



SAFETY DATA SHEET

Section 1: Identification

1.1 Product identifier:

510 Bronze Tube	Phosphor Bronze, 5%
519 Bronze Tube	Phosphor Bronze, 6%
521 Bronze Tube	Phosphor Bronze, 8%

Product Codes: UNS C51000, C 51900, C52100

1.2 Recommended Use:

Identified uses:

Metal tube products –various consumer, construction, and manufacturing uses.

Uses advised against:

None known

1.3 Supplier:

Small Tube Products
200 Oliphant Drive, PO
Box 1017,
Duncansville, PA, USA
16635
www.smalltubeproducts.com

1.4 Telephone number:

814-693-6000 (8 am – 5 pm; Mon-Fri; Eastern time zone)

Section 2: Hazard Identification

2.1 Classification of the substance or mixture:

Not classified under any GHS hazard class

2.2 Label elements:

Not applicable (not classified)

2.3 Other hazards:

No known health hazards from copper tube in solid form. Under normal conditions of use, the solid article does not release more than very small quantities of hazardous substances and does not pose a physical hazard or health risk to employees.

Metallic fumes may be released from heating copper tube above its melting point [1083°C (1981°F)]. Operations such as brazing, welding or melting may generate fumes. Exposures by inhalation to metallic fumes may cause metal fume fever.

Machining operations such as grinding or cutting may release metal particles such as filings or dust. Exposure by inhalation to metallic dust may have adverse health effects.

2.4 Other hazard classifications:

USA: As sold, the solid article is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). “Articles” by definition of the standard, “means a manufactured item other than a fluid or particle (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees.

Canada: As sold, the solid manufactured article is not considered a hazardous product.



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Section 3: Composition/Information on Ingredients

Chemical Name	CAS No.	Wt. %
Copper (Cu)	7440-50-8	Remainder (estimated 90.3– 95.8)
Tin (Sn)	7440-31-5	4.2 – 9.0
Zinc (Zn)	7440-66-6	0 – 0.3
Phosphorus (P)	7723-14-0	0.03 – 0.35
Lead (Pb)	7439-92-1	0 – 0.05
Iron (Fe)	7439-89-6	0 – 0.1

The values listed above represent reasonable approximations suitable for general engineering use. Due to commercial variations in compositions and to manufacturing limitations, they should not be used for specification purposes. See applicable ASTM International specification references.

Section 4: First Aid Measures

4.1 Description of first aid measures:

Inhalation: If symptoms are experienced, remove source of contamination or move person to fresh air. Get medical advice/attention if you feel unwell or are concerned.

Eye Contact: Do not allow victim to rub eye(s). Let the eye(s) water naturally for a few minutes. Have victim look right and left, and then up and down. If particle does not dislodge, flush with lukewarm, gently flowing water for 15 minutes or until particle is removed, while holding the eyelid(s) open. If irritation persists, get medical attention. DO NOT attempt to manually remove anything stuck to the eye(s).

Skin Contact: If on skin, wash with plenty of water. If skin irritation occurs, get medical advice.

Ingestion: Call a Poison Centre or doctor if you feel unwell or are concerned.

4.2 Most important symptoms and effects, acute and delayed:

No adverse health effects expected when handled properly. Refer to Section 7 of this SDS for safe handling information.

Inhalation: Overexposure to metal dust or fume may cause coughing, shortness of breath, respiratory tract irritation, nasal septum perforation, congestion of the mucous membranes, lung damage and/or metal fume fever. The symptoms of metal fume fever typically appear several hours after exposure and are associated with any combination of the following symptoms: dry throat, cough, chills, fever, headache, chest tightening, shortness of breath, metallic taste, vomiting and fatigue. Metal alloy contains up to 0.05% lead; repeated exposures to low levels of lead from dust and/or fume may result in an accumulation of lead in the body. Exposure to Lead may cause cancer.

Eye Contact: Overexposure to this material in the form of metal fragments may cause mechanical irritation as a "foreign object". Fumes may be irritating to the eyes. Repeated occupational exposures to dust and fumes may cause conjunctivitis.

Skin Contact: Overexposure to this material in the form of metal fragments or dust may cause mechanical irritation or dermatitis. Contact with the heated product will cause thermal burns.

Ingestion: Swallowing metallic dust may cause a metallic taste, gastro-intestinal discomfort with nausea, vomiting and diarrhea.

4.3 Indication of any immediate medical attention and special treatment needed:

Not available

4.4 Medical Conditions Aggravated by Exposure:

Pre-existing pulmonary and skin conditions may be aggravated by exposure to fumes and dusts of this material. Individuals with "Wilson's disease", a rare condition that interferes with the body's ability to eliminate copper, should consult a physician before exposures to copper dusts and fumes.



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Section 5: Firefighting Measures

5.1 Extinguishing media:

Use water or other extinguishing media appropriate for the surrounding fire. Do not apply water to hot or molten metal.

5.2 Special hazards arising from the substance or mixture:

Not flammable. Copper tube will not burn or support combustion or decompose to toxic gases.

Finely divided metal dust (500 µm or smaller) from grinding or cutting may explode in the presence of an ignition source or in contact with strong oxidizing agents (e.g. chlorates, ammonium nitrate).

5.3 Advice for firefighters:

As for any fire, evacuate the area and fight the fire from a safe distance. Wear a pressure-demand, self-contained breathing apparatus and full protective gear.

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures:

Wear approved personal protective equipment as indicated in Section 8.

6.2 Environmental precautions:

Prevent material from contaminating soil and from entering sewers or waterways.

6.3 Methods and materials for containment and cleaning up:

Scoop or shovel spilled material into an appropriate waste container for recycling or disposal. For dust, use a vacuum with appropriate filters or a wet method to reduce airborne dust during clean-up; do not dry sweep dusts.

Section 7: Handling and Storage

7.1 Precautions for safe handling:

Refer to the applicable regulatory standards for safety in welding, cutting and allied processes (e.g. OSHA standards related to welding, cutting and brazing, ANSI Z49.1 or CAN/CSA-W117.2-12).

Workers must be properly trained in safety procedures and regulatory standards for cutting, grinding, welding, brazing and other machine operations where these products are used.

Wear appropriate personal protective equipment suitable for the type of operation and conforming to workplace requirements.

Avoid operations that generate fumes or fine dust.

Refer to recommended handling practices for bending, joining, soldering, brazing and welding of copper tube such as those described in The Copper Tube Handbook, published by the Copper Development Association Inc. (www.copper.org).

7.2 Conditions for safe storage, including any incompatibilities:

Product should be stored in a clean, dry area.

Section 8: Exposure Controls / Personal Protection

8.1 Control parameters:

Occupational Exposure Limits:

Consult local authorities for acceptable exposure limits.

<u>Ingredient</u>	<u>ACGIH TWA</u>	<u>OSHA PEL</u>
Copper (Cu)	0.2 mg/m ³ (fume) 1 mg/m ³ (dust and mist)	0.1 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
Tin (Sn) metal	0.2 mg/m ³	2 mg/m ³
Lead (Pb)	0.05 mg/m ³ BEI	0.05 mg/m ³ (29 CFR 1910.1025) OSHA Carcinogen
Other Exposure controls: NIOSH IDLH (Immediately Dangerous to Life or Health) = 100 mg/m ³ (as Cu or Pb) NIOSH REL Copper dust = 1 mg/m ³ TWA		



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Section 8: Exposure Controls / Personal Protection

8.2 Exposure controls:

Engineering Controls: General ventilation is usually adequate. In workplaces where fumes or dusts are generated, provide local exhaust ventilation or general dilution to maintain exposure levels below the exposure limits. Monitor the workplace air to determine the effectiveness of ventilation. For welding, cutting and allied processes refer to the ventilation recommendations in the applicable safety standard (e.g. OSHA, ANSI or CSA).

If engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable personal protective equipment including approved respiratory protection. Have equipment available for use in emergencies such as spills or fire.

Monitor noise levels to determine the hearing protection requirements.

Personal Protection: Workers must comply with the Personal Protective Equipment requirements of the workplace in which this product is handled. Wear equipment appropriate to the process (e.g. welding).

Eye/Face Protection: Wear safety glasses with side shields or goggles. For brazing or welding operations, wear eye/face protection that meets the occupational safety standard.

Skin Protection: Wear suitable gloves and long sleeve clothing to protect skin during cutting and high temperature handling. Wear safety footwear. Consult safety supplier for glove, clothing and boot specifications.

Respiratory Protection: When metal fume or dust concentrations in air exceed the occupational exposure guidelines, always wear respiratory protection. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

Where copper dust is generated and is not controlled by engineering controls, wear an approved dust respirator. NIOSH has published Respirator Recommendations for Copper fume.

A respiratory protection program that meets the regulatory requirement, such as OSHA's 29 CFR 1910.134, ANSI Z88.2 or Canadian Standards Association (CSA) Standard Z94.4-2002, must be followed whenever workplace conditions warrant a respirator's use.

Other Protection: Wear hearing protection appropriate to the noise levels during all machine operations.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties:

Appearance:	Solid. Metal tube or shaped piece, lustrous copper/orange-color
Odor:	Odorless
Odor threshold:	Not available
pH:	Not available
Melting point:	1027-1049°C (1880-1920°F)
Initial boiling point and boiling range:	Not available
Flash point:	Not applicable
Flammability (solid, gas):	Not flammable
Auto-ignition temperature:	Not available
Upper/lower flammability or explosive limits:	Not available
Sensitivity to mechanical impact:	Not applicable
Sensitivity to static discharge:	Not available
Vapor pressure:	Not applicable
Vapor density:	Not applicable
Relative density:	8.8 - 8.86 g/cm ³ at 20°C (68°F)
Solubility (ies):	Insoluble
Partition coefficient (n-octanol/water):	Not available
Decomposition temperature:	Not available
Viscosity:	Not applicable



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Section 10: Stability and Reactivity

10.1 Reactivity:

Not reactive under normal conditions of use.

10.2 Chemical Stability:

Normally stable. May turn green on prolonged contact with air due to formation of cupric carbonate.

10.3 Possibility of Hazardous Reactions:

Finely divided metal dust from grinding or cutting may explode in contact with strong oxidizing agents (e.g. chlorates, ammonium nitrate).

10.4 Conditions to Avoid:

Avoid extreme heat.

10.5 Incompatible Materials:

Chlorine, fluorine, strong oxidizing agents (chlorates, bromates, iodates, ammonium nitrate), strong acids (nitric acid), strong bases, sodium azide, acetylene. Contact with incompatible materials may increase risk of explosion.

10.6 Hazardous Decomposition Products:

Thermal decomposition may release metal oxide fumes when product is heated above its melting point.

Section 11: Toxicological Information

11.1 Information on toxicological effects:

Likely routes of exposure

No known health hazards from copper tube in solid form. Inhalation exposures to dust and fume from processing.

Acute Toxicity

Inhalation: Data not available. Inhalation of metal fume from high heat processes may cause a condition known as metal fume fever. Symptoms of metal fume fever include dryness and irritation of the throat, metallic taste, tightness of the chest and cough. Symptoms may occur be delayed several hours following exposure.

Ingestion: Data not available. Ingestion of copper particulates is expected to cause nausea and vomiting.

Skin: Data not available. Prolonged exposure to copper dust may cause a green discoloration to the skin, hair, nails and teeth.

Acute Toxicity Data

Data not available for the solid article.

Skin corrosion / irritation

Data not available. Exposure to particulate may cause irritation and discomfort.

Serious eye damage / irritation

Data not available. Contact with particulates may cause mechanical irritation.

STOT (Specific Target Organ Toxicity) – Single Exposure

From exposures to metal fume and dust: Upper respiratory system, Eyes, Skin, Liver and Kidney (increased risk to persons with Wilson's Disease).

STOT (Specific Target Organ Toxicity) – Repeated Exposure

Long-term, repeated exposures to low levels of Lead from dust and/or fume may result in an accumulation of Lead in the body. Lead may affect the GI tract, Central Nervous System (CNS), kidneys, blood, gingival tissue and eyes.

Aspiration hazard

Not known to be an aspiration hazard.

Sensitization - respiratory and/or skin

Not known to cause respiratory or dermal sensitization.



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Section 11: Toxicological Information, continued

Carcinogenicity

Copper metal is not considered a human carcinogen by IARC (International Agency for Research on Cancer), ACGIH (American Conference of Governmental Industrial Hygienists), OSHA or NTP (National Toxicology Program). ACGIH has designated metallic Copper as A4 – Not Classifiable as a Human Carcinogen.

Lead carcinogenicity: IARC has concluded that Lead is probably carcinogenic to humans, Group 2A; ACGIH has designated lead as an animal carcinogen A3. NTP has listed lead as reasonably anticipated to be a human carcinogen. [Lead is present at less than 0.1%].

Reproductive toxicity

Development of offspring: Long-term, repeated exposures to low levels of Lead from dust and/or fume may result in an accumulation of Lead in the body. Lead: saturnism; injury during the postnatal period in humans. May cause harm to the unborn child. [Lead is present at less than 0.1%].

Sexual function and fertility: Not known to cause effects on sexual function or fertility. Lead: embryotoxicity in animals; reproductive toxicity in humans. Possible risk of impaired fertility. [Lead is present at less than 0.1%].

Effects on or via lactation: No information was located.

Germ cell mutagenicity

Data not available.

Interactive effects

No information was located.

Section 12: Ecological Information

12.1 Toxicity:

Copper metal is not classified as an environmentally hazardous substance. In natural environments, Copper will slowly be transformed to copper compounds, some of which can cause ecotoxic effects.

Do not release metal fragments, dust or solid metal to the environment.

12.2 Persistence and degradability:

Solid metal, not readily biodegradable.

12.3 Bioaccumulative potential:

Data not available

12.4 Mobility in soil:

Data not available

Section 13: Disposal Considerations

13.1 Waste treatment methods:

Copper tube is recyclable.

It is the responsibility of the user to dispose of, or send for metal reclamation, any unused material, residues and containers in accordance with local, regional, national and international regulations. Prevent releases of this material into the environment.

Do NOT discard into any sewers, on the ground or into any body of water. Store material for disposal or recycling as indicated in Section 7 Handling and Storage.



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Section 14: Transport Information

- 14.1 UN Number:** Not regulated
- 14.2 Shipping name:** Not regulated
- 14.3 Transport hazard class(es):** Not regulated
- 14.4 Packing group:** Not regulated
- 14.5 Environmental hazards:** Not available
- 14.6 Special precautions for user:** Not available
- 14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:** Not applicable

Section 15: Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:

USA

TSCA Status: All ingredients are on the TSCA Inventory or are exempt from TSCA Inventory requirements.

SARA Title III : May contain chemicals subject to the reporting requirements of Sara Section 313, including: Copper, Zinc, Lead

CERCLA RQ: Applicable to Copper, Zinc, Lead. The RQ for these hazardous substances is limited to those pieces of the metal having a diameter smaller than 100 µm.

OSHA HazCom 2012 Hazards: Article according to the definition. Not classified as a hazardous product.

Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the SDS contains all the information required by the *Controlled Products Regulations*.

WHMIS Classification:

As sold, this product is considered a manufactured article and is not classified as a hazardous product. In some workplaces, operations with this product may lead to generation of metallic dust or fume.

Exposure to metallic dusts and fumes may have occupational health hazards.

NSNR Status: All ingredients are listed on the DSL or are not required to be listed.

National Pollutant Release Inventory: Copper, Zinc, Lead are NPRI reportable substances.



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Section 16: Other Information

Revision date: December 22, 2020

References and sources for data:

Copper Development Association Inc. Copper Tube Handbook www.copper.org
CCOHS, Cheminfo
RTECS, Registry of Toxic Effects of Chemical Substances
The Copper Tube Handbook, published by the Copper Development Association Inc. (www.copper.org).

Methods for classification of mixtures:

USA: Haz Com Standard 29 CFR 1910.1200 (2012)
Canada: Controlled Products Regulations WHMIS(1988); Hazardous Products Regulations WHMIS (2020)

Legend to abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienist
ANSI – American National Standards Institute
CSA – Canadian Standards Association
GHS- Globally Harmonized System for Classification and Labeling.
NIOSH-National Institute for Occupational Safety and Health
OEL– Occupational exposure limit
OSHA - Occupational Safety and Health Administration
TWA – Time weighted average
TLV - Threshold Limit Value
WHMIS – Workplace Hazardous Materials Information System.

Additional information:

This Safety Data Sheet has been prepared for the guidance of plant engineering, operations, and management and for persons working with or handling this product.

To the best of The Supplier's knowledge and belief, the information within this document is accurate and reliable as of the date of preparation of this document. However, no warranty or guarantee, express or implied, is made as to the accuracy or reliability. The Supplier shall not be liable for any loss or damage arising out of the use thereof, including abnormal use, or failure to adhere to recommended practices with respect to any hazards inherent in the nature of the product. This safety data sheet provides guidelines for the safe handling and processing of this product; it does not and cannot advise on all possible situations. Therefore, your specific use of this product should be evaluated to determine if additional precautions are required. Individuals exposed to this product should read and understand this information and be provided pertinent training prior to working with this product.

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