A: 43 Clapham Road, Regents Park NSW 2143
P: (02) 9645 4433
F: (02) 9645 4030
E: info@chlorinediscounters.com.au
W: www.chlorinediscounters.com.au

# *SAFETY DATA SHEET – Copper Sulphate*

## 1. IDENTIFICATION

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| **Revision Date** | July 2023 (*valid for 5 years from this date)* |
| **Product Name** | COPPER SULPHATE PENTAHYDRATE |
| **Other Names** | CUPRIC SULPHATE |
| **Uses** | Algaecide |
| **Contact Information** | Chlorine Discounters<br>43 Clapham Road, Regents Park NSW 2143<br>Phone: 02-96454433<br>Fax: 02-96454030<br>Email:info@chlorinediscounters.com.au<br>W: www.chlorinediscounters.com.au |
| **Emergency Contact** | Managing Director or Operations Manager |

## 2. HAZARD IDENTIFICATION

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|---|---|
| **Poisons Schedule (Aust)** | 6 |
| **Globally Harmonised System** | |
| **Hazard Classification** | Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) |
| **Hazard Categories** | Acute Toxicity (Oral) - Category 4<br>Skin Corrosion/Irritation - Category 2<br>Serious Eye Damage/Irritation - Category 2A<br>Acute Hazard To The Aquatic Environment - Category 1<br>Long-term Hazard To The Aquatic Environment - Category 1 |
| **Pictograms** |  |
| **Signal Word** | Warning |

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| **Hazard Statements** | H302<br>H315<br>H319<br>H410 | Harmful if swallowed<br>Causes skin irritation<br>Causes serious eye irritation<br>Very toxic to aquatic life with long lasting effects. |
| **Precautionary Statements** | | |
| **General** | P102 | Keep out of reach of children. |
| **Prevention** | P273<br>P280 | Avoid release to the environment.<br>Wear protective gloves/eye protection/face protection. |
| **Response** | P301 + P312 | IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. |
| | P302 + P352 | IF ON SKIN: Wash with plenty of soap and water. |
| | 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. |
| **Disposal** | P501 | Dispose of contents/container in accordance with local / regional / national / international regulations. |
| **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) |

# 3. COMPOSITION / INFORMATION ON INGREDIENTS

**Ingredients**

| Chemical Entity | CAS Number | Proportions (%) |
|---|---|---|
| COPPER (II) SULPHATE PENTAHYDRATE | [7758-99-8] | 98.0-100.0 |

# 4. FIRST AID MEASURES

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

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| **Swallowed** | If swallowed seek immediately for medical advice. Show this safety data sheet or the label. |
| **Eye** | Wash immediately with plenty of water for at least 15 minutes. Seek immediately for medical advice |
| **Skin** | Take off the contaminated clothes and wash with soap and plenty of water all the contaminated parts of the body. In case of irritation seek for medical advice. |

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| **Inhaled** | If possible reduce exposure using fresh air. Remove from exposure take the person in a well aerated place and calm. Seek for medical advice. |
| **Advice to Doctor** | Therapy: Gastric lavage with milk-albumin solution, If the copper level in blood is high use chelates, penicillamine if the oral via is practicable otherwise CaEDTA intravenous and BAL intramuscular; for the remainder symptomatic therapy. |
| **Medical Conditions Aggravated by Exposure** | Most important symptoms and effects, both acute and delayed: May cause pain in mouth and pharynx, nausea, watery and bloody diarrhoeas and/or decrease of blood pressure. Desaturation of protein with damage at mucosa level, hepatic and renal damage and of the central nervous system, hemolysis. Vomiting with emission of green coloured material, gastric burning, haematic diarrhea, abdominal pain, haemolytic jaundice, hepatic and renal insufficiency, convulsion, collapse. Fever from metal inhalation. Possible eyes and skin irritation. |

## 5. FIRE FIGHTING MEASURES

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| **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** | Product is a non-flammable solid. |
| **Extinguishing Media** | Product is not flammable. Use extinguishing media appropriate for surrounding fire (micronized water, CO2, foam). Collect the contaminated water to avoid reaching of sewers or water courses.<br>NON SUITABLE EXTINGUISHING MEDIA: None but avoid using plenty of water. |
| **Hazardous Products of Combustion** | Toxic gases / fumes of sulphur oxides SOx could be produced. The product decomposes over 560 deg C producing toxic gases of sulphur oxides (SOx). |
| **Special Fire Fighting Instructions** | Do NOT allow fire fighting water to reach waterways, drains or sewers. Store fire fighting water for treatment. |
| **Personal Protective Equipment** | 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). |
| **Flash Point** | Not applicable to an inorganic solid |
| **Lower Explosion Limit** | No Data Available |
| **Upper Explosion Limit** | No Data Available |
| **Auto Ignition Temperature** | No Data Available |
| **Hazchem Code** | No Data Available |

## 6. ACCIDENTAL RELEASE MEASURES

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| **General Response Procedure** | Protect adequately all the body parts. The air passages must be protected (suitable filter mask FFP2/P2) if the material form dust (microcrystals form has more probability to forms dust). Take away all the unauthorised people, children and animals. Avoid that the product could reach water bodies or sewage. In case this happens advise immediately competent Authorities |
| **Clean Up Procedures** | Use sand or soil to contain the loss of product. Avoid the possibility that significant quantity of product has entered water courses or sewer; if this should happen advise immediately the local competent authority. |

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| **Containment** | Cover drains near the polluted area. Vacuum the product if possible otherwise cover the product with sand or soil and clean up accurately all the product. Put it into another clean and dry container, close and remove it from the area. Do not clean contaminated area with water. If necessary arrange disposal in an authorised area. Contact local Waste Disposal Authority |
| **Environmental Precautionary Measures** | Do NOT let product reach drains or waterways. If product does enter a waterway, advise the Environmental Protection Authority or your local Waste Management. |
| **Evacuation Criteria** | Evacuate all unnecessary personnel. |
| **Personal Precautionary Measures** | Wear plastic disposable cloths, appropriated FFP2/P2 filter musk, rubber gloves and protective eye goggles or total face protection. |

## 7. HANDLING AND STORAGE

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| **Handling** | Avoid dust formation. Do not breathe dust. Handle in a well-ventilated area or wear adequate respiratory protection (FFP2/P2 filter mask). Avoid contact with skin and eyes wearing working clothes, gloves and protective glasses. Do not eat, smoke or drink during use. After use keep the packaging well closed. See also point 8. Specific end uses: Refer to point 1.2 and at the attached exposure scenario. An exposure scenario need to be requested by the user of this substances indicating the appropriate uses and destination |
| **Storage** | Keep in sealed containers away from humidity and sunlight. Store the product in well ventilated warehouse away from flammable product. Keep out of the reach of children, animal and unauthorised people. Keep away from food, drink and feeding stuff. Incompatibility: None known. Due to its chemical Cu++ in presence of water/humidity is corrosive to iron.<br><br>Incompatibility: None known. Due to its chemical Cu++ in presence of water/humidity is corrosive to iron. This product has a UN classification of 3077 and a Dangerous Goods Class 9 (Miscellaneous) according to The Australian Code for the Transport of Dangerous Goods by Road and Rail. NOTE: This product is subject to special provision AU01 according to The ADG7. SP No. AU01 Environmentally Hazardous Substances meeting the descriptions of UN 3077 or UN 3082 are not subject to this Code when transported by road or rail in; (a) packagings; (b) IBCs; or (c) any other receptacle not exceeding 500 kg(L). |
| **Container** | Container type/packaging must comply with all applicable local legislation. Store in original packaging as approved by manufacturer. Packaging material: Polyethylene or polypropylene. |

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

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| **General** | No exposure standard has been established for this product by the Australian Safety and Compensation Council (ASCC). However, the exposure standard for constituents: Copper Dusts and Mists (as Cu) : 8hr TWA = 1 mg/m3 Copper (fume) : 8hr TWA = 0.2 mg/m3 NOTE: 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. These exposure standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity. |
| **Exposure Limits** | No Data Available |
| **Biological Limits** | No information available on biological limit values for this product. |

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| **Engineering Measures** | Industrial use of the product should to be conducted under LEV (Local Exhaust Ventilation) but please refer to the Exposure scenario (to be required for the intended uses and destination) for detailed conditions. |
| **Personal Protection Equipment** | RESPIRATOR: Use a suitable dust mask (FFP2/P2 filter mask) if the product forms dust. Do not breathe dust (AS1715/1716)<br>EYES: Avoid contact with eyes. Use protective glasses or total face protection (AS1336/1337).<br>HANDS: Protect the hands using suitable gloves (plastic, rubber or resistant to chemical product). Wash the hands after use (AS2161).<br>CLOTHING: Use appropriate clothes and avoid prolonged contact with skin and wear safety footwear (AS3765/2210). |
| **Work Hygienic Practices** | Wash deeply and daily the working clothes. After use wash the body with water and soap. |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

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| **Physical State** | Solid |
| **Odour** | Odourless |
| **Colour** | Blue or Light Blue |
| **pH** | 3.0 - 4.2 5% water solution |
| **Vapour Pressure** | Not applicable to inorganic solids |
| **Boiling Point** | No Data Available |
| **Flash Point** | Not applicable to an inorganic solid |
| **Bulk Density** | 1.1 - 1.3 Kg/L |
| **Corrosion Rate** | No Data Available |
| **Decomposition Temperature** | Substance loses crystallization water at 110 deg C and decompose above 560 deg C |
| **Density** | >=2.286 g/cm3 Relative |
| **Additional Characteristics** | Solubility: Soluble in methanol (57-67 g/l at room temperature) and practically insoluble in most common organic solvent (< 1 g/L ) Copper content: 25% w/w |
| **Potential for Dust Explosion** | No Data Available |
| **Appearance** | Crystalline solid (crystals or microcrystals) |
| **Solubility** | 266 g/100 ml 20°C |

## 10. STABILITY AND REACTIVITY

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| **General Information** | Stable to the light, humidity and heat. Stable in the usual warehouse conditions and in the original bags for at least 2 years. Loss water of crystallization from 50-60 degC and 250 degC. Decomposes over 560 degC. |
| **Chemical Stability** | The product is stable under normal ambient and anticipated storage and handling condition. Loss of water of crystallization could change the colour of the product to very light blue to white (anhydrous form) |
| **Conditions to Avoid** | The product could be corrosive for iron material in presence of humidity. |
| **Materials to Avoid** | Strong reducing agents. |

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| **Hazardous Decomposition Products** | Toxic gases / fumes of sulphur oxides SOx could be produced. The product decomposes over 560 deg C producing toxic gases of sulphur oxides (SOx). |
| **Hazardous Polymerisation** | Reactivity: The substance is a water soluble inorganic salt of copper (2+) and sulphate ions. It is not considered to have a high reactivity. Due to the presence of copper (2+) ion the product results corrosive to iron in presence of water or humidity. |

## 11. TOXICOLOGICAL INFORMATION

**General Information**

Oral: LD50 = 482 mg/kg bw (male and female rats).
Test guideline OECD 401.
Copper sulphate pentahydrate meets the criteria for classification as harmful if swallowed.
Inhalation: Available information on particle size distribution indicates that exposure to copper sulphate pentahydrate will not occur by the inhalation route. Copper sulphate pentahydrate does not meet the criteria for classification.
Dermal: LD50 > 2000 mg/kg (male and female rats).
Test guideline OECD 402: Copper sulphate pentahydrate does not meet the criteria for classification.
Negative effects on health: Possible symptoms: Could cause sore throat, abdominal pains, diarrhoea, vomiting. Strongly irritating to eyes and irritating to skin and mucosa.

Most important symptoms and effects, both acute and delayed: May cause pain in mouth and pharynx, nausea, watery and bloody diarrhoeas and/or decrease of blood pressure. Denaturation of protein with damage at mucosa level, hepatic and renal damage and of the central nervous system, hemolysis. Vomiting with emission of green coloured material, gastric burning, haematic diarrheal, abdominal pain, hemolitic jaundice, hepatic and renal insufficiency, convulsion and collapse. Fever from metal inhalation. Possible eyes and skin irritation.

Acute toxicity: OECD 401 (Acute Oral Toxicity)
Male/female LD50: 482 mg/kg b.w. OECD 402 (Acute Dermal Toxicity)
Male/female LD50: > 2000 mg/kg b.w.

LC50 Inhalation (rat):Despite the official classification (harmful by inhalation) due to its particle size the product contains negligible amounts of particles of inhalable size.

Skin corrosion/irritation: OECD 404 (Acute Dermal Irritation / Corrosion):Erythema: 0.22 (mean at 24, 48 and 72 hours across 3 animals). Oedema: 0 (mean at 24, 48 and 72 hours across 3 animals).

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| **Carcinogenicity** | Based on a weight of evidence approach, it was concluded that copper compounds do not have carcinogenic potential. Copper sulphate pentahydrate does not meet the criteria for classification. |
| **Eye Irritant** | Irritating to eyes. A test carried out in 3 male rabbits resulted in severe ocular irritation that was not reversible within the duration of the test. Test guideline OECD 405. Copper sulphate pentahydrate meets the criteria for causing serious eye damage. This is more severe than the harmonized classification as an eye irritant set out in Annex VI of Regulation EC 1272/2008 |
| **Ingestion** | Harmful if swallowed. |
| **Inhalation** | Fever from metal inhalation. |
| **Skin Irritant** | No skin irritation was seen in 3 male rabbits. Test guideline OECD 404. Copper sulphate does not meet the criteria for classification. However, classification as a skin irritant is included in Annex VI of Regulation EC 1272/2008. |

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| **Sensitisation** | No sensitisation reaction was seen in any test animals in a guinea pig Maximisation test carried out in accordance with OECD 406. Copper sulphate pentahydrate does not meet the criteria for classification. |
| **Reproduction** | NOAEL for reproductive toxicity of copper sulphate pentahydrate in rats is > 1500 ppm in food. Test guideline OECD 416. Copper sulphate pentahydrate does not meet the criteria for classification. |
| **Carcinogen Category** | No Data Available |

## 12. ECOLOGICAL INFORMATION

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| **Eco- toxicity** | Very toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment. |
| **Persistence/Degradability** | Copper ions derived from copper sulphate pentahydrate cannot be degraded. The fate of copper ions in the water column was modelled using the Ticket Unit World Model. Removal was also assessed using data from one mesocosm and three field studies. “Rapid” removal was demonstrated, defined as 70% removal within 28 days. Literature data confirm the strong binding of copper ions to sediment, with the formation of stable Cu-S complexes. Re-mobilisation of copper ions to the water column is therefore not expected. Copper does not meet the criteria as “persistent”. |
| **Mobility** | In soil copper is mainly bounded to organic material naturally present in the soil. Organic material content and pH determine the bioavailability of copper. Copper is strongly bounded to various components of the soil so that the free copper is at a very low level in the soil. The mobility of copper towards the deeper layer is negligible. PNEC soil: PNEC soil (mg/kg dw): Value: 65; Assessment Factor: 1 Remarks/Justification: in accordance to the Competent Authorities for Biocides and Existing Substance Regulations. |
| **Environmental Fate** | The PBT and vPvB criteria of Annex XIII to the Regulation do not apply to inorganic substances, such as copper and its inorganic compounds. Copper (as copper sulphate pentahydrate) is not PBT or vPvB. |
| **Bioaccumulation** | Potential Aquatic bioaccumulation: The information demonstrates that copper is well regulated in all living organisms and that BCF and BAF values have no meaning for a hazard assessment. The available data demonstrate that waterborne exposure is most the critical exposure route and that copper is not biomagnified in aquatic ecosystems.<br><br>Terrestrial bioaccumulation: The available information demonstrates that copper is well regulated in all living organisms and that the BCF and BAF values have no meaning for a hazard assessment<br><br>The available data demonstrate that copper is not biomagnified in the terrestrial ecosystems and that there is no issue for secondary poisoning of copper |
| **Environmental Impact** | No Data Available |

## 13. DISPOSAL CONSIDERATIONS

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| **General Information** | 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. Waste treatment method: Product: Contact your supplier, local competent authorities or a serious disposal company to collect and dispose of the product or contaminated containers. |

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| | The product has to be disposed of as hazardous waste. Packaging: Dispose according to current national or local legislation recommendations.<br><br>Copper could be toxic for STP (sewage treatment plant) micro organism. Across endpoints/studies 0.23 mg dissolved Cu/L was considered as the most reliable NOEC Sewage disposal must be avoided. PNEC stp (ug/l): Value: 230; Assessment factor: 1 Remarks/Justification: Extrapolation method: statistical extrapolation as agreed by the Competent Authorities for Biocides and Existing Substance Regulations |
| **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**

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| **Proper Shipping Name** | COPPER SULPHATE PENTAHYDRATE |
| **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** | SPAU01 |

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| **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) |

## 15. REGULATORY INFORMATION

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|---|---|
| **General Information** | No Data Available |
| **Poisons Schedule (Aust)** | 6 |
| **National/Regional Inventories** | |
| **Australia (AICS)** | Listed |

## 16. OTHER INFORMATION

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|---|---|
| **Literature References** | No data available. |
| **Sources for Data** | No data available. |

**Legend to Abbreviations and Acronyms**

| | |
|---|---|
| **<** | less than |
| **<** | greater than |
| **ADG** | Australian Dangerous Goods Code |
| **AICS** | Australian Inventory of Chemical Substances |
| **CAS** | Chemical Abstracts Service (Registry Number) |
| **cm2** | square centimetres |
| **CO2** | Carbon Dioxide |
| **COD** | Chemical Oxygen Demand |
| **deg C ( 'C )** | degrees Celsius |
| **ERMA** | Environmental Risk Management Authority |
| **g** | gram |
| **g/cm3** | grams per cubic centimetre |
| **g/l** | grams per litre |
| **HSNO** | Hazardous Substance and New Organism |
| **IATA** | International Air Transport Association Dangerous Goods Regulations |
| **IDLH** | Immediately Dangerous to Life and Health |
| **IMDG** | International Maritime Dangerous Goods Code |
| **Immiscible** | liquids are insoluble in each other |
| **Kg** | kilogram |
| **kg/m3** | kilograms per cubic metre |
| **LC50** | 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. |
| **LD50** | 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 |
| **ltr** | Litre |
| **m3** | cubic metre |
| **mbar** | millibar |
| **mg** | milligram |
| **mg/24H** | milligrams per 24 hours |
| **mg/kg** | milligrams per kilogram |
| **mg/m3** | milligrams per cubic metre |
| **Misc** | miscible |
| **Miscible** | liquids form one homogeneous liquid phase regardless of the amount of either component present |
| **mm** | millimetre |
| **mPa.s** | milli Pascal per second |
| **N/A** | Not Applicable |
| **NOHSC** | National Occupational Health and Safety Commission |

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|---|---|
| **OECD** | Organization for Economic Co-operation and Development |
| **PEL** | Permissible Exposure Limit |
| **ppb** | parts per billion |
| **ppm** | parts per million |
| **ppm/2h** | parts per million per 2 hours |
| **ppm/6h** | parts per million per 6 hours |
| **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 (number) |
| **wt** | weight |

This SDS summarises Chlorine Discounters best knowledge of the health and safety hazard information of the selected substance and how to safely handle the selected substance in the workplace however Chlorine Discounters expressly disclaims that the SDS is a representation or guarantee of the chemical specifications for the substance.

Each user should read the SDS and consider the information in the context of how the selected substance will be handled and used in the workplace including its use in conjunction with other substances.