Infosafe No™	1CH0X	Issue Date : December 2016	RE-ISSUED by CHEMSUPP

Product Name : **AMMONIUM CHLORIDE**

Classified as hazardous

1. Identification

GHS Product Identifier: AMMONIUM CHLORIDE

Company Name: CHEM-SUPPLY PTY LTD (ABN 19 008 264 211)

Address: 38 - 50 Bedford Street GILLMAN
SA 5013 Australia

Telephone/Fax Number: Tel: (08) 8440-2000
Fax: (08) 8440-2001

Recommended use of the chemical and restrictions on use: Electrolyte in dry-cell batteries; manufacture of quarrying explosives; component of soldering flux; zinc and tin plating; electrolytic refining of zinc; hardener for formaldehyde-based adhesives; flame suppressant; etching solutions; fertilizer; mordant in dyeing and printing; manufacture of ammonium compounds; rapid fixer additive in photography; freezing mixtures; cleaning soldering irons; pharmaceuticals and veterinary medicine; washing powders; snow treatment; manufacture of dyes; tanning; cement for iron pipes and bakery products.

Other Names

Name	Product Code
AMMONIUM CHLORIDE L.R.	AL049
AMMONIUM CHLORIDE A.R.	AA049
Sal ammoniac	
AMMONIUM CHLORIDE BP	AP049

Other Information: EMERGENCY CONTACT NUMBER: +61 08 8440 2000
Business hours: 8:30am to 5:00pm, Monday to Friday.

Chem-Supply Pty Ltd does not warrant that this product is suitable for any use or purpose. The user must ascertain the suitability of the product before use or application intended purpose. Preliminary testing of the product before use or application is recommended. Any reliance or purported reliance upon Chem-Supply Pty Ltd with respect to any skill or judgement or advice in relation to the suitability of this product of any purpose is disclaimed. Except to the extent prohibited at law, any condition implied by any statute as to the merchantable quality of this product or fitness for any purpose is hereby excluded. This product is not sold by description. Where the provisions of Part V, Division 2 of the Trade Practices Act apply, the liability of Chem-Supply Pty Ltd is limited to the replacement of supply of equivalent goods or payment of the cost of replacing the goods or acquiring equivalent goods.

2. Hazard Identification

GHS classification of the substance/mixture: Eye Damage/Irritation: Category 2A
Acute Toxicity - Oral: Category 4

Signal Word (s): WARNING

Hazard Statement (s): H302 Harmful if swallowed.
H319 Causes serious eye irritation.

Pictogram (s): Exclamation mark

Precautionary statement – Prevention: P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statement – Response: P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P330 Rinse mouth.
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 advice/attention.

Precautionary statement – Disposal: P501 Dispose of contents/container to an approved waste disposal plant.

3. Composition/information on ingredients

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Chemical Characterization	Solid				
Ingredients	**Name**	**CAS**	**Proportion**	**Hazard Symbol**	**Risk Phrase**
	Ammonium Chloride	12125-02-9	100 %	Xn, Xi	R22, R36

4. First-aid measures

Inhalation	If inhaled, remove from contaminated area to fresh air immediately. Apply artificial respiration if not breathing. If breathing is difficult, give oxygen. Immediately obtain medical aid if cough or other symptoms appear.
Ingestion	Rinse mouth thoroughly with water immediately, repeat until all traces of product have been removed. DO NOT INDUCE VOMITING. Seek medical advice if effects persist.
Skin	Remove contaminated clothing and wash before re-use. Wash affected areas with copious quantities of water immediately. If irritation occurs seek medical advice.
Eye contact	Immediately irrigate with copious quantity of water for at least 15 minutes. Eyelids to be held open. Seek medical advice if effects persist.
First Aid Facilities	Maintain eyewash fountain and safety shower in work area.
Advice to Doctor	Treat symptomatically based on judgement of doctor and individual reactions of the patient.
Other Information	For advice, contact a Poisons Information Centre (Phone eg Australia 13 1126; New Zealand 0800 764 766) or a doctor.

5. Fire-fighting measures

Hazards from Combustion Products	Toxic and irritating fumes (ammonia, hydrogen chloride/hydrochloric acid fumes/hydrogen chloride gas, and nitrogen oxides).
Specific Methods	No limitations to the type of extinguishing media. Small fire: Use dry chemical, CO2, water spray or foam. Large fire: Use water spray, fog or foam.
Precautions in connection with Fire	Wear SCBA and structural firefighter's uniform.

6. Accidental release measures

Personal Precautions	Avoid substance contact. Avoid generation of dusts: do not inhale dusts. Ensure supply of fresh air in enclosed rooms.
Personal Protection	Wear protective clothing specified for normal operations (see Section 8)
Clean-up Methods - Small Spillages	Sweep up (avoid generating dust) and using clean non-sparking tools transfer to a clean, suitable, clearly labelled container for disposal in accordance with local regulations.

7. Handling and storage

Precautions for Safe Handling	Avoid ingestion and inhalation of vapours, or dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure. Minimize dust generation and accumulation. Ensure good ventilation at the workplace. Keep container tightly closed. Use with adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Wear suitable protective clothing. Ensure a high level of personal hygiene is maintained when using this product. That is; always wash hands before eating, drinking, smoking or using the toilet. Wash thoroughly after handling. Hygroscopic. Keep away from incompatibles such as water, oxidizing agents, acids, alkalis. Protect from physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.
Conditions for safe storage, including any incompatabilities	Store in tightly closed, labelled containers, in a cool, dry, well-ventilated area, out of direct sunlight, away from sources of heat and flame, moisture and incompatibilities. Separated from ammonium nitrate, potassium chlorate. This product is hygroscopic. Keep container dry. Protect from humidity, moisture and water. Protect from physical damage.
Corrosiveness	Corrosive to ferrous metals (e.g. gray cast iron and steel), aluminium, and copper and its alloys (e.g. brass and bronze). It is corrosive to most metals at fire temperatures.
Storage Temperatures	Store at room temperature (15 to 25 °C recommended).
Recommended Materials	Sacks, or big bags, of paper or polyethylene.
Unsuitable Materials	Plastic or metal drums.

8. Exposure controls/personal protection

Occupational exposure limit values	Name	STEL		TWA		
		mg/m3	ppm	mg/m3	ppm	Footnote
	Ammonium Chloride	20		10		Ammonium chloride (fume)

Other Exposure Information
A time weighted average (TWA) has been established for Ammonium chloride (fume) (Safe Work Australia) of 10 mg/m³. The corresponding STEL level is 20 mg/m³. The STEL (Short Term Exposure Limit) is an exposure value that should not be exceeded for more than 15 minutes and should not be repeated for more than 4 times per day. There should be at least 60 minutes between successive exposures at the STEL. The exposure value at the TWA is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week.

Appropriate engineering controls
In industrial situations maintain the concentrations values below the TWA. This may be achieved by process modification, use of local exhaust ventilation, capturing substances at the source, or other methods.

Respiratory Protection
Where ventilation is not adequate, respiratory protection may be required. Avoid breathing dust, vapours or mists. Respiratory protection should comply with AS 1716 - Respiratory Protective Devices and be selected in accordance with AS 1715 - Selection, Use and Maintenance of Respiratory Protective Devices. Filter capacity and respirator type depends on exposure levels. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

Eye Protection
The use of a face shield, chemical goggles or safety glasses with side shield protection as appropriate. Must comply with Australian Standards AS 1337 and be selected and used in accordance with AS 1336.

Hand Protection
Hand protection should comply with AS 2161, Occupational protective gloves - Selection, use and maintenance. Recommendation: Excellent: NR latex, vinyl. Good: Neoprene or nitrile rubber gloves.

Personal Protective Equipment
Final choice of personal protective equipment will depend on individual circumstances and/or according to risk assessments undertaken.

Footwear
Safety boots in industrial situations is advisory, foot protection should comply with AS 2210, Occupational protective footwear - Guide to selection, care and use.

Body Protection
Clean clothing or protective clothing should be worn, preferably with an apron. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals. Recommendation: Suitable protective clothing should be worn e.g. cotton overalls buttoned at neck and wrist. When large quantities are handled the use of plastic aprons and rubber boots is recommended.

Hygiene Measures
Always wash hands before smoking, eating or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

Other Information
Final choice of personal protective equipment will depend on individual circumstances and/or according to risk assessments undertaken.

9. Physical and chemical properties

Form Solid

Appearance Colourless crystals or crystal masses; or white granular powder.

Odour Odourless or slight odour.

Melting Point Sublimes at 340 °C.

Boiling Point 520 °C

Solubility in Water Very soluble (37.2 g/100 mL at 20 °C).

Solubility in Organic Solvents Very soluble in liquid ammonia; soluble in methanol and glycerol; slightly soluble in ethanol; almost insoluble in acetone, diethyl ether and ethyl acetate.

Specific Gravity 1.53 at 20 °C; 1.52 at 25 °C.

pH 4.5 - 5.5 (5% aqueous solution) at 25 °C.

Vapour Pressure 1.3 hPa (30 °C).

Vapour Density (Air=1) 1.8

Evaporation Rate	Does not form a vapour.
Volatile Component	0 %vol @ 21 °C
Partition Coefficient: n-octanol/water	Log P (o/w): -4.37.
Flammability	Non combustible material.
Auto-Ignition Temperature	>400 °C
Explosion Properties	Reaction with interhalogens (e.g. bromine trifluoride, bromine pentafluoride or iodine heptafluoride) may be violent, fiery and explosive. Reaction with strong oxidizing agents (e.g. nitrates) may be violent and explosive. Reaction with hydrogen cyanide may form explosive nitrogen trichloride. Reaction with potassium chlorate may be violently explosive, due to formation of unstable ammonium chlorate. Reaction with lead salts or silver salts may form shock-sensitive explosive salts, lead or silver nitride.
Molecular Weight	53.49

10. Stability and reactivity

Chemical Stability	Stable at room temperature in closed containers under normal storage and handling conditions. Hygroscopic: absorbs moisture or water from the air. Exposure to moisture may affect product quality. Concentrated solutions of ammonium chloride may volatize and condense, or crystallize when exposed to cool surfaces or low temperatures. Has an acid reaction in aqueous solution. Solid tends to lose ammonia and become more acid on exposure and in storage.
Conditions to Avoid	Strong heating, high temperatures, direct sunlight, exposure to moisture, moist air or water, incompatibles.
Incompatible Materials	Strong acids; alkalis and their carbonates; interhalogens (e.g. bromine trifluoride, bromine pentafluoride or iodine heptafluoride); strong oxidizing agents (e.g. nitrates); ammonium nitrate; hydrogen cyanide; potassium chlorate; lead salts or silver salts; weed-killer; most metals at high (i.e., fire) temperatures]; copper and its compounds.
Hazardous Decomposition Products	Ammonia and hydrochloric acid.
Possibility of hazardous reactions	Reaction with interhalogens (e.g. bromine trifluoride, bromine pentafluoride or iodine heptafluoride) may be violent, fiery and explosive. Reaction with strong oxidizing agents (e.g. nitrates) may be violent and explosive. Reaction with hydrogen cyanide may form explosive nitrogen trichloride. Reaction with potassium chlorate may be violently explosive, due to formation of unstable ammonium chlorate. Reaction with lead salts or silver salts may form shock-sensitive explosive salts, lead or silver nitride. Reaction with strong acids may evolve hydrogen chloride gas. Reaction with alkalis and their carbonates may evolve ammonia gas. Reaction with ammonium nitrate may be violent at high temperatures, liberating chlorine. Ammonium chloride attacks copper and its compounds.
Hazardous Polymerization	Will not occur.

11. Toxicological Information

Acute Toxicity - Oral	LD50 (rat): 1440 mg/kg
Ingestion	Harmful if swallowed. Causes irritation to mucous membranes and to the gastrointestinal tract. Symptoms may include nausea, vomiting, diarrhoea, and thirst. Ingestion of approximately 100 mg/kg has caused mild metabolic acidosis in humans. Larger doses have caused severe metabolic acidosis with symptoms such as headache, drowsiness, vomiting, confusion and unconsciousness. May affect behaviour/central nervous system (headache, somnolence, confusion, drowsiness, tremor, convulsions, coma), eyes (Mydriasis), cardiovascular system (bradycardia), respiration (respiratory stimulation, apnea, hyperventilation, pulmonary oedema). May cause serious metabolic acidosis with hypokalemia. Transient hyperglycemia and glycosuria may also occur. For ammonium salts generally: After ingestion: local irritation symptoms, general feeling of sickness, nausea, vomiting, diarrhoea. After absorption of large quantities: drop in blood pressure, collapse, CNS disorders, spasms, narcotic conditions, respiratory paralysis, haemolysis. Ingestion is not a typical route of occupational exposure.

Inhalation	Dusts may cause irritations of the mucous membranes, respiratory tract and lungs, which are usually mild. Symptoms may include coughing, sneezing, breathing difficulties, and dyspnoea. Ammonium chloride fumes or mist can probably cause irritation of the nose, throat and lungs, with symptoms such as sore throat and coughing. Ammonium chloride fume may cause an asthma-like allergy. Future exposure may cause asthma attacks with shortness of breath, wheezing, coughing, and/or chest tightness.
Skin	Ammonium chloride dust, solutions or fumes are probably mildly irritating. Symptoms may include redness, pain, itching, scaling, and occasionally, blistering. May be harmful if absorbed through the skin.
Eye	Ammonium chloride is probably a mild eye irritant, based on limited animal information. Some tearing, blinking and mild irritation may occur as the dust is rinsed from the eye by tears. Symptoms may include redness, and blurred vision. It may cause Salt Cataract, increased ocular pressure, and degeneration of the retina. In humans, 5% to 10% solutions of ammonium chloride have occasionally been used to irrigate the eye in treatment of chemical burns, and no injury has been attributed to treatment.
Carcinogenicity	Not listed in the IARC Monographs.
Chronic Effects	Prolonged or repeated skin contact may cause dermatitis (red, dry, itchy skin), an allergic reaction. Prolonged or repeated ingestion may affect metabolism (anorexia, metabolic acidosis) and urinary system (enlargement of kidneys). Prolonged or repeated inhalation may affect the kidneys. Ammonium ions may accumulate in individuals with liver or kidney disease producing jerky respirations. Reportedly high concentrations may cause convulsions or tremors. Prolonged or repeated inhalation may cause bronchospasm (asthma).
Mutagenicity	There is no information available on humans or human cell cultures. Positive results have been obtain in a test using cultured mammalian cells and negative results in a bacterial test.

12. Ecological information

Ecological Information	No ecological problems are to be expected when the product is handled and used with due care and attention.
Persistence and degradability	Methods for the determination of biodegradability are not applicable to inorganic substances.
Mobility	Distribution: log P(oct): -4.37.
Bioaccumulative Potential	No bioaccumulation is to be expected (log P(o/w) <1.0).
Acute Toxicity - Fish	LC50 (Cyprinus carpio): 209 mg/l /96 h; LC50 (Lepomis macrochirus): 725 mg/l /96 h. The following applies to ammonium ions in general: fish: toxic as from 0.3 mg/l; nourishment for fish: toxic as from 0.3 mg/l.
Acute Toxicity - Daphnia	EC50 (Daphnia magna): > 100 mg/l/48 h.

13. Disposal considerations

Disposal Considerations	Whatever cannot be saved for recovery or recycling should be disposed of according to relevant local, state and federal government regulations.

14. Transport information

Transport Information	Not classified as a Dangerous Good according to the Australian Code for the Transport of Dangerous Goods by Road and Rail.

15. Regulatory information

Regulatory Information	Listed in the Australian Inventory of Chemical Substances (AICS).
Poisons Schedule	Not Scheduled
Packaging & Labelling	On account of its corrosive nature and its tendency to cake, ammonium chloride is best packed in sacks, or in big bags, of paper or polyethylene rather than plastic or metal drums.
Hazard Category	Harmful,Irritant

16. Other Information

Literature References	'Standard for the Uniform Scheduling of Medicines and Poisons No. 15', Commonwealth of Australia, November 2016. Lewis, Richard J. Sr. 'Hawley's Condensed Chemical Dictionary 13th. Ed.', Rev., John Wiley and Sons, Inc., NY, 1997. National Road Transport Commission, 'Australian Code for the Transport of Dangerous Goods by Road

and Rail 7th. Ed.', 2007.
Safe Work Australia, 'National Code of Practice fot the Preparation of Safety Data Sheets for Hazardous Chemicals', 2011.
Standards Australia, 'SAA/SNZ HB 76:2010 Dangerous Goods - Initial Emergency Response Guide', Standards Australia/Standards New Zealand, 2010.
Safe Work Australia, 'Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (2004)]'.
Safe Work Australia, 'Hazardous Substances Information System, 2005'.
Safe Work Australia, 'National Code of Practice for the Labelling of Safe Work Hazardous Substances (2011)'.
Safe Work Australia, 'National Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:1003(1995) 3rd Edition]'.

Contact Person/Point

Paul McCarthy Ph. (08) 8440 2000 DISCLAIMER STATEMENT:
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Empirical Formula & Structural Formula

NH_4Cl

...End Of MSDS...