

SAFETY DATA SHEET

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1. Product and Company Information

PRODUCT NAME	Copper Powder
PRODUCT CODE	Cu-PO-PBF, Cu-DED
COMPANY	Solitecs Pte Ltd
ADDRESS	22 Sin Ming Lane #06-76, Midview City, Singapore 573969
EMERGENCY PHONE #	+65 9756 0818
WEBSITE	https://www.solitecs.com
EMAIL	info@solitecs.com
RECOMMENDED USE	Industrial additive manufacturing, research and development.
TYPICAL APPLICATIONS	Aerospace structural components Medical Instruments Oil & Gas Tooling Wear Resistant Components Additive Manufacturing Materials Development Research & Development

2. Hazard Identification

2.1 GHS CLASSIFICATION (29 CFR 1910.1200):

Eye Irritant: Category 2B

Copper Fume: Irritant, Respiratory – Category 3

Environmental hazards: Hazardous to the aquatic environment, Chronic Category 3

Acute Toxicity (Oral): Category 4

Physical hazards: Fine copper powder may form combustible/explosive dust-air mixtures. Classification as flammable solid should be confirmed by particle size and burning-rate test data. Where applicable, classify as Flammable Solid Category 2.

2.2 GHS LABEL ELEMENTS:



SIGNAL WORD: Warning

HAZARD STATEMENTS:

H302 – Harmful if swallowed

H320 – Causes eye irritation

H335 – May cause respiratory irritation

H412 – Harmful to aquatic life with long lasting effects.

PRECAUTIONARY STATEMENTS:

P261 – Avoid breathing dust/fume/gas/mist/vapors/spray

P264 – Wash hands thoroughly after handling

P270 – Do not eat, drink or smoke when using this product

P273 – Avoid release to the environment

P284 – Wear respiratory protection

P301 + P330 – IF SWALLOWED – Rinse mouth with water

P304 + P340 – IF INHALED – Remove victim to fresh air and Keep at rest in a position comfortable for breathing.

P405 – Store locked up.

ADDITIONAL HAZARD

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Fine metallic powders may form explosive dust clouds when dispersed in air in the presence of an ignition source.

ADDITIONAL PHYSICAL HAZARDS

Dust may cause mechanical eye irritation.

Dust may cause respiratory tract irritation.

Fine metallic powder may present a combustible dust explosion hazard.

3. Composition/Information on Ingredients

<u>Chemical name</u>	<u>CAS #</u>	<u>Content (Wt%)</u>
Cu	7440-50-8	>99

4. First Aid Measures

4.1 Description of first aid measures:

GENERAL MEASURES:	No special requirements
AFTER INHALATION:	If inhaled, remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
AFTER SKIN CONTACT:	Remove contaminated clothing, brush material off skin, wash affected area with soap and water. Seek medical attention if symptoms persist.
AFTER EYE CONTACT:	Flush eyes with lukewarm water, including under upper and lower eyelids, for at least 15 minutes. Seek medical attention if symptoms persist.
AFTER INGESTION:	If swallowed, wash out mouth with water provided person is conscious. Do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention immediately.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically and supportively.

5. Fire Fighting Measures

FLAMMABILITY:	Bulk material is not considered flammable. Fine powder may present combustible dust hazards.
EXTINGUISHING MEDIA:	Dry sand, Class D metal fire extinguishing agents (e.g., Met-L-X®, Lith-X®)
SUITABLE EXTINGUISHING MEDIA:	Use dry sand or approved Class D metal fire extinguishing agent. For surrounding fire, use extinguishing media appropriate to surrounding materials, while preventing powder dispersion.
UNSUITABLE EXTINGUISHING MEDIA:	Do not use water jets. Avoid disturbing deposited powder.
SPECIAL FIRE FIGHTING PROCEDURE:	Use full-face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes. See section 10 for decomposition products.
SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS:	Full face, self-contained breathing apparatus and full protective clothing when necessary.
ADVICE FOR FIREFIGHTERS:	Evacuate personnel to safe areas. As in any fire, wear self-contained, breathing apparatus and full protective gear for firefighting.

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FURTHER INFORMATION: According to the standard chemical firefighting measures, choose extinguishing method appropriate for surrounding fire. Keep fire-fighting run-off water out of sewers and water sources. Avoid disturbing deposited dust during firefighting operations.

6. Accidental Release Measures

PROCEDURE(S) OF PERSONAL PRECAUTION(S):

Evacuate area. Ventilate area. Use personal protective equipment. Avoid dust formation. Avoid breathing dust. Avoid contact with skin and eyes. Wear self-contained breathing apparatus, safety glasses, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP:

Do not create dust. Sweep up/shovel or use explosion-proof vacuum cleaner. Keep in suitable, closed containers for disposal or recycle.

ENVIRONMENTAL PRECAUTIONS:

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

7. Handling and Storage

HANDLING:

Avoid creating dust. Avoid breathing dust or fumes. Provide adequate ventilation if dusts are created. Avoid contact with skin and eyes. Wash thoroughly before eating or smoking. Avoid sweeping dry powder. Ground and bond powder handling equipment to minimize static discharge. Prevent accumulation of airborne powder. See section 8 for information on personal protection equipment. Avoid generation of airborne respirable powder. Avoid use of compressed air for cleaning.

STORAGE:

Keep container tightly closed. Keep away from heat, sparks and open flame. Store in a cool, dry ventilated place. See section 10 for more information on incompatible materials.

8. Exposure Controls/Personal Protection

Exposure Limits:

Component	OSHA PEL
Copper dusts and mists, as Cu	1.0 mg/m ³
Copper fume, as Cu	0.1 mg/m ³
Total dust	15.0 mg/m ³
Respirable dust	5.0 mg/m ³

Occupational exposure limits vary by jurisdiction. Refer to applicable Singapore WSH and customer-country requirements.

ENGINEERING CONTROLS:

Ensure adequate ventilation to maintain exposures below occupational limits. Whenever possible the use of local exhaust ventilation or other engineering controls is the preferred method of controlling exposure to airborne dust and fume to meet established occupational exposure limits. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating or smoking. Do not blow dust off clothing or skin with compressed air.

RESPIRATORY PROTECTION:

If permissible levels are exceeded, use P100 / NIOSH approved dust respirator.

EYE PROTECTION:

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Not required under normal conditions. Use face shield and safety glasses if in-eye risk exists. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

BODY PROTECTION:

Wear antistatic protective clothing against chemicals and conductive safety shoes. The type of protective equipment must be selected according to the concentration and amount of the dangerous substances at the specific workplace.

HANDS PROTECTION:

Handle with chemical-resistant gloves. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product.

OTHER PROTECTION:

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. Physical and Chemical Properties

COLOR:	Red to brown
FORM:	Solid in powder form
BOILING POINT:	2595 °C
ODOR:	Odorless
ODOR THRESHOLD:	Not determined
pH:	N/A
MELTING POINT:	Approximately 1085 °C
FLASH POINT:	Not applicable, solid
FLAMMABILITY:	Bulk material not readily flammable; fine powder may form combustible/explosive dust-air mixtures. Flammable solid classification depends on particle size and burning-rate test data.
UPPER EXPLOSIVE LIMIT % (V/V):	Not determined; airborne dust may form explosive mixtures.
LOWER EXPLOSIVE LIMIT % (V/V):	Not determined; airborne dust may form explosive mixtures.
VAPOR PRESSURE:	N/A
VAPOR DENSITY:	N/A
DENSITY:	8.9 – 9.0 g/cm ³
SOLUBILITY IN WATER:	Insoluble
PARTITION COEFFICIENT / N-OCTANOL/WATER:	N/A
DECOMPOSITION TEMPERATURE:	N/A
VISCOSITY:	N/A

10. Stability and Reactivity

REACTIVITY:

May react with strong oxidizing agents and / or strong acids

CHEMICAL STABILITY:

Stable under normal conditions

POSSIBILITY OF HAZARDOUS REACTIONS:

Not expected under normal conditions

CONDITIONS TO AVOID (STABILITY)

Avoid moisture, keep container tightly closed. Avoid dust generation.

INCOMPATIBILITY WITH OTHER MATERIALS:

Incompatible with strong oxidizing agents and strong acids. Other decomposition products- no data available. In the event of fire- see section 5.

11. Toxicological Information

LIKELY ROUTES OF EXPOSURE:

Inhalation, skin, eyes, mouth.

SYMPTOMS OF EXPOSURE:

May cause irritation.

ACUTE AND CHRONIC EFFECTS:

Acute effects – irritation.

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ACUTE TOXICITY:	No data
SKIN CORROSION/IRRITATION:	May cause irritation.
SERIOUS EYE DAMAGE/EYE IRRITATION:	May cause eye irritation.
RESPIRATORY OR SKIN SENSITIZATION:	No data
GERM CELL MUTAGENICITY:	Based on available data, the classification criteria are not met.
CARCINOGENICITY:	No component of these products present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by IARC, ACGIH or NTP.
REPRODUCTIVE TOXICITY:	Based on available data, the classification criteria are not met.
SPECIFIC TARGET ORGAN TOXICITY- SINGLE EXPOSURE (GLOBALLY HARMONIZED SYSTEM):	Dust exposure may cause transient respiratory irritation.
SPECIFIC TARGET ORGAN TOXICITY- REPEATED EXPOSURE (GLOBALLY HARMONIZED SYSTEM):	No data
ASPIRATION HAZARD:	Based on available data, the classification criteria are not met.
POTENTIAL HEALTH EFFECTS:	INHALATION: May cause respiratory irritation. Appropriate engineering controls and PPE should be used.
SKIN CONTACT:	May cause irritation.
EYE CONTACT:	May cause serious irritation.
INGESTION:	Not an expected route of exposure. May be harmful if swallowed.

To the best of our knowledge the chemical, physical and toxicological characteristics of the substance are not fully known.

12. Ecological Information

Insoluble metallic powder.

Very toxic/harmful to aquatic organisms depending on particle size, bioavailability and soluble copper release. Avoid uncontrolled release to the environment.

13. Disposal Considerations

Dispose according to local regulations.

Do not dispose into drains or waterways.

14. Transport Information

SHIPPING REGULATIONS:	Not regulated
UN NUMBER:	Not regulated
UN PROPER SHIPPING NAME:	Not regulated
TRANSPORT HAZARD CLASS:	Not regulated
PACKING GROUP:	Not regulated
MARINE POLLUTANT:	No

Not regulated as dangerous goods based on available information. Classification should be confirmed according to particle size, packaging, quantity, and applicable transport regulations.

During transport, protect containers from direct sunlight, rain, high temperature, ignition sources and physical damage. Keep containers tightly closed and dry. Do not transport together with strong oxidizers, acids, food or food additives. Transport vehicles should carry appropriate fire-fighting and spill-response equipment where required.

15. Regulatory Information (Not meant to be all-inclusive, selected regulations represented)

Sec 302 Extremely Hazardous: No
Sec 304 Reportable Quantities: N/A
Sec 313 Refer to applicable national and local regulations.

US Regulations:

Fire Hazard: Not classified under applicable regulations. Fine powder may present combustible dust hazards.
Pressure Hazard- No
Reactivity Hazard – No

Singapore regulations:

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This product should be managed in accordance with applicable Singapore workplace safety and health requirements, including the Workplace Safety and Health Act and relevant subsidiary regulations. Safety Data Sheet and hazard communication should be prepared and maintained in accordance with Singapore Standard SS 586, including SS 586 Part 2 for GHS classification and labelling and SS 586 Part 3 for SDS preparation. The product may be considered a hazardous substance for workplace hazard communication purposes where it is classified as an irritant, hazardous to the aquatic environment, or combustible dust. Users should conduct workplace risk assessment and ensure appropriate hazard communication, storage, handling, PPE, ventilation and emergency controls. Import, transport and storage requirements should be verified against applicable Singapore regulatory controls, including SCDF requirements for petroleum and flammable materials where the product is classified or tested as a flammable solid, and NEA requirements where the product or impurities are listed as controlled hazardous substances.

16. Additional Information

Abbreviations:

pH- Relates to hydrogen or hydroxide ion concentration - this value will relate to a scale of 0 - 14, where 0 is highly acidic and 14 is highly alkaline

OSHA- Occupational Safety and Health Administration

NTP- National Toxicology Program

IARC- International Agency for Research on Cancer

CAS#- Chemical Abstract Service number - used to uniquely identify chemical compounds

ACGIH- The American Conference of Governmental Industrial Hygienists

ADR- Agreement on Dangerous Goods by Road

IATA - International Air Transport Association

IMDG- International Maritime Dangerous Goods

DISCLAIMER

The information herein is believed to be accurate and is provided in good faith. However, no warranty, expressed or implied, is made regarding its accuracy or completeness. The given information is based on the available information and chemical properties of the materials and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Information provided in this SDS is meant to be used as a guide for use and handling of this product. Solitecs Pte Ltd shall not be held liable for any damage resulting from handling, contact and use of this material. Normal terms and Sales conditions apply for the use of these materials. Consult Solitecs Pte Ltd for further information.

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