



SAFETY DATA SHEET

This Safety Data Sheet complies with the Canadian Hazardous Product Regulations, the United States Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR 1910 (OSHA HCS)

1. Product and Supplier Identification

- 1.1 **Product:** S-39 Universal
- 1.2 **Product Use:** Soldering Flux
- 1.3 **Producer:** Bison International
Dr. A.F. Philipsstraat 9,
NL-4462 EW Goes
Netherlands
- Supplier:** JSA Sales,
75A Clipper Street,
Coquitlam, B.C.
Canada, V3K 6X2
- 1.4 **Emergencies (24-hour number):** +31 113 235700
Facsimile: +31 113 232077
Telephone: +1 (604) 525-4774

2. Hazards Identification

2.1 Classification of product or mixture

Note to reader: This product in an untested mixture and GHS classification is based on the classification of the ingredients and their concentrations. Proprietary ingredients, if any, do NOT exhibit any health effects not listed in this SDS.

GHS Classification: Acute Toxicity, Oral, Category 4
Skin Corrosion, category 1B
Eye Irritation, Category 2A
Specific Target Organ Toxicity- Single Exposure (Respiratory/dust)
Category 3
Aquatic Toxicity, Acute, Category 1 *
Aquatic Toxicity, Chronic, Category 1 *

2.2 GHS Label Elements, including precautionary statements

Pictogram:



*

Note: * Not currently a Canadian Requirement for product labelling

Signal Word: Danger

GHS Hazard Statements: H302: Harmful if swallowed
H314: Cause severe skin burns and eye damage.
H319: Causes serious eye irritation.
H336: May cause respiratory irritation
H400: Very toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects.

GHS Precautionary Statements:

Prevention: P260: Do not breathe dusts
P264: Wash exposed skin and hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/clothing/eye protection and face protection.

Response: P301+P312+P331: IF SWALLOWED: Call a POISON CENTRE or doctor if you feel unwell. Do not induce vomiting
P330: Rinse mouth.
P303+P361+P353: IF ON SKIN (or hair): Immediately take off all contaminated clothing. Rinse skin with water [or shower].
P363: Wash contaminated clothing before reuse.
P304+P340: Remove person to fresh air and keep comfortable for breathing.
P310: Immediately call a POISON CENTRE or doctor.
P321: Specific treatment may be seen in Section 4
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P337+P313: If eye irritation persists: Get medical attention.
P391: Collect spillage.

Storage: P403+P233: Store in a well-ventilated place. Keep container tightly closed.
P405: Store locked up.

Disposal: P501: Dispose of contents and container according to instructions in Section 13.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS: None

2.4 Additional Information

Primary Routes of Entry:

Skin Contact:	Yes
Skin Absorption:	No
Eye Contact:	Yes
Ingestion:	Yes
Inhalation:	Yes

Target Organs: May cause damage to the following organs: upper respiratory tract, eyes and skin

Emergency Overview: Corrosive to the eyes and skin! Fumes may cause irritation of the nose, throat and lungs. Irritation may produce phlegm and initiate coughing. May cause skin irritation and/or a mild burning sensation upon contact. Eye contact will produce redness, pain and a burning sensation, and failure to treat eyes immediately may lead to scarring of the cornea resulting in impaired vision, or blindness.

Effects of Short-Term (Acute) Exposure:

Inhalation: As supplied this product will not produce irritating vapours. Irritating vapours occur upon use of the product, or when heated sufficiently. These vapours/ fumes are irritating to the nose, throat and lungs. Inhalation of these fumes are sufficiently irritating to cause the production of phlegm and initiate coughing. Metal fume fever is unlikely at the heat ranges the product is exposed to during recommended use.

Skin Contact: Contact with skin may produce varying degrees of irritation ranging from moderate to severe. Moderate effects may include itching and mild rash, while a more severe effect may produce sores. Persons with existing skin problems are more likely to experience the rashes. Contact with broken skin will cause stinging. Unlikely to cause sensitization.

Eye Contact: This product can cause severe eye burns. Treatment should be immediate to alleviate chances of permanent eye damage. Severe contact may cause scarring of the cornea causing impaired vision or in severe cases, blindness.

Ingestion: Although an unlikely route of entry, ingestion may cause burns to the mouth and throat. Ingestion of large amounts can cause anemia and stomach symptoms (including nausea, vomiting, abdominal pain, diarrhea and, in severe cases, vomiting of blood), based on human and animal information.

Effects of Long-Term (Chronic) Exposure: Prolonged contact with skin may cause severe skin problems such as exema, and other forms of dermatitis.

Medical Conditions Aggravated By Exposure: Persons susceptible to skin problems may find that the use of this product will cause increased symptoms of existing skin problems.

3. Composition

3.1 Mixture composition

Component	% (w/w)	GHS Classification
Zinc Chloride CAS No. 7646-85-7	25 - 50	Acute Toxicity, Category 4 Skin Corrosion, Category 1B STOT-SE (respiratory/dust), Category 3 Aquatic Toxicity, Acute, Category 1 Aquatic Toxicity, Chronic, Category 1
Ethylene Glycol CAS No 107-21-1	10 - 25	Acute Toxicity, Category 4
Ammonium Chloride CAS No. 12125-02-9	10 - 25	Acute Toxicity, Category 4 Eye Irritation, Category 2A
Non-hazardous ingredients	65 - 88	Not applicable

4. First Aid Measures

4.1 Description of First Aid Measures

General advice: This is a corrosive paste. Extremely corrosive to the eyes and skin. Ingestion may cause corrosion of the mouth, esophagus and cause gastro-intestinal tract upset. Provide general supportive measures (comfort, warmth, rest). Consult a doctor and/or the nearest Poison Control Centre for all exposures except minor instances of inhalation or skin contact. Some first aid procedures recommended above require advanced first aid training. Protocols for undertaking advanced procedures must be developed in consultation with a doctor and routinely reviewed. All first aid procedures should be periodically reviewed by a doctor familiar with the material and its conditions of use in the workplace.

In case of eye contact: Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 15 minutes or until the chemical is removed, while holding the eyelid(s) open. Obtain medical attention immediately or transport to a medical facility and continue to flush the eyes en route if irritation persists.

In case of skin contact: Remove contaminated clothing. Wash gently and thoroughly with water and non-abrasive soap until all traces of the flux have been removed. If signs of irritation occur,

obtain medical advice. Completely decontaminate clothing, shoes and leather goods before re-use or discard.

In case of inhalation: If inhalation of fume occurs, remove to fresh air immediately. If breathing is difficult, oxygen may be beneficial if administered by trained personnel, preferably on a doctor's advice. DO NOT allow the victim to move about unnecessarily.

If ingestion: If swallowed, get immediate medical attention! Never give anything by mouth if victim is rapidly losing consciousness. Have victim rinse mouth thoroughly with water. **Do not induce vomiting.** Dilute contents of stomach with 240 to 300 ml of water. If vomiting occurs naturally have victim lean forward to reduce risk of aspiration. Seek immediate medical attention.

4.2 Most important symptoms and effects, both acute and delayed

Effects of Short-Term (Acute) Exposure:

Inhalation: As supplied this product will not produce irritating vapours. Irritating vapours occur upon use of the product, or when heated sufficiently. These vapours/ fumes are irritating to the nose, throat and lungs. Inhalation of these fumes are sufficiently irritating to cause the production of phlegm and initiate coughing. Metal fume fever is unlikely at the heat ranges the product is exposed to during recommended use.

Skin Contact: Contact with skin may produce varying degrees of irritation ranging from moderate to severe. Moderate effects may include itching and mild rash, while a more severe effect may produce sores. Persons with existing skin problems are more likely to experience the rashes. Contact with broken skin will cause stinging. Unlikely to cause sensitization.

Eye Contact: This product can cause severe eye burns. Treatment should be immediate to alleviate chances of permanent eye damage. Severe contact may cause scarring of the cornea causing impaired vision or in severe cases, blindness.

Ingestion: Although an unlikely route of entry, ingestion may cause burns to the mouth and throat. Ingestion of large amounts can cause anemia and stomach symptoms (including nausea, vomiting, abdominal pain, diarrhea and, in severe cases, vomiting of blood), based on human and animal information.

Effects of Long-Term (Chronic) Exposure: Prolonged contact with skin may cause severe skin problems such as exema, and other forms of dermatitis.

Medical Conditions Aggravated By Exposure: Persons susceptible to skin problems may find that the use of this product will cause increased symptoms of existing skin problems.

4.3 Indication of any immediate medical attention and special treatment needed

No data available.

5. Fire Fighting Measures

5.1 Extinguishing Media

Suitable extinguishing media: Product is not flammable. Use extinguishing media appropriate to surrounding fire conditions, such as dry chemical powder, carbon dioxide, or foam. Use water in large quantities for fires involving nitrous oxide.

Unsuitable extinguishing media: Not known

5.2 Special hazards arising from mixture:

Hydrogen chloride, oxides of carbon and nitrogen may be liberated during the soldering process. Ammonia may be liberated below 500°C, but ammonia decomposes above 500°C to hydrogen and nitrogen. Carbon dioxide, carbon monoxide and undetermined organic compounds in smoke may also be produced.

Protective Equipment: Wear protective equipment detailed in Section 8.

Advice for firefighters: Evacuate area and fight fire from a safe distance or protected location. Approach the fire from upwind to avoid contact with hazardous vapours and decomposition products. Do not enter fire area without proper protection. Containers, when heated, may explode. Use of water to cool non fire exposed containers. Isolate material not yet involved in the fire and protect personnel. Move containers away from fire, if safe to do so. Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Use pressurized air mask if product is involved in a fire.

5.3 Further Information:

Sensitivity to Impact: No
Sensitivity to Static Discharge: No

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) HAZARD INDEX:

HEALTH: 3
FLAMMABILITY: 0
REACTIVITY: 0
SPECIAL HAZARD: N/ap

HAZARDOUS MATERIAL INFORMATION SYSTEM (HMIS):

HEALTH HAZARD: 3
CHRONIC HEALTH HAZARD: *
FLAMMABILITY: 0
PHYSICAL HAZARD: 0

6. Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Restrict access to spill area until completion of cleanup. Ensure cleanup is conducted by trained personnel only. Wear protective equipment before attempting clean up.

Respiratory Protection: No specific recommendation.

Skin protection: Depending upon the conditions of use, protective gloves made from chemical resistant nitrile rubber, PVC, PE or neoprene. Neoprene aprons or suitable clothing to prevent skin contact.

Eye and Face Protection: Tightly sealed goggles and/or face shield must be worn when a possibility exists for eye contact. Contact lenses should not be worn.

Footwear: No specific recommendation.

Other: Emergency eyes wash fountains should be available in vicinity of use.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Follow cleanup methods as described in Section 6.3. Prevent from entering waterways and sewers. If entry occurs, contact appropriate authorities. A spill of product should be handled with urgency to prevent escape into the environment.

6.3 Methods and materials for containment and cleanup

Do not touch spilled material and prevent material from entering sewers, waterways. Stop or reduce leak, if safe to do so. For small spills, contain spill with absorbent material which does not react with the product (vermiculite, sand, sawdust). Place in suitable, covered, labeled containers. Contaminated absorbent may exhibit the same hazards as the spilled product.

Remedial Measures

Large Spills: This product is provided in “small” mean of containment. Larger spills are unlikely.

Small Spills: For small spills, contain spill with absorbent material which does not react with the product (vermiculite, sand, sawdust). Place in suitable, covered, labeled containers. Contaminated absorbent may exhibit the same hazards as the spilled product.

6.4 Reference to other sections

For disposal, see Section 13

7. Handling and Storage

7.1 Precautions for safe handling

Handling Procedures: Ensure that the product is used where there is good ventilation or exhaust. People working with this product should be trained regarding the hazards and safe handling.

Do not use with incompatible materials such as mixtures of potassium and zinc chloride, which is sensitive to mechanical shock and produces a strong explosion on impact. STRONG BASES (e.g. alkali hydroxides) - react vigorously or violently, with the evolution of heat. Wear proper protective equipment when handling this material.

7.2 Conditions for safe storage, including incompatibilities

Storage: This product may be stored in ambient temperatures up to 50°C. Do not freeze. Store away from ignition sources, and away from incompatibles, such as strong oxidizers. Keep containers closed when not in use to prevent accidental contamination.

7.3 Specific end use(s)

No other uses except those mentioned in Section 1.2

8. Exposure Controls, Personal Protection

8.1 Control parameters**Components with workplace control parameters****ACGIH Threshold Limit Values**

<u>Components</u>	<u>Type</u>	<u>Value</u>
Zinc Chloride CAS No. 7646-85-7	TWA	1 mg/m ³ (zinc fume)
Ethylene Glycol CAS No 107-21-1	C	100 mg/m ³
Ammonium Chloride CAS No. 12125-02-9	TWA	10 mg/m ³ (fume)
	STEL	20 mg/m ³ (fume)

Note: Exposure limits may vary from time to time and from one jurisdiction to another. Check with local regulatory agency for the exposure limits in your area.

ACGIH , American Conference of Governmental Industrial Hygienists.

8.2 Exposure Controls

- Engineering Controls:** When using indoors, ensure adequate ventilation by using local exhaust.
- Respiratory Protection:** UP TO 10 mg/m³: Dust, mist, and fume respirator*; or SAR*.
UP TO 25 mg/m³: Powered air-purifying respirator with dust, mist, and fume filter(s)*; or SAR operated in a continuous-flow mode*.
UP TO 50 mg/m³: Full-facepiece respirator with high-efficiency particulate filter(s); or powered air-purifying respirator with tight-fitting facepiece and high-efficiency particulate filter(s)*; or full-facepiece SCBA; or full-facepiece SAR.
EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS: Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.
ESCAPE: Full-facepiece respirator with high-efficiency particulate filter(s); or escape-type SCBA.

*NOTE: Substance reported to cause eye irritation or damage; may require eye protection.

NOTE: The IDLH concentration for zinc chloride fume is 50 mg/m³. The purpose of establishing an IDLH value is to ensure that the worker can escape from a given contaminated environment in the event of failure of the most protective respiratory protection equipment. In the event of failure of respiratory protective equipment every effort should be made to exit immediately. The respirator use limitations specified by the approving agency and the manufacturer must be observed. Recommendations apply only to NIOSH approved respirators. Air-purifying respirators do not protect against oxygen-deficient atmospheres.

*ABBREVIATIONS: SAR = supplied-air respirator; SCBA = self-contained breathing apparatus. IDLH = Immediately Dangerous to Life or Health.

When cartridge type respirators are used, ensure that the cartridges are changed frequently according to the manufacturer's recommendations. Respirator selection must be done by a qualified person and be based upon a risk assessment of the work activities and exposure levels. Respirators must be fit tested and users must be clean shaven where the respirator seals to face. Exposure must be kept at or below the applicable exposure limits and the maximum use concentration of the respirator must not be exceeded.

- Skin protection:** Depending upon the conditions of use, protective gloves made from chemical resistant nitrile rubber, PVC, PE or neoprene. Neoprene aprons or suitable clothing to prevent skin contact.
- Eye and Face Protection:** Tightly sealed goggles and/or face shield must be worn when a possibility exists for eye contact. Contact lenses should not be worn.
- Footwear:** No specific recommendation.
- Other:** Emergency eyes wash fountains should be available in vicinity of use.

9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance:	Fluid, coloured to specification
Odour:	Characteristic
Odour Threshold:	Not available
pH:	3.0
Melting Point/Freezing Point:	Not available
Initial Boiling Point:	100°C
Pour Point:	Not available
Flash Point:	Not available
Evaporation Rate:	Not available
Flammability:	Not available
Upper Explosion Limit:	53.0% (V)
Lower Explosion Limit:	3.2% (V)
Vapour Pressure:	23 hPa @ 20°C
Vapour Density:	>1 (air =1)
Relative Density:	1.44 @ 20°C (water = 1)
Solubility:	Fully miscible
Partition Coefficient:	Not available
Autoignition Temperature:	Not available
Decomposition Temperature:	Not available
Explosive Properties:	Not available
Oxidizing Properties:	Not available
Percent Volatiles:	Not available
Viscosity	200 mPas
Viscosity Index:	Not available
Total Acid Number:	Not available
Percent Solids:	51.6

9.2 Other safety information: None

10. Stability and Reactivity

10.1 Reactivity

Hazardous polymerization will not occur.

10.2 Chemical Stability

Stable as supplies and under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available.

10.4 Conditions to avoid

Avoid all possible sources of ignition (spark or flame). Do not cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

10.5 Incompatible materials

Mixtures of potassium and zinc chloride are sensitive to mechanical shock and produces a strong explosion on impact. STRONG BASES (e.g. alkali hydroxides) - react vigorously or violently, with the evolution of heat.

10.6 Hazardous decomposition products

Hydrogen chloride, oxides of carbon and nitrogen may be liberated during the soldering process. Ammonia may be liberated below 500°C, but ammonia decomposes above 500°C to hydrogen and nitrogen. Carbon dioxide, carbon monoxide and undetermined organic compounds in smoke may also be produced.

11. Toxicological Information

11.1 Information on toxicological effects

Acute toxicity

Acute Toxicity, Category 4: H302: Harmful if swallowed

Skin corrosion/irritation

Skin Corrosion/Irritation, Category 1B: H314: Cause severe skin burns and eye damage.

Serious eye damage/eye irritation

Eye Irritation, Category 2A, H319: Causes serious eye irritation.

Respiratory or skin sensitization

No GHS classification.

Germ Cell Mutagenicity

No GHS classification

Carcinogenicity

No GHS classification

Reproductive toxicity

No GHS classification

Specific Target Organ Toxicity – Single exposure

Specific Target Organ Toxicity- Single Exposure (Respiratory/dust), Category 3, H336: May cause Respiratory irritation

Specific Target Organ Toxicity – Repeated exposure

No GHS classification.

Aspiration Hazard

No GHS Classification

Aquatic Toxicity*

*Note: Symbol not required for product labeling.

Acute Toxicity, Category 1, H400: Very toxic to aquatic life.

Chronic Toxicity, Category 1, H410: Very toxic to aquatic life with long lasting effects.

Additional information

Zinc chloride, CAS No. 7646-85-7

LD₅₀: 350 mg/kg (oral/rat)

LC₅₀: ~2000 mg/m³

(inhalation/rat, 10 minute exposure, aerosol)

Ethylene Glycol, CAS No 107-21-1

LD₅₀: 4000 mg/kg (oral/female rat)

LD₅₀: 9530 mg/kg (dermal/rabbit)

LC₅₀: 2725 mg/m³ (inhalation/4hr)

Ammonium Chloride, CAS No. 12125-02-9

LD₅₀: 1650 mg/kg (oral/rat)

LC₅₀: No data

12. Ecological Information

12.1 Toxicity

Zinc Chloride, CAS No. 7646-85-7

To fish: LC₅₀: Cyprinus carpio (Carp) 0.4 – 2.2 mg/l, 96 hour
To Daphnia and other aquatic invertebrates: EC₅₀, Daphnia Magna (Water Flea) 0.2 mg/l, 48 hour

To Algae: Growth Inhibition LOEC, Pseudokirchneriella subcapitata, 12.5 mg/l, 96 hour

Ammonium Chloride, CAS No. 12125-02-9

To fish: LC₅₀: Cyprinus carpio (Carp) 209 mg/l, 96 hour
LC₅₀: Oncorhynchus mykiss (rainbow trout), 3.98 mg/l, 96 hour
To Daphnia and other aquatic invertebrates: EC₅₀, Daphnia Magna (Water Flea) 161 mg/l, 48 hour

To Algae: No data

Ethylene Glycol, CAS No 107-21-9

To fish: LC₅₀: Oncorhynchus mykiss (rainbow trout), 18,500 mg/l, 96 hour
To Daphnia and other aquatic invertebrates: EC₅₀, Daphnia Magna (Water Flea) 74,000 mg/l, 48 hour

To Algae: No data

12.2 Persistence and degradability

No data

12.3 Bioaccumulative potential

Zinc Chloride, CAS No 7646-85-7
Pimephales promelas (fathead minnow) 63 days
Bioconcentration factor: 21,000

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Not conducted

12.6 Other adverse effects

No data available

13. Disposal Considerations

13.1 Waste treatment methods

Product: Review federal, provincial or state, and local government requirements prior to disposal. Store material for disposal as indicated in Storage Conditions. Disposal by controlled incineration may be acceptable.

Contaminated Packaging:

Contaminated packagings should be emptied as much as possible before disposal.

14. Transport Information

Transport of Dangerous Goods (TDG and CLR): UN 1760, CORROSIVE LIQUID, N.O.S. (Zinc Chloride), Class 8, P.G. III

United States Department of Transport (49CFR): UN 1760, CORROSIVE LIQUID, N.O.S. (Zinc Chloride), Class 8, P.G. III

International Air Transport Association (IATA): UN 1760, CORROSIVE LIQUID, N.O.S. (Zinc Chloride), Class 8, P.G. III

International Maritime Organization (IMO): UN 1760, CORROSIVE LIQUID, N.O.S. (Zinc Chloride), Class 8, P.G. III, EmS No. F-A, S-B, Stowage category "A", Clear of living quarters. Marine Pollutant

15. Regulatory Information

CANADIAN FEDERAL REGULATIONS:

CEPA, DOMESTIC SUBSTANCES LIST: Listed

UNITED STATES REGULATORY INFORMATION

SARA 302 Components: None subject to this regulation

SARA 313 Components: Zinc Chloride, CAS No. 7646-85-7, Rev Date: 2007/03/01

SARA 311/312 Hazards: Immediate (Acute) health hazard, Long Term (Chronic) health hazard.

Right to Know: Massachusetts, zinc chloride, ethylene glycol, ammonium chloride

Pennsylvania, zinc chloride, ethylene glycol, ammonium chloride

New Jersey, zinc chloride, ethylene glycol, ammonium chloride

California, Prop 65, Warning: This product contains ethylene glycol, a chemical known by California to cause birth defects or other reproductive harm.

16. Other Information

Original Preparation Date: September 3, 2008

Prepared by: KJ Pearson, West Vancouver, BC

Disclaimer: This Safety Data Sheet (SDS) was prepared using information provided by CCINFO, ingredient supplier SDS and other relevant sources. This product has been classified using weight of evidence, expert judgment and previous testing as per Part 1.3 of the Fifth Edition of The Globally Harmonized System of Classification and Labelling of Chemicals (GHS). The information in this SDS is offered for your consideration and guidance when exposed to this product. JSA Sales and Bison International expressly disclaims all expressed or implied warranties and assumes no responsibilities for the accuracy or completeness of the data contained herein. The data in this SDS does not apply to use with any other product or in any other process.

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