### Section 1. Identification

<table>
<thead>
<tr>
<th><strong>Product name</strong></th>
<th>Styrene</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chemical name</strong></td>
<td>styrene</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>benzene, vinyl-; cinnamene; cinnamol; cinnamol; diarex hf 77; ethylene, phenyl-; nci-c02200; phenethylene; phenylethene; phenylethylene; stireno (italian); stireen (dutch); stiren (czech); styrol (german); styrole; styrolene; styrone; styropol; styropor; vinylbenzen (czech); vinylbenzene; vinylbenzol; styrene monomer</td>
</tr>
<tr>
<td><strong>Product type</strong></td>
<td>Liquid.</td>
</tr>
<tr>
<td><strong>CAS number</strong></td>
<td>100-42-5</td>
</tr>
</tbody>
</table>

**Supplier’s details**

SABIC Innovative Plastics  
One Plastics Avenue  
Pittsfield, MA 01201 USA

**Emergency telephone number (with hours of operation)**

CHEMTREC, U.S.: (800) 424-9300  
International: (703) 527-3887

### Section 2. Hazards identification

**OSHA/HCS status**

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture**

- FLAMMABLE LIQUIDS - Category 3  
- ACUTE TOXICITY (inhalation) - Category 4  
- SKIN CORROSION/IRRITATION - Category 2  
- SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2  
- TOXIC TO REPRODUCTION (Fertility) - Category 2  
- SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3  
- SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1  
- ASPIRATION HAZARD - Category 1

**GHS label elements**

**Hazard pictograms**

- Flammable liquid and vapor.
- Harmful if inhaled.
- Causes serious eye irritation.
- Causes skin irritation.
- Suspected of damaging fertility.
- May be fatal if swallowed and enters airways.
- May cause respiratory irritation.
- Causes damage to organs through prolonged or repeated exposure.

**Precautionary statements**

**Prevention**

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Wear protective gloves; > 8 hours (breakthrough time): Vilon® (> 0.7 mm); 4 - 8 hours (breakthrough time): polyvinyl alcohol (PVA). Wear eye or face protection: Recommended: safety glasses with side-shields. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container...
**Section 2. Hazards identification**

**Response**
- Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

**Storage**
- Store locked up. Store in a well-ventilated place. Keep cool.

**Disposal**
- Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Supplemental label elements**
- Eliminate sources of ignition. Avoid spark promoters. Ground/bond container and receiving equipment. These alone may be insufficient to remove static electricity.

**Hazards not otherwise classified**
- Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment. Sparks may ignite liquid and vapor may cause flash fire or explosion.

**Section 3. Composition/information on ingredients**

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Other means of identification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>benzene, vinyl-; cinnamene; cinnamol; cinnamol; diarex hf 77; ethylene, phenyl-; nci-c02200; phenethylene; phenylethene; phenylethylene; stirolo (italian); styreen (dutch); styren (czech); styrol (german); styrole; styrolene; styron; styropol; styropor; vinylbenzen (czech); vinylbenzene; vinylbenzol; styrene monomer</td>
</tr>
</tbody>
</table>

**CAS number/other identifiers**
- **CAS number**: 100-42-5
- **Product code**: S-0434

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>styrene</td>
<td>&gt;99.5</td>
<td>100-42-5</td>
</tr>
</tbody>
</table>

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

**Section 4. First aid measures**

**Eye contact**
- Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

**Inhalation**
- Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Skin contact**
- Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
**Section 4. First aid measures**

| **Ingestion** | Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. |
| **Inhalation** | Harmful if inhaled. May cause respiratory irritation. |
| **Skin contact** | Causes skin irritation. |
| **Ingestion** | May be fatal if swallowed and enters airways. Irritating to mouth, throat and stomach. |

**Potential acute health effects**

| **Eye contact** | Causes serious eye irritation. |
| **Inhalation** | Adverse symptoms may include the following: 
- respiratory tract irritation
- coughing
- reduced fetal weight
- increase in fetal deaths
- skeletal malformations |
| **Skin contact** | Adverse symptoms may include the following: 
- irritation
- redness
- reduced fetal weight
- increase in fetal deaths
- skeletal malformations |
| **Ingestion** | Adverse symptoms may include the following: 
- nausea or vomiting
- reduced fetal weight
- increase in fetal deaths
- skeletal malformations |

**Over-exposure signs/symptoms**

**Eye contact**
- pain or irritation
- watering
- redness

**Inhalation**
- respiratory tract irritation
- coughing
- reduced fetal weight
- increase in fetal deaths
- skeletal malformations

**Skin contact**
- irritation
- redness
- reduced fetal weight
- increase in fetal deaths
- skeletal malformations

**Ingestion**
- nausea or vomiting
- reduced fetal weight
- increase in fetal deaths
- skeletal malformations

**Indication of immediate medical attention and special treatment needed, if necessary**

**Notes to physician**
Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments**
No specific treatment.

**Protection of first-aiders**
No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)
Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media**: Use dry chemical, CO₂, water spray (fog) or foam.

**Unsuitable extinguishing media**: Do not use water jet.

**Specific hazards arising from the chemical**: Flammable liquid and vapor. This product is a poor conductor of electricity and can become electrostatically charged. If sufficient charge is accumulated, ignition of flammable mixtures can occur. To reduce potential for static discharge, use proper bonding and grounding procedures. This liquid may accumulate static electricity when filling properly grounded containers. Static accumulation may be significantly increased by the presence of small quantities of water or other contaminants. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

**Hazardous thermal decomposition products**: Decomposition products may include the following materials:
- Carbon dioxide
- Carbon monoxide

**Special protective actions for fire-fighters**: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

**Special protective equipment for fire-fighters**: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel**: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders**: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions**: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

**Methods and materials for containment and cleaning up**

**Small spill**: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

**Large spill**: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.
### Section 7. Handling and storage

#### Precautions for safe handling

**Protective measures**: Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not swallow. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (venting, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container. Handling operations that can promote accumulation of static charges include but are not limited to: mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank cleaning, sampling, gauging, switch loading, vacuum truck operations. Restrict flow velocity according to API 2003 (2008), NFPA 77 (2007), and Laurence Britton, “Avoiding Static Ignition Hazards in Chemical Operations”. To reduce potential for static discharge, ensure that all equipment is properly grounded and bonded and meets appropriate electrical classification requirements.

**Advice on general occupational hygiene**: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities**: Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. May produce or accumulate static electricity with the risk of causing fire and explosion. Take precautionary measures against static discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. (Steel drum, vessel/container). Static sparks can readily ignite flammable vapour-air mixtures. Bonding and grounding may be insufficient to eliminate the fire or explosion hazard. Take additional precautionary measures, like adding an inert gas, adding anti-static agent, reducing transfer flow velocity (<1m/s). Avoid splash filling. Do NOT use compressed air for filling, discharging or handling operations.

### Section 8. Exposure controls/personal protection

#### Control parameters

**Occupational exposure limits**

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Exposure limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>styrene</td>
<td>ACGIH TLV (United States, 4/2014). Absorbed through skin. STEL: 170 mg/m³ 15 minutes. STEL: 40 ppm 15 minutes. TWA: 85 mg/m³ 8 hours. TWA: 20 ppm 8 hours. NIOSH REL (United States, 10/2013). STEL: 425 mg/m³ 15 minutes. STEL: 100 ppm 15 minutes. TWA: 215 mg/m³ 10 hours. TWA: 50 ppm 10 hours.</td>
</tr>
</tbody>
</table>

Section 8. Exposure controls/personal protection

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AMP: 600 ppm 5 minutes.</td>
<td>Notes: See Table Z-2.</td>
</tr>
<tr>
<td></td>
<td>CEIL: 200 ppm 0 hours.</td>
<td>STEL: 425 mg/m³ 15 minutes.</td>
</tr>
<tr>
<td></td>
<td>TWA: 100 ppm 8 hours.</td>
<td>STEL: 100 ppm 15 minutes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA: 215 mg/m³ 8 hours.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA: 50 ppm 8 hours.</td>
</tr>
</tbody>
</table>

**Appropriate engineering controls**: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

**Environmental exposure controls**: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

**Individual protection measures**

**Hygiene measures**: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection**: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles. Recommended: safety glasses with side-shields

**Skin protection**

**Hand protection**: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. > 8 hours (breakthrough time); Viton® (> 0.7 mm)

4 - 8 hours (breakthrough time): polyvinyl alcohol (PVA).

**Body protection**: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

**Other skin protection**: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Respiratory protection**: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: organic vapor filter (Type A)

**Personal protective equipment (Pictograms)**: 

## Section 9. Physical and chemical properties

**Appearance**

<table>
<thead>
<tr>
<th>Physical state</th>
<th>Liquid.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Colorless to light yellow.</td>
</tr>
<tr>
<td>Odor</td>
<td>Characteristic. Sweetish.</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>0.05 to 0.08 ppm</td>
</tr>
<tr>
<td>pH</td>
<td>Not available.</td>
</tr>
<tr>
<td>Melting point</td>
<td>-31°C (-23.8°F)</td>
</tr>
<tr>
<td>Boiling point</td>
<td>145°C (293°F)</td>
</tr>
<tr>
<td>Flash point</td>
<td>Closed cup: 31°C (87.8°F) [Closed cup]</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>0.536 (butyl acetate = 1)</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Lower and upper explosive (flammable) limits</td>
<td>Lower: 1.1% Upper: 6.1%</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>0.67 kPa (5 mm Hg) [room temperature]</td>
</tr>
<tr>
<td>Vapor density</td>
<td>3.6 [Air = 1]</td>
</tr>
<tr>
<td>Density</td>
<td>0.9 to 0.91 g/cm³ [20°C (68°F)]</td>
</tr>
<tr>
<td>Relative density</td>
<td>0.906</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>0.32 g/l</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not available.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>490°C (914°F)</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Dynamic (room temperature): 0.696 mPa·s (0.696 cP)</td>
</tr>
</tbody>
</table>
| Physical/chemical properties comments | Liquid Conductivity (ps/m): 10  
Dielectric Constant: 2.43 |

## Section 10. Stability and reactivity

**Reactivity**

Maintain dissolved oxygen and inhibitor concentrations at proper levels to prevent runaway polymerization.

**Chemical stability**

The product is stable.

**Possibility of hazardous reactions**

Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid**

Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

**Incompatible materials**

Reactive or incompatible with the following materials: oxidizing materials

**Hazardous decomposition products**

Under normal conditions of storage and use, hazardous decomposition products should not be produced.
# Section 11. Toxicological information

## Information on toxicological effects

### Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>styrene</td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>11.8 mg/l</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Rat</td>
<td>&gt;2000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>5000 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

**Conclusion/Summary**: Irritating to respiratory system.

### Irritation/Corrosion

Not available.

**Conclusion/Summary**

- **Skin**: Irritating to skin.
- **Eyes**: Severely irritating to eyes.

### Sensitization

Not available.

**Conclusion/Summary**

- **Skin**: Non-sensitizer to skin.
- **Respiratory**: Non-sensitizer.

### Mutagenicity

Not available.

**Conclusion/Summary**: Not mutagenic.

### Carcinogenicity

Not available.

**Conclusion/Summary**: U.S. National Toxicology Program.-Reasonably anticipated to be a human carcinogen. International Agency for Research on Cancer.-Group 2B

### Classification

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>OSHA</th>
<th>IARC</th>
<th>NTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>styrene</td>
<td>-</td>
<td>2B</td>
<td>Reasonably anticipated to be a human carcinogen.</td>
</tr>
</tbody>
</table>

### Reproductive toxicity

Not available.

**Conclusion/Summary**: Maternal toxicity

### Teratogenicity

Not available.

**Conclusion/Summary**: Maternal toxicity

### Specific target organ toxicity (single exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>styrene</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
</tbody>
</table>

### Specific target organ toxicity (repeated exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>styrene</td>
<td>Category 1</td>
<td>Not determined</td>
<td>Not determined</td>
</tr>
</tbody>
</table>

### Aspiration hazard

<table>
<thead>
<tr>
<th>Name</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>styrene</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
</tbody>
</table>

**Date of issue/Date of revision**: 5/8/2015. **Date of previous issue**: 5/8/2015. **Version**: 2
Section 11. Toxicological information

Information on the likely routes of exposure

Routes of entry anticipated: Inhalation.

Potential acute health effects

Eye contact: Causes serious eye irritation.
Inhalation: Harmful if inhaled. May cause respiratory irritation.
Skin contact: Causes skin irritation.
Ingestion: May be fatal if swallowed and enters airways. Irritating to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact: Adverse symptoms may include the following:
- pain or irritation
- watering
- redness

Inhalation: Adverse symptoms may include the following:
- respiratory tract irritation
- coughing
- reduced fetal weight
- increase in fetal deaths
- skeletal malformations

Skin contact: Adverse symptoms may include the following:
- irritation
- redness
- reduced fetal weight
- increase in fetal deaths
- skeletal malformations

Ingestion: Adverse symptoms may include the following:
- nausea or vomiting
- reduced fetal weight
- increase in fetal deaths
- skeletal malformations

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects
- Eye contact: Causes serious eye irritation.
- Inhalation: Harmful if inhaled. May cause respiratory irritation.
- Ingestion: May be fatal if swallowed and enters airways. Irritating to mouth, throat and stomach.
- Skin contact: Causes skin irritation.

Potential delayed effects: Not available.

Long term exposure

Potential immediate effects: Harmful if inhaled.
- Causes serious eye irritation.
- Causes skin irritation.
- May be fatal if swallowed and enters airways.
- May cause respiratory irritation.

Potential delayed effects: Causes damage to ears through prolonged or repeated exposure.

Potential chronic health effects

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>styrene</td>
<td>Chronic NOAEL Inhalation Vapor</td>
<td>Rat</td>
<td>2.13 mg/l</td>
<td>4 weeks; 6 hours per day 5 workdays/week.</td>
</tr>
<tr>
<td></td>
<td>Chronic NOAEL Inhalation Vapor</td>
<td>Rat</td>
<td>2.13 mg/l</td>
<td>13 weeks; 6 hours per day 5 workdays/week.</td>
</tr>
</tbody>
</table>

General: Causes damage to organs through prolonged or repeated exposure.
Section 11. Toxicological information

- **Carcinogenicity**: No known significant effects or critical hazards.
- **Mutagenicity**: No known significant effects or critical hazards.
- **Teratogenicity**: No known significant effects or critical hazards.
- **Developmental effects**: No known significant effects or critical hazards.
- **Fertility effects**: Suspected of damaging fertility.

**Numerical measures of toxicity**

**Acute toxicity estimates**

Not available.

Section 12. Ecological information

**Toxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>styrene</td>
<td>Acute EC50 4.9 mg/l Fresh water</td>
<td>Algae - Selenastrum capricornutum</td>
<td>72 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 4.7 mg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 9.5 mg/l Fresh water</td>
<td>Crustaceans - Hyalella azteca</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 4.02 mg/l Fresh water</td>
<td>Fish - Pimephales promelas</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 10 mg/l Fresh water</td>
<td>Fish - Pimephales promelas</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 1.01 mg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>21 days</td>
</tr>
</tbody>
</table>

**Persistence and degradability**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Test</th>
<th>Result</th>
<th>Dose</th>
<th>Inoculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>styrene</td>
<td>ISO DIS 9408</td>
<td>68 % - Readily - 10 days</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Bioaccumulative potential**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>LogP&lt;sub&gt;ow&lt;/sub&gt;</th>
<th>BCF</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>styrene</td>
<td>2.96</td>
<td>74</td>
<td>low</td>
</tr>
</tbody>
</table>

**Mobility in soil**

| Soil/water partition coefficient (K<sub>oc</sub>) | 352  |

**Other adverse effects**: No known significant effects or critical hazards.

Section 13. Disposal considerations

**Disposal methods**: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere.
Section 13. Disposal considerations

inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

<table>
<thead>
<tr>
<th>DOT Classification</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>UN2055</td>
<td>UN2055</td>
</tr>
<tr>
<td>UN proper shipping name</td>
<td>Styrene monomer, stabilized</td>
<td>STYRENE MONOMER, STABILIZED</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
<td>III</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td>No.</td>
<td>No.</td>
</tr>
<tr>
<td>Reportable quantity</td>
<td>Yes.</td>
<td>Yes.</td>
</tr>
<tr>
<td>Limited quantity</td>
<td>Yes.</td>
<td>Yes.</td>
</tr>
<tr>
<td>Packaging instruction</td>
<td>Passenger aircraft</td>
<td>Quantity limitation: 60 L</td>
</tr>
<tr>
<td>Cargo aircraft</td>
<td>Quantity limitation: 220 L</td>
<td>Quantity limitation: 220 L</td>
</tr>
<tr>
<td>Special provisions</td>
<td>B1, IB3, T2, TP1</td>
<td></td>
</tr>
</tbody>
</table>

Special precautions for user : Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.
Section 15. Regulatory information

U.S. Federal regulations

- **Clean Water Act (CWA) 311**: styrene

**TSCA 8(b) inventory**: All components are listed or exempted.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)**

- **Clean Air Act Section 602 Class I Substances**: Not listed
- **Clean Air Act Section 602 Class II Substances**: Not listed

**DEA List I Chemicals (Precursor Chemicals)**

- Not listed

**DEA List II Chemicals (Essential Chemicals)**

- Not listed

**SARA 302/304 Composition/information on ingredients**

No products were found.

**SARA 304 RQ**: Not applicable.

**SARA 311/312 Classification**

- Fire hazard
- Immediate (acute) health hazard
- Delayed (chronic) health hazard

**Composition/information on ingredients**

<table>
<thead>
<tr>
<th>Name</th>
<th>%</th>
<th>Fire hazard</th>
<th>Sudden release of pressure</th>
<th>Reactive</th>
<th>Immediate (acute) health hazard</th>
<th>Delayed (chronic) health hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>styrene</td>
<td>&gt;99.5</td>
<td>Yes.</td>
<td>No.</td>
<td>No.</td>
<td>Yes.</td>
<td>Yes.</td>
</tr>
</tbody>
</table>

**SARA 313**

<table>
<thead>
<tr>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form R - Reporting requirements styrene</td>
<td>100-42-5</td>
<td>100</td>
</tr>
<tr>
<td>Supplier notification styrene</td>
<td>100-42-5</td>
<td>100</td>
</tr>
</tbody>
</table>

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

**State regulations**

- **Massachusetts**: The following components are listed: STYRENE MONOMER
- **New York**: The following components are listed: Styrene
- **New Jersey**: The following components are listed: STYRENE MONOMER; BENZENE, ETHENYL-
- **Pennsylvania**: The following components are listed: BENZENE, ETHENYL-

**International regulations**

**Chemical Weapon Convention List Schedules I, II & III Chemicals**

- Not listed.

**Montreal Protocol (Annexes A, B, C, E)**

- Not listed.

**Stockholm Convention on Persistent Organic Pollutants**

- Not listed.

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Section 15. Regulatory information

Rotterdam Convention on Prior Inform Consent (PIC)
Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals
Not listed.

International lists
National inventory
Australia: All components are listed or exempted.
Canada: All components are listed or exempted.
China: All components are listed or exempted.
Europe: All components are listed or exempted.
Japan: All components are listed or exempted.
New Zealand: All components are listed or exempted.
Philippines: All components are listed or exempted.
Republic of Korea: All components are listed or exempted.
Taiwan: All components are listed or exempted.
United States inventory (TSCA 8b): All components are listed or exempted.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Physical hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Instability/Reactivity</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

History
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Date of previous issue: 5/8/2015.
Section 16. Other information

Version : 2

Key to abbreviations :
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
UN = United Nations

References : Not available.

Notice to reader
The information contained in the Safety Data Sheet is at the date of its issuance to the best of our knowledge correct according to the data available to us. The information is meant as a guideline for safe use, handling, disposal, storage and transport of products and does not imply any warranty (not implied nor explicitly) or specification. The Supplier shall to the extent permitted by law not be liable for any error or incorrectness in the information contained in this Safety Data Sheet. The information relates exclusively to the specified products, which may not be suitable for combination with other materials or use in processes other than those specifically described here.