

SPI Supplies Division

Structure Probe, Inc.

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Manufacturer's CAGE: 1P573

Safety Data Sheet

Date Effective: February 21, 2014

SPI#05063-AB

SPI Supplies® Silver Paste Plus™

Section 1: Identification

Chemical Name/Synonyms..... Silver Composition

Chemical family..... Silver colloid in carrier with polymer

Emergencies

Contacting CHEMTREC:

24 Hour Emergency Use Only #'s...

Worldwide phone: 1-(703)-527-3887

Worldwide FAX: 1-(703)-741-6090

Toll-free phone: 1-(800)-424-9300 USA only

Product or Trade Name..... Silver Paste Plus

CAS #'s..... 7440-22-4; 108-65-6; 65859-05-4

Chemical Formula..... Proprietary

Main use..... Mounting of samples for scanning electron microscopy; mounting of silicon wafers when producing high temperature thin film superconductor materials.

Secondary use..... PC board repairs and other electronic industry applications.

Emergency Overview

OSHA Hazards

Flammable liquid, Target Organ Effect

Target Organs

Blood, Kidney

GHS Classification

Flammable liquids (Category 3)

Skin irritation (Category 2)

Eye irritation (Category 2A)

Specific target organ toxicity - single exposure (Category 3), Respiratory system

Acute aquatic toxicity (Category 3)

GHS Label elements, including precautionary statements

Pictogram



Signal Word: Danger

Hazard statement(s)

H226 Flammable liquid and vapor.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation
H402 Harmful to aquatic life.

Precautionary statement(s)

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P281: Use personal protective equipment as required .
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Hazardous Material Information System USA, estimated

Health..... 0
Fire Hazard..... 2
Reactivity..... 0
Personal Protection.....

NFPA Rating (estimated)

Health..... 0
Flammability..... 2
Reactivity..... 0

Section 2: Composition

Component	CAS No.	ECCN No.	Concentration
Silver Powder	7740-22-4		60 – 70 %
1Methoxy-2-propyl acetate	108-65-6		10 – 20 %
Acrylic resin	65859-05-4		1 – 10 %
Organic solvent	proprietary		0.1 – 1 %

Section 3: Hazard Identification

Emergency Overview:

Flammable liquid. Handle in accordance with good industrial hygiene and safety practice.
Avoid contact with skin, eyes, and clothing.

Potential Health Effects:

Skin: Repeated or prolonged skin contact may cause allergic reactions with susceptible persons. May cause skin irritation. May cause discomfort, itching, redness, or swelling. Prolonged or repeated skin contact with liquid may cause defatting resulting in drying, redness, and possible blistering. May be harmful if absorbed through skin. Effects of skin contacts may include altered blood chemistry, kidney effects.

Eyes: May cause eye irritation, blurred vision, tearing, redness, or discomfort.

Inhalation: Respiratory irritation, Cough, Discomfort.

Ingestion: May be harmful if swallowed. Effects due to ingestion may include bloody urine, In-coordination.

Repeated exposure: Adverse effects from repeated exposure may include Argyria – blue-gray discoloration of skin, mucous membranes and conjunctiva, cornea or lens.

Target Organ: Blood, Kidney

Carcinogenicity: None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, or OSHA, as a carcinogen.

Section 4: First Aid Measures

Skin Contact: Wash off with soap and water. Get medical attention if irritation develops and persists. Wash contaminated clothing before re-use.

Eye Contact: Immediately flush eyes for at least 15 minutes. Get medical attention.

Inhalation: If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

Ingestion: If swallowed, rinse mouth with water. Call a physician or poison control center immediately. DO NOT induce vomiting unless directed to do so by a physician or poison control center.

Section 5: Fire Fighting Measures

Flammable Properties Flash Point: 51 °C (124 °F) Closed Cup

Fire and Explosion Hazard: Hazardous decomposition products formed under fire conditions. (see also section 10) Avoid breathing decomposition products.)

Suitable extinguishing media: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Firefighting Instructions: Exposure to decomposition products may be a health hazard. Wear self contained breathing apparatus for fire fighting if necessary. Evacuate personnel to safe areas. Stop spill/release if it can be done with minimal risk. Do not allow run-off from fire fighting to enter drains or water courses.

Section 6: Accidental Release Measures

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Safeguards (Personnel): Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Wear suitable protective equipment.

Spill Clean-up: Contain spill. Soak up with inert absorbent material. Collect and contain contaminated absorbent and dike material for disposal. Keep in suitable closed containers for disposal. Ventilate the area. Clean contaminated surface thoroughly.

Accidental Release Measures: Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Clean contaminated floors and objects thoroughly while observing environmental regulations. Dispose of in accordance with local regulations.

Section 7: Handling and Storage

Handling (Personnel): Avoid inhalation, ingestion and contact with skin and eyes. Do not use in areas without adequate ventilation. Keep container closed when not in use. Take care to avoid waste and spillage when weighing, loading and mixing the product.
Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. Contaminated work clothing should not be allowed out of the workplace. Remove contaminated clothing and protective equipment before entering eating areas. Remove and wash contaminated clothing before re-use.

Handling (Physical Aspects): Avoid formation of dust and aerosols. Keep away from heat and sources of ignition. Take measures to prevent the build up of electrostatic charge. Static charges can cause explosions in solvent and dust laden atmospheres.

Storage: Store in original container. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from sources of ignition - No smoking. Do not store or consume food, drink or tobacco in areas where they may become contaminated with this material. Keep container closed when not in use. Do not reuse empty container. Stable under normal conditions.

Section 8: Exposure Controls and Personal Protection

Engineering controls: Local exhaust or a laboratory hood should be used when handling the materials. Maintain air concentrations below occupational exposure standards.

Personal protective equipment

Respiratory protection: Provide adequate ventilation. No personal respiratory protective equipment normally required. Where there is potential for airborne exposures in excess of applicable limits, wear approved respiratory protection with dust/mist cartridge. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Consult the respirator manufacturer to determine the appropriate type of equipment for a given application. Observe respirator use limitations specified by the manufacturer.

Hand protection: Material: Impervious gloves. Additional protection: Gloves must

be inspected prior to use.

Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough. The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. The exact break through time can be obtained from the protective glove producer, and this has to be observed. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

Eye Protection: Wear safety glasses with side shields.

Skin and body protection: Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Light protective clothing, safety shoes.

Exposure Guidelines

Exposure Limit Values:

Silver powder

PEL: (OSHA)	0.01 mg/m ³	8 hr. TWA as Ag
TLV: (ACGIH)	0.1 mg/m ³	TWA Dust and fume

1-Methoxy-2-propyl acetate

AEL* (Industry)	30 ppm	15 minute TWA
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Organic Solvent

TLV (ACGIH)	20 ppm	TWA
AEL* (Industry)	20 ppm	* & 12 hr. TWA

*AEL is Industry's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

Section 9: Physical and Chemical Properties

Form:	Viscous liquid
Color:	Grey
Odor:	Acrylic-like
Density:	3 g/cm ³
Water solubility:	at 20°C (68°F) slightly soluble

Section 10: Stability and Reactivity

Stability: Stable at normal temperatures and storage conditions.

Conditions to avoid: Heat, flames and sparks.
Incompatibility: Acids, bases, and strong oxidizing agents.
Hazardous decomposition products: No decomposition if stored and applied as directed.
Under fire conditions: Carbon monoxide, carbons dioxide, unburned hydrocarbons, metal oxides.
Hazardous reactions: Polymerization will not occur.

Section 11: Toxicological Information

Silver powder

Oral LD50: >2,000 mg/kg, rat
Skin irritation: No skin irritation, rabbit
slight irritation
Eye irritation: No eye irritation, rabbit
Skin sensitization: There are rare or inconclusive reports of human skin sensitization
Repeated dose toxicity: Oral, rat Altered blood chemistry
Carcinogenicity: An increased incidence of tumors was observed in some laboratory
animals, but not in others.
Mutagenicity: Overall weight of evidence indicates that the substance is not
mutagenic.
Did not cause genetic damage in animals.
Did not cause genetic damage in cultured bacterial cells.
Genetic damage in cultured mammalian cells was observed in
some laboratory tests but not in others.
Information given is based on data obtained from similar substances.
Teratogenicity: Evidence suggests the substance is not a developmental toxin
in animals.
Information given is based on data obtained from similar substances.

1-Methoxy-2-propyl acetate

Dermal LD50: >5,000 mg/kg, rabbit
Oral LD50: 8,532 mg/kg, rat
Skin irritation: No skin irritation, rabbit
Eye irritation: Mild eye irritation, rabbit
Skin sensitization: Did not cause sensitization on laboratory animals, guinea pig.
Repeated dose toxicity: Inhalation
multiple speciesRespiratory irritation
Mutagenicity: Tests on bacterial or mammalian cell cultures did not show
mutagenic effects.
Reproductive toxicity: Animal testing showed no reproductive toxicity.
Teratogenicity: Animal testing showed no developmental toxicity.

Organic Solvent

Dermal LD50: 1,500 mg/kg, rabbit altered hematology
Oral LD50: 1,880 mg/kg, rat bloody urine
Inhalation, 4h, LC50: >2.66 mg/l, rat
An LC50/inhalation/4h/rat could not be determined because no
mortality of rats was observed at the maximum achievable
concentration.
Skin irritation: No skin irritation, rabbit
slight irritation
Eye irritation: No eye irritation, rabbit
slight irritation

Skin sensitization: Does not cause skin sensitization, guinea pig
Information given is based on data obtained from similar substances.

Repeated dose toxicity: Oral-drinking water, rat Liver effects
Inhalation, multiple species - altered hematology
Dermal, rabbit No toxicologically significant effects were found.

Carcinogenicity: Overall weight of evidence indicates that the substance is not carcinogenic.

Mutagenicity: Animal testing did not show any mutagenic effects.
Test on bacterial or mammalian cell cultures did not show mutagenic effects.
Information given is based on data obtained from similar product.

Reproductive toxicity: Animal testing showed no reproductive toxicity.

Teratogenicity: Animal testing showed no developmental toxicity.
Did not show teratogenic effects in animal experiments.
Information given is based on data obtained from similar substances.

Section 12: Ecological Information

Aquatic Toxicity

Silver powder

96h LC50: Pimephales promelas (fathead minnow) 0.0012 mg/l
Information given is based on data obtained from similar substances.

24 h EC100: Pseudokirchneriella subcapitata (green algae) 0.00041 mg/l
Information given is based on data obtained from similar substances.

48 h EC50: Daphnia magna (Water flea) 0.00022 mg/l
Information given is based on data obtained from similar substances.

28d: NOEC Pimephales promelas (fathead minnow) 0.000351 mg/l

1-Methoxy-2-propyl acetate

96 h LC50: Oryzias latipes (medaka) > 100 mg/l

96 h LC50: Oncorhynchus mykiss (rainbow trout) 134 mg/l

96 h LC50: Pimephales promelas (fathead minnow) 161 mg/l

72 h EC50: Scenedesmus capricornutum (fresh water algae) > 1,000 mg/l

48 h EC50: Daphnia magna (Water flea) 380 mg/l

Organic solvent

96 h LC50: Pimephales promelas (fathead minnow) 22 mg/l

72 h EC50: Pseudokirchneriella subcapitata (green algae) 1,570 mg/l

48 h EC50: Daphnia magna (Water flea) 37 mg/l

7d EC10: Ceriodaphnia Dubia (water flea) 304. mg/l

Environmental Fate

Silver powder

Biodegradability: Not inherently biodegradable.

1-Methoxy-2-propyl acetate

Biodegradability: Readily biodegradable.

Section 13: Disposal Considerations

- Waste Disposal: If recycling is not practicable, dispose of in compliance with local regulations. Never place unused product down any indoor or out door drain.
- Container Disposal: Do not reuse empty container.
Contaminated/not leaned containers should be treated/handled like product waste.
Dispose of container properly.
Refer to applicable Local, State/Provincial, and Federal Regulations, as well as industry standards.

Section 14: Transport Information

DOT

Shipping name: Paint Related Material
Hazard Class: 3
UN/NA Class: UN1263
Label: Flammable liquid
Packing Group III

IATA

Shipping name: Paint Related Material
Hazard Class: 3
UN/NA Class: UN1263
Label: Flammable liquid
Packing Group III

Section 15: Regulatory Information

- TSCA (US) Status: On the inventory, or in compliance with the inventory
- SARA 313 Regulated Chemicals: Silver powder
- CERCLA Reportable Quantity: 200 lbs
Base on the percentage composition of this chemical in the product: 2-Butoxyethyl acetate
- California Prop. 65: WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm: Toluene.

NJ, PA Right to Know Lists: Substances present at a concentration of 1% or more: Silver powder

Canadian WHMIS Classification: Class B, Division 3; Class D, Division 2, Subdivision B

Section 16: Other Information

Disclaimer of Liability:

Caution! Do not use SPI Supplies products or materials in applications involving implantation within the body; direct or indirect contact with the blood pathway; contact with bone, tissue, tissue fluid, or blood; or prolonged contact with mucous membranes. Products offered by SPI Supplies are not designed or manufactured for use in implantation in the human body or in contact with internal body fluids or tissues. SPI Supplies will not provide to customers making devices for such applications any notice, certification, or information necessary for such medical device use required by US FDA (Food and Drug Administration) regulation or any other statute. SPI Supplies and Structure Probe, Inc. make no representation, promise, express warranty or implied warranty concerning the suitability of these materials for use in implantation in the human body or in contact with internal body tissues or fluids.

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