THE FEDERAL METAL CO.

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)

MANGANESE BRONZE ALLOY CASTINGS
LEADED MANGANESE BRONZE ALLOY CASTINGS

SDS SC-000-022 Rev 13

DATE ISSUED

01/15

SECTION 1—PRODUCT IDENTIFICATION & COMPANY INFORMATION

PRODUCT NAME

MANGANESE BRONZE ALLOY CASTINGS
LEADED MANGANESE BRONZE ALLOY CASTINGS

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

C86100	C86500	C99700
C86200	C86700	C99750
C86300	C86800	
C86400	C99600	

PRODUCT IDENTIFICATION (Label Identifier)
X86... X99...

MANUFACTURER'S NAME The Federal Metal Co.	**STREET ADDRESS** 7250 Divison Street
EMERGENCY TELEPHONE NO. 440-232-8700	**MAILING ADDRESS** 7250 Division Street
TELEPHONE NO. 440-232-8700	**CITY, STATE, ZIP CODE, COUNTRY** Bedford, Ohio, 44146, U.S.A.
FAX NO. 440-232-8726	**E-MAIL ADDRESS/WEBSITE** www.FederalMetal.com

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	0.5–7.5	7429-90-5
Cobalt (Co) Metal	0.0–6.0	7440-48-4
Copper (Cu) Metal	54.0–68.0	7440-50-8
Iron (Fe) Metal	0.4–4.0	1309-37-1
Lead (Pb) Metal	<0.2–2.0	7439-92-1
Manganese (Mn) Metal	0.1–23.0	7439-96-5
Nickel (Ni) Metal	0.0–6.0	7440-02-0
Tin (Sn) Metal	<0.2–2.5	7440-31-5
Zinc (Zn) Metal	17.1–42.0	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 Respirable Dust	 N/E 1 (R)	 15 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
Tin (Sn) Metal	2	2
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
Aluminum Oxide (Al)		
Total Dust	N/E	15
Respirable Dust	1 (R)	5 (R)
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_2O_3) Fume	N/E	10
Iron Oxide (Fe_2O_3) Respirable	5 (R)	N/E
Lead Compounds		
Inorganic Compounds (Pb)	0.05	30µg/m³ AL 50µg/m³ PEL See 29CFR 1910.1025)
Manganese Compounds (Mn)		
Fume and Inorganic Compounds	0.02 (R) 0.1 (I)	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
Tin Oxide (Sn)	2	N/E
Zinc Compounds (Zn)		
Zinc Oxide Total Dust	N/E	15
Zinc Oxide Respirable Dust	2 / 10 (R) 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^3 =	milligrams per cubic meter
$\mu g/m^3$ =	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 (17–42% 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	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
29 CFR 1910.1025 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, 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	DATE
American Foundry Society, Inc. Occupational Safety & Health Committee (10-Q)	**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

PRODUCT IDENTIFIER

SC-000-022 Rev 13
MANGANESE BRONZE ALLOY CASTINGS
LEADED MANGANESE BRONZE ALLOY CASTINGS

SUPPLIER IDENTIFICATION

Company Name The Federal Metal Co.

Street Address 7250 Division Street

Mailing Address 7250 Division Street

City Bedford State OH

Zip/Postal Code 44146 Country U.S.A.

Emergency Phone Number 440-232-8700

Other Info

HAZARD PICTOGRAMS

None*

SIGNAL WORD

None*

PRECAUTIONARY STATEMENTS

None*

HAZARD STATEMENTS

None*

*Castings 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 of the SDS for further information.