

SAFETY DATA SHEET

Lead-Free Solder Paste (SnBiAg)



First issue: 2018-07-30
Revision date: 2018-07-30
Version: 1.0

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Product name: Lead-Free Solder Paste (SnBiAg)
Synonyms: Water Soluble 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

SECTION 2: HAZARDS IDENTIFICATION

GHS Class Phrases: Acute Tox. 4
Skin Sens. 1
Hazardous to the aquatic environment, short-term, acute Category 1
Hazardous to the aquatic environment, long-term, chronic Category 1

Label Elements



Signal Words: WARNING.
Hazard Statements: H302 Harmful if swallowed
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
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

SAFETY DATA SHEET

Lead-Free Solder Paste (SnBiAg)



First issue: 2018-07-30
Revision date: 2018-07-30
Version: 1.0

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.
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.

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

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS	% by Weight	Hazard Descriptions
Modified Rosins (Rosin)	8050-09-7	<45	
Pine Oil Derivatives (Terpineol)	8000-41-7	<5	
Mixed Carboxylic Acids (Maleic acid)	110-16-7	<4	
Tin	7440-31-5	Not specified	
Silver	7440-22-4	0.4	Acute oral toxicity (Category 4) Acute hazard to the aquatic environment (Category 1) Chronic hazard to the aquatic environment (Category 1)
Bismuth	7440-69-9	57.4	
Hydrogenated Rosin	65997-06-0	3.0-9.0	Eye irritation (Category 2)
Tridecyl alcohol	68526-86-3	0.0-7.0	Acute hazard to the aquatic environment (Category 1) Chronic hazard to the aquatic environment (Category 1)
Alpha terpineol	98-55-5	1.0-7.0	Eye irritation (Category 2)
Malonic acid	141-82-2	0.25-0.28	Acute oral toxicity (Category 4) Serious eye damage (Category 1)

SECTION 4: FIRST AID MEASURES

Eye Contact: Immediately flush eyes with plenty of water for 15 to 20 minutes. Get medical attention, if irritation or symptoms of overexposure persists.
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, give artificial respiration or give oxygen by trained personnel. Seek immediate medical attention.

SAFETY DATA SHEET

Lead-Free Solder Paste (SnBiAg)



First issue: 2018-07-30
Revision date: 2018-07-30
Version: 1.0

Ingestion: If swallowed, do NOT induce vomiting. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.

Other First Aid: Exposures to soldering fumes and vapors may be irritating to eyes, respiratory system, and skin.

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

SECTION 5: FIRE-FIGHTING MEASURES

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.

SECTION 6: ACCIDENTAL RELEASE MEASURES

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.

SECTION 7: HANDLING AND STORAGE

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.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limit Values:

Rosin flux fumes (as total resin acids)

MEL: 0.05 mg/m³ 8h TWA.

SAFETY DATA SHEET

Lead-Free Solder Paste (SnBiAg)



First issue: 2018-07-30
Revision date: 2018-07-30
Version: 1.0

MEL: 0.15 mg/m³ 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 ume areas. Clean protective equipment regularly. Clean up spills immediately.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

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

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

SECTION 10: STABILITY AND REACTIVITY

Stability:	Stable
Conditions to Avoid (Stability):	NE

SAFETY DATA SHEET

Lead-Free Solder
Paste (SnBiAg)

First issue: 2018-07-30
Revision date: 2018-07-30
Version: 1.0

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.

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 and sensitization.

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/m ³	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
ACGIH: NA
NTP: NA
IARC: NA

Reproductive toxicity: NA

SAFETY DATA SHEET

Lead-Free Solder
Paste (SnBiAg)

First issue: 2018-07-30
Revision date: 2018-07-30
Version: 1.0

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
Silver	Acute EC50 1.5 µg/l Marine water	Algae – Chroomonas sp.	4 days
	Acute EC50 0.24 µg/l Fresh water	Daphnia – Daphnia magna	48 hours
	Acute LC50 11 sepg/l Fresh water	Crustaceans – Ceriodaphnia reticulata	48 hours
	Acute LC50 2.13 µg/l Fresh water	Fish – Pimephales promelas	96 hours
	Chronic NOEC 5 mg/l Marine water	Algae – Glenodinium halli	72 hours
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
Copper	Acute EC60 1100 µg/l Fresh water	Aquatic plants - Lemna minor	4 days
	Acute EC50 2.1 µg/l Fresh water	Daphnia – Daphnia longispina – Juvenile (Fledgling, Hatchling, Weanling)	48 hours
	Acute IC50 13 µg/l Fresh water	Algae – Pseudokirchneriella subcapitata – Exponential growth phase	72 hours
	Acute IC50 5.4 mg/l Marine water	Aquatic plants – Plantae – Exponential growth phase	72 hours
	Acute LC50 0.072 µg/l Marine water	Crustaceans – Amphipoda – Adult	48 hours
	Acute LC50 7.56 µg/l Marine water	Fish – Periophthalmus waltoni – Adult	96 hours
	Chronic NOEC 2.5 µg/l Marine water	Algae – Nitzschia closterium – Exponential growth phase	72 hours
	Chronic NOEC 7 mg/l Fresh water	Aquatic plants – Ceratophyllum demersum	3 days
	Chronic NOEC 0.02 mg/l Fresh water	Crustaceans – Cambarus bartonii – Mature	21 days
	Chronic NOEC 2 µg/l Fresh water	Daphnia – Daphnia magna	21 days
	Chronic NOEC 0.8 µg/l Fresh water	Fish – Oreochromis niloticus – Juvenile (Fledgling, Hatchling, Weanling)	6 weeks

Persistence and Degradability: NE
Bioaccumulative Potential:

Product/Ingredient Name	LogPow	BCF	Potential
-------------------------	--------	-----	-----------

SAFETY DATA SHEET

Lead-Free Solder
Paste (SnBiAg)

First issue: 2018-07-30
Revision date: 2018-07-30
Version: 1.0

Silver	-	70	Low
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

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 Material Classification: Non-Hazardous
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

SAFETY DATA SHEET

Lead-Free Solder Paste (SnBiAg)



First issue: 2018-07-30
Revision date: 2018-07-30
Version: 1.0

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
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 _{ow}	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

Revision Date: 2018-07-30

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.