



INDIUM CORPORATION OF AMERICA ® \ EUROPE ® \ ASIA-PACIFIC ®
 INDIUM CORPORATION (SUZHOU) ®
SAFETY DATA SHEET

This safety data sheet represents a family grouping of all metal mixes that are blended with the same flux known as Indium 9.72HF. A product table is provided that lists all metal groupings.

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: INDALLOY WITH INDIUM 9.72HF FLUX VEHICLE

SDS Number: SDS-5210

Revised Date: 20 MARCH 2017

Product Use: Industrial Use (mixture) - Solder paste consisting of a flux vehicle blended with an 83-92 % pre-alloyed metal powder. Review alloy table for product mixtures.

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2. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY:

⊕ Eye ⊕ Inhalation ⊕ Skin ⊕ Ingestion

Carcinogen listed by agency

NTP IARC OSHA ⊕Not Listed

*See Section 11

GHS:

Lead free products:



Signal Word: Warning

Hazard statement(s)

H317 May cause an allergic skin reaction
 H319 Causes serious eye irritation
 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
 H335 May cause respiratory irritation
 EUH208 Contains rosin. May produce an allergic reaction

Precautionary statement(s)

P233 Keep container tightly closed
 P261 Avoid breathing dust/fume/gas/mist/vapors/spray
 P270 Do not eat, drink or smoke when using this product
 P273 Avoid release to the environment
 P280 Wear protective gloves/protective clothing/eye protection/face protection
 P362 Take off contaminated clothing and wash before reuse
 P301 + P314 IF SWALLOWED: Get Medical advice if you feel unwell
 P302 +P352 IF ON SKIN: Wash with plenty of soap and water
 P304 + P341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing
 P305 + P351 IF IN EYES: Rinse continuously with water for several minutes (15 mins)

Lead containing products:



Signal Word: Warning

Hazard statement(s)

H303 May be harmful if swallowed
 H317 May cause an allergic skin reaction
 H319 Causes serious eye irritation
 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
 H335 May cause respiratory irritation
 H351 Suspected of causing cancer (lead)
 H361 Suspected of damaging fertility or the unborn child (applicable to lead containing product)

| | |
|-----------------------------------|--|
| H373 | May cause damage to organs through prolonged or repeated exposure (applicable to lead containing product) |
| H410 | Very toxic to aquatic life with long lasting harmful effects (lead) |
| EUH201A | Warning! Contains lead (applicable only to the products listed that contain lead) Review listing. |
| EUH208 | Contains rosin. May produce an allergic reaction |
| <u>Precautionary statement(s)</u> | |
| P233 | Keep container tightly closed |
| P261 | Avoid breathing dust/fume/gas/mist/vapors/spray |
| P270 | Do not eat, drink or smoke when using this product |
| P273 | Avoid release to the environment |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection |
| P362 | Take off contaminated clothing and wash before reuse |
| P301 + P314 | IF SWALLOWED: Get Medical advice if you feel unwell |
| P302 + P352 | IF ON SKIN: Wash with plenty of soap and water |
| P304 + P341 | IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing |
| P305 + P351 | IF IN EYES: Rinse continuously with water for several minutes (15 mins) |

POTENTIAL HEALTH EFFECTS:

Eye Contact: Contact with material at room temperature or fume from material at typical re-flow temperatures over 100°C may cause severe eye irritation.

Ingestion: This product contains alloy metal powder and organic chemicals. May be harmful if swallowed.

Inhalation: Vapors or fumes from this material at typical re-flow temperatures over 100°C may cause local irritation or harm to the respiratory system. When heated, rosin may be a respiratory sensitizer.

Skin Contact: May cause skin irritation. Rosin and Antimony may cause dermatitis.

Chronic:

LEAD: Prolonged exposure to vapors or fumes at higher temperatures may cause respiratory irritation and systematic lead poisoning. Symptoms of lead poisoning include headache, nausea, abdominal pain, muscle and joint pain and damage to the nervous system, blood system and kidneys.

SILVER: Chronic skin contact or ingestion of silver dust, salts, or fume can result in a condition known as Argyria, a condition with bluish pigmentation of the skin and eyes.

TIN: Has been shown to increase incidence of sarcoma in animal tests.

COPPER: Overexposure to fumes may cause metal fume fever (chills, muscle aches, nausea, fever; dry throat, cough, weakness, lassitude); metallic or sweet taste; discoloration of skin and hair.

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

NOTE: The Indium Corporation does not recommend, manufacture, market or endorse any of its products for human consumption.

WARNING: This product contains lead. Lead may be harmful to your health. Federal law prohibits the use of leaded solder in making joints and fittings of any private or public water supply system. Keep out of the reach of children.

3. COMPOSITION / INFORMATION ON INGREDIENTS

| Components | % wt | CAS Registry #/ EINECS # | PEL mg/m³ | TLV-TWA mg/m³ | TLV-STEL mg/m³ |
|-------------------|-------------|-------------------------------------|---------------------------------|-------------------------------------|--------------------------------------|
| TIN | * | 7440-31-5/231-141-8 | | | |
| | | (US) | 2 | 2 | - |
| | | (EU) | - | 2 | 4 |
| | | (Canada) | - | 2 | 4 |
| | | (Singapore) | 2 | - | - |
| LEAD | * | 7439-92-1/231-100-4 | | | |
| | | (US) | 0.05 | 0.05 | - |
| | | (EU) | - | 0.15 | - |
| | | (Canada) | 0.05 | 0.05 | - |
| | | (Singapore) | 0.15 | - | - |
| | | (Mexico) | N.E. | 0.15 | - |
| (China) | - | 0.05(dust) 0.03(fume) | - | | |
| SILVER | * | 7440-22-4/231-131-3 | | | |
| | | (US) | 0.01 | 0.1 | - |
| | | (EU) | - | 0.1 | - |
| | | (Canada) | - | 0.1 | 0.3 |
| | | (Mexico) | - | 0.1 | - |
| (Singapore) | 0.1 | - | - | | |
| BISMUTH | * | 7440-69-9/231-177-4 | N.E. | N.E. | N.E. |
| COPPER | * | 7440-50-8/231-159-6 | | | |
| | | (US) | 0.1 (fume) | 0.2 (fume) | - |
| | | (EU) | - | 0.2 (fume) | - |
| | | (Canada) | - | 0.2 (fume) | 0.6 (fume) |
| | | (Mexico) | - | 0.2 (fog) | 2 (powder) |
| | | (Singapore) | 0.2(fume) | 1(dust) | - |
| (China) | - | 1(dust) 0.2(fume) | 2.5 0.6 | | |
| ANTIMONY | * | 7440-36-0/231-146-5 | | | |
| | | (US) | 0.5 | 0.5 | - |

| | | | | | |
|-------------------------------|---------|-------------|------|------|-------------------|
| | | (EU) | 0.5 | - | - |
| | | (Canada) | - | 0.5 | 1.5 |
| | | (Mexico) | N.E. | 0.5 | - |
| | | (Singapore) | 0.5 | - | - |
| | | (China) | - | 0.5 | - |
| ROSIN | 4.0-8.0 | 65997-05-9 | N.E. | N.E. | N.E. |
| | | (EU) | 0.05 | N.E. | 0.15 (sensitiser) |
| PROPRIETARY ACTIVATORS | 3.0-5.0 | - | N.E. | N.E. | N.E. |
| POLYGLYCOL ETHER | 3.0-6.0 | 9038-95-3 | N.E. | N.E. | N.E. |

N.E. = Not established * See Alloy Table

ALLOY TABLE

| Indalloy Alloy | % TIN Sn | % SILVER Ag | % LEAD Pb | % BISMUTH Bi | % COPPER Cu | % ANTIMONY Sb | RoHS 2* Compliance |
|--|-----------|-------------|-----------|--------------|-------------|---------------|--------------------|
| 151 (92.5Pb/5Sn/2.5Ag) | 4.2-4.6 | 2.1-2.3 | 76.8-85 | - | - | - | YES* |
| 160 (97Sn/3Ag) | 80.5-89.2 | - | - | - | 2.5-2.8 | - | YES* |
| 171 (95Pb/5Sn) | 4.2-4.6 | - | 78.9-87.4 | - | - | - | YES* |
| 209 (65Sn/25Ag/10Sb) | 54-60 | 20.8-23 | - | - | - | 8.3-9.2 | YES |
| 228 (88Pb/10Sn/2Ag) | 8.3-9.2 | 1.7-1.8 | 73-81 | - | - | - | YES* |
| 256 (96.5Sn/3Ag/0.5Cu) | 80-88.8 | 2.5-2.8 | - | - | 0.42-0.46 | - | YES |
| Non Standard (83.25Bi/10.5Ag/6.2Sn/0.05Cu) | 5.1-5.7 | 8.7-9.7 | - | 69.1-76.6 | 0.042-0.046 | - | YES |
| Non Standard (85.5Bi/4.7Sn/9.8Ag) | 3.9-4.3 | 8.1-9.0 | - | 71.-78.7 | - | - | YES |
| Non Standard (86.2Bi/3.7Sn/10.1Ag) | 3.1-3.4 | 8.4-9.3 | - | 71.5-79.3 | - | - | YES |

| | | | | | | | |
|--|-----------|---------|---|-------|---|-------|-----|
| Non Standard 87Bi/10.3Ag/2.7Sn) | 2.2-2.5 | 8.5-9.5 | - | 72-80 | - | - | YES |
| Non Standard (91.5Sn/8.5Sb) | 75.9-84.2 | - | - | - | - | 7-7.8 | YES |

***RoHS 2 = Restriction on Hazardous Substances (review applicable exemptions, if any, that may apply) (2011/65/EU)**

4. FIRST AID MEASURES

Eye Contact: Hold eyelids apart and flush eyes with plenty of tepid water for at least 15 minutes. Seek medical attention if irritation persists.

Ingestion: If patient is conscious, ONLY induce vomiting as directed by trained personnel. NEVER give anything by mouth to an unconscious person. Seek medical attention immediately.

Inhalation: Remove to fresh air. If not breathing, give artificial respiration or oxygen by trained personnel. Seek immediate medical attention.

Skin Contact: Remove contaminated clothing. Wash affected area with soap and water. Wash clothing before reuse. If irritation persists, obtain medical attention.

5. FIRE FIGHTING MEASURES

Flash Point: Not established. **Method:** Not established.

Auto-ignition Temperature: Not established.

Flammable Limits: Limits not established. Not flammable

Extinguishing Media: Use extinguishers appropriate for the surrounding fire conditions.

Special Fire Fighting Procedures: Firefighters must wear NIOSH approved self-contained breathing apparatus and full protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Spill or Leak Procedures: Using a spatula, scoop up paste and place in a plastic or glass jar and tightly cap. Remove traces of paste residue using cloth rags or paper towels moistened with ethyl or isopropyl alcohol. Dispose contaminated cloth rags or paper towels following all Federal, State and Local regulations. In the EU refer to the Special Waste Regulations.

7. HANDLING AND STORAGE

Handling Precautions: Keep containers tightly closed when not in use. Use care to avoid spills. Use only with production equipment specifically designed for use with solder paste. Wear appropriate personal protective equipment when working or handling solder paste. Always thoroughly wash your hands after handling this product. DO NOT touch or rub eyes until hands are washed.

Storage Precautions: Store product in tightly capped original containers in a cool, dry area. Refer to product label for specific storage temperature requirements. Rotate stock to ensure use before expiration date on the label.

Consult Product Data Sheet for additional information.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls: Use only with production equipment (such as stencil printers and re-flow furnaces) with adequate ventilation and other safety features specifically designed for use with solder paste. Control concentration of all components so that the exposure levels are not exceeded. Use exhaust ventilation.

Personal protection:

Eyes: Chemical safety glasses/goggles. Face shield for any splash hazards.

Respirator: An approved or compliant marked air-purifying respirator with a fume/organic chemical cartridge is recommended under certain circumstances (i.e. when re-flowing manually on a plate instead of a ventilated re-flow furnace) where airborne concentrations are expected to be elevated or exceed exposure limits.

Skin: Compatible chemical resistant gloves or nitrile disposable to keep skin from direct contact.

Other: Lab coat, eyewash fountain in work area. Avoid the use of contact lenses in high fume areas.

Work/Hygienic Practices: Maintain good housekeeping. Clean up spills immediately. DO NOT allow rags or paper towels contaminated with solder paste to accumulate in the work area. Good personal hygiene is essential. Avoid eating, smoking or drinking in the work area. Wash hands thoroughly with soap and water immediately upon leaving the work area. When applicable use standard lead work practices.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|--------------------------|---------------------------|-----------------------------|-------------------|
| Appearance: | Grey colored paste. | Boiling Point: | Not applicable. |
| Odor: | Mild characteristic odor. | Melting Point: | Not applicable |
| Specific Gravity: | 1 g/cc | pH: | 4-8 (flux) |
| Vapor Pressure: | Not applicable. | Solubility in Water: | Insoluble (paste) |
| Vapor Density: | (air=1) Not applicable. | Flash Point: | Not applicable |

10. STABILITY AND REACTIVITY

| | |
|----------------------------------|--|
| General: | Stable. |
| Conditions to Avoid: | Not established. |
| Incompatible Materials: | Avoid contact with acids, bases or oxidizing agents. |
| Hazardous Decomposition | Harmful organic fumes and toxic oxide fumes may form at elevated temperatures. |
| Hazardous Polymerization: | Will not occur. |

11. TOXICOLOGICAL INFORMATION

| | | |
|-------------------------|------------------|---|
| Carcinogenicity: | NTP: No | |
| | OSHA: No | |
| | IARC: Yes | Lead and lead compounds are listed as possible carcinogens. |
| LD50: | Not established. | LC50: Not established. |

Other: Chronic Toxicity: Prolonged or repeated exposure to rosin flux fume may cause workers to develop occupational asthma. Lead can cause potential harm to the developing fetus. Contains <1 % of other ingredients that are classified as a carcinogen.

12. ECOLOGICAL INFORMATION

Product not tested.

Contains substances that are harmful to the aquatic environment.

Lead – Toxicity to fish – mortality LOEC – rainbow trout – 1.19 mg/l – 96h. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Bioaccumulation – *Oncorhynchus kisutch* – 2 weeks
Bioconcentration factor (BCF): 12. Fresh fish: 0.44 mg/l LC50 96h/ 1.32 mg/l LC50 96h/water Flea: 600 ug/l EC50 = 48h

13. DISPOSAL CONSIDERATION

Waste Disposal Method: Scrap metal alloy usually has value. Contact a commercial reclaimer for recycling. Otherwise, dispose of in accordance with all Federal, State and Local environmental regulations. In Europe follow the Special Waste Regulations. Avoid release to the environment. Do not discharge to drain or any body of water.

14. TRANSPORT INFORMATION

Transport in accordance with applicable regulations and requirements. Not regulated under US Department of Transportation. Non hazardous under shipping regulations.

IATA-Ground-Ocean – not regulated

UN - None

15. REGULATORY INFORMATION

The information in this Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations promulgated hereunder (29 CFR 1910.1200 ET. SEQ.).

California PROP 65 (Safe Drinking Water Standard): WARNING:

This product contains a chemical known to the State of California to cause cancer and/or birth defects (or other reproductive harm). lead

SARA 313 Listing - 40 CFR 372.65

Lead CAS# 7439-92-1, Antimony CAS# 7440-36-0

EPA Genetic Toxicology Program – Lead CAS# 7439-92-1

All ingredients are listed on the EPA TSCA Inventory.

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation (CPR).



Canadian WHMIS: D2A-Materials Causing Other Toxic Effects-Very Toxic Material (Chronic).
D2B Materials Causing Other Toxic Effects –irritant

This product has been classified in accordance with the guidelines set by the Dept. of Industrial Health of the Republic of Singapore.

This product has been classified in accordance with the Mexican Standards: NOM-010-STPS-2015 and NOM-018-STPS-2014.

Regulatory Information China:

GB/T 16483-2008, GB/T 17519-2013, Safety Data Sheets for Chemical Products

GB 30000.2-29-2013, Rules for classification and labeling of chemicals (GHS)

Decree No. 591: Regulations on the Control Over Safety of Hazardous Chemicals.

This product has been classified under the Chinese Occupational Exposure Limit for Hazardous Agents in the Workplace, GBZ2-2007.

For Compliance with EU Directive 2011/65/EU, Restriction on Hazardous Substances (RoHS 2) - See Alloy Table.

This product has been classified in accordance with: Malaysian – OCCUPATIONAL SAFETY AND HEALTH (CLASSIFICATION, LABELING AND SAFETY DATA SHEET OF HAZARDOUS CHEMICALS) REGULATION OCTOBER 2013 – (CLASS).

16. OTHER INFORMATION

| | | |
|----------------------------|-------------------------|---|
| HMIS Hazard Rating: | Health: | 2 |
| | Fire: | 1 |
| | Physical Hazard: | 0 |

Revised Date: 20 MARCH 2017

Prepared by: Nancy Swarts, Indium Corporation of America

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