

EMERGENCY PHONE: 1-618-258-5167

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

PRODUCT NAME: TIN COATED ALUMINUM BRONZE

(OLIN BRASS SDS No: 01427.0001)

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

Base Metal - >99% - Aluminum Bronze
Coating - <1% - Tin Alloy

THE INFORMATION IN THE ENCLOSED SDSs 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 SDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT OLIN AT THE PHONE NUMBER BELOW TO MAKE CERTAIN THAT THE SDS IS CURRENT.

SDS Control Group
Olin Brass
305 Lewis and Clark Blvd
East Alton, IL 62024-1197
Phone Number: (618) 258-5654
www.olinbrass.com

Olin Brass SDS No.: 00020.0001
Revision No.: 13Review Date: 1/1/15
Revision Date: 6/1/15**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 ADDRESS	SDS Control Group Olin Brass 305 Lewis and Clark Blvd East Alton, IL 62024-1197 www.olinbrass.com	TECHNICAL INFORMATION:	EMERGENCY TELEPHONE NUMBER:
		618-258-5654	1-618-258-5167

2. HAZARD IDENTIFICATION

United States (US)
According to 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
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.

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

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
Appearance:	Solid-silver to gray metallic	Vapor Density (air = 1):	Not applicable
Odor:	None	Boiling Point (°F):	1740°C (3164°F)
Molecular Weight:	Not applicable - Mixture	Melting point:	183 - 324°C (361 - 616°F)
Physical State:	Solid	Specific gravity (g/cc):	5.83 - 11.27
pH:	Not applicable	Bulk Density	Not applicable
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:

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

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.

PERSISTANCE/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>						
<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:	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	Health:	Acute -	Fire:	Reactivity:	Release of Pressure:
Class:	For dust or fume only	No, 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
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

REVISED: Format revised 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 is reviewed annually

Olin Brass SDS No.: 00019.0001
Revision No.: 15

Review Date: 1/1/15
Revision: 6/1/15

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: ALUMINUM ALLOY
Chemical Name: Metal Alloy
Synonyms: Metallic Aluminum and Aluminum based
Aluminum/Copper/Iron/Manganese/Zinc Alloy Formulations
Chemical Family: Mixture - Metal Alloy
Formula: Not applicable - mixture
Product Use: Metallurgical Products

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

TECHNICAL
INFORMATION:
618-258-5654

EMERGENCY TELEPHONE NUMBER:
1-618-258-5167

2. HAZARD IDENTIFICATION

United States (US)

According to 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

<u>EYE CONTACT:</u>	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
<u>SKIN CONTACT:</u>	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
<u>INHALATION:</u>	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
<u>INGESTION:</u>	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	0.1 - 4.7	231-159-6	None	None
7440-21-3	Silicon	1 - 13.5	231-130-8	None	None
7439-95-4	Magnesium	1 - 5	231-104-6	None	None
7439-96-5	Manganese	1 - 2	231-105-1	None	None
7439-89-6	Iron	0.1 - 1.3	231-096-4	None	None
7429-90-5	Aluminum	81 - 99	231-072-3	None	None
7440-02-0	Nickel	1 - 5	231-111-4	Xn	R 40-43

OSHA REGULATORY STATUS: In solid form, not hazardous. Dust or fume: carcinogen, irritant, 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	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

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 None known.

Packaging:

Incompatible Materials for Storage None known.

or Transport:

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)
7439-96-5	Manganese	0.2 mg/m ³	Ceiling - 5 mg/m ³	Belgium, Denmark, Finland, France, Switzerland, U.K. - 1 mg/m ³ Sweden - 2.5 mg/m ³ Germany (MAK) - 0.5 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
7439-95-4	Magnesium	None established	None established	None established
7439-89-6	Iron	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 Switzerland - 4 mg/m ³

7429-90-5	Aluminum*	10 mg/m ³	15 mg/m ³	Belgium, France, Hungary , Sweden- 5 mg/m ³ (resp. dust) Germany, Switzerland - 6 mg/m ³ Denmark, Netherlands, U.K. - 10
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*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/m³.

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:	Gray to silver metallic	Vapor Density (air = 1):	Not applicable
Odor:	None	Boiling Point (°F):	No data
Molecular Weight:	Not applicable - Mixture	Melting point:	482 - 642°C (900 - 1200°F)
Physical State:	Solid	Specific gravity (g/cc):	> 3
pH:	Not applicable	Bulk Density	> 3 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:

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:

 For finely divided aluminum:
 Strong Oxidizers - violent reaction with heat generation. Acids and Alkalis - reacts to generate hydrogen.

Water - water/aluminum mixtures may be hazardous when confined due to hydrogen generation.

HAZARDOUS DECOMPOSITION PRODUCTS:

Halogenated hydrocarbons can react violently with finely divided. 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:		For Components						
		Copper	Manganese	Silicon	Aluminum	Magnesium	Iron	Nickel
Oral LD ₅₀	Believed to be > 5 g/kg	3.5 mg/kg (mouse, intraperitoneal)	9 g/kg (rat)	3.16 g/kg (rat)	No data	No data	30 g/kg (rat)	> 5 g/kg (rat)
Dermal LD ₅₀	Believed to be > 2 g/kg	375 mg/kg (rabbit, subcutaneous)	No data	No data	No data	No data	No data	> 7.5 g/kg (rabbit subcutaneous)
Inhalation LC ₅₀	Believed to be slightly to moderately toxic	No data	No data	No data	> 1000 mg/m ³ (4 hr, rat)	No data	No data	> 12 mg/kg (rat, intratracheal)
Irritation	Eye and respiratory irritant, sensitizer	Respiratory irritant	Mild skin & eye irritant	Eye, skin, respiratory irritant	Mild eye and skin irritant	No data	Eye irritant	Respiratory irritant, skin sensitizer

SUBCHRONIC/ CHRONIC TOXICITY: No information for product.

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 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.

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

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

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 LC₅₀, rainbow trout =31.7 mg/L; 96 hr LC₅₀, fathead minnow = 3.1 mg/L; 72 hr EC₅₀, freshwater algae (4 species): = 0.1 mg/L; 96 hr LC₅₀, *Daphnia* = 0. 51 mg/L

MOBILITY: No data

PERSISTANCE/DEGRADABILITY: Not 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.; 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, Manganese, Aluminum (fume or dust), Nickel				
SARA 313 Hazard Class:	<u>Health:</u> For dust or fume only	Acute - Yes, Chronic - Yes	<u>Fire:</u> None	<u>Reactivity:</u> None	<u>Release of Pressure:</u> 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
Manganese	Not listed	X	X	X	Not listed
Magnesium	Not listed	Not listed	Not listed	Not listed	Not listed
Nickel	X	X	X	X	X
Aluminum	Not listed	X	X	X	Not listed
Silicon	Not listed	Not listed	X	X	Not listed
Iron	Not listed	Not listed	Not listed	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

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: Copper, Manganese, and Nickel

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

16. OTHER INFORMATION

REVISED: Format revised 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.