Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: HIGH COPPER ALLOY
Chemical Name: Metal Alloy
Synonyms: High Copper, UNS/CDA Alloy Nos. c18000-c19999 (excluding 18135), WRM 194-9, B-52
Chemical Family: Copper
Formula: Not applicable - mixture
Product Use: Metallurgical Products
Manufacturer:

SDS Control Group
Olin Brass
305 Lewis and Clark Blvd
East Alton, IL 62024-1197
www.olinbrass.com

Technical Information:
(618)258-5654

Emergency Information:
(618)258-5167

2. HAZARD IDENTIFICATION

United States (US)

According to the OSHA 29 CFR 1910.1200 HCS

Health hazards associated with this product only apply in a fume or dust form.

Classification of the substance or mixture (Fume or Dust)

OSHA HCS 2012 Flammability – 0 Health – 1 Physical – 0

Label Elements OSHA HSC 2012

Hazard Statements
Causes skin irritation – H315

May cause respiratory irritation – H335

Precautionary statements
Avoid breathing dust or fumes – P261

Prevention
Avoid breathing dust or fumes – P261

Do not get in eyes, on skin, or on clothing – P262

In case of inadequate ventilation wear respiratory protection – P285

Response

EYE CONTACT: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. – P305 + P351 + P338.

If eye irritation develops, Get medical advice/attention – P313

SKIN CONTACT: Rinse skin with water/shower – P353

Take off contaminated clothing and wash before reuse – P362

If skin irritation or rash develops, get medical advice/attention – P363

INHALATION: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing – P340

Get medical advice/attention – P313

INGESTION: Not a likely route of exposure for finished metal alloy.

If dust is ingested, immediately drink water to dilute.

Get medical advice/attention – P363

NOTE TO PHYSICIANS: There is no specific antidote to the active ingredients in this product; use symptomatic treatment.

Other Hazards

OSHA HSC 2012 Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Exposure to dust or fume may aggravate an existing dermatitis, asthma, emphysema, or other respiratory disease.

Canada According to WHMIS

Classification of the substance or mixture

WHMIS This product is considered to be a manufactured article and therefore not subject to WHMIS requirements.

Other Information

NFPA Not rated

3. COMPOSITION/INFORMATION ON INGREDIENTS

CAS Number	Components	% By Weight	EINECS/ ELINCS #	EU Classification	
				Symbol	R-Phrase
7440-50-8	Copper	91.5 – 99.9	231-159-6	None	None
7439-89-6	Iron	0 – 3.0	231-096-4	None	None
7440-66-6	Zinc	0 – 5.0	231-096-4	None	None
7440-48-4	Cobalt	0 – 1.3	231-158-0	Xn	R 42/43
7440-02-0	Nickel	0 – 3.0	231-111-4	Xn	R 40-43
7440-47-3	Chromium (non-Hexavalent)	0 – 1.5	231-157-5	None	None
7440-31-5	Tin	0 – 2.5	231-141-8	None	None
7439-92-1	Lead	0 – 3.5	231-100-4	None	None
7440-32-6	Titanium	0 – 3.4	231-142-3	None	None

7440-21-3	Silicon	0 – 1.0	231-130-8	None	None
7440-22-4	Silver	0 – 1.0	231-131-3	None	None
7439-95-4	Magnesium	0 – 1.0	231-104-6	None	None

OSHA REGULATORY STATUS: In solid form, not hazardous. Dust or fume: carcinogen, irritant, lung, blood, kidney, reproductive and developmental toxin, neurotoxin, sensitizer

In solid form, this material is not hazardous. Dust and fumes are hazardous materials.

4. FIRST AID MEASURES

EYE CONTACT: Immediately flush out fume and dust particles with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If eye irritation develops, call a physician at once.

SKIN CONTACT: If exposed to dust or fumes, wash skin with plenty of water. Remove contaminated clothing and shoes and launder before reuse. If skin irritation or rash develops and persists or recurs, get medical attention.

INHALATION: If symptoms of lung irritation occur (coughing, wheezing or breathing difficulty), remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial respiration. Keep affected person warm and at rest. Get medical attention.

INGESTION: Not a likely route of exposure for finished metal alloy. If dust is ingested, immediately drink water to dilute. Consult a physician if symptoms develop.

NOTE TO PHYSICIANS: There is no specific antidote to the active ingredients in this product; use symptomatic treatment.

5. FIRE FIGHTING MEASURES

PROPERTY	VALUE	PROPERTY	VALUE
Explosive	No	Flammable	No
Combustible	No	Pyrophoric	No
Flash Point (°C):	Not Applicable	Burning Rate of Material	Not Applicable
Lower Explosive Limit:	Not Applicable	Auto Ignition Temp:	Not Applicable
Upper Explosive Limit:	Not Applicable	Flammability Classification: (Defined by 29 CFR 1910.1200)	Not Applicable

UNSUAL FIRE AND EXPLOSION HAZARDS: Dust may cause an ignitable and/or an explosive atmosphere.

EXTINGUISHING MEDIA: For localized powder fires, smother with dry sand, dry dolomite, sodium chloride or soda ash. Use fire-extinguishing media appropriate to fight surrounding fire.

SPECIAL FIREFIGHTING PROCEDURES: None required.

6. ACCIDENTAL RELEASE MEASURES

FOR ALL TRANSPORTATION ACCIDENTS, CALL (618) 258-5167.

In dust form, this product may be an explosion hazard. Remove all sources of ignition. Dust of fume may be suppressed by the use of a local exhaust system. Dispose of per guidelines under Section 13, WASTE DISPOSAL.

7. HANDLING AND STORAGE

HANDLING:	Avoid dispersion of dust in air.
STORAGE:	No special requirements.
Shelf Life Limitations:	None known.
Incompatible Materials for Packaging:	None known.
Incompatible Materials for Storage or Transport:	None known.
OTHER PRECAUTIONS:	Do not shake clothing, rags or other items to remove dust. Dust should be removed by washing or HEPA vacuuming.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CAS #	*CHEMICAL NAME*	*ACGIH TLV*	*OSHA PEL*	*INTERNATIONAL OELS*
7440-50-8	Copper	0.2 mg/m^3 (fume), 1 mg/m^3 (dusts and mists)	0.1mg/m^3 (fume) 1 mg/m^3 (dusts and mists)	Austria, Belgium, Canada: 0.2 mg/m^3 (fumes), 1 mg/m^3 (dusts) Denmark: 1.0 mg/m^3 (dust and powder) Germany (MAK): 0.1 mg/m^3 (fume), 1 mg/m^3 (dusts and mists)
7439-89-6	Iron	None established	None established	None established
7440-66-6	Zinc	None established	None established	None established
7440-48-4	Cobalt	0.02 mg/m^3	0.1 mg/m^3	Austria: Group A2 carcinogen, skin & resp. sensitizer Canada (BC): 0.02 mg/m^3, K3, Z, A Canada (Alberta & others): 0.05 mg/m^3 Denmark: 0.02 mg/m^3 Germany: MAK - 2 (Sah)
7440-47-3	Chromium	0.5 mg/m^3	1 mg/m^3	Finland: 0.1 mg/m^3 Belgium, Denmark, France, Netherlands, Norway, Poland, Sweden, U.K.: 0.5 mg/m^3
7440-31-5	Tin	2 mg/m^3	2 mg/m^3	U.K. (LTEL): 5 mg/m^3 Austria & Germany (MAK), Belgium, Finland, Denmark, The Netherlands, Poland, Switzerland: 2 mg/m^3 Hungary, Norway: 1 mg/m^3
7440-02-0	Nickel	1.5 mg/m^3 (inhalable)	1 mg/m^3	Germany, MAK = 1 mg/m^3 Canada (B.C.), Czechoslovakia, Denmark, Norway – 0.05 mg/m^3, K1, sensitizer Poland = 0.25 mg/m^3 Ireland, Sweden, Switzerland, U.K. = 0.5 mg/m^3 Belgium, Canada (Alberta & others), Finland, Japan, Mexico, Netherlands – 1 mg/m^3 Portugal = 1.5 mg/m^3

7439-92-1	Lead	0.05 mg/m^3	0.05 mg/m^3	Austria, Denmark, Germany, Sweden, Switzerland: 0.1 mg/m^3 Norway, Poland: 0.05 mg/m^3
7439-95-4	Magnesium	None established	None established	None established
7440-21-3	Silicon*	10 mg/m^3	15 mg/m^3	Belgium, Denmark, France, Netherlands, U.K. – 10 mg/m^3
7440-22-4	Silver	0.1 mg/m^3	0.01 mg/m^3	Germany: 0.1 mg/m^3 (inhalable)
7440-32-6	Titanium	None established	None established	None established

*This substance is regulated by OSHA as a Particulate Not Otherwise Regulated (PNOR). The exposure limits listed for both OSHA and ACGIH refer to total dust; the OSHA PEL for the respirable fraction is 5 mg/m^3.

ENGINEERING CONTROLS: Local exhaust ventilation is recommended if significant dusting occurs or fumes are generated. Otherwise, use general exhaust ventilation.

EYE / FACE PROTECTION: Use safety glasses.

SKIN PROTECTION: Wear impervious (cut-resistant) gloves and other protective clothing (aprons, coveralls) as appropriate to prevent skin contact when using this product. If generating a dust, wash thoroughly after handling, especially before eating, drinking, 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 this product in dust form.

9. PHYSICAL AND CHEMICAL PROPERTIES

PROPERTY	VALUE	PROPERTY	VALUE
Appearance:	Red metallic	*Vapor Density (air = 1):*	Not applicable
Odor:	None	*Boiling Point (° F):*	No data
Molecular Weight:	Not applicable - Mixture	*Melting point:*	L:1080–1090°C (1976-1995°F) S:965-1085°C (1769- 1985°F)
Physical State:	Solid	*Specific gravity (g/cc):*	8.94
pH:	Not applicable	*Bulk Density:*	8.94 g/cc
Vapor Pressure (mm Hg):	Not applicable	*Viscosity (cps):*	Not applicable
Vapor Density:	Not applicable	*Decomposition:*	Not applicable
Solubility in Water (20° C):	Negligible	*Evaporation Rate:*	Not Applicable
Volatiles, Percent by volume:	Not applicable	*Octanol/water partition coefficient:*	Unknown

10. STABILITY AND REACTIVITY

STABILITY:	Stable under normal temperatures and pressure
CONDITIONS TO AVOID:	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 known as "metal fume fever" which is characterized by flu-like symptoms.
HAZARDOUS POLYMERIZATION:	Will not occur.

11. TOXICOLOGICAL INFORMATION

POTENTIAL EXPOSURE ROUTES: For dust: ingestion, inhalation, and eye contact. For fume: inhalation and eye contact. The finished alloy metal is not hazardous.

ACUTE ANIMAL TOXICITY DATA:

	Oral LD50	Dermal LD50	Inhalation LC50	Irritation
For Product:	Believed to be > 5 g/kg	Believed to be > 2 g/kg	Believed to be slightly to moderately toxic	Eye and respiratory irritant, sensitizer
Copper	3.5 mg/kg (mouse, intraperitoneal)	375 mg/kg (rabbit, subcutaneous)	No data	Respiratory irritant
Iron	30 g/kg (rat)	No data	No data	Eye irritant
Zinc	No data	No data	No data	Eye irritant
Cobalt	6.171 g/kg (rat)	No data	165 mg/m^3 (30-min., rat, cobalt oxides)	Respiratory irritant, skin and respiratory sensitizer
Lead	No data	No data	No data	Not irritating
Magnesium	No data	No data	No data	No data
Chromium	27.5 mg/kg (rat)	No data	87 mg/m^3 (4 hrs, rat)	Respiratory and nasal irritant
Tin	No data	No data	No data	No data
Nickel	> 5 g/kg (rat)	> 7.5 g/kg (rabbit subcutaneous)	> 12 mg/kg (rat, intratracheal)	Respiratory irritant, skin sensitizer
Silver	> 10 g/kg (mouse)	No data	No data	No data
Silicon	3.16 g/kg (rat)	No data	No data	Eye, skin, respira- tory irri-tant
Titanium	No data	No data	No data	No data

SUBCHRONIC/ CHRONIC TOXICITY:	No information for product. Lead has caused blood, kidney and nervous system damage in laboratory animals.

CARCINOGENICITY:	IARC lists cobalt and cobalt compounds as possibly carcinogenic to humans, Group 2B. The International Agency for Research on Cancer (IARC) lists lead as possibly carcinogenic to humans, group 2B. 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 National Toxicology Program (NTP) classifies nickel as a known human carcinogen.
MUTAGENICITY:	This product is not known or reported to be mutagenic. Nickel has been shown to be mutagenic in in vitro studies. Lead has been shown to be mutagenic in several *in vitro* assays.
REPRODUCTIVE, TERATOGENICITY, OR DEVELOPMENTAL EFFECTS:	This product is not known or reported to cause reproductive or developmental effects. Lead has been shown to affect fetal development including birth defects and reduce male reproductive function in laboratory animals. 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. Exposure at these levels is highly unlikely under normal working conditions.
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.
INTERACTIONS WITH OTHER CHEMICALS WHICH ENHANCE TOXICITY:	None known or reported.

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.

Chromium: *Daphnia magna*, 48 hr. LC_{50} = 0.022 mg/L; Fathead minnow, 96 hr LC_{50} = 39 mg/L

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}, freshwater algae (4 species): = 0.1 mg/L; 96 hr LC_{50}, *Daphnia* = 0. 51 mg/L

Lead: LC50 (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: Lead may persist and accumulate in the environment.

BIOACCUMULATION: Chromium, BCF = 10 after 24 days in trout.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it DOES NOT meet the criteria of a hazardous waste as defined under 40 CFR 261, in that it does not exhibit the characteristics of hazardous waste of Subpart C, nor is it listed as a hazardous waste under Subpart D. Care must be taken to prevent environmental contamination from the use of this material. The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and non- hazardous wastes. This product may be a candidate for metal reclamation.

14. TRANSPORTATION INFORMATION

	U.S. DOT	RID/ADR	IMDG	IATA	IMO	Canada TDG
PROPER SHIPPING NAME:	Not regulated					
HAZARD CLASS:						
UN NO.:						
PACKING GROUP:						
LABEL:						
REPORTABLE QUANTITY:						

15. REGULATORY INFORMATION

US FEDERAL

TSCA	The components of this product are listed on the Toxic Substance Control Act inventory.				
CERCLA:	Zinc, R.Q. = 1000 lbs.; Copper, R.Q.= 5000 lbs.; Chromium, R.Q. = 5000 lbs.; Lead, R.Q. = 10 lbs.; Nickel, R.Q. = 100 lbs.; Silver, R.Q. = 1000 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, Cobalt, Chromium, Nickel, Zinc (fume or dust), Lead, Silver				
SARA 313 Hazard Class:	*Health*: For dust of fume only	Acute – Yes Chronic - Yes	*Fire:* None	*Reactivity:* None	*Release of Pressure*: None
SARA 302 EHS List:	None of the components of this product are listed.				

*RQ = Reportable Quantity

STATE RIGHT-TO-KNOW STATUS

Component	*CA Prop. 65	New Jersey	Pennsylvania	Massachusetts	Michigan
Copper	Not listed	X	X	X	X
Iron	Not listed	Not listed	Not listed	Not listed	Not listed
Zinc	Not listed	X	Not listed	X	X
Cobalt	X	X	X	X	X
Chromium (not hexavalent)	Not listed	X	X	X	X
Tin	Not listed	Not listed	X	X	Not listed
Nickel	X	X	X	X	X
Titanium	Not listed	Not listed	Not listed	Not listed	Not listed
Lead	X	X	X	X	X

Silver	Not listed	X	X	X	X
Silicon	Not listed	Not listed	X	X	Not listed
Magnesium	Not listed	Not listed	X	Not listed	Not listed

*"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 nickel at > 0.1%, lead and cobalt at > 0.2%, 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: Unknown

CANADIAN REGULATIONS

DSL LIST: The components of this product are on the DSL or are exempt from reporting under the New Substances Notification Regulations.

IDL: Cobalt, Copper, Tin, Nickel, Lead, Chromium, Silver

WHMIS: This product is considered to be a manufactured article and therefore not subject to WHMIS requirements.

16. OTHER INFORMATION

REVISIONS: Update to composition 1/1/04, revised format 6/1/15

PREPARED BY: Olin Brass

NOTICE: THE INFORMATION IN THIS SDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. OLIN BRASS BELIEVES THIS INFORMATION TO BE RELIABLE AND CURRENT AS OF THE DATE OF PUBLICATION, BUT MAKES NO WARRANTY THAT IT IS.

This document reviewed annually