



SAFETY DATA SHEET

LITHIUM HYPOCHLORITE

**1. Identification of the Substance/Mixture and of the Company/Undertaking:**

- 1.1 **Product Identifier:** Lithium Hypochlorite
- 1.1.1 **Substances** Not applicable
- 1.1.1 **Alternate names and trade name** Formula 2<sup>®</sup>
- 1.1.2 **Mixture name:** Lithium Hypochlorite
- 1.2 **Relevant Identified Uses of the Substance or Mixture and Uses Advised Against:**  
Formulation and chemical synthesis in industrial manufacturing operations;  
Additive for preparations and articles for industrial and consumer use.  
Do not use for private purposes (household).
- 1.3 **Details of the Supplier of the Safety Data Sheet**

**North America**  
FMC Lithium  
Seven LakePointe Plaza  
2801 Yorkmont Rd, Suite 300  
Charlotte, NC 28208  
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Fax: +1.704.868.5370  
1.888.lithium

**Europe**  
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CH62 3NL, England  
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**Asia Pacific**  
FMC Asia Innovation Center  
No 3 Building No. 4560  
Jinke Road  
Shanghai, China 201203  
T: +86.21.2067.5888

Email: [lithium.info@fmc.com](mailto:lithium.info@fmc.com)  
Web: [www.fmclithium.com](http://www.fmclithium.com)

1.4 **Emergency Telephone Number:**

**North America**  
CHEMTREC: +1.800.424.9300  
                  +1.703.527.3887  
Plant: +1.704.629.5361  
Medical: +1.303.595.9048

**Europe**  
**24 hr Specialist advice number:**  
CHEMTREC: +1.703.527.3887  
Office (0900-1700): +44.151.334.8085

**Asia Pacific**  
Phone: +86.21.2067.5888

**2. Hazards Identification**

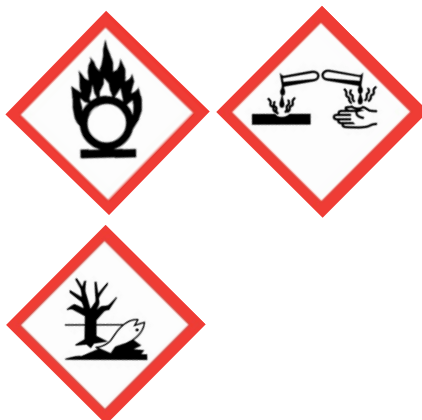
2.1 **Classification of the Substance or mixture:**  
**2.1.1 GHS Classification [EC Regulation No 1272/2008 and US OSHA regulations:**

Oxidizer, Solid Category 3  
Skin Corrosion Category 1B  
Eye damage; Category 1  
Acute Aquatic, Category 1

**2.2.2 EC: Classification according to 67/548/EEC or 1999/45/EC [DSD/DPD]**  
O, R9; C, R34; N, R50

2.2 **Label Elements:**

**2.2.3 Hazard Pictograms(s):**



**2.2.4 Signal Word:** Danger  
**Hazard Statement(s):** May intensify fire; oxidizer

H272

Causes severe skin burns and eye damage. H314  
 Very toxic to aquatic life H400

**Precautionary Statement(s):**

Keep away from heat. P210  
 Take any precaution to avoid mixing with combustibles (wood, paper, oil etc.) P221  
 In case of fire: Use water only for extinction. Do not use dry chemical, CO<sub>2</sub> or Halon. P370 + P378  
 Wear protective gloves/protective clothing/eye protection/face protection. P280  
 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P305 + P351 + P338  
 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. P303 + P361 + P353  
 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P301 + P330 + P331  
 Immediately call a POISON CENTER or doctor/physician. P310

**Additional Precautionary Statements(s):**

Do not breathe dust/fume/gas/mist/vapours/spray. P260  
 Keep/Store away from clothing/.../ combustible materials. P220  
 Wash hands thoroughly after handling. P264  
 If INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P304 + P340  
 Wash contaminated clothing before reuse. P363  
 Store locked up. P405  
 Dispose of contents/ container to an approved waste disposal plant. P501

**2.3 Other Hazards**

None.

**3. Composition / Information on Ingredients**

**3.1 Substances** Not applicable.

**3.2 Mixtures**

**3.2.1 GHS Classification [EC: Regulation No 1272/2008; US: OSHA regulations]**

| Chemical Name        | CAS #      | EC No     | EC Index No | REACH Reg No  | Wt. %       | Classification, Hazard Statement Codes                                  |
|----------------------|------------|-----------|-------------|---------------|-------------|---|
| Lithium hypochlorite | 13840-33-0 | 237-558-1 | None        | Not available | 28 – 35     | Ox. Sol. 3<br>Skin Corr. 1B<br>Acute Aquatic, 1<br>H272<br>H314<br>H400 |
| Sodium chloride      | 7647-14-5  | 231-598-3 | None        | Not available | 29 – 36     | None  |
| Sodium sulfate       | 7757-82-6  | 231-820-9 | None        | Not available | 10.9 – 20.7 | None  |
| Lithium chloride     | 7447-41-8  | 231-212-3 | None        | Not available | 2 – 4       | Acute Tox. 4<br>Eye Irrit. 2<br>Skin Irrit. 2<br>H302<br>H319<br>H315   |
| Lithium carbonate    | 554-13-2   | 209-062-5 | None        | Not available | 1.3 – 3.7   | Acute Tox. 4<br>Eye Irrit. 2<br>H302<br>H315                            |
| Lithium chlorate     | 36355-96-1 | None      | None        | Not available | 2.6 – 4.4   | Skin Irrit. 2<br>Acute Tox. 4<br>H316<br>H302                           |
| Lithium hydroxide    | 1310-66-3  | 215-183-4 | None        | Not available | 1.2 – 2.1   | Skin Corr. 1B<br>Acute Tox. 4<br>H314<br>H302                           |
| Water                | 7732-18-5  | None      | None        | None          | 2-7         | None  |

**3.2.2 EC: Classification according to 67/548/EEC or 1999/45/EC [DSD/DPD]**

| Chemical Name        | CAS #      | EC No     | Wt. %       | Symbols     | R-phrases        |
|----------------------|------------|-----------|-------------|-------------|------------------|
| Lithium hypochlorite | 13840-33-0 | 237-558-1 | 28 – 35     | O<br>C<br>N | R9<br>R34<br>R50 |
| Sodium chloride      | 7647-14-5  | 231-598-3 | 29 – 36     | None        |                  |
| Sodium sulfate       | 7757-82-6  | 231-820-9 | 10.9 – 20.7 | None        |                  |
| Lithium chloride     | 7447-41-8  | 231-212-3 | 2 – 4       | Xn<br>Xi    | R22<br>R36, 38   |
| Lithium carbonate    | 554-13-2   | 209-062-5 | 1.3 – 3.7   | Xn<br>Xi    | R22<br>R36       |
| Lithium chlorate     | 36355-96-1 | None      | 2.6 – 4.4   | Xi          | R38              |

|                   |           |           |           |         |            |
|-------------------|-----------|-----------|-----------|---------|------------|
|                   |           |           |           | Xn      | R22        |
| Lithium hydroxide | 1310-66-3 | 215-183-4 | 1.2 – 2.1 | C<br>Xn | R34<br>R22 |
| Water             | 7732-18-5 | None      | 2-7       | None    |            |

(see Section 16 for R-phrase text)

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## 4. First Aid Measures

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### 4.1 Description of First Aid Measures

- EYES:** Hold eyelids open and rinse slowly and gently with a stream of water for 15 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue to rinse the eye. **Call a Physician or Poison Control Center for treatment advice.**
- SKIN:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Wash with plenty of soap and water. **Call a Physician or Poison Control Center for treatment advice.**
- INGESTION:** **Immediately call a Physician or Poison Control Center for treatment advice.** Do not induce vomiting unless instructed by Physician or Poison Control Center. Promptly drink large quantities of water if able to swallow. Do not give anything by mouth to an unconscious person. Avoid Alcohol.
- INHALATION:** Remove person to fresh air. If not breathing, call 911 or ambulance and then give artificial respiration, preferably mouth-to-mouth, if possible. **Call a Physician or Poison Control Center for treatment advice.**  
 Have the product container or label with you when calling the poison control center or doctor, or going for treatment.

### 4.2 Most Important Symptoms and effects, both acute and delayed

This product is corrosive.

### 4.3 Indication of any immediate medical attention and special treatment needed.

**Notes to medical doctor:**

Lithium hypochlorite is corrosive to eyes, skin and mucous membranes with chemical burns (caustic). Treatment is dilution/flushing of site with copious amounts of water with controlled removal of exposure followed by symptomatic and supportive care to maintain life functions. Consideration should be given to careful endoscopy as stomach or esophageal burns, perforations or strictures may occur. Probable mucosal damage may contraindicate the use of gastric lavage. Careful gastric lavage with an endotracheal tube in place should be considered. Observation may be warranted. Medical advice – 303 595 9048 (collect)

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## 5. Fire-Fighting Measures

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- 5.1 **Extinguishing media** Use water only. Do not use dry chemical, CO<sub>2</sub> or Halon.
- 5.2 **Special hazards arising from the substance or mixture**  
**Hazardous combustion products** Oxygen and toxic chlorine vapors. Corrosive lithium hydroxide dust.  
**General Hazard** Oxidizer. Contact with easily oxidizable or combustible materials can cause fire or explosion upon ignition from any source.  
 Strong oxidizer. Contact with combustible material may cause fire.
- Properties contributing to**  
**Flammability**  
**Flashpoint** Not applicable  
**Flammable limits in air** Not applicable  
**Auto ignition temperature** Not applicable  
**Sensitivity to static discharge** Not applicable  
**Sensitivity to static impact** Not applicable
- 5.3 **Advice for fire-fighters**  
 Wear full protective clothing and self-contained breathing apparatus (SCBA) approved for fire fighting. This is necessary to protect against the hazards of heat, products of combustion and oxygen deficiency. Do not breathe smoke, gases or vapors generated.

### COMMENTS:

(See Section 10, Stability and Reactivity)

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## 6. Accidental Release Measures

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### 6.1 Personal precautions, protective equipment and emergency procedures

Before cleanup measures begin, review the entire SDS with particular attention to Section 2, Hazards

- Identification; and Section 8, Exposure Controls/Personal Protection.
- 6.2 Environmental precautions**  
 Do not wash into drains. Dispose of at qualified waste disposal facility.
- 6.3 Methods and material for containment and cleaning up**  
 Keep combustibles (wood, paper, oil etc.) away from spilled material. With clean shovel, place into clean dry container, and cover loosely.
- 6.4 Reference to other sections**  
 Before cleanup measures begin, review the entire SDS with particular attention to Section 2, Hazards Identification; and Section 8, Exposure Controls/Personal Protection.
- 6.5 Additional information**  
 Not specified.

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## 7. Handling and Storage

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- 7.1 Precautions for safe handling**  
 Do not get in eyes, on skin or clothing. Avoid breathing dust. Wash thoroughly after handling.
- 7.2 Conditions for safe storage, including any incompatibilities**  
 Store away from readily oxidizable materials, strong acids and flammable materials. Protect from moisture. Keep container closed.
- 7.3 Specific end use(s)**  
 Not available. Industrial and professional use only

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## 8. Exposure Controls / Personal Protection

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### 8.1 Control parameters

#### **DNEL**

Long-term exposure, systemic, inhalation      Not available  
 Long-term exposure, systemic, dermal          Not available

#### **PNEC**

PNEC aqua (freshwater)                              Not available  
 PNEC STP    Not available

### **EXPOSURE LIMITS**

| <b>Chemical Name</b> | <b>EU</b>  |             | <b>EH40 (UK WEL)</b> |             | <b>USA (ACGIH)</b> |                     | <b>USA (OSHA)</b> |                     |
|----------------------|------------|-------------|----------------------|-------------|--------------------|---------------------|-------------------|---------------------|
|                      | <b>TWA</b> | <b>STEL</b> | <b>TWA</b>           | <b>STEL</b> | <b>TWA</b>         | <b>STEL/Ceiling</b> | <b>PEL</b>        | <b>STEL/Ceiling</b> |
| Lithium hypochlorite | none*      |             | none*                |             | none*              |                     | none*             |                     |

\* No occupational exposure limit value

### 8.2 Exposure controls

#### **Engineering controls:**

Use local exhaust ventilation to keep airborne concentrations below exposure limits.

#### **Personal protective equipment**

##### **Eyes and Face:**

Safety glasses or goggles

##### **Respiratory:**

When engineering controls are not adequate, wear a respirator approved for protection against inorganic dusts. See Exposure Scenario for more details.  
 US: NIOSH or MSHA approved  
 Europe: CEN Class P type

##### **Protective Clothing:**

**Gloves:** Nitrile (Typical permeation breakthrough time >480 minutes)  
 These glove recommendations should not be used as the absolute basis for glove selection. Actual in-use conditions may vary glove performance from the controlled conditions of laboratory tests. Factors such as concentration and temperature, glove thickness and glove reuse, may affect performance. Other glove requirements, such as length, dexterity, cut, abrasion, puncture and snag resistance, or glove grip need to be considered in making your final selection.  
**Other:** Not specified.

##### **Work Hygienic Practices:**

Quick-drench eyewash and safety shower.

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## 9. Physical and Chemical Properties

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### 9.1 Information on basic physical and chemical properties

|  |   |
|--|---|
| <u>Appearance:</u>                             | White granular solid  |
| <u>Odor:</u>                                   | Burning, chlorine-like odor   |
| <u>Odor threshold:</u>                         | Not available   |
| <u>pH:</u>                                     | (1% solution) @ 25°C: 11  |
| <u>Melting point:</u>                          | Decomposes @ 135°C (275°F)  |
| <u>Boiling point:</u>                          | Not applicable  |
| <u>Flash point:</u>                            | Not applicable  |
| <u>Evaporation rate(butyl acetate = 1):</u>    | Not applicable  |
| <u>Flammability:</u>                           | Oxidizer. Promotes combustion. Contact with combustible materials may cause fire. |
| <u>Flammable limits:</u>                       | Not applicable  |
| <u>Vapor pressure:</u>                         | Not applicable  |
| <u>Vapor density (air = 1):</u>                | Not applicable  |
| <u>Specific gravity:</u>                       | 0.9 to 1.0 g/cc   |
| <u>Solubility in water:</u>                    | 43 % by wt. @ 25°C (77°F)   |
| <u>Partition coefficient n-octanol/ water:</u> | Not applicable  |
| <u>Autoignition temperature:</u>               | Not applicable  |
| <u>Decomposition temperature:</u>              | Decomposes @ 135°C (275°F)  |
| <u>Viscosity:</u>                              | Not applicable  |
| <u>Explosive properties:</u>                   | Not explosive   |
| <u>Oxidizing properties:</u>                   | Oxidizer  |

### 9.2 Other information

|                                  |  |
|----------------------------------|--|
| <u>Self-reactive properties</u>  | Does not meet classification criteria. |
| <u>Pyrophoric properties</u>     | Does not meet classification criteria. |
| <u>Self-heating properties</u>   | Does not meet classification criteria. |
| <u>Water reactive properties</u> | Does not meet classification criteria. |
| <u>Corrosive to metals</u>       | Does not meet classification criteria. |
| <u>Molecular weight:</u>         | 58.39                                  |

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## 10. Stability and Reactivity

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|   |  |
|---|--|
| 10.1 <u>Reactivity</u>                        | Oxidizer. Keep from combustible materials, acids and oxidizable materials.             |
| 10.2 <u>Chemical stability</u>                | Stable at room temperature.  |
| 10.3 <u>Possibility of hazardous reaction</u> | Hazardous polymerization will not occur  |
| 10.4 <u>Conditions to avoid</u>               | Contact with combustible materials (wood, paper, oil).<br>Contamination with moisture. |
| 10.5 <u>Incompatible materials</u>            | Acids, oxidizable materials, combustible materials.                                    |
| 10.6 <u>Hazardous decomposition products</u>  | Oxygen, lithium hydroxide, lithium chlorates.  |

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## 11. Toxicological Information

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### 11.1 Information on toxicological effects

|                                    |  |
|------------------------------------|--|
| (a) acute toxicity                 | Classified as not acutely toxic based on lithium hypochlorite.                           |
| (b) skin corrosion/irritation      | Classified as corrosive, category 1B on the basis of data for the formulation.           |
| (c) serious eye damage/irritation  | Classified as corrosive to eyes on the basis of data for the formulation.                |
| (d) respiratory/skin sensitisation | Classed as not sensitizing to skin on the basis of data for the formulation.             |
| (e) germ cell mutagenicity         | Classified as not mutagenic based on data for the formulation.                           |
| (f) carcinogenicity                | Classified as not carcinogenic basis of data for the formulation.                        |
| (g) reproductive toxicity          | Classified as not a reproductive toxin based on lithium hypochlorite                     |
| (h) STOT-single exposure           | Classified as not causing organ damage based on lithium hypochlorite.                    |
| (i) STOT-repeated exposure         | Classified as not causing organ damage on repeat exposure based on lithium hypochlorite. |
| (j) aspiration hazard              | Lithium hypochlorite, a solid, does not present an aspiration hazard.                    |

**Acute Effects From Overexposure:**

This product is severely irritating/corrosive to the eyes (may cause blindness), skin, respiratory tract, and mucous membranes

**Chronic Effects From Overexposure:**

Continuous inhalation exposure may cause lung damage.

**Carcinogenicity Listings**

EH40: Not listed.

IARC: Not listed.

NTP: Not listed.

OSHA: Not considered a carcinogen under OSHA.

ACGIH: Not listed.

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## 12. Ecological Information

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- 12.1 **Toxicity:** Acute Aquatic; Category 1  
Lithium Hypochlorite formulation: Mallard duck: Acute Oral LD<sub>50</sub> = 1,960 mg/kg; 5 Day Dietary LC<sub>50</sub>>17,240 ppm (no deaths at maximum dose)  
Bobwhite quail: 5 Day Dietary LC<sub>50</sub> >17,240 ppm  
Rainbow trout: 96 hour LC<sub>50</sub> 0.69 mg/L  
Bluegill: 96 hour LC<sub>50</sub> = 0.97 mg/L  
Daphnia: 48 hour LC<sub>50</sub> = 0.37 µg/L
- 12.2 **Persistence and degradability**  
No applicable for metal salts.
- 12.3 **Bioaccumulative potential**  
No applicable for metal salts.
- 12.4 **Mobility in soil**  
No data available for the product.
- 12.5 **Results of PBT and vPvB assessment**  
No applicable for metal salts.
- 12.6 **Other adverse effects**  
None

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## 13. Disposal Considerations

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- 13.1 **Waste treatment methods**  
Use a qualified industrial waste disposal facility. Dispose of waste according to local and Federal laws and regulations.

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## 14. Transport Information

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- 14.1 **UN Number** UN1479
- 14.2 **UN proper shipping name (IMDG, ICAO, ADR, DOT)** Oxidizing solid, N. O. S. (lithium hypochlorite, mixture)
- 14.3 **Transport hazard class(es) (IMDG, ICAO, ADR, DOT)** 5.1, Oxidizer
- 14.4 **Packing group (IMDG, ICAO, ADR, DOT)** III
- 14.5 **Environmental hazards** Marine pollutant
- 14.6 **Special precautions for user** None
- 14.7 **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** None

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## 15. Regulatory Information

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- 15.1 **Safety, health and environmental regulations/legislation specific for the substance or mixture**

**EUROPEAN UNION:**

German Wassergefährdungsklasse (water hazard class)

|                      |             |
|----------------------|-------------|
| lithium hypochlorite | not listed. |
| sodium chloride      | 1           |
| sodium sulfate       | 1           |
| lithium chloride     | 1           |
| lithium carbonate    | 1           |
| lithium hydroxide    | 2           |

**UNITED STATES:**

**Section 311 Hazard Category (40 CFR 370):**  
**Section 313 Reportable Ingredients (40 CFR 372):**

Immediate (acute) health hazard, reactive.  
This product contains lithium carbonate which is subject to the reporting requirements of Section 313 of the Emergency Planning and Right-To-Know Act of 1986.  
This information must be included in all MSDS's that are copied and distributed for this material.  
Not listed

**Section 302 Extremely Hazardous Substances (40 CFR 355):**  
**CERCLA Hazardous Substance (40 CFR 302.4):**

Not listed

**TSCA Sec 12b Export Notification:**

This product is not subject to TSCA 12 (b) Export Notification Requirements.

**NFPA Rating:**

**Health: 3 Flammability: 0 Reactivity: 1 Special: OXY**

**INTERNATIONAL INVENTORY STATUS:**

| <b><u>Inventory/Country</u></b> | <b><u>Product Status</u></b> |
|---------------------------------|------------------------------|
| EINECS (EU)                     | Listed.                      |
| TSCA (US)                       | Listed.                      |
| ECL (Korea)                     | Listed.                      |
| DSL (Canada)                    | Listed.                      |

**15.2 Chemical Safety Assessment**

The Chemical Safety Assessment has been completed for lithium hydroxide anhydrous.

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## **16. Other Information**

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**European Union:**

**R Phrases:**

|     |  |
|-----|--|
| R9  | Explosive when mixed with combustible material |
| R22 | Harmful if swallowed                           |
| R34 | Causes burns                                   |
| R36 | Irritating to eyes                             |
| R38 | Irritating to skin                             |
| R50 | Very toxic to aquatic organisms                |

**List of Abbreviations used in this SDS:**

|      |                                       |
|------|---------------------------------------|
| PBT  | Persistent, Bioaccumulative and Toxic |
| vPvB | very Persistent, very Bioaccumulative |
| PEC  | Predicted environmental concentration |
| PNEC | Predicted no effect concentration     |
| DNEL | Derived no effect level               |

**Specific uses identified for Exposure Scenarios**

Not available

**REVISION SUMMARY:** Revision # 1. New SDS.

This SDS has been prepared to meet U. S. OSHA Hazard Communication Standard requirements.

type 6a

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