MATERIAL SAFETY DATA SHEET

PRODUCT: COPPER SULPHATE

Date of Issue: 30 SEPT 2025 **Valid until:** 29 SEPT 2030 **GHS** Format

1. IDENTIFICATION OF MATERIAL & SUPPLIER

Product (material) Name: MANUTEC COPPER SULPHATE
Other names: Blue stone
Chemical Name: Copper Sulphate Pentahydrate
Chemical formula: $CUSO4.5H_2O$
Manufacturer's codes: MTO0533B
Recommended use: as a trace element nutrient to correct Copper deficiency in plants

Manufacturer/Supplier Information:

Name: MANUTEC PTY LTD
Address: 30 Jonal drive, Cavan, South Australia 5094
Telephone No:+61-8-8260 2277 **Fax**:+61-8-8260 2399
Email: manutec@manutec.com.au

Emergency contact only: Poisons Information Centre (Australia) 131126

2. HAZARD(S) IDENTIFICATION

Dangerous Goods Classification:

ADG CODE (Land Transport)
Although this product comes under Class-9 Miscellaneous DG good, Under Special provision AU01, UN3077 is Not regulated as DG good when transported by road & rail in packaging that do not incorporate a receptacle exceeding 500 kg (L) or IBCs

IMDG CODE (Sea Transport)
DG Class: 9 Miscellaneous Dangerous Goods & Articles

Classified as ENVIRONMENTALY HAZARDOUS SUBSTANCE, SOILD N.O.S. under Class-9 Miscellaneous DG goods.
UN Number: 3077
Hazchem code: 2Z
Packing group: III

IATA DGR CODE (Air Transport)
DG Class: 9 Miscellaneous Dangerous Goods & Articles

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Hazard Classification:
Hazardous according to the criteria of Globally Harmonised System of classification and labelling of Chemicals (GHS)

Poisons Schedule **6**
Signal Word: Warning

Hazard Categories:

Acute Toxicity (Oral) - Category 4
Skin Corrosion/Irritation - Category 2
Serious Eye Damage/Irritation - Category 2A
Acute Hazard To The Aquatic Environment - Category 1
Long-term Hazard To The Aquatic Environment - Category 1

Pictograms:

Hazard Statements:

H302 Harmful if swallowed.
H319 Causes serious eye irritation.
H315 Causes skin irritation.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary Statements:

General P102 Keep out of reach of children.

Prevention P280 Wear protective gloves/eye protection/face protection.
P273 Avoid release to the environment.

Response P301 + P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
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.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

Disposal P501 Dispose of contents/container in accordance with local / regional / national / international regulations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Entity	Formula	CAS Number	Proportion
Copper (II) Sulphate Pentahydrate	CuSO4.5H2O	7758-99-8	<=100.0 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure:

Swallowed:	**If swallowed** rinse mouth, then drink plenty of water. Call immediately Poisons Information Centre (131126) or Doctor for immediate medical advice/help. Show this safety data sheet or the product label.
Eye:	**If in Eyes**, wash immediately with plenty of water for at least 15 minutes, holding eyelids open and occasionally lifting the upper & lower lids. Seek immediately for medical advice from Poisons information Centre (131126) or Doctor.
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.
Inhaled:	If possible reduce exposure using fresh air. Remove from exposure take the person in a well aerated place and calm. Seek medical advice.
Advice to Doctor:	Treat symptomatically. Keep victim calm & warm-obtain immediate medical care. Ensure that attending medical personnel are aware of the identity and nature of the product involved and take precautions. Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression & convulsions may be needed.
Medical Conditions Aggravated by Exposure:	Wilson's disease can be aggravated by excessive exposure

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. Cool containers with water spray after the fire is out
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.

NON SUITABLE EXTINGUISHING MEDIA: None but avoid using plenty of water

Hazards from 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 firefighting water to reach waterways, drains or sewers. Runoff may pollute waterways and poison aquatic life.

Protective Equipment: Fire fighters should wear a positive-pressure self-contained breathing apparatus (SCBA) and protective firefighting clothing (includes firefighting 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

Hazchem Code 2Z

6. ACCIDENTAL RELEASE MEASURES

General Response/Cleanup 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 unauthorized people, children and animals. Avoid that the product could reach water bodies or sewage. In case this happened 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.

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 authorized area. Contact local Waste Disposal Authority

Environmental Precautionary Measures Do NOT let product reach drains or waterways. If product does enter a waterway, advise Environmental Protection Authority or your local Waste Management

Personal Precautionary Measures: Wear plastic disposable cloths, appropriated FFP2/P2 filter musk, rubber gloves and protective eye goggles or total face protection (see section-8)

7. HANDLING AND STORAGE

Safe Handling: Handle in accordance with good industrial hygiene & safety practice. 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. Refer also section 8.

Safe storage conditions: 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 unauthorized 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.

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) packaging; (b) IBCs; or (c) any other receptacle not exceeding 500 kg(L).

Container: Always store in original container with original label intact.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure standards/limits: No data available

Biological limit values: No information is available

Engineering controls: 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)

EYES: Avoid contact with eyes. Use protective glasses or total face protection (AS1336/1337).

HANDS: Protect the hands using suitable gloves (plastic, rubber or resistant to chemical product). Wash the hands after use (AS2161).

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. Do not eat, drink or smoke while handling this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Blue Crystalline powder
Odour:	Odourless
Solubility:	soluble in water 22% at @25º C
Melting Point range /Boiling Point range	Not available
Flash Point:	Not flammable
Ignition temperature:	Not flammable
Oxidising properties:	None
Vapour pressure:	not available
Bulk Density:	1.1 – 1.3kg/L
pH value:	3 – 4.2 @5% solution

Decomposition Temperature: Substance loose crystallization water at 110 deg C and decompose above 560 deg C

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

10. STABILITY AND REACTIVITY

General Information: Solutions are mildly corrosive to steel. Contact with Magnesium can generate dangerous levels og hydrogen gas. Stable to the light, humidity and heat. Stable in the usual warehouse conditions and in the original packaging. Loss water of crystallization from 50-60 deg C and 250 deg C. Decomposes over 560 deg C.

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)

Incompatible materials: Strong reducing agents

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 sulfate 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

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, 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 ist 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).
Serious eye damage/irritation:
OECD 405 (Acute Eye Irritation/Corrosion):
Cornea: Average for 3 animals at 24, 48 and 72 h: 2.56
Iris: Average for 3 animals at 24, 48 and 72 h: 1.0
Conjunctivae: Average for 3 animals at 24, 48 and 72 h: 2.0
Chemosis: Average for 3 animals at 24, 48 and 72 h: 3.78. Lesions observed at 72 hours were still present in the
three rabbits when examined on day 21. The test material was shown to elicit severe ocular irritation and other lesions.

Respiratory or skin sensitisation:
OECD 406 (Skin sensitisation): 0/20 test animals sensitised.
Germ cell mutagenicity: micronucleus assay mouse (CD-1) male/female oral: gavage 447 mg/kg EU Method B.12 (Mutagenicity - In Vivo Mammalian Erythrocyte Micronucleus Test) (Cited as Directive 2000/32/EC, B.12)

Carcinogenicity: None, the available data for copper and copper compounds do not meet the criteria requiring classification for carcinogenicity.

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.
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: 0

12. ECOLOGICAL INFORMATION

Ecotoxicity: Very toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment
The lowest species-specific acute L(E) C50and chronic NOEC values at the three pH levels and across pHs were selected as final environmental classification reference values.

Acute and chronic reference values for soluble copper ions:

pH range	Acute reference L(E) C50 (ug Cu/l)	Chronic reference NOEC (ug Cu/l)
pH 5.5-6.5	25	20
pH >6.5-7.5	35	7.4
pH >7.5-8.5	29.8	11.4
Across pHs	34.4	14.9

Persistence and 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.

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.

Bio accumulative potential:

Aquatic bioaccumulation: The available data demonstrate that waterborne exposure is most the critical exposure route and that copper is not biomagnified in aquatic ecosystems.

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

13. DISPOSABLE CONSIDERATIONS

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 local competent authorities or a serious disposal company to collect and dispose of the product or contaminated containers. **The product has to be disposed of as a hazardous waste.**

Packaging: Dispose according to current national or local legislation recommendations. DO NOT reuse container/packaging

Copper could be toxic for STP (sewage treatment plant) microorganism. 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

Special Precautions for Land Fill: Contact a specialist disposal company or the local waste regulator for advice

14. TRANSPORT INFORMATION

ADG CODE (Land Transport)

Comments: Although this product comes under Class-9 Miscellaneous DG good, Under Special provision AU01, UN3077 is Not regulated as DG when transported by road & rail in packaging that do not incorporate a receptacle exceeding 500 kg (L) or IBCs

Proper shipping name: Copper Sulphate, pentahydrate

EPG: 47, Low to moderate Hazardous substance

Special Provision: AU01
UN3077 is Not regulated as DG when transported by road & rail in packaging that do not incorporate a receptacle exceeding 500 kg (L) or IBCs

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UN Number: 3077
Hazchem code: 2Z
Packing group: III
Marine Pollutant: Yes

IATA DGR CODE (Air Transport)
DG Class: 9 Miscellaneous Dangerous Goods & Articles

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Hazchem code: 2Z
Packing group: III
Marine Pollutant: Yes

15. REGULATORY INFORMATION

Hazchem code: 2Z
UN No: 3077
Regulatory status of product/materials:
Poisons Schedule (Aust) 6
AICS Name Sulfuric acid, copper(2+) salt (1:1), pentahydrate

16. OTHER INFORMATION

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

STATEMENT OF DISCLAIM:

This Material Safety Data Sheet has been developed according to WHS Code of Practice Preparation of Safety Data Sheets for Hazardous Chemicals Guidelines and written in accordance with GHS format.

All information is as accurate and up-to-date as possible. Since Manutec Pty Ltd cannot anticipate or control the conditions under which this information may be used, each user should review the information in the specific context of the intended application. Manutec Pty Ltd will not be responsible for damages of any nature resulting from use of or reliance upon this information.

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