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

<table>
<thead>
<tr>
<th>Ashland</th>
<th>Regulatory Information Number</th>
<th>1-800-325-3751</th>
</tr>
</thead>
<tbody>
<tr>
<td>P.O. Box 2219</td>
<td>Telephone</td>
<td>614-790-3333</td>
</tr>
<tr>
<td>Columbus, OH 43216</td>
<td>Emergency telephone</td>
<td>1-800-ASHLAND (1-800-274-5263)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product name</th>
<th>TOLUENE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product code</td>
<td>20054</td>
</tr>
<tr>
<td>Product Use Description</td>
<td>SOLVENT</td>
</tr>
</tbody>
</table>

2. HAZARDS IDENTIFICATION

**Emergency Overview**

Appearance: liquid, colourless

WARNING! FLAMMABLE LIQUID AND VAPOR. MAY AFFECT THE CENTRAL NERVOUS SYSTEM CAUSING DIZZINESS, HEADACHE OR NAUSEA. HARMFUL IF INHALED. MAY BE HARMFUL IF INHALED OR SWALLOWED. MAY CAUSE EYE IRRITATION. PROLONGED OR REPEATED CONTACT MAY DRY THE SKIN AND CAUSE IRRITATION AND BURNS. PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE IRRITATION.

**Potential Health Effects**

**Routes of exposure**

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

**Eye contact**

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

**Skin contact**

May cause mild skin irritation. Prolonged or repeated contact may dry the skin. Symptoms may include redness, burning, drying and cracking of skin, and skin burns. 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
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
Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material: upper respiratory tract, Skin, lung (for example, asthma-like conditions), kidney, Central nervous system, auditory system. Individuals with preexisting heart disorders maybe more susceptible to arrhythmias (irregular heartbeats) if exposed to high concentrations of this material.

Symptoms
Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: metallic taste, 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, temporary changes in mood and behavior, weakness, lack of coordination, confusion, irregular heartbeat, coma, and death

Target Organs
Prolonged intentional toluene abuse may lead to damage to many organ systems having effects on: central and peripheral nervous systems, vision, hearing, liver, kidneys, heart and blood. Such abuse has been associated with brain damage characterized by disturbances in gait, personality changes and loss of memory. Comparable central nervous system effects have not been shown to result from occupational exposure to toluene. Prolonged intentional toluene abuse may lead to hearing loss progressing to deafness. In addition, while noise is known to cause hearing loss in humans, it has been suggested that workers exposed to organic solvents, including toluene, along with noise may suffer greater hearing loss than would be expected from exposure to noise alone. Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals: mild, reversible liver effects, mild, reversible kidney effects, respiratory tract damage (nose, throat, and airways), effects on hearing,
central nervous system damage. Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans: kidney damage.

**Carcinogenicity**
This material is not expected to cause cancer in humans since it did not cause cancer in laboratory animals. This material is not listed as a carcinogen by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or the Occupational Safety and Health Administration (OSHA).

**Reproductive hazard**
Toluene may be harmful to the human fetus based on positive test results with laboratory animals. Case studies show that prolonged intentional abuse of toluene during pregnancy can cause birth defects in humans.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOLUENE</td>
<td>108-88-3</td>
<td>&gt;=90-%&lt;=100%</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. Wash exposed area with soap and water. If 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.

**Treatment:** No information available.

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### 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media**
- Foam
- Carbon dioxide (CO2)
- Dry chemical

**Hazardous combustion products**
- Carbon dioxide and carbon monoxide, hydrocarbons

**Precautions for fire-fighting**
- 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. 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 liquid with water used for cooling purposes.

**Flammability Class for Flammable Liquids**
- Flammable Liquid Class IB

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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
Absorb liquid on vermiculite, floor absorbent or other absorbent material.

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 away from sources of heat, moisture, and incompatible substances. Store out of direct sunlight.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

<table>
<thead>
<tr>
<th>TOLUENE</th>
<th>108-88-3</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>
<tr>
<td>NIOSH</td>
<td>Recommended exposure limit (REL):</td>
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<tr>
<td>NIOSH</td>
<td>Short term exposure limit</td>
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<tr>
<td>NIOSH</td>
<td>Short term exposure limit</td>
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<tr>
<td>OSHA Z2</td>
<td>time weighted average</td>
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<tr>
<td>OSHA Z2</td>
<td>Ceiling Limit Value:</td>
</tr>
<tr>
<td>OSHA Z2</td>
<td>Maximum concentration:</td>
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</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 TLV(s). Explosion-proof ventilation system is acceptable.

Eye protection
Chemical splash goggles in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. Consult your safety representative.

Skin and body protection
To prevent repeated or prolonged skin contact, wear impervious clothing and boots. Wear resistant gloves such as: polyvinyl alcohol

Respiratory protection
If workplace exposure limit(s) of product or any component is exceeded (see exposure guidelines), a NIOSH-approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH respirators (negative pressure type) under specified conditions (see your industrial hygienist). Engineering or administrative controls should be implemented to reduce exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Physical state</th>
<th>liquid</th>
</tr>
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<tbody>
<tr>
<td>Form</td>
<td>Liquid</td>
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<tr>
<td>Colour</td>
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<tr>
<td>Odour</td>
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<tr>
<td>Boiling point/boiling range</td>
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<tr>
<td>Melting point/range</td>
<td>-138.8 °F / -94.9 °C</td>
</tr>
<tr>
<td>pH</td>
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<tr>
<td>Flash point</td>
<td>39.99 °F / 4.44 °C, Closed Cup</td>
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</table>
10. STABILITY AND REACTIVITY

Stability
Stable.

Conditions to avoid

Incompatible products
Strong acids, strong oxidizing agents

Hazardous decomposition products
carbon dioxide and carbon monoxide, hydrocarbons

Hazardous reactions
Product will not undergo hazardous polymerization.

Thermal decomposition
No data

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity

| TOLUENE | LD 50 Rat: 2,600 - 7,500 mg/kg |

Acute inhalation toxicity
12. ECOLOGICAL INFORMATION

Aquatic toxicity

Acute and Prolonged Toxicity to Fish
No data

Acute Toxicity to Aquatic Invertebrates
No data

Environmental fate and pathways
No data

13. DISPOSAL CONSIDERATIONS

Waste disposal methods
Destroy by incineration in accordance with applicable 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:
UN1294, TOLUENE 3, II
IATA_P:
UN1294, Toluene 3, II
IATA_C:
UN1294, Toluene 3, II
CFR_ROAD:
UN1294, Toluene 3, II
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.
BENZENE

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

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

<table>
<thead>
<tr>
<th>SARA Hazard Classification</th>
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<th>Acute Health Hazard</th>
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<table>
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<th>SARA 313 Component(s)</th>
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<td>TOLUENE 108-88-3</td>
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<td>TOLUENE 108-88-3</td>
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<tr>
<td></td>
<td>1*</td>
<td>3</td>
<td>0</td>
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</tbody>
</table>

| NFPA         |        | 3            | 0          |       |

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).