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

<table>
<thead>
<tr>
<th>Product name</th>
<th>Valvoline Professional Series™ COMPLETE FUEL SYSTEM CLEANER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product code</td>
<td>VP052</td>
</tr>
<tr>
<td>Product Use Description</td>
<td>No data</td>
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</tbody>
</table>

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance: liquid, yellow

WARNING! COMBUSTIBLE LIQUID AND VAPOR. MAY AFFECT THE CENTRAL NERVOUS SYSTEM CAUSING DIZZINESS, HEADACHE OR NAUSEA. CAUSES EYE IRRITATION. MAY CAUSE SKIN AND RESPIRATORY TRACT IRRITATION. PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE DERMATITIS AND BURNS.

Potential Health Effects

Exposure routes

Inhalation, Skin absorption, Skin contact, Eye Contact, Ingestion

Eye contact

Can cause severe eye irritation. Symptoms include stinging, tearing, redness, and swelling of eyes. Can injure eye tissue.

Skin contact

Can cause skin irritation. Symptoms may include redness and burning of skin, and other skin damage. Prolonged or repeated contact may dry the skin. Symptoms may include redness, burning, and drying and cracking of skin, skin burns, and other skin damage.
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

Breathing of vapor or mist is possible. 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

Individuals with preexisting heart disorders maybe more susceptible to arrhythmias (irregular heartbeats) if exposed to high concentrations of this material,. 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,. 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, immune system

Symptoms

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include:, allergic skin reaction (delayed skin rash which may be followed by blistering, scaling and other skin effects), stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), Lung irritation, central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness), Lack of coordination, confusion, irregular heartbeat, narcosis (dazed or sluggish feeling), Convulsions, respiratory failure, 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,. Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals:, mild, reversible liver effects

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).

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

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Hazardous Components</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distillates (petroleum), sweetened middle</td>
<td>64741-86-2</td>
<td>&gt;=30-&lt;40%</td>
</tr>
<tr>
<td>KEROSENE</td>
<td>8008-20-6</td>
<td>&gt;=20-&lt;30%</td>
</tr>
<tr>
<td>POLYETHER AMINE</td>
<td></td>
<td>&gt;=20-&lt;30%</td>
</tr>
<tr>
<td>Poly[oxy(methyl-1,2-ethanediyl)]alpha-(3-propane)omega-hydroxy-C12-15 alkyl ethers</td>
<td></td>
<td>&gt;=1.5-&lt;5%</td>
</tr>
<tr>
<td>SOLVENT NAPHTHA (PETROLEUM), HEAVY AROMATIC</td>
<td>64742-94-5</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, immediately move individual away from exposure and into fresh air. Flush eyes gently with water for at least 15 minutes while holding eyelids apart; seek immediate 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.
Treatment: No information available.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
Dry chemical, Carbon dioxide (CO2), Water spray

Hazardous combustion products
Aldehydes, carbon dioxide and carbon monoxide, Hydrocarbons, nitrogen oxides (NOx), sulfur oxides Aldehydes, carbon dioxide and carbon monoxide, Hydrocarbons, nitrogen oxides (NOx), sulfur oxides, Sulphur oxides

Precautions for fire-fighting
If product is heated above its flash point it will produce vapors sufficient to support combustion. Vapors are heavier than air and may travel along the ground and be ignited by heat, pilot lights, other flames and ignition sources at locations near the point of release. Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively. Wear full firefighting turn-out gear (full Bunker gear), and respiratory protection (SCBA). Use water spray to cool fire exposed containers and structures until fire is out if it can be done with minimal risk. Avoid spreading burning material with water used for cooling purposes.

NFPA Flammable and Combustible Liquids Classification
Combustible Liquid Class II
6. ACCIDENTAL RELEASE MEASURES

Personal precautions
For personal protection see section 8. Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Ensure adequate ventilation. Eliminate all ignition sources (flares, flames including pilot lights, electrical sparks). Pay attention to the spreading of gases especially at ground level (heavier than air) and to the direction of the wind.

Environmental precautions
Prevent spreading over a wide area (e.g. by containment or oil barriers). Do not let product enter drains. Do not flush into surface water or sanitary sewer system. Local authorities should be advised if significant spillages cannot be contained.

Methods for cleaning up
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

Other information
Comply with all applicable federal, state, and local regulations. Suppress (knock down) gases/vapours/mists with a water spray jet.

7. HANDLING AND STORAGE

Handling
Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. Static ignition hazard can result from handling and use. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Special precautions may be necessary to dissipate static electricity for non-conductive containers. Use proper bonding and grounding during product transfer as described in National Fire Protection Association document NFPA 77.

Storage
Store in a cool, dry, ventilated area.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION
Exposure Guidelines

Exposure Guidelines

<table>
<thead>
<tr>
<th>KEROSENE</th>
<th>8008-20-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
<td>time weighted average</td>
</tr>
<tr>
<td>NIOSH</td>
<td>Recommended exposure limit (REL):</td>
</tr>
</tbody>
</table>

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. Maintain eye wash station near work area.

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 (consult your safety equipment supplier). Discard gloves that show tears, pinholes, or signs of wear.

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
Physical state: liquid
Form: no data available
Colour: yellow
Odour: no data available
Boiling point/boiling range: 275.0 °F / 135.0 °C
Melting point/range: no data available
Sublimation point: no data available
pH: no data available
Flash point: 119.8 °F / 48.8 °C
Ignition temperature: no data available
Evaporation rate: no data available
Lower explosion limit/Upper explosion limit: 1.0 %(V) / 6.6 %(V)
Particle size: no data available
Vapour pressure: 9.000 mmHg @ 68.00 °F / 20.00 °C
Relative vapour density: no data available
Density: 0.8526 g/cm³ @ 60.01 °F / 15.56 °C
Bulk density: No data
Water solubility: no data available
Solubility(ies): no data available
Partition coefficient: n-octanol/water: no data available
log Pow: no data available
Autoignition temperature: no data available
Viscosity, dynamic: no data available
Viscosity, kinematic: no data available
Solids in Solution: no data available
Decomposition temperature: no data available
Burning number: no data available
Dust explosion constant: no data available
Minimum ignition energy: no data available

10. STABILITY AND REACTIVITY

Stability
Stable.

Conditions to avoid
Heat, flames and sparks.
Incompatible products
   Strong oxidizing agents

Hazardous decomposition products
   carbon dioxide and carbon monoxide, Hydrocarbons, nitrogen oxides (NOx), Sulphur oxides

Hazardous reactions
   Product will not undergo hazardous polymerization.

Thermal decomposition
   No data

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity
Distillates (petroleum), sweetened middle : LD 50 Rat: > 5,000 mg/kg
KEROSENE : LD 50 Rat: > 5,000 mg/kg
POLYETHER AMINE : no data available
Poly[oxy(methyl-1,2-ethanediyl)]alpha-(3-propane)omega-hydroxy-C12-15 alkyl ethers : no data available
SOLVENT NAPHTHA (PETROLEUM), HEAVY AROMATIC : LD 50 Rat: 3,000 mg/kg
NAPHTHALENE : LD50 Oral Rat: 2,200 mg/kg

Acute inhalation toxicity
Distillates (petroleum), sweetened middle : no data available
KEROSENE : LC 50 Rat: > 5,000 mg/m3; 4 h
POLYETHER AMINE : no data available
Poly[oxy(methyl-1,2-ethanediyl)]alpha-(3-propane)omega-hydroxy-C12-15 alkyl ethers : no data available
SOLVENT NAPHTHA (PETROLEUM), HEAVY AROMATIC : LC 50 Rat: > 3,800 mg/m3; 4 h
NAPHTHALENE : no data available
Acute dermal toxicity
Distillates (petroleum), sweetened middle : no data available

KEROSENE : LD 50 Rabbit: > 2 g/kg

POLYETHER AMINE : no data available

Poly[oxy(methyl-1,2-ethanediyl)]alpha-(3-propane)omega-hydroxy-C12-15 alkyl ethers : no data available

SOLVENT NAPHTHA (PETROLEUM), HEAVY AROMATIC : LD 50 Rabbit: > 3,000 mg/kg

NAPHTHALENE : LD50 Dermal Rabbit: > 2.0 g/kg

12. ECOLOGICAL INFORMATION

Biodegradability
Distillates (petroleum), sweetened middle : no data available

KEROSENE : no data available

POLYETHER AMINE : no data available

Poly[oxy(methyl-1,2-ethanediyl)]alpha-(3-propane)omega-hydroxy-C12-15 alkyl ethers : no data available

SOLVENT NAPHTHA (PETROLEUM), HEAVY AROMATIC : no data available

NAPHTHALENE : no data available

Bioaccumulation
Distillates (petroleum), sweetened middle : no data available

KEROSENE : no data available

POLYETHER AMINE : no data available

Poly[oxy(methyl-1,2-ethanediyl)]alpha-(3-propane)omega-hydroxy-C12-15 alkyl ethers : no data available

SOLVENT NAPHTHA (PETROLEUM), HEAVY AROMATIC : no data available
NAPHTHALENE: Species: Rainbow trout, donaldson trout (Oncorhynchus mykiss)
Exposure time: 16 d
Dose: 0.023 mg/l
Bioconcentration factor (BCF): 25
Method: Flow through

Ecotoxicity effects

Toxicity to fish
Distillates (petroleum), sweetened middle: no data available
KEROSENE: no data available
POLYETHER AMINE: no data available
Poly[oxy(methyl-1,2-ethanediyl)]alpha-(3-propane)omega-hydroxy-C12-15 alkyl ethers: no data available
SOLVENT NAPHTHA (PETROLEUM), HEAVY AROMATIC: no data available
NAPHTHALENE: 96 h static test LC 50 Rainbow trout, donaldson trout (Oncorhynchus mykiss): 0.91 - 2.82 mg/l

Toxicity to daphnia and other aquatic invertebrates.
Distillates (petroleum), sweetened middle: no data available
KEROSENE: no data available
POLYETHER AMINE: no data available
Poly[oxy(methyl-1,2-ethanediyl)]alpha-(3-propane)omega-hydroxy-C12-15 alkyl ethers: no data available
SOLVENT NAPHTHA (PETROLEUM), HEAVY AROMATIC: no data available
NAPHTHALENE: 48 h static test EC 50 Water flea (Daphnia magna): 1.09 - 3.40 mg/l

Toxicity to algae
Distillates (petroleum), sweetened middle: no data available
Valvoline Professional Series™ COMPLETE FUEL SYSTEM CLEANER
VP052

KEROSENE : no data available
POLYETHER AMINE : no data available
Poly[oxy(methyl-1,2-ethanediyl)]alpha-(3-propane)omega-hydroxy-C12-15 alkyl ethers : no data available
SOLVENT NAPHTHA (PETROLEUM), HEAVY AROMATIC
NAPHTHALENE : no data available

Toxicity to bacteria
Distillates (petroleum), sweetened middle : no data available
KEROSENE : no data available
POLYETHER AMINE : no data available
Poly[oxy(methyl-1,2-ethanediyl)]alpha-(3-propane)omega-hydroxy-C12-15 alkyl ethers : no data available
SOLVENT NAPHTHA (PETROLEUM), HEAVY AROMATIC
NAPHTHALENE : no data available

Biochemical Oxygen Demand (BOD)
Distillates (petroleum), sweetened middle : no data available
KEROSENE : no data available
POLYETHER AMINE : no data available
Poly[oxy(methyl-1,2-ethanediyl)]alpha-(3-propane)omega-hydroxy-C12-15 alkyl ethers : no data available
SOLVENT NAPHTHA (PETROLEUM), HEAVY AROMATIC
NAPHTHALENE : no data available

Chemical Oxygen Demand (COD)
Distillates (petroleum), sweetened middle : no data available
KEROSENE : no data available
13. DISPOSAL CONSIDERATIONS

Waste disposal methods
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

<table>
<thead>
<tr>
<th>REGULATION</th>
<th>PROPER SHIPPING NAME</th>
<th>*HAZARD CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. DOT - ROAD</td>
<td>Not dangerous goods</td>
<td></td>
</tr>
</tbody>
</table>

U.S. DOT - RAIL
Not dangerous goods

U.S. DOT - INLAND WATERWAYS
Not dangerous goods

TRANSPORT CANADA - ROAD
Not dangerous goods

TRANSPORT CANADA - RAIL
Not dangerous goods

TRANSPORT CANADA - INLAND WATERWAYS
Not dangerous goods

INTERNATIONAL MARITIME DANGEROUS GOODS

<table>
<thead>
<tr>
<th>UN</th>
<th>Description</th>
<th>Class</th>
<th>Division</th>
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<tbody>
<tr>
<td>1993</td>
<td>FLAMMABLE LIQUID, N.O.S.</td>
<td>3</td>
<td>III</td>
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<tr>
<td>KEROSENE</td>
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INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO

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<th>UN</th>
<th>Description</th>
<th>Class</th>
<th>Division</th>
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<tbody>
<tr>
<td>1993</td>
<td>Flammable liquid, n.o.s.</td>
<td>3</td>
<td>III</td>
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<tr>
<td>KEROSENE</td>
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</table>

INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER

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<th>UN</th>
<th>Description</th>
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<tbody>
<tr>
<td>1993</td>
<td>Flammable liquid, n.o.s.</td>
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<td>III</td>
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<td>KEROSENE</td>
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MEXICAN REGULATION FOR THE LAND TRANSPORT OF HAZARDOUS MATERIALS AND WASTES

<table>
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<th>UN</th>
<th>Description</th>
<th>Class</th>
<th>Division</th>
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<tbody>
<tr>
<td>1993</td>
<td>LIQUIDO INFLAMABLE, N.E.P.</td>
<td>3</td>
<td>III</td>
</tr>
<tr>
<td>KEROSENE</td>
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</tbody>
</table>

*ORM = ORM-D, CBL = COMBUSTIBLE LIQUID

Dangerous goods descriptions (if indicated above) may not reflect 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

Proposition 65 warnings are not required for this product based on the results of a risk assessment.

SARA Hazard Classification

Fire Hazard
Acute Health Hazard
Chronic Health Hazard

SARA 313 Component(s)

NAPHTHALENE 0.14 %

New Jersey RTK Label Information

Distillates (petroleum), sweetened middle 64741-86-2
KEROSENE 8008-20-6
POLYETHER AMINE
GASOLINE ADDITIVE
Phenol, (dimethylamino)methyl-,polyisobutylene derivs.

Pennsylvania RTK Label Information

Distillates (petroleum), sweetened middle 64741-86-2
KEROSENE 8008-20-6
POLYETHER AMINE
GASOLINE ADDITIVE
Phenol, (dimethylamino)methyl-,polyisobutylene derivs.
Poly[oxy(methyl-1,2-ethanediyl)]alpha-(3-propane)omega-hydroxy-C12-15 alkyl ethers
SOLVENT NAPHTHA (PETROLEUM), HEAVY AROMATIC 64742-94-5

Notification status

US. Toxic Substances Control Act y (positive listing)
Australia. Industrial Chemical (Notification and Assessment) Act n (Negative listing)
Canada. Canadian Environmental Protection Act (CEPA). y (positive listing)
Japan. Kashin-Hou Law List n (Negative listing)
Korea. Toxic Chemical Control Law (TCCL) List y (positive listing)
Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act y (positive listing)
China. Inventory of Existing Chemical Substances y (positive listing)
Valvoline Professional Series™ COMPLETE
FUEL SYSTEM CLEANER
VP052

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand

Reportable quantity - Product
US. EPA CERCLA Hazardous Substances (40 CFR 302) 70821 lbs

Reportable quantity - Components
NAPHTHALENE 91-20-3 100 lbs

<table>
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<tr>
<th></th>
<th>HMIS</th>
<th>NFPA</th>
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<tbody>
<tr>
<td>Health</td>
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<td>2</td>
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<tr>
<td>Flammability</td>
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<tr>
<td>Physical hazards</td>
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<tr>
<td>Instability</td>
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<td>0</td>
</tr>
<tr>
<td>Specific Hazard</td>
<td>--</td>
<td>--</td>
</tr>
</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).