1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE 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 number</td>
<td>1-800-ASHLAND (1-800-274-5263)</td>
</tr>
</tbody>
</table>

Product name: Derakane Momentum™ 411-350 EPOXY VINYL ESTER RESIN
™ Trademark, Ashland or its subsidiaries, registered in various countries
Product code: 40210
Product Use Description: No data

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance: liquid, light yellow

WARNING! FLAMMABLE LIQUID AND VAPOR. MAY AFFECT THE CENTRAL NERVOUS SYSTEM CAUSING DIZZINESS, HEADACHE OR NAUSEA. MAY BE HARMFUL IF INHALED. ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE. MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. PROLONGED OR REPEATED CONTACT MAY DRY SKIN, CAUSE IRRITATION AND BURNS.

Potential Health Effects

Exposure routes
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
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. 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 aerosol and/or mist is possible when material is sprayed. Aerosol and mist may present a greater risk of injury because more material may be present in the air than from vapor alone. 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: respiratory tract, skin, lung (for example, asthma-like conditions), liver, central nervous system, male reproductive system, auditory system.

**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 depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness) and other central nervous system effects, loss of coordination, confusion, liver damage.

**Target Organs**

Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals: mild, reversible kidney effects, effects on hearing, respiratory tract damage (nose, throat, and airways), testis damage, liver damage. Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans: mild effects on color vision, effects on hearing, respiratory tract damage (nose, throat, and airways), central nervous system effects.

**Carcinogenicity**

There was no increase in cancer in rats exposed to styrene by inhalation. However, there was an increase in lung cancer in styrene-exposed mice. The relevance of the mouse lung cancer to humans is uncertain. Styrene did not cause cancer in mice in studies in which the chemical was placed in the
stomachs through a feeding tube, or in a study in which styrene was given by injection. Epidemiological studies do not provide a basis for concluding that styrene causes cancer. Styrene is listed as a possible human carcinogen by the International Agency for Research on Cancer (IARC).

Reproductive hazard
This material (or a component) has been shown to cause harm to the fetus in laboratory animal studies. Harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to humans is uncertain.

Other information
Styrene readily reacts with low concentrations of halogens (for example, fluorine, chlorine, bromine, or iodine) to form a tear-producing substance.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Hazardous Components</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>STYRENE</td>
<td>100-42-5</td>
<td>&gt;=40-&lt;50%</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:** 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.

### 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media**

Water spray, Carbon dioxide (CO2), Alcohol-resistant foam, Foam, Dry chemical

**Hazardous combustion products**

phenols, toxic fumes, various hydrocarbons, carbon dioxide and carbon monoxide

**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. During a fire, irritating or toxic decomposition products may be generated. 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. Polymerization will take place under fire conditions. If polymerization occurs in a closed container, there is a possibility it will rupture violently. Cool storage container with water, if exposed to fire.

**NFPA Flammable and Combustible Liquids Classification**

Flammable Liquid Class IC
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. Avoid prolonged or frequently repeated skin contact with this material. Skin contact can be minimized by wearing impervious protective gloves. As with all products of this nature, good personal hygiene is essential. Hands and other exposed areas should be washed thoroughly with soap and water after contact, especially before eating and/or smoking. Regular laundering of contaminated clothing is essential to reduce indirect skin contact with this material. Do not use pressure to empty container. 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. Warning. Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions. Spills of these organic
materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion.

**Storage**

Do not store near extreme heat, open flame, or sources of ignition. Maintain inhibitor and dissolved oxygen level. Do not blanket or purge with an inert gas to avoid depleting the oxygen concentration. Store out of direct sunlight. Store in a cool, dry, ventilated area, away from incompatible substances.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Exposure Guidelines

<table>
<thead>
<tr>
<th>STYRENE</th>
<th>100-42-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
<td>time weighted average</td>
</tr>
<tr>
<td>ACGIH</td>
<td>Short term exposure limit</td>
</tr>
<tr>
<td>NIOSH</td>
<td>Recommended exposure limit (REL):</td>
</tr>
<tr>
<td>NIOSH</td>
<td>Recommended exposure limit (REL):</td>
</tr>
<tr>
<td>NIOSH</td>
<td>Short term exposure limit</td>
</tr>
<tr>
<td>NIOSH</td>
<td>Short term exposure limit</td>
</tr>
<tr>
<td>OSHA Z2</td>
<td>time weighted average</td>
</tr>
<tr>
<td>OSHA Z2</td>
<td>Ceiling Limit Value:</td>
</tr>
<tr>
<td>OSHA Z2</td>
<td>Maximum concentration:</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 TLV(s). OSHA has formally endorsed a styrene industry proposal for a voluntary 50 ppm workplace limit on styrene. Members of the Styrene Information and Research Council (SIRC), Composites Institute (CI), Composite Fabricators Association (CFA), International Cast Polymers Association (ICPA) and National Marine Manufacturers Association (NMMA) have agreed to use either engineering controls, work practices or respiratory protection to achieve this voluntary limit for styrene.
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
Wear resistant gloves (consult your safety equipment supplier). To prevent repeated or prolonged skin contact, wear impervious clothing and boots. Wear normal work clothing covering arms and legs. 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>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>liquid</td>
</tr>
<tr>
<td>Form</td>
<td>liquid</td>
</tr>
<tr>
<td>Colour</td>
<td>light yellow</td>
</tr>
<tr>
<td>Odour</td>
<td>pungent</td>
</tr>
<tr>
<td>Boiling point/boiling range</td>
<td>293 °F / 145 °C</td>
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<tr>
<td>Melting point/range</td>
<td>no data available</td>
</tr>
<tr>
<td>Sublimation point</td>
<td>no data available</td>
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<tr>
<td>pH</td>
<td>no data available</td>
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<tr>
<td>Flash point</td>
<td>84.9 °F / 29.4 °C Seta closed cup</td>
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<tr>
<td>Ignition temperature</td>
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<tr>
<td>Evaporation rate</td>
<td>(&lt;)1 Ethyl Ether</td>
</tr>
<tr>
<td>Lower explosion limit/Upper explosion limit</td>
<td>1.1 %(V) / 6.1 %(V)</td>
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<tr>
<td>Particle size</td>
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<tr>
<td>Vapour pressure</td>
<td>0.853 kPa @ 77 °F / 25 °C</td>
</tr>
<tr>
<td>Relative vapour density</td>
<td>(&gt;1) AIR=1</td>
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<tr>
<td>Density</td>
<td>1.078 g/cm³ @ 68 °F / 20 °C</td>
</tr>
<tr>
<td></td>
<td>8.7 lb/gal @ 77 °F / 25 °C</td>
</tr>
<tr>
<td>Bulk density</td>
<td>No data</td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Stability
Stable.

Conditions to avoid
Heat, flames and sparks., Exposure to sunlight., Exposure to air.

Incompatible products
Acids, alkalis, aluminum, aluminum chloride, Bases, Copper, Copper alloys, halogens, iron chloride, metal salts, Peroxides, Strong oxidizing agents

Hazardous decomposition products
phenols, toxic fumes, various hydrocarbons, carbon dioxide and carbon monoxide

Hazardous reactions
Product can undergo hazardous polymerization., Avoid exposure to excessive heat, peroxides and polymerization catalysts.

Thermal decomposition
No data

11. TOXICOLOGICAL INFORMATION
Acute oral toxicity
STYRENE : LD 50 Rat: 2,650 mg/kg

Acute inhalation toxicity
STYRENE : LC 50 Rat: 2800 ppm; 4 h

Acute dermal toxicity
STYRENE : no data available

12. ECOLOGICAL INFORMATION

Biodegradability
STYRENE : no data available

Bioaccumulation
STYRENE : no data available

Ecotoxicity effects
Toxicity to fish
STYRENE : no data available

Toxicity to daphnia and other aquatic invertebrates.
STYRENE : no data available

Toxicity to algae
STYRENE : no data available

Toxicity to bacteria
STYRENE : no data available
Biochemical Oxygen Demand (BOD)

STYRENE : no data available

Chemical Oxygen Demand (COD)

STYRENE : no data available

Additional ecological information

STYRENE : no data available

13. DISPOSAL CONSIDERATIONS

Waste disposal methods

Contaminated absorbent may be deposited in a landfill in accordance with local, state and federal regulations. Destroy by liquid incineration in accordance with applicable regulations. Dispose of in accordance with all applicable local, state and federal regulations. Do not discharge effluent containing this product into lakes, streams, ponds or estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit, and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA. 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>ID NUMBER</th>
<th>PROPER SHIPPING NAME</th>
<th>*HAZARD CLASS</th>
<th>SUBSIDIARY HAZARDS</th>
<th>PACKING GROUP</th>
<th>MARINE POLLUTANT / LTD. QTY.</th>
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<tbody>
<tr>
<td>MEXICAN REGULATION FOR THE LAND TRANSPORT OF HAZARDOUS MATERIALS AND WASTES</td>
<td>UN 1866</td>
<td>RESINA, SOLUCIONES DE</td>
<td>3</td>
<td>III</td>
<td></td>
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<tr>
<td>INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER</td>
<td>UN 1866</td>
<td>Resin solution</td>
<td>3</td>
<td>III</td>
<td></td>
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</table>
INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO  
UN  1866  Resin solution  3  III 

INTERNATIONAL MARITIME DANGEROUS GOODS  
UN  1866  RESIN SOLUTION  3  III 

TRANSPORT CANADA - INLAND WATERWAYS  
UN  1866  RESIN SOLUTION  3  III 

TRANSPORT CANADA - RAIL  
UN  1866  RESIN SOLUTION  3  III 

TRANSPORT CANADA - ROAD  
UN  1866  RESIN SOLUTION  3  III 

U.S. DOT - INLAND WATERWAYS  
UN  1866  Resin solution  3  III 

U.S. DOT - RAIL  
UN  1866  Resin solution  3  III 

U.S. DOT - ROAD  
UN  1866  Resin solution  3  III 

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

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

| BENZENE | TOLUENE |

SARA Hazard Classification
Reactivity Hazard

Fire Hazard
Acute Health Hazard
Chronic Health Hazard

SARA 313 Component(s)

| STYRENE | 43.96 % |

New Jersey RTK Label Information

| POLYMER | 800986-5229P |
| STYRENE | 100-42-5 |

Pennsylvania RTK Label Information

| POLYMER | 800986-5229P |
| STYRENE | 100-42-5 |

Notification status

US. Toxic Substances Control Act y (positive listing)
Australia. Industrial Chemical (Notification and Assessment) Act q (quantity restricted)
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 n (Negative listing)
China. Inventory of Existing Chemical Substances y (positive listing)
New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand n (Negative listing)

Reportable quantity - Product

US. EPA CERCLA Hazardous Substances (40 CFR 302) 2274 lbs
**Reportable quantity-Components**

<table>
<thead>
<tr>
<th></th>
<th>HMIS</th>
<th>NFPA</th>
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</thead>
<tbody>
<tr>
<td>Health</td>
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<tr>
<td>Flammability</td>
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<td>3</td>
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<tr>
<td>Physical hazards</td>
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<tr>
<td>Instability</td>
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<td>2</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).