

EMERGENCY PHONE: 1-618-258-5167

THIS MATERIAL SAFETY DATA SHEET (MSDS) KIT HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200.

PRODUCT NAME: TIN COATED BERYLLIUM COPPER ALLOY

(OLIN MSDS No: 01450.0001)

This product consists of a base metal alloy coated with another metal. Attached are Material Safety Data Sheets (MSDS) for the following metal products:

**Base Metal - >99% - Beryllium Copper Alloy
Coating - <1% - Tin Alloy**

THE INFORMATION IN THE ENCLOSED MSDSs 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 BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION, BUT MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF AN MSDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT OLIN AT THE PHONE NUMBER BELOW TO MAKE CERTAIN THAT THE MSDS IS CURRENT.

**MSDS Control Group
Olin Brass**
427 North Shamrock Street
East Alton, IL 62024-1197
Phone Number: (618) 258-5003
www.olinbrass.com

Olin MSDS No.: 00003.0001
Revision No.: 12

Revision Date: 1/1/10
Supercedes: 1/1/09

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: BERYLLIUM COPPER ALLOY
Chemical Name: Metal Alloy
Synonyms: Beryllium Coppers, UNS/CDA Alloy Nos. C17000 - C17999
Chemical Family: Metallic Alloy
Formula: Not applicable - mixture
Product Use: Metallurgical Products

COMPANY ADDRESS	MSDS Control Group Olin Brass 427 North Shamrock St. East Alton, IL 62024-1197 www.olinbrass.com	TECHNICAL INFORMATION: 618-258-5003	EMERGENCY TELEPHONE NUMBER: 1-618-258-5167
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2. COMPOSITION/INFORMATION ON INGREDIENTS

CAS Number	Components	% By Weight	EINECS/ ELINCS #	EU Classification	
				Symbol	R-Phrase
7440-50-8	Copper	98 - 100	231-159-6	None	None
7440-41-7	Beryllium	0.15 - 2.0	231-150-7	T+	R 49-25-26-36/37/38-43-48/23-51/53
7440-48-4	Cobalt	0.2 - 2.7	231-158-0	Xn	R 42/43

OSHA REGULATORY STATUS: In solid form, not hazardous. Dust or fume: carcinogen, irritant, lung and respiratory system toxin, sensitizer

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

3. HAZARDS IDENTIFICATION

WARNING!

EXPOSURE TO DUST OR FUMES CAN CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. EXPOSURE TO DUST OR FUMES CAN CAUSE RESPIRATORY SYSTEM DAMAGE. MAY CAUSE AN ALLERGIC SKIN AND/OR RESPIRATORY REACTION. CONTAINS A MATERIAL WHICH MAY CAUSE CANCER. USE ONLY WITH ADEQUATE VENTILATION. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. WASH THOROUGHLY AFTER HANDLING.

<u>HAZARD RATINGS (for dust or fume)</u>	Degree of hazard (0 = low, 4 = extreme)		
<u>Hazardous Materials Identification System (HMIS)</u>	Health: 3*	Flammability: 0	Physical Hazard: None
<u>National Fire Protection Association (NFPA)</u>	Mixture. Not rated.		

HUMAN THRESHOLD RESPONSE DATA

<u>Odor Threshold:</u>	Unknown
<u>Irritation Threshold:</u>	Unknown
<u>Immediately Dangerous to Life or Health (IDLH) Value(s):</u>	The IDLH for this product is not known. The IDLH for beryllium is 4 mg/m ³ . The IDLH for cobalt is 20 mg/m ³ . The IDLH for copper is 100 mg/m ³ .

POTENTIAL HEALTH EFFECTS

ACUTE EFFECTS

Eye: Dust or fume can cause irritation consisting of redness, swelling, and pain. May cause conjunctivitis with repeated exposures.

Skin: Material not expected to be absorbed through the skin. Contact with dust may cause mild irritation consisting of redness and/or swelling.

Inhalation: Harmful if inhaled. Inhalation of high concentrations of powder, dust, or fume may cause respiratory and nasal irritation, coughing, and difficulty breathing.

Inhalation of high concentrations of metallic copper dusts or fumes may cause nasal irritation and/or nausea, vomiting and stomach pain. Inhalation of high concentrations of beryllium dust can cause a condition known as berylliosis which is a form of chemically induced pneumonia causing fever, chest pain, coughing, fatigue, bloody sputum, wheezing and difficulty breathing. These symptoms may be delayed and not appear for up to 2 weeks after an acute high exposure.

Ingestion: Ingestion of large amounts of dust may cause nausea, diarrhea and or stomach pain.
CHRONIC Prolonged or repeated inhalation of dust or fume may cause more severe irritation
EFFECTS: and possibly lung damage. Repeated exposure may cause an allergic skin reaction consisting of itching, redness, swelling, and rash or urticaria(hives) in sensitized individuals. Prolonged or repeated inhalation of dust or fume may cause an allergic type of asthma reaction characterized by wheezing, coughing, and extreme breathing difficulty in sensitized individuals. Prolonged, repeated exposures to beryllium can cause a chronic lung disease characterized by coughing, wheezing and reduced capacity of the lungs which can lead to heart failure. Ingestion of large amounts of cobalt may affect the heart, but this type of exposure is not anticipated under normal occupational conditions. Epidemiological studies in humans have shown an association between increased incidence of lung cancer and prolonged exposures to beryllium. Beryllium is classified as a known human carcinogen.

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

POTENTIAL ENVIRONMENTAL EFFECTS: None known. Product has not been tested for environmental properties.

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

<i>PROPERTY</i>	<i>VALUE</i>	<i>PROPERTY</i>	<i>VALUE</i>
Explosive	No	Flammable	No
Combustible	No	Pyrophoric	No
Flash Point (°C):	Not applicable	Burning Rate of Material:	Not applicable
Lower Explosive Limit:	Not applicable	Autoignition Temp.:	Not applicable
Upper Explosive Limit:	Not applicable	Flammability Classification: (defined by 29 CFR 1910.1200)	Not applicable

UNUSUAL 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)	0.1 mg/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)
7440-48-4	Cobalt	0.02 mg/m ³	0.1 mg/m ³	Austria: Group A2 carcinogen, skin & respiratory 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)
7440-41-7	Beryllium	0.002 mg/m ³ (inhalable) Sensitizer STEL = 0.01 mg/m ³ Confirmed human carcinogen	0.002 mg/m ³ Ceiling = 0.005 mg/m ³ 30 min. peak per 8 hr. shift = 0.025 mg/m ³	Germany, MAK - Category 2 Denmark, Finland, Iceland, Norway, Poland - 0.001 mg/m ³ , carcinogen Belgium, Canada, Czechoslovakia, France, Ireland, Japan, Portugal, Spain, Sweden, Switzerland, U.K. - 0.002 mg/m ³ , sensitizer, K1 carcinogen Greece - 0.005 mg/m ³

ENGINEERING CONTROLS: When welding, melting, casting, grinding, sanding, polishing, or otherwise abrading the surface of beryllium alloys in a manner which generates finely divided particles, an exposure to airborne beryllium in excess of the occupational standard may occur. Use with adequate ventilation to meet exposure limits listed. Operations generating airborne beryllium must be air sampled to determine exposure levels. Where exposure data indicate, medical surveillance should be conducted.

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. Contaminated work clothing and overgarments should be managed in such a manner so as to prevent secondary exposure to beryllium dust.

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:	Metallic brass color	Vapor Density (air = 1):	Not applicable
Odor:	None	Boiling Point (°F):	No data
Molecular Weight:	Not applicable - Mixture	Melting point:	871°C (1600 °F)
Physical State:	Solid	Specific gravity (g/cc):	8.4
pH:	Not applicable	Bulk Density:	8.4 g/cc
Vapor Pressure (mm Hg):	Not applicable	Viscosity (cps):	Not applicable
Vapor Density:	Not applicable	Decomposition Temperature:	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: Not affected by mechanical impact or shock or by electrical discharge.
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:

For Product: (dust or fume):		For Components		
		Copper	Cobalt	Beryllium
Oral LD ₅₀	Believed to be moderately toxic	3.5 mg/kg (mouse, intraperitoneal)	6.171 g/kg (rat)	18 - 200 mg/kg (rat, various beryllium compounds)
Dermal LD ₅₀	Believed to be > 2 g/kg	375 mg/kg (rabbit, subcutaneous)	No data	No data
Inhalation LC ₅₀	Believed to be slightly to moderately toxic	No data	165 mg/m ³ (30-min., rat, cobalt oxides)	> 0.8 mg/m ³ (50 min., rat)
Irritation	Believed to be an eye and respiratory irritant	Respiratory irritant	Respiratory irritant, skin and respiratory sensitizer	Irritant, skin sensitizer

SUBCHRONIC/ CHRONIC TOXICITY: No information for product. Acute and chronic exposure to beryllium via inhalation has caused lung damage in laboratory animals.

CARCINOGENICITY:

IARC lists cobalt and cobalt compounds as possibly carcinogenic to humans, Group 2B. Chronic exposure to beryllium has produced lung cancer in several species of laboratory animals. Beryllium is listed as a known human carcinogen by IARC (Group 1), OSHA, NTP, and EPA.

MUTAGENICITY:

This product is not known or reported to be mutagenic. Beryllium has shown evidence of mutation in *in vitro* bacterial and mammalian systems.

REPRODUCTIVE, TERATOGENICITY, OR DEVELOPMENTAL EFFECTS:

This product is not known or reported to cause reproductive or developmental effects. Laboratory studies in animals have shown that beryllium can cross the placenta and cause fetal toxicity.

NEUROLOGICAL EFFECTS:

This product is not known or reported to cause neurological effects.

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.

MOBILITY:

No data

PERSISTENCE/DEGRADABILITY:

No data

BIOACCUMULATION:

No data

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. TRANSPORT INFORMATION

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

15. REGULATORY INFORMATION

US FEDERAL

TSCA	The components of this product are listed on the Toxic Substance Control Act inventory.					
CERCLA:	Copper, R.Q.= 5000 lbs.; Beryllium, R.Q. = 10 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, Beryllium					
SARA 313 Hazard	<u>Health:</u>	Acute -	<u>Fire:</u>	<u>Reactivity:</u>	<u>Release of Pressure:</u>	

Class:	For dust or fume only	Yes, Chronic - Yes	None	None	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
Cobalt	X	X	X	X	X
Beryllium	X	X	X	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 beryllium at > 0.1% this material is classified as: **T+, Very Toxic.** 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, Beryllium

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

16. OTHER INFORMATION

PREPARED BY: Olin Brass

NOTICE: THE INFORMATION IN THIS MSDS 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.

Olin MSDS No.: 00020.0001
Revision No.: 12

Revision Date: 1/1/10
Supercedes: 1/1/09

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: TIN ALLOY
Chemical Name: Metal Alloy
Synonyms: Metallic Tin Coatings and Tin based Tin/Lead Formulation Solders/Alloys
Chemical Family: Copper
Formula: Not applicable - mixture
Product Use: Metallurgical Products

COMPANY	MSDS Control Group	TECHNICAL	EMERGENCY TELEPHONE NUMBER:
ADDRESS	Olin Brass	INFORMATION:	1-618-258-5167
	427 North Shamrock St.	618-258-5003	
	East Alton, IL 62024-1197		
	www.olinbrass.com		

2. COMPOSITION/INFORMATION ON INGREDIENTS

CAS Number	Components	% By Weight	EINECS/ ELINCS #	EU Classification	
				Symbol	R-Phrase
7439-92-1	Lead	0 - 40	231-100-4	None	None
7440-31-5	Tin	60 - 100	231-141-8	None	None

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

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

3. HAZARDS IDENTIFICATION

WARNING!

EXPOSURE TO DUST OR FUMES CAN CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. CONTAINS A MATERIAL WHICH MAY CAUSE KIDNEY, BLOOD, REPRODUCTIVE, DEVELOPMENTAL AND NERVOUS SYSTEM EFFECTS. CONTAINS A MATERIAL WHICH MAY CAUSE CANCER. USE ONLY WITH ADEQUATE VENTILATION. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. WASH THOROUGHLY AFTER HANDLING.

<i>HAZARD RATINGS (for dust or fume)</i>	Degree of hazard (0 = low, 4 = extreme)		
<u>Hazardous Materials Identification System (HMIS)</u>	Health: 2*	Flammability: 0	Physical Hazard: None
<u>National Fire Protection Association (NFPA)</u>	Mixture. Not rated.		

HUMAN THRESHOLD RESPONSE DATA

<u>Odor Threshold:</u>	Unknown
<u>Irritation Threshold:</u>	Unknown
<u>Immediately Dangerous to Life or Health (IDLH) Value(s):</u>	The IDLH for lead and tin is 100 mg/m ³ .

POTENTIAL HEALTH EFFECTS

ACUTE EFFECTS

Eye: Dust or fume can cause irritation consisting of redness, swelling, and pain. May cause conjunctivitis with repeated exposures.

Skin: Material not expected to be absorbed through the skin. Contact with dust may cause mild irritation consisting of redness and/or swelling.

Inhalation: Harmful if inhaled. Inhalation of high concentrations of powder, dust, or fume may

Ingestion: cause respiratory and nasal irritation, coughing, and difficulty breathing. Ingestion of large amounts of dust may cause nausea, vomiting, constipation, cramps, and or stomach pain.

CHRONIC EFFECTS: Prolonged or repeated skin contact with dust may cause more severe irritation or dermatitis. Prolonged or repeated inhalation of dust or fume may cause more severe irritation and possibly lung damage. Chronic exposure to lead can cause kidney damage, anemia, reproductive effects, developmental effects and permanent nervous system damage in humans including changes in cognitive function.

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

POTENTIAL ENVIRONMENTAL EFFECTS: None known. Product has not been tested for environmental properties.

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

<i>PROPERTY</i>	<i>VALUE</i>	<i>PROPERTY</i>	<i>VALUE</i>
Explosive	No	Flammable	No
Combustible	No	Pyrophoric	No
Flash Point (°C):	Not applicable	Burning Rate of Material:	Not applicable
Lower Explosive Limit:	Not applicable	Autoignition Temp.:	Not applicable
Upper Explosive Limit:	Not applicable	Flammability Classification: (defined by 29 CFR 1910.1200)	Not applicable

UNUSUAL 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 or 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. Do not use compressed air for cleaning or dry sweeping.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CAS #	CHEMICAL NAME	ACGIH TLV	OSHA PEL	INTERNATIONAL OELS
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
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

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
<i>Appearance:</i>	Solid-silver to gray metallic	<i>Vapor Density (air = 1):</i>	Not applicable
<i>Odor:</i>	None	<i>Boiling Point (°F):</i>	1740°C (3164°F)
<i>Molecular Weight:</i>	Not applicable - Mixture	<i>Melting point:</i>	183 - 324°C (361 - 616°F)
<i>Physical State:</i>	Solid	<i>Specific gravity (g/cc):</i>	5.83 - 11.27
<i>pH:</i>	Not applicable	<i>Bulk Density:</i>	Not applicable
<i>Vapor Pressure (mm Hg):</i>	Not applicable	<i>Viscosity (cps):</i>	Not applicable
<i>Vapor Density:</i>	Not applicable	<i>Decomposition Temperature:</i>	Not applicable
<i>Solubility in Water (20 °C):</i>	Negligible	<i>Evaporation Rate:</i>	Not Applicable
<i>Volatiles, Percent by volume:</i>	Not applicable	<i>Octanol/water partition coefficient:</i>	Unknown

10. STABILITY AND REACTIVITY

STABILITY: Stable under normal temperatures and pressure.

CONDITIONS TO AVOID: Not affected by mechanical impact or shock or by electrical discharge.

MATERIALS TO AVOID: Strong oxidizers, acids, hydrogen peroxide, chlorine, turpentine, active metals - sodium, potassium; powdered lead fused with ammonium nitrate may cause a violent reaction.

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. Hydrogen gas may be generated from reaction with strong alkalis.

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:

For Product (dust or fume)		For Components	
		Lead	Tin
Oral LD ₅₀	Believed to be slightly toxic	No data	No data
Dermal LD ₅₀	Believed to be > 2 g/kg	No data	No data
Inhalation LC ₅₀	Believed to be slightly to moderately toxic	No data	No data
Irritation	Eye and respiratory irritant	Not irritating	No data

SUBCHRONIC/ CHRONIC TOXICITY:

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

CARCINOGENICITY:

IARC lists lead as possibly carcinogenic to humans, Group 2B.

MUTAGENICITY:

This product is not known or reported to be mutagenic. 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.

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:

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.

PERSISTENCE/DEGRADABILITY: Not biodegradable. Lead may persist and accumulate in the environment.

BIOACCUMULATION: No data.

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. TRANSPORT INFORMATION

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

<i>LABEL:</i>	
<i>REPORTABLE QUANTITY:</i>	

15. REGULATORY INFORMATION

US FEDERAL

TSCA	The components of this product are listed on the Toxic Substance Control Act inventory.				
CERCLA:	Lead, R.Q. = 10 lbs (No reporting is required if diameter of the pieces of metal is equal to or exceeds 100 micrometers (0.004 inches)).				
SARA 313:	Lead				
SARA 313 Hazard Class:	<i>Health:</i> For dust or fume only	Acute - No, Chronic - Yes	<i>Fire:</i> None	<i>Reactivity:</i> None	<i>Release of Pressure:</i> 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
Lead	X	X	X	X	X
Tin	Not listed	Not listed	X	X	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

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: Lead and Tin

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

16. OTHER INFORMATION

PREPARED BY: Olin Brass

NOTICE: THE INFORMATION IN THIS MSDS 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.