

Material Safety Data Sheet

Copper Powder & Flake (1-10 micron nominal)

Date of Preparation: 4-20-07

Rev. Date: 1-8-10

Section 1 - Chemical Product and Company Identification

Product/Chemical Name: Copper Powder & Copper Flake
Chemical Formula: Cu
CAS Number: 744-50-8
Other Designations: NA
General Use: Metal powder (1-10 micron nominal) used for microelectronics
Manufacturer: Ames Goldsmith Corp. 21 Roger Street, Glens Falls, NY 12801
Emergency Telephone: 518-792-5808 (all calls)
Chemtrec: 1-800-424-9300

Section 2 - Composition / Information on Ingredients

Ingredient Name	CAS Number	% wt or % vol					
Copper	7440-50-8	>99.0%					
Trace Impurities:							
Ingredient	OSHA PEL		ACGIH TLV		NIOSH REL		NIOSH IDLH
	TWA	STEL	TWA	STEL	TWA	STEL	
Copper	1 mg/m ³	none estab.	none estab.	none estab.	1 mg/m ³	none estab.	1 mg/m ³

Section 3 - Hazards Identification

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Potential Health Effects

Primary Entry Routes: Skin contact, skin absorption, eye contact, inhalation, ingestion

Target Organs: Skin, eyes, respiratory system, digestive system, liver, kidneys.

HMIS
H 2
F 1
R 0
PPE [†]
[†] Sec. 8

Acute Effects

Inhalation: Harmful if inhaled. Inhalation of dusts or fumes may cause nose, throat and respiratory tract irritation. Symptoms may include congestion of nasal mucous membranes, and ulceration and perforation of the nasal septum (bone that divides the nose). Inhalation of fumes may cause metal fume fever, a flu-like illness with symptoms including high temperature, metallic taste in mouth, nausea, general weakness and muscle aches.

Eye: May cause irritation, discoloration and damage

Skin: May cause irritation. Symptoms may include redness, itching and pain. Could cause greenish-black skin discoloration. This product may be absorbed.

Ingestion: Harmful if swallowed. May cause nausea, vomiting, pain and a metallic taste in the mouth. Ingestion of larger doses could cause stomach ulceration, jaundice, and liver and kidney damage.

Carcinogenicity: IARC, NTP, and OSHA do not list Copper as a carcinogen.

Medical Conditions Aggravated by Long-Term Exposure: May aggravate pre-existing skin, respiratory, digestive, liver and kidney problems.

Chronic Effects: Chronic ingestion could cause liver and kidney damage. Prolonged or repeated inhalation could cause respiratory irritation and chronic respiratory disease. Prolonged or repeated skin contact could cause discoloration of the skin and hair.

Section 4 - First Aid Measures

Inhalation: Immediately remove person to fresh air. If breathing is difficult, administer oxygen. If breathing has stopped, begin artificial respiration. Obtain medical attention immediately.

Eye Contact: Immediately flush eyes with running water for a minimum of 15 minutes. Obtain medical attention.

Skin Contact: Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water. Obtain medical attention. Launder clothing before reuse.

Ingestion: Contact a physician or Poison Control Center immediately! Inducing vomiting should only be performed under the direct supervision of medical personnel. Never give anything by mouth to an unconscious or convulsing person.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians:

Special Precautions/Procedures:

Section 5 - Fire-Fighting Measures

Flash Point: >1292 °F (700 °C)

Flash Point Method: CC?, OC?, COC?

Burning Rate:

Autoignition Temperature: NA °F (NA °C)

LEL: NA% v/v

UEL: NA% v/v

Flammability Classification: (OSHA 29 CFR 1910.1200): Non-flammable

Extinguishing Media: Class D fire extinguishers using Sodium chloride are preferable. DO NOT USE WATER

Unusual Fire or Explosion Hazards: Not considered flammable. This material may, however, present a low dust explosion hazard. Copper powder with particle sizes in the 50 um size range are classified as weakly explosive by the US Bureau of Mines report RI-6516. When present as a dust cloud, the material will not readily explode and is not easily ignited by sparks.

Hazardous Combustion Products: NA

Fire-Fighting Instructions: Do not enter fire area without proper protection. Move containers from the fire area if it can be done without risk. Water spray may ONLY be useful in cooling equipment exposed to heat and flame. Do not release runoff from fire control methods to sewers or waterways.

Fire-Fighting Equipment: Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full face piece operated in pressure-demand or positive-pressure mode.



Section 6 - Accidental Release Measures

Spill /Leak Procedures: Eliminate all sources of ignition. Ventilate area of release. Stop leak if you can do so without risk.

Using HEPA vacuum, wet vacuum, or other dustless methods, gather up spilled material and place in suitable container for later disposal (see section 13). Avoid generating dust. Contaminated absorbent material may pose the same hazards as the spilled product. Notify the appropriate authorities as required.

Small Spills: Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. All persons dealing with clean-up should wear the appropriate chemically protective equipment. Keep all other personnel upwind and away from the spill/release. Refer to Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION, for additional information on acceptable personal protective equipment (PPE)

Large Spills: Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. All persons dealing with clean-up should wear the appropriate chemically protective equipment. Keep all other personnel upwind and away from the spill/release. Refer to Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION, for additional information on acceptable personal protective equipment (PPE)

Environmental precautions: Ensure spilled product and flush solutions do not enter drains, sewers, waterways or confined spaces.

Containment: For large spills, dike far ahead of liquid spill for later disposal.

Regulatory Requirements: If a spill/release in excess of EPA reportable quantity is made into the environment, immediately notify the national response center in the United States (phone: 1-800-424-8002) Follow applicable OSHA regulations (29 CFR 1910.120).

DOT/CERCLA Reportable Quantity (RQ): Copper (RQ 5000 lbs.)

Section 7 - Handling and Storage

Normal Handling Precautions: This material is a harmful solid. Wear suitable protective equipment for dusty conditions during handling. Use only in a well ventilated area. Avoid breathing dusts or fumes. Avoid contact with eyes, skin and clothing. Keep away from extreme heat and flame. Avoid and control operations which create dust. Keep away from oxidizing materials and other incompatibles. Avoid exposure to air and moisture. Keep container tightly closed when not in use. Assume empty containers contain residues, which are hazardous. Wash hands before eating, drinking, smoking or use of toilet facilities. Immediately remove soiled clothing and wash it thoroughly before reuse.

Storage Recommendations: Store in a cool, dry, well ventilated area away from heat, flame and incompatible materials. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks. No smoking in the area.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls:

Ventilation: Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.

Administrative Controls:

Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA.

Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection with side shields must be worn instead of contact lenses.

Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.

Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9 - Physical and Chemical Properties

Physical State: Solid powder
Appearance: Reddish Brown
Odor: NA
Odor Threshold: NA
Vapor Pressure: 1 @ 2962 °F (1628 °C)
Vapor Density (Air=1): N/Ap
Formula Weight: NA
Density: NA
Specific Gravity (H₂O=1, at 4 °C): 8.9
pH: N/Ap

Water Solubility: Insoluble
Other Solubilities: NA
Boiling Point: 4703°F (2595 °C)
Melting Point: 1981°F (1083 °C)
Viscosity: NA
Refractive Index: NA
Surface Tension: NA
% Volatile: 0
Evaporation Rate: N/Ap

Section 10 - Stability and Reactivity

Stability: Copper Powder & Flake is normally stable under the recommended storage and handling conditions prescribed. May turn green on prolonged contact with moist air, due to the formation of cupric carbonate.

Polymerization: Hazardous polymerization will not occur.

Chemical Incompatibilities: Acetylene, strong oxidizing material (e.g. chlorates, bromates, iodates, ammonium nitrate, hydrogen peroxide, sodium azide), chlorine, fluorine, 1-bromo-2-propyne, potassium dioxide.

Conditions to Avoid: Avoid sources of heat and flame. Moist air. Avoid contact with incompatibles.

Hazardous Decomposition Products: None known. Refer to Section 5 for Hazardous combustion products.

Section 11- Toxicological Information

Toxicity Data:*

Eye Effects: Prevent eye contact

Skin Effects: Prevent skin contact

Acute Inhalation Effects:

There is no available data for the product itself, only for the ingredients. See below for individual ingredient acute toxicity data.

Acute Oral Effects:

LC50 (4 hr.)

Rat, oral, LD₅₀: Copper N/Av

Chronic Effects: NA

Carcinogenicity: None of the ingredients listed are classified by IARC, ACGICH, NTP or OSHA as carcinogenic.

Mutagenicity: None Known

Teratogenicity: None Known

Sensitization to Material: May cause allergic contact dermatitis in hypersensitive individuals. Symptoms may include itching, redness, swelling and pustulation.

* See NIOSH, *RTECS* (GL5325000), for additional toxicity data.

Section 12 - Ecological Information

Environmental Stability: The ecological characteristics of this product have not been fully investigated. The product should not be allowed to enter drains or water courses or be deposited where it can affect ground or surface waters. Do not discharge product unmonitored into the environment.

Section 13 - Disposal Considerations

RCRA: If this product, as supplied, becomes a waste, it may meet the criteria of a hazardous waste as defined under RCRA, Title 40 CFR 261. It is the responsibility of the waste generator to determine the proper waste identification and disposal method. For disposal of unused or waste material, check with local, state, and federal environmental agencies.

The unused product is NOT a RCRA hazardous waste if discarded.

Handling for disposal: Handle according to recommendations listed in Section 7.

Methods of disposal: Dispose in accordance with all applicable local, state, and federal regulations Contact your local, state or federal environmental agencies for specific rules

NOTE: The information offered in section 13 is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

Section 14 - Transport Information

DOT Transportation Data (49 CFR 172.101):

Shipping Name: N/Av

Shipping Symbols: N/Av

Hazard Class: Not regulated

ID No. N/Av

Packing Group: N/Av

Label: N/Av

Special Provisions (172.102): N/Av

Packaging Authorizations

a) **Exceptions:** N/Av

b) **Non-bulk Packaging:**
N/Av

c) **Bulk Packaging:** N/Av

Quantity Limitations

a) **Passenger, Aircraft, or Railcar:** N/Av

b) **Cargo Aircraft Only:** N/Av

Vessel Stowage Requirements

a) **Vessel Stowage:** N/Av

b) **Other:** N/Av

Section 15 - Regulatory Information

Toxic Substances Control Act (TSCA)

TSCA Inventory Status: All ingredients are listed on the TSCA inventory.

Other TSCA Issues:

SARA Title III/CERCLA

Copper Powder & Flake

Rev. date: 1-8-10

Sec. 313, Toxic Chemicals Notification, 40 CFR 372: This product may be subject to the TSCA notification requirements, since it contains Copper, a Toxic Chemical constituent. This product also contains the following Toxic Chemical constituents at trace levels (below de minimus concentrations): Silver (CAS# 7440-22-4), Nickel (CAS# 7440-02-0), Aluminum (CAS# 7429-90-5), Cobalt (CAS# 7440-48-4), Chromium (CAS# 7440-47-3), Manganese (CAS# 7439-96-5).

EPA /CERCLA (40 CFR 302.4) Information: This product contains the following chemicals with established reportable quantities and which are designated as hazardous under CERCLA (40 CFR 302.4):

<u>Chemical</u>	<u>CAS#</u>	<u>% (weight)</u>	<u>CERCLA Reportable Quantities (RQ)</u>
Copper	7440-50-8	90-100	5000 lbs
Sodium	7440-23-5	<0.1	10 lbs
Silver	7440-22-4	<0.1	1000lbs
Nickel	7440-02-0	<0.1	100 lbs
Chromium	7440-47-3	<0.1	5000 lbs

State Regulations:

California Proposition 65: This product contains trace levels of Nickel (CAS# 7440-02-0) and Cobalt (CAS# 7440-48-4). These chemicals are known to the State of California to cause cancer.

New Jersey labeling Requirements: This product contains the following substances required to be disclosed on product labeling:
Copper CAS# 7440-50-8 90-100% (weight) Listed as a New Jersey Hazardous Substance: YES

WHMIS Classification (Canada): Class D@B (Materials causing other toxic effects, Toxic Material)

Foreign Chemical Control Inventory Status: Canadian CEPA Information: All ingredients listed are present on the DSL.

Health: 2 Flammability: 1 Reactivity: 0

Section 16 - Other Information

Prepared By: Charles T. McCabe

Disclaimer:

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained therein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of this product's use. Each individual must make his or her own determination as to the suitability of the information for such purpose(s) or use.

Important: Do not leave any blank spaces. If required information is unavailable, unknown or does not apply, so indicate.