



SDS No.: .0001 COPPER-BASE , REVISION 2, DATE: 03/21/2016

Material Name: Copper Alloys

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## **SECTION 1: PRODUCT AND COMPANY IDENTIFICATION**

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**MANUFACTURER: HEYCO METALS INC.**

**ADDRESS:** 1069 Stinson Drive, Reading, PA 19605

**EMERGENCY PHONE:** 610-926-4131 Fax: 610-926-4134

[www.heycometals.com](http://www.heycometals.com)

**IMPORTANT:** Read this SDS prior to handling, processing or disposing of this product. Pass this information to employees or anyone using this product. Where users or customers of this product are changing its characteristics in any way by further processing, a new SDS must be generated incorporating the changes made.

### **PRODUCT NAME:**

Copper Alloy, Oxygen-free C102  
Copper Alloy, Electrolytic Tough Pitch C110  
Copper Alloy, Phosphorus Deoxidized C122  
Copper Alloy, Zirconium Copper C151  
Copper Alloy, Iron-Bearing C194  
Copper Alloy, Iron-Bearing C19210  
Copper Alloy, C197  
Copper Alloy, Brass C274 (Yellow Brass, 63%)  
Copper Alloy, Brass C272 (Yellow Brass, 64% )  
Copper Alloy, Brass C270 (yellow Brass, 65%)  
Copper Alloy, Brass C268 (Yellow Brass, 66%)  
Copper Alloy, Brass C260 (Cartridge Brass, 70%)  
Copper Alloy, Brass C240 (Low Brass, 80%)  
Copper Alloy, Brass C230 (Red Brass, 85%)  
Copper Alloy, Brass C226 (Jewelry Bronze, 87%)  
Copper Alloy, Brass C220 (Commercial Bronze, 90%)  
Copper Alloy, Brass C210 (Gilding metal, 95%)  
Copper Alloy, Phosphor Bronze 4% C511  
Copper Alloy, Phosphor Bronze 5% C510  
Copper Alloy, Phosphor Bronze 6% C519  
Copper Alloy, Phosphor Bronze 8% C521  
Copper Alloy, C725  
Copper Alloy, Nickel Silver 18% C752  
Copper Alloy, Nickel Silver 18% C770  
Copper Alloy, Cn/Ni/Si C7025, C19010

These alloys are widely used because of their excellent electrical and thermal conductivities, resistance to corrosion, their relative strength and ability to be readily formed, brazed, welded etc. Uses include electrical conductors, electronic connectors, ammunition components, coinage and heat exchangers. Copper alloys should not be used at elevated temperatures where strength



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degrades, nor be exposed to strong acids, bases, oxidizing agents, mercury, ammonia and acetylene.

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## SECTION 2: HAZARDS IDENTIFICATION

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**General Hazard Statement:** Solid metallic products are generally classified as “articles” and do not constitute a hazardous materials in solid form under the definitions of the OSHA Hazard Communication Standard (29 CFR 1910.1200). Any articles manufactured from these solid products would be generally classified as non-hazardous. However some hazardous elements contained in these products can be emitted under certain processing conditions such as but not limited to: burning, melting, cutting, sawing, brazing, grinding, machining, milling, and welding. Products in the solid state present no fire or explosion hazard. Small chips, fines, and dust may ignite readily, though. The following classification information is for the hazardous elements which may be released during processing.

**GHS Classification:**

Serious Eye Damage/Irritation - Category 2B

Respiratory Sensitizer - Category 1

Skin Sensitizer - Category 1

Germ Cell Mutagenicity - Category 2

Carcinogenicity - Category 2

Toxic to reproduction - Category 1B

Specific target organ toxicity - Single exposure - Category 1 (kidneys, respiratory system)

Specific target organ toxicity - Repeated exposure - Category 1 (respiratory system, skin)

Hazardous to aquatic environment - Acute Hazard - Category 1

Hazardous to aquatic environment - Chronic Hazard - Category 1

### GHS LABEL ELEMENTS

Symbol(s)



### Signal Word

Danger

### Hazard Statements

Causes eye irritation

May cause allergy or asthma symptoms or breathing difficulties if inhaled

May cause an allergic skin reaction

Suspected of causing genetic defects

Suspected of causing cancer



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Causes damage to organs (kidneys, respiratory system)

Causes damage to organs through prolonged or repeated exposure (respiratory system)

Very toxic to aquatic life

Very toxic to aquatic life with long lasting effects

**Precautionary Statements**

**Prevention**

Do not breathe dust/fume/gas/mist/vapours/spray.

In case of inadequate ventilation wear respiratory protection

Contaminated work clothing should not be allowed out of the workplace.

Wash thoroughly after handling

Wear protective gloves

Obtain special instructions before use

Do not handle until all safety precautions have been read and understood

Use personal protective equipment as required

Do not eat, drink or smoke when using this product.

Avoid release to the environment

**Response**

IF exposed or concerned: Get medical advice/attention

IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists get medical advice/attention.

If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.

IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

If exposed or concerned: Get medical advice/attention.

Collect spillage

**Storage**

Store locked up

**Disposal**

Dispose of contents/container in accordance with local/regional/national/international regulations.

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**SECTION 3: COMPOSITION/INFORMATION, INGREDIENTS**

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<b>CAS #</b>	<b>Component</b>	<b>Percent</b>
7440-50-8	Copper	61-100
7440-31-5	Tin	0-8
7440-67-7	Zirconium	0-.15
7440-02-0	Nickel	0-19.5
7440-66-6	Zinc	0-39
7439-92-1	Lead	0-0.1
7439-89-6	Iron	0-2.6



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7440-21-3	Silicon	0-4.0
7439-96-5	Manganese	0-1.5

The above listing is a summary of elements used in alloying copper. Various grades will contain different combinations of these elements. Other trace elements may also be present in minute amounts. These small quantities (less than 0.1%) are frequently referred to as “trace” or “residual” elements; generally they originate in the raw material used. Such elements include antimony (Sb), arsenic (As), bismuth (Bi), cadmium (Cd), chromium (Cr), cobalt (Co), nitrogen (N), oil mist (mineral), oxygen (O), phosphorus (P), selenium (Se), silver (Ag), and sulfur (S). Various byproducts of processing from these trace elements may include carbon monoxide, carbon dioxide, nitric oxide, nitrogen dioxide, and ozone, and these byproducts may also be considered trace. If listed in the above table, the ingredient is considered to be a component rather than trace.

\*Copper alloy products as provided contain trace amounts of chromium metal in the zero valence state. As such, chromium metal does not present any unusual health hazard. However, welding, torch cutting, brazing, or grinding of trace chromium metal contained in copper alloys may generate trace airborne concentrations of hexavalent chromium.

**Footnotes:**

1. The product may have a light coating of oil to prevent corrosion.

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## **SECTION 4: FIRST AID MEASURES**

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**First Aid: Eyes**

Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. Consult a physician.

**First Aid: Skin**

Wash skin with soap and water. In the case of skin irritation or allergic reactions see a physician.

**First Aid: Ingestion**

Do NOT induce vomiting. Call a physician or Poison Control Center immediately. Drink plenty of water. Never give anything by mouth to an unconscious person.

**First Aid: Inhalation**

Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Consult a physician.

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## **SECTION 5: FIRE-FIGHTING MEASURES**

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**General Fire Hazards**

See Section 9 for Flammability Properties.

This product does not present fire or explosion hazards as shipped. Small chips, fines, and dust from processing may be readily ignitable.

**Hazardous Combustion Products**



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Thermal decomposition can lead to release of irritating gases and vapors. In the event of fire and/or explosion do not breathe fumes. May cause sensitization by inhalation and skin contact.

**Extinguishing Media**

Class D extinguishing agents on fines, dust or molten metal. Use coarse water spray on chips and fines.

**Unsuitable Extinguishing Media**

DO NOT use halogenated extinguishing agents on small chips or fines. DO NOT use water for fires involving molten metal. These fire extinguishing agents will react with burning material.

**Fire Fighting Equipment/Instructions**

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

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**SECTION 6 - Accidental Release Measures**

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**General**

No notable environmental hazard is anticipated from the “release” of this material in bulk solid form on land. This material should be recovered from aquatic environments.

**Recovery and Neutralization**

Avoid dust formation. Collect scrap for recycling.

**Materials and Methods for Clean-Up**

If product is molten, contain the flow using dry sand or salt flux as a dam. All tools and containers which come in contact with molten metal must be preheated or specially coated and rust free. Allow the spill to cool before remelting as scrap.

**Emergency Measures**

Keep people away from and upwind of spill/leak.

**Personal Precautions and Protective Equipment**

Wear appropriate protective clothing and respiratory protection for the situation.

**Environmental Precautions**

Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Do not flush into surface water or sanitary sewer system.

**Prevention of Secondary Hazards**

None

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**SECTION 7: HANDLING AND STORAGE**

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**Handling, storage and decontamination procedures:**



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Avoid contact with skin, eyes, clothing. Wear personal protective equipment when handling. Avoid dust creation. Keep material dry. Avoid contact with sharp edges, corners, hot metal. Good housekeeping must be practiced during storage, transfer, handling. and use to avoid excessive dust accumulation. Apply recommendations of NFPA 491 for copper alloys.

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## **SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

### **Component Exposure Limits:**

#### **Copper (7440-50-8) TWA**

ACGIH: Fume 0.2 mg/m<sup>3</sup>, dust 1 mg/m<sup>3</sup>

OSHA: Fume 0.1 mg/m<sup>3</sup>, dust 1 mg/m<sup>3</sup>

NIOSH: Fume 0.1 mg/m<sup>3</sup>, dust 1 mg/m<sup>3</sup>

#### **Tin (7440-31-5) TWA**

ACGIH: 2 mg/m<sup>3</sup>

OSHA: 2 mg/m<sup>3</sup>

NIOSH: 2 mg/m<sup>3</sup>

#### **Nickel (7440-02-0) TWA**

ACGIH: 1 mg/m<sup>3</sup>

OSHA: 1 mg/m<sup>3</sup>

NIOSH: 0.015 mg/m<sup>3</sup>

#### **Zinc (7440-66-6) TWA**

ACGIH: Fume 5 mg/m<sup>3</sup>, dust 10 mg/m<sup>3</sup>

OSHA: Fume 5 mg/m<sup>3</sup>, dust 10 mg/m<sup>3</sup>

#### **Silicon (7440-21-3) TWA**

ACGIH: 10 mg/m<sup>3</sup>

OSHA: 10 mg/m<sup>3</sup>

#### **Iron (7439-89-6)**

ACGIH: None established

OSHA: None established

#### **Manganese (7439-96-5)**

ACGIH: .2mg/m<sup>3</sup> TLV

OSHA: 5mg/m<sup>3</sup> PEL

#### **Lead (7439-92-1)**

ACGIH: .05 mg/m<sup>3</sup> TLV



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OSHA: .05mg/m3 PEL

**Engineering Measures**

Use adequate ventilation to keep fume or dust concentration below the occupational exposure limits shown above. Where dust is generated, enclose the process to prevent dispersion and exposure to personnel in the work area. Use appropriate NIOSH/OSHA-approved respiratory protection when necessary as specified in the Occupational Health and/or local regulations. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations.

Use safety glasses with side shields or goggles to protect against flying particles.

See ANSI Z49.1 “Safety in Welding and Cutting” and OSHA Regulation CFR 1910.252.

Use protective gloves to protect against hot objects and sharp edges.

Do not eat, drink or smoke while using these products in dust form. Use good personal hygiene.

Wash hands and face with mild soap and water before eating, drinking or smoking.

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

Physical Appearance

Shades of yellow through reddish brown solid metal.

Odor

None.

Boiling Points

N/AP

Viscosity Units, Temp Method

N/AP

Dry Point

N/AP

Freezing Point

N/AP

Vapor Pressure

N/AP

Sol. In Water

N/AP

Volatile Char.

Solids not Volatile

Specific Gravity Water at 39F = 1

~8.45 to 9.0

Vapor Sp. Gr. (Air = 1 at STP)

N/AP

pH

N/AP

**SECTION 10: STABILITY AND REACTIVITY**

Hazardous Reaction Potential:

None

Stability

Stable

Other Chemical Reactivity:

N/AP

Other Physical and Chemical Properties:

Melting/freezing range 1650 F – 1950 F degrees odorless metallic material.

Conditions to avoid



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Dust formation, Exposure during storage to strong acids, bases or oxidizing agents.

Materials to Avoid:

Mercury, Ammonia and Acetylene.

Hazardous Decomposition Products:

Metal fumes may be generated under extreme heat.

**SECTION 11: TOXICOLOGICAL INFORMATION**

Use good personal hygiene. Wash hands and face before eating, drinking, smoking.

**Exposure routes:**

For dust: ingestion, eye contact, inhalation.

For fume: inhalation, eye contact.

The solid, finished metal alloy is not hazardous.

Salts of metal components have demonstrated mutagenic potential in several bioassays, but the health significance of these results is unknown.

**Acute Animal Toxicity data:**

For Product in dust/fume form:

Oral LD50: Believed to be >5g/kg

Dermal LD50: Believed to be >2g/kg

Inhalation LC50: Believed to be slightly to moderately toxic.

Irritation: Eye and respiratory irritant, sensitizer.

For Copper:

Oral LD50: 3.5g/kg

Dermal LD50: 375mg/kg

Inhalation LC50: No data

Irritation: Respiratory irritant

For Iron:

Oral LD50: 30g/kg

Dermal LD50: No data

Inhalation LC50: No data

Irritation: Eye irritant

For Zinc:

Oral LD50: No data

Dermal LD50: No data

Inhalation LC50: No data

Irritation: Eye irritant





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For Tin:

Oral LD50: No data

Dermal LD50: No data

Inhalation LC50: No data

Irritation: No data

For Nickel:

Oral LD50: >5g/kg

Dermal LD50: >7.5g/kg

Inhalation LC50: >12mg/kg

Irritation: Respiratory irritant, skin sensitizer

For Silicon:

Oral LD50: 3.16 g/kg

Dermal LD50: No data

Inhalation LC50: No data

Irritation: Eye, Skin, respiratory irritant

For Manganese:

Oral LD50: 9g/kg

Dermal LD50: No data

Inhalation LC50: No data

Irritation: Mild skin and eye irritant

#### **SUBCHRONIC/ CHRONIC TOXICITY:**

No information for product. Lead has caused blood, kidney and nervous system damage in laboratory animals.

#### **CARCINOGENICITY:**

In laboratory animal studies, chronic exposure to high concentrations of nickel has caused an increase in lung and nasal tumors. The International Agency for Research on Cancer (IARC) has classified nickel as possibly carcinogenic to humans, group 2B. The International Agency for Research on Cancer (IARC) lists lead as possibly carcinogenic to humans, group 2B.

**MUTAGENICITY:** This product is not known or reported to be mutagenic. Nickel and lead have been shown to be mutagenic in *in vitro* studies.

#### **REPRODUCTIVE, TERATOGENICITY, OR DEVELOPMENTAL EFFECTS:**

This product is not known or reported to cause reproductive or developmental effects. Exposure of male rats to high concentrations of nickel caused testicular degeneration. However, symptoms of systemic toxicity, including severe weight loss were also observed at the same concentrations indicating that the testicular effects were secondary to the frank toxicity. Lead has been shown to affect fetal development including birth defects and reduce male reproductive function in laboratory animals.



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**NEUROLOGICAL EFFECTS:**

This product is not known or reported to cause neurological effects. Lead has caused peripheral and central nervous system damage and behavioral effects in laboratory animals. Chronic exposure to very high concentrations of manganese dust has caused nervous system effects including muscle weakness, tremors, and behavioral changes in humans.

**INTERACTIONS WITH OTHER CHEMICALS WHICH ENHANCE TOXICITY:**

None known or reported.

**SECTION 12: ECOLOGICAL INFORMATION**

No notable environmental hazard is anticipated from “release” of this material in bulk solid form on land. This material should be recovered from aquatic environments. If finely divided material is spilled in excess of EPA or state reportable quantities, the appropriate authorities should be contacted. For air emissions consult your local authority.

Details for individual components are as follows:

**ECOTOXICITY:**

**Copper:**

The toxicity of copper to aquatic organisms varies significantly not only with the species, but also with the physical and chemical characteristics of the water, such as its temperature, hardness, turbidity and carbon dioxide content. Copper concentrations varying from 0.1 to 1.0 mg/l have been found by various investigators to be not toxic for most fish.

However, concentrations of 0.015 to 3.0 mg/l have been reported as toxic, particularly in soft water to many kinds of fish, crustaceans, mollusks, insects, and plankton.

**Nickel:**

96 hr LC50, rainbow trout =31.7 mg/L; 96 hr LC50, fathead minnow = 3.1 mg/L; 72 hr EC50, freshwater algae (4 species): = 0.1 mg/L; 96 hr LC50, *Daphnia* = 0. 51 mg/L

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**Lead:** LC50 (48 hrs.) to bluegill (*Lepomis macrochirus*) is reported to be 2-5 mg/l. Lead is toxic to waterfowl.

**MOBILITY:**

Dissolved lead may migrate through soil.

**PERSISTANCE/DEGRADABILITY:**



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Not biodegradable. Lead may persist and accumulate in the environment.

**BIOACCUMULATION:**

No data.

**SECTION 13: DISPOSAL CONSIDERATIONS**

Maximize product recovery for reuse or recycling. Conditions of use may cause this material to become a solid “Hazardous Waste” as defined by state or federal laws. Solid waste “leachate” testing may indicate the need for properly permitted disposal of such wastes in compliance with all applicable laws.

Conditions of use may also generate liquid wastes with metal concentrations in excess of those permitted through pre-treatment or direct discharge NPDES requirements. Appropriate analyses should be conducted to ensure compliance with existing wastewater permits.

**SECTION 14: TRANSPORT INFORMATION**

Not regulated.

DOT Hazardous Materials Proper Shipping Name:

None.

DOT Hazard Class: N/AP

**SECTION 15: REGULATORY INFORMATION**

The components in this material makes it subject to the reporting requirements of section 313 of Title III of the superfund amendments and reauthorization act of 1986 and 40 CFR Part 372. This notice must not be detached from this Material Safety Data Sheet and any copying or redistribution of this data sheet must include this notice.

**SECTION 16: OTHER INFORMATION**

Note: EQ = Equal

AP = Approximately

N/P = Not Applicable

LT = Less Than

UK = Unknown

GT = Greater Than

TR = Trace N/AP = Not Applicable

N/DA = No Data Available



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Revision History:

03/21/2016 Added C19010