

### 1. IDENTIFICATION

<b>Product Name</b>	<b>Choline Chloride Solution</b>
<b>Other Names</b>	No Data Available
<b>Uses</b>	Feed additive.
<b>Chemical Family</b>	No Data Available
<b>Chemical Formula</b>	No Data Available
<b>Chemical Name</b>	Choline Chloride Solution
<b>Product Description</b>	No Data Available

#### Contact Details of the Supplier of this Safety Data Sheet

<b>Organisation</b>	<b>Location</b>	<b>Telephone</b>
Redox Pty Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Pty Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia	+60-3-5614-2111

#### Emergency Contact Details

*For emergencies only; DO NOT contact these companies for general product advice.*

<b>Organisation</b>	<b>Location</b>	<b>Telephone</b>
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887

### 2. HAZARD IDENTIFICATION

**Poisons Schedule (Aust)** Not scheduled

#### Globally Harmonised System

**Hazard Classification** NOT hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

**Signal Word** None

### National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

**Dangerous Goods Classification** NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

### Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

<b>HSNO Classifications</b>	Health Hazards	<b>6.1E</b>	Substances that are acutely toxic –May be harmful, Aspiration hazard
		<b>6.3B</b>	Substances that are mildly irritating to the skin
		<b>6.4A</b>	Substances that are irritating to the eye

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

### Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Choline chloride	Unspecified	67-48-1	>=75 %
Water	H2O	7732-18-5	<=25 %

## 4. FIRST AID MEASURES

### Description of necessary measures according to routes of exposure

**Swallowed** Rinse mouth with water. Give water to drink. Do NOT induce vomiting. If symptoms develop, seek medical attention.

**Eye** Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If symptoms persist, call a physician.

**Skin** Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. If skin irritation persists, call a physician.

**Inhaled** Not hazardous by inhalation. Move to fresh air. If not breathing, give artificial respiration

**Advice to Doctor** Treat symptomatically based on judgement of doctor and individual reactions of patient.

**Medical Conditions Aggravated by Exposure** No information available on medical conditions aggravated by exposure to this product.

## 5. FIRE FIGHTING MEASURES

**General Measures** Clear fire area of all non-emergency personnel.  
Stay upwind.  
Keep out of low areas.  
Eliminate ignition sources.  
Move fire exposed containers from fire area if it can be done without risk.

**Flammability Conditions** Combustible liquid.

**Extinguishing Media** In case of fire, use appropriate extinguishing media most suitable for surrounding fire conditions.

	Cool containers / tanks with water spray.
<b>Hazardous Products of Combustion</b>	Heating can release hazardous gases.
<b>Special Fire Fighting Instructions</b>	Do NOT allow fire fighting water to reach waterways, drains or sewers. Store fire fighting water for treatment.
<b>Personal Protective Equipment</b>	Fire fighters should wear a positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots and gloves) or chemical splash suit.
<b>Flash Point</b>	>200 °C
<b>Lower Explosion Limit</b>	No Data Available
<b>Upper Explosion Limit</b>	No Data Available
<b>Auto Ignition Temperature</b>	330 °C
<b>Hazchem Code</b>	No Data Available

## 6. ACCIDENTAL RELEASE MEASURES

<b>General Response Procedure</b>	Avoid accidents, clean up immediately. Increase ventilation. Avoid walking through spilled product as it is slippery when spilled. Use clean, non-sparking tools and equipment. Shut off all possible sources of ignition.
<b>Clean Up Procedures</b>	Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. Large spills should be collected mechanically (remove by pumping) for disposal.
<b>Containment</b>	Stop leak if safe to do so. Isolate the danger area.
<b>Environmental Precautionary Measures</b>	Do NOT let product reach drains or waterways. If product does enter a waterway, advise the Environmental Protection Authority or your local Waste Management.
<b>Evacuation Criteria</b>	Evacuate all unnecessary personnel.
<b>Personal Precautionary Measures</b>	Personnel involved in the clean up should wear full protective clothing as listed in section 8.

## 7. HANDLING AND STORAGE

<b>Handling</b>	Ensure an eye bath and safety shower are available and ready for use. Observe good personal hygiene practices and recommended procedures. Wash thoroughly after handling. Take precautionary measures against static discharges by bonding and grounding equipment. Avoid contact with eyes, skin and clothing. Do not inhale product vapours.
<b>Storage</b>	Store in a cool, dry, well-ventilated area. Keep containers tightly closed when not in use. Inspect regularly for deficiencies such as damage or leaks. Protect against physical damage. Store away from incompatible materials as listed in section 10. Protect from direct sunlight, moisture and static discharges. Storage temperature must not exceed 48.9°C. This product is classified as a 'C2' Combustible Liquid for the purpose of storage and handling in accordance with the requirements of AS1940.
<b>Container</b>	Store in original packaging as approved by manufacturer.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

<b>General</b>	No exposure standard has been established for this product by the Australian Safety and Compensation Council (ASCC).  No exposure standard has been established for this product by the New Zealand Ministry of Business, Innovation & Employment.
<b>Exposure Limits</b>	No Data Available
<b>Biological Limits</b>	No information available on biological limit values for this product.
<b>Engineering Measures</b>	A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local

exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Adequate ventilation should be provided so that exposure limits are not exceeded.

**Personal Protection Equipment** RESPIRATOR: As in any fire, wear self-contained breathing apparatus (pressure- demand) where dusts/vapours are generated and engineering controls are inadequate (AS1715/1716).  
EYES: Tightly fitting safety goggles, face-shield or chemical-resistant goggles must be worn (AS1336/1337).  
HANDS: Wear rubber neoprene impervious gloves (AS2161).  
CLOTHING: Chemical-resistant coveralls, apron, and safety footwear (AS3765/2210).

**Work Hygienic Practices** No Data Available

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical State</b>	Liquid
<b>Appearance</b>	Liquid
<b>Odour</b>	Slight
<b>Colour</b>	Clear, colourless
<b>pH</b>	5 - 8 75% Solution
<b>Vapour Pressure</b>	2287.2 Pa (@ 20 °C)
<b>Relative Vapour Density</b>	No Data Available
<b>Boiling Point</b>	No Data Available
<b>Melting Point</b>	-10 °C
<b>Freezing Point</b>	No Data Available
<b>Solubility</b>	Miscible
<b>Specific Gravity</b>	1.10
<b>Flash Point</b>	>200 °C
<b>Auto Ignition Temp</b>	330 °C
<b>Evaporation Rate</b>	No Data Available
<b>Bulk Density</b>	No Data Available
<b>Corrosion Rate</b>	No Data Available
<b>Decomposition Temperature</b>	No Data Available
<b>Density</b>	1,10 g/mL
<b>Specific Heat</b>	No Data Available
<b>Molecular Weight</b>	No Data Available
<b>Net Propellant Weight</b>	No Data Available
<b>Octanol Water Coefficient</b>	( 75 % solution) log Pow -3,77
<b>Particle Size</b>	No Data Available
<b>Partition Coefficient</b>	No Data Available
<b>Saturated Vapour Concentration</b>	No Data Available
<b>Vapour Temperature</b>	No Data Available
<b>Viscosity</b>	26.2 mPas (@ 20 °C)
<b>Volatile Percent</b>	No Data Available
<b>VOC Volume</b>	No Data Available
<b>Additional Characteristics</b>	No Data Available
<b>Potential for Dust Explosion</b>	Product is a liquid.
<b>Fast or Intensely Burning Characteristics</b>	No Data Available
<b>Flame Propagation or Burning Rate of Solid Materials</b>	No Data Available
<b>Non-Flammables That Could Contribute Unusual Hazards to a Fire</b>	No Data Available

<b>Properties That May Initiate or Contribute to Fire Intensity</b>	No Data Available
<b>Reactions That Release Gases or Vapours</b>	No Data Available
<b>Release of Invisible Flammable Vapours and Gases</b>	No Data Available

## 10. STABILITY AND REACTIVITY

<b>Chemical Stability</b>	Product is stable under normal conditions of use, storage and temperature.
<b>Conditions to Avoid</b>	Stable under normal conditions.
<b>Materials to Avoid</b>	None known based on information supplied.
<b>Hazardous Decomposition Products</b>	None under normal processing.
<b>Hazardous Polymerisation</b>	Hazardous polymerization does not occur.

## 11. TOXICOLOGICAL INFORMATION

<b>General Information</b>	LD50/oral/rat = 5450 mg/kg  Eye irritation No eye irritation, rabbits Skin irritation Non-irritating to the skin, rabbits sensitization No sensitization responses were observed Mutagenic effects Did not show mutagenic effects in animal experiments Reproductive Toxicity Did not show teratogenic effects in animal experiments  Specific target organ systemic toxicity (repeated exposure) No observed adverse effect level : 1300-2900 mg/kg/d, Rat, oral
<b>Skin Irritant</b>	No known hazard in contact with skin
<b>Eye Irritant</b>	May cause eye irritation with susceptible persons.
<b>Carcinogen Category</b>	No Data Available

## 12. ECOLOGICAL INFORMATION

<b>Ecotoxicity</b>	LC50/96h/Fish Leuciscus idus (golden orfe) > 10000 mg/l LC50/48h/daphnia = 500 mg/l LC50/96h/algae = > 500 mg/l Toxicity to bacteria : Pseudomonas putida, EC50 (17 hour) : 132.8 mg/l
<b>Persistence/Degradability</b>	According to the results of tests of biodegradability this product is considered as being readily biodegradable.
<b>Mobility</b>	Log Pow -3.77
<b>Environmental Fate</b>	Avoid contaminating waterways, drains and sewers.
<b>Bioaccumulation Potential</b>	Minimum.
<b>Environmental Impact</b>	No Data Available

## 13. DISPOSAL CONSIDERATIONS

<b>General Information</b>	Dispose of in accordance with all local, state and federal regulations. All empty packaging should be disposed of in accordance with Local, State, and Federal Regulations or recycled/reconditioned at an approved facility.
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**Special Precautions for Land Fill** Contact a specialist disposal company or the local waste regulator for advice.

## 14. TRANSPORT INFORMATION

### Land Transport (Australia)

ADG Code

<b>Proper Shipping Name</b>	Choline Chloride Solution
<b>Class</b>	C2 Combustible Liquids - Flash Point >93°C, Closed Cup, Not Excluded Flammable
<b>Subsidiary Risk(s)</b>	No Data Available
	No Data Available
<b>UN Number</b>	No Data Available
<b>Hazchem</b>	No Data Available
<b>Pack Group</b>	No Data Available
<b>Special Provision</b>	No Data Available

### Land Transport (Malaysia)

ADR

<b>Proper Shipping Name</b>	Choline Chloride Solution
<b>Class</b>	No Data Available
<b>Subsidiary Risk(s)</b>	No Data Available
	No Data Available
<b>UN Number</b>	No Data Available
<b>Hazchem</b>	No Data Available
<b>Pack Group</b>	No Data Available
<b>Special Provision</b>	No Data Available

### Land Transport (New Zealand)

NZS5433

<b>Proper Shipping Name</b>	Choline Chloride Solution
<b>Class</b>	No Data Available
<b>Subsidiary Risk(s)</b>	No Data Available
	No Data Available
<b>UN Number</b>	No Data Available
<b>Hazchem</b>	No Data Available
<b>Pack Group</b>	No Data Available
<b>Special Provision</b>	No Data Available

### Land Transport (United States of America)

US DOT

<b>Proper Shipping Name</b>	Choline Chloride Solution
<b>Class</b>	No Data Available
<b>Subsidiary Risk(s)</b>	No Data Available
	No Data Available
<b>UN Number</b>	No Data Available
<b>Hazchem</b>	No Data Available
<b>Pack Group</b>	No Data Available

**Special Provision** No Data Available

### Sea Transport

IMDG Code

**Proper Shipping Name** Choline Chloride Solution  
**Class** No Data Available  
**Subsidiary Risk(s)** No Data Available  
**UN Number** No Data Available  
**Hazchem** No Data Available  
**Pack Group** No Data Available  
**Special Provision** No Data Available  
**EMS** No Data Available  
**Marine Pollutant** No

### Air Transport

IATA DGR

**Proper Shipping Name** Choline Chloride Solution  
**Class** No Data Available  
**Subsidiary Risk(s)** No Data Available  
**UN Number** No Data Available  
**Hazchem** No Data Available  
**Pack Group** No Data Available  
**Special Provision** No Data Available

### National Transport Commission (Australia)

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**Dangerous Goods Classification** NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

## 15. REGULATORY INFORMATION

**General Information** No Data Available

**Poisons Schedule (Aust)** Not scheduled

### Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

**Approval Code** HSR006672

### National/Regional Inventories

**Australia (AICS)** Listed

**Canada (DSL)** Not Determined

**Canada (NDSL)** Not Determined

**China (IECSC)** Not Determined

<b>Europe (EINECS)</b>	Not Determined
<b>Europe (REACH)</b>	Not Determined
<b>Japan (ENCS/METI)</b>	Not Determined
<b>Korea (KECI)</b>	Not Determined
<b>Malaysia (EHS Register)</b>	Not Determined
<b>New Zealand (NZIoC)</b>	Not Determined
<b>Philippines (PICCS)</b>	Not Determined
<b>Switzerland (Giftliste 1)</b>	Not Determined
<b>Switzerland (Inventory of Notified Substances)</b>	Not Determined
<b>Taiwan (NCSR)</b>	Not Determined
<b>USA (TSCA)</b>	Not Determined

## 16. OTHER INFORMATION

<b>Related Product Codes</b>	CHCHLO1016, CHCHLO1017, CHCHLO1104, CHCHLO1160, CHCHLO1400, CHCHLO2300, CHCHLO2301, CHCHLO2800, CHCHLO2801, CHCHLO2802, CHCHLO2803, CHCHLO3700, CHCHLO3701, CHCHLO3703, CHCHLO4100, CHCHLO4200, CHCHLO4800, CHCHLO5300, CHCHLO5500, CHCHLO5600, CHCHLO6300, CHCHLO6400, CHCHLO6700, CHCHLO7000, CHCHLO7001, CHCHLO7002, CHCHLO7003, CHCHLO7004, CHCHLO7005, CHCHLO7006, CHCHLO7100, CHCHLO7300, CHCHLO7400, CHCHLO7500, CHCHLO7501, CHCHLO7502, CHCHLO7503, CHCHLO7504, CHCHLO7505, CHCHLO7506, CHCHLO7507, CHCHLO7508, CHCHLO7509, CHCHLO7510, CHCHLO7511, CHCHLO7512, CHCHLO7513, CHCHLO7514, CHCHLO7515, CHCHLO7516, CHCHLO7517, CHCHLO7518, CHCHLO7519, CHCHLO7520, CHCHLO7600, CHCHLO7601, CHCHLO7602, CHCHLO7603, CHCHLO7701, CHCHLO7900, CHCHLO8200, CHCHLO8600
<b>Revision</b>	3
<b>Revision Date</b>	21 Jan 2016
<b>Reason for Issue</b>	SDS Updated
<b>Key/Legend</b>	<p>&lt; Less Than &gt; Greater Than</p> <p><b>AICS</b> Australian Inventory of Chemical Substances  <b>atm</b> Atmosphere  <b>CAS</b> Chemical Abstracts Service (Registry Number)  <b>cm<sup>2</sup></b> Square Centimetres  <b>CO<sub>2</sub></b> Carbon Dioxide  <b>COD</b> Chemical Oxygen Demand  <b>deg C (°C)</b> Degrees Celcius  <b>EPA (New Zealand)</b> Environmental Protection Authority of New Zealand  <b>deg F (°F)</b> Degrees Farenheit  <b>g</b> Grams  <b>g/cm<sup>3</sup></b> Grams per Cubic Centimetre  <b>g/l</b> Grams per Litre  <b>HSNO</b> Hazardous Substance and New Organism  <b>IDLH</b> Immediately Dangerous to Life and Health  <b>immiscible</b> Liquids are insoluable in each other.  <b>inHg</b> Inch of Mercury  <b>inH<sub>2</sub>O</b> Inch of Water  <b>K</b> Kelvin  <b>kg</b> Kilogram  <b>kg/m<sup>3</sup></b> Kilograms per Cubic Metre  <b>lb</b> Pound  <b>LC50</b> LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.  <b>LD50</b> LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.  <b>ltr</b> or <b>L</b> Litre  <b>m<sup>3</sup></b> Cubic Metre</p>



**mbar** Millibar  
**mg** Milligram  
**mg/24H** Milligrams per 24 Hours  
**mg/kg** Milligrams per Kilogram  
**mg/m<sup>3</sup>** Milligrams per Cubic Metre  
**Misc** or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present.  
**mm** Millimetre  
**mmH<sub>2</sub>O** Millimetres of Water  
**mPa.s** Millipascals per Second  
**N/A** Not Applicable  
**NIOSH** National Institute for Occupational Safety and Health  
**NOHSC** National Occupational Health and Safety Commission  
**OECD** Organisation for Economic Co-operation and Development  
**Oz** Ounce  
**PEL** Permissible Exposure Limit  
**Pa** Pascal  
**ppb** Parts per Billion  
**ppm** Parts per Million  
**ppm/2h** Parts per Million per 2 Hours  
**ppm/6h** Parts per Million per 6 Hours  
**psi** Pounds per Square Inch  
**R** Rankine  
**RCP** Reciprocal Calculation Procedure  
**STEL** Short Term Exposure Limit  
**TLV** Threshold Limit Value  
**tne** Tonne  
**TWA** Time Weighted Average  
**ug/24H** Micrograms per 24 Hours  
**UN** United Nations  
**wt** Weight