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)

SELENIUM-BISMUTH ALLOY CASTINGS
BISMUTH ALLOY CASTINGS

SDS SC-000-059 Rev 4

DATE ISSUED

01/15

SECTION 1— PRODUCT IDENTIFICATION & COMPANY INFORMATION

PRODUCT NAME

SELENIUM-BISMUTH ALLOY CASTINGS
BISMUTH ALLOY CASTINGS

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

C89510	C89535	C89835
C89520 (SeBiloy)	C89836	
C89530	C89844	
C89833	C89325	

PRODUCT IDENTIFICATION (Label Identifier)
X895… X898…

MANUFACTURER'S NAME **The Federal Metal Co.**	**STREET ADDRESS** **7250 Division 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, USA**
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
Bismuth (Bi) Metal	0.5–3.5	7440-69-9
Cobalt (Co) Metal	(Included with Ni%)	7440-48-4
Copper (Cu) Metal	85.0–91.0	7440-50-8
Lead (Pb) Metal	0.25 (max)	7439-92-1
Nickel (Ni) Metal	1.0 (max) Includes Co%)	7440-02-0
Selenium (Se) Metal	0.35–1.2	7782-49-2
Tin (Sn) Metal	2.0–6.5	7440-31-5
Zinc (Zn) Metal	2.0–9.0	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/m³	OSHA PEL mg/m³
Bismuth (Bi) Metal	N/E	N/E
Cobalt (Co) Metal	0.02	0.1
Copper (Cu) Metal	1	1
Lead (Pb) Metal	0.5	30µg/m³ AL 50µg/m³ PEL (See 29CFR1910.1025)
Nickel (Ni) Metal	1.5 (I)	1
Selenium (Se) Metal	0.2	N/E
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
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/m³ AL 50µg/m³ PEL (See 29CFR 1910.1025)
Nickel Compounds (Ni)		
Insoluble, Inorganic Compounds	0.2 (I)	1
Soluble, Inorganic Compounds	0.1 (I)	1
Nickel Oxide	0.2 (I)	1
Selenium Compounds (Se)	0.2	0.2
Tin Oxide (Sn)	2	N/E
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/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	VAPOR DENSITY
None	Not applicable

MELTING POINT/FREEZING POINT Approximately 1085°C (1984°F) for copper	**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
Selenium Metal	NL	NL	3	Eye & URT (Upper Respiratory Tract)

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 bismuth, cobalt, copper, lead, nickel, selenium, 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, Selenium 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-000-059 Rev 4
SELENIUM-BISMUTH ALLOY CASTINGS
BISMUTH 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

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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.