

### 1. IDENTIFICATION

<b>Product Name</b>	<b>Cupric oxide</b>
<b>Other Names</b>	Copper(II) oxide
<b>Uses</b>	Colourant in ceramic, anti-fouling paints; reagent; catalyst; solvent; insecticides; electroplating; metallurgical and welding fluxes.
<b>Chemical Family</b>	No Data Available
<b>Chemical Formula</b>	CuO
<b>Chemical Name</b>	Copper oxide
<b>Product Description</b>	No Data Available

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

Organisation	Location	Telephone
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.*

Organisation	Location	Telephone
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)** Schedule 6

#### Globally Harmonised System

<b>Hazard Classification</b>	Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)		
<b>Hazard Categories</b>	Acute Toxicity (Oral) - Category 4 Acute Hazard To The Aquatic Environment - Category 1 Long-term Hazard To The Aquatic Environment - Category 1		
<b>Pictograms</b>	 		
<b>Signal Word</b>	Warning		
<b>Hazard Statements</b>	<b>H302</b>	Harmful if swallowed.	
	<b>H410</b>	Very toxic to aquatic life with long lasting effects.	
<b>Precautionary Statements</b>	Prevention	<b>P273</b>	Avoid release to the environment.
		<b>P264</b>	Wash exposed skin thoroughly after handling.
		<b>P270</b>	Do not eat, drink or smoke when using this product.
	Response	<b>P391</b>	Collect spillage.
		<b>P301 + P312</b>	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
		<b>P330</b>	Rinse mouth.
	Disposal	<b>P501</b>	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)

### Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

<b>HSNO Classifications</b>	Health Hazards	<b>6.1D</b>	Substances that are acutely toxic - Harmful
		<b>6.4A</b>	Substances that are irritating to the eye
		<b>6.9B</b>	Substances that are harmful to human target organs or systems
	Environmental Hazards	<b>9.1A</b>	Substances that are very ecotoxic in the aquatic environment
		<b>9.1C</b>	Substances that are harmful in the aquatic environment
		<b>9.3C</b>	Substances that are harmful to terrestrial vertebrates

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

### Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Copper oxide	CuO	1317-38-0	<=100 %

## 4. FIRST AID MEASURES

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

<b>Swallowed</b>	IF SWALLOWED: Rinse mouth. Do not induce vomiting. Call a Poison Centre or doctor/physician if you feel unwell.
<b>Eye</b>	IF IN EYES: Immediately flush eyes with running water for several minutes, holding eyelids open and occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do. Continue rinsing for at least 15 minutes. If eye irritation persists, get medical advice/attention.
<b>Skin</b>	IF ON SKIN: Remove material from skin immediately. Wash with plenty of soap and water. Take off contaminated clothing and wash before reuse. If skin irritation occurs, get medical advice/attention.
<b>Inhaled</b>	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If respiratory symptoms persist, get medical advice/attention. Apply resuscitation if victim is not breathing. Administer oxygen if breathing is difficult.
<b>Advice to Doctor</b>	Treat symptomatically.
<b>Medical Conditions Aggravated by Exposure</b>	No information available.

## 5. FIRE FIGHTING MEASURES

<b>General Measures</b>	If safe to do so, move undamaged containers from fire area. Cool containers with water spray until well after fire is out.
<b>Flammability Conditions</b>	Non-combustible; Material does not burn.
<b>Extinguishing Media</b>	Use dry chemical, Carbon dioxide (CO <sub>2</sub> ), foam or water spray for extinction. Use extinguishing media most appropriate for the surrounding fire.
<b>Fire and Explosion Hazard</b>	Containers may explode when heated.
<b>Hazardous Products of Combustion</b>	Fire or heat will produce irritating, toxic and/or corrosive fumes, including copper fumes, copper alloys, cuprous oxide and oxygen, acrid smoke and dust.
<b>Special Fire Fighting Instructions</b>	Contain runoff from fire control water - Runoff may pollute waterways.
<b>Personal Protective Equipment</b>	Wear self-contained breathing apparatus (SCBA) in combination with normal firefighting clothing (full fire kit).
<b>Flash Point</b>	No Data Available
<b>Lower Explosion Limit</b>	No Data Available
<b>Upper Explosion Limit</b>	No Data Available
<b>Auto Ignition Temperature</b>	No Data Available
<b>Hazchem Code</b>	No Data Available

## 6. ACCIDENTAL RELEASE MEASURES

<b>General Response Procedure</b>	Ensure adequate ventilation. Do not touch or walk through spilled material. Avoid dust formation. Avoid breathing dust and contact with eyes, skin and clothing.
<b>Clean Up Procedures</b>	Use clean, non-sparking tools to collect material and place it into suitable, labelled containers for later disposal (see SECTION 13). Keep dry.
<b>Containment</b>	Stop leak if safe to do so – Prevent entry into waterways, drains or confined areas. Prevent dust cloud.
<b>Decontamination</b>	No information available.
<b>Environmental Precautionary Measures</b>	Prevent entry into drains and waterways.
<b>Evacuation Criteria</b>	Spill or leak area should be isolated immediately. Keep unauthorised personnel away.
<b>Personal Precautionary Measures</b>	Use personal protective equipment as required (see SECTION 8).

## 7. HANDLING AND STORAGE

<b>Handling</b>	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Avoid dust formation. Avoid breathing dust and contact with eyes, skin and clothing. Use personal protective equipment as required; In case of inadequate ventilation, wear respiratory protection. (see SECTION 8).
<b>Storage</b>	Store in a cool, dry and well-ventilated place, protected from direct sunlight. Keep container tightly closed. Protect against physical damage. Avoid exposure to moisture and air. Keep away from heat and sources of ignition. Keep away from incompatible materials (oxidising agents, reducing agents, strong acids, alkali metals and finely powdered metals).
<b>Container</b>	Keep in the original or suitable, labelled containers. Containers of this material may be hazardous when empty since they retain product residues; Observe all warnings and precautions listed for the product.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

<b>General</b>	No specific exposure standard is available for this product. For Copper, dusts & mists (as Cu): - Safe Work Australia Exposure Standard: TWA = 1 mg/m <sup>3</sup> . DECOMPOSITION PRODUCT: Copper (fume): - Safe Work Australia Exposure Standard: TWA = 0.2 mg/m <sup>3</sup> .
<b>Exposure Limits</b>	No Data Available
<b>Biological Limits</b>	No information available.
<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.
<b>Personal Protection Equipment</b>	- Respiratory protection: Wear respiratory protection in case of inadequate ventilation or exposure to dust/mists or fume. Recommended filter type: P (particulate). In case of emergency or planned entry into unknown concentrations, a positive pressure, full-facepiece SCBA should be used. - Eye/face protection: Wear appropriate eye protection to avoid eye contact. Recommended: Safety glasses with side-shields; Chemical goggles; Face-shield as appropriate. - Hand protection: Handle with gloves. Recommended: Impervious gloves. - Skin/body protection: Wear appropriate personal protective clothing to avoid skin contact. Recommended: Apron; Safety boots.
<b>Special Hazards Precautions</b>	No information available.
<b>Work Hygienic Practices</b>	Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Take off contaminated clothing and other protective equipment and wash before storage or reuse.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical State</b>	Solid
<b>Appearance</b>	Powder, granules or crystals
<b>Odour</b>	Odourless
<b>Colour</b>	Black
<b>pH</b>	~7
<b>Vapour Pressure</b>	No Data Available
<b>Relative Vapour Density</b>	No Data Available
<b>Boiling Point</b>	No Data Available
<b>Melting Point</b>	1,326 °C (decomposition)
<b>Freezing Point</b>	No Data Available
<b>Solubility</b>	Insoluble in water
<b>Specific Gravity</b>	6.48
<b>Flash Point</b>	No Data Available
<b>Auto Ignition Temp</b>	No Data Available
<b>Evaporation Rate</b>	No Data Available

<b>Bulk Density</b>	~500 kg/m <sup>3</sup>
<b>Corrosion Rate</b>	No Data Available
<b>Decomposition Temperature</b>	>1,026 °C
<b>Density</b>	No Data Available
<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>	No Data Available
<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>	No Data Available
<b>Volatile Percent</b>	No Data Available
<b>VOC Volume</b>	No Data Available
<b>Additional Characteristics</b>	Hygroscopic.
<b>Potential for Dust Explosion</b>	No information available.
<b>Fast or Intensely Burning Characteristics</b>	No information available.
<b>Flame Propagation or Burning Rate of Solid Materials</b>	No information available.
<b>Non-Flammables That Could Contribute Unusual Hazards to a Fire</b>	No information available.
<b>Properties That May Initiate or Contribute to Fire Intensity</b>	Non-combustible; Material does not burn.
<b>Reactions That Release Gases or Vapours</b>	Fire or heat will produce irritating, toxic and/or corrosive fumes, including copper fumes, copper alloys, cuprous oxide and oxygen, acrid smoke and dust.
<b>Release of Invisible Flammable Vapours and Gases</b>	No information available.

## 10. STABILITY AND REACTIVITY

<b>General Information</b>	Exposure to moist air at >100 °C can result in spontaneous combustion.
<b>Chemical Stability</b>	Stable at room temperature in closed containers under ordinary conditions of use and storage.
<b>Conditions to Avoid</b>	Avoid dust generation. Avoid exposure to moisture and moist air at temperatures above 100 °C. Keep away from heat and sources of ignition.
<b>Materials to Avoid</b>	Incompatible/reactive with oxidising agents, reducing agents, strong acids, alkali metals and finely powdered metals. Reacts violently with boron, hydrazine and derivatives, hydroxylamine, sodium and magnesium. Ignites on contact with hydrogen sulfide, fluorine, silane, hydrides. Can explode when heated with powdered aluminium, potassium, acid anhydrides and hydrogen.
<b>Hazardous Decomposition Products</b>	Fire or heat will produce irritating, toxic and/or corrosive fumes, including copper fumes, copper alloys, cuprous oxide and oxygen, acrid smoke and dust.
<b>Hazardous Polymerisation</b>	Will not occur.

## 11. TOXICOLOGICAL INFORMATION

<b>General Information</b>	- Acute toxicity: Harmful if swallowed; May cause gastrointestinal irritation, metallic or sweet taste, severe nausea and vomiting, diarrhoea, salivation, abdominal pain, gastric burning, headache, cold sweat, dizziness, lethargy and muscular weakness. May cause gastrointestinal bleeding and ulceration with haemorrhagic gastritis, anaemia, weak pulse, tachycardia, respiratory difficulty, liver and kidney damage and failure, jaundice, hypotension, CNS disorders, seizures, CNS excitation followed by depression, circulatory system failure vascular collapse and damage, convulsions, paralysis and coma, shock and death in severe cases. Hepatic and renal failure may develop several
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days after acute ingestion. May be harmful if absorbed through the skin. May be harmful if inhaled.

- Skin corrosion/irritation: May be irritating to skin; May cause redness, erythema, scaling, itchiness, eczema, allergic contact dermatitis.
- Eye damage/irritation: May cause eye irritation, redness, lacrimation, possible corneal injury and conjunctivitis.
- Respiratory/skin sensitisation: No information available.
- Germ cell mutagenicity: No evidence of mutagenic properties.
- Carcinogenicity: Not listed in the IARC Monographs.
- Reproductive toxicity: No information available.
- STOT (single exposure): May be irritating to the respiratory system, with headaches, nausea, coughing and breathing difficulties. Inhalation of copper fumes may cause metal fume fever (flu-like symptoms with metallic taste, burning sensation, irritation and redness of the throat, coughing, wheezing, sneezing, shortness of breath, nausea, vomiting, rigors, fever, chills, weakness, chest pain, muscle pain, increased white blood cell count).
- STOT (repeated exposure): Prolonged or repeated exposure to (copper) dusts may cause discolouration of the skin or hair, blood and liver damage, ulceration and perforation of the nasal septum, runny nose, metallic taste, gastrointestinal effects, hepatic cirrhosis, brain damage, kidney defects and liver failure.
- Aspiration toxicity: No information available.

#### Acute

##### Ingestion

Acute toxicity (Oral):  
- LD50, Rat: 470 mg/kg.

##### Carcinogen Category

None

## 12. ECOLOGICAL INFORMATION

#### Ecotoxicity

Aquatic toxicity:  
- LC50, Fish (*Oncorhynchus mykiss* (Rainbow trout)): 25 mg/l (96 h) [above the solubility limit in the test medium].  
- EC50, Daphnia (*Daphnia magna* (Water flea)): 0.4 mg/l (48 h) [above the solubility limit in the test medium].

#### Persistence/Degradability

Methods for the determination of biodegradability are not applicable to inorganic substances.

#### Mobility

No information available.

#### Environmental Fate

Very toxic to aquatic life with long lasting effects - Avoid release to the environment; Prevent entry into drains and waterways.

#### Bioaccumulation Potential

No information available.

#### Environmental Impact

No Data Available

## 13. DISPOSAL CONSIDERATIONS

#### General Information

Dispose of contents/container in accordance with local/regional/national regulations. Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility.

#### Special Precautions for Land Fill

Processing, use or contamination of this product may change the waste management options.

## 14. TRANSPORT INFORMATION

#### Land Transport (Australia)

ADG Code

##### Proper Shipping Name

Cupric oxide

##### Class

No Data Available

##### Subsidiary Risk(s)

No Data Available

##### EPG

47 Low To Moderate Hazard Substances

##### UN Number

No Data Available

##### Hazchem

No Data Available

##### Pack Group

No Data Available

**Special Provision** AU01  
**Comments** UN#3077

### Land Transport (Malaysia)

ADR Code

**Proper Shipping Name** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID N.O.S. (Cupric oxide)  
**Class** 9 Miscellaneous Dangerous Goods and Articles  
**Subsidiary Risk(s)** No Data Available  
**EPG** 47 Low To Moderate Hazard Substances  
**UN Number** 3077  
**Hazchem** 2Z  
**Pack Group** III  
**Special Provision** No Data Available

### Land Transport (New Zealand)

NZS5433

**Proper Shipping Name** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID N.O.S. (Cupric oxide)  
**Class** 9 Miscellaneous Dangerous Goods and Articles  
**Subsidiary Risk(s)** No Data Available  
**EPG** 47 Low To Moderate Hazard Substances  
**UN Number** 3077  
**Hazchem** 2Z  
**Pack Group** III  
**Special Provision** No Data Available

### Land Transport (United States of America)

US DOT

**Proper Shipping Name** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID N.O.S. (Cupric oxide)  
**Class** 9 Miscellaneous Dangerous Goods and Articles  
**Subsidiary Risk(s)** No Data Available  
**ERG** 171 Substances (Low to Moderate Hazard)  
**UN Number** 3077  
**Hazchem** 2Z  
**Pack Group** III  
**Special Provision** No Data Available

### Sea Transport

IMDG Code

**Proper Shipping Name** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID N.O.S. (Cupric oxide)  
**Class** 9 Miscellaneous Dangerous Goods and Articles  
**Subsidiary Risk(s)** No Data Available  
**UN Number** 3077  
**Hazchem** 2Z  
**Pack Group** III  
**Special Provision** No Data Available  
**EMS** F-A, S-F  
**Marine Pollutant** Yes

### Air Transport

IATA DGR

<b>Proper Shipping Name</b>	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID N.O.S. (Cupric oxide)
<b>Class</b>	9 Miscellaneous Dangerous Goods and Articles
<b>Subsidiary Risk(s)</b>	No Data Available
<b>UN Number</b>	3077
<b>Hazchem</b>	2Z
<b>Pack Group</b>	III
<b>Special Provision</b>	No Data Available

#### **National Transport Commission (Australia)**

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

<b>Dangerous Goods Classification</b>	NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)
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### **15. REGULATORY INFORMATION**

<b>General Information</b>	No Data Available
<b>Poisons Schedule (Aust)</b>	Schedule 6

#### **Environmental Protection Authority (New Zealand)**

Hazardous Substances and New Organisms Amendment Act 2015

<b>Approval Code</b>	HSR002766
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#### **National/Regional Inventories**

<b>Australia (AICS)</b>	Listed
<b>Canada (DSL)</b>	Not Determined
<b>Canada (NDSL)</b>	Not Determined
<b>China (IECSC)</b>	Not Determined
<b>Europe (EINECS)</b>	215-269-1
<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>	Listed
<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



## 16. OTHER INFORMATION

<b>Related Product Codes</b>	CUPOXI0500, CUPOXI0700, CUPOXI0800, CUPOXI1000, CUPOXI1001, CUPOXI1002, CUPOXI1003, CUPOXI1004, CUPOXI1005, CUPOXI1006, CUPOXI1007, CUPOXI1008, CUPOXI1009, CUPOXI1010, CUPOXI1022, CUPOXI1100, CUPOXI1500, CUPOXI2000, CUPOXI2001, CUPOXI2010, CUPOXI2011, CUPOXI2015, CUPOXI2500, CUPOXI3000, CUPOXI3500, CUPOXI3600, CUPOXI4000, CUPOXI4100, CUPOXI5000, CUPOXI5001, CUPOXI5002, CUPOXI6000, CUPOXI6001, CUPOXI8510
<b>Revision</b>	3
<b>Revision Date</b>	11 Jul 2018
<b>Key/Legend</b>	<p>&lt; Less Than &gt; Greater Than  <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>LC<sub>50</sub></b> LC stands for lethal concentration. LC<sub>50</sub> 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>LD<sub>50</sub></b> LD stands for Lethal Dose. LD<sub>50</sub> 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  <b>mbar</b> Millibar  <b>mg</b> Milligram  <b>mg/24H</b> Milligrams per 24 Hours  <b>mg/kg</b> Milligrams per Kilogram  <b>mg/m<sup>3</sup></b> Milligrams per Cubic Metre  <b>Misc</b> or <b>Miscible</b> Liquids form one homogeneous liquid phase regardless of the amount of either component present.  <b>mm</b> Millimetre  <b>mmH<sub>2</sub>O</b> Millimetres of Water  <b>mPa.s</b> Millipascals per Second  <b>N/A</b> Not Applicable  <b>NIOSH</b> National Institute for Occupational Safety and Health  <b>NOHSC</b> National Occupational Health and Safety Commission  <b>OECD</b> Organisation for Economic Co-operation and Development  <b>Oz</b> Ounce  <b>PEL</b> Permissible Exposure Limit  <b>Pa</b> Pascal  <b>ppb</b> Parts per Billion  <b>ppm</b> Parts per Million  <b>ppm/2h</b> Parts per Million per 2 Hours  <b>ppm/6h</b> Parts per Million per 6 Hours  <b>psi</b> Pounds per Square Inch  <b>R</b> Rankine  <b>RCP</b> Reciprocal Calculation Procedure  <b>STEL</b> Short Term Exposure Limit  <b>TLV</b> Threshold Limit Value  <b>tne</b> Tonne  <b>TWA</b> Time Weighted Average</p>

**ug/24H** Micrograms per 24 Hours

**UN** United Nations

**wt** Weight