

**MATERIAL SAFETY DATA SHEET****SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

<b>PRODUCT NAME</b>	Copper Brass/Bronze Rod, Parts, and Wire				
<b>CATEGORIES</b>	Copper/Mixtures of copper and other elements (alloys). Products include wrought alloys – coppers, copper-zinc (brasses), copper-zinc-lead (lead brasses), copper-tin-phosphorus (phosphor bronzes), copper-silicon (silicon bronzes), and copper-nickel.				
<b>PRODUCTS INCLUDE</b>	C10100	C10200	C10500	C10700	C11000
<b>THE FOLLOWING CDA ALLOYS</b>	C11400	C12200	C12220	C14500	C15000
	C15720	C15725	C15760	C22000	C24000
	C26000	C36000	C51000	C65100	C65500
	C71500				
<b>INTENDED USE</b>	Finished Product or Raw Material				
<b>COMPANY NAME</b>	<b>LUVATA OHIO, INC.</b>				
<b>ADDRESS</b>	<b>801 Pittsburgh Drive Delaware, OH 43015</b>				
<b>EMERGENCY PHONE NUMBER</b>	<b>(740) 363-1981</b>				
<b>CONTACT (TITLE)</b>	<b>James Osteen (Regulatory Compliance Engineer)</b>				
<b>DATE OF MSDS REVISION</b>	<b>May 15, 2006</b>				

**SECTION 2. COMPOSITION AND INFORMATION ON INGREDIENTS**

Nippert alloys may contain any or all of the elements listed below (1% or greater for all chemicals and 0.1% or greater for carcinogens). All ingredients are listed on the TSCA inventory. Refer to Properties of Wrought and Cast Copper Alloys at <http://properties.copper.org> for information on the composition of a specific copper or copper alloy. Additional information may be obtained from ASTM Standards Volume 02.01.

ELEMENT	CAS NUMBER	WEIGHT PERCENT	OSHA PEL* (mg/m <sup>3</sup> )	
			TWA	STEL
Copper (Mol. Wt. 63.55)	7440-50-8	60 – 99.99	0.1 [0.2] fume 1 dust & mist	NE
Zinc (Mol. Wt. 65.37)	1314-13-2	0 – 37.15	5 fume 5 respirable dust 15 total dust [10 dust]	(10 fume)
Nickel (Mol. Wt. 58.71)	7440-02-0	0 – 33	1 [1.5]	NE
Tin (Mol. Wt. 118.69)	7440-31-5	0 – 5.8	2	NE
Silicon (Mol Wt. 28.09)	7440-21-3	0 – 3.8	5 respirable dust 15 total dust [10]	NE
Lead (Mol. Wt. 207.20)	7439-92-1	0 – 3.7	0.05	NE
Manganese (Mol. Wt. 54.94)	7439-96-5	0 – 1.3	[0.2]	5 fume Ceiling
Iron (Mol. Wt. 55.85)	1309-37-1	0 – 1	10 [5] dust & fume	NE

### SECTION 3. HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW:** *The solid alloy presents no significant health hazard. Processing of the alloy (e.g., grinding, heating, welding) may result in airborne metal particulates or fumes. Dusts can form explosive mixtures in air. Molten metal may react violently with water. Keep away from strong acids, bases, gases, oxidizers, mercury, ammonia and acetylene.*

**POTENTIAL HEALTH EFFECTS:**

**INHALATION:** Airborne exposures to dust or fumes may result from welding, grinding or sanding operations or during repair or maintenance on contaminated equipment. Irritation of nose, throat, lungs, cough, metallic taste in mouth, fever, fatigue, nausea, bronchitis, chills, "metal fume fever," decreased pulmonary function, asthma-like symptoms.

**INGESTION:** Ingestion can occur during hand-to-mouth transfer. No significant health hazards identified.

**SKIN:** An allergic dermal response may result from prolonged skin contact with nickel. Irritation may result from metal abrasion.

**EYES:** Irritation or mechanical injury to cornea or conjunctiva may result from contact with airborne dust or contaminated hands.

**CHRONIC HEALTH EFFECTS:** Overexposure to metal dusts/fumes. From copper, nasal septum perforation, and skin and hair discoloration. From iron, siderosis. From tin, stannosis. From lead, central nervous system damage, kidney dysfunction, weakness, lassitude, insomnia, facial pallor, anemia, paralysis of wrist or ankles, encephalopathy, nephropathy, hypotension, reproductive or mutagenic effects, skin and hair discoloration. From manganese, Parkinson-like symptoms, insomnia, chronic manganese poisoning.

**TARGET ORGANS:** Generally, for exposure to dusts or fumes containing these elements, the respiratory system may be affected. Additionally, target organs include, for copper, skin, liver, and kidneys; for lead, gastrointestinal tract, central nervous system, kidneys, blood, and gingival tissue; for manganese, central nervous system, blood, and kidneys; for nickel, paranasal sinus and central nervous system; for tin, eyes and skin.

**CARCINOGENICITY:** Lead and nickel have been classified by the USEPA, IARC, MAK or ACGIH as recognized or probable human carcinogens.

**CONDITIONS AGGRAVATED BY EXPOSURE:** Allergic reaction or sensitivity to metals. Persons with impaired pulmonary function, airway diseases or conditions such as asthma, emphysema, or chronic bronchitis. Prior damage to blood, nervous system or kidneys. Wilson's disease can occur in those with a rare metabolic disorder characterized by retention of copper in liver, brain, kidneys and corneas. These individuals are at increased risk from copper exposure, which may lead to liver cirrhosis, brain damage, demyelination and kidney disease. If untreated, Wilson's disease is progressive and may lead to fatal liver failure.

### SECTION 4. EMERGENCY AND FIRST AID MEASURES

**INHALATION:** Breathing difficulty requires immediate removal to fresh air. If breathing has stopped, perform artificial respiration and obtain medical assistance.

**INGESTION:** Drink large quantities of water and obtain medical assistance.

**SKIN:** Treat cuts and abrasions by standard first aid. For contact with dusts, flush with soap and water. If irritation persists or for accidental implantation beneath the skin, obtain medical assistance.

**EYES:** Flush dust or powder from eyes with copious amounts of clean, running water, while holding eyelids open. Obtain immediate medical assistance. Contact lenses should not be worn when working with metal dusts because the contact lens must be removed to provide adequate treatment.

**MEDICAL TREATMENT:** Refer to standard medical references for information on chelation therapy.

### SECTION 5. FIRE FIGHTING MEASURES

Fire and explosion hazards are moderate when material is in form of dust and exposed to heat, flames, chemical reaction or in contact with powerful oxidizers.

**Flash Point**

Non-combustible as a solid.

<b>Explosive Limits</b>	Not applicable to solids.		
<b>Extinguishing Media</b>	These alloys are generally non-combustible. Use extinguishing media appropriate for surrounding fire.		
<b>Special Firefighting Procedures</b>	To extinguish a metal powder fire, use Class D fire extinguishing powder.		
<b>Unusual Fire/Explosion Hazards</b>	Do not use water to extinguish fires around molten metal due to potential for steam explosions.		
<b>Special Firefighting Procedures</b>	If this material becomes airborne in fire, pressure-demand self-contained breathing apparatus must be worn.		
<b>NFPA and HMIS Rating</b>	Flammability: 0	Health: 0	
	Reactivity: 2	Special Hazards: 0	
	(ref: OHMTADS for Copper)		
<b>Autoignition Temperature</b>	Not Applicable		

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## SECTION 6. ACCIDENTAL RELEASE MEASURES

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Product is a solid, but dusts or fumes may be generated during use. Establish a restricted entry zone based on the severity of the release. Persons entering the restricted zone must wear adequate respiratory protection and appropriate protective clothing. Cleanup may include HEPA vacuum and/or wet cleaning methods. Depending on the quantity and characteristics, powder or dust releases may require reporting to the National Response Center at (800) 424-8802 as well as the State Emergency Response Commission and Local Emergency Planning Committee. If discarded, material should be tested for hazardous waste classification. Maximize product recovery for reuse or recycling.

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## SECTION 7. HANDLING AND STORAGE

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Surface scale or oxidation should be removed prior to working the surface to reduce exposures. HEPA vacuum or wet cleaning methods recommended for dust removal. De-energize electrical equipment before beginning wet cleaning. Use of compressed air for dust removal should be prohibited. Avoid contact with skin, eyes or clothing. Do not breathe dusts or fumes from heated/molten material. Isolate from moisture, acids, caustics, gases, chlorinated hydrocarbons and oxidizing materials.

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## SECTION 8. EXPOSURE CONTROLS, PERSONAL PROTECTION

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**VENTILATION AND ENGINEERING CONTROLS:** Local exhaust ventilation or other engineering controls is the preferred method of controlling exposure to airborne dust and fume. Ventilation for welding shall meet OSHA requirements (29 CFR 1910.252), i.e., a minimum rate for general ventilation of 2,000 cubic feet per minute per welder or freely movable hoods should be positioned as close to the source as possible, and provided with a rate of airflow sufficient to maintain 100 linear feet per minute in the zone of welding when the hood is at its most remote distance from the point of welding. Disruption of airflow, such as by a floor fan, should be avoided.

**RESPIRATORY PROTECTION:** When potential exposures are above OSHA PELs, approved respirators must be used, as specified by an industrial hygienist or other qualified personnel, and respirator users must be included in a respiratory protection program. The minimum respiratory protection recommended is a negative pressure air-purifying fullface respirator with cartridges that are NIOSH approved against dusts, fumes and mists having a TWA not less than 0.05 mg/m<sup>3</sup>. Pressure-demand airline respirators are recommended for jobs with high exposure potential. Exposure to unknown concentrations of fumes or dusts requires the wearing of a pressure-demand airline respirator or pressure-demand self-contained breathing apparatus.

**PROTECTIVE GLOVES:** Wear gloves to prevent metal cuts and skin abrasions particularly during handling of wrought forms, solid metal sheet, strip or tube. Glove types may include NBR-coated hot mill gloves, nitrile-coated abrasive resistant gloves or others depending on the application. Wear gloves during melt, grind, cut or weld operations.

**EYE PROTECTION:** Wear safety glasses, goggles, face shield or welder's helmet when risk of eye injury is present during any process that generates dust, fumes or chips.

**OTHER PROTECTIVE EQUIPMENT:** No protective equipment or clothing is required when handling solid forms. Fire retardant clothing and splash resistant garments should be worn as necessary to protect against accidental molten metal splash. Protective overgarments or work clothing should be worn by persons with potential to become contaminated with dusts or

fumes. Contaminated clothing and overgarments should be managed in such a manner to prevent secondary exposure to others.

Never use compressed air to clean work clothing.

**OTHER REQUIREMENTS:** Workplace exposure to lead is regulated by 29 CFR 1910.1025, which contains additional requirements. OSHA's hazard communication standard requirements for labeling of potential carcinogens (29 CFR 1910.1000 and 29 CFR 1910.1200) must be followed. For welding requirements, refer to ANSI Z49.1 "Safety in Welding and Cutting" published by the American Welding Society.

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## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

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<b>Appearance</b>	Copper Metallic or Bright Nickel to Yellow Red
<b>Odor</b>	None
<b>Volatile Organic Compound content</b>	Not Applicable
<b>Physical State</b>	Solid; though residues may include metal oxides as dust or fume.
<b>Boiling Point</b>	Not Applicable
<b>Vapor Pressure</b>	Not Applicable
<b>Evaporation Rate</b>	Not Applicable
<b>Specific Gravity</b>	8.50 – 8.94
<b>Vapor Density</b>	Not Applicable
<b>Solubility in Water</b>	Insoluble

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## SECTION 10. STABILITY AND REACTIVITY

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<b>Stability</b>	Alloys are stable.
<b>Incompatibility</b>	Avoid contact with mineral acids and oxidizing agents which may generate hydrogen gas, an explosion hazard. Molten metal may react violently with water. See information on specific elements below.
<b>Hazardous Decomposition Products</b>	Metal fumes.
<b>Hazardous Polymerization</b>	Will not occur.
<b>Reactivity:</b>	Copper is incompatible with oxidizers, acetylene, ammonium nitrate, bromates, phosphorus, potassium peroxide, sodium azide, sodium peroxide, 1-bromo-2-propyne, acid chlorides, halogens, and acids. Contact of copper with hydrogen peroxide may cause a violent reaction. Contact with acetylene may form unstable acetylides. Copper foil burns spontaneously in gaseous chlorine. Finely divided copper with finely divided halogenates may explode with heat, percussion or light friction. Iron is incompatible with acids, moisture, and oxygen and reacts violently with strong oxidizing agents, halogens, and phosphorus. Lead is incompatible with strong oxidizers such as hydrogen peroxide, chlorine trifluoride, and active metals. Manganese is incompatible with acids, bases, halogens, phosphorus, and sulfur oxides and reacts with moisture. Phosphorus is incompatible with strong oxidizing materials, heat, and flames. Phosphor copper is hygroscopic and must be stored in a dry location with desiccant to prevent moisture buildup. Tin is incompatible with acids, alkalies, and oxidizing agents and is a strong reducing agent. Tin powder oxidizes in air and may generate excessive heat when in powder form.

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## SECTION 11. TOXICOLOGICAL INFORMATION

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Toxicity not established for product as a whole. Copper LD<sub>50</sub> (mouse, interperitoneal): 3,500 µg/kg. Silicon LD<sub>50</sub> (rat, oral): 3,160 mg/kg.

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## SECTION 12. ECOLOGICAL INFORMATION

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Copper - In freshwater, acute toxicity decreases as hardness increases. At a hardness of 100 mg/l, acute National Ambient Water Quality Criterion is 18 µg/l and chronic NAWQ is 12 µg/l. In saltwater, acute sensitivities of aquatic life range from 5.8 µg/l for blue mussel to 600 µg/l for green crab. Freshwater plants have similar sensitivities as freshwater animals. Lowest chronic value for aquatic plants is 1 µg/l. Lowest Observed Effect Concentration (LOEC) for terrestrial plant (little bluestem) is 100 mg/kg. Because many copper compounds and complexes are readily soluble, copper is among the more mobile heavy metals in soil and other surface environments. The major process that limits the environmental mobility of copper is adsorption to organic matter, clays, and other materials. As an essential nutrient, copper is accumulated by plants and animals, although

apparently it is not generally biomagnified. Bioconcentration factors in freshwater species range from zero for the bluegill to 2,000 for the alga *Chlorella regularis*. Among saltwater species, the highest bioaccumulation factors are those for the bivalve mollusks. Oysters can bioaccumulate copper up to 28,200 times without any significant mortality.

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### SECTION 13. DISPOSAL CONSIDERATIONS

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Maximize product recovery for reuse or recycling. Waste must be disposed of in accordance with federal, state and local environmental control regulations. If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste (40 CFR 261.20-24). Use may also generate liquid wastes with metal concentrations in excess of those permitted through pretreatment or direct discharge NPDES requirements. Appropriate analyses should be conducted to ensure compliance with existing wastewater permits.

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### SECTION 14. TRANSPORT INFORMATION

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<b>DOT Hazardous Material Description</b>	Not Applicable
<b>Proper Shipping Name</b>	Not Applicable
<b>Hazard Class</b>	Not Applicable
<b>ID Number</b>	Not Applicable
<b>Packing Group</b>	Not Applicable
<b>Canadian Transportation of Dangerous Goods Classification</b>	Not Applicable

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### SECTION 15. REGULATORY INFORMATION

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CERCLA Reportable Quantity: 5,000 lbs (for solid copper pieces less than 100 micrometers in diameter).

Canadian WHMIS: Not Applicable

This product contains the following toxic chemicals, which may be subject to reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (40 CFR 372):

WROUGHT ALLOY	COPPER NO.	DESCRIPTION	CHEMICAL NAME	WEIGHT PERCENT
COPPERS	C10100	Oxygen-Free Electronic	Copper	99.99
	C10200	Oxygen-Free	Copper	99.95
	C10500	Oxygen-Free with Ag	Copper	99.95
	C10700	Oxygen-Free with Ag	Copper	99.95
	C11000	Electrolytic Tough Pitch	Copper	99.90
	C11400	Tough Pitch with Ag	Copper	99.90
	C12200	Phosphorus-Deoxidized, High Residual Phosphorus	Copper	99.9
	C12220	Phosphorus-Deoxidized, High Residual Phosphorus	Copper	99.9
	C14500	Tellurium-Bearing	Copper	99.90
	C15000	Zirconium Copper	Copper	99.80
	C15720	Dispersion Strengthening Copper	Copper	99.52
	C15725	Dispersion Strengthening Copper	Copper	99.43
	C15760	Dispersion Strengthening Copper	Copper	98.77

WROUGHT ALLOY	COPPER NO.	DESCRIPTION	CHEMICAL NAME	WEIGHT PERCENT
COPPER-ZINC (BRASSES)	C22000	Commercial Bronze, 90%	Copper Zinc	89.0 – 91.0 8.7 – 10.9
	C24000	Low Brass, 80%	Copper Zinc	78.5 – 81.5 18.2 – 21.4
	C26000	Cartridge Brass, 70%	Copper Zinc	68.5 – 71.5 28.18 – 31.38
COPPER-ZINC-LEAD (LEAD BRASSES)	C36000	Free-Cutting Brass	Copper Lead Zinc	60.0 – 63.0 2.5 – 3.7 32.45 – 37.15
COPPER-TIN- PHOSPHORUS (PHOSPHOR BRONZES)	C51000	Phosphor Bronze, 5% A	Copper Tin	93.4 – 95.32 4.2 – 5.8
COPPER-SILICON (SILICON BRONZES)	C65100	Low Silicon Bronze B	Copper Silicon Zinc	94.95 – 96.15 0.8 – 2.0 1.5
	C65500	High Silicon Bronze A	Copper Manganese Nickel Silicon Zinc	91.95 – 93.75 0.50 – 1.3 0.6 2.8 – 3.8 1.5
COPPER-NICKEL	C71500	Copper-Nickel, 30%	Copper Iron Manganese Nickel Zinc	63.45 – 68.55 0.40 – 1.0 1.0 29.0 – 33.0 1.0

## SECTION 16. OTHER INFORMATION

This MSDS supercedes that issued October 1,2004.

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