

# SAFETY DATA SHEET

# Leaded Solder Paste (Sn60Pb40)



First issue: 2018-08-01  
Revision date: 2021-08-09  
Version: 1.1

## SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

### Product Identifier

Product name: Leaded Solder Paste (SnBiAg)  
Synonyms: Solder Paste, Solder Cream, Solder Paste

### Relevant identified uses of the substance or mixture and uses advised against

Intended use: Circuit board prototyping

### Supplier's Details

Supplier Name: Voltera Inc.  
Supplier Address 1: 100-113 Breithaupt St.  
City: Kitchener  
Province: Ontario  
Postal Code: N2H5G9  
Country: Canada  
Business Phone: 1-888-381-3332

### Emergency Phone Number

Emergency Phone: CANUTEC 1+ 613-996-6666 or 1-888-CAN-UTEC (226-8832)

## SECTION 2: HAZARDS IDENTIFICATION

### Classified in accordance with European CLP Regulation 1272/2008

GHS Class Phrases: Acute Tox. 4\*  
Skin Irritant 2  
Eye Irritant 2A  
Hazardous to the aquatic environment, short-term, acute Category 1  
Hazardous to the aquatic environment, long-term, chronic Category 1  
Chronic toxicity 2  
Reproductive toxicity 2  
Carcinogenic 2

Chemical Name: NA  
Chemical Family: Mixture  
Chemical Formula: Proprietary

Routes of Entry: Inhalation, Ingestion, Skin/Eye Contact  
Target Organs: Blood, Kidneys, Skin, Respiratory System, Nasal, Septum, Liver, Eyes

### Label Elements



Signal Words: Danger

### LEAD WARNING

Hazard Statements: H302 Harmful if swallowed

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H315 Causes skin irritation  
H317 May cause an allergic skin reaction  
H319 Causes serious eye irritation  
H332 Harmful if inhaled  
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled  
H335 May cause respiratory irritation  
H351 Suspected of causing cancer  
H361 Suspected of damaging fertility or the unborn child.  
H410 Very toxic to aquatic life with long-lasting effects.

**Precautionary Statements:** P102 Keep out of reach of children.  
P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood  
P233 Keep container tightly closed  
P260 Do not breathe dust/fume/gas/mist/vapor/spray  
P262 Do not get in eyes, on skin, or on clothing  
P264 Wash hands thoroughly after handling  
P270 Do not eat, drink, or smoke when using this product  
P271 Use in a well-ventilated area.  
P272 Contaminated work clothing should not be allowed out of the workplace  
P273 Avoid release to the environment  
P280 Wear protective gloves / protective clothing / eye protection / face protection.  
P284 In case of inadequate ventilation wear respiratory protection  
P301/P330/P331/P310 IF SWALLOWED: Rinse mouth. DO NOT induce vomiting. Immediately call a poison center/doctor.  
P303/P361/P352/P333/P313 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Wash with soap & water. Get medical advice / attention if skin irritation or rash occurs or if you feel unwell.  
P304/P340/P312 IF INHALED: remove victim to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.  
P305/P351/P338/P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call POISON CENTER/Doctor.  
P308/P311 IF EXPOSED OR CONCERNED: Get medical advice/attention.  
P342/P311 IF EXPERIENCING RESPIRATORY SYMPTOMS: CALL POISON CENTER/DOCTOR.  
P362 Take off contaminated clothing and wash it before reuse.  
P391 Collect spillage.  
P402/P404 Store in a dry place. Store in a closed container.  
P405 Store locked up.  
P501 Dispose of contents / container in accordance with local/regional/national/international regulations.

## POTENTIAL HEALTH EFFECTS (CHRONIC AND OVEREXPOSURE)

**Tin:** Dust or fumes may cause irritation of the skin mucous membranes and may result in a benign Pneumoconiosis (Stannosis).  
**Silver:** May cause discoloration of eyes and skin (Argyria)  
**Bismuth:** May cause foul breath, a blue-black line on the gums, and Stomatitis.  
**Antimony:** May cause gastrointestinal upset, sleeplessness, irritability, and muscular pain.  
**Indium:** May cause weight loss, pulmonary edema, blood damage and degenerative changes in liver and kidneys.

## CHRONIC/ACUTE HEALTH HAZARDS

**Lead:** Women of child-bearing age should avoid exposure to lead and its inorganic compounds due to post-natal effects. Lead can cause potential injury to developing fetus and possible effects on reproduction. Exposure to high levels of airborne or ingested lead may produce symptoms of anemia, weakness, constipation, nausea, and abdominal pain. Prolonged exposure may result in kidney and/or nervous system involvement.

**MEDICAL CONDITIONS POSSIBLY AGGRAVATED BY EXPOSURE:** Diseases of blood-forming organs, kidneys, nervous and possibly reproductive systems. Occupational Asthma.

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**Chronic Toxicity-Proposition 65, State of California:** Warning! This product Contains Lead, which may be harmful to your health and is a chemical known to the State of California to cause cancer, birth defects, or other reproductive har, Federal and State Laws prohibit the use of lead solder in makin-g joints in any private or public potable (drinking) water supply system. Breathing fumes may cause respiratory system irritation or damage. After handling solder, wash hands with soap and water before eating or smoking.

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredients	CAS	Weight Percent	OSHA PEL [mg/m3]	ACGIH TLV TWA [mg/m3]	LD 50 Ingested [g/kg]	LD 50 Inhaled [g/m3]
Modified Rosins (Rosin)	8050-09-7	<45	NE	NE	NE	NE
Pine Oil Derivatives (Terpineol)	8000-41-7	<5	NE	NE	NE	NE
Mixed Carboxylic Acids (Maleic acid)	110-16-7	<4	NE	NE	NE	NE
*+ Lead	7439-92-1	Product contains one or more of these metallic elements in varying percentages	0.05	0.05	NE	NE
Tin	7440-31-5		2.00	2.00	NE	NE
Silver	7440-22-4		0.01	0.10	NE	NE
Bismuth	7440-69-9		NE	NE	NE	NE
Antimony	65997-06-0		0.50	0.50	7.0 Rat	NE
Indium	68526-86-3		NE	0.10	NE	NE
Copper	98-55-5		1.00	1.00	NE	NE

Hazardous Ingredients	CAS	Weight Percent	OSHA PEL [mg/m3]	ACGIH TLV TWA [mg/m3]	LD 50 Ingested [g/kg]	LD 50 Inhaled [g/m3]
Surfactants	NA	<4	NE	NE	NE	NE
Rheological Modifier	NA	<5	NE	NE	NE	NE

#### SECTION 3 NOTES:

\* denotes a chemical that is also listed in 29 CFR 1910.1200 (D) #4 as a known or suspected cancer hazard.

+ denotes a chemical regulated as toxic by the Environmental Protection Agency (EPA) as outlined in the 40CFR Part 372 (section 313). Percentages of individual components are not listed as this information is considered a trade secret.

- (1) **Per 29 CFR 1910** the mixture has not been tested as a whole. All hazardous components, which compris1% of the mixture (0.1% carcinogenic) are listed. Percentages of individual components are not listed as this information is considered a trade secret.
- (2) The identity of the specific chemical(s) is being withheld as a trade secret per 29 CFR 1910.1200. The hazardous properties of these ingredients are disclosed in the SDS.

### SECTION 4: FIRST AID MEASURES

**Signs and symptoms of first exposure:** Inhalation-Nose and throat irritation, headache, dizziness, difficulty breathing, coughing. Ingestion-nausea, vomiting, cramps. Skin-redness, burning, rash, dryness. Eye-redness, burning, tearing, blurred vision.

#### Emergency first-aid procedures:

- Eye Contact:** Immediately flush eyes with plenty of water for 15 to 20 minutes, contact a physician. If contact lenses can be removed easily, flush eyes without contact lenses.
- Skin Contact:** Immediately wash skin with soap and plenty of water. Get medical attention if irritation develops or persists.
- Inhalation:** If inhaled, remove to fresh air. If not breathing, seek immediate medical attention, give artificial respiration or give oxygen by trained personnel.
- Ingestion:** If swallowed, do NOT induce vomiting. Call a physician or poison control center immediately. Drink large amounts of water. Never give anything by mouth to an unconscious person.
- Other First Aid:** **Lead:** Excessive exposure may result in acute or chronic illness. If symptoms are present, the individual should be immediately removed from exposure and a physician consulted.

Exposures to soldering fumes and vapors may be irritating to eyes, respiratory system, and skin.

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**Note to Physicians:** Provide general supportive measures and treat symptomatically.

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## SECTION 5: FIRE-FIGHTING MEASURES

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**Extinguishing Media:** Dry chemical, foam  
**Special Firefighting Procedures:** Do not use water. Use NIOSH-approved self-contained Breathing Apparatus and full protective clothing if involved in a fire.

**Unusual Fire and Explosion Hazards:** May release Toxic metal and oxide fumes. High concentrations of dust may present explosion hazard. Water trapped below molten metal may explode thus spattering molten metal.

**Hazardous Decomposition Products:** Lead oxide fumes and/or Lead particulate may be evolved.

**SECTION 5 Notes:** Molten solder alloys consisting of Antimony, Bismuth, Copper, Indium, Lead, Silver, and/or Tin do not produce significant quantities of fumes below 900°F.

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## SECTION 6: ACCIDENTAL RELEASE MEASURES

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**Precautions and equipment:** Material is extremely thick and will not flow out.

**Accidental release measures:** If material spills or leaks use a spatula to collect and place it in a plastic or glass jar. Remove traces of residue using cloth rags or paper towels moistened with Isopropyl Alcohol. Exposure to spilled material may be irritating. Follow on-site personal protective equipment recommendations.

**Environmental precautions:** Avoid release to the environment. Collect spillage.

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## SECTION 7: HANDLING AND STORAGE

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**Handling / Storage:** Keep containers tightly closed when not in use. Use care to avoid spills. Avoid inhalation of fumes or dust. Avoid contact with eyes, skin, and clothing. Store in a closed corrosive resistant container, with corrosive resistant liner, in a cool dry place. Wear appropriate personal protective equipment when working with or handling. Always wash hands thoroughly after handling this product. Dispose of following Federal, State/Provincial, and Local regulations.

**Other Precautions:** Empty containers may retain product residues in vapor, liquid, and/or solid form. All labeled hazard precautions should be observed.

**Work Hygienic Practices:** Cosmetics/Food/Drink/Tobacco should not be consumed or used in work areas. Always wash hands after handling material and before applying or using cosmetics/food/drink/tobacco.

**Section 7 Notes:** For industrial use only.  
Keep out of reach of children.  
Not for internal consumption.

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## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

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**Occupational Exposure Limit Values:**  
Rosin flux fumes (as total resin acids)

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**MEL:** 0.05 mg/m<sup>3</sup> 8h TWA.

**MEL:** 0.15 mg/m<sup>3</sup> 15 min.

Extraction is necessary to remove fumes during reflow. Also see section 3.

**Engineering Controls:** Use only with production equipment designed for use with solder paste.

**Ventilation:** Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLVs.

**Respiratory Protection:** A (US: NIOSH; EU: EN 140:1998, EN 14387:2004 A) approved air-purifying respirator with fume/organic chemical cartridge should be worn when airborne concentrations may be exceeded. General and local exhaust ventilation is the preferred means of protection.

**Eye Protection:** Use with appropriate eye protection: Goggles or face shield (EU: EN 166-S 3 9)

**Skins Protection:** Protective gloves should be worn when the possibility of skin contact exists (EU: EN 374-1:2003).

**Protective Clothing or Equipment:** Work clothes should be worn and laundered in accordance with current Lead (Pb) Standards (US: OSHA)

**Work Hygienic Practices:** Cosmetics/Food/Drink/Tobacco should not be consumed or used in work areas. Always wash hands after handling material and before applying or using cosmetics/food/drink/tobacco.

**Other:** Maintain eye wash stations in work areas. Avoid the use of contact lenses in high fume areas. Clean protective equipment regularly. Clean up spills immediately.

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## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

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<b>Appearance:</b>	Grey paste
<b>Odour:</b>	Odorless
<b>Odour Threshold:</b>	NE
<b>pH as Supplied:</b>	NA
<b>Melting Temperature:</b>	Varies
<b>Freezing Temperature:</b>	Varies
<b>Initial Boiling Point:</b>	Varies
<b>Boiling Range:</b>	NA
<b>Flash Point:</b>	NA
<b>Evaporation rate:</b>	NA
<b>Flammability (solid):</b>	NE
<b>Upper/Lower Flammability:</b>	NE
<b>Upper/Lower Explosive Limits:</b>	NE
<b>Vapor pressure (mmHg):</b>	NA
<b>Vapor density (Air = 1):</b>	NA
<b>Relative density:</b>	NE
<b>Solubility in water:</b>	Insoluble
<b>Partition coefficient (n-octanol/water)</b>	NE
<b>Autoignition Temperature:</b>	NE
<b>Decomposition Temperature:</b>	NE
<b>Viscosity:</b>	NA

**Note from Section 9:** Other physical and chemical properties depend on alloy composition.

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## SECTION 10: STABILITY AND REACTIVITY

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**Stability:** Stable  
**Conditions to Avoid (Stability):** NE  
**Incompatibility (Material to avoid):** Oxidizing materials, acids, hydrogen peroxide, bases  
**Hazardous Decomposition/By-Products:** Harmful organic fumes and toxic oxide fumes may form at elevated temperatures. Lead oxide fumes and/or Lead particulate may be evolved.  
**Possibility of Hazardous Reactions:** NE

## SECTION 11: TOXICOLOGICAL INFORMATION

**Inhalation:** This product does not present a risk at ambient temperatures. The flux fumes evolved during soldering will irritate the nose, throat and lungs. Repeated or prolonged exposure to flux fumes may cause an allergic effect which may lead to occupational asthma.  
**Skin:** Contact with flux fumes and flux residues may cause irritation and sensitization.  
**Eyes:** Contact with flux fumes and flux residues may cause irritation.  
**Health Hazards (acute and chronic):** Contact with dust and fumes may cause skin, eye and respiratory irritation. Ingestion and/or inhalation of material or fumes may result in flu-like symptoms, insomnia, muscle weakness, nausea and abdominal pain. Prolonged inhalation or ingestion may be toxic and can result in death. Symptoms of toxicity may take hours or days to manifest. Chronic exposures, inhalation and ingestion may result in kidney, red blood cell, reproductive and nervous system effects. Health effects may be cumulative over many exposures. Studies show that health risks vary by individual. Minimize exposure as a precaution. See OSHA 29CFR 1910.1025(subpart Z) for more information.

### Acute toxicity:

Product/Ingredient Name	Result	Species	Dose	Exposure
Rosin:	LD50 Oral	Rat	7600 mg/kg	-
Terpineol	LD50 Oral	Rat	2000 mg/kg	-
	LD50 Inhalation	Rat	4.76 mg/l	4 hours
	LD50 Dermal	Rat	2000 mg/kg	-
Maleic acid	LD50 Oral	Rat	7089 mg/kg	Remarks: Behavioral: Convulsions or effect on seizure threshold. Behavioural: Muscle weakness. Gastrointestinal: Ulceration or bleeding from stomach.
	LD50 Inhalation	Rat	720 mg/m3	1 hour
	LD50 Dermal	Rabbit	1560 mg/kg	Remarks: Behavioural: Tremor
Antimony	LD50 Oral	Rat	7000 mg/kg	-
Silver	LD50 Oral	Mouse	100 mg/kg	-

**Skin Corrosion/Irritation:** NE  
**Serious Eye Damage/Irritation:** NA  
**Respiratory or skin sensitization:** NE  
**Germ Cell Mutagenicity:** NA  
**Carcinogenicity:** OSHA: NA

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ACGIH: Lead (Pb)-A3  
NTP: NA  
IARC: Lead (Pb)-Group 2B

Reproductive toxicity: NA

STOT-Single Exposure:

Product/Ingredient Name	Category	Route of Exposure	Target Organs
Maleic Acid	Category 3	Not applicable	Respiratory Trace irritation

STOT-Repeated Exposure: NA

Aspiration Hazard: NA

Section 11 Notes: This product has not been tested as a whole to determine its hazards. Synergistic or additive effects of the above chemicals are unknown, as are the effects of exposure to these chemicals in addition to others present in the work place. See Section 2 for additional health hazards.

## SECTION 12: ECOLOGICAL INFORMATION

Product/Ingredient Name	Result	Species	Exposure
Lead	Acute EC50 105 ppb Marine water	Algae – Chaetoceros sp. – Exponential growth phase.	72 hours
	Acute EC50 0.489 mg/l Marine water	Algae – Ulva pertusa	96 hours
	Acute EC50 8000 µg/l Fresh water	Aquatic plants – Lemna minor	4 days
	Acute LC50 530 µg/l Fresh water	Crustaceans – Ceriodaphnia reticulata	48 hours
	Acute LC50 4400 µg/l Fresh water	Daphnia magna	48 hours
	Acute LC50 0.44 ppm Fresh water	Fish – Cyprinus carpio – Juvenile (Fledgling, Hatchling, Weanling)	96 hours
	Chronic NOEC 0.26 mg/l Marine water	Algae – Ulva pertusa	96 hours
	Chronic NOEC 0.03 µg/l Fresh water	Fish – Cyprinus carpio	4 weeks
Rosin	Acute LC50 60.3 mg/l Fresh water	Brachydanio rerio (zebra fish)	96 hours
Terpineol	Acute LC50 62.80 mg/l Fresh water	Danio rerio (zebra fish)	96 hours
	Acute LC50 68 mg/l Marine water	Algae – Pseudokirchneriella subcapitata (green algae)	72 hours
Maleic Acid	Acute EC50 316200 µg/l Fresh water	Daphnia – Daphnia magna – Larvae	48 hours
	Acute LC50 5000 µg/l Fresh water	Fish – Pimephales promelas	96 hours

Persistence and Degradability: NE  
Bioaccumulative Potential:

Product/Ingredient Name	LogP <sub>ow</sub>	BCF	Potential
Rosin	1.9 to 7.7	0	High
Terpineol	-	-	NE
Maleic acid	-1.3	-	Low

Mobility in Soil: NE  
Result of PBT and vPvB Assessment: Not applicable  
Other Adverse Effects: NE

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## SECTION 13: DISPOSAL CONSIDERATIONS

**Waste Disposal Method:** Scrap and waste should be recycled or stored in a dry, sealed container for later disposal. Disposal must be in accordance with Federal, State/Provincial and Local Regulations.

**Other precautions:** Avoid skin & eye contact, inhalation & ingestion of fumes and material. Wash contaminated clothing before reuse. Keep away from children.

## SECTION 14: TRANSPORT INFORMATION

**UN number:** Not available  
**UN Proper shipping name:** Not available  
**Packaging Group:** Not applicable  
**Environmental Hazards:** None

### TRANSPORT HAZARD CLASSES:

**US DOT Hazardous** Non-Hazardous  
**Material Classification:**  
**Water Transportation:** Non-Hazardous  
**IATA Hazardous Material Classification:** Non-Hazardous  
**ADR Road Regulations** Not regulated  
**IMDG Sea Regulations** Not regulated  
**ADG Land Transportation** Not regulated

## SECTION 15: REGULATORY INFORMATION

All ingredients used to manufacture this product are listed on the EPA TSCA Inventory. Finished product is not listed on the EPA TSCA Inventory.

**US Federal Regulations:** Not regulated  
**State Regulations:** Not regulated  
**International Regulations:** Not regulated  
**Australian Regulations:** Not regulated

## SECTION 16: Additional Information

Legend:

**ACGIH:** American Conference Of Governmental Industrial Hygienists  
**ADG** Australian Dangerous Goods Code  
**ADR** European Agreement Concerning The International Carriage Of Dangerous Goods By Road  
**AICS** Australian Inventory Of Chemical Substances  
**BCF** Bioconcentration Factor  
**C.A.S** Chemical Abstract Service  
**CLP** Classification, Labeling And Packaging  
**DOT** Department Of Transportation  
**EC** Effective Concentration  
**EPA** Environmental Protection Agency  
**GHS** Global Harmonized System  
**HMIS** Hazardous Material Identification System  
**IARC** International Agency For Research On Cancer  
**IATA** International Air Transport Association  
**IMDG** International Maritime Dangerous Goods Code  
**LC** Lethal Concentration  
**LD** Lethal Dose  
**NA** Not Available  
**NE** Not Established  
**NIOSH** National Institute For Occupational Safety & Health



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NOEC	No Observed Effective Concentration
NOHSC	National Occupational Health And Safety Commission (Australia)
NTP	National Toxicology Program
OSHA	Occupational Safety And Health Administration
PEL	Permissible Exposure Limit
P <sub>ow</sub>	Octanol Water Partition Coefficient
SDS	Safety Data Sheet
STEL	Short-Term Exposure Limit
STOT	Specific Target Organ Toxicity
TLV	Threshold Limit Value
TSCA	Toxic Substance Control Act
TWA	Time Weighted Average
US DOT	United States Department Of Transportation

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**Disclaimer:** The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Additionally, Voltera Inc. assumes no responsibility for injury to the end user proximately caused by the material even if reasonable safety procedures are followed. The end user assumes the risk in their use of this material.