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

Ashland Regulatory Information Number 1-800-325-3751
P.O. Box 2219 Telephone 614-790-3333
Columbus, OH 43216 Emergency telephone 1-800-ASHLAND
(1-800-274-5263)

Product name PYROIL® ENGINE FLUSH
Product code PYBL0005
Product Use Description No data

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance: liquid, clear

CAUTION! COMBUSTIBLE LIQUID AND VAPOR. MAY AFFECT THE CENTRAL NERVOUS SYSTEM CAUSING DIZZINESS, HEADACHE OR NAUSEA. MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION.

Potential Health Effects

Routes of exposure
Inhalation, Skin absorption, Skin contact, Eye Contact, Ingestion

Eye contact
May cause mild eye irritation. Symptoms include stinging, tearing, and redness.

Skin contact
Can cause skin irritation. Prolonged or repeated contact may dry the skin. Symptoms may include redness, burning, and drying and cracking of skin, burns and other skin damage. Additional symptoms of skin contact may include: Blistering Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

Ingestion
Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful. This material can get
into the lungs during swallowing or vomiting. This results in lung inflammation and other lung injury.

**Inhalation**

It is possible to breathe this material under certain conditions of handling and use (for example, during heating, spraying, or stirring). Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms are not expected at air concentrations below the recommended exposure limits, if applicable (see Section 8.).

**Aggravated Medical Condition**

Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material: Skin, lung (for example, asthma-like conditions), Upper respiratory tract, kidney, immune system, eye, Liver, urinary system, Exposure to this material may aggravate any preexisting condition sensitive to a decrease in available oxygen, such as chronic lung disease, coronary artery disease or anemias., Individuals with preexisting heart disorders maybe more susceptible to arrhythmias (irregular heartbeats) if exposed to high concentrations of this material., Individuals with erythrocyte glucose-6-phosphate dehydrogenase deficiency are particularly susceptible to hemolytic agents and rapidly develop hemolytic anemia from ingestion or inhalation of this material (or a component).

**Symptoms**

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include:, stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), central nervous system excitation (giddiness, liveliness, light-headed feeling) followed by central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness) and other central nervous system effects, Lowered blood pressure, Lack of coordination, sweating, Fever, Abdominal pain, frequent or painful urination, blood abnormalities (breakage of red blood cells), kidney damage, lung damage, respiratory failure, Difficulty in breathing, Bloody urine, liver damage, confusion, irregular heartbeat, narcosis (dazed or sluggish feeling), Convulsions, coma

**Target Organs**

This material (or a component) has been shown to lower activity of certain immune system cells in experimental animals. The significance of this effect with respect to human health is uncertain., Exposure to this material (or a component) has been found to cause kidney damage in male rats., The mechanism by which this toxicity occurs is specific to the male rat and the kidney effects are not expected to occur in humans., Acute lethal exposure to ethylene glycol monobutyl ether in animal studies has
resulted in congestion of organs including kidney, spleen, and lung. Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals: mild, reversible spleen effects, cataracts, anemia, nasal damage, blood abnormalities, kidney damage, liver damage, eye damage, central nervous system damage. Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans: cataracts, eye damage.

**Carcinogenicity**

This product (or a component) is a petroleum-derived material. Similar materials and certain compounds occurring naturally in petroleum oils have been shown to cause skin cancer in laboratory animals following repeated exposure without washing or removal. In a National Toxicology Program (NTP) study, lifetime inhalation exposure to naphthalene resulted in increases in tumors of the nose in rats. In a previous NTP study, lifetime exposure to naphthalene caused lung tumors in female mice. Male mice with the same exposure did not develop tumors. The relevance of this finding to humans is uncertain. Naphthalene is listed as carcinogenic by IARC (International Agency for Research on Cancer) and the National Toxicology Program (NTP). Ethylene glycol monobutyl ether has been shown to cause cancer in laboratory animals. The relevance of this finding to humans is uncertain.

**Reproductive hazard**

This material (or a component) causes harm to the fetus.

**Other information**

Infants are more sensitive than adults to the toxic effects of naphthalene. Diapers or cloths stored with mothballs and used directly on infants have caused skin rashes and illness. Naphthalene vapors from clothing or blankets that had been stored in or near the infant's room have caused illness and death.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEROSENE</td>
<td>8008-20-6</td>
<td>&gt;=90-&lt;=100%</td>
</tr>
<tr>
<td>AROMATIC HYDROCARBONS</td>
<td>NJTS# 254504001-5543</td>
<td>&gt;=1.5-&lt;5%</td>
</tr>
<tr>
<td>ETHYLENE GLYCOL</td>
<td>111-76-2</td>
<td>&gt;=1.5-&lt;5%</td>
</tr>
<tr>
<td>MONOBUTYL ETHER</td>
<td></td>
<td>&gt;=1.5-&lt;5%</td>
</tr>
<tr>
<td>DIACETONE ALCOHOL</td>
<td>123-42-2</td>
<td>&gt;=1.5-&lt;5%</td>
</tr>
<tr>
<td>NAPHTHALENE</td>
<td>91-20-3</td>
<td>&gt;=0.1-&lt;0.5%</td>
</tr>
</tbody>
</table>
4. FIRST AID MEASURES

Eyes
If symptoms develop, move individual away from exposure and into fresh air. Flush eyes gently with water while holding eyelids apart. If symptoms persist or there is any visual difficulty, seek medical attention.

Skin
Remove contaminated clothing. Flush exposed area with large amounts of water. If skin is damaged, seek immediate medical attention. If skin is not damaged and symptoms persist, seek medical attention. Launder clothing before reuse.

Ingestion
Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation
If symptoms develop, move individual away from exposure and into fresh air. If symptoms persist, seek medical attention. If breathing is difficult, administer oxygen. Keep person warm and quiet; seek immediate medical attention.

Notes to physician
Hazards: Inhalation of high concentrations of this material, as could occur in enclosed spaces or during deliberate abuse, may be associated with cardiac arrhythmias. Sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to this material. This material is an aspiration hazard. Potential danger from aspiration must be weighed against possible oral toxicity (See Section 2 - Swallowing) when deciding whether to induce vomiting. Inhalation or ingestion of high levels of this material (or a component) may cause a hemolytic reaction. Complications of acute intravascular hemolysis include anemia, leukocytosis, fever, hemoglobinuria, jaundice, renal insufficiency, and sometimes disturbances in liver function. Fats, for example, baby oil on the skin or ingested oil, facilitate absorption of naphthalene.

Treatment: No information available.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
Foam, Carbon dioxide (CO2), Dry chemical

**Hazardous combustion products**
- Aldehydes, carbon dioxide and carbon monoxide, Hydrocarbons, nitrogen oxides (NOx), sulfur oxides, Sulphur oxides, Ketones, Organic acids, acetone, acrid smoke and fumes

**Precautions for fire-fighting**
- Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively. Material is volatile and readily gives off vapors which may travel along the ground or be moved by ventilation and ignited by pilot lights, flames, sparks, heaters, smoking, electric motors, static discharge or other ignition sources at locations near the material handling point. Wear full firefighting turn-out gear (full Bunker gear), and respiratory protection (SCBA). DO NOT direct a solid stream of water or foam into hot, burning pools of liquid since this may cause frothing and increase fire intensity. Frothing can be violent and possibly endanger any firefighter standing too close to the burning liquid.

**Flammability Class for Flammable Liquids**
- Combustible Liquid Class II

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**6. ACCIDENTAL RELEASE MEASURES**

**Personal precautions**
- For personal protection see section 8. Eliminate all ignition sources (flares, flames including pilot lights, electrical sparks). Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source. Prevent from entering drains, sewers, streams or other bodies of water. Prevent from spreading. If runoff occurs, notify authorities as required. Pump or vacuum transfer spilled product to clean containers for recovery. Absorb unrecoverable product. Transfer contaminated absorbent, soil and other materials to containers for disposal.

**Environmental precautions**
- Prevent run-off to sewers, streams or other bodies of water. If run-off occurs, notify proper authorities as required, that a spill has occurred.

**Methods for cleaning up**
- Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source, dike area of spill to prevent
spreading, pump liquid to salvage tank. Remaining liquid may be taken up on sand, clay, earth, floor absorbent, or other absorbent material and shoveled into containers.

**Other information**
Notify the proper authorities as required that a spill has occurred.

### 7. HANDLING AND STORAGE

**Handling**
Hydrocarbon solvents are basically non-conductors of electricity and can become electrostatically charged during mixing, filtering or pumping at high flow rates. If this charge reaches a sufficiently high level, sparks can form that may ignite the vapors of flammable liquids.

**Storage**
No data

### 8. EXPOSURE CONTROLS/PERSOAL PROTECTION

<table>
<thead>
<tr>
<th>Exposure Guidelines</th>
<th>KEROSENE</th>
<th>8008-20-6</th>
<th>ETHYLENE GLYCOL MONOBUTYL ETHER</th>
<th>111-76-2</th>
<th>DIACETONE ALCOHOL</th>
<th>123-42-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
<td>time weighted average</td>
<td>200 mg/m³</td>
<td>NIOSH Recommended exposure limit (REL):</td>
<td>5 ppm</td>
<td>NIOSH Recommended exposure limit (REL):</td>
<td>24 mg/m³</td>
</tr>
<tr>
<td>NIOSH</td>
<td>Recommended exposure limit (REL):</td>
<td>100 mg/m³</td>
<td>NIOSH Recommended exposure limit (REL):</td>
<td>20 ppm</td>
<td>OSHA Z1 Permissible exposure limit</td>
<td>50 ppm</td>
</tr>
<tr>
<td>NIOSH</td>
<td>Recommended exposure limit (REL):</td>
<td></td>
<td>OSHA Z1 Permissible exposure limit</td>
<td>240 mg/m³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSHA Z1</td>
<td>Permissible exposure limit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSHA Z1</td>
<td>Permissible exposure limit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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General advice

These recommendations provide general guidance for handling this product. Personal protective equipment should be selected for individual applications and should consider factors which affect exposure potential, such as handling practices, chemical concentrations and ventilation. It is ultimately the responsibility of the employer to follow regulatory guidelines established by local authorities.

Exposure controls

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected or apparent adverse effects.

Eye protection

Wear chemical splash goggles when there is the potential for exposure of the eyes to liquid, vapor or mist.

Skin and body protection

Wear normal work clothing including long pants, long-sleeved shirts and foot covering to prevent direct contact of the product with the skin. Launder clothing before reuse. If skin irritation develops, contact your facility health and safety professional or your local safety equipment supplier to determine the proper personal protective equipment for your use.

Wear resistant gloves such as:
Neoprene
Nitrile rubber

Respiratory protection

A NIOSH-approved air-purifying respirator with an appropriate cartridge and/or filter may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits (if applicable) or if overexposure has otherwise been determined. Protection provided by air-purifying respirators is limited. Use a positive pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are not known or any other circumstances where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL AND CHEMICAL PROPERTIES
10. STABILITY AND REACTIVITY

Stability
Stable

Conditions to avoid

Incompatible products
Strong oxidizing agents, aluminum, Acids, Bases, Ammonia, Amines, chlorates, Chlorine, salts of strong bases, Lead, peroxides, Chromic acid

Hazardous decomposition products
carbon dioxide and carbon monoxide, Hydrocarbons, nitrogen oxides (NOx), Sulphur oxides, Aldehydes, ketones, Organic acids, acetone, acrid smoke and fumes

Hazardous reactions
Product will not undergo hazardous polymerization.

Thermal decomposition
11. TOXICOLOGICAL INFORMATION

Acute oral toxicity

<table>
<thead>
<tr>
<th>Substance</th>
<th>LD 50 Rat:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>KEROSENE</td>
<td>&gt; 5,000 mg/kg</td>
<td></td>
</tr>
<tr>
<td>AROMATIC HYDROCARBONS</td>
<td>3,000 mg/kg</td>
<td></td>
</tr>
<tr>
<td>ETHYLENE GLYCOL MONOBUTYL ETHER</td>
<td>1,200 mg/kg</td>
<td></td>
</tr>
<tr>
<td>DIACETONE ALCOHOL</td>
<td>4,000 mg/kg</td>
<td></td>
</tr>
<tr>
<td>NAPHTHALENE</td>
<td>490 mg/kg</td>
<td></td>
</tr>
<tr>
<td>AROMATIC HYDROCARBONS</td>
<td>3,000 mg/kg</td>
<td></td>
</tr>
<tr>
<td>ETHYLENE GLYCOL MONOBUTYL ETHER</td>
<td>&gt; 633 ppm, 1 h</td>
<td></td>
</tr>
<tr>
<td>DIACETONE ALCOHOL</td>
<td>no data available</td>
<td></td>
</tr>
<tr>
<td>NAPHTHALENE</td>
<td>no data available</td>
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</tbody>
</table>

Acute inhalation toxicity

<table>
<thead>
<tr>
<th>Substance</th>
<th>LC 50 Rat:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>KEROSENE</td>
<td>&gt; 5,000 mg/m3, 4 h</td>
<td></td>
</tr>
<tr>
<td>AROMATIC HYDROCARBONS</td>
<td>&gt; 3,800 mg/m3, 4 h</td>
<td></td>
</tr>
<tr>
<td>ETHYLENE GLYCOL MONOBUTYL ETHER</td>
<td>&gt; 633 ppm, 1 h</td>
<td></td>
</tr>
<tr>
<td>DIACETONE ALCOHOL</td>
<td>no data available</td>
<td></td>
</tr>
<tr>
<td>NAPHTHALENE</td>
<td>no data available</td>
<td></td>
</tr>
</tbody>
</table>

Acute dermal toxicity

<table>
<thead>
<tr>
<th>Substance</th>
<th>LD 50 Rabbit:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>KEROSENE</td>
<td>&gt; 2 g/kg</td>
<td></td>
</tr>
<tr>
<td>AROMATIC HYDROCARBONS</td>
<td>&gt; 3,000 mg/kg</td>
<td></td>
</tr>
<tr>
<td>ETHYLENE GLYCOL MONOBUTYL ETHER</td>
<td>&gt; 2,000 mg/kg</td>
<td></td>
</tr>
<tr>
<td>DIACETONE ALCOHOL</td>
<td>13,500 mg/kg</td>
<td></td>
</tr>
<tr>
<td>NAPHTHALENE</td>
<td>&gt; 20,000 mg/kg</td>
<td></td>
</tr>
</tbody>
</table>

12. ECOLOGICAL INFORMATION

Aquatic toxicity

Acute and Prolonged Toxicity to Fish
No data
Acute Toxicity to Aquatic Invertebrates
No data

Environmental fate and pathways
13. DISPOSAL CONSIDERATIONS

Waste disposal methods
Destroy by liquid incineration. Contaminated absorbent may be deposited in a landfill in accordance with local, state and federal regulations. For assistance with your waste management needs - including disposal, recycling and waste stream reduction, contact Ashland Distribution's Environmental Services Group at 800-637-7922.

14. TRANSPORT INFORMATION

IMDG:
UN1993, FLAMMABLE LIQUID, N.O.S. (KEROSENE, ) 3, III

IATA_P:
UN1993, Flammable liquid, n.o.s. (KEROSENE, ) 3, III

IATA_C:
UN1993, Flammable liquid, n.o.s. (KEROSENE, ) 3, III

CFR_ROAD:
UN1993, Flammable liquids, n.o.s. (KEROSENE, ) 3, III

CFR_RAIL:
UN1993, Flammable liquids, n.o.s. (KEROSENE, ) 3, III

CFR_INWTR:
UN1993, Flammable liquids, n.o.s. (KEROSENE, ) 3, III

IMDG_ROAD:
UN1993, FLAMMABLE LIQUID, N.O.S. (KEROSENE, ) 3, III

IMDG_RAIL:
UN1993, FLAMMABLE LIQUID, N.O.S. (KEROSENE, ) 3, III

Dangerous goods descriptions (if indicated above) may not reflect package size, quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

15. REGULATORY INFORMATION

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

PYROIL® ENGINE FLUSH
PYBL0005

NAPHTHALENE
BENZENE

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

BENZENE
TOLUENE

SARA Hazard Classification
Fire Hazard
Acute Health Hazard
Chronic Health Hazard

SARA 313 Component(s)
ETHYLENE GLYCOL 111-76-2 3.1479%
MONOBUTYL ETHER
NAPHTHALENE 91-20-3 0.3743%

Reportable quantity - Product
US. EPA CERCLA Hazardous Substances (40 CFR 302) 26716 lbs

Reportable quantity - Components
KEROSENE 8008-20-6 none
AROMATIC HYDROCARBONS NJTS# 254504001-5543 none
ETHYLENE GLYCOL 111-76-2 none
MONOBUTYL ETHER
DIACETONE ALCOHOL 123-42-2 none
NAPHTHALENE 91-20-3 100 lbs

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Reactivity</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMIS</td>
<td>1*</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>NFPA</td>
<td>1</td>
<td>2</td>
<td>0</td>
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</tbody>
</table>

16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This MSDS has been prepared by Ashland's Environmental Health and Safety Department (1-800-325-3751).