, at 1 vol.%, it doubles the required digestion period. Higher concentrations interfere with floc formation and sludge settling and also plug filters or exchange beds. Vapor emissions from a bio-oxidation process contaminated by this material might prove to be a health hazard.

Conditions of use may cause this material to become a hazardous waste, as defined by Federal or State regulations. It is the responsibility of the user to determine if the material is a RCRA "hazardous waste" at the time of disposal. Transportation, treatment, storage, and disposal of waste material must be conducted in accordance with RCRA regulations (see 40 CFR Parts 260 through 271). State and/or local regulations might be even more restrictive. Contact the RCRA/Superfund Hotline at (800) 424-9346 or your regional US EPA office for guidance concerning case specific disposal issues.

Coker Light Gas Oil (CLGO)

SECTION 14: TRANSPORT INFORMATION

DOT Status	This material is regulated by the U.S. Department of Transportation (DOT) only when transported in bulk containers, via vessel, or via aircraft.		
Proper Shipping Name	Gas Oil or Petroleum distillates, n.o.s. (Naphthalene, Biphenyl) or Combustible liquid, n.o.s. (Naphthalene, Biphenyl) for bulk containers; it may or may not be regulated in non-bulk container shipments. If this product has a flash point temperature between 100° and 140°F (37.8° to 60.5°C), it is classified as a "Flammable liquid". And, if its flash point temperature is between 141° and 200°F (60.5° to 93°C), it is classified as a DOT "Combustible liquid" for bulk shipments. However, according to 49 CFR 173.150(f)(2), certain transportation-related requirements, such as labeling, may not apply to this product when shipped in non-bulk packaging of less than 119 gallons capacity. Also, pursuant to 49 CFR 173.150(b) and 173.150(f)(2) and (3), "limited-quantities" offered for or transported via aircraft may be subject to DOT regulation.		
Hazard Class	DOT Class: "3" (Flammable liquid) or "COMBUSTIBLE LIQUID" [with a flash point greater than 60.5° C (>141° F)] for bulk containers.	Packing Group(s) UN/NA ID	PG III or Not applicable. UN1202 or UN1268 or NA1993 or Not applicable.
Reportable Quantity	The Reportable Quantity (RQ) substance component in this material which might require DOT HAZMAT bill-of-lading display is Naphthalene and Xylenes .		
Placards			Emergency Response Guide No. 128 or Not applicable HAZMAT STCC No. 4912218 or 4910256 or 4914112 MARPOL III Status All impacted components were delisted as DOT "Marine Pollutants" per 66 FR 120 (page 33413) dated 6/21/2001.

SECTION 15: REGULATORY INFORMATION

TSCA Inventory	This material and/or its components are listed on the Toxic Substance Control Act (TSCA) inventory.
SARA 302/304	The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to Subparts 302 and 304 to submit emergency planning and notification information based on Threshold Planning Quantities (TPQs) and Reportable Quantities (RQs) for "Extremely Hazardous Substances" listed in 40 CFR 302.4 and 40 CFR 355. No components were identified.
SARA 311/312	The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to this subpart to submit aggregate information on chemicals by "Hazard Category" as defined in 40 CFR 370.2. This material would be classified under the following hazard categories: Fire Hazard, Acute (Immediate) Health Hazard, and Chronic (Delayed) Health Hazard.
SARA 313	This material contains the following components in concentrations which might be at or above de minimis levels and are listed as "toxic chemicals" in 40 CFR Part 372 pursuant to the requirements of Section 313: 1,2,4-Trimethylbenzene (Pseudocumene) [CAS No. 95-63-6] concentration: 0.25 to 1.0% Naphthalene [CAS No. 91-20-3] concentration: 1 to 3% Biphenyl (Diphenyl) [CAS No. 92-52-4] concentration: 1 to 5%.
CERCLA	The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center concerning release of quantities of "hazardous substances" equal to or greater than the reportable quantities (RQ's) listed in 40 CFR 302.4. As defined by CERCLA, the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically designated in 40 CFR 302.4. Chemical substances present in this material subject to this statute are: Xylenes [CAS No. 1330-20-7] (RQ = 100 lbs. [45.36 kg]) concentration: 0 to 1.5% Ethylbenzene [CAS No. 100-41-4] (RQ = 1000 lbs. [453.6 kg]) concentration: 0 to 0.1% Cumene [CAS No. 98-82-8] (RQ = 5000 lbs. [2268 kg]) concentration: 0.1 to 0.5% Naphthalene [CAS No. 91-20-3] (RQ = 100 lbs. [45.36 kg]) concentration: 1 to 3% Benzo[a]phenanthrene (Chrysene) [CAS No. 218-01-9] concentration: 0.0005 to 0.002%.

Coker Light Gas Oil (CLGO)

CWA	This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.
California Proposition 65	This material, especially if used as a fuel, might be considered to contain the following chemical substances which are known to the State of California to cause cancer, birth defects, or other reproductive harm; and therefore, it might be subject to requirements of California Health & Safety Code Section 25249.5: Naphthalene [CAS No. 91-20-3] concentration: 1 to 3% Benzo[a]phenanthrene (Chrysene) [CAS No. 218-01-9] concentration: 0.0005 to 0.002% Diesel Engine Exhaust (following combustion).
New Jersey Right-to-Know Label	For New Jersey labeling, refer to the components listed in Section 2.
Additional Regulatory Remarks	Under the Federal Hazardous Substances Act, related statutes, and Consumer Product Safety Commission regulations, as defined by 16 CFR 1500.14(b)(3) and 1500.83(a)(13): This product contains "Petroleum Distillates" which may require special labeling if distributed in a manner intended or packaged in a form suitable for use in the household or by children. Precautionary label dialogue should display the following: Contains Petroleum Distillates! May be harmful or fatal if swallowed! Keep Out of Reach of Children! In regulations promulgated pursuant to the Clean Air Act - Section 111 "Standards of Performance for New Stationary Sources" (40 CFR 60.489), the EPA classifies the following component of this material as a "Volatile Organic Compound (VOC)" which contributes significantly to air pollution which endangers public health and welfare": Xylenes (mixed) [CAS No. 1330-20-7], Ethylbenzene [100-41-4], Cumene [98-82-8], and Biphenyl (Diphenyl) [CAS No. 92-52-4].

SECTION 16: OTHER INFORMATION

Refer to the top of Page 1 for the HMIS and NFPA Hazard Ratings for this product.

REVISION INFORMATION

Version Number 2.1
Revision Date 11/01/06

ABBREVIATIONS

AP: Approximately	EQ: Equal	>: Greater Than	<: Less Than	NA: Not Applicable	ND: No Data	NE: Not Established
ACGIH: American Conference of Governmental Industrial Hygienists				AIHA: American Industrial Hygiene Association		
IARC: International Agency for Research on Cancer				NTP: National Toxicology Program		
NIOSH: National Institute of Occupational Safety and Health				OSHA: Occupational Safety and Health Administration		
NPCA: National Paint and Coating Manufacturers Association				HMIS: Hazardous Materials Information System		
NFPA: National Fire Protection Association				EPA: US Environmental Protection Agency		

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