

SAFETY DATA SHEET (SDS)

LEAD-FREE SOLDER ALLOYS (IPC J-STD-006)

STIRRI

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Lead Free (LF) Alloyed Products containing Antimony, Bismuth, Copper, Gold, Nickel, Silver, and Tin

BRAND: STIRRI™

SYNONYMS: LF Solder Powder, LF Solder Spheres, LF BGA, LF Preforms, LF Bar Solder, LF Solid Wire, LF Solid Core

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REVISION DATE: December 30, 2023

REVISION NUMBER: 231230

DOCUMENT NAME: SDS-SW-LF-231230

PRODUCT USE: Soldering components for bonding semiconductor chips and packages to circuit boards

SECTION 2: HAZARDS IDENTIFICATION

CHEMICAL NAME: N/A

CHEMICAL FAMILY: Inorganic Metals

CHEMICAL FORMULA: N/A

ROUTES OF ENTRY: Inhalation, Ingestion, Skin/Eye Contact

GHS:



Signal Word: Warning

Hazard statement(s)

H302 Harmful if swallowed

H315 Causes skin irritation

H317 May cause an allergic skin reaction

H333 May be harmful if inhaled

H335 May cause respiratory irritation

H336 May cause drowsiness or dizziness

Precautionary statement(s)

P102 Keep out of reach of children

P261 Avoid breathing dust/fume/gas/mist/vapors/spray

P270 Do not eat, drink, or smoke when using this product

P280 Wear protective gloves/protective eye protection/face protection

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician

P302 + P352 IF ON SKIN: Wash with plenty of soap and water

P304 + P340 IF INHALED: If breathing is difficult, remove person to fresh air and keep comfortable for breathing

P305 + P351 IF IN EYES: Rinse continuously with water for several minutes

MEDICAL CONDITIONS POSSIBLY AGGRAVATED BY EXPOSURE:

Diseases of the blood-forming organs, kidneys, nervous and possibly reproductive systems

POTENTIAL HEALTH EFFECTS

EYE CONTACT: May cause moderate irritation, tearing, and reddening. Contact with fumes from molten metal may cause irritation.

INHALATION: Inhalation of fumes or dust may cause local irritation to the respiratory system, dizziness, weakness, fatigue, nausea, and/or headache.

SKIN CONTACT: May cause mild skin irritation.

INGESTION: Harmful if swallowed. May cause irritation to the mouth, throat, and stomach. May cause abdominal discomfort, nausea, vomiting, and/or diarrhea.

POTENTIAL HEALTH EFFECTS (CHRONIC & 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).

SECTION 2: HAZARDS IDENTIFICATION (continued)

BISMUTH: May cause foul breath, a blue-black line on the gums, and Stomatitis.

ANTIMONY: May cause gastrointestinal upset, sleeplessness, irritability, and muscular pain.

SECTION 2 NOTES:

STIRRI LLC does not recommend, manufacture, market, or endorse any of its products for human consumption.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

<u>Ingredient</u>	<u>CAS Number</u>	<u>OSHA PEL</u>	<u>ACGIH TLV</u>
Tin	7440-31-5	2.0 MG/M ³	2.0 MG/M ³
Silver	7440-22-4	0.01 MG/M ³	0.1 MG/M ³
Bismuth	7440-69-9	Not Established	Not Established
Antimony	7440-36-0	0.5 MG/M ³	0.5 MG/M ³
Nickel	7440-02-0	1.0 Mg./Cu. M.	1.0 Mg./Cu. M.
Copper	7440-50-8	1.0 Mg./Cu. M.	1.0 Mg./Cu. M.
Gold	7440-57-5	Not Established	Not Established

SECTION 3 NOTES:

Product contains one or more of these metallic elements in varying percentages.

SECTION 4: FIRST AID MEASURES

EYES: Flush with water, contact a physician. Dust and/or fumes may cause irritation. If contact lenses can be removed easily, flush eyes without contact lenses.

SKIN: For hot metal burns, exposed area should be cooled with water and medical attention sought. After handling material wash hands thoroughly with soap and water. Dust, vapor, and/or fumes are not readily absorbed through the skin.

INGESTION: Call a physician or Poison Control Center immediately. Do not induce vomiting.

INHALATION: If symptoms are present, the individual should be immediately removed from exposure and a physician consulted.

SECTION 5: FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Use extinguishers appropriate for conditions.

SPECIAL FIRE FIGHTING PROCEDURES: Use NIOSH-approved self-contained Breathing Apparatus and full protective clothing if involved in a fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Moderate in the form of dust when exposed to heat or flame.

SECTION 5 NOTES:

Molten solder alloys consisting of Antimony, Bismuth, Copper, Gold, Silver, and/or Tin do not produce significant quantities of fumes below 900 °F.

SECTION 6: ACCIDENTAL RELEASE MEASURES

ACCIDENTAL RELEASE MEASURES: Material is non-hazardous. Follow directions listed under HANDLING/STORAGE.

SECTION 6 NOTES:

See Sections 2, 4, and 7 for additional information.

SECTION 7: HANDLING AND STORAGE

HANDLING/STORAGE: Avoid inhalation of solder fumes or dust. Vacuuming is recommended. Do not use dry sweeping or compressed air cleaning systems. Wear protective gloves to pick up solid metal pieces. Dispose of following Federal, State/Provincial, and Local regulations. Metal may have reclaim value.

WORK HYGIENIC PRACTICES: Cosmetics/Food/Drink/Tobacco should not be consumed or used in areas where solder products may be used. Always wash hands after handling soldering products and before applying or using cosmetics/food/drink/tobacco.

OTHER PRECAUTIONS: Empty containers may retain product residues in vapor, liquid, and/or solid form. All labeled hazard precautions must be observed.

SECTION 7 NOTES:

For industrial use only.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

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

RESPIRATORY PROTECTION: A NIOSH-approved dust/fume respirator should be worn when applicable limits may be exceeded.

EYE PROTECTION: Safety glasses and/or face protection is recommended for exposures where there is a risk of dust or hot metal splashing.

SKIN PROTECTION: Protective gloves should be worn to reduce burn exposure. Disposable gloves are recommended to minimize direct exposure to material.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Silver-gray
SHAPE:	Sphere, rectangular, or washer shaped; wire; bar or ingot form
ODOR:	Odorless
ODOR THRESHOLD:	Not established
pH as SUPPLIED:	N/A
MELTING POINT:	Varies
FREEZING POINT:	Varies
INITIAL BOILING POINT:	Varies
BOILING RANGE:	Varies
FLASH POINT:	N/A (°F/°C)
EVAPORATION RATE:	N/A
FLAMMABILITY (solid):	Not established
UPPER/LOWER FLAMMABILITY:	Not established
UPPER/LOWER EXPLOSIVE LIMITS:	Not established
VAPOR PRESSURE (mmHg):	N/A (°F/°C)
VAPOR DENSITY (AIR = 1):	N/A (°F/°C)
RELATIVE DENSITY:	Not established
SOLUBILITY IN WATER:	Insoluble
PARTITION COEFFICIENT (n-octanol/water):	Not established
AUTOIGNITION TEMPERATURE:	Not established
DECOMPOSITION TEMPERATURE:	Not established
VISCOSITY:	N/A (°F/°C)

SECTION 9 NOTES: Some typical alloy compositions are:

96.5%Tin/3%Silver/0.5%Copper	99.3%Tin/0.7%Copper
95%Tin/5%Antimony	95.5%Tin/4.0%Silver/0.5%Copper
42%Tin/58%Bismuth	80%Gold/20%Tin

SECTION 10: STABILITY AND REACTIVITY

STABILITY:	Stable
CONDITIONS TO AVOID (STABILITY):	Not established
INCOMPATIBILITY (MATERIAL TO AVOID):	Oxidizing materials, acids, hydrogen peroxide
HAZARDOUS DECOMPOSITION/BY-PRODUCTS:	N/A
POSSIBILITY OF HAZARDOUS REACTIONS:	Will not occur

SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE TOXICITY:

Antimony (7440-36-0)	
LD50 Ingested rat	7000 mg/kg

Silver (7440-22-4)	
LD50 Oral mouse	100/mg/kg

SKIN CORRIOSION/IRRITATION:	Not established
SERIOUS EYE DAMAGE/IRRITATION:	Not available
RESPIRATORY OR SKIN SENSITIZATION:	Not established
GERM CELL MUTAGENICITY:	Not available
CARCINOGENICITY:	Not available
REPRODUCTIVE TOXICITY:	Not available
STOT-SINGLE EXPOSURE:	Not available
STOT-REPEATED EXPOSURE:	Not available
ASPIRATION HAZARD:	Not available

SECTION 12: ECOLOGICAL INFORMATION

TOXICITY: Not established
PERSISTENCE AND DEGRADABILITY: Not established
BIOACCUMULATIVE POTENTIAL: Not established
MOBILITY IN SOIL: Not established
OTHER ADVERSE EFFECTS: Not established

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Scrap and waste solder should be recycled or stored in a dry, sealed container for later disposal. Disposal must be in accordance with standards, regulations, laws, and statutes set forth by Federal, State/Provincial, and Local Regulations.

SECTION 14: TRANSPORT INFORMATION

Transport in accordance with applicable regulations and requirements.

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: Alloyed Products are not listed as a DOT hazardous material
Water Transportation: Alloyed Products are not listed as a hazardous material
IATA Hazardous Material Classification: Alloyed Products are not listed as IATA hazardous material

SECTION 15: REGULATORY INFORMATION

All ingredients are listed on the EPA TSCA Inventory. Finished product is not listed on the EPA TSCA Inventory

U.S. FEDERAL REGULATIONS: None
STATE REGULATIONS: None
INTERNATIONAL REGULATIONS: None

SECTION 16: OTHER INFORMATION

HMIS Rating: Health=1 Flammability=1 Physical Hazard=0 Personal Protection=X

PREPARATION INFORMATION:

This update supersedes all previously released documents.

KEY:

N/A: Not applicable
GHS: Global Harmonized System
CAS: Chemical Abstract Service
OSHA: Occupational Safety and Health Administration
PEL: Permissible Exposure Limit
ACGIH: American Conference of Governmental Industrial Hygienists
LD50: Lethal Dose, 50% or medial lethal dose
STOT: Specific target organ toxicity
TLV: Threshold limit value
NTP: National Toxicology Program
IARC: International Agency for Research on Cancer
NIOSH: National Institute for Occupational Safety and Health
US DOT: United States Department of Transportation
DOT: Department of Transportation
IATA: International Air Transport Association
EPA: Environmental Protection Agency
TSCA: Toxic Substance Control Act
HMIS: Hazardous Material Identification System

PREPARED BY: Compliance Officer
APPROVED BY: Operations Manager

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