

SAFETY DATA SHEET

CIGWELD COMWELD SILVER BRAZING FLUX NO. 2

Infosafe No.: 8CDX2
ISSUED Date : 23/12/2022
ISSUED by: Cigweld Pty Ltd

Section 1 - Identification

Product Identifier

CIGWELD COMWELD SILVER BRAZING FLUX NO. 2

Company Name

Cigweld Pty Ltd

Address

71 Gower Street
Victoria 3072 Australia

Telephone/Fax Number

Tel: +613 9474 7400 | +1 1300 654 674

Recommended use of the chemical and restrictions on use

Relevant identified uses: Used with Comweld Silver Brazing Alloys 245, 235, 242 and 250 for silver brazing of steels and dissimilar metals, ie. carbon steel, stainless steel, nickel alloys and copper and brass.

Other Names

Name	Product Code
CIGWELD COMWELD SILVER BRAZING FLUX NO. 2	321840
CIGWELD COMWELD SILVER BRAZING FLUX NO. 2	321841
CIGWELD COMWELD SILVER BRAZING FLUX NO. 2	321843

Additional Information

Website: www.cigweld.com.au

Chemical Name: Not Applicable

Synonyms: Not Available

Section 2 - Hazard(s) Identification

GHS classification of the substance/mixture

[1] Acute Toxicity (Oral) Category 3, Skin Corrosion/Irritation Category 1A, Serious Eye Damage/Eye Irritation Category 1, Specific Target Organ Toxicity - Single Exposure (Respiratory Tract Irritation) Category 3, Reproductive Toxicity Category 2

Signal Word (s)

DANGER

Hazard Statement (s)

H301 Toxic if swallowed.

H314 Causes severe skin burns and eye damage.

H335 May cause respiratory irritation.

H361fd Suspected of damaging fertility. Suspected of damaging the unborn child.

Pictogram (s)

Corrosion, Skull and crossbones, Health hazard

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Precautionary Statement – Prevention

P201 Obtain special instructions before use.
P260 Do not breathe dust/fume.
P264 Wash all exposed external body areas thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.

Precautionary Statement – Response

P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor/physician/first aider.
P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Precautionary Statement – Storage

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

Precautionary Statement – Disposal

P501 Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.

Other Information

Classification of the substance or mixture:
HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.

Legend: 1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI

Section 3 - Composition and Information on Ingredients

Ingredients

Name	CAS	Proportion
Potassium bifluoride	7789-29-9	30-59 %weight
Potassium borate - K ₂ B ₄ O ₇	12712-38-8	30-59 %weight
Potassium chloride	7447-40-7	1-9 %weight
Water	7732-18-5	Balance

Other Information

Substances:
See section below for composition of Mixtures

Mixtures:

Legend: 1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L; * EU IOELVs available

Section 4 - First Aid Measures

Inhalation

If fumes or combustion products are inhaled remove from contaminated area.

Lay patient down. Keep warm and rested.

Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.

Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.

Transport to hospital, or doctor, without delay.

For massive exposures:

If dusts, vapours, aerosols, fumes or combustion products are inhaled, remove from contaminated area.

Lay patient down.

Keep warm and rested.

Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.

Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.

If victim is conscious, give six calcium gluconate or calcium carbonate tablets in water by mouth.

Transport to hospital, or doctor, urgently.

Ingestion

For advice, contact a Poisons Information Centre or a doctor at once.

Urgent hospital treatment is likely to be needed.

If swallowed do NOT induce vomiting.

If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

Observe the patient carefully.

Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.

Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.

Transport to hospital or doctor without delay.

Skin

If there is evidence of severe skin irritation or skin burns:

Avoid further contact. Immediately remove contaminated clothing, including footwear.

Flush skin under running water for 15 minutes.

Avoiding contamination of the hands, massage calcium gluconate gel into affected areas, pay particular attention to creases in skin.

Contact the Poisons Information Centre.

Continue gel application for at least 15 minutes after burning sensation ceases.

If pain recurs, repeat application of calcium gluconate gel or apply every 20 minutes.

If no gel is available, continue washing for at least 15 minutes, using soap if available. If patient is conscious, give six calcium gluconate or calcium carbonate tablets in water by mouth.

Transport to hospital, or doctor, urgently.

Eye

If this product comes in contact with the eyes:

Immediately hold eyelids apart and flush the eye continuously with running water.

Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.

Transport to hospital or doctor without delay.

Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Indication of immediate medical attention and special treatment needed if necessary

For acute or repeated short term exposures to boron and its compounds:

Nausea, vomiting, diarrhoea and epigastric pain, haematemesis and blue-green discolouration of both faeces and vomitus characterise adult boron intoxication.

Access and correct any abnormalities found in airway and circulation.

A tidal volume of 10-15 mg/kg should be maintained.

Emesis should be induced unless the patient is in coma, is experiencing seizures or has lost the gag reflex. If any of these are present, gastric lavage should be performed with a large-bore tube after endotracheal intubation or in the presence of continuous respiratory action.

Activated charcoal is probably not of value though its use might be indicated following gastric evacuation. Catharsis might be useful

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to eliminate any borates remaining in the gastro-intestinal tract (magnesium sulfate: adults, 30 gms: children 250 mg/kg).

Peritoneal dialysis and haemodialysis remove some borates.

[Ellenhorn and Barceloux: Medical Toxicology]

For corrosives:

BASIC TREATMENT

Establish a patent airway with suction where necessary.

Watch for signs of respiratory insufficiency and assist ventilation as necessary.

Administer oxygen by non-rebreather mask at 10 to 15 l/min.

Monitor and treat, where necessary, for pulmonary oedema .

Monitor and treat, where necessary, for shock.

Anticipate seizures.

Where eyes have been exposed, flush immediately with water and continue to irrigate with normal saline during transport to hospital.

DO NOT use emetics. Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.

Skin burns should be covered with dry, sterile bandages, following decontamination.

DO NOT attempt neutralisation as exothermic reaction may occur.

ADVANCED TREATMENT

Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.

Positive-pressure ventilation using a bag-valve mask might be of use.

Monitor and treat, where necessary, for arrhythmias.

Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.

Drug therapy should be considered for pulmonary oedema.

Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.

Treat seizures with diazepam.

Proparacaine hydrochloride should be used to assist eye irrigation.

EMERGENCY DEPARTMENT

Laboratory analysis of complete blood count, serum electrolytes, BUN, creatinine, glucose, urinalysis, baseline for serum aminotransferases (ALT and AST), calcium, phosphorus and magnesium, may assist in establishing a treatment regime.

Positive end-expiratory pressure (PEEP)-assisted ventilation may be required for acute parenchymal injury or adult respiratory distress syndrome.

Consider endoscopy to evaluate oral injury.

Consult a toxicologist as necessary.

BRONSTEIN, A.C. and CURRANCE, P.L. EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994

For acute or short term repeated exposures to fluorides:

Fluoride absorption from gastro-intestinal tract may be retarded by calcium salts, milk or antacids.

Fluoride particulates or fume may be absorbed through the respiratory tract with 20-30% deposited at alveolar level.

Peak serum levels are reached 30 mins. post-exposure; 50% appears in the urine within 24 hours.

For acute poisoning (endotracheal intubation if inadequate tidal volume), monitor breathing and evaluate/monitor blood pressure and pulse frequently since shock may supervene with little warning. Monitor ECG immediately; watch for arrhythmias and evidence of Q-T prolongation or T-wave changes. Maintain monitor. Treat shock vigorously with isotonic saline (in 5% glucose) to restore blood volume and enhance renal excretion.

Where evidence of hypocalcaemic or normocalcaemic tetany exists, calcium gluconate (10 ml of a 10% solution) is injected to avoid tachycardia.

BIOLOGICAL EXPOSURE INDEX - BEI

These represent the determinants observed in specimens collected from a healthy worker exposed at the Exposure Standard (ES or TLV):

Determinant: Fluorides in urine

Index: 3 mg/gm creatinine

Sampling Time: Prior to shift

Comments: B, NS

Index: 10mg/gm creatinine

Sampling Time: End of shift

Comments: B, NS

B: Background levels occur in specimens collected from subjects NOT exposed
NS: Non-specific determinant; also observed after exposure to other exposures.

Section 5 - Firefighting Measures

Suitable Extinguishing Media

Water spray or fog.

Foam.

Dry chemical powder.

BCF (where regulations permit).

Specific hazards arising from the chemical

Fire Incompatibility: None known.

Fire/Explosion Hazard:

Non combustible.

Not considered a significant fire risk, however containers may burn.

Decomposition may produce toxic fumes of:

Hydrogen fluoride

May emit corrosive fumes.

Hazchem Code

2X

Decomposition Temperature

Not Available

Precautions in connection with Fire

Alert Fire Brigade and tell them location and nature of hazard.

Wear full body protective clothing with breathing apparatus.

Prevent, by any means available, spillage from entering drains or water course.

Use fire fighting procedures suitable for surrounding area.

Section 6 - Accidental Release Measures

Emergency Procedures

See section 8

Environmental Precautions

See section 12

Methods and materials for containment and cleaning up (Small Spills)

Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.

Check regularly for spills and leaks.

Clean up all spills immediately.

Avoid breathing vapours/ aerosols or dusts and avoid contact with skin and eyes.

Place in a suitable, labelled container for waste disposal.

Methods and materials for containment and cleaning up (Large Spills)

Clear area of personnel and move upwind.

Alert Fire Brigade and tell them location and nature of hazard.

May be violently or explosively reactive.

Wear full body protective clothing with breathing apparatus.

Other Information

Personal Protective Equipment advice is contained in Section 8 of the SDS.

Section 7 - Handling and Storage

Precautions for Safe Handling

Safe handling:

Avoid all personal contact, including inhalation.

Wear protective clothing when risk of exposure occurs.

Use in a well-ventilated area.

WARNING: To avoid violent reaction, ALWAYS add material to water and NEVER water to material.

Other information:

Store in original containers.

Keep containers securely sealed.

Store in a cool, dry, well-ventilated area.

Store away from incompatible materials and foodstuff containers.

Conditions for safe storage, including any incompatibilities

Suitable container:

Glass container is suitable for laboratory quantities

Lined metal can, lined metal pail/ can.

Plastic pail.

Polyliner drum.

Packing as recommended by manufacturer.

For low viscosity materials

Drums and jerricans must be of the non-removable head type.

Where a can is to be used as an inner package, the can must have a screwed enclosure.

For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):

Removable head packaging;

Cans with friction closures and low pressure tubes and cartridges may be used.

Storage incompatibility:

Contact with acids produces toxic fumes

Reacts with metals producing flammable / explosive hydrogen gas

Avoid storage with reducing agents.

Avoid oxidising agents, acids, acid chlorides, acid anhydrides, chloroformates.

Section 8 - Exposure Controls and Personal Protection

Occupational exposure limit values

Control parameters:

Occupational Exposure Limits (OEL):

INGREDIENT DATA:

Source: Australia Exposure Standards

Ingredient: potassium bifluoride

Material name: Fluorides (as F)

TWA: 2.5 mg/m³

STEL: Not Available

Peak: Not Available

Notes: Not Available

Emergency Limits:

Ingredient: potassium bifluoride

TEEL-1: 15 mg/m³

TEEL-2: 170 mg/m³

TEEL-3: 1,000 mg/m³

Ingredient: potassium bifluoride

Original IDLH: Not Available

Revised IDLH: Not Available

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Ingredient: potassium borate - K₂B₄O₇

Original IDLH: Not Available

Revised IDLH: Not Available

Ingredient: potassium chloride

Original IDLH: Not Available

Revised IDLH: Not Available

Ingredient: water

Original IDLH: Not Available

Revised IDLH: Not Available

Occupational Exposure Banding:

Ingredient: potassium borate - K₂B₄O₇

Occupational Exposure Band Rating: E

Occupational Exposure Band Limit: $\leq 0.01 \text{ mg/m}^3$

Notes: Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.

Engineering Controls

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:

Process controls which involve changing the way a job activity or process is done to reduce the risk.

Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.

Respiratory Protection

Type -P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.

Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor: up to 10 x ES

Half-Face Respirator: -AUS P2

Full-Face Respirator: -

Powered Air Respirator: -PAPR-AUS / Class 1 P2

Required Minimum Protection Factor: up to 50 x ES

Half-Face Respirator: -

Full-Face Respirator: -AUS / Class 1 P2

Powered Air Respirator: -

Required Minimum Protection Factor: up to 100 x ES

Half-Face Respirator: -

Full-Face Respirator: -2 P2

Powered Air Respirator: -PAPR-2 P2 ^

^ - Full-face

A (All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide (HCN), B3 = Acid gas or hydrogen cyanide (HCN), E = Sulfur dioxide (SO₂), G = Agricultural chemicals, K = Ammonia (NH₃), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds (below 65 degC)

Eye and Face Protection

Safety glasses with unperforated side shields may be used where continuous eye protection is desirable, as in laboratories; spectacles are not sufficient where complete eye protection is needed such as when handling bulk-quantities, where there is a danger of splashing, or if the material may be under pressure.

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Chemical goggles. Whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted.
[AS/NZS 1337.1, EN166 or national equivalent]

Full face shield (20 cm, 8 in minimum) may be required for supplementary but never for primary protection of eyes; these afford face protection.

Hand Protection

Elbow length PVC gloves

Recommended material(s):

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:

"Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the computer-generated selection:

Cigweld Comweld Silver Brazing Flux No. 2

Material: BUTYL

CPI: A

Material: NEOPRENE

CPI: A

Material: VITON

CPI: A

Material: NATURAL RUBBER

CPI: C

Material: PVA

CPI: C

* CPI - Chemwatch Performance Index

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

Body Protection

Overalls.

PVC Apron.

PVC protective suit may be required if exposure severe.

Eyewash unit.

Section 9 - Physical and Chemical Properties

Properties	Description	Properties	Description
Form	Solid	Appearance	White solid with no odour; soluble in water.
Odour	Not Available	Melting/Freezing Point	~450°C
Boiling Point	Not Available	Decomposition Temperature	Not Available
Solubility in Water	Miscible	pH	Not Available (as supplied) Not Available (as a solution (1%))
Vapour Pressure	Not Applicable	Relative Vapour Density (Air=1)	Not Available
Evaporation Rate	Not Available	Physical State	Solid
Odour Threshold	Not Available	Viscosity	Not Applicable
Volatile Component	Not Available	Partition Coefficient: n-octanol/water (log value)	Not Available
Surface Tension	Not Applicable	Flash Point	Not Applicable
Flammability	Not Applicable	Auto-Ignition Temperature	Not Applicable
Explosion Limit - Upper	Not Applicable	Explosion Limit - Lower	Not Applicable
Explosion Properties	Not Available	Molecular Weight	Not Applicable
Oxidising Properties	Not Available	Initial boiling point and boiling range	Not Available
Relative Density	1.6 (Water =1)		

Other Information

Taste: Not Available

Gas group: Not Available

VOC g/L: Not Available

Section 10 - Stability and Reactivity

Reactivity

See section 7

Chemical Stability

Unstable in the presence of incompatible materials.

Product is considered stable.

Hazardous polymerisation will not occur.

Possibility of hazardous reactions

See section 7

Conditions to Avoid

See section 7

Incompatible Materials

See section 7

Hazardous Decomposition Products

See section 5

Section 11 - Toxicological Information

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Toxicology Information

Cigweld Comweld Silver Brazing Flux No. 2

TOXICITY: Not Available

IRRITATION: Not Available

Potassium bifluoride

TOXICITY: Not Available

IRRITATION: Not Available

Potassium borate - K₂B₄O₇

TOXICITY:

Oral (Rat) LD₅₀: 2660 mg/kg[2]

IRRITATION:

Eye: no adverse effect observed (not irritating)[1]

Skin: adverse effect observed (irritating)[1]

Skin: no adverse effect observed (not irritating)[1]

Potassium chloride

TOXICITY:

Oral (Rat) LD₅₀: 2600 mg/kg[2]

IRRITATION:

Eye (rabbit): 500 mg/24h - mild

Water

TOXICITY: Oral (Rat) LD₅₀: >90000 mg/kg[2]

IRRITATION: Not Available

Legend: 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

POTASSIUM BIFLUORIDE:

The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic).

This form of dermatitis is often characterised by skin redness (erythema) and swelling the epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.

POTASSIUM BORATE - K₂B₄O₇:

for sodium tetraborate (borax) Reproductive effector in rats. Mutagenic towards bacteria.

POTASSIUM CHLORIDE The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

POTASSIUM BIFLUORIDE & WATER:

No significant acute toxicological data identified in literature search.

POTASSIUM BIFLUORIDE & POTASSIUM BORATE - K₂B₄O₇:

Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a nonallergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia.

Acute Toxicity

Data available to make classification

Ingestion

Toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual.

The material can produce severe chemical burns within the oral cavity and gastrointestinal tract following ingestion.

Strong evidence exists that exposure to the material may produce very serious irreversible damage (other than carcinogenesis,

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mutagenesis and teratogenesis) following a single exposure by swallowing.

Fluoride is a general protoplasmic poison which appears to produce at least four major functional derangements; (1) enzyme inhibition, (2) hypocalcaemia, (3) cardiovascular collapse and (4) specific organ damage.

Hypocalcaemia which leads to severe reductions in plasma levels of both total calcium and ionic calcium, may appear several hours after exposure producing painful and involuntary muscular contractions (tetany) initially of the extremities (carpopedal spasm, twitching of limb muscles, laryngo-spasm, cardiospasm etc). Cardiovascular collapse is probably the principal cause of death in acute fluoride poisoning with sinus tachycardia the commonest cardiac finding and serious cardiac arrhythmias also common. Poisonings also cause major adverse effects on the brain and kidneys.

Symptoms of borate poisoning include nausea, vomiting, diarrhoea, epigastric pain. These may be accompanied headache, weakness and a distinctive red skin rash. In severe cases there may be shock, increased heart rate and the skin may appear blue. Vomiting (which may be violent) is often persistent and vomitus and faeces may contain blood.

Acute potassium poisonings following ingestion are rare because large doses usually induce vomiting and a healthy kidney ensures rapid excretion. Potassium poisoning disturbs the rhythm of the heart (a slow, weak pulse, heightened T waves on the ECG, arrhythmias heart block) and eventually produces a fall in blood pressure (due to weakened cardiac contractility).

Respiration is initially accelerated but skeletal muscle weakness may bring to the stage of paralysis. Orally poisoned animals die from respiratory failure, sometimes following convulsion and gastroenteritis, dehydration of organs and early kidney damage (renal tubular necrosis).

Inhalation

Strong evidence exists that exposure to the material may produce very serious irreversible damage (other than carcinogenesis, mutagenesis and teratogenesis) following a single exposure by inhalation.

Evidence shows, or practical experience predicts, that the material produces irritation of the respiratory system, in a substantial number of individuals, following inhalation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may however, produce further lung damage resulting in the impairment of gas exchange, the primary function of the lungs. Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system.

Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by narcosis, reduced alertness, loss of reflexes, lack of coordination and vertigo.

Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may produce serious damage to the health of the individual.

Acute effects of fluoride inhalation include irritation of nose and throat, coughing, chest discomfort, chills, fever and cyanosis (blue lips and skin).

Even brief exposure to high concentrations of inorganic fluoride may cause sore throat, chest pains, pulmonary oedema, and in rare cases irreparable damage to the lungs, and death

A single acute over-exposure may cause nose bleed. Pre-existing respiratory conditions such as emphysema, bronchitis may be aggravated by exposure.

Borates, as represented by borax, may act as simple respiratory irritants. In a study of the respiratory effects of borax dust on active borax workers, the incidence of respiratory symptoms, pulmonary function and abnormalities of chest radiographs were related to estimated exposures. Dryness of the mouth, nose or throat, dry cough, nose bleeds, sore throat, productive cough, shortness of breath and chest tightness were related to exposures of 4 mg/m³ or more

Skin

The material can produce severe chemical burns following direct contact with the skin.

Strong evidence exists that exposure to the material may produce very serious irreversible damage (other than carcinogenesis, mutagenesis and teratogenesis) following a single exposure by skin contact.

The skin is readily penetrated by the fluoride ion causing liquefaction necrosis of the soft tissues and decalcification and corrosion of bone. Healing is delayed and necrotic changes may continue to occur and spread beneath a layer of tough coagulated skin.

Percutaneous absorption of pure liquefied hydrogen fluoride gas produced severe hypocalcaemia, multiple attacks of ventricular fibrillation, and death 9.5 hours after exposure. Skin contact with hydrogen fluoride or solutions containing more than 30 percent hydrogen fluoride produces immediate pain; reactions to more dilute solutions may be delayed for many hours.

Open cuts, abraded or irritated skin should not be exposed to this material

Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

Evidence exists, or practical experience predicts, that the material either produces inflammation of the skin in a substantial number of individuals following direct contact, and/or produces significant inflammation when applied to the healthy intact skin of animals, for up to four hours, such inflammation being present twenty-four hours or more after the end of the exposure period.

Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.

Skin Corrosion/Irritation

Data available to make classification

Eye

The material can produce severe chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating. When applied to the eye(s) of animals, the material produces severe ocular lesions which are present twenty-four hours or more after instillation.

Serious Eye Damage/Irritation

Data available to make classification

Respiratory Sensitisation

Data either not available or does not fill the criteria for classification

Skin Sensitisation

Data either not available or does not fill the criteria for classification

Carcinogenicity

Data either not available or does not fill the criteria for classification

Reproductive Toxicity

Data available to make classification

STOT - Single Exposure

Data available to make classification

STOT - Repeated Exposure

Data either not available or does not fill the criteria for classification

Aspiration Hazard

Data either not available or does not fill the criteria for classification

Mutagenicity

Data either not available or does not fill the criteria for classification

Chronic Effects

Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Gastrointestinal disturbances may also occur. Chronic exposures may result in dermatitis and/or conjunctivitis. Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems.

Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.

Serious damage (clear functional disturbance or morphological change which may have toxicological significance) is likely to be caused by repeated or prolonged exposure. As a rule the material produces, or contains a substance which produces severe lesions. Such damage may become apparent following direct application in subchronic (90 day) toxicity studies or following subacute (28 day) or chronic (two-year) toxicity tests.

Exposure to the material may cause concerns for humans owing to possible developmental toxic effects, generally on the basis that results in appropriate animal studies provide strong suspicion of developmental toxicity in the absence of signs of marked maternal toxicity, or at around the same dose levels as other toxic effects but which are not a secondary non-specific consequence of other toxic effects.

Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Long term exposure to vapour or dust with inorganic fluorides may result in fluorosis, with rheumatic symptoms, stiff joints, mottling of tooth enamel. Other signs may include nausea, vomiting, anorexia, diarrhoea or constipation, weight loss, anaemia, weakness and general ill-health. Polyuria and polydipsia may also occur. Exfoliative dermatitis, atopic dermatitis, stomatitis, gastrointestinal and respiratory allergy, and on occasions, central nervous system involvement have all been described.

Chronic poisoning by borates may be characterised gastrointestinal disturbances and skin rash. Chronic absorption of small amounts of borax causes mild gastroenteritis and dermatitis.

Chronic feeding studies involving borate administration to rats and dogs leads to accumulation in the testes, germ cell depletion and testicular atrophy. Hair loss in a young woman was traced to chronic ingestion of boric acid-containing mouthwashes whilst hair loss, dermatitis, gastric ulcer and hypoplastic anaemia in an adult male was attributed to the consumption of an uncharacterised "boric tartrate" for 20 years (symptoms disappeared following withdrawal).

Section 12 - Ecological Information

Ecotoxicity

Cigweld Comweld Silver Brazing Flux No. 2

Endpoint: Not Available

Test Duration (hr): Not Available

Species: Not Available

Value: Not Available

Source: Not Available

Potassium bifluoride

Endpoint: EC50

Test Duration (hr): 48h

Species: Crustacea

Value: 97mg/l

Source: 2

Endpoint: EC50

Test Duration (hr): 96h

Species: Algae or other aquatic plants

Value: 43mg/l

Source: 2

Endpoint: NOEC(ECx)

Test Duration (hr): 504h

Species: Crustacea

Value: 3.7mg/l

Source: 2

Endpoint: LC50

Test Duration (hr): 96h

Species: Fish

Value: 51mg/l

Source: 2

Potassium borate - K2B4O7

Endpoint: EC50

Test Duration (hr): 96h

Species: Algae or other aquatic plants

Value: 15.4mg/l

Source: 2

Endpoint: EC50

Test Duration (hr): 72h

Species: Algae or other aquatic plants

Value: 40.2mg/l

Source: 2

Endpoint: NOEC(ECx)

Test Duration (hr): 768h

Species: Fish

Value: 0.009mg/l

Source: 2

Endpoint: LC50

Test Duration (hr): 96h

Species: Fish

Value: 74mg/l

Source: 2

Potassium chloride

Endpoint: EC50

Test Duration (hr): 48h

Species: Crustacea

Value: 93mg/l

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Source: 4
Endpoint: EC50
Test Duration (hr): 96h
Species: Algae or other aquatic plants
Value: 894.6mg/L
Source: 4
Endpoint: EC50
Test Duration (hr): 72h
Species: Algae or other aquatic plants
Value: >100mg/l
Source: 2
Endpoint: NOEC(ECx)
Test Duration (hr): 25h
Species: Fish
Value: 9.319mg/L
Source: 4
Endpoint: LC50
Test Duration (hr): 96h
Species: Fish
Value: 390mg/l
Source: 4

Water
Endpoint: Not Available
Test Duration (hr): Not Available
Species: Not Available
Value: Not Available
Source: Not Available

Legend: Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

Although small amounts of fluorides are conceded to have beneficial effects, two forms of chronic toxic effect, dental fluorosis and skeletal fluorosis may be caused by excessive intake over long periods. Fluorides are absorbed by humans following inhalation of workplace and ambient air that has been contaminated, ingestion of drinking water and foods and dermal contact.

Fluoride accumulates, food-dependently in skeletal tissues of both aquatic and terrestrial vertebrates and invertebrates. Bioaccumulation occurs in marine organisms and, to a lesser extent, fresh water organisms.

For boron and borates:

Environmental fate:

Boron is generally found in nature bound to oxygen and is never found as the free element. Atmospheric boron may be in the form of particulate matter or aerosols as borides, boron oxides, borates, boranes, organoboron compounds, trihalide boron compounds, or borazines. Borates are relatively soluble in water, and will probably be removed from the atmosphere by precipitation and dry deposition. The half-life of airborne particles is usually on the order of days, depending on the size of the particle and atmospheric conditions.

Prevent, by any means available, spillage from entering drains or water courses.

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient: potassium chloride

Persistence: Water/Soil: HIGH

Persistence: Air: HIGH

Ingredient: water

Persistence: Water/Soil: LOW

Persistence: Air: LOW

Mobility

Mobility in soil:

Ingredient: potassium chloride

Mobility: LOW (Log KOC = 14.3)

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Bioaccumulative Potential

Ingredient: potassium chloride

Bioaccumulation: LOW (LogKOW = -0.4608)

Section 13 - Disposal Considerations

Waste Disposal

Product / Packaging disposal:

Containers may still present a chemical hazard/ danger when empty.

Return to supplier for reuse/ recycling if possible.

Otherwise:

If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.

Where possible retain label warnings and SDS and observe all notices pertaining to the product.

DO NOT allow wash water from cleaning or process equipment to enter drains.

It may be necessary to collect all wash water for treatment before disposal.

In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.

Where in doubt contact the responsible authority.

Recycle wherever possible.

Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.

Treat and neutralise at an approved treatment plant. Treatment should involve: Mixing or slurring in water; Neutralisation followed by: burial in a land-fill specifically licensed to accept chemical and / or pharmaceutical wastes or Incineration in a licensed apparatus (after admixture with suitable combustible material)

Decontaminate empty containers.

Section 14 - Transport Information

UN Number

1811

Proper Shipping Name

POTASSIUM HYDROGEN DIFLUORIDE SOLID

Transport Hazard Class

8

Subsidiary Hazard

6.1

Packing Group

II

Hazchem Code

2X

IERG Number

37

IATA UN Number

1811

IATA Proper Shipping Name

Potassium hydrogendifluoride, solid

IATA Transport Hazard Class

8

IATA Subsidiary Hazard

6.1

IATA Packing Group

II

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IMDG UN Number

1811

IMDG Proper Shipping Name

POTASSIUM HYDROGEN DIFLUORIDE, SOLID

IMDG Transport Hazard Class

8

IMDG Subsidiary Hazard

6.1

IMDG Packing Group

II

Additional Information

Labels Required:

Marine Pollutant: NO

HAZCHEM: 2X

Land transport (ADG):

UN number or ID number: 1811

UN proper shipping name: POTASSIUM HYDROGEN DIFLUORIDE SOLID

Transport hazard class(es):

Class: 8

Subsidiary Hazard: 6.1

Packing group: II

Environmental hazard: Not Applicable

Special precautions for user:

Special provisions: Not Applicable

Limited quantity: 1 kg

Air transport (ICAO-IATA / DGR):

UN number: 1811

UN proper shipping name: Potassium hydrogendifluoride, solid

Transport hazard class(es):

ICAO/IATA Class: 8

ICAO / IATA Subsidiary Hazard: 6.1

ERG Code: 8P

Packing group: II

Environmental hazard: Not Applicable

Special precautions for user:

Special provisions: Not Applicable

Cargo Only Packing Instructions: 863

Cargo Only Maximum Qty / Pack: 50 kg

Passenger and Cargo Packing Instructions: 859

Passenger and Cargo Maximum Qty / Pack: 15 kg

Passenger and Cargo Limited Quantity Packing Instructions: Y844

Passenger and Cargo Limited Maximum Qty / Pack: 5 kg

Sea transport (IMDG-Code / GGVSee):

UN number: 1811

UN proper shipping name: POTASSIUM HYDROGEN DIFLUORIDE, SOLID

Transport hazard class(es):

IMDG Class: 8

IMDG Subsidiary Hazard: 6.1

Packing group: II

Environmental hazard: Not Applicable

Special precautions for user:

EMS Number: F-A , S-B

Special provisions: Not Applicable

Limited Quantities: 1 kg

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Transport in bulk according to Annex II of MARPOL and the IBC code:
Not Applicable

Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code:

Product name: potassium bifluoride

Group: Not Available

Product name: potassium borate - K2B4O7

Group: Not Available

Product name: potassium chloride

Group: Not Available

Product name: water

Group: Not Available

Transport in bulk in accordance with the IGC Code:

Product name: potassium bifluoride

Ship Type: Not Available

Product name: potassium borate - K2B4O7

Ship Type: Not Available

Product name: potassium chloride

Ship Type: Not Available

Product name: water

Ship Type: Not Available

Section 15 - Regulatory Information

Regulatory Information

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

Potassium bifluoride is found on the following regulatory lists:

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 7

Australian Inventory of Industrial Chemicals (AIIC)

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic

Potassium borate - K2B4O7 is found on the following regulatory lists:

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4

Australian Inventory of Industrial Chemicals (AIIC)

Potassium chloride is found on the following regulatory lists:

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4

Australian Inventory of Industrial Chemicals (AIIC)

Water is found on the following regulatory lists:

Australian Inventory of Industrial Chemicals (AIIC)

Additional Regulatory Information:

Not Applicable

National Inventory Status:

National Inventory: Australia - AIIC / Australia Non-Industrial Use

Status: Yes

National Inventory: Canada - DSL

Status: Yes

National Inventory: Canada - NDSL

Status: No (potassium bifluoride; potassium chloride; water)

National Inventory: China - IECSC

Status: Yes

National Inventory: Europe - EINEC / ELINCS / NLP

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Status: Yes
National Inventory: Japan - ENCS
Status: Yes
National Inventory: Korea - KECI
Status: Yes
National Inventory: New Zealand - NZIoC
Status: Yes
National Inventory: Philippines - PICCS
Status: Yes
National Inventory: USA - TSCA
Status: Yes
National Inventory: Taiwan - TCSI
Status: Yes
National Inventory: Mexico - INSQ
Status: Yes
National Inventory: Vietnam - NCI
Status: Yes
National Inventory: Russia - FBEPH
Status: Yes

Legend:

Yes = All CAS declared ingredients are on the inventory

No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.

Poisons Schedule

S6

Hazard Rating Systems

Flammability: 0

Toxicity: 3

Body Contact: 4

Reactivity: 0

Chronic: 2

0 = Minimum

1 = Low

2 = Moderate

3 = High

4 = Extreme

Section 16 - Any Other Relevant Information

Version Number

13.1

Revisions Made

SDS Version Summary:

Version: 12.1

Date of Update: 01/11/2019

Sections Updated: One-off system update. NOTE: This may or may not change the GHS classification

Version: 13.1

Date of Update: 23/12/2022

Sections Updated: Classification review due to GHS Revision change.

Key Abbreviations or Acronyms Used

Definitions and abbreviations:

PC-TWA: Permissible Concentration-Time Weighted Average

PC-STEL: Permissible Concentration-Short Term Exposure Limit

IARC: International Agency for Research on Cancer

ACGIH: American Conference of Governmental Industrial Hygienists

STEL: Short Term Exposure Limit

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TEEL: Temporary Emergency Exposure Limit
IDLH: Immediately Dangerous to Life or Health Concentrations
ES: Exposure Standard
OSF: Odour Safety Factor
NOAEL: No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index
DNEL: Derived No-Effect Level
PNEC: Predicted no-effect concentration
AII: Australian Inventory of Industrial Chemicals
DSL: Domestic Substances List
NDSL: Non-Domestic Substances List
IECSC: Inventory of Existing Chemical Substance in China
EINECS: European INventory of Existing Commercial chemical Substances
ELINCS: European List of Notified Chemical Substances
NLP: No-Longer Polymers
ENCS: Existing and New Chemical Substances Inventory
KECI: Korea Existing Chemicals Inventory
NZIoC: New Zealand Inventory of Chemicals
PICCS: Philippine Inventory of Chemicals and Chemical Substances
TSCA: Toxic Substances Control Act
TCSI: Taiwan Chemical Substance Inventory
INSQ: Inventario Nacional de Sustancias Químicas
NCI: National Chemical Inventory
FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

Empirical Formula & Structural Formula

Not Applicable

User Codes

User Title Label	User Codes
Wis Numbers	08088804
Wis Numbers	08088901

Other Information

Safety Data Sheet according to WHS Regulations (Hazardous Chemicals) Amendment 2020 and ADG requirements

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

This SDS has been transcribed into Infosafe GHS format from an original, issued by the manufacturer on the date shown. Any disclaimer by the manufacturer may not be included in the transcription.

END OF SDS

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