

**SAFETY DATA SHEET (SDS) Non-Ferrous Alloys****Aluminum Bronze Castings, Extrusions, and Forgings**

No. J79-191, Rev. H

Dated 30-07-2015

**SECTION 1: PRODUCT IDENTIFICATION****Product Identifier:** Aluminum Bronze Castings, Extrusions, Forgings, Safety Tools**Manufacturer's Name:**AMPCO METAL S.A.  
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**Material Name:**

Copper Base Alloy Castings, Extrusions, Forgings, Rods, Bars, Tubes, Shapes, Flat Products, Scrap Materials, and Safety Tools.

These materials are commonly referred to as High-Copper Alloys, Aluminum Bronzes, Silicon Bronzes, Manganese Bronzes and Copper-Nickel Alloys.

**SECTION 2: HAZARDS IDENTIFICATION****Hazard Classification**

This product is exempt from classification according to the OSHA Hazard Communication Standard (CFR 1910.1200) since it is an article as sold and under normal conditions of use.

**Label Elements****Signal Word** Not applicable**Symbols** Not applicable**Pictograms** Not applicable**Hazards Not Otherwise Classified**

Dust or fumes generated by machining, grinding, sawing, blasting, polishing, buffing, brazing, soldering, welding or thermal cutting of the casting may produce airborne contaminants (see Section 8) that are hazardous.

**SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**

Individual AMPCO Alloy compositions are shown on the Certification of Chemical and Mechanical Properties, when supplied, or may be found in AMPCO promotional literature.

Elements having a listed percentage greater than zero will be present in all alloy grades.

Elements having percentages starting with zero may not be present in certain alloy grades.

| Element    | CAS Number | Percent(%) by weight |
|------------|------------|----------------------|
| Aluminum** | 7429-90-5  | 0-20                 |
| Chromium*  | 7440-47-3  | 0-2                  |
| Cobalt*    | 7440-48-4  | 0-3                  |
| Copper*    | 7440-50-8  | 50-100               |



| Element    | CAS Number | Percent(%) by weight |
|------------|------------|----------------------|
| Iron       | 7439-89-6  | 0-6                  |
| Lead*      | 7439-92-1  | 0-11                 |
| Manganese* | 7439-96-5  | 0-14                 |
| Nickel     | 7440-02-0  | 0-32                 |
| Silicon    | 7440-21-3  | 0-4                  |
| Tin        | 7440-31-5  | 0-20                 |
| Zinc       | 7440-66-6  | 0-42                 |
| Zirconium  | 7440-67-7  | 0-0.5                |

\* This constituent, a toxic chemical, makes this product subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40CFR Part 372. Quantity threshold for this chemical, below which reporting of releases is not required, is 25,000 pounds.

\*\* This constituent is reportable only if in the form of dust or fume.

Note: Chromium, lead and nickel have been identified as potential human carcinogens. This material is classified as not hazardous under OSHA regulations

#### **SECTION 4: FIRST AID MEASURES**

##### **Eye Contact**

No need for first aid is anticipated under normal use conditions

##### **Inhalation**

No need for first aid is anticipated under normal use conditions.

If symptoms develop following exposure to fumes or dusts released from the processing of the casting (e.g. machining, grinding, sawing, blasting, polishing, buffing, brazing, soldering, welding or thermal cutting), immediately remove person from exposure. Seek medical attention if symptoms persist.

##### **Skin**

No need for first aid is anticipated under normal use conditions.

Vacuum off excess dust. Wash well with soap and water. Avoid blowing particulate into the atmosphere. Contact with these alloy grades in the molten condition will cause severe burns. Get medical attention.

##### **Ingestion**

No need for first aid is anticipated under normal use conditions.

Seek medical attention if large quantities of material have been ingested.

##### **Most Important Symptoms and Effects, both Acute and Delayed**

None expected under normal conditions of use.

Dust or fumes generated by machining, grinding, sawing, blasting, polishing, buffing, brazing, soldering, welding or thermal cutting of the casting may produce airborne contaminants (see Sections 8 and 11) that are hazardous.

##### **Indication of Immediate Medical Attention and Special Treatment Needs**

Not applicable

#### **SECTION 5: FIRE FIGHTING MEASURES**

##### **Suitable Extinguishing Media**

Use suitable extinguishing methods for surrounding fire

##### **Special Hazards Arising from the Substance**

Not applicable

##### **Special Protective Actions for Fire Fighter**

Not applicable

#### **SECTION 6: ACCIDENTAL RELEASE MEASURES**

##### **Personal Precautions, Protective Equipment and Emergency Procedures**

No special measures required



**Environmental Precautions**

Not applicable

**Methods and Material for Containment and Clean-up**

Not applicable

**SECTION 7: HANDLING AND STORAGE**

**Precautions for Safe Handling**

No special requirements.

**Conditions for Safe Storage, Including Any Incompatibilities**

No special storage requirements.

**SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION**

Occupational Exposure Limits

Dust or fumes generated by machining, grinding, sawing, blasting, polishing, buffing, brazing, soldering, welding or thermal cutting of the casting may produce airborne contaminants with the following Occupational Exposure Limits (OELs):

| Component                                 | CAS Number | Percent %  | OSHA PEL TWA                       | ACGIH TLV® TWA      |
|---|------------|------------|------------------------------------|---------------------|
|   |            |            | Milligrams Per Cubic Meter (mg/m3) |                     |
| Aluminum**<br>Metal & Insoluble Compounds | 7429-90-5  | 0-20       |                                    |                     |
|   |            | Dust       | 15                                 | 1 (R)               |
|   |            | Fume       | 5 (R)                              | 1 (R)               |
| Chromium*                                 | 7440-47-3  | 0-2        |                                    |                     |
|   |            |            |                                    | 0.1                 |
| Cobalt*                                   | 7440-48-4  | 0-3        |                                    |                     |
|   |            |            |                                    | 0.1                 |
| Copper*                                   | 7440-50-8  | 50-100     |                                    |                     |
|   |            | Dust       | 1                                  | 1                   |
|   |            | Fume       | 0.1                                | 0.2                 |
| Iron<br>Iron Oxide                        | 7439-89-6  | 0-6        |                                    |                     |
|   |            | Dust/Fume  | 10                                 | 5 (R)               |
| Lead*<br>Metal & Inorganic                | 7439-92-1  | 0-11       |                                    |                     |
|   |            | Dust/Fume  | 0.05                               | 0.15                |
| Manganese*                                | 7439-96-5  | 0-14       |                                    |                     |
|   |            | Dust       | 5                                  | 0.020 (R)           |
|   |            | Fume       |                                    | 0.1 (I)             |
| Component                                 | CAS Number | Percent %  | OSHA PEL 8-Hr TWA                  | ACGIH TLV® 8-Hr TWA |
|   |            |            | Milligrams Per Cubic Meter (mg/m3) |                     |
| Nickel*                                   | 7440-02-0  | 0-32       |                                    |                     |
|   |            | Elemental  | 1                                  | 1.5 (I)             |
|   |            | Insoluble  | 1                                  | 0.2 (I)             |
| Niobium                                   | 7440-03-1  | 0-3        | None Established                   |                     |
| Silicon                                   | 7440-21-3  | 0-4        |                                    |                     |
|   |            | Total Dust | 15                                 |                     |
|   |            | Respirable | 5                                  |                     |



| Tin<br>Oxide & Inorganic Compounds | 7440-31-5     | 0-20       |                                    |                   |
|------------------------------------|---------------|------------|------------------------------------|-------------------|
|                                    |               |            | 0.1                                | 0.1               |
| Component                          | CAS<br>Number | Percent %  | OSHA PEL<br>TWA                    | ACGIH TLV®<br>TWA |
|                                    |               |            | Milligrams Per Cubic Meter (mg/m3) |                   |
| Zinc**<br>Oxide                    | 7440-66-6     | 0-42       |                                    |                   |
|                                    |               | Total Dust | 15                                 | 10                |
|                                    |               | Fume       | 5                                  | 5                 |
|                                    |               |            |                                    | 10 (STEL)         |
| Zirconium                          | 7440-67-7     | 0-0.5      | 5                                  | 5                 |

Elements having a listed percentage greater than zero will be present in all alloy grades. Elements having percentages starting with zero may not be present in certain alloy grades.

\* This constituent, a toxic chemical, makes this product subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40CFR Part 372. Quantity threshold for this chemical, below which reporting of releases is not required, is 25,000 pounds.

\*\* This constituent is reportable only if in the form of dust or fume.

**Exposure Limit Abbreviations**

**NE**= None Established

**ACGIH TLV**= American Conference of Governmental Industrial Hygienists Threshold Limit Value®, 2015 Edition

**OSHA PEL**= Occupational Health and Safety Administration Permissible Exposure Limit

**TWA**= Time Weighted Average

**STEL**= Short Term Exposure Limit

**C**= Ceiling Limit

**mg/m3**= milligram of substance per cubic meter of air

**R**= Respirable fraction of particulate sampled

**I**= Inhalable fraction of particulate sampled

**Appropriate Engineering Controls**

In the solid state, no special requirements are necessary. If processes such as machining, grinding, sawing, blasting, polishing, buffing, brazing, soldering, welding or thermal cutting are used on the casting, local exhaust ventilation may be required to maintain concentrations of airborne hazardous ingredients below the applicable exposure limits.

**Personal Protective Equipment**

**Eye Protection**

Wear safety glasses with side-shields if there is a risk of particles getting in eyes

**Skin protection**

No chemical protective clothing is required. If material is processed, use appropriate protective clothing and gloves for the application.

**Respiratory Protection**

In the solid state, no special requirements are necessary. Airborne dust or fumes can be generated by machining, grinding, sawing, blasting, polishing, buffing, brazing, soldering, welding or thermal cutting of the castings. Respiratory protection may be necessary if concentrations of these hazardous ingredients exceed the applicable exposure limits. In these cases a NIOSH approved respirator should be selected based on the form and concentration of the contaminant in air

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

|   |  |
|---|--|
| <b>Appearance</b>                                   | Solid, Golden or copper colored material |
| <b>Odor</b>   | Not applicable                           |
| <b>Odor threshold</b>                               | Not applicable                           |
| <b>pH</b>   | Not applicable                           |
| <b>Melting Point</b>                                | 1742-2050° F (950-1121° C)               |
| <b>Initial boiling point &amp; boiling range</b>    | Not applicable                           |
| <b>Flash Point</b>                                  | Not applicable                           |
| <b>Evaporation Rate</b>                             | Not applicable                           |
| <b>Flammability</b>                                 | Not applicable                           |
| <b>Upper/Lower flammability or explosive limits</b> | Not applicable                           |
| <b>Vapor Pressure</b>                               | Not applicable                           |
| <b>Vapor Density</b>                                | Not applicable                           |
| <b>Relative Density</b>                             | Not applicable                           |
| <b>Solubility in Water</b>                          | Not applicable                           |
| <b>Partition Coefficient</b>                        | Not applicable                           |
| <b>Auto-Ignition Temperature</b>                    | Not applicable                           |
| <b>Decomposition Temperature</b>                    | Not applicable                           |
| <b>Viscosity</b>                                    | Not applicable                           |

**SECTION 10: STABILITY AND REACTIVITY**

|   |   |
|---|---|
| <b>Reactivity</b>                         | Inert, not reactive                           |
| <b>Chemical Stability</b>                 | Stable  |
| <b>Possibility of Hazardous Reactions</b> | Will not occur                                |
| <b>Conditions to avoid</b>                | None known                                    |
| <b>Incompatible Materials</b>             | None known                                    |
| <b>Hazardous Decomposition Products</b>   | None expected under conditions of normal use. |

**SECTION 11: TOXICOLOGICAL INFORMATION**

This product as sold is an article but processing may release hazardous substances. Information about these components is supplied.

**Acute Toxicity**

|               |  |
|---------------|--|
| <b>Copper</b> | Eye and respiratory irritation may occur. High exposure to copper dust may cause gastrointestinal effects due to oral ingestion. |
| <b>Nickel</b> | One study showed severe lung and kidney damage following exposure to extremely high levels of nickel powder.                     |

**Skin Corrosion / Irritation**

None expected

**Serious Eye Damage or Irritation**

None expected

**Respiratory or Skin Sensitization**

- Cobalt** May cause allergy or asthma symptoms or breathing difficulties if inhaled. Contact allergic dermatitis may occur.
- Nickel** Contact allergic dermatitis may occur.

**Germ Cell Mutagenicity**

- Nickel** Chromosomal aberrations and in vitro and in vivo testing has shown that nickel is genotoxic (ASTDR)

**Carcinogenicity**

- Aluminum** Not listed by IARC, NTP or OSHA
- Cobalt** Listed by IARC (possibly carcinogenic to humans-Group 2B). Not listed by NTP or OSHA.
- Copper** Not listed by IARC, NTP or OSHA
- Iron** Not listed by IARC, NTP or OSHA
- Manganese** Not listed by IARC, NTP or OSHA
- Nickel** Listed by IARC (possibly carcinogenic to humans-Group 2BA) and NTP (known to be a human carcinogen). The strongest evidence for carcinogenicity is for sulfidic nickel forms and the evidence for oxidic forms of nickel are the weakest. There is no evidence that metallic nickel is associated with nasal or lung cancer (ASTDR).

**Reproductive Toxicity**

None expected

**Specific Target Organ Toxicity-Single Exposure**

- Copper** A few studies have shown copper to cause metal fume fever, a condition characterized by chills, fever, muscular pain, nausea, and vomiting but these are limited in number and details. Studies have reported upper respiratory tract irritation, metallic taste sensation and nausea.
- Nickel** One study showed severe lung and kidney damage following exposure to extremely high levels of nickel powder.

**Specific Target Organ Toxicity-Repeated Exposure**

- Aluminum** There is some evidence that aluminum may accumulate in the body with long-term exposure. Lung changes have been reported in workers exposed to high levels of aluminum dust. Some studies have indicated that there may be subtle neurological effects following long-term exposure to aluminum.
- Cobalt** Animal studies have shown respiratory effects following inhalation exposure (lung edema, decreased pulmonary function). Transient myocardial changes have also been reported. Studies have shown asthma and pulmonary function changes in workers in the cemented tungsten carbide industry and cobalt is thought to play a significant role in these effects although it is not the only substance these workers were exposed to.
- Iron** Prolonged exposure may lead result in iron deposits in the lung, a condition known as siderosis
- Manganese** Inflammatory changes in the lung were found in monkeys exposed to manganese dioxide via inhalation for 10 months. At high exposure levels (greater than 5 mg/m<sup>3</sup>), manganism (chronic manganese poisoning) has been reported in workers. Symptoms of manganism include sleepiness, weakness in the legs, a mask-like facial appearance, emotional disturbances and a spastic gait. High levels of pneumonia have also been reported in workers inhaling large amounts of manganese dust and fume. In some studies, manganese has been associated with longer reaction times, hand steadiness and eye-hand coordination. Effects appear to be more pronounced with exposures to respirable sized particles.
- Nickel (elemental and nickel oxide)** Animal studies have shown lung changes and inflammation.

**Aspiration Hazard**

Based on the physical form, the product is not expected to be an aspiration hazard.



**SECTION 12: ECOLOGICAL INFORMATION**

**Toxicity** Eco toxicity is expected to be minimal since the casting is a solid with low water solubility.  
**Persistence and Degradation** Not applicable  
**Bioaccumulation** Not applicable  
**Mobility in Soil** Not applicable  
**Environmental Fate** Not applicable

**SECTION 13: DISPOSAL INFORMATION**

This product is not considered to be hazardous waste according to US RCRA and Canadian regulations. Recover or recycle if possible. Dispose of according to federal, state and local regulations. Dust collected from casting processing operations (e.g. machining, grinding, sawing, blasting, polishing, buffing, brazing, soldering, welding or thermal cutting) may be classified as a hazardous waste. Consult federal, state and local regulations.

**SECTION 14: TRANSPORTATION INFORMATION**

**U.S. Department of Transportation (DOT)** Product is not regulated  
**International Maritime Dangerous Goods (IMDG)** Product is not regulated  
**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** Product is not regulated  
**International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)** Product is not regulated

**SECTION 15: REGULATORY INFORMATION**

If this product is reformulated or further processed, the regulatory status of the components listed in the composition section of this sheet may be altered. The following regulatory information may not be complete and should not be relied upon as the sole source of information regarding regulatory responsibilities.

**Occupational Health and Safety Administration**

This product is an article as sold. Dust or fumes generated by machining, grinding, sawing, blasting, polishing, buffing, brazing, soldering, welding or thermal cutting of the casting may produce airborne contaminants that are regulated by OSHA.

**TSCA Chemical Inventories**

This product is an article as defined by TSCA regulations, and is exempt from TSCA Inventory listing requirements

**Other Regulatory Information**

| Chemical                | CAS #     | EINECS    | CERCLA RQ (lbs) | Section 313 | NPRI Threshold Category | California Prop 65 |
|-------------------------|-----------|-----------|-----------------|-------------|-------------------------|--------------------|
| Aluminum (fume or dust) | 7429-90-5 | 231-072-3 |                 | 313         | 1A                      |                    |
| Cobalt                  | 7440-48-4 | 231-158-0 |                 | 313         | 1A                      | Carcinogen         |
| Copper                  | 7440-50-8 | 231-159-6 | 5,000           | 313         | 1A                      |                    |
| Iron                    | 7439-89-6 | 231-096-4 |                 |             |                         |                    |
| Manganese               | 7439-96-5 | 231-105-1 |                 | 313         | 1A                      |                    |
| Nickel                  | 7440-02-0 | 231-111-4 | 100             | 313         | 1A                      | Carcinogen         |

**CAS-** Chemical Abstract Service- Registry Number

**EINECS** - European Inventory of Existing Commercial Chemical Substances

**CERCLA RQ (reportable quantity)** - if a value is listed then releases of particles, ≤ 100 µm in size, to the environment may require reporting under CERCLA Sections 102-103 (40 CFR Part 302)



**Section 313** - if '313' is listed then may be subject to the reporting requirements found under EPCRA Section 313 (40 CFR Part 372)

**NPRI (National Pollutant Release Inventory) Threshold Category** - if 1A or 1B is listed, may be subject to reporting under the Canadian Environmental Protection Act, 1999

**California Prop 65** - if listed WARNING: This product contains chemicals known to the State of California to cause cancer.

These products are not believed to contain any substances that meet the notification requirements found under EPCRA Sections 302 or 304 (40 CFR Part 355) nor subject to the accidental release prevention requirements under CAA 112(r) (40 CFR Part 68).

## **SECTION 16: OTHER INFORMATION**

This MSDS is intended to be used as a guide to the appropriate handling, storage, and use of this product by an adequately trained person. AMPCO METAL S.A. is not responsible for the misuse, mishandling or improper storage of this material by the user. This product is exempt from classification according to the OSHA Hazard Communication Standard (CFR 1910.1200) since it is an article as sold and under normal conditions of use.

Dust or fumes generated by machining, grinding, sawing, blasting, polishing, buffing, brazing, soldering, welding or thermal cutting of the casting can produce airborne contaminants that are hazardous. Consult the Safety Data Sheet (SDS) for this product for further information.

WARNING: This product contains chemical(s) known to the State of California to cause cancer.