SAFETY DATA SHEET

Brass Alloy / Phosphor Bronze Alloy / Nickel Silver Alloy

SECTION 1 - Product and Company Identification

Product Name :	**UNS# / CDA #**	**COMMON NAME**
	C21000	Gilding Metal
	C22000	Commercial Bronze
	C22600	Jewelry Bronze
	C23000	Red Brass
	C24000	Low Brass
	C26000	Cartridge Brass
	C27000	Yellow Brass
	C50700	Phosphor Bronze E
	C51000	Phosphor Bronze A
	C52100	Phosphor Bronze C
	C74000	C740
	C74500	Nickel Silver, 65-10
	C75200	Nickel Silver, 65-18
	C75700	Nickel Silver, 65-12

Manufacturer Information: Nacobre
Carretera Panamericana Km 292
38260 Villagran Gto. México

Telephone: 01 (411)-155-1111

Chemical Family: Copper Alloy

Emergency: 01 (55) 5728-5300

Issue Date: June 25th, 2015

SECTION 2 - Hazards Identification

GHS Classification:
Copper Alloy Products in the natural state do not present an inhalation, ingestion, or contact hazard.
Metal with high level of specified mass, can cause strokes if not handled properly.

GHS Label Elements:
None required

SECTION 3 - Composition / Information on Ingredients

COMPONENT	CAS #	%
Copper	7440-50-8	63 - 96
Lead	7439-92-1	0 - 0.25
Manganese	7439-96-5	0 - 0.50
Nickel	7440-02-0	0 - 19.5
Tin	7440-31-5	0 - 9.0
Zinc	7440-66-6	0 - 37

Note: This SDS applies to a range of alloys. For actual compositions refer to material test report or specifi alloy specification. All percentages are by weight.

SECTION 4 - First Aid Measures

Eyes:

Lift eyelids and flush immediately with flooding amounts of water for at least 15 minutes. Do not allow the victim to rub his/her eyes or keep them shut. Consult a physician or ophthalmologist if all material cannot be removed or it there is continuing irritation.

Skin:

Remove dothing around affected area. Rinse away loose material and wash affected area with soap and water. If there is a severe skin reaction or reddened or blistered skin, consult a physician.

Ingestion:

Get immediate medical attention. Do not induce vomiting unless directed by medical personnel.

Inhalation:

Move the person to fresh air and support breathing as required. Consult a physician if victim has continued.

SECTION 5 - Fire Fighting Measures

PROPERTY	VALUE
Explosive	No
Flammable	No
Combustible	No
Pyrophoric	No
Flash Point (°C)	Not Applicable
Burning Rate of Metgerial	Not Applicable
Lower Explosive Limit	Not Applicable
Autoignition Temperature	Not Applicable
Upper Explosive Limit	Not Applicable

Extinguishing Media:

This material is noncombustible. Use extinguishing media appropriate to the surrounding fire.

Special Fire Fighting Procedures:

Copper Alloy products in the solid state present no fire or explosion hazard.

SECTION 6 - Accidental Release Measures

Steps to be Taken in the event of Spills, Leaks, or Releases: Not applicable.

SECTION 7 - Handling and Storage

Handling:

In welding; precautions should be taken for airborne contaminants that may originate from components of the welding rod.

Storage:

Protect containers from physical damage.

SECTION 8 - Exposure Controls / Personal Protection

COMPONENT	CAS #	ACGIH TLV TWA	OSHA PEL TWA
Copper	7440-50-8	0.2 mg/m³ (fumes) 1 mg/m³ (dusts and mists)	0.1 mg/m³ (fumes) 1 mg/m³ (dusts and mists)
Lead	7439-92-1	0.05 mg/m³	0.05 mg/m³
Manganese	7439-96-5	0.2 mg/m³	Ceiling - 5 mg/m³
Nickel	7440-02-0	1.5 mg/m³ (inhalable fraction)	1 mg/m³
Tin	7440-31-5	2 mg/m³	2 mg/m³
Zinc	7440-66-6	None Established	None Established

Note: If this product is heated and fumes are generated, zinc oxide fumes could be formed. The ACGIH TLV and OSHA PEL for zinc oxide fume is 5 mg/m³.

Engineering Controls:

Local exhaust ventilation is recommended if significant dusting occurs or fumes are generated. Other-wise, use general exhaust ventilation.

Eye / Face Protection:

Use safety glasses.

Skin Protection:

Wear impervious (cut-resistant) gloves and other protective clothing. If generating a dust, wash thoroughly after handling, especially before eating, dringing, or smoking.

Respiratory Protection:

Respiratory protection not normally needed. If dusting occurs or fumes are generated above the PEL / TLV, use a NIOSH-approved half-face or full-face respirator equipped with High Efficiency Particulate (HEPA) filter cartridges.

General Hygiene Considerations:

Do not eat, drink or smoke while using tis product in dust form.

SECTION 9 - Physical and Chemical Properties

PROPERTY	VALUE
Appearance:	BRASS ALLOY: Red/Gold Metallic BRONZE ALLOY: Red Metallic NICKEL SILVER ALLOY: Silvery White Metallic
Odor:	None
Molecular Weight:	Not Applicable - Mixture
Physical State:	Solid
pH:	Not Applicable
Vapor Pressure (mm Hg):	Not Applicable
Vapor Density:	Not Applicable
Solubility in Water (20°C):	Negligible
Volatiles, Percent by volume:	Not Applicable
Vapor Density (air = 1):	Not Applicable

PROPERTY	VALUE
Boiling Point (°F):	No data
Melting Point:	BRASS ALLOY: L= 930-1065°C (1706-1949°F) S= 905-1050°C (1661-1922°F) BRONZE ALLOY: L= 1020-1075°C (1868-1967°F) S= 880-1050°C (1616-1922°F) NICKEL SILVER ALLOY: L= 1021-1110°C (1870-2030°F) S= 980-1071°C (1796-1960°F)
Specific Gravity (g/cc):	BRASS ALLOY: 8.69 BRONZE ALLOY: 8.85 NICKEL SILVER ALLOY: 8.70
Bulk Density:	BRASS ALLOY: 8.69 g/cc BRONZE ALLOY: 8.85 g/cc NICKEL SILVER ALLOY: 8.70 g/cc
Viscosity (cps):	Not Applicable
Decomposition Temperature:	Not Applicable
Evaporation Rate:	Not Applicable
Octanol/Water partition coefficient:	Unknown

SECTION 10 - Stability and Reactivity

Stability:

Stable under normal temperatures and pressure.

Conditions to Avoid:

Not affected by mechanical impact or shock or by electrical descharge. For nickel silver alloy, avoid contact with carbon monoxide, particularly at temperatures between 50°C and 300°C, to prevent formation of nickel carbonyl which is toxic and a carcinogen.

Materials to Avoid:

Acetylene, chlorine.

Hazardous Decomposition Products:

When heated to decomposition, may produce metal oxides and fumes. Inhalation of high concentrations of metal fumes may cause a condition know as "metal fume fever" wich is characterized by flu-like symptoms.

Hazardous Polymerization:

Will not occur.

SECTION 11 - Toxicological Information

Acute Toxicity:

Type	For Product (Dust or Fume)	For Components					
		Copper	Lead	Manganese	Nickel	Tin	Zinc
Oral LD_{50}	Believed to be moderately toxic	3.5 mg/kg (mouse intraperi-toneal)	No data	9 g/kg (rat)	> 5 g/kg (rat)	No data	No data
Dermal LD_{50}	Believed to be > 2 g/kg	375 mg/kg (rabbit, subcutan-eous)	No data	No data	> 7.5 g/kg (rabbit subcutan-eous)	No data	No data

Type	For Product (Dust or Fume)	For Components					
		Copper	Lead	Manganese	Nickel	Tin	Zinc
Inhalation LD_{50}	Believed to be slightly to moderately toxic	No data	No data	No data	> 12 g/kg (rat, intra-tracheal)	No data	No data
Irritation	Believed to be an eye and respiratory irritant	Respiratory irritant	Not irritating	Mild skin and eye irritant	Respiratory irritant, skin sensitizer	No data	Eye irritant

Subchronic / Chronic Toxicity:

No information for product. Lead has caused blood, kidney and nervous system damage in laboratory animals.

Carcinogenicity:

In laboratory animal studies, chronic exposure to high concentrations of nickel has caused an increase in lung and nasal tumors. The International Agency for Research on Cancer (IARC) has classified nickel as possibly carcinogenic to humans, group 2B. The International Agency for Research on Cancer (IARC) lists leas as possibly carcinogenic to humans, group 2B.

Mutagenicity:

This product is not known or reported to be mutagenic. Nickel and lead have been shown to be mutagenic in "in vitro" studies.

Reproductive, Teratogenicity, or Developmental Effects:

This product is not known or reported to cause reproductive or developmental effects. Exposure of male rats to high concentrations of nickel caused testicular degeneration. However, symptoms of systemic toxicity, including severe weight loss were also observed at the same concentrations indicating that the testicular effects were secondary to the frank toxicity. Lead has been shown to affect fetal development including birth defects and reduce male reproductive function in laboratory animals.

Neurological Effects:

This product is not known or reported to cause neurological effects. Lead has caused peripheral and central nervous system damage and behavioral effects in laboratory animals. Chronic exposure to very high concentrations of manganese dust has caused nervous system effects including muscle weakness, tremors, and behavioral changes in humans.

Interactions with other Chemicals which enhance Toxicity:

None known or reported.

SECTION 12 - Ecological Information

Ecotoxicity:

No data is available on this product. Individual constituents are as follows:

COPPER: The toxicity of copper to aquatic organisms varies significantly not only with the species, but also with the physical and chemical characteristics of the water, such as its temperature, hardness, turbidity and carbon dioxide content. Copper concentrations varying from 0.1 to 1.0 mg/l have been found by various investigators to be not toxic for most fish.

However, concentrations of 0.015 to 3.0 mg/l have been reported as toxic, particularly in soft water to many kinds of fish, crustaceans, mollusks, insects and plankton.

NICKEL: 96 hr LC_{50}, rainbow trout=31.7 mg/L; 96 hr LC_{50}, fathead minnow=3.1 mg/L; 72 hr $EC_{50}C$, freshwater algae (4 species):=01 mg/L; 96 hr LC_{50}, Daphmia=0.51 mg/L.

LEAD: LC_{50} (48 hrs.) to bluegill (lepomis macrochirus) is reported to be 2-5 mg/l. Lead is toxic to waterfowl.

Mobility:
Dissolved lead may migrate through soil.

Persistance / Degradability:
Not biodegradable. Lead may persist and accumulate in the environment.

Bioaccumulation:
No data.

SECTION 13 - Disposal Considerations

Maximize product recovery for reuse or recycling. Conditions of use may cause this material to become a solid "Hazardous Waste" as defined by state or federal laws. Solid waste "leachate" testing may indicate the need for properly permitted through pre-treatment or direct discharge NPDES requirements. Appropriate analyses should be conducted to ensure compliance with existing wasterwater permits.

SECTION 14 - Transport Information

Not regulated.
DOT Hazardous Materials Proper Shipping Name:
None.
DOT Hazard Class: No Data Available.

SECTION 15 - Regulatory Information

US FEDERAL

TSCA	The components of this product are listed on the Toxic Substance Control Act inventory.				
CERCLA:	Zinx, R.Q.= 1000 lbs; Copper, R.Q.= 5000 lbs; Lead, R.Q.0 10 lbs; Nickel, R.Q.=100 lbs No reporting is required if diameter of the pieces of metal is equal to or exceeds 100 micrometers (0.004 inches)				
SARA 313:	Copper, Nickel, Zinc (fume or dust), Lead, Manganese				
SARA 313 Hazard Class:	Health: For dust or fume only	Acute - Yes, Chronic - Yes	Fire: None	Reactivity: None	Realease of Pressure: None
SARA 302 EHS List:	None of the components of this product are listed.				

R.Q. = Reportable Quantity

STATE RIGHT-TO-KNOW STATUS

Component	*CA Prop. 65	New Jersey	Pennsylvania	Massachusetts	Michigan
Copper	Not Listed	X	X	X	X
Lead	X	X	X	X	X
Manganese	Not Listed	X	X	X	Not Listed
Nickel	X	X	X	X	X
Tin	Not Listed	Not Listed	X	X	Not Listed
Zinc	Not Listed	X	Not Listed	X	X

* "WARNING: This product contains detectable amounts of a chemical (s) known to the State of California to cause cancer and/or birth defects or other reproductive harm."

EUROPEAN REGULATIONS

Because this material contains lead at > 0.2%, and nickel at > 0.1%, this material is classified as **Xn, Harmful.** However, this material in its massive solid form is not required to be labeled under EC regulations.

German WGK Classification: Unknow.

CANADIAN REGULATIONS

DSL LIST:	The components of this product are on the DSL or are exempt from reporting under the New Substances Notidication Regulations.
IDL:	Copper, Lead, Nickel and Manganese-
WHMIS:	This product is considered to be a manufactured article and therefore not subject to WHMIS requirements.

SECTION 16 - Other Information

National Fire Protection Association (NFPA) Ratings:
This information is intended solely for the use of individuals trained in the NFPA systems.

Health: 2 Flammability: 0 Reactivity: 0

Disclaimer:
This information in this SDS was obtained from sources which we believe are reliable. However, the information is provided without warranty, express or implied, regarding its correctness.
The conditions or methods of handling, storage, use and disposal of this product are beyond our control and may be beyond our knowledge. For this and other reasons, we don not assume responsibility and expressly disclaim liability for loos, damage or expense aristing out of or in any way connected with the handling, storage and disposal of the product.

Glossary:
ACGIH= American Conference of Govemmental Industrial Hygienists; **CAS**= Chemical Abstract Service; **CERCLA**= Comprehensive Environmental Response, Compensation and Liability Act; **GHS**= The Globally Harmonized System of classification and # labelling of chemicals; **LC_{50}**= The concentration of a chemical in air or of a chemical in water wich causes the death of 50% (one half) of a group of test animals; **LD_{50}**= The amount of a chemical, given all at once, wich causes the death of 50% (one half) of agroup of test animals; **OSHA**= Occupational Safety and Health Act; **NIOSH**= National Institute for Occupational Safety and Health; **SARA**= Superfund Amendments and Reauthoryzation Act; **TLV**= Threshold Limit Value; **TWA**= Time weighted Average.