Material Safety Data Sheet

Section I - Product Information

Product Name Grade B - Aluminum Bronze Alloys **Product Description** Bronze Casting	
Manufacturer's Name and Address MetalTek International, Inc. 905 E. St. Paul Ave. Waukesha, WI 53188-3898	**Telephone Number for Information** 262-544-7777 **Emergency Telephone Number** 1-800-424-9300

Section II - Hazard Ingredients/Identity Information

Castings may contain all or some of the following components:

Hazardous Components	CAS #	ACGIH TLV®*	OSHA PEL**
Aluminum	7429-90-5	10 mg/m^3(TWA)	15 mg/m^3(TWA) for total dust 5 mg/m^3(TWA) for respirable fraction
Copper	7440-50-8	0.2 mg/m^3 (TWA) for copper fume 1 mg/m^3 (TWA) for copper dust	0.1 mg/m^3 (TWA) for copper fume 1 mg/m^3 (TWA) for copper dust
Iron	7439-89-6 (metal) 1309-37-1 (iron oxide)***	10 mg/m^3 (TWA) for iron dust 5 mg/m^3 (TWA) for iron oxide ***	15 mg/m^3 (TWA) for iron dust 10 mg/m^3 (TWA) for iron oxide***
Manganese	7439-96-5	0.2 mg/m^3 (TWA)	5 mg/m^3 (C)
Nickel	7440-02-0	1.5 mg/m^3 (TWA) as the inhalable fraction	1.0 mg/m^3 (TWA) as total dust

* From the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) for 2002
** From the Occupational Safety and Health Administration's Permissible Exposure Limits (PEL) in CFR 1910.1000
*** Iron oxide is formed when alloys containing iron are heated to high temperatures in processes such as welding, torching or melting. Iron dust, generated in operations such as grinding, would use the particles, not otherwise classified (PNOC) exposure limits that are referenced in the Table.
TWA = Time Weighted Average for an 8 hour period of exposure
STEL = Short Term Exposure Limit for a 15 minute time period of exposure
C = Ceiling limit; this number should not be exceeded at any time during exposure

Note: Dust would be created from abrasive processes such as grinding, cutting, sawing or sanding while fumes would be created when the metal is heated to high temperatures such as melting the product in a furnace or welding on the metal.

Section III - Physical and Chemical Properties

Boiling Point
Not known for mixture.
Melting Point
Depends on the composition of the alloy but greater than 1500° F.
pH
Not applicable.
Specific Gravity
Not known for the mixture.
Vapor Pressure
Not applicable.
Vapor Density
Not applicable.
Evaporation Rate
Not applicable.
Solubility
Not soluble in water; may be soluble in some acids.
Appearance and Odor
Solid; silver, golden or copper colored material; odorless.

Section IV - Fire and Explosion Hazard Data

Flash Point
Not applicable; non-combustible.
Flammable Limits
Not applicable; non-combustible in solid form.
Unusual Fire and Explosion Hazards
Not a fire hazard in the solid form. Dust can be generated from this product during operations such as grinding, sawing, cutting, polishing, or buffing. Suspensions of metal dusts containing aluminum, iron and manganese in the air may pose a moderate to serious explosion hazard. The fire/explosion potential increases as the particle size decreases. The dust may ignite and explode through contact with excessive heat, flame, or other sources of ignition as well as with chemical reactions with powerful oxidizers.
Fire Extinguishing Measures
For castings use extinguishing media appropriate for surrounding fire. Use class D extinguisher for fires involving metal fines. DO NOT use water or halogenated extinguishing agents on fires with small metal chips or fines.
Hazardous Combustion Products
Not applicable.

Section V – Reactivity Data

Stability
Stable compound when in the solid form.
Conditions and Materials to Avoid
In the solid form, material is very stable and no special precautions are needed. Molten metal may explode upon contact with water.
Hazardous Polymerization
None expected.
Hazardous Decomposition Products
When present in a finely divided form, some of the metal components may react with water, strong acids and bases, halogens, or strong oxidizers; these reactions may cause the evolution of flammable hydrogen gas.

Section VI – Health Hazard Information

Route(s) of Entry

Inhalation - Yes.
Skin - Yes, but no absorption through skin.
Ingestion - No, not under normal occupational conditions of use.
Eyes - Yes, if in the form of dust.

Health Hazards (Acute and Chronic)

Inhalation - In the solid form, there is no inhalation hazard from this material. Breathing dusts created through grinding, cutting or sawing may cause symptoms including irritation of the respiratory tract. Effects of overexposures to the individual metal components in dusts or fumes can be described as follows:

Aluminum: Aluminum dust may cause irritation of the respiratory tract.
Copper: Overexposure to copper dust and fumes can cause irritation to the nose and throat. Overexposure to copper fumes may cause alterations in taste.
Iron: Overexposure to iron oxide may cause siderosis, a usually benign lung condition.
Manganese: Overexposure to manganese may cause mucous membrane irritation, lung damage, and pneumonia. Chronic overexposure may result in adverse central nervous system effects such as sleepiness, weakness in the legs, and emotional disturbances (uncontrollable laughter, spastic gait).
Nickel: Overexposure to nickel may cause pulmonary irritation, pulmonary fibrosis, pulmonary edema and bronchial asthma. Some forms of nickel may cause cancer of the lungs, sinus or larynx although exposure to nickel in the metallic form (the form which would exist in dusts generated from alloys containing nickel) do not appear to be strongly associated with cancer.

Ingestion - Not applicable when in the solid form.
Skin Contact – Nickel may cause irritation of the skin resulting in redness or allergic skin reactions. Such exposure can occur when handling the materials in the solid state but more often come from contact with dust. Contact with hot metal particles can cause burns.
Eye Contact – In the solid form, there is no hazard to the eyes from this product. Metal dust generated during grinding, sawing, cutting etc. may cause irritation of the eyes from physical abrasion.

Carcinogenicity

NTP – Yes for the following: Nickel: Category 2B (Reasonably Anticipated to be Carcinogenic to humans)
IARC Monographs - Yes, for the following: Nickel: Category 2B (Possibly carcinogenic to humans)
OSHA Regulated – No
ACGIH – No

Signs and Symptoms of Exposure

Irritation of the eyes, nose and throat.

Medical Conditions Generally Aggravated by Exposure

Individuals with allergies to nickel may experience allergic skin reactions.

Emergency and First Aid Procedures

Inhalation - If discomfort occurs, move to a well ventilated area. Seek medical attention if discomfort persists.
Ingestion - Give large amounts of water to drink. Seek medical attention.
Skin Contact – Wash skin with soap and water. If irritation develops, seek medical attention.
Eye Contact – Metal particles should be removed only by trained personnel. Seek medical attention if discomfort persists.

Section VII - Precautions for Safe Handling and Use

Respiratory Protection

A properly fitted NIOSH approved respirator for protection against particulates is recommended if the airborne exposures exceed the applicable exposure limits. For emergencies or other instances where the exposure levels are unknown and expected to be high, a full facepiece, positive pressure, air supplied respirator should be worn.

Ventilation

In the solid state, no special requirements are necessary. If a casting is to be welded, machined, torched, cut, ground, polished or buffed, local exhaust ventilation may be needed to maintain concentrations of hazardous ingredients below the exposure limits. If finely divided particles are going to be generated through the use of this product, special ventilation should be provided to eliminate explosion hazards. The dust concentrations in the ventilation ducts should be maintained below the lower explosive limit for the metals involved, and sources of ignition should be eliminated.

Eye Protection

If particles are generated from processes such as grinding, sawing, cutting, polishing or buffing, safety glasses with side shields should be worn. Proper eye protection is needed when welding is performed on the casting.

Skin Protection

No special skin protection is required to protect from exposures to toxic substances although individuals with allergic responses to nickel may need skin protection to reduce the potential for adverse skin reactions. Hand protection should be worn to protect hands from sharp metal edges when handling castings. Additional skin protection may be needed when castings are welded, gouged or cut to protect against flying and/or hot particles.

Handling and Storage Precautions

No special storage requirements needed. Finely divided dusts may be reactive and may present a fire and explosion risk and special ventilation procedures are needed. Concentrations of fine particles should be kept below the lower explosive limit at all times. Metal scrap should be thoroughly dried before remelting. Dust collected from machining, welding or grinding operations may be classified as hazardous waste depending on the alloy and federal, state, and/or local regulations.

Steps to be Taken in Case Material is Released or Spilled; Waste Disposal
Metal products can be recycled. No special neutralizing agents are needed for clean up of metal spills. Dispose of in accordance with federal, state and local regulations.

Section VIII - Other Information

Section 313 Supplier Notification
This product may contain one or more of the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right to Know Act of 1986 (Title III of SARA) and of 40 CFR 372:

Chemical Name	CAS #
Aluminum	7429-90-5
Copper	7440-50-8
Manganese	7439-96-5
Nickel	7440-02-0

California Proposition 65 Listed Chemicals
This product may contain one or more of the following substances classified as a cancer or reproductive hazard:

Chemical Name	CAS #
Nickel	7440-02-0

Kay Dally Rowntree, CIH of Industrial Hygiene Solutions, LLC prepared this MSDS on July 2, 2002.

Disclaimer:
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. MetalTek International, Inc. and Industrial Hygiene Solutions, LLC is not responsible for the misuse, mishandling or improper storage of this material by the user. METALTEK INTERNATIONAL, INC. AND INDUSTRIAL HYGIENE SOLUTIONS, LLC NEITHER MAKES, NOR OFFERS NOR SHALL BE HELD LIABLE FOR ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING ANY WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WITH RESECT TO THE USE OF THE INFORMATION PROVIDED.

Hazardous Substances Present in Aluminum Bronze Alloys
(% by weight in alloy)

C	Mn	Si	Cr	Ni	Mo	S	P	Cu	W	Co	Nb	Zr	Ti	Va	Ta	Al	Fe	Pb	Zn	Sn
	<20			**<5**				**>70**								**<20**	**<10**			**<5**

C= Carbon
Mn= Manganese
Si= Silicon
Cr= Chromium
Ni= Nickel
Mo= Molybdenum
S= Sulfur
P= Phosphorus
Cu= Copper
W= Tungsten
Co= Cobalt
Nb= Niobium (columbium)
Zr= Zirconium
Ti= Titanium
Va= Vanadium
Ta= Tantalum
Al= Aluminum
Fe= Iron
Pb= Lead
Zn= Zinc
Sn= Tin