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CA-1317

BABBITTS

SOLDERS

TYPE METAL

LEAD

ZINC

**N-F METALS**

# NON-FERROUS METALS, INC.

SMELTERS AND REFINERS

2905 - 13th Ave. S.W. - Seattle, Washington 98134

Phone: 624-8414

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MATERIAL SAFETY DATA SHEET  
May be used to comply with OSHA  
Hazard Communication Standard  
CFR 1910.1200. Standard must  
be consulted for specific requirements

## A. GENERAL INFORMATION

TRADE NAME: Tin-Based Babbitts, Lead-Free Pewter

CHEMICAL NAME: Tin-Antimony-Copper

FORMULA: SN-SB-CU

MOLECULAR WEIGHT: not applicable

ADDRESS: Non-Ferrous Metals, Inc.  
2905 - 13th Avenue S.W.  
Seattle, WA 98134

CONTACT: Non-Ferrous Metals, Inc.  
2905 - 13th Avenue S.W.  
Seattle, WA 98134

PHONE: (206) 624-8414

ISSUE DATE:

REVISED DATE:

## B. HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENT	CAS #	WT %	PERMISSIBLE AIR CONCENT
Tin	7440-31-5	95	2.0mg/cu.m.
Antimony	7440-36-0	5	0.5mg/cu.m.

## C. FIRST AID MEASURES

**Inhalation:** If symptoms of respiratory distress occur or there has been a known exposure to dense fume, remove from exposure, place individual at bed rest, and immediately call a physician.

**Ingestion:** Induce vomiting in conscious individual and call a physician.

**Skin or eyes:** Flush with plenty of water. If symptoms develop, consult a physician.

### SYMPTOMS:

**INGESTION:** Tin is relatively non-toxic but may cause fever, nausea, stomach cramps or diarrhea. Antimony causes severe irritation of stomach and intestines. Systematic poisoning may occur.

**SKIN:** Dermatitis may result from repeated skin contact with antimony compounds. Possible mechanical irritation of skin.

**EYES:** Severe eye irritation may occur from antimony exposure.

**MEDICAL CONDITIONS POSSIBLE AGGRAVATED:** Diseases of the liver, kidneys, nervous system, blood, blood forming organs and possibly reproductive systems. Diseases of the lungs as well.

V# 090820

UNUSUAL CHRONIC TOXICITY: Liver and kidney abnormalities or pneumonitis may result from chronic antimony exposure. Possible increase in throat or lung cancer from antimony exposure. See Section K.

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FIRE AND EXPLOSION:

Flash Point - Not applicable      Auto Ignition Temperature - Not applicable  
Flammable Limits In Air ( % by Volume ) - Tin Dust --0.19 oz/cu.ft.  
Unusual Fire and Explosion Hazards: Finely divided tin dust may form explosive mixtures with air.

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D. PRECAUTIONS/PRECEDURES

FIRE EXTINGUISHING AGENTS RECOMMENDED: Class D Extinguisher; dry powder type.

FIRE EXTINGUISHING AGENTS TO AVOID: No specific agents.

SPECIAL FIRE FIGHTING PRECAUTIONS: Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in fire.

ENGINEERING CONTROLS: Local exhaust ventilation is required for melting, grinding, screening, soldering, or other operations where excessive exposures may occur.

NORMAL HANDLING: Use of approved respirators is required for applications where adequate ventilation cannot be provided. When melted, the temperature should be kept as low as possible. Activities which generate dust or fumes should be avoided.

STORAGE: Avoid storage near acids, bases, nascent hydrogen or reducing agents. Avoid storage near chlorine or other halogens and alkaline nitrates.

SPILL OR LEAK: A clean-up procedure which minimizes exposure is required. Vacuuming is preferred. Place all material in closed containers. Do not use compressed air for cleaning. Use approved respiratory protection if possibility of dust/fume exposure exists.

SPECIAL PRECAUTIONS/PROCEDURES/LABEL INSTRUCTIONS: Signs and labels in work areas and for contaminated containers or equipment may be required under OSHA regulations. Medical examinations, monitoring, recordkeeping and hygiene facilities and practices specified by OSHA may have to be met. Employee training program may be required.

PERSONAL HYGIENE: Practice good housekeeping and personal hygiene procedures. No tobacco or food in work area. Wash thoroughly before eating or smoking. Avoid ingestion or inhalation. Take a shower and change clothes at end of shift. Do not wear contaminated clothing home. Do not use compressed air for blowing dust off of clothes.

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E. PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: NIOSH/MSHA approved respirator for toxic dust and/or fumes

EYES AND FACE: Safety glasses recommended for grinding or other operations generating flying particles.

HANDS, ARMS, AND BODY: Gloves or other protective clothing required if skin contact is appreciable.

OTHER CLOTHING AND EQUIPMENT: Full protective clothing (coveralls) is required if the permissible exposure limit is exceeded. Recommended for any operation with significant skin contact. All contaminated clothing should be removed before leaving the plant area.

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F. PHYSICAL DATA

MATERIAL AT NORMAL CONDITIONS IS: Solid (bar, ingot, wire etc.)

APPEARANCE AND ODOR: Gold tinged to white metallic - no odor.

BOILING POINT: Antimony 2484 F MELTING POINT: 520 F

SPECIFIC GRAVITY: 7.52 VAPOR DENSITY (AIR 1): Not applicable

SOLUBILITY IN WATER (% by weight): Insoluble PH: Not applicable

VAPOR PRESSURE (MM HG AT 20'C): Not applicable EVAPORATION RATE: Not applicable

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G. REACTIVITY DATA

STABILITY: Stable CONDITIONS TO AVOID: Not applicable

INCOMPATIBILITY (MATERIALS TO AVOID): Contact with hydrogen peroxide may cause violent reaction. Bromine, chlorine plus heat, sodium or potassium peroxides or perchloric acid may react with incandescence, heat or explosion. Antimony is spontaneously flammable in chlorine, fluorine, or bromine. With any alkali nitrate and heat explosion may result.

HAZARDOUS DECOMPOSITION PRODUCTS: Under reducing conditions (i.e., any strong acid or base plus active metal) or in the presence of nascent hydrogen, highly toxic stibine gas (TLV=0.10ppm) may be evolved. At temperatures above the melting point, metal oxide fumes may be evolved.

HAZARDOUS POLYMERIZATION: Will not occur CONDITIONS TO AVOID: Not applicable

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H. ENVIRONMENTAL

EPA HAZARDOUS SUBSTANCE? No (40 CFR 116-117)

WASTE DISPOSAL METHODS (DISPOSER MUST COMPLY W/FEDERAL, STATE AND LOCAL LAWS): If hazardous under 40 CFR 261, Subpart B & C, material must be treated or disposed in a facility meeting the requirements of 40 CFR 264 or 265. If non-hazardous, material should be disposed in a facility meeting the requirements of 40 CFR 257. This material may have value on a recycled basis.

RCRA STATUS OF UNUSED MATERIAL: (40 CFR 261-11) If discarded in unaltered form, material should be considered a hazardous waste due to listing in 40 CFR 261.11 (3), Appendix VIII. Under specific circumstances, application can be made to EPA Administrator to have a particular waste designated non-hazardous.

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## I. REFERENCES

PERMISSIBLE CONCENTRATION REFERENCES: OSHA regulations for airborne contaminants 29 CFR 1910.1000. OSHA regulation 29 CFR 1010.1025. ACGIH "Threshold Limit Values for Chemical Substances..." ; 1983-84.

HAZARD INFORMATION REFERENCES: "Documentation of the Threshold Limit Values," 4th ED., ACGIH Patty's Industrial Hygiene and Toxicology, Vol. 2A, 3rd Rev. Ed., 1981. NFPA "Fire Protection Guide on Hazardous Materials," NIOSH, 1980. "Registry of Toxic Effects of Chemical Substances," NIOSH, 1980. "Criteria for a Recommended Standard.. Occupational Exposure to Antimony," NIOSH, 1978.

GENERAL: "Inflammability and Explosibility of Metal Powders," Bureau of Mines RI 3722, 1943. Jacobsen, M., et. al., "Explosibility of Metal Powders," Bureau of Mines RI 6516, 1964. OSHA Regulation 29 CFR 1910.134 Respiratory Protection. ACGIH "Industrial Ventilation Manual"

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## J. ADDITIONAL INFORMATION

INFORMATION. (HAZARDS, PRECAUTIONS, FIRST AID, ETC.) IS ABBREVIATED. MORE DETAILED INFORMATION IS CONTAINED IN REFERENCES FOUND IN SECTION J.

Hazard Information; Inhalation: Stannosis, a benign pneumoconiosis, may result from chronic tin exposure. Pulmonary function is not affected. Antimony exposure may cause respiratory tract irritation, metallic taste or damage to kidney, liver, or nervous system.

Recommended Exposure Limit: Antimony--0.2mg/cu.m respirable fraction.

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THIS MATERIAL SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION AND INVESTIGATION. NON-FERROUS METALS, INC., PROVIDED NO WARRANTIES, EITHER EXPRESS OR IMPLIED AND ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE DATA CONTAINED HEREIN.

**Material Safety Data Sheet**  
 May be used to comply with  
 OSHA's Hazard Communication Standard,  
 29 CFR 1910.1200. Standard must be  
 consulted for specific requirements.

**U.S. Department of Labor**  
 Occupational Safety and Health Administration  
 (Non-Mandatory Form)  
 Form Approved  
 OMB No. 1218-0072



**IDENTITY (As Used on Label and List)**      **ANTIMONY**      *Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.*

**Section I**

<b>Manufacturer's Name</b> NA ( a base metal)	<b>Emergency Telephone Number</b> NA
<b>Address (Number, Street, City, State, and ZIP Code)</b> NA	<b>Telephone Number for Information</b> NA
	<b>Date Prepared</b>
	<b>Signature of Preparer (optional)</b>

**Section II — Hazardous Ingredients/Identity Information**

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Antimony, other contaminants: NONE				100.0

**Exposure Limits:**

Antimony:

- 0.5 MG/M3 OSHA TWA;
- 0.5 MG/M3 ACGIH TWA;
- 0.5 MG/M3 NIOSH recommended TWA

**Section III — Physical/Chemical Characteristics**

<b>Boiling Point</b> 2516 F (1635 C)	<b>Specific Gravity (H<sub>2</sub>O = 1)</b> 6.7
<b>Vapor Pressure (mm Hg.)</b> 1 MMHG @ 1627 F	<b>Melting Point</b> 1202 F (630 C)
<b>Vapor Density (AIR = 1)</b> NA	<b>Evaporation Rate (Butyl Acetate = 1)</b> NA
<b>Solubility in Water</b> Insoluble Solvent solubility: soluble in Ammonium Sulfide, hot sulfuric acid	
<b>Appearance and Odor</b> Silvery-White Lustrous Metal	

**Section IV — Fire and Explosion Hazard Data**

<b>Flash Point (Method Used)</b> Moderate Fire Hazard when exposed to heat or flame. See attached sheets.	<b>Flammable Limits</b> LEL	<b>UEL</b>
<b>Extinguishing Media</b> Dry chemical, carbon dioxide, water spray or foam/larger fires, use water spray, fog or		
<b>Special Fire Fighting Procedures</b> See attached sheets	alcohol foam.	

**Unusual Fire and Explosion Hazards**  
See attached sheets

### Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid	See attached sheets
	Stable	xx		Under normal temperatures and pressures.

Incompatibility (Materials to Avoid) See attached sheets.

Hazardous Decomposition or Byproducts May release toxic stibine gas under thermal decomposition. Stirred antimony halide yields explosive antimony.

Hazardous Polymerization	May Occur		Conditions to Avoid	See attached sheets.
	Will Not Occur	xx		Hazardous Polymerization has not been reported to occur under normal temperatures and pressures.

### Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? See attached sheets. Skin? Ingestion?

Health Hazards (Acute and Chronic) See attached sheets.

Carcinogenicity: NTP? IARC Monographs? OSHA Regulated?  
According to the 4th annual report on carcinogens, 1985 U.S. Public Health.

Service Antimony is not listed as carcinogen.

Signs and Symptoms of Exposure See attached sheets.

Medical Conditions Generally Aggravated by Exposure See attached sheets.

Emergency and First Aid Procedures See attached sheets.

### Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled See attached sheets.

Waste Disposal Method See attached sheets.

Precautions to Be Taken in Handling and Storing See attached sheets.

Other Precautions See attached sheets.

### Section VIII — Control Measures

Respiratory Protection (Specify Type) See attached sheets.

Ventilation	Local Exhaust	Provide local exhaust or process enclosure ventilation to meet published exposure limits.
	Mechanical (General)	Other

Protective Gloves Employee must wear appropriate protective gloves to prevent contact. Eye Protection Employee must wear splash-proof or resistant safety goggles to prevent eye contact.

Other Protective Clothing or Equipment Employee must wear appropriate protective clothing and equipment to prevent repeated or prolonged skin contact with this substance.

Work/Hygienic Practices See attached sheets.

# Material Safety Data Sheet

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## U.S. Department of Labor

Occupational Safety and Health Administration  
(Non-Mandatory Form)  
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IDENTITY (As Used on Label and List)

COPPER

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### Section I

Manufacturer's Name NA (A Base Metal)	Emergency Telephone Number NA
Address (Number, Street, City, State, and ZIP Code) NA	Telephone Number for Information NA
	Date Prepared
	Signature of Preparer (optional)

### Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Copper, other contaminants: NONE				

#### Exposure Limits:

##### Copper:

0.1 MG/M3 OSHA TWA (Fume); 1 MG/M3 OSHA TWA (dust & mist)

0.2 MG/M3 ACGIH TWA (Fume); 1 MG/M3 ACGIH TWA (dust & mist)

### Section III — Physical/Chemical Characteristics

Boiling Point 4653 F (2567 C)	Specific Gravity (H <sub>2</sub> O = 1) 8.92
Vapor Pressure (mm Hg.) 1 MMHG @ 1628 C	Melting Point 1946 F (1083 C)
Vapor Density (AIR = 1) NA	Evaporation Rate (Butyl Acetate = 1) NA
Solubility in Water Insoluble	Solvent solubility: Nitric Acid, Sulfuric Acid
Appearance and Odor Reddish, Ductile, Malleable Metal	

### Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used) Flammable (dust)	Flammable Limits See attached sheets	LEL	UEL
Extinguishing Media Use dry sand, dry dolomite, dry graphite, or sodium chloride. Do not use water.			
Special Fire Fighting Procedures See attached sheets.			
Unusual Fire and Explosion Hazards See attached sheets.			

**Section V — Reactivity Data**

Stability	Unstable		Conditions to Avoid See attached sheets.
	Stable	XX	Stable under normal temperatures and pressures.

Incompatibility (Materials to Avoid) See attached sheets.

Hazardous Decomposition or Byproducts Thermal decomposition may release toxic and/or hazardous gases.

Hazardous Polymerization	May Occur		Conditions to Avoid See attached sheets.
	Will Not Occur	XX	None Known.

**Section VI — Health Hazard Data**

Route(s) of Entry: See attached sheets. Inhalation? Skin? Ingestion?

Health Hazards (Acute and Chronic) See attached sheets.

Carcinogenicity: According to the 4th annual report on carcinogens, 1985 U.S. Public Health Service, NTP? IARC Monographs? OSHA Regulated? Copper is not listed as carcinogen.

Signs and Symptoms of Exposure See attached sheets.

Medical Conditions Generally Aggravated by Exposure See attached sheets.

Emergency and First Aid Procedures See attached sheets.

**Section VII — Precautions for Safe Handling and Use**

Steps to Be Taken in Case Material Is Released or Spilled See attached sheets.

Waste Disposal Method See attached sheets.

Precautions to Be Taken in Handling and Storing See attached sheets.

Other Precautions See attached sheets.

**Section VIII — Control Measures**

Respiratory Protection (Specify Type) See attached sheets.

Ventilation	Local Exhaust Provide ventilation system to meet published exposure limits.	Special See attached sheets.
	Mechanical (General)	Other
Protective Gloves	Employee must wear to prevent contact with substance.	Eye Protection Employee must wear safety goggles to prevent eye contact with this substance
Other Protective Clothing or Equipment	Employee must wear appropriate protective clothing. (Impervious)	
Work/Hygienic Practices	Clothing and equipment to prevent repeated or prolonged skin contact with this substance. See attached sheets.	



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**U.S. Department of Labor**  
 Occupational Safety and Health Administration  
 (Non-Mandatory Form)  
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 OMB No. 1218-0072



IDENTITY (As Used on Label and List)	TIN	Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.
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**Section I**

Manufacturer's Name NA (a base metal)	Emergency Telephone Number NA
Address (Number, Street, City, State, and ZIP Code) NA	Telephone Number for Information NA
	Date Prepared
	Signature of Preparer (optional)

**Section II — Hazardous Ingredients/Identity Information**

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Tin, other contaminants: None			NA	100

**Exposure Limits:**

Tin: 2 MG/M3 OSHA TWA  
 2 MG/M3 ACGIH TWA

**Section III — Physical/Chemical Characteristics**

Boiling Point 4100 F (2260 C)	Specific Gravity (H <sub>2</sub> O = 1) 7.3
Vapor Pressure (mm Hg) 1 MMHG @ 1610 C	Melting Point 449 F (232 C)
Vapor Density (AIR = 1) NA	Evaporation Rate (Butyl Acetate = 1) NA

Solubility in Water  
 Insoluble - Solvent solubility: Hydrochloric acid, sulfuric acid, alkali

Appearance and Odor  
 Odorless, Silver-white, Lustrous, Soft Metal.

**Section IV — Fire and Explosion Hazard Data**

Flash Point (Method Used) See attached sheets	Flammable Limits See attached sheets	LEL	UEL
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Extinguishing Media  
 See attached sheets

Special Fire Fighting Procedures  
 See attached sheets

Unusual Fire and Explosion Hazards  
 See attached sheets

**Section V — Reactivity Data**

Stability	Unstable		Conditions to Avoid	See attached sheets
	Stable	xx		Stable under normal temperatures and pressures.

Incompatibility (Materials to Avoid) See attached sheets

**Hazardous Decomposition or Byproducts**

Thermal decomposition may give off stannic oxide.

Hazardous Polymerization	May Occur		Conditions to Avoid	Avoid dispersion of dust in air. Finely divided particals, dust, or fumes may be a slight fire hazard.
	Will Not Occur	xx		None known.

**Section VI — Health Hazard Data**

Route(s) of Entry: <sup>Inhalation?</sup> See attached sheets      Skin?      Ingestion?

Health Hazards (Acute and Chronic) See attached sheets

Carcinogenicity: <sup>NTP?</sup> According to the 4th annual report on carcinogens, 1985 <sup>IARC Monographs?</sup> U.S. Public Health Service, tin <sup>OSHA Regulated?</sup> is not listed as carcinogen.

Signs and Symptoms of Exposure See attached sheets

Medical Conditions Generally Aggravated by Exposure See attached sheets

Emergency and First Aid Procedures See attached sheets

**Section VII — Precautions for Safe Handling and Use**

Steps to Be Taken in Case Material Is Released or Spilled See attached sheets

Waste Disposal Method See attached sheets

Precautions to Be Taken in Handling and Storing See attached sheets

Other Precautions See attached sheets

**Section VIII — Control Measures**

Respiratory Protection (Specify Type) See attached sheets

Ventilation	Local Exhaust	Provide general dilution ventilation to meet published exposure limits.	Special	See attached sheets
	Mechanical (General)	See attached sheets	Other	See attached sheets

Protective Gloves Not required but recommended.      Eye Protection, Employee must wear splash-proof & dust-resistant safety goggles.

**Other Protective Clothing or Equipment**

Protective clothing not required. Avoid repeated or prolonged contact with substance.

Work/Hygienic Practices See attached sheets