

# Material Safety Data Sheet

Flux ST-501A



## 1. Product and company identification

<b>Product name</b>	: Flux ST-501A
<b>Synonym</b>	: Not applicable
<b>Trade name</b>	: Flux ST-501A
<b>Manufacturer</b>	: AIM 9100 Henri Bourassa East Montreal, QC H1E 2S4 (514) 494-2000  In the United States: AIM 25 Kenney Drive Cranston, RI 02920 (800) CALL-AIM
<b>Validation date</b>	: 10/24/2016
<b>Print date</b>	: 10/24/2016
<b><u>In case of emergency</u></b>	: INFOTRAC North America: (800) 535-5053 International: (352) 323-3500
<b>Product type</b>	: Liquid.

## 2. Hazards identification

### Emergency overview

<b>Physical state</b>	: Liquid.
<b>Color</b>	: Colorless.
<b>Odor</b>	: Chlorinated. [Strong]
<b>Signal word</b>	: DANGER!
<b>Hazard statements</b>	: CAUSES RESPIRATORY TRACT, EYE AND SKIN BURNS. HARMFUL IF INHALED, ABSORBED THROUGH SKIN OR SWALLOWED. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.
<b>Precautionary measures</b>	: Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Do not get in eyes. Do not get on skin. Do not eat, drink or smoke when using this product. Avoid contact with eyes, skin and clothing. Keep container tightly closed. Wash thoroughly after handling.
<b>OSHA/HCS status</b>	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

### Potential acute health effects

<b>Inhalation</b>	: Toxic by inhalation. Corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
<b>Ingestion</b>	: Toxic if swallowed. May cause burns to mouth, throat and stomach.
<b>Skin</b>	: Corrosive to the skin. Causes burns. Toxic in contact with skin.
<b>Eyes</b>	: Corrosive to eyes. Causes burns.

### Potential chronic health effects

<b>Chronic effects</b>	: Contains material that can cause target organ damage.
<b>Carcinogenicity</b>	: No known significant effects or critical hazards.

## 2. Hazards identification

- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : No known significant effects or critical hazards.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.
- Target organs** : Contains material which causes damage to the following organs: lungs, eye, lens or cornea.  
Contains material which may cause damage to the following organs: the nervous system, cardiovascular system, upper respiratory tract, skin, teeth.

### Over-exposure signs/symptoms

- Inhalation** : Adverse symptoms may include the following:  
respiratory tract irritation  
coughing
- Ingestion** : Adverse symptoms may include the following:  
stomach pains
- Skin** : Adverse symptoms may include the following:  
pain or irritation  
redness  
blistering may occur
- Eyes** : Adverse symptoms may include the following:  
pain  
watering  
redness

- Medical conditions aggravated by over-exposure** : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

## 3. Composition/information on ingredients

### United States

Name	CAS number	%
zinc chloride	7646-85-7	20 - 30
Hydrochloric acid	7647-01-0	10 - 20
ammonium chloride	12125-02-9	10 - 20

### Canada

Name	CAS number	%
zinc chloride	7646-85-7	20 - 30
Hydrochloric acid	7647-01-0	10 - 20
ammonium chloride	12125-02-9	10 - 20

### Mexico

Name	CAS number	UN number	%	IDLH	Classification			
					H	F	R	Special
zinc chloride	7646-85-7	UN2331	20 - 30	50 mg/m <sup>3</sup>	3	0	1	-
Hydrochloric acid	7647-01-0	Not available.	10 - 20	50 ppm	3	0	0	-
ammonium chloride	12125-02-9	Not available.	10 - 20	-	2	0	0	-

### 3. Composition/information on ingredients

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.

### 4. First aid measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- 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.
- 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.

### 5. Fire-fighting measures

- Flammability of the product** : In a fire or if heated, a pressure increase will occur and the container may burst.
- Extinguishing media**
- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : 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. 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:  
nitrogen oxides  
halogenated compounds  
metal oxide/oxides
- 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.

### 6. Accidental release measures

- Personal precautions** : 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. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
- 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.

## 6. Accidental release measures

### Methods for cleaning up

- Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). The spilled material may be neutralized with sodium carbonate, sodium bicarbonate or sodium hydroxide. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see Section 8). 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. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Keep away from alkalis. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. 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. Separate from alkalis. 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.

## 8. Exposure controls/personal protection

### United States

Ingredient	Exposure limits
zinc chloride	<p><b>ACGIH TLV (United States, 3/2016).</b> TWA: 1 mg/m<sup>3</sup> 8 hours. Form: Fume STEL: 2 mg/m<sup>3</sup> 15 minutes. Form: Fume</p> <p><b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 1 mg/m<sup>3</sup> 8 hours. Form: Fume STEL: 2 mg/m<sup>3</sup> 15 minutes. Form: Fume</p> <p><b>ACGIH (United States, 0/1994).</b> TWA: 1 mg/m<sup>3</sup> STEL: 2 mg/m<sup>3</sup></p> <p><b>NIOSH REL (United States, 10/2013).</b> TWA: 1 mg/m<sup>3</sup> 10 hours. Form: Fume STEL: 2 mg/m<sup>3</sup> 15 minutes. Form: Fume</p> <p><b>OSHA PEL (United States, 2/2013).</b> TWA: 1 mg/m<sup>3</sup> 8 hours. Form: Fume</p> <p><b>OSHA (United States, 0/1989).</b> TWA: 1 mg/m<sup>3</sup> STEL: 2 mg/m<sup>3</sup></p>

## 8. Exposure controls/personal protection

Hydrochloric acid	<p><b>ACGIH (United States, 0/1994).</b>  CEIL: 5 ppm  TWA: 5 mg/m<sup>3</sup>  CEIL: 7.5 mg/m<sup>3</sup></p> <p><b>NIOSH (United States, 0/1994).</b>  TWA: 7 ppm  STEL: 10 ppm  CEIL: 5 ppm  TWA: 2 mg/m<sup>3</sup>  STEL: 8 mg/m<sup>3</sup>  CEIL: 7 mg/m<sup>3</sup></p> <p><b>OSHA (United States, 0/1989).</b>  TWA: 8 ppm  CEIL: 5 ppm  TWA: 7 mg/m<sup>3</sup>  CEIL: 7 mg/m<sup>3</sup></p> <p><b>ACGIH TLV (United States, 3/2016).</b>  C: 2 ppm</p> <p><b>OSHA PEL 1989 (United States, 3/1989).</b>  CEIL: 5 ppm  CEIL: 7 mg/m<sup>3</sup></p> <p><b>NIOSH REL (United States, 10/2013).</b>  CEIL: 5 ppm  CEIL: 7 mg/m<sup>3</sup></p> <p><b>OSHA PEL (United States, 2/2013).</b>  CEIL: 5 ppm  CEIL: 7 mg/m<sup>3</sup></p>
ammonium chloride	<p><b>ACGIH (United States, 0/1994).</b>  TWA: 10 mg/m<sup>3</sup>  STEL: 20 mg/m<sup>3</sup>  CEIL: 20 mg/m<sup>3</sup></p> <p><b>ACGIH TLV (United States, 3/2016).</b>  TWA: 10 mg/m<sup>3</sup> 8 hours. Form: Fume  STEL: 20 mg/m<sup>3</sup> 15 minutes. Form: Fume</p> <p><b>NIOSH REL (United States, 10/2013).</b>  TWA: 10 mg/m<sup>3</sup> 10 hours. Form: Fume  STEL: 20 mg/m<sup>3</sup> 15 minutes. Form: Fume</p> <p><b>NIOSH (United States, 0/1994).</b>  TWA: 10 mg/m<sup>3</sup>  STEL: 20 mg/m<sup>3</sup></p> <p><b>OSHA (United States, 0/1989).</b>  TWA: 10 mg/m<sup>3</sup>  STEL: 20 mg/m<sup>3</sup></p> <p><b>OSHA PEL 1989 (United States, 3/1989).</b>  TWA: 10 mg/m<sup>3</sup> 8 hours.  STEL: 20 mg/m<sup>3</sup> 15 minutes.</p>

[Canada](#)

## 8. Exposure controls/personal protection

<u>Occupational exposure limits</u>		<u>TWA (8 hours)</u>			<u>STEL (15 mins)</u>			<u>Ceiling</u>			
<u>Ingredient</u>	<u>List name</u>	<u>ppm</u>	<u>mg/m<sup>3</sup></u>	<u>Other</u>	<u>ppm</u>	<u>mg/m<sup>3</sup></u>	<u>Other</u>	<u>ppm</u>	<u>mg/m<sup>3</sup></u>	<u>Other</u>	<u>Notations</u>
zinc chloride	US ACGIH 3/2016	-	1	-	-	2	-	-	-	-	[a]
	AB 4/2009	-	1	-	-	2	-	-	-	-	[3] [a]
	BC 5/2015	-	1	-	-	2	-	-	-	-	[a]
	ON 7/2015	-	1	-	-	2	-	-	-	-	[a]
	QC 1/2014	-	1	-	-	-	-	-	-	-	[b]
	SK 7/2013	-	1	-	-	2	-	-	-	-	[a]
Hydrochloric acid	US ACGIH 3/2016	-	-	-	-	-	-	2	-	-	
	AB 4/2009	-	-	-	-	-	-	2	3	-	[3]
	BC 5/2015	-	-	-	-	-	-	2	-	-	
	ON 7/2015	-	-	-	-	-	-	2	-	-	
	QC 1/2014	-	-	-	5	7.5	-	-	-	-	
	SK 7/2013	-	-	-	-	-	-	-	-	-	2 PPM
ammonium chloride	US ACGIH 3/2016	-	10	-	-	20	-	-	-	-	[a]
	AB 4/2009	-	10	-	-	20	-	-	-	-	[3] [a]
	BC 5/2015	-	10	-	-	20	-	-	-	-	[a]
	ON 7/2015	-	10	-	-	20	-	-	-	-	[a]
	QC 1/2014	-	10	-	-	20	-	-	-	-	[b]
	SK 7/2013	-	10	-	-	20	-	-	-	-	

[3]Skin sensitization

Form: [a]Fume [b]fume

### Mexico

#### Occupational exposure limits

<u>Ingredient</u>	<u>Exposure limits</u>
zinc chloride	<b>NOM-010-STPS (Mexico, 4/2016).</b> LMPE-PPT: 1 mg/m <sup>3</sup> 8 hours. Form: Fumes LMPE-CT: 2 mg/m <sup>3</sup> 15 minutes. Form: Fumes
Hydrochloric acid	<b>NOM-010-STPS (Mexico, 4/2016).</b> LMPE-Pico: 2 ppm
ammonium chloride	<b>NOM-010-STPS (Mexico, 4/2016).</b> LMPE-PPT: 10 mg/m <sup>3</sup> 8 hours. Form: Fumes LMPE-CT: 20 mg/m <sup>3</sup> 15 minutes. Form: Fumes

#### **Consult local authorities for acceptable exposure limits.**

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.
- Engineering measures** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- 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.
- Personal protection**
- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## 8. Exposure controls/personal protection

- Hands** : 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.
- Eyes** : 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 or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.
- Skin** : 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.
- 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.

## 9. Physical and chemical properties

- Physical state** : Liquid.
- Flash point** : [Product does not sustain combustion.]
- Color** : Colorless.
- Odor** : Chlorinated. [Strong]
- pH** : 2
- Aerosol product**

## 10. Stability and reactivity

- Chemical stability** : The product is stable.
- Conditions to avoid** : No specific data.
- Incompatible materials** : Attacks many metals producing extremely flammable hydrogen gas which can form explosive mixtures with air.  
Reactive or incompatible with the following materials:  
alkalis
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

## 11. Toxicological information

- United States**  
**Acute toxicity**

## 11. Toxicological information

Product/ingredient name	Result	Species	Dose	Exposure
zinc chloride	LD50 Oral	Guinea pig	200 mg/kg	-
	LD50 Oral	Mouse	329 mg/kg	-
	LD50 Oral	Rat	350 mg/kg	-
	LD50 Oral	Rat	350 mg/kg	-
Hydrochloric acid	LD50 Oral	Mouse	151 mg/kg	-
	LD50 Oral	Mouse	2950 mg/kg	-
	LD50 Oral	Rat	915 mg/kg	-
	LDLo Oral	Mouse	150 mg/kg	-
	LDLo Oral	Mouse	110 mg/kg	-
ammonium chloride	LD50 Oral	Mouse	1300 mg/kg	-
	LD50 Oral	Rat	1650 mg/kg	-
	LD50 Oral	Rat	1650 mg/kg	-
	LDLo Oral	Dog	600 mg/kg	-

**Conclusion/Summary** : Not available.

### Chronic toxicity

**Conclusion/Summary** : Not available.

### Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
zinc chloride	Skin - Severe irritant	Rabbit	-	120 hours 1 Percent	-
Hydrochloric acid	Eyes - Mild irritant	Rabbit	-	0.5 minutes 5 milligrams	-
	Skin - Mild irritant	Human	-	24 hours 4 Percent	-
ammonium chloride	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Severe irritant	Rabbit	-	100 milligrams	-

**Conclusion/Summary** : Not available.

### Sensitizer

**Conclusion/Summary** : Not available.

### Carcinogenicity

**Conclusion/Summary** : Not available.

### Classification

Product/ingredient name	OSHA	IARC	NTP	ACGIH	EPA	NIOSH
zinc chloride	-	-	-	-	-	None.
Hydrochloric acid	-	3	-	A4	-	None.
ammonium chloride	-	-	-	-	-	None.

### Mutagenicity

**Conclusion/Summary** : Not available.

### Teratogenicity

**Conclusion/Summary** : Not available.

### Reproductive toxicity

**Conclusion/Summary** : Not available.

### Canada

#### Acute toxicity



## 11. Toxicological information

Product/ingredient name	Result	Species	Dose	Exposure
zinc chloride	LD50 Oral	Guinea pig	200 mg/kg	-
	LD50 Oral	Mouse	329 mg/kg	-
	LD50 Oral	Rat	350 mg/kg	-
	LD50 Oral	Rat	350 mg/kg	-
Hydrochloric acid	LD50 Oral	Mouse	151 mg/kg	-
	LD50 Oral	Mouse	2950 mg/kg	-
	LD50 Oral	Rat	915 mg/kg	-
	LDLo Oral	Mouse	150 mg/kg	-
	LDLo Oral	Mouse	110 mg/kg	-
ammonium chloride	LD50 Oral	Mouse	1300 mg/kg	-
	LD50 Oral	Rat	1650 mg/kg	-
	LD50 Oral	Rat	1650 mg/kg	-
	LDLo Oral	Dog	600 mg/kg	-

**Conclusion/Summary** : Not available.

### Chronic toxicity

**Conclusion/Summary** : Not available.

### Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
zinc chloride	Skin - Severe irritant	Rabbit	-	120 hours 1 Percent	-
Hydrochloric acid	Eyes - Mild irritant	Rabbit	-	0.5 minutes 5 milligrams	-
	Skin - Mild irritant	Human	-	24 hours 4 Percent	-
ammonium chloride	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Severe irritant	Rabbit	-	100 milligrams	-

**Conclusion/Summary** : Not available.

### Sensitizer

**Conclusion/Summary** : Not available.

### Carcinogenicity

**Conclusion/Summary** : Not available.

### Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
zinc chloride	-	-	-	None.	-	-
Hydrochloric acid	A4	3	-	None.	-	-
ammonium chloride	-	-	-	None.	-	-

### Mutagenicity

**Conclusion/Summary** : Not available.

### Teratogenicity

**Conclusion/Summary** : Not available.

### Reproductive toxicity

**Conclusion/Summary** : Not available.

### Mexico

### Acute toxicity

## 11. Toxicological information

Product/ingredient name	Result	Species	Dose	Exposure
zinc chloride	LD50 Oral	Guinea pig	200 mg/kg	-
	LD50 Oral	Mouse	329 mg/kg	-
	LD50 Oral	Rat	350 mg/kg	-
	LD50 Oral	Rat	350 mg/kg	-
Hydrochloric acid	LD50 Oral	Mouse	151 mg/kg	-
	LD50 Oral	Mouse	2950 mg/kg	-
	LD50 Oral	Rat	915 mg/kg	-
	LDLo Oral	Mouse	150 mg/kg	-
	LDLo Oral	Mouse	110 mg/kg	-
	LDLo Oral	Mouse	110 mg/kg	-
ammonium chloride	LD50 Oral	Mouse	1300 mg/kg	-
	LD50 Oral	Rat	1650 mg/kg	-
	LD50 Oral	Rat	1650 mg/kg	-
	LDLo Oral	Dog	600 mg/kg	-

**Conclusion/Summary** : Not available.

### Chronic toxicity

**Conclusion/Summary** : Not available.

### Irritation/Corrosion

Product/ingredient name	Result	Score	Score	Exposure	Observation
zinc chloride	Skin - Severe irritant	Rabbit	-	120 hours 1 Percent	-
Hydrochloric acid	Eyes - Mild irritant	Rabbit	-	0.5 minutes 5 milligrams	-
	Skin - Mild irritant	Human	-	24 hours 4 Percent	-
ammonium chloride	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Severe irritant	Rabbit	-	100 milligrams	-

**Conclusion/Summary** : Not available.

### Sensitizer

**Conclusion/Summary** : Not available.

### Carcinogenicity

**Conclusion/Summary** : Not available.

### Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
zinc chloride	-	-	-	None.	-	-
Hydrochloric acid	A4	3	-	None.	-	-
ammonium chloride	-	-	-	None.	-	-

### Mutagenicity

**Conclusion/Summary** : Not available.

### Teratogenicity

**Conclusion/Summary** : Not available.

### Reproductive toxicity

**Conclusion/Summary** : Not available.

## 11. Toxicological information

**Other information** : To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

## 12. Ecological information

**Ecotoxicity** : Water polluting material. May be harmful to the environment if released in large quantities.

### United States

#### Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
zinc chloride	Acute EC50 26 µg/l	Algae - Navicula incerta	96 hours
	Acute EC50 34 µg/l Fresh water	Algae - Chlorella vulgaris - Exponential growth phase	72 hours
	Acute EC50 1.8 mg/l Fresh water	Aquatic plants - Lemna aequinoctialis	96 hours
	Acute EC50 100 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 49.99 µg/l Fresh water	Crustaceans - Moina irrasa - Neonate	48 hours
	Acute LC50 0.027 mg/l Marine water	Fish - Limanda punctatissima - Pre-larvae	96 hours
	Chronic NOEC 20 µg/l Marine water	Algae - Chlorella sp. - Exponential growth phase	72 hours
	Chronic NOEC 1000 µg/l Fresh water	Crustaceans - Procambarus clarkii - Intermolt	21 days
Hydrochloric acid	Chronic NOEC 31.5 µg/l Fresh water	Daphnia - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)	21 days
	Acute LC50 240000 µg/l Marine water	Fish - Oncorhynchus mykiss	30 days
ammonium chloride	Acute LC50 282 ppm Fresh water	Crustaceans - Carcinus maenas - Adult	48 hours
	Acute EC50 0.07 mg/l Marine water	Fish - Gambusia affinis - Adult	96 hours
	Acute LC50 20 µg/l Fresh water	Algae - Hormosira banksii - Gamete	72 hours
	Acute LC50 390 µg/l Fresh water	Crustaceans - Macrobrachium rosenbergii - Post-larvae	48 hours
	Acute LC50 80 µg/l Fresh water	Daphnia - Daphnia magna - Young	48 hours
	Chronic EC10 0.03 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
	Chronic NOEC 0.6 mg/l Marine water	Daphnia - Daphnia obtusa	21 days
	Chronic NOEC 330 µg/l Fresh water	Algae - Entomoneis punctulata - Exponential growth phase	72 hours
	Chronic NOEC 0.006 mg/l Fresh water	Crustaceans - Crangonyx sp. - Juvenile (Fledgling, Hatchling, Weanling)	21 days
		Fish - Ictalurus punctatus - Fry	30 days

**Conclusion/Summary** : Not available.

#### Persistence/degradability

**Conclusion/Summary** : Not available.

### Canada

#### Aquatic ecotoxicity

## 12. Ecological information

Product/ingredient name	Result	Species	Exposure
zinc chloride	Acute EC50 26 µg/l	Algae - Navicula incerta	96 hours
	Acute EC50 34 µg/l Fresh water	Algae - Chlorella vulgaris - Exponential growth phase	72 hours
	Acute EC50 1.8 mg/l Fresh water	Aquatic plants - Lemna aequinoctialis	96 hours
	Acute EC50 100 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 49.99 µg/l Fresh water	Crustaceans - Moina irrasa - Neonate	48 hours
	Acute LC50 0.027 mg/l Marine water	Fish - Limanda punctatissima - Pre-larvae	96 hours
	Chronic NOEC 20 µg/l Marine water	Algae - Chlorella sp. - Exponential growth phase	72 hours
Hydrochloric acid	Chronic NOEC 1000 µg/l Fresh water	Crustaceans - Procambarus clarkii - Intermolt	21 days
	Chronic NOEC 80 µg/l Fresh water	Daphnia - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)	21 days
	Chronic NOEC 31.5 µg/l Fresh water	Fish - Oncorhynchus mykiss	30 days
ammonium chloride	Acute LC50 240000 µg/l Marine water	Crustaceans - Carcinus maenas - Adult	48 hours
	Acute LC50 282 ppm Fresh water	Fish - Gambusia affinis - Adult	96 hours
ammonium chloride	Acute EC50 0.07 mg/l Marine water	Algae - Hormosira banksii - Gamete	72 hours
	Acute LC50 20 µg/l Fresh water	Crustaceans - Macrobrachium rosenbergii - Post-larvae	48 hours
	Acute LC50 390 µg/l Fresh water	Daphnia - Daphnia magna - Young	48 hours
	Acute LC50 80 µg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
	Chronic EC10 0.03 mg/l Fresh water	Daphnia - Daphnia obtusa	21 days
	Chronic NOEC 0.6 mg/l Marine water	Algae - Entomoneis punctulata - Exponential growth phase	72 hours
	Chronic NOEC 330 µg/l Fresh water	Crustaceans - Crangonyx sp. - Juvenile (Fledgling, Hatchling, Weanling)	21 days
	Chronic NOEC 0.006 mg/l Fresh water	Fish - Ictalurus punctatus - Fry	30 days

**Conclusion/Summary** : Not available.

**Persistence/degradability**

**Conclusion/Summary** : Not available.

**Mexico**

**Aquatic ecotoxicity**

Product/ingredient name	Result	Species	Exposure
zinc chloride	Acute EC50 26 µg/l	Algae - Navicula incerta	96 hours
	Acute EC50 34 µg/l Fresh water	Algae - Chlorella vulgaris - Exponential growth phase	72 hours
	Acute EC50 1.8 mg/l Fresh water	Aquatic plants - Lemna aequinoctialis	96 hours
	Acute EC50 100 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 49.99 µg/l Fresh water	Crustaceans - Moina irrasa - Neonate	48 hours
	Acute LC50 0.027 mg/l Marine water	Fish - Limanda punctatissima - Pre-larvae	96 hours
	Chronic NOEC 20 µg/l Marine water	Algae - Chlorella sp. - Exponential growth phase	72 hours
	Chronic NOEC 1000 µg/l Fresh water	Crustaceans - Procambarus	21 days

## 12. Ecological information

Hydrochloric acid  ammonium chloride	Chronic NOEC 80 µg/l Fresh water	clarkii - Intermolt Daphnia - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)	21 days
	Chronic NOEC 31.5 µg/l Fresh water Acute LC50 240000 µg/l Marine water	Fish - Oncorhynchus mykiss Crustaceans - Carcinus maenas - Adult	30 days 48 hours
	Acute LC50 282 ppm Fresh water Acute EC50 0.07 mg/l Marine water	Fish - Gambusia affinis - Adult Algae - Hormosira banksii - Gamete	96 hours 72 hours
	Acute LC50 20 µg/l Fresh water	Crustaceans - Macrobrachium rosenbergii - Post-larvae	48 hours
	Acute LC50 390 µg/l Fresh water	Daphnia - Daphnia magna - Young	48 hours
	Acute LC50 80 µg/l Fresh water Chronic EC10 0.03 mg/l Fresh water Chronic NOEC 0.6 mg/l Marine water	Fish - Oncorhynchus mykiss Daphnia - Daphnia obtusa Algae - Entomoneis punctulata - Exponential growth phase	96 hours 21 days 72 hours
	Chronic NOEC 330 µg/l Fresh water	Crustaceans - Crangonyx sp. - Juvenile (Fledgling, Hatchling, Weanling)	21 days
	Chronic NOEC 0.006 mg/l Fresh water	Fish - Ictalurus punctatus - Fry	30 days

**Conclusion/Summary** : Not available.

**Persistence/degradability**

**Conclusion/Summary** : Not available.

**Toxicity of the products of biodegradation** : The products of biodegradation are as toxic as the original product.

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

## 13. Disposal considerations










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

**Disposal should be in accordance with applicable regional, national and local laws and regulations.**





**Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.**

## 14. Transport information

## 14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
<b>DOT Classification</b>	2922	CORROSIVE LIQUID, TOXIC, N.O.S (Hydrochloric acid, Ammonium Bifluoride)	8 (6.1)	II	  	<p>This product is not regulated as a marine pollutant when transported on inland waterways in sizes of ≤5 L or ≤5 kg or by road, rail, or inland air in non-bulk sizes, provided the packagings meet the general provisions of §§ 173.24 and 173.24a.</p> <p><b>Reportable quantity</b> 4545.5 lbs / 2063.6 kg Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.</p>
<b>TDG Classification</b>	2922	CORROSIVE LIQUID, TOXIC, N.O.S (Hydrochloric acid, Ammonium Bifluoride)	8 (6.1)	II	 	<p>Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.40-2.42 (Class 8), 2.26-2.36 (Class 6).</p>
<b>Mexico Classification</b>	2922	CORROSIVE LIQUID, TOXIC, N.O.S (Hydrochloric acid, Ammonium Bifluoride)	8 (6.1)	II	 	-
<b>ADR/RID Class</b>	2922	CORROSIVE LIQUID, TOXIC, N.O.S (Hydrochloric acid, Ammonium Bifluoride)	8 (6.1)	II	 	<p>The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg.</p> <p><b>Tunnel code</b> (E)</p>

## 14. Transport information

<b>IMDG Class</b>	2922	CORROSIVE LIQUID, TOXIC, N.O.S (Hydrochloric acid, Ammonium Bifluoride)	8 (6.1)	II	 	-
<b>IATA-DGR Class</b>	2922	Corrosive toxic liquids n.o.s. (ZINC CHLORIDE, Ammonium bifluoride)	8 (6.1)	II	 	The environmentally hazardous substance mark may appear if required by other transportation regulations.

PG\* : Packing group

## 15. Regulatory information

### United States

**HCS Classification** : Toxic material  
Corrosive material  
Target organ effects

**U.S. Federal regulations** : **TSCA 8(a) CDR Exempt/Partial exemption:** Not determined

All components are listed or exempted.

**Clean Water Act (CWA) 307:** zinc chloride

**Clean Water Act (CWA) 311:** zinc chloride; Hydrochloric acid; ammonium chloride

**Clean Air Act (CAA) 112 regulated toxic substances:** Hydrochloric acid

**Clean Air Act Section 112** : Listed

**(b) Hazardous Air Pollutants (HAPs)**

**Clean Air Act Section 602** : Not listed

**Class I Substances**

**Clean Air Act Section 602** : Not listed

**Class II Substances**

**DEA List I Chemicals** : Not listed

**(Precursor Chemicals)**

**DEA List II Chemicals** : Listed

**(Essential Chemicals)**

### SARA 302/304

#### Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
Hydrochloric acid	10 - 20	Yes.	500	-	5000	-

**SARA 304 RQ** : 30303 lbs / 13757.6 kg

### SARA 311/312

**Classification** : Immediate (acute) health hazard  
Delayed (chronic) health hazard

#### Composition/information on ingredients

## 15. Regulatory information

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
zinc chloride	20 - 30	No.	No.	No.	Yes.	Yes.
Hydrochloric acid	10 - 20	No.	Yes.	No.	Yes.	Yes.
ammonium chloride	10 - 20	No.	No.	No.	Yes.	Yes.

### SARA 313

	Product name	CAS number	%
<b>Form R - Reporting requirements</b>	zinc chloride	7646-85-7	20 - 30
	Hydrochloric acid	7647-01-0	10 - 20
	ammonium chloride	12125-02-9	10 - 20
<b>Supplier notification</b>	zinc chloride	7646-85-7	20 - 30
	Hydrochloric acid	7647-01-0	10 - 20
	ammonium chloride	12125-02-9	10 - 20

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

### State regulations

- Massachusetts** : The following components are listed: zinc chloride; Hydrochloric acid; ammonium chloride
- New York** : The following components are listed: Zinc chloride; Hydrochloric acid; Ammonium chloride
- New Jersey** : The following components are listed: zinc chloride; Hydrochloric acid; ammonium chloride
- Pennsylvania** : The following components are listed: zinc chloride; Hydrochloric acid; ammonium chloride
- United States inventory (TSCA 8b)** : All components are listed or exempted.

### Canada

- WHMIS (Canada)** : Class D-1A: Material causing immediate and serious toxic effects (Very toxic).  
Class E: Corrosive material

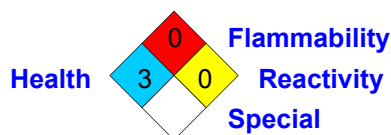
### Canadian lists

- Canadian NPRI** : The following components are listed: Zinc (and its compounds); Hydrochloric acid; Ammonia (total)
- CEPA Toxic substances** : None of the components are listed.
- Canada inventory** : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

### Mexico

**Classification** :



### International regulations



## 15. Regulatory information

- International lists** :
- Australia inventory (AICS):** All components are listed or exempted.
  - China inventory (IECSC):** All components are listed or exempted.
  - Japan inventory (ENCS):** All components are listed or exempted.
  - Japan inventory (ISHL):** Not determined.
  - Korea inventory:** All components are listed or exempted.
  - Malaysia Inventory (EHS Register):** All components are listed or exempted.
  - New Zealand Inventory of Chemicals (NZIoC):** All components are listed or exempted.
  - Philippines inventory (PICCS):** All components are listed or exempted.
  - Taiwan Chemical Substances Inventory (TCSI):** All components are listed or exempted.
  - Turkey inventory:** Not determined.
- Chemical Weapons Convention List Schedule I Chemicals** : Not listed
- Chemical Weapons Convention List Schedule II Chemicals** : Not listed
- Chemical Weapons Convention List Schedule III Chemicals** : Not listed

## 16. Other information

- Label requirements** : CAUSES RESPIRATORY TRACT, EYE AND SKIN BURNS. HARMFUL IF INHALED, ABSORBED THROUGH SKIN OR SWALLOWED. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

- Hazardous Material Information System (U.S.A.)** :

Health	3
Flammability	0
Physical hazards	0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

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

- National Fire Protection Association (U.S.A.)** :



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## 16. Other information

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

**References** : -ACGIH, Threshold Limit Values, 1994-1995. -Canada Gazette Part II, Vol. 122, No. 2 Registration SOR/88-64 31 December, 1987 Hazardous Products Act "Ingredient Disclosure List". -CFR29, OSHA's Permissible Exposure Limits, revision July, 1993. -CFR29, part 1910.1200, Hazard Communication. -CHEMTOX database -Components' manufacturer's Material Safety Data Sheet. -CRC Handbook of chemistry and physics, 67 th edition, CRC Press inc., Boca Raton, Florida. -CSST (Comission de Santé et Sécurité au Travail), document #RT-12: Classification of Certain Chemical Substances. -IATA, Dangerous Goods Regulations, 37th edition (January 1, 1996) -NFPA, Fire Protection Guide to Chemical Hazards, 11th edition. -NIOSH, Pocket Guide to Chemical Hazards, revision June 1994. Sigma-Alrich handbook of fine chemicals, 1998 -TSCA (Toxic Substance Contral Act), Chemical Substance Inventory List, 1985.

**Other special considerations** : -ALL INGREDIENTS WITH SUSCEPTIBLE HAZARDS THAT ARE PRESENT IN A CONCENTRATION GREATER THAN 1 % ( GREATER THAN 0.1 % FOR CARCINOGENS ) HAVE BEEN DISCLOSED IN THIS SAFETY DOCUMENT.

**Date of printing** : 10/24/2016

**Date of issue** : 10/24/2016

**Date of previous issue** : 7/27/2015

**Version** : 0.03

**Prepared by** : C. Gosselin

▣ Indicates information that has changed from previously issued version.

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Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.