

MATERIAL SAFETY DATA SHEET

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IMPORTANT - Read this MSDS before handling and disposing of this product, and pass this information on to employees, customers, and users of the product.

SECTION I - MATERIAL IDENTIFICATION

Description: Copper-Lead-Nickel-Zinc Alloys
Product Code(s): 31400, 31600, 32000
Forms: Wire, rod, large diameter tubing, and scrap metal

HMIS Ratings
Health - 3
Fire - 1
Reactivity - 1

SECTION II - COMPOSITION/INFORMATION ON INGREDIENTS

| Component | CAS Number | OSHA PEL-TWA | OSHA PEL-C | ACGIH TLV-TWA | ACGIH TLV-STEL |
|-----------|------------|--|------------|--|---------------------------------------|
| Copper | 7440-50-8 | 1 mg/m ³ , as dust 0.1 mg/m ³ , as fume | None | 1 mg/m ³ , as dust 0.2 mg/m ³ , as fume | None |
| Lead | 7439-92-1 | 0.05 mg/m ³ | None | 0.05 mg/m ³ | None |
| Nickel | 7440-02-0 | 1 mg/m ³ | None | 1.5 mg/m ³ | None |
| Zinc | 7440-66-6 | 5 mg/m ³ (as ZnO fume) | None | 5 mg/m ³ (as ZnO fume) | 10 mg/m ³ (as ZnO fume) |

WARNING: These products contain chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

SECTION III - PHYSICAL DATA

| | | | |
|----------------------------|---|--------------------------------|-------------------------|
| Physical Form: | Solid (metal residues may include oxides) | Specific Gravity: | 7.4 - 9.0 |
| Boiling Point: | Not Applicable | Vapor Density: | Not Applicable |
| Melting Temperature Range: | Approximately 1500-2260°F/815-1240°C. | Solubility (H ₂ O): | Insoluble |
| Vapor Pressure: | Not Applicable | Color: | Silver to yellow to red |
| Evaporation Rate: | Not Applicable | Odor: | None |

SECTION IV - FIRE AND EXPLOSION DATA

Flash Point (Method): Not Applicable **Autoignition Temperature:** Not Applicable **Flammable Limits (LEL/UEL):** Not Applicable

Overview: Solid massive form is not combustible under normal conditions of temperature and pressure. Fire and explosion hazards are moderate for material in the form of dust and fine powder when exposed to heat, flames, sparks, or by reaction with incompatible materials (see Section V).

Conditions to Avoid: Do not allow dust and fine powder to accumulate. Avoid creating sources of ignition sources, sparks, and flame in areas of dust and powder accumulations, or where there is a high airborne concentration.

Extinguishing Media to Use: Class D dry powder, dry sand, or specialized dry powders.

Extinguishing Media to Avoid: Water, moist sand, other liquids, foam, or halogenated extinguishing agents.

Special Fire Fighting Instructions: Firefighters should wear NIOSH- approved self-contained breathing apparatus with full facepiece in a positive-pressure mode, and full protective clothing. Avoid spreading fires of powder or dust. Dust clouds may be explosive. Take all appropriate steps to prevent formation of dust clouds. If fire is isolated, it may be allowed to burn itself out. Do not disturb burning metal while extinguishing the fire. Use fire fighting methods and media as appropriate for surrounding materials.

Hazardous Combustion Products: Metals Involved in a fire at very high temperatures or in a molten state produce metal or metal oxide fumes that may be toxic as well as irritating to the respiratory system.

SECTION V - REACTIVITY DATA

Stability: Stable under foreseeable conditions of transport and storage.

Hazardous Decomposition Byproducts: Metal fume and/or metal oxide fume.

Hazardous Polymerization: Will not occur

SECTION V - REACTIVITY DATA (Continued)

Conditions to Avoid:

- During storage, avoid exposure to strong acids, bases, oxidizers and the materials indicated below in the *Incompatibility* section.
- Molten metal may react violently with water. Never put water or other liquids on it, as it may explode. Similarly, do not melt wet metal.
- This product can react with strong acids or oxidizing agents, which can liberate highly-flammable hydrogen gas.
- Copper forms potentially explosive reactants with acetylene, ammonium nitrate, 3-bromopropyne, ethylene oxide and lead azide.
- In the presence of halogenated compounds, copper powder may explode through heat, percussion, or friction.
- Upon extended contact with wet acetylene and ammonia, copper may form an explosive peroxide.

Incompatibility (Materials to Avoid): Strong acids; strong bases; oxidizing agents; ammonium nitrate; inorganic and organic peroxides; bromates, chlorates, and iodates of alkali and alkali earth metals; alkali metal oxides; halogens; hydrazine; hydrazine mononitrate; hydrazoic acid; performic acid; selenium; dioxane; sulfur; titanium plus potassium perchlorate; inorganic nitrates; barium dioxide; carbon disulfide; hydroxylamine; selenium; tellurium; azides; nitrides; acetylides; carbides; zirconium.

SECTION VI - HEALTH HAZARD DATA

Overview: These products have not been tested for toxicological properties by the manufacturer. Symptoms and health effects of the component elements from scientific studies and reports are described herein.

Route(s) of Entry: Ingestion; inhalation.

Eye Hazards: Eye contact with these products in finely-divided forms may cause irritation, conjunctivitis, and/or ulceration of the cornea.

Skin Hazards: Skin contact with these products in finely-divided forms may cause irritation, discoloration, and contact dermatitis. The component nickel is a known skin allergen, and can cause allergic dermatitis, particularly from prolonged contact with moist skin.

Ingestion Hazards: Ingestion of finely-divided forms of these products may cause nausea, vomiting, and gastrointestinal (GI) tract irritation. Potential health effects from chronic long-term ingestion are similar to those described under *Inhalation Hazards* below.

Inhalation Hazards: The symptoms and effects of the component elements described here have occurred from excessively high and/or prolonged exposures, and do not necessarily represent the potential health hazards existing under foreseeable conditions of product use.

- **Copper:** Acute exposure may cause "metal fume fever", which is characterized by respiratory tract irritation, a metallic taste, cough, dry throat, chills, fever, tightness of chest, headache, nausea, shortness of breath, vomiting, and fatigue. Symptoms usually abate in 24-48 hours, leaving no known permanent effects. Long-term chronic exposure may damage the liver, kidney, spleen, pancreas, and brain.
- **Nickel:** Acute exposure to nickel may cause headache, nausea, vertigo, and pulmonary edema. Chronic exposure may increase the risk of cancer to the nasopharynx, lungs, prostate, and kidney.
- **Lead:** Chronic exposure may cause various systemic effects, such as damage to hematological, neurological, and renal functions. Lead inhibits the synthesis of hemoglobin, and may lead to anemia. Neurological effects may include central and peripheral nervous system disorders. Symptoms of chronic lead overexposure include anemia, pale skin, a blue line at the gums, decreased hand-grip strength, abdominal pain, nausea, vomiting, and weakness of the wrist. Lead may affect the cardiovascular, hepatic, gastrointestinal, and endocrine systems, and has been determined to adversely affect the male reproductive organs and functions.
- **Zinc:** Acute exposure to zinc oxide fume may cause "metal fume fever" (see *Copper*, above). Chronic effects from long-term exposure have not been established for either zinc oxide or metallic zinc.

Carcinogenicity: Lead is classified as a potential human carcinogen (Group 2B) by the International Agency for Research on Cancer (IARC). Nickel is classified as a potential human carcinogen by IARC (Group 2B) and the National Toxicology Program (Group R). Neither copper nor zinc are classified as potential or demonstrated carcinogens by IARC, NTP, or the Occupational Safety and Health Administration (OSHA).

Medical Conditions Aggravated by Overexposure: Pre-existing pulmonary diseases (e.g., bronchitis, asthma) may be aggravated by inhalation overexposure, particularly as fume. Chronic overexposure may aggravate pre-existing diseases of the liver, kidneys, gastrointestinal system, nervous system, blood-forming organs, and male reproductive system.

Emergency First Aid Procedures:

- **Eyes:** Flush affected areas with water for at least fifteen minutes. Seek medical assistance if necessary.
- **Skin:** Remove contaminated clothing. Wash affected area with large quantities of water for at least five minutes.
- **Ingestion:** If subject is conscious, induce vomiting. If unconscious or convulsive, get immediate medical assistance.
- **Inhalation:** If signs and symptoms of toxicity are observed, remove subject from area, administer oxygen, and seek medical attention. Keep the subject warm and at rest. Perform artificial respiration if breathing has stopped.

Note to Physician: None of the components are acutely toxic by ingestion, nor are they absorbed through the skin. Extensive or prolonged skin contact may cause contact or allergic dermatitis.

SECTION VI - HEALTH HAZARD DATA (Continued)

| Toxicology Data: | Component (CASRN) | LD ₅₀ (Route/species) | LC ₅₀ (Route/species) |
|------------------|--------------------|----------------------------------|----------------------------------|
| | Copper (7440-50-8) | No data available | No data available |
| | Lead (7439-92-1) | No data available | No data available |
| | Nickel (7440-02-0) | 5 gm/kg (oral/rat) | No data available |
| | Zinc (7440-66-6) | No data available | No data available |

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

Potential for Exposure: Metal dust and fume exposure may occur when alloys are subject to grinding, cutting, extreme heat, and other forms of metalworking. If dust and fume are generated, avoid inhalation through the use of appropriate engineering controls (e.g., ventilation) and/or personal protective equipment, as described in Section VIII.

Handling and Storage: No special handling procedures are required. Do not store near strong acids, bases, oxidizing agents, or incompatible materials (see Section V). Prevent exposure to rainwater, which may cause storm water pollution.

Accidental Release Measures: If a powdered form of product is spilled, clean up spillage so as to minimize dust generation. Wet sweeping or vacuuming using HEPA filtration are recommended. Prevent exposure to rainwater and possible storm water pollution.

Waste Disposal: Recycle unused product whenever possible. These products contain lead and nickel, and may be classifiable as RCRA hazardous wastes, depending upon test methodology and findings, as required by the U.S. Environmental Protection Agency or State/Provincial authority. Dispose of all waste product in accordance with applicable Federal, State/Provincial, and local regulations.

SECTION VIII - CONTROL MEASURES

Engineering Controls: Use appropriate ventilation (e.g., dilution, local exhaust) adequate to maintain concentrations of all components and their decomposition byproducts to within their respective OSHA PELs or other applicable standards. Follow appropriate guidance documents, such as NFPA, ANSI, and industrial ventilation design principles and practices.

Eye/Face Protection: Wear eye protection adequate to prevent eye contact with powdered forms of product and/or injury from the type of operation in which the product is used. Appropriate protection may include safety glasses with side shields, goggles, face shields, helmets, or lenses of tinted glass. Safety eyewash stations should be nearby locations of work with these products.

Skin Protection: Wear protective gloves and clothing appropriate to the type of operation in which the product is used. Melting, pouring, grinding, cutting, or welding operations will require appropriate protective gloves and/or clothing. Depending upon the operation, additional protective gear, such as leggings, gauntlets, helmets, etc. may be required. If there is the potential for extensive or prolonged contact with powdered forms of product, wear protective gloves or barrier creams to prevent sensitization and/or dermatitis.

Respiratory Protection: If an exposure level exceeds an applicable exposure standard, use a NIOSH-approved respirator having a configuration (type of facepiece, filter media, assigned protection factor, etc.) appropriate to the concentration of the contaminant(s) generated. For guidance on selection and use of respiratory protection, consult American National Standard Z88.2 (ANSI, New York, NY 10036 USA).

Work/Hygiene Practices: Eating, drinking, and use of tobacco should be prohibited in work areas. Wash hands and face before eating, drinking, using tobacco products, or applying cosmetics. Do not wear contaminated clothing into break and lunch rooms. Contaminated clothing should not be worn home, but should be left at the workplace. For lead-contaminated clothing, OSHA requires that it be collected in a secure container and properly labeled for cleaning or repair.

SECTION IX - REGULATORY INFORMATION

Transportation Regulatory Information: These products are not classified as *Hazardous Substances* or *Dangerous Goods* per U.S. Department of Transportation (DOT), International Air Transport Association (IATA), or International Maritime Organization (IMO) regulations.

U.S. Regulatory Information

SARA Hazard Classes: Acute Health Hazard; Delayed Health Hazard

Section 313 Supply Notification: These products contain the following ingredients in concentrations greater than 1% (for carcinogens 0.1%) that are subject to Toxic Release Inventory (TRI) reporting under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 and 40CFR Part 372:

- Copper (CASRN 7440-50-8)
- Lead (CASRN 7439-92-1)
- Nickel (CASRN 7440-02-0)

Occupational Safety and Health Administration: Lead is regulated by a substance-specific standard (29CFR Part 1910.1025). If these products are used in a manner creating employee exposures exceeding 30 micrograms per cubic meter as a time-weighted average exposure, some or all of the requirements of that standard may apply. Consult the standard for requirements specific to your operation. If uncertain, consult a qualified industrial hygienist or other health professional for guidance.

SECTION IX - REGULATORY INFORMATION (Continued)**Canadian Regulatory Information**

Workplace Hazardous Materials Information System (WHMIS) Class(es) and Division(s): D2A, D2B

Components on *Ingredients Disclosure List*:

- Copper, elemental (CASRN 7440-50-8)
- Lead, elemental (CASRN 7439-92-1)
- Nickel, elemental (CASRN 7440-02-0)

SECTION X – REVISION INFORMATION

Date of Previous Edition: February 26, 2003 (originally issued as *Copper Alloys 314/316/320*)

Section(s) Materially Revised: I

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