Marine Diesel Oil
Safety Data Sheet

Axeon Specialty Products
400 Grove Road
West Deptford, NJ 08066

MSDS No. 13084
Revision Date 3/24/2014

IMPORTANT: Read this MSDS before handing or disposing of this product and pass this information onto employees, customers and users of this product.

EMERGENCY OVERVIEW

Physical State: Liquid. Color: Dark amber to black
Odor: Sour hydrocarbon odor.

WARNING!
CONTAINS MATERIAL WHICH CAN CAUSE CANCER
Combustible liquid; vapor may cause flash fire.
Hydrogen sulfide can evolve from this product particularly at elevated temperatures or long term storage.
Harmful or fatal if swallowed - can enter lungs and cause damage.
Can cause eye, skin or respiratory tract irritation.
May be harmful if inhaled or absorbed through the skin.
Overexposure can cause central nervous system (CNS) depression and/or other target organ effects.
Harmful to aquatic organisms.

SECTION 1. IDENTIFICATION

Trade Name: Marine Diesel Oil
Product Number: 13084
CAS Number: Mixture
Product Family: Motor fuels.
Synonyms: Gas Oil; CITGO® Material Code No.: 13084, 13086

SECTION 2. COMPOSITION

This product may be composed, in whole or in part, of any of the following refinery streams:

Kerosene [CAS No.: 8008-20-6]
Straight-run middle distillate (petroleum) [CAS No.: 64741-44-2]
Distillates, petroleum, hydrotreated middle [CAS No.: 64742-46-7]
Distillates, petroleum, full-range straight-run middle [CAS No.: 68814-87-9]
Light vacuum gas oil (petroleum) [CAS No.: 64741-58-8]
Diesel Fuel No. 2 [CAS No.: 68476-34-6]
Distillates, petroleum, light catalytic cracked [CAS No.: 64741-59-9]

HAZARD RANKINGS

<table>
<thead>
<tr>
<th>HMIS NFPA</th>
<th>Health Hazard</th>
<th>Fire Hazard</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2*</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

* = Chronic Health Hazard

Protective Equipment

Minimum Recommended
See Section 8 for Details

CHEMTREC EMERGENCY
U.S. and Canada only (800) 424-9300
Outside U.S and Canada (703) 527-3887

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This product contains the following chemicals as components of the refinery streams listed above:

<table>
<thead>
<tr>
<th>Component Name(s)</th>
<th>CAS Registry No.</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonane, all isomers</td>
<td>Mixture</td>
<td>1-10</td>
</tr>
<tr>
<td>Trimethylbenzenes, all isomers</td>
<td>25551-13-7</td>
<td>&lt; 3</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>91-20-3</td>
<td>&lt; 3</td>
</tr>
<tr>
<td>Biphenyl (Diphenyl)</td>
<td>92-52-4</td>
<td>&lt; 2</td>
</tr>
<tr>
<td>1, 2, 4 Trimethylbenzene</td>
<td>95-63-6</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>100-41-4</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Cumene</td>
<td>98-82-8</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>&lt; 0.5</td>
</tr>
<tr>
<td>Benzene</td>
<td>71-43-2</td>
<td>&lt; 0.5</td>
</tr>
<tr>
<td>Hydrogen Sulfide</td>
<td>7783-06-4</td>
<td>&lt; 0.1</td>
</tr>
</tbody>
</table>

SECTION 3. HAZARD 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, Inhalation.

Signs and Symptoms of Acute Exposure

**Inhalation**

Breathing high concentrations may be harmful. Mist or vapor can irritate the throat and lungs. Breathing this material may cause central nervous system depression with symptoms including nausea, headache, dizziness, fatigue, drowsiness, or unconsciousness. Breathing heated vapor or product mists can irritate the mucous membranes of the nose, throat, upper respiratory tract and lungs. Inhalation can result in central nervous system depression. Depending upon the concentration and duration of exposure, signs and symptoms can include headache, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory distress and death.

This material can release hydrogen sulfide (H₂S) gas during storage, agitation, or handling particularly at elevated temperatures. Inhalation of H₂S can be harmful or fatal. DO NOT rely on the ability to smell H₂S. Concentrations of H₂S at or below 250 ppm may cause respiratory tract irritation and pulmonary edema. H₂S concentrations between 250 ppm and 500 ppm may result in headache, nausea, disorientation, irregular heartbeat, low blood pressure, and/or coma. Greater than 500 ppm H₂S may cause sudden collapse, respiratory paralysis, convulsions, and death. NIOSH has determined that H₂S concentrations above 100 ppm are immediately dangerous to life and health.

**Eye Contact**

This material can cause eye irritation with tearing, redness, or a stinging or burning feeling. Further, it can cause swelling of the eyes with blurred vision. Effects may become more serious with repeated or prolonged contact.

**Skin Contact**

May cause mild skin irritation with redness and/or an itching or burning feeling. Effects may become more serious with repeated or prolonged contact. It is likely that some components of this material are able to pass into the body through the skin and may cause similar effects as from breathing or swallowing it.

**Ingestion**

If swallowed, this material may irritate the mouth, throat, and esophagus. It can be absorbed into the blood stream through the stomach and intestinal tract. Symptoms may include a burning sensation of the mouth and esophagus, nausea and vomiting. In addition, it can cause central nervous system effects characterized by dizziness, staggering, drowsiness, delirium and/or loss of consciousness.

Because of the low viscosity, this material can enter the lungs directly by aspiration during swallowing or subsequent vomiting. Aspiration of a small amount of liquid can cause severe lung damage and/or death.
Chronic Health Effects Summary

Secondary effects of ingestion and subsequent aspiration into the lungs may cause pneumatocele (lung cavity) formation and chronic lung dysfunction.

This product contains petroleum middle distillates similar to those shown to produce skin tumors on laboratory rodents following repeated application. All tumors appeared during the latter portion of the typical 2-year lifespan of the animals. Certain studies have shown that washing the exposed skin of the test animal with soap and water between treatments greatly reduces the potential tumorigenic effects. These data suggest that good personal hygiene is effective in reducing the risk of this potential adverse health effect.

This material and/or its components have been associated with developmental toxicity, reproductive toxicity, genotoxicity, immunotoxicity, and/or carcinogenicity. Refer to Section 11 of this MSDS for additional health-related information.

Conditions Aggravated by Exposure
Disorders of the following organs or organ systems that may be aggravated by significant exposure to this material or its components include: Skin, Respiratory System, Liver, Kidneys, Central Nervous System (CNS)

Target Organs
May cause damage to the following organs: kidneys, liver, upper respiratory tract, skin, eyes, central nervous system (CNS)

Carcinogenic Potential
This material is classified as carcinogenic by OSHA, NTP, or IARC. See Section 11 of this MSDS for additional information concerning the carcinogenic potential of this product. This material may contain benzene at concentrations above 0.1%. Benzene is considered to be a known human carcinogen by OSHA, IARC and NTP. This material may contain ethylbenzene and naphthalene at concentrations above 0.1%. IARC has identified ethylbenzene and naphthalene as possibly carcinogenic to humans (Group 2B) based on laboratory animal studies. The NTP has determined that naphthalene is reasonably anticipated to be a human carcinogen based on sufficient evidence from studies in experimental animals. NTP has determined that exposure to diesel exhaust particulates, a complex mixture of combustion products of diesel fuel, is reasonably anticipated to be a human carcinogen.

OSHA Hazard Classification is indicated by an "X" in the box adjacent to the hazard title. If no "X" is present, the product does not exhibit the hazard as defined in the OSHA Hazard Communication Standard (29 CFR 1910.1200).

<table>
<thead>
<tr>
<th>OSHA Health Hazard Classification</th>
<th>OSHA Physical Hazard Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irritant X</td>
<td>Combustible X</td>
</tr>
<tr>
<td>Toxic</td>
<td>Explosive</td>
</tr>
<tr>
<td>Corrosive</td>
<td>Pyrophoric</td>
</tr>
<tr>
<td>Sensitizer</td>
<td>Flammable</td>
</tr>
<tr>
<td>Highly Toxic</td>
<td>Oxidizer</td>
</tr>
<tr>
<td>Carcinogenic X</td>
<td>Organic Peroxide</td>
</tr>
<tr>
<td>Compressed Gas</td>
<td>Water-reactive</td>
</tr>
<tr>
<td>Unstable</td>
<td></td>
</tr>
</tbody>
</table>

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
Move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If breathing is difficult, 100 percent humidified oxygen should be administered by a qualified individual. Seek medical attention immediately. Keep the affected individual warm and at rest.

Eye Contact
Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water for at least 15 minutes while occasionally lifting and lowering eyelids. Do not use eye ointment unless directed to by a physician. Seek medical attention if excessive tearing, irritation, or pain persists.
**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. 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:** 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. Administer supplemental oxygen with assisted ventilation, as required.

**INGESTION:** If ingested, this material presents a significant aspiration and chemical pneumonitis hazard. Induction of emesis is not recommended. Consider activated charcoal and/or gastric lavage. If patient is obtunded, protect the airway by cuffed endotracheal intubation or by placement of the body in a Trendelenburg and left lateral decubitus position.

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**SECTION 5. FIRE FIGHTING MEASURES**

**NFPA Flammability Classification**
NFPA Class-III combustible liquid.

**Flash Point**
Closed cup: >60°C (>140°F). (Estimated)

**Lower Flammable Limit**
AP 0.6 %

**Upper Flammable Limit**
AP 7.5 %

**Auto-ignition Temperature**
Not available.

**Hazardous Combustion Products**
Carbon dioxide, carbon monoxide, smoke, fumes, unburned hydrocarbons and oxides of sulfur and nitrogen.

**Special Properties**
Combustible Liquid! This material releases vapors when heated above ambient temperatures. Vapors can cause a flash fire. Vapors can travel to a source of ignition and flashback. A vapor and air mixture can create an explosion hazard in confined spaces such as sewers. Use only with adequate ventilation. If container is not properly cooled, it can rupture in the heat of a fire.

**Extinguisher Media**
SMALL FIRE: Use dry chemicals, carbon dioxide, foam, or inert gas (nitrogen). Carbon dioxide and inert gas can displace oxygen. Use caution when applying carbon dioxide or inert gas in confined spaces.

LARGE FIRE: Use foam, water fog, or water spray. Water fog and spray are effective in cooling containers and adjacent structures. However, water can cause frothing and/or may not extinguish the fire. Water can be used to cool the external walls of vessels to prevent excessive pressure, autoignition or explosion. DO NOT use a solid stream of water directly on the fire as the water may spread the fire to a larger area.

**Protection of Fire Fighters**
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 a venting safety device or discoloration of vessels, tanks, or pipelines. Be aware that burning liquid will float on water. Notify appropriate authorities of potential fire and explosion hazard if liquid enter sewers or waterways.
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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 can result in a fire hazard. Evacuate all non-essential personnel from release area. Establish a regulated zone with site control and security. Eliminate all ignition sources. Stop the leak if it can be done without risk. A vapor-suppressing foam may be used to reduce vapors. Properly bond or ground all equipment used when handling this material. Avoid skin contact. Do not walk through spilled material. Verify that responders are properly trained and wearing appropriate personnel protective equipment. Dike far ahead of a liquid spills. Do not allow released material to enter waterways, sewers, basements, or confined areas. This material will float on water. Absorb or cover with dry earth, sand or other non-combustible material. Use clean, non-sparking tools to collect absorbed material. Place spent sorbent materials, free liquids and other clean-up debris into proper waste containers for appropriate disposal. Certain releases must be reported to the National Response Center (800/424-8802) and state or regulatory authorities. Comply with all laws and regulations.

SECTION 7. HANDLING AND STORAGE

Handling

Combustible Liquid!
A static electrical charge can accumulate when this material is flowing through pipes, nozzles or filters and when it is agitated. A static spark discharge can ignite accumulated vapors particularly during dry weather conditions. Always bond receiving containers to the fill pipe before and during loading. Always keep nozzle in contact with the container throughout the loading process. Do not fill any portable container in or on a vehicle. Special precautions, such as reduced loading rates and increased monitoring, must be observed during "switch loading" operations (i.e., loading this material in tanks or shipping compartments that previously containing gasoline or similar low flash point products).

Fire hazard increases as product temperature approaches its flash point. Keep container closed and drum bungs in place. Remove spillage immediately from walking areas. Do not handle or store near heat, sparks or other potential ignition sources. Do not handle or store with oxidizing agents. Avoid breathing mist or vapor. Never siphon by mouth. Do not taste or swallow. Avoid contact with eyes, skin and clothing. Use gloves constructed of impervious materials and protective clothing if direct contact is anticipated. Provide ventilation to maintain exposure potential below applicable exposure levels. Avoid water contamination. Wash thoroughly after handling. Prevent contact with food or tobacco products.

When performing repairs and maintenance on contaminated equipment, keep unnecessary persons from hazard area. Eliminate heat, flame and other potential ignition sources. Drain and purge equipment, as necessary, to remove material residues. Remove contaminated clothing. Wash exposed skin thoroughly with soap and water after handling.

Protect the environment from releases of this material. Prevent discharges to surface waters and groundwater. Maintain handling, transfer and storage equipment in proper working order.

Misuse of empty containers can be dangerous. Empty containers may contain material residues which can ignite with explosive force. **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 in a cool, dry, well-ventilated place. Keep containers tightly closed. Do not store this product near heat, flame or other potential ignition sources. Do not store with oxidizers. Do not store this product in unlabeled containers. Do not puncture or incinerate containers. Ground all
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equipment containing this material. All electrical equipment in areas where this material is stored or handled must meet all applicable requirements of the NFPA’s National Electrical Code (NEC). Store and transport in accordance with all applicable laws.

### SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Engineering Controls</th>
<th>Personal Protective Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide ventilation or other engineering controls to keep the airborne concentrations of vapor or mists below the applicable workplace exposure limits indicated below. All electrical equipment should comply with the National Electric Code. An emergency eye wash station and safety shower should be located near the work-station.</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Eye Protection**

Safety glasses equipped with side shields are recommended as minimum protection in industrial settings. Chemical goggles should be worn during transfer operations or when there is a likelihood of misting, splashing, or spraying of this material. A suitable emergency eye wash water and safety shower should be located near the work station.

**Hand Protection**

Avoid skin contact. Use heavy duty gloves constructed of chemical resistant materials such as Viton® or heavy nitrile rubber. Wash hands with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners.

**Body Protection**

Avoid skin contact. Wear long-sleeved fire-retardant garments (e.g., Nomex®) while working with flammable and combustible liquids. Additional chemical-resistant protective gear may be required if splashing or spraying conditions exist. This may include an apron, boots and additional facial protection. If product comes in contact with clothing, immediately remove soaked clothing and shower. Promptly remove and discarded contaminated leather goods.

**Respiratory Protection**

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. Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134). For airborne vapor concentrations that exceed the recommended protection factors for organic vapor respirators, use a full-face, positive-pressure, supplied air respirator. Due to fire and explosion hazards, do not enter atmospheres containing concentrations greater than 10% of the lower flammable limit of this product.

**General Comments**

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

### Occupational Exposure Guidelines

<table>
<thead>
<tr>
<th>Substance</th>
<th>NIOSH REL (United States). TWA: 100 mg/m³ 8 hour(s).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel Fuel No. 2</td>
<td><strong>ACGIH TLV (United States). Skin</strong> TWA: 100 mg/m³ 8 hour(s).</td>
</tr>
<tr>
<td>Naphthalene</td>
<td><strong>ACGIH (United States). Skin</strong> TWA: 10 ppm 8 hour(s). STEL: 15 ppm 15 minute(s).</td>
</tr>
<tr>
<td></td>
<td><strong>OSHA (United States). TWA:</strong> 10 ppm 8 hour(s).</td>
</tr>
</tbody>
</table>
Biphenyl (Diphenyl)  
ACGIH TLV (United States).  
TWA: 0.2 ppm 8 hour(s).  
OSHA PEL Z2 (United States).  
TWA: 0.2 ppm 8 hour(s).

Diesel exhaust particulate  
ACGIH (United States, 2001).  
TWA: 0.05 mg/m³.

Ethylbenzene  
ACGIH (United States).  
TWA: 100 ppm 8 hour(s).  
STEL: 125 ppm 15 minute(s).  
OSHA (United States).  
TWA: 100 ppm 8 hour(s).

Cumene  
ACGIH (United States).  
TWA: 50 ppm 8 hour(s).  
OSHA (United States). Skin  
TWA: 50 ppm 8 hour(s).

Toluene  
ACGIH (United States). Skin  
TWA: 50 ppm 8 hour(s).  
OSHA (United States).  
TWA: 200 ppm 8 hour(s).  
CEIL: 300 ppm  
PEAK: 500 ppm

Benzene  
ACGIH (United States). Skin  
TWA: 0.5 ppm 8 hour(s).  
STEL: 2.5 ppm 15 minute(s).  
OSHA (United States). Skin Notes: See Table Z-2 for exclusions in 20 CFR 1910.1028 to the PEL.  
TWA: 1 ppm 8 hour(s).  
STEL: 5 ppm 15 minute(s).

Hydrogen Sulfide  
ACGIH TLV (United States).  
TWA: 10 ppm 8 hour(s).  
STEL: 15 ppm 15 minute(s).  
OSHA (United States).  
CEIL: 20 ppm 8 hour(s).  
STEL: 50 ppm 15 minute(s). Form: *10 minute peak; once per 8 hour shift

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES (TYPICAL)

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Liquid.</th>
<th>Color</th>
<th>Odor</th>
<th>Water = 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Dark amber to black</td>
<td>Sour Hydrocarbon odor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable</td>
<td></td>
<td>Vapor Density &gt;1 (Air = 1)</td>
<td></td>
</tr>
<tr>
<td>Boiling Range</td>
<td>Not available</td>
<td></td>
<td>Melting/Freezing Point Not available.</td>
<td></td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not available</td>
<td></td>
<td>Volatility AP 850 g/l VOC (w/v)</td>
<td></td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Very slightly soluble in cold water</td>
<td></td>
<td>Viscosity (cSt @ 40°F) Not available</td>
<td></td>
</tr>
<tr>
<td>Flash Point</td>
<td>Closed cup: &gt;60°C (&gt;140°F). (Estimated)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional Properties</td>
<td>No additional information.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SECTION 10. STABILITY AND REACTIVITY

Chemical Stability
Stable.  

Hazardous Polymerization
Not expected to occur.

Conditions to Avoid
Keep away from all ignition sources and strong oxidizing conditions.

Materials Incompatibility
Strong acids, alkalies, and oxidizers such as liquid chlorine, other halogens, hydrogen peroxide and oxygen.

Hazardous Decomposition Products
No additional hazardous decomposition products were identified other than the combustion products identified in Section 5 of this MSDS.

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
Trimethylbenzenes, all isomers:

Studies of Workers:
Levels of total hydrocarbon vapors present in the breathing atmosphere of these workers ranged from 10 to 60 ppm. The TCLo for humans is 10 ppm, with somnolence and respiratory tract irritation noted.

Studies in Laboratory Animals:
In inhalation studies with rats, four of ten animals died after exposures of 2400 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.

Naphthalene:
Studies in Humans Overexposed to Naphthalene:
Severe jaundice, neurotoxicity (kernicterus) and fatalities have been reported in young children and infants as a result of hemolytic anemia from over-exposure to naphthalene. Persons with Glucose 6-phosphate dehydrogenase (G6PD) deficiency are more prone to the hemolytic effects of naphthalene. Adverse effects on the kidney have also been reported from over-exposure to naphthalene but these effects are believed to be a consequence of emolytic anemia, and not a direct effect.

Studies in Laboratory Animals:
Hemolytic anemia has been observed in laboratory animals exposed to naphthalene. Laboratory rodents exposed to naphthalene vapor for 2 years (lifetime studies) developed non-neoplastic and neoplastic tumors and inflammatory lesions of the nasal and respiratory tract. Cataracts and other adverse effects on the eye have been observed in laboratory animals exposed to high levels of naphthalene. Findings from a large number of bacterial and mammalian cell mutation assays have been negative. A few studies have shown chromosomal effects (elevated levels of Sister Chromatid Exchange or chromosomal aberrations) in vitro.

Biphenyl (Diphenyl):
Studies in Humans Overexposed to Biphenyl:
Evidence of adverse effects on the liver and the nervous system have been described in studies of workers exposed to high levels for prolonged periods.

Studies in Laboratory Animals:
Evidence of adverse effects on the kidney and liver, and changes in whole blood (reduced hematocrit and hemoglobin levels) have been observed in laboratory rodents following subchronic exposure to...
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biphenyl.

Genotoxicity & Carcinogenicity:
Biphenyl tested negative in bacteriological systems but some evidence of positive responses have been reported in mammalian cell systems in the presence of metabolic activation. The EPA has determined human and animal data are inadequate to classify the carcinogenic potential of biphenyl.

Diesel exhaust particulate:
Lung tumor and lymphomas were identified in rats and mice exposed to unfiltered diesel fuel exhaust in chronic inhalation studies. Further, epidemiological studies have identified increase incidences of lung cancer in US railroad workers and bladder cancer in bus and truck drivers possibly associated with exposure to diesel engine exhaust. NTP has determined that exposure to diesel exhaust particulates, a complex mixture of combustion products of diesel fuel, is reasonably anticipated to be a human carcinogen. In addition, NIOSH has identified complete diesel exhaust as a potential carcinogen.

Ethylbenzene:
Effects from Acute Exposure:
ORAL (LD50), Acute: 3,500 mg/kg [Rat].
DERMAL (LD50), Acute: 17,800 uL/kg [Rabbit].
INTRAPERITONEAL (LD50), Acute: 2,624 mg/kg [Rat].

Effects from Prolonged or Repeated Exposure:
Findings from a 2-year inhalation study in rodents conducted by NTP were as follows: Effects were observed only at the highest exposure level (750 ppm). At this level the incidence of renal tumors was elevated in male rats (tubular carcinomas) and female rats (tubular adenomas). Also, the incidence of tumors was elevated in male mice (alveolar and bronchiolar carcinomas) and female mice (hepatocellular carcinomas). IARC has classified ethyl benzene as “possibly carcinogenic to humans” (Group 2B). Studies in laboratory animals indicate some evidence of post-implantation deaths following high levels of maternal exposure. The relevance of these findings to humans is not clear at this time. Studies in laboratory animals indicate limited evidence of renal malformations, resorptions, and developmental delays following high levels of maternal exposure. The relevance of these findings to humans is not clear at this time. Studies in laboratory animals indicate evidence of adverse effects on the liver, kidney, thyroid, and pituitary gland.

Benzene:
ORAL (LD50): Acute: 930 mg/kg [Rat]. 4700 mg/kg [Mouse].
INHALATION (LC50):
(VAPOR): Acute: 10000 ppm 7 hour(s) [Rat]. 9980 ppm 8 hour(s) [Mouse].

Studies of Workers Over-Exposed to Benzene:
Studies of workers exposed to benzene show clear evidence that over-exposure can cause cancer of the blood forming organs (acute myelogenous leukemia) and aplastic anemia, an often fatal disease. Studies also suggest over-exposure to benzene may be associated with other types of leukemia and other blood disorders. Some studies of workers exposed to benzene have shown an association with increased rates of chromosome aberrations in circulating lymphocytes. One study of women workers exposed to benzene suggested a weak association with irregular menstruation. However, other studies of workers exposed to benzene have not demonstrated clear evidence of an effect on fertility or reproductive outcome in humans. Benzene can cross the placenta and affect the developing fetus. Cases of aplastic anemia have been reported in the offspring of persons severely over-exposed to benzene.

Studies in Laboratory Animals:
Studies in laboratory animals indicate that prolonged, repeated exposure to high levels of benzene vapor can cause bone marrow suppression and cancer in multiple organ systems. Studies in laboratory animals show evidence of adverse effects on male reproductive organs following high levels of exposure but no significant effects on reproduction have been observed. Embryotoxicity has been reported in studies of laboratory animals but effects were limited to reduced fetal weight and skeletal variations.
Marine Diesel Oil

**Middle distillates, petroleum:**
Long-term repeated (lifetime) skin exposure to similar materials has been reported to result in an increase in skin tumors in laboratory rodents. The relevance of these findings to humans is not clear at this time.

**Distillates, petroleum, light catalytic cracked:**
Oils similar to this material have been shown to cause adverse effects in the liver and kidneys of laboratory rodents, and an increase in the incidence of fetal resorptions in pregnant laboratory rodents following prolonged and repeated exposure. Long-term repeated (lifetime) skin exposure to similar materials has been reported to result in an increase in skin tumors in laboratory rodents. The International Agency for Research on Cancer (IARC) has concluded that this category of untreated and mildly-treated oils are carcinogenic to humans. (Group 1).

### SECTION 12. ECOLOGICAL INFORMATION

**Ecotoxicity**
Ecotoxicity data are not available for this product. Based on aquatic testing of similar products, this product is harmful to aquatic organisms.

**Environmental Fate**
If spilled, this material will normally evaporate. Hydrocarbon components may contribute to atmospheric smog. If released to the subsoils, petroleum middle distillate fuels will strongly adsorb to soils. Groundwater should be considered as an exposure pathway. Liquid and vapor can migrate through the subsurface and preferential pathways (such as utility line backfill) to downgradient receptors.

Middle distillates are potentially toxic to freshwater and saltwater ecosystems. Distillate fuels will normally float on water. In stagnant or slow-flowing waterways, a hydrocarbon layer can cover a large surface area. As a result, this oil layer can limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway can cause a fish kill or create an anaerobic environment. Also, this coating action can also kill plankton, algae, and water birds.

### 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 disposal.

Maximize material recovery for reuse or recycling. Recovered non-usable material may be regulated by US EPA as a hazardous waste due to its ignitibility (D001) and/or its toxic (D018) characteristics. 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 260 through 40 CFR 271). State and/or local regulations may be more restrictive. Contact your regional US EPA office for guidance concerning case specific disposal issues.

### SECTION 14. TRANSPORT INFORMATION

The shipping description below may not represent requirements for all modes of transportation, shipping methods or locations outside of the United States.

**US DOT Status**
A U.S. Department of Transportation (DOT) regulated material. The following U. S. DOT hazardous materials shipping description applies to bulk packaged material that is transported by highway or rail. Alternate shipping descriptions may be required for product transported by marine vessel, air or other method and for non-bulk packaged material.

**Proper Shipping Name**
Diesel Fuel, Combustible liquid, NA1993, PG III

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Marine Diesel Oil

Hazard Class: Combustible Liquid
Packing Group: III

UN/NA Number: NA 1993 or UN 1202

Reportable Quantity: A Reportable Quantity (RQ) has not been established for this material.

Placard(s): 

Emergency Response Guide No.: 128

MARPOL III Status: Not a DOT “Marine Pollutant” per 49 CFR 171.18

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 Emergency Planning and Notification: 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 Hazard Identification: 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, Acute (Immediate) Health Hazard, Chronic (Delayed) Health Hazard

SARA 313 Toxic Chemical Notification and Release Reporting: This product contains the following components in concentrations above de minimis levels that are listed as toxic chemicals in 40 CFR Part 372 pursuant to the requirements of Section 313 of SARA:

- Naphthalene [CAS No.: 91-20-3] Concentration: <3%
- Biphenyl (Diphenyl) [CAS No.: 92-52-4] Concentration: <2%
- Ethylbenzene [CAS No.: 100-41-4] Concentration: <0.5%
- Benzene [CAS No.: 71-43-2] Concentration: <0.5%

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 product or refinery stream that may be subject to this statute are:

- Naphthalene [CAS No.: 91-20-3] RQ = 100 lbs. (45.36 kg) Concentration: <3%
- Ethylbenzene [CAS No.: 100-41-4] RQ = 1000 lbs. (453.6 kg) Concentration: <1%
- Cumene [CAS No.: 98-82-8] RQ = 5000 lbs. (2268 kg) Concentration: <1%
- Toluene [CAS No.: 108-88-3] RQ = 1000 lbs. (453.6 kg) Concentration: <0.5%
- Benzene [CAS No.: 71-43-2] RQ = 10 lbs. (4.536 kg) Concentration: <0.5%

Clean Water Act (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.

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California Proposition 65

This material may contain the following components which are known to the State of California to cause cancer, birth defects or other reproductive harm, and may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):
- Naphthalene: <3%
- Diesel exhaust particulate
- Ethylbenzene: <1%
- Toluene: <0.5%
- Benzene: <0.5%

New Jersey Right-to-Know Label

Diesel Fuel

Additional Remarks

As minimum requirements, Axeon recommends that the following advisory information be displayed on equipment used to dispense diesel fuel. Additional warnings specified by various regulatory authorities may be required: “Diesel Fuel DANGER: Combustible Liquid. Use as a Motor Fuel Only. DO NOT FILL CONTAINERS THAT HAVE PREVIOUSLY CONTAINED GASOLINE OR OTHER FLAMMABLE LIQUIDS. Sparks From static electricity can ignite flammable vapor residues. PLACE CONTAINER ON GROUND. DO NOT FILL ANY PORTABLE CONTAINER IN OR ON A VEHICLE. Containers must be metal or other material approved for storing diesel fuel. Keep nozzle spout in contact with the container during the entire filling operation. NO SMOKING! Do not leave nozzle unattended during filling. HARMFUL OR FATAL IF SWALLOWED. If swallowed, do not induce vomiting. Call Physician Immediately. Keep Out of Reach of Children. Avoid prolonged breathing of vapors. Never siphon by mouth. Do not store in vehicle or living space. Store and use in a well-ventilated area. Do not use near heat, spark or flame. Keep container closed.”

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 5.0
Revision Date: 3/24/14
Print Date: 3/24/2014

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
IARC: International Agency for Research on Cancer
NIOSH: National Institute of Occupational Safety and Health
NPCA: National Paint and Coating Manufacturers Association
NFPA: National Fire Protection Association
AIHA: American Industrial Hygiene Association
NTP: National Toxicology Program
OSHA: Occupational Safety and Health Administration
HMIS: Hazardous Materials Information System
EPA: US Environmental Protection Agency
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*** END OF MSDS ***