SDS number:
**Not available.**

# SAFETY DATA SHEET

Republic of Korea

In accordance with the Standard for Classification and Labeling of Chemical Substance and Safety Data Sheet, Article 10 Paragraph 1

## Section 1. Chemical product and company identification

**A. Product name** HyClone™ prime expression medium (chemically defined), 1000L

**Catalogue Number** SH31198.06

**Article Number** 31141436

**B. Recommended use of the chemical**

For further manufacturing.

**Restrictions on use**

**Uses advised against**

**C. Manufacturer / Supplier**

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Logan, Utah 84321
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## Section 2. Hazards identification

**A. Hazard classification**

GERM CELL MUTAGENICITY - Category 1B
AQUATIC HAZARD (LONG-TERM) - Category 3

This product is classified in accordance with the Industrial Safety and Health Act and the Chemical Control Act.

Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 50.7%

**B. GHS label elements, including precautionary statements**

**Symbol**

**Signal word** Danger

**Hazard statements**

May cause genetic defects.
Harmful to aquatic life with long lasting effects.

**Precautionary statements**

| | |
|---|---|
| **Prevention** | Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves, protective clothing and eye or face protection. Avoid release to the environment. |
| **Response** | IF exposed or concerned: Get medical advice or attention. |
| **Storage** | Store locked up. |
| **Disposal** | Dispose of contents and container in accordance with all local, regional, national and international regulations. |
| **C. Other hazards which do not result in classification** | May form explosible dust-air mixture if dispersed. |

## Section 3. Composition/information on ingredients

**Substance/mixture** Mixture

**Other means of identification** Not available.

| Ingredient name | Common name | Identifiers | % |
|---|---|---|---|
| SODIUM GLUCONATE | | CAS: 527-07-1<br>EC: 208-407-7 | ≤5 |
| L-BETA-ASPARAGINE | | CAS: 70-47-3<br>EC: 200-735-9 | ≤5 |
| L-serine | | CAS: 56-45-1<br>EC: 200-274-3 | ≤5 |
| POTASSIUM CHLORIDE | | CAS: 7447-40-7<br>EC: 231-211-8 | ≤5 |
| L-(+)-LYSINE MONOHYDROCHLORIDE | | CAS: 657-27-2<br>EC: 211-519-9 | ≤5 |
| L-(-)-LEUCINE | | CAS: 61-90-5<br>EC: 200-522-0 | ≤5 |
| L-valine | | CAS: 72-18-4<br>EC: 200-773-6 | ≤5 |
| L-(-)-THREONINE | | CAS: 72-19-5<br>EC: 200-774-1 | ≤5 |
| ASPARTIC ACID | | CAS: 56-84-8<br>EC: 200-291-6 | ≤5 |
| L-(+)-ARGININE MONOHYDROCHLORIDE | | CAS: 1119-34-2<br>EC: 214-275-1 | ≤5 |
| MAGNESIUM SULFATE | | CAS: 7487-88-9<br>EC: 231-298-2 | ≤5 |

**There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.**

Occupational exposure limits, if available, are listed in Section 8.

## Section 4. First aid measures

| | |
|---|---|
| **A. 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. |
| **B. Skin contact** | Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse. |
| **C. Inhalation** | Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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 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. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. |
| **D. Ingestion** | Wash out mouth with water. Remove dentures if any. 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. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. 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. |
| **E. Notes to physician** | In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. |
| **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. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. |

**See toxicological information (Section 11)**

## Section 5. Fire-fighting measures

**A. Extinguishing media**

| | |
|---|---|
| **Suitable** | Use dry chemical powder. |
| **Not suitable** | Avoid high pressure media which could cause the formation of a potentially explosible dust-air mixture. |
| **B. Specific hazards arising from the chemical** | May form explosible dust-air mixture if dispersed. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain. |
| **Hazardous thermal decomposition products** | Decomposition products may include the following materials:<br>carbon dioxide<br>carbon monoxide<br>nitrogen oxides<br>sulfur oxides<br>phosphorus oxides<br>halogenated compounds<br>metal oxide/oxides |
| **C. 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. |
| **Special precautions 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. |

## Section 6. Accidental release measures

| | |
|---|---|
| **A. Personal precautions, protective equipment and emergency procedures** | 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 dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment. |
| **B. 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). Water polluting material. May be harmful to the environment if released in large quantities. |

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

| | |
|---|---|
| **Small spill** | Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor. |
| **Large spill** | 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. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Dispose of via a licensed waste disposal contractor. |

## Section 7. Handling and storage

**A. Precautions for safe handling**

| | |
|---|---|
| **Protective measures** | 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. |
| **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. |
| **B. Conditions for safe storage, including any incompatibilities** | Store between the following temperatures: 2 to 8°C (35.6 to 46.4°F). 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. See Section 10 for incompatible materials before handling or use. |

## Section 8. Exposure controls/personal protection

**A. Control parameters**

**Occupational exposure limits**

None.

**Biological exposure indices**

No exposure indices known.

| | |
|---|---|
| **B. Appropriate engineering controls** | Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, 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. |

**C. Personal protective equipment**

| | |
|---|---|
| **Respiratory protection** | Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. |
| **Eye 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: safety glasses with side-shields. If operating conditions cause high dust concentrations to be produced, use dust goggles. |
| **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. |
| **Skin 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. |
| **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. |

## Section 9. Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

**A. Appearance**

| | |
|---|---|
| **Physical state** | Solid. [Powder.] |
| **Color** | Off-white. |
| **B. Odor** | Not available. |
| **C. Odor threshold** | Not available. |
| **D. pH** | 5.2 to 7.4 |
| **E. Melting/freezing point** | Not available. |
| **F. Boiling point or initial boiling point and boiling range** | Not available. |
| **G. Flash point** | Not applicable. |
| **Fire point** | Not available. |
| **Burning time** | Not available. |
| **Burning rate** | Not available. |
| **H. Evaporation rate** | Not available. |
| **I. Flammability (solid, gas)** | Not available. |
| **J. Lower and upper explosive (flammable) limits** | Not applicable. |
| **K. Vapor pressure** | Not available. |
| **L. Solubility in water** | Not available. |
| **M. Vapor density** | Not applicable. |
| **N. Relative density** | Not available. |

| | | |
|---|---|---|
| **O.** | **Partition coefficient: n-octanol/water** | Not applicable. |
| **P.** | **Auto-ignition temperature** | Not applicable. |
| **Q.** | **Decomposition temperature** | Not available. |
| | **SADT** | Not available. |
| **R.** | **Viscosity** | Dynamic (room temperature): Not available.<br>Kinematic (room temperature): Not available.<br>Kinematic (40°C (104°F)): Not available. |
| | **Flow time (ISO 2431)** | Not available. |
| **S.** | **Molecular weight** | Not applicable. |

**Particle characteristics**

| | |
|---|---|
| **Median particle size** | Not available. |

## Section 10. Stability and reactivity

| | | |
|---|---|---|
| **A.** | **Chemical stability** | The product is stable. |
| | **Possibility of hazardous reactions** | Under normal conditions of storage and use, hazardous reactions will not occur. |
| **B.** | **Conditions to avoid** | Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Prevent dust accumulation. |
| **C.** | **Incompatible materials** | Reactive or incompatible with the following materials:<br>oxidizing materials |
| **D.** | **Hazardous decomposition products** | Under normal conditions of storage and use, hazardous decomposition products should not be produced. |

## Section 11. Toxicological information

**A. Information on the likely routes of exposure**

Routes of entry anticipated: Oral, Dermal, Eyes.

**Potential acute health effects**

| | |
|---|---|
| **Respiratory** | Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs. |
| **Oral** | No known significant effects or critical hazards. |
| **Skin** | No known significant effects or critical hazards. |
| **Eyes** | Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes. |

**Over-exposure signs/symptoms**

| | |
|---|---|
| **Inhalation** | Adverse symptoms may include the following:<br>respiratory tract irritation<br>coughing |
| **Ingestion** | No specific data. |
| **Skin contact** | No specific data. |
| **Eye contact** | Adverse symptoms may include the following:<br>irritation<br>redness |

**B. Health hazards**

**Acute toxicity**

| Product/ingredient name | Result |
|---|---|
| L-serine | **Rat - Oral - LD50**<br>14 g/kg |
| POTASSIUM CHLORIDE | **Rat - Male - Oral - LD50**<br>2600 mg/kg<br>Toxic effects: Gastrointestinal - Hypermotility, diarrhea Gastrointestinal - Nausea or vomiting |
| L-(+)-LYSINE MONOHYDROCHLORIDE | **Rat - Oral - LD50**<br>10 g/kg<br>Toxic effects: Behavioral - Altered sleep time (including change in righting reflex) Behavioral - Ataxia Lung, Thorax, or Respiration - Dyspnea |
| L-(-)-LEUCINE | **Rat - Oral - LD50**<br>16000 mg/kg |
| L-valine | **Rat - Oral - LD50**<br>2000 mg/kg |

| | |
|---|---|
| ASPARTIC ACID | **Rat - Oral - LD50**<br>5000 mg/kg<br>**Rabbit - Dermal - LD50**<br>5000 mg/kg |
| L-(+)-ARGININE MONOHYDROCHLORIDE | **Rat - Oral - LD50**<br>12 g/kg<br>Toxic effects: Behavioral - Altered sleep time (including change in righting reflex) Behavioral - Ataxia Lung, Thorax, or Respiration - Dyspnea |

**Conclusion/Summary [Product]** Not available.

**Skin corrosion/irritation**

Not available.

**Conclusion/Summary [Product]** Not available.

| Ingredient name | Conclusion/Summary |
|---|---|
| L-serine | May cause skin irritation. |
| L-(+)-LYSINE MONOHYDROCHLORIDE | May cause skin irritation. |
| L-(-)-LEUCINE | May cause skin irritation. |
| L-valine | May cause skin irritation. |
| L-(-)-THREONINE | May cause skin irritation. |

**Serious eye damage/eye irritation**

Not available.

**Conclusion/Summary [Product]** Not available.

| Ingredient name | Conclusion/Summary |
|---|---|
| L-serine | May cause eye irritation. |
| L-(+)-LYSINE MONOHYDROCHLORIDE | May cause eye irritation. |
| L-(-)-LEUCINE | May cause eye irritation. |
| L-valine | May cause eye irritation. |
| L-(-)-THREONINE | May cause eye irritation. |

**Respiratory corrosion/irritation**

Not available.

**Conclusion/Summary [Product]** Not available.

**Respiratory or skin sensitization**

Not available.

**Skin**

**Conclusion/Summary [Product]** Not available.

**Respiratory**

**Conclusion/Summary [Product]** Not available.

Not available.

**Germ cell mutagenicity**

Not available.

**Conclusion/Summary [Product]** Not available.

**Carcinogenicity**

Not available.

**Conclusion/Summary [Product]** Not available.

**Reproductive toxicity**

Not available.

**Conclusion/Summary [Product]** Not available.

**Specific target organ toxicity (single exposure)**

| Product/ingredient name | Result |
|---|---|
| SODIUM GLUCONATE | SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 |
| L-BETA-ASPARAGINE | SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 |
| POTASSIUM CHLORIDE | SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) - Category 2<br>SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 |
| L-(-)-THREONINE | SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 |
| ASPARTIC ACID | SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 |

**Specific target organ toxicity (repeated exposure)**

Not available.

**Aspiration hazard**

Not available.

**Potential chronic health effects**

Not available.

**Conclusion/Summary [Product]** Not available.

| | |
|---|---|
| **General** | Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation. |
| **Carcinogenicity** | No known significant effects or critical hazards. |
| **Mutagenicity** | May cause genetic defects. |
| **Reproductive toxicity** | No known significant effects or critical hazards. |

**Numerical measures of toxicity**

**Acute toxicity estimates**

| Product/ingredient name | Oral (mg/kg) | Dermal (mg/kg) | Inhalation (gases) (ppm) | Inhalation (vapors) (mg/l) | Inhalation (dusts and mists) (mg/l) |
|---|---|---|---|---|---|
| HyClone™ prime expression medium (chemically defined) | 40705.5 | 155553.8 | N/A | N/A | N/A |
| L-serine | 14000 | N/A | N/A | N/A | N/A |
| POTASSIUM CHLORIDE | 2600 | N/A | N/A | N/A | N/A |
| L-(+)-LYSINE MONOHYDROCHLORIDE | 10000 | N/A | N/A | N/A | N/A |
| L-(-)-LEUCINE | 16000 | N/A | N/A | N/A | N/A |
| L-valine | 2000 | N/A | N/A | N/A | N/A |
| ASPARTIC ACID | 5000 | 5000 | N/A | N/A | N/A |
| L-(+)-ARGININE MONOHYDROCHLORIDE | 12000 | N/A | N/A | N/A | N/A |

## Section 12. Ecological information

**A. Ecotoxicity**

| Product/ingredient name | Result |
|---|---|
| L-serine | **Acute - EC50**<br>Daphnia<br>83 mg/l [48 hours]<br>**Acute - NOEC**<br>Algae<br>1000 mg/l [72 hours] |
| POTASSIUM CHLORIDE | **Acute - LC50 - Fresh water**<br>Crustaceans - Water flea - *Pseudosida ramosa* - Neonate<br>Age: ≤24 hours<br>9.68 mg/l [48 hours] |

| | |
|---|---|
| | Effect: Mortality<br>**Acute - EC50 - Fresh water**<br>ISO<br>Algae - Green algae - *Desmodesmus subspicatus*<br>9.24 g/l [72 hours]<br>Effect: Population<br>**Acute - LC50 - Fresh water**<br>Fish - Zebra danio - *Danio rerio*<br>509.65 mg/l [96 hours]<br>Effect: Mortality |
| L-valine | **LC50**<br>Fish<br>10000 mg/l [96 hours] |
| MAGNESIUM SULFATE | **Chronic - NOEC - Fresh water**<br>Daphnia - Water flea - *Daphnia magna* - Neonate<br>Age: <24 hours<br>360 mg/l [3 weeks]<br>Effect: Reproduction<br>**Chronic - IC10 - Fresh water**<br>Aquatic plants - Lesser Duckweed - *Lemna aequinoctialis*<br>1.9 mg/l [96 hours]<br>Effect: Population<br>**Acute - IC50 - Fresh water**<br>Aquatic plants - Lesser Duckweed - *Lemna aequinoctialis*<br>4.4 mg/l [96 hours]<br>Effect: Population<br>**Acute - LC50 - Fresh water**<br>Fish - Purple Spotted Gudgeon - *Mogurnda mogurnda* - Larvae<br>40 mg/l [96 hours]<br>Effect: Mortality<br>**Acute - EC50 - Fresh water**<br>Daphnia - Water flea - *Daphnia magna*<br>343.56 mg/l [48 hours]<br>Effect: Intoxication |

**Conclusion/Summary [Product]** Not available.

| Ingredient name | Conclusion/Summary |
|---|---|
| L-BETA-ASPARAGINE | Naturally occurring substance |
| L-serine | Naturally occurring substance |
| L-(+)-LYSINE MONOHYDROCHLORIDE | Naturally occurring substance |
| L-(-)-LEUCINE | Naturally occurring substance |
| L-valine | Naturally occurring substance |
| L-(-)-THREONINE | Naturally occurring substance |
| ASPARTIC ACID | Naturally occurring substance |
| L-(+)-ARGININE MONOHYDROCHLORIDE | Naturally occurring substance |

**B. Persistence/degradability**

| Product/ingredient name | Result |
|---|---|
| L-valine | 82% [28 days] |

**Conclusion/Summary [Product]** Not available.

| Ingredient name | Conclusion/Summary |
|---|---|
| L-serine | Not expected to bioaccumulate. Naturally occurring substance |
| L-(+)-LYSINE MONOHYDROCHLORIDE | Not expected to bioaccumulate. Naturally occurring substance |
| L-(-)-LEUCINE | Not expected to bioaccumulate. Naturally occurring substance |
| L-valine | Not expected to bioaccumulate. Naturally occurring substance |
| ASPARTIC ACID | Not expected to bioaccumulate. Naturally occurring substance |
| L-(+)-ARGININE MONOHYDROCHLORIDE | Not expected to bioaccumulate. Naturally occurring substance |

| Product/ingredient name | Aquatic half-life | Photolysis | Biodegradability |
|---|---|---|---|
| L-valine | - | - | Readily |

**C. Bioaccumulative potential**

| Product/ingredient name | $LogP_{ow}$ | BCF | Potential |
|---|---|---|---|
| asparagine | -3.82 | 3 | Low |
| L-serine | -3.07 | 0.609 | Low |
| lysine hydrochloride | <-3.3 | 1.041 | Low |
| L-leucine | -1.52 | 0.849 | Low |
| L-valine | -2.26 | 0.846 | Low |
| L-threonine | -2.94 | 0.811 | Low |
| aspartic acid | -3.89 | - | Low |

**D. Mobility in soil**

**Soil/Water partition coefficient** Not available.

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

## Section 13. Disposal considerations

**A. 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.

**B. Disposal precautions** 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. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

**UN**

**A. UN number** Not available.

**B. Proper shipping name** Not available.

**C. Classes** Not available.

**D. Packing group** Not available.

**E. Marine pollutant** No.

**F. Additional information** -

**Label**

**IMDG**

**A. UN number** Not available.

**B. Proper shipping name** Not available.

**C. Classes** Not available.

**D. Packing group** Not available.

**E. Marine pollutant** No.

**F. Additional information** -

**Label**

**IATA**

**A. UN number** Not available.

**B. Proper shipping name** Not available.

**C. Classes** Not available.

**D. Packing group** Not available.

**E. Marine pollutant** No.

**F. Additional information** -

**Label**

**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 IMO instruments** Not available.

## Section 15. Regulatory information

**A. Regulation according to ISHA**

**ISHA article 117 (Harmful substances prohibited from manufacture)** None of the components are listed.

**ISHA article 118 (Harmful substances requiring permission)** None of the components are listed.

**Exposure Limits of Chemical Substances and Physical Factors**

None of the components have an OEL.

| | |
|---|---|
| **ISHA Enforcement Regs Annex 19 (Exposure standards established for harmful factors)** | The following components are listed: cobalt and its inorganic compounds, manganese and its inorganic compounds, Cadmium and its compounds |
| **ISHA Enforcement Regs Annex 21 (Harmful factors subject to Work Environment Measurement)** | None of the components are listed. |
| **ISHA Enforcement Regs Annex 22 (Harmful Factors Subject to Special Health Check-up)** | None of the components are listed. |
| **Standard of Industrial Safety and Health Annex 12 (Hazardous substances subject to control)** | None of the components are listed. |

**B. Regulation according to Chemicals Control Act**

| | |
|---|---|
| **Article 11 (TRI)** | None of the components are listed. |
| **Article 18 Prohibited (K-Reach Article 27)** | None of the components are listed. |
| **Article 19 Candidate substances subject to authorization (K-Reach Article 25)** | None of the components are listed. |
| **Article 19 Subject to authorization (K-Reach Article 25)** | None of the components are listed. |
| **Article 20 Toxic Chemicals (K-Reach Article 20)** | Not applicable |
| **Article 20 Restricted (K-Reach Article 27)** | None of the components are listed. |

**Article 39 (Accident Precaution Chemicals)**

Not listed.

**MoE 2021-51 - Regulations on the quantity of toxic substances, restricted substances, prohibited substances and permitted substances**

| Ingredient name | Higher regulated quantity | Lower regulated quantity |
|---|---|---|
| inorganic zinc, salts | 400 tonnes | 20 tonnes |
| 2-Methyl-1,4-naphthalenedione | 400 tonnes | 20 tonnes |
| acetic acid | 400 tonnes | 20 tonnes |
| selenium compounds | 200 tonnes | 5 tonnes |
| Ergocalciferol | 400 tonnes | 20 tonnes |
| cadmium compounds | 400 tonnes | 20 tonnes |
| inorganic tin, salts | - | 20 tonnes |

| | |
|---|---|
| **Existing Chemical Substances Subject to Registration** | The following components are listed: Sulfuric acid, zinc salt (1:1), heptahydrate, Cadmium chloride, hydrate (2:5), Tin chloride (SnCl2), dihydrate |
| **C. Dangerous Materials Safety Management Act** | Not applicable. |
| **D. Wastes regulation** | Dispose of contents and container in accordance with all local, regional, national and international regulations. |

**E. Regulation according to other foreign laws**

| | |
|---|---|
| **Article 2 of Youth Protection Act on Substances Hazardous to Youth** | Not applicable. |

**International regulations**

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

Not listed.

**Montreal Protocol**

Not listed.

**Stockholm Convention on Persistent Organic Pollutants**

Not listed.

**Rotterdam Convention on Prior Informed Consent (PIC)**

Not listed.

**UNECE Aarhus Protocol on POPs and Heavy Metals**

Not listed.

**Inventory list**

| | |
|---|---|
| **Republic of Korea** | Not determined. |
| **United States** | Not determined. |
| **China** | At least one component is not listed. |
| **Japan** | **Japan inventory (CSCL)**: Not determined.<br>**Japan inventory (ISHL)**: Not determined. |

## Section 16. Other information

**A. References**

| | | |
|---|---|---|
| **B.** | **First issue date** | 18 July 2024 |
| **C.** | **Date of issue/Date of revision** | 18 July 2024 / 10 September 2025 |
| **D.** | **Version** | 0.02 |
| | **Date of printing** | **10 September 2025** |
| | | sds_author@cytiva.com |

**E. Other**

**Indicates information that has changed from previously issued version.**

**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
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
N/A = Not available
UN = United Nations

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