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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

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
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 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/m ³	OSHA PEL mg/m ³
Aluminum Oxide (Al) Total Dust Respirable Dust	N/E 1	15 5
Cobalt (Co) Metal Dust and Fume Metal 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
Iron Compounds Iron Oxide (Fe ₂ O ₃) Fume Iron Oxide (Fe ₂ O ₃) Respirable	N/E 5 (R)	10 N/E
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

SPECIFIC GRAVITY (relative density)

8.96 g/cm³ 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
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 aluminum, cobalt, copper, iron, lead, manganese, nickel, silicon, 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 **Aluminum (fume or dust), 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.

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

<u>PRODUCT IDENTIFIER</u> SC-000-028 Rev 12 ALUMINUM BRONZE ALLOY CASTINGS COPPER-ALUMINUM-IRON ALLOY CASTINGS COPPER-ALUMINUM-IRON-NICKEL 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.	