1. Identification

Product identifier: Chlorobenzene

Other means of identification

- CAS number: 108-90-7

Recommended use: General purpose solvent.

Recommended restrictions: Use in accordance with manufacturer's recommendations.

Manufacturer/Importer/Supplier/Distributor information

- Company Name: Greenfield Global USA Inc.
- Address: 1101 Isaac Shelby Drive, Shelbyville, KY 40065, USA
- Telephone: 502.232.7600
- Fax: 502.633.6100

- Company Name: Greenfield Global USA Inc.
- Address: 58 Vale Road, Brookfield, CT 06804, USA
- Telephone: 203.740.3471
- Fax: 203.740.3481

Emergency phone number

- USA: CHEMTREC: 1.800.424.9300 (CCN 17213)
- International: CHEMTREC: +1.703.527.3887 (CCN 17213)

2. Hazard(s) identification

Physical hazards

- Flammable liquids: Category 3

Health hazards

- Acute toxicity, inhalation: Category 4
- Skin corrosion/irritation: Category 2

Environmental hazards

- Hazardous to the aquatic environment, acute hazard: Category 2
- Hazardous to the aquatic environment, long-term hazard: Category 2

OSHA defined hazards

- Not classified.

Label elements

Signal word: Warning

Hazard statement: Flammable liquid and vapor. Harmful if inhaled. Causes skin irritation. Toxic to aquatic life with long lasting effects.
Precautionary statement

Prevention
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Avoid breathing vapors. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/eye protection/face protection. Avoid release to the environment.

Response
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell. In case of fire: Use foam, carbon dioxide, dry powder or water fog for extinction. Collect spillage.

Storage
Store in a well-ventilated place. Keep cool.

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC)
None known.

Supplemental information
None.

3. Composition/information on ingredients

Substances

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorobenzene</td>
<td></td>
<td>108-90-7</td>
<td>100</td>
</tr>
</tbody>
</table>

Composition comments
All concentrations are in percent by weight unless otherwise indicated.

4. First-aid measures

Inhalation
Remove victim to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Call a poison center or doctor/physician if you feel unwell.

Skin contact
Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Eye contact
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Get medical attention if irritation develops and persists.

Ingestion
Rinse mouth. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed
Direct contact with eyes may cause temporary irritation. Skin irritation. May cause redness and pain.

Indication of immediate medical attention and special treatment needed
Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General information
Take off all contaminated clothing immediately. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media
Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media
Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical
Vapors may form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. During fire, gases hazardous to health may be formed. Combustion products may include: Hydrogen chloride gas.

Special protective equipment and precautions for firefighters
Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions
In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk. Use water spray to keep fire-exposed containers cool.

Specific methods
Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards
Flammable liquid and vapor.
6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Avoid inhalation of vapors and spray mists. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up

Use water spray to reduce vapors or divert vapor cloud drift. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material. Take precautionary measures against static discharge. Use only non-sparking tools. Prevent product from entering drains.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water.

Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Environmental precautions

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

7. Handling and storage

Precautions for safe handling

Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. When using do not smoke. Explosion-proof general and local exhaust ventilation. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Avoid inhalation of vapors and spray mists. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Use only outdoors or in a well-ventilated area. Wear appropriate personal protective equipment. Avoid release to the environment. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Store in tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

<table>
<thead>
<tr>
<th>Material</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorobenzene (CAS 108-90-7)</td>
<td>PEL</td>
<td>350 mg/m3</td>
</tr>
<tr>
<td>Chlorobenzene (CAS 108-90-7)</td>
<td>75 ppm</td>
<td></td>
</tr>
</tbody>
</table>

US. ACGIH Threshold Limit Values

<table>
<thead>
<tr>
<th>Material</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorobenzene (CAS 108-90-7)</td>
<td>TWA</td>
<td>10 ppm</td>
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</tbody>
</table>

Biological limit values

<table>
<thead>
<tr>
<th>Material</th>
<th>Value</th>
<th>Determinant</th>
<th>Specimen</th>
<th>Sampling Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorobenzene (CAS 108-90-7)</td>
<td>100 mg/g</td>
<td>4-Chlorocatechol, with hydrolysis</td>
<td>Creatinine in urine</td>
<td>*</td>
</tr>
</tbody>
</table>

* - For sampling details, please see the source document.

Appropriate engineering controls

Explosion-proof general and local exhaust ventilation. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.
Individual protection measures, such as personal protective equipment

**Eye/face protection**  
Wear safety glasses with side shields (or goggles).

**Skin protection**  
**Hand protection**  
Wear appropriate chemical resistant gloves. Viton® gloves are recommended. Be aware that the liquid may penetrate the gloves. Frequent change is advisable.

**Skin protection**  
**Other**  
Wear appropriate chemical resistant clothing.

**Respiratory protection**  
If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.

**Thermal hazards**  
Wear appropriate thermal protective clothing, when necessary.

**General hygiene considerations**  
When using do not smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

### 9. Physical and chemical properties

**Appearance**
- **Physical state**: Liquid.
- **Form**: Liquid.
- **Color**: Colorless.

**Odor**  
Not available.

**Odor threshold**  
Not available.

**pH**  
Not available.

**Melting point/freezing point**  
-49 °F (-45 °C)

**Initial boiling point and boiling range**  
269.6 °F (132 °C)

**Flash point**  
82.4 °F (28.0 °C) Closed Cup

**Evaporation rate**  
Not available.

**Flammability (solid, gas)**  
Not applicable.

**Upper/lower flammability or explosive limits**
- **Flammability limit - lower (%)**: 9.6 % v/v
- **Flammability limit - upper (%)**: 1.3 % v/v

**Vapor pressure**  
11.8 mm Hg (77 °F (25 °C))

**Relative density**  
1.106 g/cm³ (77 °F (25 °C))

**Solubility(ies)**
- **Solubility (water)**: Insoluble.

**Auto-ignition temperature**  
1099.4 °F (593 °C)

**Decomposition temperature**  
Not available.

**Viscosity**  
Not available.

**Other information**
- **Explosive properties**: Not explosive.
- **Molecular formula**: C₆-H₅-Cl
- **Molecular weight**: 112.56 g/mol
- **Oxidizing properties**: Not oxidizing.

### 10. Stability and reactivity

**Reactivity**  
The product is stable and non-reactive under normal conditions of use, storage and transport.

**Chemical stability**  
Material is stable under normal conditions.

**Possibility of hazardous reactions**  
Hazardous polymerization does not occur.

**Conditions to avoid**  
Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Contact with incompatible materials.
Incompatible materials
Strong oxidizing agents.

Hazardous decomposition products
No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation
Harmful if inhaled.

Skin contact
Causes skin irritation.

Eye contact
Direct contact with eyes may cause temporary irritation.

Ingestion
May cause discomfort if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics
Direct contact with eyes may cause temporary irritation. Skin irritation. May cause redness and pain.

Information on toxicological effects

Acute toxicity
Harmful if inhaled.

Product
Species
Test Results

Chlorobenzene (CAS 108-90-7)

Acute
Inhalation
LC50
Rat
2965 ppm, 6 Hours

Skin corrosion/irritation
Causes skin irritation.

Serious eye damage/eye irritation
Direct contact with eyes may cause temporary irritation.

Respiratory or skin sensitization

Respiratory sensitization
Not a respiratory sensitizer.

Skin sensitization
This product is not expected to cause skin sensitization.

Germ cell mutagenicity
No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity
IARC Monographs. Overall Evaluation of Carcinogenicity
Not listed.

NTP Report on Carcinogens
Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)
Not listed.

Reproductive toxicity
This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure
Not classified.

Specific target organ toxicity - repeated exposure
Not classified.

Aspiration hazard
Not an aspiration hazard.

Chronic effects
Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity
Toxic to aquatic life with long lasting effects.

Product
Species
Test Results

Chlorobenzene (CAS 108-90-7)

Aquatic
Fish
LC50
Sheepshead minnow (Cyprinodon variegatus)
10 mg/l, 96 hours

Persistence and degradability
No data is available on the degradability of this substance.

Bioaccumulative potential
No data available for this product.

Mobility in soil
Expected to be mobile in soil.
### Other adverse effects

No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

### 13. Disposal considerations

#### Disposal instructions

Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Incinerate the material under controlled conditions in an approved incinerator. Do not incinerate sealed containers. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. If discarded, this product is considered a RCRA ignitable waste, D001. Dispose of contents/container in accordance with local/regional/national/international regulations.

**Local disposal regulations**

Dispose in accordance with all applicable regulations.

**Hazardous waste code**

D001: Waste Flammable material with a flash point <140 °F

D021: Waste Chlorobenzene

The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

#### Disposal instructions

Dispose in accordance with all applicable regulations.

**Local disposal regulations**

D001: Waste Flammable material with a flash point <140 °F

**Hazardous waste code**

Chlorobenzene (CAS 108-90-7) U List: Reference

Chlorobenzene (CAS 108-90-7) U037

**US RCRA Hazardous Waste U List: Reference**

Chlorobenzene (CAS 108-90-7) U037

**Waste from residues / unused products**

Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

**Contaminated packaging**

Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

### 14. Transport information

#### DOT

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
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<tbody>
<tr>
<td>UN number</td>
<td>UN1134</td>
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<tr>
<td>UN proper shipping name</td>
<td>Chlorobenzene (Chlorobenzene RQ = 100 LBS)</td>
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<tr>
<td>Transport hazard class(es)</td>
<td>3</td>
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<tr>
<td>Class</td>
<td>3</td>
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<tr>
<td>Subsidiary risk</td>
<td>-</td>
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<tr>
<td>Label(s)</td>
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<td>Packing group</td>
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<tr>
<td>Environmental hazards</td>
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<tr>
<td>Marine pollutant</td>
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<tr>
<td>Special precautions for user</td>
<td>Read safety instructions, SDS and emergency procedures before handling.</td>
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<tr>
<td>Special provisions</td>
<td>B1, IB3, T2, TP1</td>
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<tr>
<td>Packaging exceptions</td>
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<td>Packaging non bulk</td>
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<td>Packaging bulk</td>
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</table>

#### IATA

<table>
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<tr>
<th>Code</th>
<th>Value</th>
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<td>UN number</td>
<td>UN1134</td>
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<tr>
<td>UN proper shipping name</td>
<td>Chlorobenzene</td>
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<tr>
<td>Transport hazard class(es)</td>
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<tr>
<td>Class</td>
<td>3</td>
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<tr>
<td>Subsidiary risk</td>
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<td>Packing group</td>
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<td>Environmental hazards</td>
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<td>ERG Code</td>
<td>3L</td>
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<td>Read safety instructions, SDS and emergency procedures before handling.</td>
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#### IMDG

<table>
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<tr>
<th>Code</th>
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<td>UN1134</td>
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<td>UN proper shipping name</td>
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<td>Transport hazard class(es)</td>
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<td>Class</td>
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<tr>
<td>Subsidiary risk</td>
<td>-</td>
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<tr>
<td>Packing group</td>
<td>III</td>
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<tr>
<td>Environmental hazards</td>
<td>Yes.</td>
</tr>
<tr>
<td>Marine pollutant</td>
<td>Yes.</td>
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<td>EmS</td>
<td>F-E, S-D</td>
</tr>
<tr>
<td>Special precautions for user</td>
<td>Read safety instructions, SDS and emergency procedures before handling.</td>
</tr>
</tbody>
</table>
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

- This product is a liquid and when transported in bulk is covered under MARPOL 73/78 Annex II.
- This product is listed in the IBC Code.
- Ship type: 2
- Pollution category: Y

15. Regulatory information

US federal regulations

- This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
- TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
  - Not regulated.
- CERCLA Hazardous Substance List (40 CFR 302.4)
  - Chlorobenzene (CAS 108-90-7) Listed.
- SARA 304 Emergency release notification
  - Not regulated.
  - Not listed.
- Toxic Substances Control Act (TSCA)
  - This substance is on the TSCA 8(b) inventory and is designated “active”.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

- SARA 302 Extremely hazardous substance
  - Not listed.
- SARA 311/312 Hazardous chemical
  - Yes
- Classified hazard categories
  - Flammable (gases, aerosols, liquids, or solids)
  - Acute toxicity (any route of exposure)
  - Skin corrosion or irritation
- SARA 313 (TRI reporting)
  - Chemical name: Chlorobenzene
  - CAS number: 108-90-7
  - % by wt.: 100

Other federal regulations

- Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
  - Chlorobenzene (CAS 108-90-7)
- Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)
  - Not regulated.
- Clean Water Act (CWA) Section 112(r) (40 CFR 68.130)
  - Hazardous substance
  - Priority pollutant
  - Toxic pollutant
- Safe Drinking Water Act (SDWA)
  - Contains component(s) regulated under the Safe Drinking Water Act.

US state regulations

- US. Massachusetts RTK - Substance List
  - Chlorobenzene (CAS 108-90-7)
- US. New Jersey Worker and Community Right-to-Know Act
  - Chlorobenzene (CAS 108-90-7)
- US. Pennsylvania Worker and Community Right-to-Know Law
  - Chlorobenzene (CAS 108-90-7)
- US. Rhode Island RTK
  - Chlorobenzene (CAS 108-90-7)
- California Proposition 65
  - California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

California Proposition 65

- US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. CodeRegs, tit. 22, 69502.3, subd. (a))
  - Chlorobenzene (CAS 108-90-7)
# International Inventories

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
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<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>Yes</td>
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<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
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<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Taiwan Chemical Substance Inventory (TCSI)</td>
<td>Yes</td>
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<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*A “Yes” indicates this product complies with the inventory requirements administered by the governing country(s). A “No” indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

## 16. Other information, including date of preparation or last revision

<table>
<thead>
<tr>
<th>Issue date</th>
<th>05-July-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revision date</td>
<td>-</td>
</tr>
<tr>
<td>Version #</td>
<td>01</td>
</tr>
</tbody>
</table>

**HMIS® ratings**
- Health: 2
- Flammability: 3
- Physical hazard: 0

**Disclaimer**

This product is subject to Greenfield Global USA Inc.'s terms and conditions, which can be found at http://www.greenfield.com/tc-po-us/. Greenfield cannot anticipate all conditions under which this information and this product, or the products of other manufacturers in combination with this product, may be used. The user is responsible for the proper and safe use, handling, storage and disposal of the product, and assumes liability for any loss, injury, damage or expense arising from any failure to do so. The data in this sheet is based on information and experience available at the time of writing.