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Meets the Requirements of OSHA Standard 29 CFR 1910.1200 Hazard Communication and EPA Supplier Notification Requirements under Section 313 of the Emergency Planning and Community Right-to-Know Act.

SAFETY DATA SHEET (SDS)

**COPPER-TIN-LEAD ALLOY CASTINGS
LEADED-TIN BRONZE ALLOY CASTINGS**

SDS SC-000-025 Rev 12

DATE ISSUED

01/15

SECTION 1—PRODUCT IDENTIFICATION & COMPANY INFORMATION

PRODUCT NAME

**COPPER-TIN-LEAD ALLOY CASTINGS
LEADED-TIN BRONZE ALLOY CASTINGS**

OTHER DESIGNATIONS: Copper Alloy Specification No's Unified Numbering System (UNS)

UNS ALLOY DESIGNATIONS:

C92200	C92400	C92700	C92900
C92210	C92500	C92710	
C92300	C92600	C92800	
C92310	C92610	C92810	

PRODUCT IDENTIFICATION (Label Identifier)

MANUFACTURER'S NAME

STREET ADDRESS

EMERGENCY TELEPHONE NO.

MAILING ADDRESS

TELEPHONE NO.

CITY, STATE, ZIP CODE, COUNTRY

FAX NO.

E-MAIL ADDRESS/WEBSITE

RECOMMENDED USE OF CHEMICAL AND RESTRICTIONS ON USE

Solid casting; no restrictions

SECTION 2—HAZARD IDENTIFICATION

CLASSIFICATION

Castings are metallic articles that do not present hazards in their original form.

OTHER INFORMATION

1. Grinding castings that have not been cleaned or that contain embedded sand may generate significant amounts of dust containing crystalline silica.
2. Fumes from hot processes may contain other compounds with different exposure limits. Dust or fumes generated by machining, grinding, welding or thermal cutting of the casting may produce airborne contaminants. Consult Sections 3 & 8 for further information.

SECTION 3—COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAME/Common Name/Synonym	Wt %	CAS NUMBER
Cobalt (Co) Metal	0.0–4.0	7440-48-4
Copper (Cu) Metal	78.0–90.0	7440-50-8
Lead (Pb) Metal	0.3–6.0	7439-92-1
Nickel (Ni) Metal	0.0–4.0	7440-02-0
Phosphorus, Yellow (P) Metal	<0.5–1.5	12185-10-3
Tin (Sn) Metal	4.5–17.0	7440-31-5
Zinc (Zn) Metal	0.0–5.0	7440-66-6

SECTION 4—FIRST AID MEASURES

EYE CONTACT: Not applicable to solid castings

SKIN CONTACT: No special requirements for solid castings

INGESTION: Not applicable

INHALATION: Not applicable

SECTION 5—FIREFIGHTING MEASURES

FLAMMABLE PROPERTIES: Not applicable

EXTINGUISHING MEDIA: Not applicable

PROTECTION OF FIREFIGHTERS: Not applicable

SECTION 6—ACCIDENTAL RELEASE MEASURES

Not applicable

SECTION 7—HANDLING & STORAGE**RECOMMENDED STORAGE**

No special requirements

PROCEDURES FOR HANDLING

Proper hand and foot protection is recommended.

SECTION 8—EXPOSURE CONTROLS/PERSONAL PROTECTION**ENGINEERING CONTROLS**

None Required. There are no health hazards from castings in solid form.

SUBSTANCE	ACGIH TLV mg/m ³	OSHA PEL mg/m ³
Cobalt (Co) Metal	0.02	0.1
Copper (Cu) Metal	1	1
Lead (Pb) Metal	0.5	30µg/m ³ AL 50µg/m ³ PEL (See 29CFR1910.1025)
Nickel (Ni) Metal	1.5 (I)	1
Tin (Sn) Metal	2	2
Phosphorus, Yellow (P) Metal	0.1	0.1
Zinc (Zn) Metal	N/E	N/E

SUPPLEMENTAL INFORMATION

Grinding castings that have not been cleaned or that contain embedded sand may generate significant amounts of dust containing crystalline silica.

Fumes from hot processes may contain other compounds with different exposure limits than those listed herein. Dust or fumes generated by machining, grinding, welding or thermal cutting of the casting may produce airborne contaminants. Exposure limits for the most common contaminants are offered as reference. Please consult a competent person for guidance on exposure assessment and controls.

SUBSTANCE	ACGIH TLV mg/m ³	OSHA PEL mg/m ³
Cobalt (Co) Metal		
Metal Dust and Fume	N/E	0.1
Elemental and Inorganic Compounds	0.02	N/E
Copper Compounds		
Fume (Cu)	0.2	0.1
Dusts and Mists (Cu)	1	1

Lead Compounds Inorganic Compounds (Pb)	0.05	30µg/m ³ AL 50µg/m ³ PEL See 29CFR 1910.1025)
Nickel Compounds (Ni) Insoluble, Inorganic Compounds Soluble, Inorganic Compounds Nickel Oxide	0.2 (I) 0.1 (I) 0.2 (I)	1 1 1
Tin Oxide (Sn)	2	N/E
Zinc Compounds (Zn) Zinc Oxide Total Dust Zinc Oxide Respirable Dust Zinc Oxide Fume	N/E 2 (R) / 10 (R) STEL N/E	15 5 (R) 5

TERMS

All exposure limits referenced herein are 8 hour time weighted averages (TWA) unless otherwise noted.

N/E = None Established

C = Ceiling

I = Inhalable fraction

R = Respirable fraction

STEL = Short Term Exposure Limit

TLV = Threshold Limit Value/American Conference of Governmental Industrial Hygienists (ACGIH)

PEL = Permissible Exposure Limit / OSHA

AL = Action Level / OSHA

mg/m³ = milligrams per cubic meter

µg/m³ = micrograms per cubic meter

PERSONAL PROTECTION

Proper hand and foot protection is recommended.

SECTION 9—PHYSICAL & CHEMICAL PROPERTIES

APPEARANCE /PHYSICAL STATE

Solid, Orange-red in color

ODOR/ODOR THRESHOLD

None

VAPOR DENSITY

Not applicable

MELTING POINT/FREEZING POINT

Approximately 1085°C (1984°F) for copper

SPECIFIC GRAVITY (relative density)

8.96 g/cm³ for copper (water = 1)

BOILING POINT

2562°C (4644°F) for copper
Melting point of copper-tin alloy (17% tin) is approximately 900°C (1652°F)

VAPOR PRESSURE

Not applicable

FLASH POINT

Not applicable for solid castings

EVAPORATION RATE

Not applicable

FLAMMABILITY

Not flammable for castings in solid form

SOLUBILITY IN WATER

Insoluble

UPPER AND LOWER FLAMMABILITY LIMITS

Not applicable for castings in solid form

pH

Not applicable

AUTO IGNITION TEMPERATURE

Not applicable

VISCOSITY

Not applicable

DECOMPOSITION TEMPERATURE

Not applicable

PARTITION COEFFICIENT

Not applicable

SECTION 10—STABILITY & REACTIVITY**CHEMICAL STABILITY:** Castings in solid form are stable**CONDITIONS TO AVOID:** None**REACTIVITY:** Not reactive**INCOMPATIBLE MATERIALS:** None**HAZARDOUS DECOMPOSITION PRODUCTS**
None**HAZARDOUS POLYMERIZATION**
Not applicable**SECTION 11—TOXICOLOGICAL INFORMATION****POTENTIAL HEALTH EFFECTS****EYE CONTACT:** None**SKIN:** None**INGESTION:** None**INHALATION:** None**Carcinogen Classification of Ingredients**

INGREDIENT	OSHA	NTP	IARC	TARGET ORGAN(S)
Cobalt and Compounds	NL	NL-	2B	Lung
Lead and Inorganic Compounds	NL	R	2A	Lung, Stomach, Liver, Kidney
Nickel Metal	NL	K	2B	Lung, Nasal passages

TERMS**OSHA—Occupational Safety & Health Administration**

Y = Listed as a Human Carcinogen

NTP—National Toxicology Program

K = Known to be a Human Carcinogen

R = Reasonably Anticipated to be a Human Carcinogen (RAHC)

IARC—International Agency for Research on Cancer

1 = Carcinogenic to Humans

2A = Probably Carcinogenic to Humans

2B = Possibly Carcinogenic to Humans

3 = Unclassifiable as to Carcinogenicity in Humans

4 = Probably not Carcinogenic to Humans

Other

NL = Not Listed

SECTION 12—ECOLOGICAL INFORMATION**ECOTOXICITY**

Not applicable

PERSISTENCE AND DEGRADABILITY

Not applicable

BIOACCUMULATION POTENTIAL

Not applicable

MOBILITY IN SOIL

Not applicable

OTHER ADVERSE EFFECTS

Not applicable

SECTION 13—DISPOSAL CONSIDERATIONS

Recover or recycle if possible. Dispose of according to federal, state and local regulations. Dust collected from machining, welding, etc. may be classified as a hazardous waste. Consult federal, state and local regulations.

SECTION 14—TRANSPORT INFORMATION**US DEPARTMENT OF TRANSPORTATION (DOT)-HMR (Hazardous Materials Registration)**

Not Regulated

CANADIAN TRANSPORTATION OF DANGEROUS GOODS (TDG)

Not regulated

UN SHIPPING NAME

Not regulated

UN NUMBER

Not regulated

TRANSPORT HAZARD CLASS

Not regulated

PACKING GROUP

Not regulated

ENVIRONMENTAL HAZARDS None	LABEL(S) REQUIRED? No
TRANSPORT IN BULK Not applicable	SPECIAL SHIPPING INFORMATION Not applicable
SECTION 15—REGULATORY INFORMATION	
US-OSHA (Hazard Communication Standard) References: 29 CFR 1910.1200 Hazard Communication Standard A finished casting is an article as defined in 29CFR 1910.1200 (c) 29 CFR 1910.1000 Air Contaminants 29CFR1910.1025 Lead Dust or fumes generated by cleaning, machining, grinding, or welding of the casting may produce airborne contaminants, such as cobalt, copper, lead, nickel, yellow phosphorus, tin, zinc and silica.	
US-EPA (Toxic Substances Control Act—TSCA) All components of these products are on the TSCA inventory list or are excluded from listing.	
US-EPA (SARA Title III) Releases to the environment of Cobalt, Copper, Lead, Nickel, and Zinc (fume or dust) may be subject to reporting under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.	
CANADA-WHMIS (Workplace Hazardous Materials Information System) This SDS has been prepared according to the hazard criteria of the Controlled Product Regulations (CPR) and the SDS contains the information required by the CPR.	
CANADA DSL (Domestic Substances List) Inventory Status All components of these products are on the DSL Inventory.	
CEPA (Canadian Environmental Protection Act) Lead is on the Toxic Substances List.	
EINECS No. (European Inventory of Existing Commercial Chemical Substances) All components of these products are on the EINECS list.	
RoHS (Restriction of Certain Hazardous Substances) Compliance Castings comply with RoHS	
CALIFORNIA PROPOSITION 65 Compliance WARNING: This product contains or produces chemicals known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code 25248.5 et seq.)	
US STATE REGULATORY INFORMATION Some of the components listed in Section 3 may be covered under specific state regulations.	
SECTION 16 — OTHER INFORMATION	
SDS PREPARED BY American Foundry Society, Inc. Occupational Safety & Health Committee (10-Q)	DATE 01/15
NOTE This data and label information is offered in good faith as typical values and not as a product specification. No warranty either expressed or implied is hereby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review the recommendations in specific context of the intended use and determine if they are appropriate.	

Addendum: Label Information

<p><u>PRODUCT IDENTIFIER</u></p> <p>SC-000-025 Rev 12 COPPER-TIN-LEAD ALLOY CASTINGS LEADED-TIN BRONZE ALLOY CASTINGS</p>	
<p><u>SUPPLIER IDENTIFICATION</u></p> <p>Company Name _____</p> <p>Street Address _____</p> <p>Mailing Address _____</p> <p>City _____ State _____</p> <p>Zip/Postal Code _____ Country _____</p> <p>Emergency Phone Number _____</p> <p>Other Info _____</p>	<p><u>HAZARD PICTOGRAMS</u></p> <p>None*</p> <hr/> <p><u>SIGNAL WORD</u></p> <p>None*</p>
<p><u>PRECAUTIONARY STATEMENTS</u></p> <p>None*</p>	<p><u>HAZARD STATEMENTS</u></p> <p>None*</p>
<p>*Castings do not present hazards in their original form.</p> <p>OTHER INFORMATION</p> <ol style="list-style-type: none"> 1. Grinding castings that have not been cleaned or that contain embedded sand may generate significant amounts of dust containing crystalline silica. 2. Fumes from hot processes may contain other compounds with different exposure limits. Dust or fumes generated by machining, grinding, welding or thermal cutting of the casting may produce airborne contaminants. Consult Sections 3 & 8 of the SDS for further information. 	