

Copper Sulphate

Safety data sheet in the 16-section GHS format · CAS 7758-99-8

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1. Identification of the substance and of the supplier

Product name	Copper Sulphate
Synonyms	copper sulfate, blue vitriol, tutiya, copper sulphate pentahydrate, CuSO ₄
C.A.S. number	7758-99-8 (copper sulphate pentahydrate). The ANHYDROUS salt is CAS 7758-98-7 and carries a different, milder harmonised classification - do not interchange them. EC number 231-847-6.
Molecular formula	CuSO ₄ .5H ₂ O
Grade supplied	98% pentahydrate
Product group	Industrial Salts & Inorganics
Identified uses	Agrochemicals, Electroplating, Mining, Water & ponds, Industrial
Supplier	Velora Chemicals Private Limited
Emergency contact	Medical, fire or spill emergency — call the emergency services first: 112 (all-India), 101 fire, 108 ambulance. Velora Chemicals Private Limited does not at present operate a 24-hour chemical emergency advice line, and this sheet does not pretend otherwise. Every consignment despatched by road carries an emergency information panel under rule 134 of the Central Motor Vehicles Rules 1989 bearing a number from which expert advice on this material can be obtained, and the producer's safety data sheet issued with the consignment carries the producer's own 24-hour number where one is operated. For product, grade and documentation queries in business hours: +91 99255 22674.

2. Hazards identification

GHS signal word	Danger
Hazard classification	EU harmonised classification - CLP Annex VI, Index 029-023-00-4 (copper sulphate pentahydrate): Acute Tox. 4 - H302; Eye Dam. 1 - H318; Aquatic Acute 1 - H400; Aquatic Chronic 1 - H410. Confirmed independently by two producer SDSs citing that index number, and consistent with ILO ICSC 1416. IMPORTANT: the ANHYDROUS salt has its own, separate and milder harmonised entry, Index 029-004-00-0: Acute Tox. 4 - H302; Skin Irrit. 2 - H315; Eye Irrit. 2 - H319; Aquatic Acute 1 - H400; Aquatic Chronic 1 - H410, signal word WARNING. A pentahydrate label must carry Eye Dam. 1 / H318 and Danger, not the anhydrous Eye Irrit. 2 / H319 / Warning.

3. Composition / information on ingredients

Substance	Copper Sulphate
C.A.S. number	7758-99-8 (copper sulphate pentahydrate). The ANHYDROUS salt is CAS 7758-98-7 and carries a different, milder harmonised classification - do not interchange them. EC number 231-847-6.
Molecular weight	249.7 (ILO ICSC 1416). Anhydrous CuSO ₄ is 159.6.

Composition	98% pentahydrate
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4. First-aid measures

Eye contact	Immediately flush the open eye with gently running water for at least 15 minutes, holding the eyelids apart; remove contact lenses if easily possible and continue rinsing. Refer IMMEDIATELY for medical attention - the pentahydrate causes serious eye damage (H318) and delay risks permanent corneal injury.
Skin contact	Remove contaminated clothing. Wash the affected skin and hair thoroughly with plenty of soap and running water. Refer for medical attention if irritation or discolouration develops or persists. Wash clothing before reuse.
Inhalation	Move the casualty to fresh air and keep them at rest in a position comfortable for breathing. Rinse the nose and mouth with water. Refer for medical attention if coughing, throat irritation or breathing difficulty develops. Dust exposure can cause nasal and respiratory irritation and, with heavy repeated exposure, ulceration of the nasal septum.
Ingestion	Do NOT induce vomiting. Rinse the mouth and, if the casualty is conscious and able to swallow, give one or two glasses of water to drink. Call a poison centre or doctor immediately and obtain medical attention. Copper salts are harmful if swallowed (H302); ingestion typically causes a metallic taste, burning, vomiting and abdominal pain, and larger doses can cause systemic copper toxicity with haemolysis and liver and kidney injury, so a medical assessment is needed even if early vomiting has emptied the stomach.

5. Fire-fighting measures

Flash point	Not flammable
Suitable extinguishing media	Water fog, foam, dry chemical powder or carbon dioxide, chosen to suit the surrounding fire. The substance itself does not contribute fuel.
Unsuitable extinguishing media	Do not use a high-pressure water jet: it will spread the material and the fire.
Special hazards arising from the substance	Hazardous gases and decomposition products may be formed in a fire, from this substance or from its packaging and the materials stored with it. Packaging and pallets are themselves a substantial fire load. That is true even though the contents do not contribute fuel.
Advice for fire-fighters	Fire-fighters must wear self-contained breathing apparatus and full protective clothing. Keep unnecessary personnel away and upwind. Prevent firefighting run-off from entering drains, surface water or groundwater.

6. Accidental release measures

Keep unnecessary personnel away and upwind, and ventilate. Wear the protective equipment in section 8, including respiratory protection, before approaching. Eliminate ignition sources and prohibit smoking before approaching. Avoid raising dust, and never blow a spilled powder down with compressed air. Dry-collect — vacuum with a HEPA-filtered unit, or sweep gently without raising dust — into labelled, closable containers for disposal under section 13. A spill inside a vessel, tank, silo, container or pit is a confined-space job: test the atmosphere and work under permit. A fine powder makes a floor slippery, especially once wet, so treat every wetted surface as slippery until it has been washed and dried. Prevent entry to drains, surface water and groundwater. Do not return spilled material to the original container; a damaged bag should be overpacked into a labelled outer rather than decanted into an unmarked one.

7. Handling and storage

- Keep bags dry and closed — the crystals cake with moisture and slowly lose water of crystallisation in dry heat.
- Copper sulphate solution attacks iron and galvanised steel (copper plates out on them). Make up and store solutions in plastic, rubber-lined or stainless equipment.

- Harmful if swallowed and an eye irritant; very toxic to aquatic life, so prevent any release to drains or waterways. Store away from food and animal feed.
- Classified for transport as UN 3077, environmentally hazardous substance, solid, n.o.s. (copper sulphate), Class 9, packing group III, marine pollutant.

Storage: Store in the original, well-closed container in a cool, dry, well-ventilated place out of direct sunlight, on a bunded floor with no drain or sewer access. Protect from moisture and humidity; the pentahydrate cakes, and in a hot dry store it effloresces and loses its blue colour. Segregate from bases, ammonia and amines, reducing agents, acetylene, metal powders, and from foodstuffs and animal feed. Do not use mild steel or galvanised containers, scoops or pipework - use plastic, stainless steel or lined equipment. Contain all spillage and washings; they must not reach surface water, groundwater or drains.

8. Exposure controls / personal protection

Engineering controls. Enclose every transfer, tipping, bag-slitting and sampling point and fit local exhaust extraction at each, and keep airborne concentrations below the limit in force at the place of use. Provide an eyewash within reach of the working position, and a safety shower wherever the material is classified corrosive or irritant or is handled in quantity. Do not eat, drink or smoke in the handling area; wash before breaks. Where no limit is stated above, occupational exposure limits vary by jurisdiction: check the limit in force at the place of use and the producer's sheet for the grade supplied, and record which value your assessment adopted. Select eye, skin and respiratory protection on the strength of a measured or modelled exposure assessment, not on this sheet alone.

9. Physical and chemical properties

Appearance	Blue to light blue crystals, granules or crystalline powder, odourless
Physical state	Solid
Melting / freezing point	Not applicable - the pentahydrate loses water of crystallisation rather than melting. Producer data: about 2 H ₂ O lost near 30 C, a further 2 H ₂ O near 110 C, becoming anhydrous by about 250 C. ILO ICSC 1416 records 'decomposes at 110 C'.
Boiling point	Not applicable - decomposes before boiling
Relative density	2.28-2.286 g/cm ³
Solubility in water	Freely soluble - 317 g/L at 20 C (ILO ICSC 1416); about 22 g/100 g water at 25 C. Also soluble in methanol, ethanol and glycerol.
pH	3.7-4.5 in a 50 g/L (5% w/v) aqueous solution at 25 C - acidic through hydrolysis. The dry solid has no pH.
Flash point	Not flammable
Auto-ignition / ignition temperature	Not available
Explosive / dust-explosion properties	Not available
Vapour pressure	Not available
Vapour density	Not available
Partition coefficient (log Pow)	Not available
Particle characteristics	Not available
Molecular weight	249.7 (ILO ICSC 1416). Anhydrous CuSO ₄ is 159.6.

10. Stability and reactivity

Incompatible materials Strong bases and caustics. Hydroxylamine - reacts violently. Acetylene and acetylides, and potassium chlorate. Finely divided metals, especially magnesium and aluminium powder - may evolve flammable hydrogen and react violently. Plain/mild steel and galvanised pipework, scoops and vessels - rapidly corroded by the acidic solution, with copper plating out. Sodium hypobromite solutions. Strong reducing agents and strong oxidising agents. Ammonia, aliphatic amines, alkanolamines, amides, alkylene oxides, epichlorohydrin, organic anhydrides, isocyanates, vinyl acetate. Solutions also attack copper alloys and aluminium.

Conditions to avoid Store in the original, well-closed container in a cool, dry, well-ventilated place out of direct sunlight, on a bunded floor with no drain or sewer access. Protect from moisture and humidity; the pentahydrate cakes, and in a hot dry store it effloresces and loses its blue colour. Segregate from bases, ammonia and amines, reducing agents, acetylene, metal powders, and from foodstuffs and animal feed. Do not use mild steel or galvanised containers, scoops or pipework - use plastic, stainless steel or lined equipment. Contain all spillage and washings; they must not reach surface water, groundwater or drains.

11. Toxicological information

The health hazards classified for this substance are listed in section 2, and the corresponding first-aid measures in section 4. Numerical toxicological endpoints are not reproduced here: refer to the producer's safety data sheet for the grade supplied, and to the ECHA and PubChem entries for the substance.

12. Ecological information

Where section 2 or section 14 classifies this substance as hazardous to the aquatic environment, prevent any release to drains, surface water or groundwater and treat aqueous effluent before discharge. Otherwise, refer to the producer's sheet.

13. Disposal considerations

Dispose of the substance and its container through an authorised facility under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 where the waste is scheduled under those Rules, and otherwise as non-hazardous industrial waste, in each case under the conditions of the State Pollution Control Board consent in force at the site. Whether a particular waste stream is scheduled depends on the substance and on what it has been mixed with, so classify the waste before consigning it. Do not reuse empty containers for any other purpose.

14. Transport information

UN number	UN 3077
Class	9 (miscellaneous dangerous substances and articles), classification code M7
Packing group	III
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (COPPER SULPHATE PENTAHYDRATE) - marine pollutant. The technical name in brackets is mandatory under special provision 274.

15. Regulatory information

Supply in India is subject to the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 where the substance is scheduled, and to any product-specific licensing named on the product page. Classification and labelling follow the GHS as adopted in the jurisdiction of use.

Note: YES - this product carries an environmentally hazardous transport entry. Copper sulphate pentahydrate is classified Aquatic Acute 1 / Aquatic Chronic 1 (H400/H410) and is consequently a Class 9 dangerous good, UN 3077, PG III, and a marine pollutant. Sheets that declare it 'not regulated for transport' are wrong for packages above the small-quantity threshold. That threshold: under ADR/RID special provision 375, IMDG (2.10.2.7 / SP 375) and IATA special provision A197, UN 3077 in PG III is exempt from the dangerous goods provisions when packed in single or inner packagings of not more than 5 kg net each, regardless of the number of packages in the consignment - and in that case it must NOT be marked, labelled or declared as dangerous goods. A 25 kg or 50 kg bag is above the threshold and must be consigned as UN 3077. Second trap: the pentahydrate and the anhydrous salt have different CAS numbers, different molecular weights and different harmonised CLP entries (Eye Dam. 1 versus Eye Irrit. 2) - do not mix the two on one document. Third: a '98%' commercial grade is 98% CuSO₄.5H₂O, equivalent to roughly 25% copper as metal; a customer specification quoted as '25% Cu' is the same material described differently. The pH

quoted is for a 50 g/L solution, not the solid. Copper is also highly toxic to sheep and to fish at low concentrations - relevant to agricultural and aquaculture end uses.

16. Other information

Version	1.0
Date of issue	07 October 2026
Supersedes	No previous version
Regulatory basis as at the date of issue	EU CLP Regulation 1272/2008 as amended, including Annex VI harmonised classifications; UN Model Regulations and the IMDG Code Amendment 42-24, mandatory from 1 January 2026; ADR 2025; and, in India, the Manufacture, Storage and Import of Hazardous Chemical Rules 1989 and the Central Motor Vehicles Rules 1989.

How this sheet was compiled and what governs. This sheet was prepared by Velora Chemicals Private Limited as the supplier, from PubChem, the ECHA CLP inventory including Annex VI harmonised classifications, ILO International Chemical Safety Cards and published producer safety data sheets. Values that could not be confirmed from those sources are shown as "Not available" rather than estimated. **The producer's safety data sheet for the specific grade and lot supplied is the governing document** and is issued with the consignment; where the two differ, the producer's sheet prevails. This sheet carries no warranty of the properties of any particular batch. Velora Chemicals Private Limited is a bulk supplier and trader, not a manufacturer.

Sources consulted: https://chemicalsafety.ilo.org/dyn/icsc/showcard.display?p_card_id=1416&p_version=2&p_lang=en;
<https://deca.upc.edu/en/laboratories/latem/security/reactius-quimics/copper-ii-sulfate-pentahydrate-panreac.pdf>;
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