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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-ZINC-SILICON ALLOY CASTINGS
SILICON BRONZE ALLOY CASTINGS
SILICON BRASS ALLOY CASTINGS**

SDS SC-000-023 Rev 13

DATE ISSUED

06/15

SECTION 1—PRODUCT IDENTIFICATION & COMPANY INFORMATION

PRODUCT NAME

**COPPER-ZINC-SILICON ALLOY CASTINGS
SILICON BRONZE ALLOY CASTINGS
SILICON BRASS ALLOY CASTINGS**

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

UNS ALLOY DESIGNATIONS:

C87200	C87420	C87510	C87600	C87900
C87400	C87430	C87520	C87610	
C87410	C87500	C87530	C87800	

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	0.0–0.2	7440-48-4
Copper (Cu) Metal	63.0–95.0	7440-50-8
Lead (Pb) Metal	0.0–1.0	7439-92-1
Manganese (Mn) Metal	0.0–1.5	7439-96-5
Nickel (Ni) Metal	0.0–0.2	7440-02-0
Silicon (Si) Metal	0.8–5.5	7440-21-3
Zinc (Zn) Metal	1.0–40.0	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	0.05	30µg/m ³ AL 50µg/m ³ PEL (See 29CFR1910.1025)
Manganese (Mn) Metal	N/E	N/E
Nickel (Ni) Metal	1.5 (I)	1
Silicon (Si) Metal		
Total Dust	N/E	15
Respirable Dust	N/E	5 (R)
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/m³	OSHA PEL mg/m³
Cobalt (Co) Metal Metal Dust and Fume Elemental and Inorganic Compounds	N/E 0.02	0.1 N/E
Copper Compounds Fume (Cu) Dusts and Mists (Cu)	0.2 1	0.1 1
Lead Compounds Inorganic Compounds (Pb)	0.05	30µg/m ³ AL 50µg/m ³ PEL See 29CFR 1910.1025
Manganese Compounds (Mn) Inorganic Compounds Fume	0.02 (R) ; 0.1 (I) 0.2	5 (C) 5 (C)
Nickel Compounds (Ni) Insoluble, Inorganic Compounds Soluble, Inorganic Compounds Nickel Oxide	0.2 (I) 0.1 (I) 0.2 (I)	1 1 1
Zinc Compounds (Zn) Zinc Oxide Total Dust Zinc Oxide Respirable Dust Zinc Oxide Fume	N/E 2 / 10 STEL N/E	15 5 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 Melting point of copper-zinc alloy (20-40% zinc) is approximately 900-1000°C (1652-1832°F)	SPECIFIC GRAVITY (relative density) 8.96 g/cm ³ for copper (water = 1)
BOILING POINT 2562°C (4644°F) for copper	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	---	---	2B	Lung
Lead and Inorganic Compounds	NL	R	2A	Lung Stomach, Liver, Kidney
Nickel Metal	---	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

<p>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</p> <p>Dust or fumes generated by cleaning, machining, grinding, or welding of the casting may produce airborne contaminants, such as cobalt, copper, lead, manganese, nickel, silicon, zinc and silica.</p>
<p>US-EPA (Toxic Substances Control Act—TSCA) All components of these products are on the TSCA inventory list or are excluded from listing.</p> <p>US-EPA ((SARA Title III) Releases to the environment of Cobalt, Copper, Lead, Manganese, 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.</p>
<p>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.</p>
<p>CANADA DSL (Domestic Substances List) Inventory Status All components of these products are on the DSL Inventory.</p>
<p>CEPA (Canadian Environmental Protection Act) Lead is on the Toxic Substances List.</p>
<p>EINECS No. (European Inventory of Existing Commercial Chemical Substances) All components of these products are on the EINECS list.</p>
<p>RoHS (Restriction of Certain Hazardous Substances) Compliance Castings comply with RoHS</p>

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

06/15

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

<u>PRODUCT IDENTIFIER</u> SC-000-023 Rev 13 COPPER-ZINC-SILICON ALLOY CASTINGS SILICON BRONZE ALLOY CASTINGS SILICON BRASS ALLOY CASTINGS	
<u>SUPPLIER IDENTIFICATION</u> Company Name _____ Street Address _____ Mailing Address _____ City _____ State ____ Zip/Postal Code _____ Country _____ Emergency Phone Number _____ Other Info _____	<u>HAZARD PICTOGRAMS</u> None* <u>SIGNAL WORD</u> None*
<u>PRECAUTIONARY STATEMENTS</u> None*	<u>HAZARD STATEMENTS</u> None*
<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.	