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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)

**ALUMINUM BRONZE ALLOY CASTINGS  
COPPER-ALUMINUM-IRON ALLOY CASTINGS  
COPPER-ALUMINUM-IRON-NICKEL ALLOY  
CASTINGS**

**SDS SC-000-028 Rev 12**

**DATE ISSUED**

**01/15**

### SECTION 1—PRODUCT IDENTIFICATION & COMPANY INFORMATION

#### PRODUCT NAME

**ALUMINUM BRONZE ALLOY CASTINGS  
COPPER-ALUMINUM-IRON ALLOY CASTINGS  
COPPER-ALUMINUM-IRON-NICKEL ALLOY CASTINGS**

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

**UNS ALLOY DESIGNATIONS:**

C95200	C95410	C95700	C99500
C95300	C95500	C95710	
C95400	C95600	C95800	

#### 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
Aluminum (Al) Metal	0.50–11.5	7429-90-5
Cobalt (Co) Metal	0.0–5.5	7440-48-4
Copper (Cu) Metal	71.0–91.5	7440-50-8
Iron (Fe) Metal	0.5–5.0	1309-37-1
Lead (Pb) Metal	0.0–0.25	7439-92-1
Manganese (Mn) Metal	0.0–14.0	7439-96-5
Nickel (Ni) Metal	0.0–5.5	7440-02-0
Silicon (Si) Metal	0.0–3.3	7440-21-3
Zinc (Zn) Metal	0.05–2.0	7440-66-6

**SECTION 4—FIRST AID MEASURES**

<b>EYE CONTACT:</b>	Not applicable to solid castings
<b>SKIN CONTACT:</b>	No special requirements for solid castings
<b>INGESTION:</b>	Not applicable
<b>INHALATION:</b>	Not applicable

**SECTION 5—FIREFIGHTING MEASURES**

<b>FLAMMABLE PROPERTIES:</b>	Not applicable
<b>EXTINGUISHING MEDIA:</b>	Not applicable
<b>PROTECTION OF FIREFIGHTERS:</b>	Not applicable

**SECTION 6—ACCIDENTAL RELEASE MEASURES**

Not applicable
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**SECTION 7—HANDLING & STORAGE**

<b>RECOMMENDED STORAGE</b>
No special requirements
<b>PROCEDURES FOR HANDLING</b>
Proper hand and foot protection is recommended.

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

<b>ENGINEERING CONTROLS</b>		
None Required. There are no health hazards from castings in solid form.		
SUBSTANCE	ACGIH TLV mg/m <sup>3</sup>	OSHA PEL mg/m <sup>3</sup>
Aluminum (Al) Metal		
Total Dust	N/E	15
Respirable Dust	1(R)	5 (R)
Cobalt (Co) Metal	0.02	0.1
Copper (Cu) Metal	1	1
Iron (Fe) Metal	N/E	N/E
Lead (Pb) Metal	0.05	30µg/m <sup>3</sup> AL 50µg/m <sup>3</sup> 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/m <sup>3</sup>	OSHA PEL mg/m <sup>3</sup>
Aluminum Oxide (Al)		
Total Dust	N/E	15
Respirable Dust	1	5
Cobalt (Co)		
Metal Dust and Fume	N/E	0.1
Metal and Inorganic Compounds	0.02	N/E
Copper Compounds		
Fume (Cu)	0.2	0.1
Dusts and Mists (Cu)	1	1
Iron Compounds		
Iron Oxide (Fe <sub>2</sub> O <sub>3</sub> ) Fume	N/E	10
Iron Oxide (Fe <sub>2</sub> O <sub>3</sub> ) Respirable	5 (R)	N/E
Lead Compounds		
Inorganic Compounds (Pb)	0.05	30µg/m <sup>3</sup> AL 50µg/m <sup>3</sup> PEL (See 29CFR 1910.1025)
Manganese Compounds (Mn)		
Inorganic Compounds	0.02 (R) 0.1 (I)	5 (C)
Fume	0.2	5 (C)
Nickel Compounds (Ni)		
Insoluble, Inorganic Compounds	0.2 (I)	1
Soluble, Inorganic Compounds	0.1 (I)	1
Nickel Oxide	0.2 (I)	1
Zinc Compounds (Zn)		
Zinc Oxide Total Dust	N/E	15
Zinc Oxide Respirable Dust	2 / 10 STEL	5
Zinc Oxide Fume	N/E	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/m <sup>3</sup> =	milligrams per cubic meter
µg/m <sup>3</sup> =	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/cm<sup>3</sup> 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	NL	NL	2B	Lung
Lead and Inorganic Compounds	NL	R	2A	Lung, Stomach, Liver, Kidney
Nickel Metal	NL	K	2B	Lung, Nasal passages
<b>TERMS</b> <b>OSHA—Occupational Safety &amp; Health Administration</b> Y = Listed as a Human Carcinogen <b>NTP—National Toxicology Program</b> K = Known to be a Human Carcinogen R = Reasonably Anticipated to be a Human Carcinogen (RAHC) <b>IARC—International Agency for Research on Cancer</b> 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 <b>Other</b> NL = Not Listed				
SECTION 12—ECOLOGICAL INFORMATION				
<b>ECOTOXICITY</b> Not applicable		<b>PERSISTENCE AND DEGRADABILITY</b> Not applicable		
<b>BIOACCUMULATION POTENTIAL</b> Not applicable		<b>MOBILITY IN SOIL</b> Not applicable		
<b>OTHER ADVERSE EFFECTS</b> 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				
<b>US DEPARTMENT OF TRANSPORTATION (DOT)-HMR (Hazardous Materials Registration)</b> Not Regulated		<b>CANADIAN TRANSPORTATION OF DANGEROUS GOODS (TDG)</b> Not regulated		
<b>UN SHIPPING NAME</b> Not regulated		<b>UN NUMBER</b> Not regulated		
<b>TRANSPORT HAZARD CLASS</b> Not regulated		<b>PACKING GROUP</b> Not regulated		
<b>ENVIRONMENTAL HAZARDS</b> None		<b>LABEL(S) REQUIRED?</b> No		
<b>TRANSPORT IN BULK</b> Not applicable		<b>SPECIAL SHIPPING INFORMATION</b> Not applicable		
SECTION 15—REGULATORY INFORMATION				
<b>US-OSHA (Hazard Communication Standard)</b> 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 aluminum, cobalt, copper, iron, lead, manganese, nickel, silicon, zinc and silica.				

<b>US-EPA (Toxic Substances Control Act–TSCA)</b> All components of these products are on the TSCA inventory list or are excluded from listing.	
<b>US-EPA (SARA Title III)</b> Releases to the environment of <b>Aluminum (fume or dust), Cobalt, Copper, Lead, Manganese, Nickel and Zinc (fume or dust)</b> 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.	
<b>CANADA-WHMIS (Workplace Hazardous Materials Information System)</b> 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.	
<b>CANADA DSL (Domestic Substances List) Inventory Status</b> All components of these products are on the DSL Inventory.	
<b>CEPA (Canadian Environmental Protection Act)</b> <b>Lead</b> is on the Toxic Substances List.	
<b>EINECS No. (European Inventory of Existing Commercial Chemical Substances)</b> All components of these products are on the EINECS list.	
<b>RoHS (Restriction of Certain Hazardous Substances) Compliance</b> Castings comply with RoHS	
<b>CALIFORNIA PROPOSITION 65 Compliance</b> 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.)	
<b>US STATE REGULATORY INFORMATION</b> Some of the components listed in Section 3 may be covered under specific state regulations.	
<b>SECTION 16—OTHER INFORMATION</b>	
<b>SDS PREPARED BY</b> American Foundry Society, Inc. Occupational Safety & Health Committee (10-Q)	<b>DATE</b> <b>01/15</b>
<b>NOTE</b> 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

<b><u>PRODUCT IDENTIFIER</u></b>  SC-000-028 Rev 12 ALUMINUM BRONZE ALLOY CASTINGS COPPER-ALUMINUM-IRON ALLOY CASTINGS COPPER-ALUMINUM-IRON-NICKEL ALLOY CASTINGS	
<b><u>SUPPLIER IDENTIFICATION</u></b>  Company Name _____  Street Address _____  Mailing Address _____  City _____ State _____  Zip/Postal Code _____ Country _____  Emergency Phone Number _____  Other Info _____	<b><u>HAZARD PICTOGRAMS</u></b>  None*  <b><u>SIGNAL WORD</u></b>  None*
<b><u>PRECAUTIONARY STATEMENTS</u></b>  None*	<b><u>HAZARD STATEMENTS</u></b>  None*
<p>*Castings do not present hazards in their original form.</p> <p><b>OTHER INFORMATION</b></p> <ol style="list-style-type: none"><li>1. Grinding castings that have not been cleaned or that contain embedded sand may generate significant amounts of dust containing crystalline silica.</li><li>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 &amp; 8 of the SDS for further information.</li></ol>	