MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Manufacturer's Name:	**Emergency Telephone Number:**	**Distributor Name:**
Bow Solder Products Co. 1 Crossman Road Sayreville, NJ 08872	800-535-5053 **Information Phone:** 732-316-2100 **Origination Date**: January 29, 1991 **Revision Date:** April 29, 1999	CooperTools 3535 Glenwood Avenue Raleigh, NC 27612 Information: 919-783-2126
COMMON NAME:	**PRODUCT CAS NO.:**	
Lead Free Solder	Mixture	

2. INGREDIENTS: COMPOSITION/INFORMATION*

INGREDIENT	% WEIGHT	PEL-OSHA	TLV-ACGIH	LD 50/LC 50 ROUTE/SPECIES
Tin CAS No.: 7440-31-5 RTECS: XP7320000	> 90	2 mg/m^3	2 mg/m^3	No Data
Copper CAS No.: 7440-50-8 RTECS: GL5325000	< 5	1 mg/m^3 (as Cu) 0.1 mg/m^3 (fume)	1 mg/m^3 (dusts and mists) 0.2 mg/m^3 (fume)	LD50: 3500 µg/kg intraperitoneal/ mouse
Silver CAS No.: 7440-22-4 RTECS: VW3500000	< 2	0.01 mg/m^3	0.1 mg/m^3	LD: > 10 gm/kg oral/mouse
Antimony CAS No.: 7440-36-0 RTECS: CC4025000	< 2	0.5 mg/m^3	0.05 mg/m^3	LD50: 7 gm/kg intraperitoneal/rat

* Product contains <0.20% lead. Releases in excess of the TLV/PEL are not anticipated under normal working conditions.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Dusts, mists, and fumes from this silver-white odorless solder may produce skin eye and upper respiratory irritation. Contact with heated product can cause thermal burns. Repeated contact may cause dermatitis. Nonflammable. Contains < 0.20% lead.

POTENTIAL HEALTH EFFECTS

EYES: Contact with soldering fumes, dusts, or particles may cause eye irritation. Contact with heated solder can cause severe burns.

SKIN: Repeated contact may cause skin irritation Sensitive individuals may develop dermatitis or eruptions resembling chicken pox (antimony spots). Contact with heated solder can cause severe burns.

INHALATION: Inhalation of dusts and fumes may cause irritation of the upper respiratory tract. Inhalation of freshly formed metal oxides may cause metal fume fever, a brief (24-48 H) flu-like illness. Inhalation of tin oxide may cause pneumonia.

INGESTION: Ingestion of sufficient quantities may cause nausea, vomiting and diarrhea.
SIGNS AND SYMPTOMS: Exposure may cause general eye, skin and upper respiratory irritation. Metal fume fever is characterized by chills, nausea, aching muscles, metallic taste, and fever.

CHRONIC: Repeated exposure to silver over a long period of time may result in argyria, a gray discoloration of the skin, conjunctiva and internal organs. Long-term exposure to copper may result in anemia. Long-term inhalation of tin and antimony may produce benign pneumoconiosis. Product contains < 0.20% lead. Although exposure to lead contained in this product is not anticipated under normal working conditions, if released in sufficient quantities over time, lead can have adverse health effects (see Section 11).

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Persons with impaired pulmonary function (particularly obstructive airway disease) may experience an exacerbation of symptoms due to the irritant properties of copper and tin. Blonde people are generally more susceptible to argyria.

CARCINOGENICITY:

NTP: No OSHA: No IARC: 2B

IARC classifies lead and lead compounds as a group of agents which are possibly carcinogenic to humans.

TARGET ORGANS: Eyes, skin, respiratory system, cardiovascular system (antimony), liver, kidneys (copper), and nasal septum (silver).

WARNING: This product contains or produces a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

4. FIRST AID MEASURES

EYE CONTACT: Flush eyes with water for 15 minutes. If irritation persists, seek medical attention.

SKIN CONTACT: Remove contaminated clothing and wash affected area with soap and water. If irritation persists, seek medical attention.

INHALATION: For dusts or fumes: Remove to fresh air. If breathing is difficult administer oxygen. If breathing has stopped, give artificial respiration. Seek medical attention.

OTHER: If accidental ingestion occurs give 1 to 2 glasses of water. If ingestion is substantial or irritation persists, seek medical attention.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASHPOINT: NOT APPLICABLE

NFPA HAZARD CLASSIFICATION: Not Classified

FLAMMABLE LIMITS: LEL: Not Applicable UEL: Not Applicable

EXTINGUISHING MEDIA: Use media appropriate for surrounding fire. Do not use water on fire where molten metal is present.

FIRE AND EXPLOSION HAZARDS: Extremely high temperatures or contact with certain acids may produce toxic tin compounds. Noncombustible solid but flammable or combustible in dust and powder form.

FIRE FIGHTING EQUIPMENT: Firefighters should wear a NIOSH/MSHA-approved self-contained breathing apparatus (SCBA) operated in positive pressure mode and full turnout gear or bunker gear.

6. ACCIDENTAL RELEASE MEASURES

Not applicable.

7. HANDLING AND STORAGE

Store in dry location away from incompatible materials.

Minimize dust accumulation. Clean dusts using method which does not scatter dust. Vacuuming is preferred. DO NOT USE compressed air to blow dust from work area.

Clean work clothing should be worn daily. Clothing which becomes dusty should be changed promptly. Wash hands thoroughly after handling and before eating, smoking, breaks, and using toilet facilities.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY PROTECTION: Under normal conditions (ambient temperature and pressure) and use none required. Above acceptable exposure guidelines, respiratory protection in accordance with 29 CFR Part 134 should be worn.

SKIN PROTECTION: Gloves to prevent skin contact with molten metal.

EYE PROTECTION: Safety glasses or goggles as necessary to prevent contact with dusts, fumes, particles or molten metal.

ENGINEERING CONTROLS: General ventilation used in combination with local exhaust in areas where dusts and/or fumes are produced from heating and machining processes.

PERSONAL CONTROL MEASURES: Air sampling for tin and antimony: Mixed cellulose ester filter, 0.8 µm (NIOSH 7300)

Air sampling for copper: Mixed cellulose ester filter, 0.8 µm (NIOSH 7029)

Air sampling for silver: Mixed cellulose ester filter, 0.8 µm (NIOSH 2(S2))

OTHER: Emergency eyewash stations

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Solid silver-white metal (various shapes and sizes)
ODOR:	Odorless
BOILING POINT:	< 4000 °F
VAPOR PRESSURE:	Not Applicable
VAPOR DENSITY:	Not Applicable
SOLUBILITY IN WATER:	Insoluble
SPECIFIC GRAVITY:	7.1 (approximate)
MELTING POINT:	430 °F (approximate)
pH:	Not Applicable
% VOLATILE:	0
VISCOSITY:	Not Applicable
SOLIDS CONTENT:	100%

10. STABILITY AND REACTIVITY

STABILITY: Stable.

INCOMPATIBILITY: Tin is incompatible with chlorine, turpentine, acids, and alkalis. Silver is

incompatible with acetylene, ammonia, hydrogen peroxide, bromoazide, chlorine trifluoride, ethyleneimine, oxalic acid, and tartaric acid. Antimony is incompatible with strong oxidizers, acids, halogenated acids. Copper is incompatible with oxidizers, alkalis, sodium azide, and acetylene. Product as a whole is incompatible with strong acids, sulfur and chlorine

HAZARDOUS DECOMPOSITION PRODUCTS: Can form toxic metal oxides when involved in fire situation. Reaction with strong acids may produce toxic organic or inorganic tin compounds.

HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

INGESTION: Tin, copper, antimony and silver have relatively low oral toxicity. Although product contains < 0.20% lead, repeated ingestion over time may cause lead poisoning (see chronic).

SKIN: Antimony spots consist of papules and pustules around sweat and sebaceous glands which resemble the chicken pox.

EYE: When the lens is directly entered or injured by a foreign body containing copper, dense cataract formation and yellow green discoloration of the lens may occur.

INHALATION: Antimony metal fume fever has been reported to occur from air concentrations below 5 mg/m^3. Argyria has not resulted from air concentrations of silver which are less than 0.01 mg/m^3.

CHRONIC: Repeated inhalation of antimony and tin can cause benign pneumoconiosis. Due to antimony's association with lead and arsenic in industry and silica in mining, it is difficult to adequately assess toxicity. Many cases of illness formerly attributed to copper are now believed to have been due to an admixture of other metals especially lead. Development of argyria through inhalation appears to be very slow and may require years.

Repeated exposure to lead over time can adversely affect the central nervous system (CNS), gastrointestinal (GI) tract, kidneys, reproductive system, and blood. Lead can adversely affect fetal development. Signs and symptoms of chronic lead poisoning are various and may include metallic taste, headache, weakness, insomnia, anorexia, constipation, abdominal pain, and anemia.

OTHER: High concentrations of tin (395 gm/kg and 840 gm/kg) produced tumors when implanted in experimental animals (rat and mouse respectively). Intrapleural administration of 100 mg/kg copper has caused focal fibrosis and tumors in rats. High doses of silver (> 2.5 gm/kg) have caused tumors in animal implantation studies. Rat inhalation of 50 mg/m^3/7H/52W-I antimony produced tumors of the thorax.

12. ECOLOGICAL INFORMATION

No Data

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with applicable local, state and federal regulations. Dispose per 40 CFR Part 261 and 262.

14. TRANSPORT INFORMATION

DOT: Not classified

15. REGULATORY INFORMATION

CANADIAN WHMIS: D2B

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200: Product is considered hazardous under the criteria of this rule.

CERCLA, 40 CFR Part 302(CERCLA): This product contains copper, antimony, and silver, CERCLA Reportable Quantity (RQ) Substances, and if 5,000 or more pounds of copper or antimony or 1,000 or more pounds of silver are released, notification to the National Response Center in Wash., D.C. (1-800-424-8802) is required.

SARA 313 INFORMATION:
This product contains copper (<5%), silver(<2%), and antimony(<2%) substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA Hazard Categories promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories: Acute Health Hazard
Chronic Health Hazard

CALIFORNIA PROPOSITION 65: This product contains lead (<0.20%), an ingredient known to the State of California to cause cancer and reproductive toxicity.

16. OTHER INFORMATION

KEY:

ACGIH: American Conference of Governmental Industrial Hygienists
IARC: International Agency for Research on Cancer
MSHA: Mine Safety and Health Administration
NIOSH: National Institute of Occupational Safety and Health
NTP: National Toxicology Program

Revision Date: August 4, 1999

OSHA:	Occupational Safety and Health Administration
PEL:	Permissible Exposure Limits
PNOC:	Particulate Not Otherwise Classified
PNOR:	Particulate Not Otherwise Regulated
TLV:	Threshold Limit Values

DISCLAIMER

The information in this MATERIAL SAFETY DATA SHEET should be provided to all who will use, handle, store, transport, or otherwise be exposed to this material. This information has been prepared for the guidance of plant engineering, operations and management, and for persons working with or handling this material. Bow Electronics Solders believes this information to be reliable and up-to-date as of the date of publication, but makes no warranty that it is.