

CIGWELD COMWELD 965 SOLDERING FLUX

Chemwatch Material Safety Data Sheet
Issue Date: 31-Oct-2006
NC317ECP

CHEMWATCH 7059-47
Revision No:2
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Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

CIGWELD COMWELD 965 SOLDERING FLUX

SYNONYMS

"Manufacturer's Product Code: 321890, 321894"

PROPER SHIPPING NAME

ZINC CHLORIDE SOLUTION

PRODUCT USE

Active flux for soldering most metals with Comweld solders.

SUPPLIER

Company: CIGWELD Pty Ltd
Address:
71 Gower Street
Preston
VIC 3072
AUS
Telephone: (03) 9474 7400
Telephone: 1300 654 674
Emergency Tel: (03) 9474 7400

Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE

HAZARDOUS SUBSTANCE. DANGEROUS GOODS. According to the Criteria of NOHSC, and the ADG Code.

POISONS SCHEDULE

S6

RISK

Harmful by inhalation and if swallowed.
Causes burns.
Risk of serious damage to eyes.
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

SAFETY

Keep locked up.
Do not breathe gas/fumes/vapour/spray.
Avoid contact with eyes.
Wear suitable protective clothing.

Use only in well ventilated areas.
Keep container in a well ventilated place.
To clean the floor and all objects contaminated by this material, use water.
Keep container tightly closed.
This material and its container must be disposed of in a safe way.
Take off immediately all contaminated clothing.
In case of accident or if you feel unwell IMMEDIATELY contact Doctor or Poisons Information Centre (show label if possible).
Use appropriate container to avoid environment

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Section 2 - HAZARDS IDENTIFICATION

contamination.
Avoid release to the environment. Refer to special instructions/Safety data sheets.
This material and its container must be disposed of as hazardous waste.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
zinc chloride	7646-85-7	30-60
ammonium chloride	12125-02-9	<10 [^]
hydrochloric acid	7647-01-0	<10
acetone	67-64-1	<1
water	7732-18-5	balance
soldering emissions as zinc chloride fume	7646-85-7	

Section 4 - FIRST AID MEASURES

SWALLOWED

- 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.
- Seek medical advice.

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.

SKIN

If skin contact occurs:

- Immediately remove all contaminated clothing, including footwear
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prosthesis 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.

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Section 4 - FIRST AID MEASURES

NOTES TO PHYSICIAN

For acute or short term repeated exposures to strong acids:

- Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
- Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling
- Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
- Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the dessicating action of the acid on proteins in specific tissues.

INGESTION:

- Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.
- DO NOT attempt to neutralise the acid since exothermic reaction may extend the corrosive injury.
- Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
- Charcoal has no place in acid management.
- Some authors suggest the use of lavage within 1 hour of ingestion.

SKIN:

- Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
- Deep second-degree burns may benefit from topical silver sulfadiazine.

EYE:

- Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjunctival cul-de-sacs. Irrigation should last at least 20-30 minutes. DO NOT use neutralising agents or any other additives. Several litres of saline are required.
- Cycloplegic drops, (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.
- Steroid eye drops should only be administered with the approval of a consulting ophthalmologist).

[Ellenhorn and Barceloux: Medical Toxicology].

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

FIRE FIGHTING

- 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.
- Do not approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 800 metres in all directions.

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Section 5 - FIRE FIGHTING MEASURES

FIRE/EXPLOSION HAZARD

- Non combustible.
 - Not considered to be a significant fire risk.
 - Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
 - Heating may cause expansion or decomposition leading to violent rupture of containers.
 - Decomposes on heating and may produce toxic fumes of carbon monoxide (CO).
 - May emit acrid smoke. May emit corrosive fumes.
- Decomposition may produce toxic fumes of: hydrogen chloride.

FIRE INCOMPATIBILITY

Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.

HAZCHEM: 2X

Personal Protective Equipment

- Breathing apparatus.
- Gas tight chemical resistant suit.
- Limit exposure duration to 1 BA set30 mins.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS

- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labelled container for waste disposal.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- 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.
- Consider evacuation (or protect in place).
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Neutralise/decontaminate residue.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

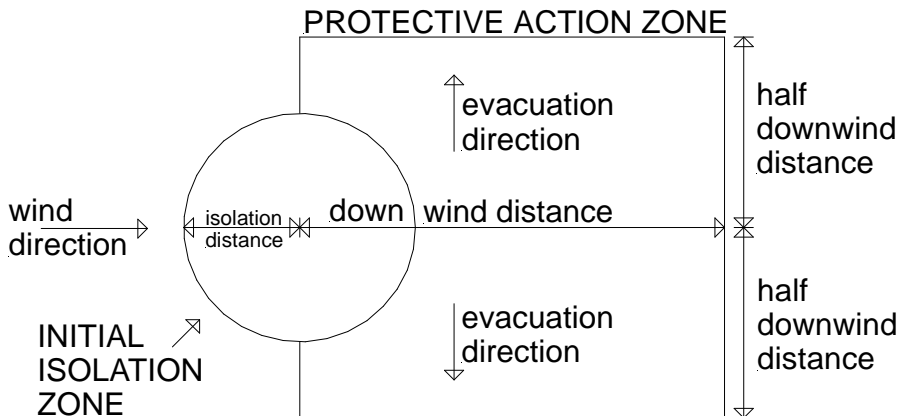
PROTECTIVE ACTIONS FOR SPILL

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Section 6 - ACCIDENTAL RELEASE MEASURES



From IERG (Canada/Australia)

Isolation Distance	25 metres
Downwind Protection Distance	250 metres
IERG Number	37

FOOTNOTES

- 1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.
- 2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.
- 3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.
- 4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills".
LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.
- 5 Guide 154 is taken from the US DOT emergency response guide book.
- 6 IERG information is derived from CANUTEC - Transport Canada.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

zinc chloride 40 mg/m³

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

zinc chloride 10 mg/m³

other than mild, transient adverse effects without perceiving a clearly defined odour is:

zinc chloride 4 mg/m³

The threshold concentration below which most people will experience no appreciable risk of health effects:

zinc chloride 2 mg/m³

American Industrial Hygiene Association (AIHA)

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Section 6 - ACCIDENTAL RELEASE MEASURES

Ingredients considered according to the following cutoffs

Very Toxic (T+)	$\geq 0.1\%$	Toxic (T)	$\geq 3.0\%$
R50	$\geq 0.25\%$	Corrosive (C)	$\geq 5.0\%$
R51	$\geq 2.5\%$		
else	$\geq 10\%$		

where percentage is percentage of ingredient found in the mixture

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

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
 - Wear protective clothing when risk of exposure occurs.
 - Use in a well-ventilated area.
 - Avoid contact with moisture.
 - Avoid contact with incompatible materials.
 - When handling, DO NOT eat, drink or smoke.
 - Keep containers securely sealed when not in use.
 - Avoid physical damage to containers.
 - Always wash hands with soap and water after handling.
 - Work clothes should be laundered separately. Launder contaminated clothing before re-use.
 - Use good occupational work practice.
 - Observe manufacturer's storing and handling recommendations.
 - Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
- DO NOT allow clothing wet with material to stay in contact with skin.

SUITABLE CONTAINER

DO NOT use aluminium or galvanised containers.
Check regularly for spills and leaks.

STORAGE INCOMPATIBILITY

Segregate from alkalis, oxidising agents and chemicals readily decomposed by acids, i.e. cyanides, sulfides, carbonates.

Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC
Australia Exposure	zinc chloride		1		2			

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC
Standards	(Zinc chloride (fume))							
Australia Exposure Standards	zinc chloride (Inspirable dust (Not specified))		10					
Australia Exposure Standards	hydrochloric acid (Hydrogen chloride)					5	7.5	
Australia Exposure Standards	acetone (Acetone)	500	1185	1000	2375			
Australia Exposure Standards	zinc chloride fume (Zinc chloride (fume))		1		2			
Australia Exposure Standards	zinc chloride fume (Inspirable dust (Not specified))		10					

The following materials had no OELs on our record under the following CAS

- zinc chloride: CAS:21351-91-7
- hydrochloric acid: CAS:7698-05-7
- water: CAS:7732-18-5

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m ³)	Revised IDLH Value (ppm)
zinc chloride	50	
hydrochloric acid		50
acetone		2, 500 [LEL]
zinc chloride fume	50	

NOTES

Values marked LEL indicate that the IDLH was based on 10% of the lower explosive limit for safety considerations even though the relevant toxicological data indicated that irreversible health effects or impairment of escape existed only at higher concentrations.

Not available. Refer to individual constituents.

INGREDIENT DATA

ZINC CHLORIDE:

Additional to effects produced by inhalation of the relatively inert oxide, exposure to the chloride produces irritancy as a result of hydrolysis to hydrogen chloride in the pulmonary fluids. Zinc chloride fume has caused death, chemical pneumonitis, alveolar and bronchiolar obliteration, and ulcerative damage to the mucous membranes of both the nasopharynx and respiratory tract. Acute pulmonary damage produces respiratory distress, gradual renal failure and combined respiratory and metabolic acidosis. These effects may be lethal. A pale grey cyanosis may be symptomatic. 30 minutes exposure at 4.8 mg/m³ produces mild, transient respiratory irritation whilst 0.4 mg/m³ is not irritating. The recommended TLV is thought to minimise the potential of respiratory irritation, pulmonary toxicity and the risk of damage to eyes and skin.

zinc

HYDROCHLORIC ACID:

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Odour Threshold Value: 0.262 ppm (detection), 10.06 ppm (recognition)

NOTE: Detector tubes for hydrochloric acid, measuring in excess of 1 ppm, are available commercially.

Hydrogen chloride is a strong irritant to the eyes, mucous membranes and skin. Chronic exposure produces a corrosive action on the teeth. Reports of respiratory irritation following short-term exposure at 5 ppm have led to the recommended TLV-C. There is no indication that skin contact with hydrogen chloride elicits systemic poisoning and a skin designation has not been applied.

Exposure of humans to hydrogen chloride at 50 to 100 ppm for 1 hour is reported to be barely tolerable; 35 ppm caused irritation of the throat on short exposure and 10 ppm was the maximal concentration for prolonged exposure. It has been stated that hydrogen chloride at concentrations of 5 ppm is immediately irritating.

-

Toxic effects of hydrochloric acid

Concentration	Clinical effects
0.067 - 0.267 ppm	Reported range of odour thresholds and changes in respiratory pattern
5 ppm	No organic damage
10 ppm	Irritation; work undisturbed
10-50 ppm	Work difficult but possible
35 ppm	Short exposure irritation of the throat
50-100 ppm	Exposure for 1 h barely tolerable
1000-2000 ppm	Brief exposure dangerous; laryngospasm
1300-2000 ppm	Lethal after a few minutes

ACETONE:

Odour Threshold Value: 3.6 ppm (detection), 699 ppm (recognition)

Saturation vapour concentration: 237000 ppm @ 20 C

NOTE: Detector tubes measuring in excess of 40 ppm, are available.

Exposure at or below the recommended TLV-TWA is thought to protect the worker against mild irritation associated with brief exposures and the bioaccumulation, chronic irritation of the respiratory tract and headaches associated with long-term acetone exposures. The NIOSH REL-TWA is substantially lower and has taken into account slight irritation experienced by volunteer subjects at 300 ppm. Mild irritation to acclimatised workers begins at about 750 ppm - unacclimatised subjects will experience irritation at about 350-500 ppm but acclimatisation can occur rapidly. Disagreement between the peak bodies is based largely on the view by ACGIH that widespread use of acetone, without evidence of significant adverse health effects at higher concentrations, allows acceptance of a higher limit.

Half-life of acetone in blood is 3 hours which means that no adjustment for shift-length has to be made with reference to the standard 8 hour/day, 40 hours per week because body clearance occurs within any shift with low potential for accumulation.

A STEL has been established to prevent excursions of acetone vapours that could cause depression of the central nervous system.

WATER:

No exposure limits set by NOHSC or ACGIH.

ZINC CHLORIDE FUME:

Additional to effects produced by inhalation of the relatively inert zinc oxide, exposure to the chloride produces irritancy as a result of hydrolysis

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

to hydrogen chloride in the pulmonary fluids.

Zinc chloride fume has caused death, chemical pneumonitis, alveolar and bronchiolar obliteration, and ulcerative damage to the mucous membranes of both the nasopharynx and respiratory tract. Acute pulmonary damage produces respiratory distress, gradual renal failure and combined respiratory and metabolic acidosis. These effects may be lethal. A pale grey cyanosis may be symptomatic. 30 minutes exposure at 4.8 mg/m³ produces mild, transient respiratory irritation whilst 0.4 mg/m³ is not irritating. The recommended TLV is thought to minimise the potential of respiratory irritation, pulmonary toxicity and the risk of damage to eyes and skin.

PERSONAL PROTECTION

EYE

- Chemical goggles.
- Full face shield may be required for supplementary but never for primary protection of eyes
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET

Wear chemical protective gloves, eg. PVC.
Wear safety footwear or safety gumboots, eg. Rubber.
When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.

OTHER

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half- face Respirator	Full- Face Respirator
1000	10	BKAX- AUS P	-
1000	50	-	BKAX- AUS P
5000	50	Airline *	-
5000	100	-	BKAX- 2 P
10000	100	-	BKAX- 3 P
	100+		Airline**

* - Continuous Flow

** - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

For further information consult site specific CHEMWATCH data (if available), or your Occupational Health and Safety Advisor.

ENGINEERING CONTROLS

Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.

An approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Pink acidic liquid; mixes with water.

PHYSICAL PROPERTIES

Liquid.

Mixes with water.

Corrosive.

Acid.

Molecular Weight: Not Applicable

Melting Range (°C): Not Available

Solubility in water (g/L): Miscible

pH (1% solution): Not Available

Volatile Component (%vol): Not Available

Relative Vapour Density (air=1): Not Available

Lower Explosive Limit (%): Not Applicable

Autoignition Temp (°C): Not Available

State: Liquid

Boiling Range (°C): 105

Specific Gravity (water= 1): 1.3

pH (as supplied): Not Available

Vapour Pressure (kPa): Not Available

Evaporation Rate: Not Available

Flash Point (°C): Not Applicable

Upper Explosive Limit (%): Not Applicable

Decomposition Temp (°C): Not Available

Viscosity: Not Available

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

Contact with alkaline material liberates heat.

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.

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

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Section 11 - TOXICOLOGICAL INFORMATION

EYE

The material can produce chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating.

SKIN

The material can produce chemical burns following direct contact with the skin.
The material may accentuate any pre-existing skin condition.

INHALED

Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful.
Inhalation of freshly formed zinc oxide particles sized below 1.5 microns and generally between 0.02 to 0.05 microns may result in "metal fume fever", with symptoms resembling influenza. Symptoms may be delayed for up to 12 hours and begin with the sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude and a generalised feeling of malaise. Mild to severe headache, nausea, occasional vomiting, fever or chills, exaggerated mental activity, profuse sweating, diarrhoea, excessive urination and prostration may also occur. Tolerance to the fumes develops rapidly, but is quickly lost. All symptoms usually subside within 24-36 hours following removal from exposure. Leucocytosis, a transient increase in white blood cell counts, is reported as a common finding in metal fume fever but is not known to be common amongst welders. Severe over-exposure to zinc oxide, following inhalation of fumes or finely divided dusts may result in bronchitis or pneumonia; a bluish skin tint may be present.

CHRONIC HEALTH EFFECTS

Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs. Chronic exposure may inflame the skin or conjunctiva.

TOXICITY AND IRRITATION

Not available. Refer to individual constituents.
unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances

ZINC CHLORIDE:

TOXICITY

Oral (rat) LD50: 350 mg/kg
Inhalation (human) TLo: 4800 mg/m³/3h
Inhalation (man) TLo: 4800 mg/m³/30 min
Inhalation (rat) LLo: 1960 mg/m³/10 min
Mutation DNA Damage Human.
Equivocal tumorigenic agent by RTECS criteria.

IRRITATION

Nil Reported

HYDROCHLORIC ACID:

TOXICITY

Unreported (man) LLo: 81 mg/kg
Inhalation (human) LLo: 1300 ppm/30 min
Inhalation (human) LLo: 3000 ppm/5 min
Inhalation (rat) LC50: 3124 ppm/1h
Oral (rat) LD50: 900 mg/kg

IRRITATION

Eye (rabbit): 5mg/30s - Mild

The substance is classified by IARC as Group 3:
NOT classifiable as to its carcinogenicity to humans.

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Section 11 - TOXICOLOGICAL INFORMATION

Evidence of carcinogenicity may be inadequate or limited in animal testing.

ACETONE:

TOXICITY

Oral (man) TDLo: 2857 mg/kg
Oral (rat) LD50: 5800 mg/kg
Inhalation (human) TCLo: 500 ppm
Inhalation (man) TCLo: 12000 ppm/4 hr
Inhalation (man) TCLo: 10 mg/m³/6 hr
Inhalation (rat) LC50: 50100 mg/m³/8 hr
Dermal (rabbit) LD50: 20000 mg/kg

IRRITATION

Eye (human): 500 ppm - Irritant
Eye (rabbit): 3.95 mg - SEVERE
Eye (rabbit): 20mg/24hr - Moderate
Skin (rabbit):395mg (open) - Mild
Skin (rabbit): 500 mg/24hr - Mild

WATER:

No significant acute toxicological data identified in literature search.

ZINC CHLORIDE FUME:

TOXICITY

Inhalation (rat) LCLo: 1960 mg/m³/10m

IRRITATION

MATERIAL	CARCINOGEN	REPROTOXIN	SENSITISER	SKIN
zinc chloride		ILOEI		
hydrochloric acid	IARC:Group 3			
zinc chloride fume		ILOEI		

REPROTOXIN

ILOEI: ILO Chemicals in the electronics industry that have toxic effects on reproduction: zinc chloride

CARCINOGEN

IARC: International Agency for Research on Cancer (IARC) Carcinogens: hydrochloric acid
Category: Group 3: Not classifiable as to carcinogenicity to humans

REPROTOXIN

ILOEI: ILO Chemicals in the electronics industry that have toxic effects on reproduction: zinc chloride fume

Section 12 - ECOLOGICAL INFORMATION

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

DO NOT discharge into sewer or waterways.

Refer to data for ingredients, which follows:

ZINC CHLORIDE:

The material is classified as an ecotoxin* because the Fish LC50 (96 hours) is less than or equal to 0.1 mg/l

* Classification of Substances as Ecotoxic (Dangerous to the Environment)
Appendix 8, Table 1

Compiler's Guide for the Preparation of International Chemical Safety Cards: 1993
Commission of the European Communities.

HYDROCHLORIC ACID:

Hazardous Air Pollutant: Yes
Fish LC50 (96hr.) (mg/l): 0.282

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

continued...

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Section 12 - ECOLOGICAL INFORMATION

DO NOT discharge into sewer or waterways.

Ecotoxicity

Fish LC100 (24 h): trout 10 mg/l

TLm (96 h): mosquito fish 282 ppm (fresh water)

LC50: goldfish 178 mg/l

Shrimp LC50 (48 h): 100 - 330 ppm (salt water)

Starfish LC50 (48 h): 100 - 330 mg/l

Cockle LC50 (48 h): 330 - 1000 mg/l

[Hach]

Hydrogen chloride in water dissociates almost completely, releasing hydrogen and chloride ions; the hydrogen ions are captured by water to produce hydronium ions.

Hydrochloric acid infiltrates soil, the rate dependent on moisture content. During soil transport, hydrochloric acid dissolves soil components.

Drinking water standard:

chloride: 400 mg/l (UK max.)

250 mg/l (WHO guideline)

ACETONE:

Fish LC50 (96hr.) (mg/l):

8300- 40000

Daphnia magna EC50 (48hr.) (mg/l):

10

log Kow (Prager 1995):

- 0.24

log Kow (Sangster 1997):

- 0.24

log Pow (Verschueren 1983):

- 0.24

BOD5:

122%

ThOD:

72

Half- life Soil - High (hours):

168

Half- life Soil - Low (hours):

24

Half- life Air - High (hours):

2790

Half- life Air - Low (hours):

279

Half- life Surface water - High (hours):

168

Half- life Surface water - Low (hours):

24

Half- life Ground water - High (hours):

336

Half- life Ground water - Low (hours):

48

Aqueous biodegradation - Aerobic - High (hours):

168

Aqueous biodegradation - Aerobic - Low (hours):

24

Aqueous biodegradation - Anaerobic - High (hours):

672

Aqueous biodegradation - Anaerobic - Low (hours):

96

Aqueous biodegradation - Removal secondary treatment - High (hours):

75%

Aqueous biodegradation - Removal secondary treatment - Low (hours):

54%

Aqueous photolysis half- life - High (hours):

270

Photooxidation half- life water - High (hours):

3.97E+06

Photooxidation half- life water - Low (hours):

9.92E+04

Photooxidation half- life air - High (hours):

2790

Photooxidation half- life air - Low (hours):

279

DO NOT discharge into sewer or waterways.

log Kow: -0.24

Half-life (hr) air: 312-1896

Half-life (hr) H2O surface water: 20

Henry's atm m³ /mol: 3.67E-05

BOD 5 if unstated: 0.31-1.76,46-55%

COD: 1.12-2.07

ThOD: 2.2

BCF: 0.69

Toxicity Fish: LC50(96) 5540-13000mg/L

Toxicity invertebrate: cell mult. inhib. 28-7500mg/L

Bioaccumulation: not sig

continued...

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Nitrif. inhib.: 75% decr. at 840mg/L
Anaerobic effects: sig degrad
Degradation Biological: sig
processes Abiotic: Rxn OH*, photodissoc
In air, acetone is lost by photolysis and reaction with photochemically
produced hydroxyl radicals; the estimated half-life of these combined
processes is about 22 days. The relatively long half-life allows acetone
to be transported long distances from its emission source.
Acetone is highly soluble and slightly persistent in water, with a
half-life of about 20 hours; it is minimally toxic to aquatic life.
Acetone released to soil volatilises although some may leach into the
ground where it rapidly biodegrades.
Acetone does not concentrate in the food chain.
Drinking Water Standard: none available.
Soil Guidelines: none available.
Air Quality Standards: none available.

ZINC CHLORIDE FUME:

The material is classified as an ecotoxin* because the Fish LC50 (96 hours) is less than
or equal to 0.1 mg/l

* Classification of Substances as Ecotoxic (Dangerous to the Environment)
Appendix 8, Table 1

Compiler's Guide for the Preparation of International Chemical Safety Cards: 1993
Commission of the European Communities.

Section 13 - DISPOSAL CONSIDERATIONS

- 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: Neutralisation with soda-ash or soda-lime followed by: Burial in a licenced land-fill or Incineration in a licenced apparatus (after admixture with suitable combustible material).
 - Decontaminate empty containers with 5% aqueous sodium hydroxide or soda ash, followed by water. Observe all label safeguards until containers are cleaned and destroyed.
 - 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 MSDS and observe all notices pertaining to the product.

Section 14 - TRANSPORTATION INFORMATION



continued...

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Section 14 - TRANSPORTATION INFORMATION

Labels Required: CORROSIVE
HAZCHEM: 2X

UNDG:

Dangerous Goods Class:	8	Subrisk:	None
UN Number:	1840	Packing Group:	III
Shipping Name: ZINC CHLORIDE SOLUTION			

Air Transport IATA:

ICAO/IATA Class:	8	ICAO/IATA Subrisk:	None
UN/ID Number:	1840	Packing Group:	III
ERG Code:	8L		
Shipping Name: Zinc chloride solution			

Maritime Transport IMDG:

IMDG Class:	8	IMDG Subrisk:	None
UN Number:	1840	Packing Group:	III
EMS Number:	F- A, S- B		
Shipping Name: ZINC CHLORIDE SOLUTION			

Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE: S6

REGULATIONS

zinc chloride (CAS: 7646-85-7) is found on the following regulatory lists;

- Australia - Australia New Zealand Food Standards Code - Processing Aids - Permitted microbial nutrients and microbial nutrient adjuncts
- Australia - Australian Capital Territory Environment Protection Regulation water quality standards - Inorganic chemicals Domesti
- Australia - Australian Capital Territory Environment Protection Regulation Pollutants entering waterways - Agricultural uses (Irrig)
- Australia - Australian Capital Territory Environment Protection Regulation Pollutants entering waterways - Agricultural uses (Stock)
- Australia - Australian Capital Territory Environment Protection Regulation Pollutants entering waterways - Domestic water quality
- Australia Exposure Standards
- Australia Inventory of Chemical Substances (AICS)
- Australia National Pollutant Inventory
- Australia Poisons Schedule
- OECD Representative List of High Production Volume (HPV) Chemicals
- WHO Guidelines for Drinking-water Quality - Chemicals for which guideline values have not been established

zinc chloride (CAS: 21351-91-7) is found on the following regulatory lists;

- Australia - Australian Capital Territory Environment Protection Regulation water quality standards - Inorganic chemicals Domesti
- Australia - Australian Capital Territory Environment Protection Regulation Pollutants entering waterways - Agricultural uses (Irrig)
- Australia - Australian Capital Territory Environment Protection Regulation Pollutants entering waterways - Agricultural uses (Stock)
- Australia - Australian Capital Territory Environment Protection Regulation Pollutants entering waterways - Domestic water quality
- Australia Exposure Standards
- Australia National Pollutant Inventory
- WHO Guidelines for Drinking-water Quality - Chemicals for which guideline values have not been established

continued...

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Section 15 - REGULATORY INFORMATION

hydrochloric acid (CAS: 7647-01-0) is found on the following regulatory lists;

Australia - Australian Capital Territory Environment Protection Regulation
water quality standards - Inorganic chemicals

Australia - Australian Capital Territory Environment Protection Regulation
Pollutants entering waterways - Agricultural uses (Irrig)

Australia - Australian Capital Territory Environment Protection Regulation
Pollutants entering waterways - Agricultural uses (Stock)

Australia - Australian Capital Territory Environment Protection Regulation
Pollutants entering waterways - Domestic water quality

Australia - Queensland Hazardous Materials and Prescribed Quantities for Major
Hazard Facilities

Australia Exposure Standards

Australia High Volume Industrial Chemical List (HVICL)

Australia Illicit Drug Reagents/Essential Chemicals - Category III

Australia Inventory of Chemical Substances (AICS)

Australia National Pollutant Inventory

Australia Poisons Schedule

CODEX General Standard for Food Additives (GSFA) - Additives Permitted for Use in
Food in General, Unless Otherwise Specified, in Accordance with GMP

IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk

International Agency for Research on Cancer (IARC) Carcinogens

International Council of Chemical Associations (ICCA) - High Production Volume List

International Maritime Dangerous Goods Requirements (IMDG Code) - Goods Forbidden for

Transport

OECD Representative List of High Production Volume (HPV) Chemicals

United Nations List of Precursors and Chemicals Frequently used in the Illicit

Manufacture of Narcotic Drugs and Psychotropic Substances Under International Control -
Table II (English)

WHO Guidelines for Drinking-water Quality - Chemicals for which guideline values have
not been established

David Craig Acetone (CAS: 67-64-1) is found on the following regulatory lists;

Australia - Australia New Zealand Food Standards Code - Processing Aids - Permitted
extraction solvents

Australia Exposure Standards

Australia High Volume Industrial Chemical List (HVICL)

Australia Illicit Drug Reagents/Essential Chemicals - Category III

Australia Inventory of Chemical Substances (AICS)

Australia National Pollutant Inventory

Australia Poisons Schedule

IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances

OECD Representative List of High Production Volume (HPV) Chemicals

United Nations List of Precursors and Chemicals Frequently used in the Illicit

Manufacture of Narcotic Drugs and Psychotropic Substances Under International Control -
Table II (English)

water (CAS: 7732-18-5) is found on the following regulatory lists;

Australia Inventory of Chemical Substances (AICS)

OECD Representative List of High Production Volume (HPV) Chemicals

zinc chloride fume (CAS: 7646-85-7) is found on the following regulatory lists;

Australia - Australia New Zealand Food Standards Code - Processing Aids - Permitted
microbial nutrients and microbial nutrient adjuncts

Australia - Australian Capital Territory Environment Protection Regulation
water quality standards - Inorganic chemicals

Australia - Australian Capital Territory Environment Protection Regulation
Pollutants entering waterways - Agricultural uses (Irrig)

Domesti

Domesti

continued...

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Section 15 - REGULATORY INFORMATION

Australia - Australian Capital Territory Environment Protection Regulation
Pollutants entering waterways - Agricultural uses (Stock)
Australia - Australian Capital Territory Environment Protection Regulation
Pollutants entering waterways - Domestic water quality
Australia Exposure Standards
Australia Inventory of Chemical Substances (AICS)
Australia National Pollutant Inventory
Australia Poisons Schedule
OECD Representative List of High Production Volume (HPV) Chemicals
WHO Guidelines for Drinking-water Quality - Chemicals for which guideline values have not been established

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
zinc chloride	7646- 85- 7, 21351- 91- 7
ammonium chloride	12125- 02- 9, 152128- 19- 3

EXPOSURE STANDARD FOR MIXTURES

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