

SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended.

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product Name: Stay Clean® Liquid Soldering Flux

Other means of identification

SDS number: 200000007464

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses: Metal Soldering

Uses advised against: Not known. Read this SDS before using this product.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Importer/Supplier/Distributor Information

Company Name: GS Metal Joining Ltd

Address: 154 Mandalay Rd
Pleasley
Mansfield
Nottinghamshire
NG19 7TJ
UK

Telephone: +44 (0)1623 707954

Contact Person: Safety Data Sheet Questions:
enquiries@gsmetaljoining.co.uk

1.4 Emergency telephone number:

+44 (0)1623 707954

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

The product has been classified according to the legislation in force.

Classification according to Regulation (EC) No 1272/2008 as amended.

Health Hazards

Acute toxicity (Oral)	Category 4	H302
Skin corrosion	Category 1A	H314

Serious eye damage	Category 1	H318
Specific Target Organ Toxicity - Single Exposure	Category 2	H371
Specific Target Organ Toxicity - Single Exposure	Category 3	H335
Environmental Hazards		
Acute hazards to the aquatic environment	Category 1	H400
Chronic hazards to the aquatic environment	Category 1	H410

2.2 Label Elements

Contains: Zinc chloride
 Ammonium chloride
 Hydrochloric acid
 Methanol



Signal Word: Danger

Hazard Statement(s): H302: Harmful if swallowed.
 H314: Causes severe skin burns and eye damage.
 H371: May cause damage to organs.
 H335: May cause respiratory irritation.
 H410: Very toxic to aquatic life with long lasting effects.

Precautionary Statements

Prevention: P260: Do not breathe dust/fume/gas/mist/vapors/spray.
 P273: Avoid release to the environment.
 P280: Wear protective gloves/protective clothing/eye protection/face protection.

Response: P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
 P310: Immediately call a POISON CENTER/doctor.
 P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
 P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
 P312: Call a POISON CENTER/doctor if you feel unwell.
 P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P308+P311: IF exposed or concerned: Call a POISON CENTER/doctor.
 P391: Collect spillage.

2.3 Other hazards

Overexposure to fumes and gases from the solder and/or flux material can be hazardous. Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this product.

Substance(s) formed under the conditions of use:

Fumes produced from use of this product may contain the following constituent(s) and/or their complex metallic oxides as well as solid particles or other constituents from the solder, brazing consumable, flux material or base metal, or base metal coating not listed below.

Chemical name	CAS-No.
Carbon dioxide	124-38-9
Carbon monoxide	630-08-0
Nitrogen dioxide	10102-44-0
Ozone	10028-15-6

SECTION 3: Composition/information on ingredients

Reportable Hazardous Ingredients 3.2 Mixtures

Chemical name	Concentration	CAS-No.	EC No.	Classification	Notes	REACH Registration No.
Zinc chloride	25 - <50%	7646-85-7	231-592-0	Skin Corr.: 1B: H314 Acute Tox.: 4: H302 Eye Dam.: 1: H318 Aquatic Acute: 1: H400 Aquatic Chronic: 1: H410	#	01-2119472431-44;
Ammonium chloride	25 - <50%	12125-02-9	235-186-4	Acute Tox.: 4: H302 Eye Irrit.: 2: H319 Aquatic Acute: 2: H401	#	01-2119487950-27;
Hydrochloric acid	5 - <10%	7647-01-0	231-595-7	Met. Corr.: 1: H290 Eye Dam.: 1: H318 Skin Corr.: 1B: H314 STOT SE: 3: H335	#	No data available.
Methanol	5 - <10%	67-56-1	200-659-6	Flam. Liq.: 2: H225 Acute Tox.: 3: H331 Acute Tox.: 3: H311 Acute Tox.: 3: H301 STOT SE: 1: H370	#	No data available.

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

This substance has workplace exposure limit(s).

This substance is listed as SVHC

CLP: Regulation No. 1272/2008.

The full text for all H-statements is displayed in section 16.

Composition Comments: The term “Hazardous Ingredients” should be interpreted as a term defined in Hazard Communication standards and does not necessarily imply the existence of a welding hazard. The product may contain additional non-hazardous ingredients or may form additional compounds under the condition of use. Refer to Sections 2 and 8 for more information.

SECTION 4: First aid measures

4.1 Description of first aid measures

- Inhalation:** Move to fresh air if breathing is difficult. If breathing has stopped, perform artificial respiration and obtain medical assistance at once.
- Skin Contact:** Remove contaminated clothing and wash the skin thoroughly with soap and water. For reddened or blistered skin, or thermal burns, obtain medical assistance at once.
- Eye contact:** Do not rub eye. Any material that contacts the eye should be washed out immediately with water. If easy to do, remove contact lenses. Continue to rinse for at least 15 minutes. Get medical attention promptly if symptoms occur after washing.
- Ingestion:** Avoid hand, clothing, food, and drink contact with fluxes, metal fume or powder which can cause ingestion of particulate during hand to mouth activities such as drinking, eating, smoking, etc. If ingested, do not induce vomiting. Contact a poison control center. Unless the poison control center advises otherwise, wash out mouth thoroughly with water. If symptoms develop, seek medical attention at once. Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.

4.2 Most important symptoms and effects, both acute and delayed:

Short-term (acute) overexposure to fumes and gases from welding and allied processes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Long-term (chronic) overexposure to fumes and gases from welding and allied processes can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects. Refer to Section 11 for more information.

4.3 Indication of any immediate medical attention and special treatment needed

- Hazards:** The hazards associated with welding and its allied processes such as soldering and brazing are complex and may include physical and health hazards such as but not limited to electric shock, physical strains, radiation burns (eye flash), thermal burns due to hot metal or spatter and potential health effects of overexposure to fumes, gases or dusts potentially generated during the use of this product. Refer to Section 11 for more information.
- Treatment:** Treat symptomatically.

SECTION 5: Firefighting measures

General Fire Hazards: As shipped, this product is nonflammable. However, welding arc and sparks as well as open flames and hot surfaces associated with brazing and soldering can ignite combustible and flammable materials. Read and understand American National Standard Z49.1, "Safety in Welding, Cutting and Allied Processes" and National Fire Protection Association NFPA 51B, "Standard for Fire Prevention during Welding, Cutting and Other Hot Work" before using this product.

5.1 Extinguishing media Suitable extinguishing media: Use fire-extinguishing media appropriate for surrounding materials.

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

5.2 Special hazards arising from the substance or mixture: During fire, gases hazardous to health may be formed.

5.3 Advice for firefighters Special fire fighting procedures: Use standard firefighting procedures and consider the hazards of other involved materials.

Special protective equipment for fire-fighters: Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures: If airborne dust and/or fume is present, use adequate engineering controls and, if needed, personal protection to prevent overexposure. Refer to recommendations in Section 8.

6.2 Environmental Precautions: Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so. Avoid release to the environment.

6.3 Methods and material for containment and cleaning up: Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Dike far ahead of larger spill for later recovery and disposal.

6.4 Reference to other sections: For further specification, refer to section 8 of the SDS.

SECTION 7: Handling and storage:

7.1 Precautions for safe handling:

Prevent abrading consumable materials or creating dust. Provide appropriate exhaust ventilation at places where fume or dust is formed. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

Read and understand the manufacturer's instruction and the precautionary label on the product. See American National Standard Z49.1, "Safety In Welding, Cutting and Allied Processes" published by the American Welding Society, <http://pubs.aws.org> and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, www.gpo.gov. Do not taste or swallow. Wash hands thoroughly after handling.

7.2 Conditions for safe storage, including any incompatibilities:

Store in closed original container in a dry place. Store in accordance with local/regional/national regulations. Store away from incompatible materials.

7.3 Specific end use(s):

No data available.

SECTION 8: Exposure controls/personal protection

8.1 Control Parameters

MAC, PEL, TLV and other exposure limit values may vary per element and form - as well as per country. All country-specific values are not listed. If no occupational exposure limit values are listed below, your local authority may still have applicable values. Refer to your local or national exposure limit values.

Control Parameters

Occupational Exposure Limits: Great Britain

Chemical Identity	Type	Exposure Limit Values	Source
Zinc chloride - Fume.	TWA	1 mg/m3	UK. EH40 Workplace Exposure Limits (WELs) (2007)
	STEL	2 mg/m3	UK. EH40 Workplace Exposure Limits (WELs) (01 2020)
Ammonium chloride - Fume.	TWA	10 mg/m3	UK. EH40 Workplace Exposure Limits (WELs) (2007)
	STEL	20 mg/m3	UK. EH40 Workplace Exposure Limits (WELs) (01 2020)
Hydrochloric acid - Gas and aerosol mists	TWA	1 ppm 2 mg/m3	UK. EH40 Workplace Exposure Limits (WELs) (2007)
Hydrochloric acid	TWA	5 ppm 8 mg/m3	EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU (12 2009)
	STEL	10 ppm 15 mg/m3	EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU (12 2009)
	TWA	5 ppm 8 mg/m3	EU. Scientific Committee on Occupational Exposure Limit Values (SCOELs), European Commission - SCOEL, as amended (2014)
	STEL	10 ppm 15 mg/m3	EU. Scientific Committee on Occupational Exposure Limit Values (SCOELs), European Commission - SCOEL, as amended (2014)
Hydrochloric acid - Gas and aerosol mists	STEL	5 ppm 8 mg/m3	UK. EH40 Workplace Exposure Limits (WELs) (01 2020)
Methanol	TWA	200 ppm 266 mg/m3	UK. EH40 Workplace Exposure Limits (WELs) (2007)
	TWA	200 ppm 260 mg/m3	EU. Indicative Exposure Limit Values in

			Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU (12 2009)
	STEL	250 ppm 333 mg/m3	UK. EH40 Workplace Exposure Limits (WELs) (01 2020)

Biological Limit Values: Great Britain

None of the components have assigned exposure limits.

Biological Limit Values: ACGIH

None of the components have assigned exposure limits.

Additional exposure limits under the conditions of use: Great Britain

Chemical Identity	Type	Exposure Limit Values	Source
Carbon dioxide	TWA	5.000 ppm	UK. EH40 Workplace Exposure Limits (WELs)
	TWA	5.000 ppm	EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU (Indicative)
	STEL	15.000 ppm	UK. EH40 Workplace Exposure Limits (WELs)
Carbon monoxide	STEL	100 ppm	EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU (Indicative)
	TWA	20 ppm	EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU (Indicative)
	STEL	100 ppm	EU. Scientific Committee on Occupational Exposure Limit Values (SCOELs), European Commission - SCOEL, as amended
	TWA	20 ppm	EU. Scientific Committee on Occupational Exposure Limit Values (SCOELs), European Commission - SCOEL, as amended
	STEL	200 ppm	UK. EH40 Workplace Exposure Limits (WELs)
	TWA	30 ppm	UK. EH40 Workplace Exposure Limits (WELs)
	STEL	100 ppm	UK. EH40 Workplace Exposure Limits (WELs)
	TWA	20 ppm	UK. EH40 Workplace Exposure Limits (WELs)
	TWA	30 ppm	UK. EH40 Workplace Exposure Limits (WELs) (The expiration date of this limit: 21 August 2023)
	STEL	200 ppm	UK. EH40 Workplace Exposure Limits (WELs) (The expiration date of this limit: 21 August 2023)
Nitrogen dioxide	TWA	0,5 ppm	EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU (Indicative)
	STEL	1 ppm	EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU (Indicative)
	STEL	1 ppm	EU. Scientific Committee on Occupational Exposure Limit Values (SCOELs), European Commission - SCOEL, as amended
	TWA	0,5 ppm	EU. Scientific Committee on Occupational Exposure Limit Values (SCOELs), European Commission - SCOEL, as amended
	TWA	0,5 ppm	UK. EH40 Workplace Exposure Limits (WELs)
	STEL	1 ppm	UK. EH40 Workplace Exposure Limits (WELs)
Ozone	STEL	0,2 ppm	UK. EH40 Workplace Exposure Limits (WELs)

Additional exposure limits under the conditions of use: US

Chemical Identity	Type	Exposure Limit Values	Source
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Carbon dioxide	TWA	5.000 ppm		US. ACGIH Threshold Limit Values (12 2010)
	STEL	30.000 ppm		US. ACGIH Threshold Limit Values (12 2010)
	PEL	5.000 ppm	9.000 mg/m ³	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Carbon monoxide	TWA	25 ppm		US. ACGIH Threshold Limit Values (12 2010)
	PEL	50 ppm	55 mg/m ³	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Nitrogen dioxide	TWA	0,2 ppm		US. ACGIH Threshold Limit Values (02 2012)
	Ceiling	5 ppm	9 mg/m ³	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Ozone	PEL	0,1 ppm	0,2 mg/m ³	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	TWA	0,05 ppm		US. ACGIH Threshold Limit Values (03 2014)
	TWA	0,20 ppm		US. ACGIH Threshold Limit Values (03 2014)
	TWA	0,10 ppm		US. ACGIH Threshold Limit Values (03 2014)
	TWA	0,08 ppm		US. ACGIH Threshold Limit Values (03 2014)

8.2 Exposure controls

Appropriate Engineering Controls

Ventilation: Use enough ventilation and local exhaust at the arc, flame or heat source to keep the fumes and gases from the worker's breathing zone and the general area. Train the operator to keep their head out of the fumes. **Keep exposure as low as possible.**

Individual protection measures, such as personal protective equipment

General information:

Exposure Guidelines: To reduce the potential for overexposure, use controls such as adequate ventilation and personal protective equipment (PPE). Overexposure refers to exceeding applicable local limits, the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) or the Occupational Safety and Health Administration's (OSHA) Permissible Exposure Limits (PELs). Workplace exposure levels should be established by competent industrial hygiene assessments. Unless exposure levels are confirmed to be below the applicable local limit, TLV or PEL, whichever is lower, respirator use is required. Absent these controls, overexposure to one or more compound constituents, including those in the fume or airborne particles, may occur resulting in potential health hazards. According to the ACGIH, TLVs and Biological Exposure Indices (BEIs) "represent conditions under which ACGIH believes that nearly all workers may be repeatedly exposed without adverse health effects." The ACGIH further states that the TLV-TWA should be used as a guide in the control of health hazards and should not be used to indicate a fine line between safe and dangerous exposures. See Section 10 for information on constituents which have some potential to present health hazards. Welding consumables and materials being joined may contain chromium as an unintended trace element. Materials that contain chromium may produce some amount of hexavalent chromium (CrVI) and other chromium compounds as a byproduct in the fume. In 2018, the American Conference of Governmental Industrial Hygienists (ACGIH) lowered the Threshold Limit Value (TLV) for hexavalent chromium from 50 micrograms per cubic meter of air (50 µg/m³) to 0.2 µg/m³. At these new limits, CrVI exposures at or above the TLV may be possible in cases where adequate ventilation is not provided. CrVI compounds are on the IARC and NTP lists as posing a lung cancer and sinus cancer risk. Workplace conditions are unique and welding fume exposures levels vary. Workplace exposure assessments must be conducted by a qualified professional, such as an industrial hygienist, to determine if exposures are below applicable limits and to make recommendations when necessary for preventing overexposures.

Eye/face protection:	Wear helmet, face shield or eye protection with filter lens shade number 2 for torch soldering and 3-4 for torch brazing, and follow the recommendations as specified in ANSI Z49.1, Section 4, based on your process details. Shield others by providing appropriate screens and eye protection.
Skin protection	
Hand Protection:	Wear protective gloves. Suitable gloves can be recommended by the glove supplier.
Other:	Protective Clothing: Wear hand, head, and body protection which help to prevent injury from radiation, open flames, hot surfaces, sparks and electrical shock. See Z49.1. At a minimum, this includes welder's gloves and a protective face shield when welding, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing when welding, brazing and soldering. Wear dry gloves free of holes or split seams. Train the operator not to permit electrically live parts or electrodes from contacting the skin . . . or clothing or gloves if they are wet. Insulate yourself from the work piece and ground using dry plywood, rubber mats or other dry insulation.
Respiratory Protection:	Keep your head out of fumes. Use enough ventilation and local exhaust to keep fumes and gases from your breathing zone and the general area. An approved respirator should be used unless exposure assessments are below applicable exposure limits.
Hygiene measures:	Do not eat, drink or smoke when using the product. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3 and F1.5, available from the American Welding Society, www.aws.org . Wash hands after handling.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	Soldering flux.
Physical state:	Liquid
Form:	Liquid
Color:	Colorless
Odor:	Sweet
Odor Threshold:	No data available.
pH:	Acidic
Freezing point:	No data available.
Boiling Point:	No data available.
Flash Point:	No data available.

Evaporation Rate:	No data available.
Flammability (solid, gas):	No data available.
Flammability Limit - Upper (%):	No data available.
Flammability Limit - Lower (%):	No data available.
Vapor pressure:	No data available.
Relative vapor density:	No data available.
Density:	1,3200 g/cm ³
Relative density:	No data available.
Solubility(ies)	
Solubility in Water:	No data available.
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Autoignition Temperature:	No data available.
Decomposition Temperature:	No data available.
SADT:	No data available.
Viscosity:	No data available.
Explosive properties:	No data available.
Oxidizing properties:	No data available.

9.2 Other information

Molecular weight:	Not available.
VOC Content:	554,4 g/l ~42 % (ASTM E1868)
Bulk density:	Not available.
Dust Explosion Limit, Upper:	Not available.
Dust Explosion Limit, Lower:	Not available.
Dust Explosion Description Number Kst:	Not available.
Minimum ignition energy:	Not available.
Minimum ignition temperature:	Not available.
Metal Corrosion:	Not available.

SECTION 10: Stability and reactivity

10.1 Reactivity:	The product is non-reactive under normal conditions of use, storage and transport.
10.2 Chemical Stability:	Material is stable under normal conditions.
10.3 Possibility of hazardous reactions:	None under normal conditions.
10.4 Conditions to avoid:	Avoid heat or contamination.

- 10.5 Incompatible Materials:** Strong acids. Strong oxidizing substances. Strong bases.
- 10.6 Hazardous Decomposition Products:** Fumes and gases from welding and its allied processes such as brazing and soldering cannot be classified simply. The composition and quantity of both are dependent upon the metal to which the joining or hot work is applied, the process, procedure - and where applicable - the electrode or consumable used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded or worked (such as paint, plating, or galvanizing), the number of operators and the volume of the work area, the quality and amount of ventilation, the position of the operator's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.)
- In cases where an electrode or other applied material is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 3, plus those from the base metal and coating, etc., as noted above. Reasonably expected fume constituents produced during arc welding and brazing include the oxides of iron, manganese and other metals present in the welding consumable or base metal. Hexavalent chromium compounds may be in the welding or brazing fume of consumables or base metals which contain chromium. Gaseous and particulate fluoride may be in the fume of consumables or flux materials which contain fluoride. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc associated with welding.

SECTION 11: Toxicological information

- General information:** The International Agency for Research on Cancer (IARC) has determined welding fumes and ultraviolet radiation from welding are carcinogenic to humans (Group 1). According to IARC, welding fumes cause cancer of the lung and positive associations have been observed with cancer of the kidney. Also according to IARC, ultraviolet radiation from welding causes ocular melanoma. IARC identifies gouging, brazing, carbon arc or plasma arc cutting, and soldering as processes closely related to welding. Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this product.
- Information on likely routes of exposure**
- Inhalation:** Inhalation is the primary route of exposure. In high concentrations, dust, vapors, fumes or mists may irritate nose, throat and mucus membranes.
- Skin Contact:** Moderately irritating to skin with prolonged exposure.
- Eye contact:** HEAT RAYS (INFRARED RADIATION) from flame or hot metal can injure eyes.

Ingestion: Avoid ingestion - wear gloves and other appropriate personal protection - wash hands thoroughly following use or handling. Harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation: Short-term (acute) overexposure to fumes and gases from brazing and soldering may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Long-term (chronic) overexposure to fumes and gases from brazing and soldering can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects. Products which contain lead or cadmium have additional specific health hazards - refer to Sections 2, 8 and 11 of this SDS. Depending on specific product composition, some products may produce hazardous concentrations of airborne oxides of cadmium, lead, zinc or fluoride compounds. Use adequate ventilation and respiratory protection during use. Avoid breathing fumes. Avoid ingestion - wear gloves and other appropriate personal protection - wash hands thoroughly following use or handling. Inhalation of fumes may cause upper respiratory tract irritation and systemic poisoning with early symptoms including headache, coughing, and a metallic taste as well as metal fume fever. Chronic cadmium exposure causes lung and kidney damage. Chronic exposure to lead causes damage to lungs, liver, kidney, nervous system as well as blood and musculoskeletal disorders. Exposures to high levels of cadmium or lead dust or fume may be immediately dangerous to life or health and can cause delayed pneumonitis with fever and chest pain, and pulmonary edema resulting in death.

11.1 Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral

Product:	ATEmix: 662,84 mg/kg
Specified substance(s):	
Zinc chloride	LD 50 (Rat): 350 mg/kg
Ammonium chloride	LD 50 (Rat): 1.650 mg/kg
Methanol	LD 50 (Rat): > 1.187 - 2.769 mg/kg

Dermal

Product:	ATEmix: 6.000 mg/kg
Specified substance(s):	
Methanol	LD 50 (Rabbit): 17.100 mg/kg

Inhalation

Product:	Not classified for acute toxicity based on available data.
Specified substance(s):	
Methanol	LC 50 (Rat, 4 h): 128,2 mg/l

Repeated dose toxicity

Product:	No data available.
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Skin Corrosion/Irritation

Product:	No data available.
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Serious Eye Damage/Eye Irritation

Product: No data available.

Respiratory or Skin Sensitization

Product: Respiratory Sensitization: Not classified
Skin Sensitization: Not classified

Carcinogenicity

Product: Not classified

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

Specified substance(s):
Hydrochloric acid Overall evaluation: 3. Not classifiable as to carcinogenicity to humans.

Germ Cell Mutagenicity

In vitro

Product: Not classified

In vivo

Product: Not classified

Reproductive toxicity

Product: Not classified

Specific Target Organ Toxicity - Single Exposure

Product: May cause damage to organs. May cause respiratory irritation.

Specific Target Organ Toxicity - Repeated Exposure

Product: Not classified

Aspiration Hazard

Product: No data available.

Symptoms related to the physical, chemical and toxicological characteristics under the condition of use

Additional toxicological information under the conditions of use:

Acute toxicity

Inhalation

Specified substance(s):
Carbon dioxide LC Lo (Human, 5 min): 90000 ppm
Carbon monoxide LC 50 (Rat, 4 h): 1300 ppm
Nitrogen dioxide LC 50 (Rat, 4 h): 88 ppm
Ozone LC Lo (Human, 30 min): 50 ppm

Other effects:

Specified substance(s):
Carbon dioxide Asphyxia

Carbon monoxide Carboxyhemoglobinemia

Nitrogen dioxide Lower respiratory tract irritation

SECTION 12: Ecological information

General information: Contains a substance which causes risk of hazardous effects to the environment.

12.1 Ecotoxicity

Acute hazards to the aquatic environment:

Fish

Product: Very toxic to aquatic organisms.
Specified substance(s):
 Zinc chloride LC 50 (Rainbow trout,donaldson trout (Oncorhynchus mykiss), 96 h): 1,85 - 2,55 mg/l
 Ammonium chloride LC 50 (Oncorhynchus mykiss, 96 h): 34,6 mg/l
 Methanol LC 50 (Lepomis macrochirus, 96 h): 15.400 mg/l

Aquatic Invertebrates

Product: Very toxic to aquatic organisms.
Specified substance(s):
 Zinc chloride LC 50 (Daphnia magna, 48 h): 100 µg/l
 Ammonium chloride EC 50 (Daphnia magna, 96 h): 139 mg/l
 Methanol EC 50 (Daphnia magna, 96 h): 18.260 mg/l

Chronic hazards to the aquatic environment:

Fish

Product: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Aquatic Invertebrates

Product: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Toxicity to Aquatic Plants

Product: No data available.

12.2 Persistence and Degradability

Biodegradation

Product: No data available.

12.3 Bioaccumulative potential

Bioconcentration Factor (BCF)

Product: No data available.

12.4 Mobility in soil: No data available.

12.5 Results of PBT and vPvB assessment: No data available.

12.6 Other adverse effects: No data available.

12.7 Additional Information: No data available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

- General information:** The generation of waste should be avoided or minimized whenever possible. When practical, recycle in an environmentally acceptable, regulatory compliant manner. Dispose of non-recyclable products in accordance with all applicable Federal, State, Provincial, and Local requirements.
- Disposal instructions:** Discharge, treatment, or disposal may be subject to national, state, or local laws. Do not allow to enter drains, sewers or watercourses.
- Contaminated Packaging:** 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.

SECTION 14: Transport information

ADR

- 14.1 UN Number: UN 1760
14.2 UN Proper Shipping Name: CORROSIVE LIQUID, N.O.S.(Zinc chloride, Hydrochloric acid)
14.3 Transport Hazard Class(es)
Class: 8
Label(s): 8
Hazard No. (ADR): 80
Tunnel restriction code: (E)
14.4 Packing Group: III
Limited quantity 5,00L
Excepted quantity E1
14.5 Marine Pollutant No

ADN

- 14.1 UN Number: UN 1760
14.2 UN Proper Shipping Name: CORROSIVE LIQUID, N.O.S.(Zinc chloride, Hydrochloric acid)
14.3 Transport Hazard Class(es)
Class: 8
Label(s): 8
Hazard No. (ADR): –
14.4 Packing Group: III
Limited quantity 5,00L
Excepted quantity E1
14.5 Marine Pollutant No

RID

- 14.1 UN Number: UN 1760
14.2 UN Proper Shipping Name: CORROSIVE LIQUID, N.O.S.(Zinc chloride, Hydrochloric acid)
14.3 Transport Hazard Class(es)
Class: 8
Label(s): 8
14.4 Packing Group: III
14.5 Marine Pollutant No

IMDG

- 14.1 UN Number: UN 1760
14.2 UN Proper Shipping Name: CORROSIVE LIQUID, N.O.S.(Zinc chloride, Hydrochloric acid)
14.3 Transport Hazard Class(es)

Class:	8
Label(s):	8
EmS No.:	ERG 154,
14.4 Packing Group:	III
Limited quantity	5,00L
Excepted quantity	E1
14.5 Marine Pollutant	No

IATA

14.1 UN Number:	UN 1760
14.2 Proper Shipping Name:	Corrosive liquid, n.o.s.(Zinc chloride, Hydrochloric acid)
14.3 Transport Hazard Class(es):	
Class:	8
Label(s):	8
14.4 Packing Group:	III
Cargo aircraft only :	852
Passenger and cargo aircraft :	852
Limited quantity:	Y841
Excepted quantity	E1
14.5 Marine Pollutant	No
Cargo aircraft only:	Allowed.

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

SECTION 15: Regulatory information

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

EU Regulations

Regulation 1005/2009/EC on substances that deplete the ozone layer, Annex I, Controlled Substances: None

Regulation 1005/2009/EC on substances that deplete the ozone layer, Annex II, New Substances: None

EU. REACH Annex XIV, Substances Subject to Authorization: None

EU. Regulation 2019/1021/EU on persistent organic pollutants (POPs) (recast), as amended: None

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended: None

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended: None

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended: None

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended: None

EU. REACH Candidate List of Substances of Very High Concern for Authorization (SVHC): None

Regulation (EC) No. 1907/2006 Annex XVII Substances subject to restriction on marketing and use:

Chemical name	CAS-No.	Concentration
Zinc chloride	7646-85-7	30 - 40%
Methanol	67-56-1	1,0 - 10%

Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens and mutagens at work.: None

Directive 92/85/EEC: on the safety and health of pregnant workers and workers who have recently given birth or are breast feeding.: None

EU. Directive 2012/18/EU (SEVESO III) on major accident hazards involving dangerous substances, Annex I:

Classification	Lower-tier Requirements	Upper-tier Requirements
E1. Hazardous to the aquatic environment	100 t	200 t

EU. Regulation No. 166/2006 PRTR (Pollutant Release and Transfer Registry), Annex II: Pollutants:

Chemical name	CAS-No.	Concentration
Zinc chloride	7646-85-7	30 - 40%
Ammonium chloride	12125-02-9	20 - 30%
Hydrochloric acid	7647-01-0	1,0 - 10%

Directive 98/24/EC on the protection of workers from the risks related to chemical agents at work:

Chemical name	CAS-No.	Concentration
Zinc chloride	7646-85-7	30 - 40%
Ammonium chloride	12125-02-9	20 - 30%
Hydrochloric acid	7647-01-0	1,0 - 10%
Methanol	67-56-1	1,0 - 10%

National Regulations

Water Hazard Class (WGK): WGK 3: severely water-endangering.

TA Luft, Technical Guidance Air:

Hydrochloric acid	Number 5.2.4 Class III, Inorganic gas-forming substance
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INRS, maladies professionnelles, table of work-related illnesses

Listed: A
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15.2 Chemical safety assessment: No Chemical Safety Assessment has been carried out.

International regulations

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:	One or more components are not listed or are exempt from listing.
Korea Existing Chemicals Inv. (KECI):	On or in compliance with the inventory
Canada NDSL Inventory:	One or more components are not listed or are exempt from listing.
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:	One or more components are not listed or are exempt from listing.
Japan Pharmacopoeia Listing:	One or more components are not listed or are exempt from listing.
Mexico INSQ:	On or in compliance with the inventory
Ontario Inventory:	On or in compliance with the inventory
Taiwan Chemical Substance Inventory:	On or in compliance with the inventory

Montreal protocol

Not applicable

Stockholm convention

Not applicable

Rotterdam convention

Not applicable

Kyoto protocol

Not applicable

SECTION 16: Other information

Definitions:

References

PBT
vPvB

PBT: persistent, bioaccumulative and toxic substance.
 vPvB: very persistent and very bioaccumulative substance.

Key literature references and sources for data:

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended.

Wording of the H-statements in section 2 and 3

H225	Highly flammable liquid and vapor.
H290	May be corrosive to metals.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.

H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H335	May cause respiratory irritation.
H370	Causes damage to organs.
H371	May cause damage to organs.
H400	Very toxic to aquatic life.
H401	Toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Classification according to Regulation (EC) No 1272/2008 as amended.

Acute Tox. 4, H302
Skin Corr. 1A, H314
Eye Dam. 1, H318
STOT SE 2, H371
STOT SE 3, H335
Aquatic Acute 1, H400
Aquatic Chronic 1, H410

Other information: Additional information is available by request.

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