

SAFETY DATA SHEET

1. Identification

Product identifier: ZINC CHLORIDE

Other means of identification

Product No.: 4326, 4322, 4320, 8780, 8772

Recommended use and restriction on use

Recommended use: Not determined.

Restrictions on use: Not determined.

Details of the supplier of the safety data sheet

| | |
|-----------------|-------------------------------------|
| | Avantor Performance Materials, LLC. |
| | 3477 Corporate Parkway |
| | Center Valley, PA 18034 |
| Telephone: | |
| | Customer Service: 855-282-6867 |
| Fax: | 610-573-2610 |
| Contact Person: | Environmental Health & Safety |
| E-mail: | info@avantormaterials.com |

Emergency telephone number:

CHEMTREC: 1-800-424-9300 within US and Canada

2. Hazard(s) identification

Hazard Classification

Health Hazards

| | |
|----------------------------------------------------|-------------------------|
| Acute toxicity (Oral) | Category 4 |
| Skin Corrosion/Irritation | Category 1 |
| Serious Eye Damage/Eye Irritation | Category 1 |
| Specific Target Organ Toxicity - Single Exposure | Category 3 ¹ |
| Specific Target Organ Toxicity - Repeated Exposure | Category 2 ² |

Target Organs

1. Respiratory tract irritation.
2. Liver

Unknown toxicity - Health

| | |
|------------------------------------------|-------|
| Acute toxicity, dermal | 100 % |
| Acute toxicity, inhalation, vapor | 100 % |
| Acute toxicity, inhalation, dust or mist | 100 % |

Environmental Hazards

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|--------------------------------------------|------------|
| Acute hazards to the aquatic environment | Category 1 |
| Chronic hazards to the aquatic environment | Category 1 |

Unknown toxicity - Environment

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|--------------------------------------------|-------|
| Acute hazards to the aquatic environment | 0 % |
| Chronic hazards to the aquatic environment | 100 % |

Label Elements

Hazard Symbol:



Signal Word: Danger

Hazard Statement: Harmful if swallowed.
Very toxic to aquatic life with long lasting effects.
Causes severe skin burns and eye damage.
May cause respiratory irritation.
May cause drowsiness or dizziness.
May cause damage to organs through prolonged or repeated exposure.

Precautionary Statements

Prevention: Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Do not breathe dust/fume/gas/mist/vapors/spray. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.

Response: Immediately call a POISON CENTER/doctor. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. Wash contaminated clothing before reuse. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Collect spillage.

Storage: Store locked up. Store in a well-ventilated place. Keep container tightly closed.

Disposal: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in GHS classification: None.

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| 3. Composition/information on ingredients |
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Substances

| Chemical name | Common name and synonyms | CAS number | Content in percent (%)* |
|---------------|--------------------------|------------|-------------------------|
| ZINC CHLORIDE | | 7646-85-7 | 97 - 100% |

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

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| General information: | Get medical advice/attention if you feel unwell. Show this safety data sheet to the doctor in attendance. |
| Ingestion: | Call a physician or poison control center immediately. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. |
| Inhalation: | Move to fresh air. If breathing is difficult, give oxygen. Call a physician or poison control center immediately. If breathing stops, provide artificial respiration. |
| Skin Contact: | Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician or poison control center immediately. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes. |
| Eye contact: | Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention immediately. |

Most important symptoms/effects, acute and delayed

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| Symptoms: | Harmful if swallowed. Causes severe skin and eye burns. |
| Hazards: | None known. |

Indication of immediate medical attention and special treatment needed

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|-------------------|-------------------------------------------------|
| Treatment: | Treat symptomatically. Symptoms may be delayed. |
|-------------------|-------------------------------------------------|

5. Fire-fighting measures

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| General Fire Hazards: | No unusual fire or explosion hazards noted. |
|------------------------------|---------------------------------------------|

Suitable (and unsuitable) extinguishing media

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| Suitable extinguishing media: | The product is non-combustible. Water spray, foam, dry powder or carbon dioxide. |
| Unsuitable extinguishing media: | None known. |

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| Specific hazards arising from the chemical: | Fire may produce irritating, corrosive and/or toxic gases. |
|----------------------------------------------------|------------------------------------------------------------|

Special protective equipment and precautions for firefighters

Special fire fighting procedures: 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. Cool containers exposed to flames with water until well after the fire is out.

Special protective equipment for fire-fighters: Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures: Keep unauthorized personnel away. Use personal protective equipment. Keep upwind. See Section 8 of the SDS for Personal Protective Equipment. Ventilate closed spaces before entering them. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Methods and material for containment and cleaning up: Avoid dust formation. Sweep up and place in a clearly labeled container for chemical waste. Clean surface thoroughly to remove residual contamination. Neutralize spill area and washings with soda ash or lime.

Notification Procedures: Dike for later disposal. Prevent entry into waterways, sewer, basements or confined areas. Stop the flow of material, if this is without risk. Inform authorities if large amounts are involved.

Environmental Precautions: Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling: Use personal protective equipment as required. Do not get in eyes, on skin, on clothing. Do not breathe dust or vapor. Do not taste or swallow. Do not eat, drink or smoke when using the product. Use only with adequate ventilation. Wash hands thoroughly after handling. See Section 8 of the SDS for Personal Protective Equipment.

Conditions for safe storage, including any incompatibilities: Keep container tightly closed. Keep in a cool, well-ventilated place. Store in a dry place.

8. Exposure controls/personal protection

Control Parameters

Occupational Exposure Limits

| Chemical Identity | Type | Exposure Limit Values | Source |
|-----------------------|------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ZINC CHLORIDE - Fume. | STEL | 2 mg/m ³ | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) (07 2009) |
| | TWA | 1 mg/m ³ | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) (07 2009) |
| ZINC CHLORIDE - Fume. | TWA | 1 mg/m ³ | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007) |
| | STEL | 2 mg/m ³ | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007) |

| | | | |
|-----------------------|------------|---------|----------------------------------------------------------------------------------------------------------------|
| ZINC CHLORIDE - Fume. | TWA | 1 mg/m3 | Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2011) |
| | STEL | 2 mg/m3 | Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2011) |
| ZINC CHLORIDE - Fume. | TWA | 1 mg/m3 | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010) |
| | STEL | 2 mg/m3 | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010) |
| ZINC CHLORIDE - Fume. | 8 HR ACL | 1 mg/m3 | Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009) |
| | 15 MIN ACL | 2 mg/m3 | Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009) |
| ZINC CHLORIDE - Fume. | TWA | 1 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (12 2008) |
| ZINC CHLORIDE - Fume. | TWA | 1 mg/m3 | US. ACGIH Threshold Limit Values (2011) |
| | STEL | 2 mg/m3 | US. ACGIH Threshold Limit Values (2011) |

Appropriate Engineering Controls No data available.

Individual protection measures, such as personal protective equipment

- General information:** Good general ventilation (typically 10 air changes per hour) 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. An eye wash and safety shower must be available in the immediate work area.
- Eye/face protection:** Wear safety glasses with side shields (or goggles) and a face shield.
- Skin Protection**
- Hand Protection:** Chemical resistant gloves
- Other:** Chemical resistant clothing
- Respiratory Protection:** In case of inadequate ventilation use suitable respirator.
- Hygiene measures:** Provide eyewash station and safety shower. Observe good industrial hygiene practices. Wash hands before breaks and immediately after handling the product. Do not eat, drink or smoke when using the product. Wash contaminated clothing before reuse.

9. Physical and chemical properties

Appearance

- Physical state:** Solid
- Form:** Crystals or granules
- Color:** White
- Odor:** Odorless
- Odor threshold:** No data available.
- pH:** 1 Aqueous solution
- Melting point/freezing point:** +/- 290 °C
- Initial boiling point and boiling range:** 732 °C
- Flash Point:** No data available.
- Evaporation rate:** No data available.

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|--------------------------------------------------------------|-----------------------------------------------|
| Flammability (solid, gas): | Noncombustible Solid |
| Upper/lower limit on flammability or explosive limits | |
| Flammability limit - upper (%): | No data available. |
| Flammability limit - lower (%): | No data available. |
| Explosive limit - upper (%): | No data available. |
| Explosive limit - lower (%): | No data available. |
| Vapor pressure: | 0,13 kPa (428 °C) |
| Vapor density: | No data available. |
| Density: | 2,91 g/ml (20 °C) |
| Relative density: | 2,907 (25 °C) |
| Solubility(ies) | |
| Solubility in water: | 4.350 g/l (20 °C) |
| Solubility (other): | glycerol: 0,5 g/ml acetone: SolubleSoluble |
| Partition coefficient (n-octanol/water): | No data available. |
| Auto-ignition temperature: | No data available. |
| Decomposition temperature: | No data available. |
| Viscosity: | No data available. |
| Other information | |
| Molecular weight: | 136,3 g/mol (Cl ₂ Zn) |

10. Stability and reactivity

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| Reactivity: | Reacts with water. |
| Chemical Stability: | Material is stable under normal conditions. |
| Possibility of hazardous reactions: | Hazardous polymerization does not occur. |
| Conditions to avoid: | Excessive heat. Contact with incompatible materials. Do not allow water to get into container because of reaction. |
| Incompatible Materials: | Strong oxidizing agents. Bases, alkalies (organic). Potassium Moisture. |
| Hazardous Decomposition Products: | Hydrogen chloride. Zinc oxide. |

11. Toxicological information

Information on likely routes of exposure

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|----------------------|-------------------------------------------------------------|
| Inhalation: | Harmful by inhalation. |
| Skin Contact: | Causes severe skin burns. |
| Eye contact: | Causes eye irritation. Causes serious eye damage. |
| Ingestion: | May cause burns of the gastrointestinal tract if swallowed. |

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral

Product: LD 50 (Rat): 350 mg/kg
LD 50 (Rat): 1.100 mg/kg
LD 50 (Mouse): 1.260 mg/kg

Dermal

Product: No data available.

Inhalation

Product: LC 50 (Rat): <= 1,975 mg/l

Repeated dose toxicity

Product: May cause damage to the liver.

Skin Corrosion/Irritation

Product: Causes skin burns. Strongly corrosive. May cause deep tissue damage.

Serious Eye Damage/Eye Irritation

Product: Causes serious eye damage.

Respiratory or Skin Sensitization

Product: Not a skin sensitizer.

Carcinogenicity

Product: This substance has no evidence of carcinogenic properties.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens:

No carcinogenic components identified

ACGIH Carcinogen List:

No carcinogenic components identified

Germ Cell Mutagenicity

In vitro

Product: No mutagenic components identified

In vivo

Product: No mutagenic components identified

Reproductive toxicity

Product: No components toxic to reproduction

Specific Target Organ Toxicity - Single Exposure

Product: No data available.

Specific Target Organ Toxicity - Repeated Exposure

Product: No data available.

Aspiration Hazard

Product: Not classified

Other effects: None known.

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| 12. Ecological information |
|-----------------------------------|

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish
Product: No data available.

Aquatic Invertebrates
Product: No data available.

Chronic hazards to the aquatic environment:

Fish
Product: No data available.

Aquatic Invertebrates
Product: No data available.

Toxicity to Aquatic Plants
Product: No data available.

Persistence and Degradability

Biodegradation
Product: The product is not readily biodegradable.

BOD/COD Ratio
Product: No data available.

Bioaccumulative potential

Bioconcentration Factor (BCF)
Product: No data available on bioaccumulation.

Partition Coefficient n-octanol / water (log Kow)

Product: No data available.

Mobility in soil: The product is water soluble and may spread in water systems.

Other adverse effects: Expected to be very toxic to aquatic organisms. May cause long-term adverse effects in the environment. The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.

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| 13. Disposal considerations |
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Disposal instructions: Discharge, treatment, or disposal may be subject to national, state, or local laws.

Contaminated Packaging: Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

TDG

| | |
|-------------------------------|--------------------------|
| UN Number: | UN 2331 |
| UN Proper Shipping Name: | ZINC CHLORIDE, ANHYDROUS |
| Transport Hazard Class(es) | |
| Class: | 8 |
| Label(s): | 8 |
| Packing Group: | III |
| Marine Pollutant: | No |
| Special precautions for user: | Not determined. |

IMDG

| | |
|-------------------------------|--------------------------|
| UN Number: | UN 2331 |
| UN Proper Shipping Name: | ZINC CHLORIDE, ANHYDROUS |
| Transport Hazard Class(es) | |
| Class: | 8 |
| Label(s): | 8 |
| EmS No.: | F-A, S-B |
| Packing Group: | III |
| Marine Pollutant: | Yes |
| Special precautions for user: | Not determined. |

IATA

| | |
|-------------------------------|--------------------------|
| UN Number: | UN 2331 |
| UN Proper Shipping Name: | Zinc chloride, anhydrous |
| Transport Hazard Class(es): | |
| Class: | 8 |
| Label(s): | 8 |
| Packing Group: | III |
| Marine Pollutant: | Yes |
| Special precautions for user: | Not determined. |
| Cargo aircraft only: | Allowed. |

Transport in bulk according to Annex II of MARPOL and the IBC Code: Not applicable

15. Regulatory information

Canada Federal Regulations

List of Toxic Substances (CEPA, Schedule 1)

Export Control List (CEPA 1999, Schedule 3)

National Pollutant Release Inventory (NPRI)

Greenhouse Gases

Not Regulated

Controlled Drugs and Substances Act

Precursor Control Regulations

International regulations

Montreal protocol

Not applicable

Stockholm convention

SDS_CA - SDS000000804

Not applicable

Rotterdam convention

Not applicable

Kyoto protocol

Not applicable

Inventory Status:

| | |
|------------------------------------------|----------------------------------------|
| Australia AICS: | On or in compliance with the inventory |
| Canada DSL Inventory List: | On or in compliance with the inventory |
| EINECS, ELINCS or NLP: | On or in compliance with the inventory |
| Japan (ENCS) List: | On or in compliance with the inventory |
| China Inv. Existing Chemical Substances: | Not in compliance with the inventory. |
| Korea Existing Chemicals Inv. (KECI): | On or in compliance with the inventory |
| Canada NDSL Inventory: | Not in compliance with the inventory. |
| Philippines PICCS: | On or in compliance with the inventory |
| US TSCA Inventory: | On or in compliance with the inventory |
| New Zealand Inventory of Chemicals: | On or in compliance with the inventory |
| Japan ISHL Listing: | On or in compliance with the inventory |
| Japan Pharmacopoeia Listing: | Not in compliance with the inventory. |

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

Revision Date: 16.05.2018

Version #: 1.1

Further Information: No data available.

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