

Pb-Free Soldering Alloys

Tin, Silver, Indium, Bismuth, Antimony, Copper, Germanium

SECTION 1: Chemical product and company identification

1.1 Product Identifier

Product form : Article
Product Name : Pb-Free Soldering Alloys
Tin, Silver, Indium, Bismuth, Antimony, Copper, Germanium - Soldering Alloys,
SAC-alloy

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1 Relevant identified uses

Industrial/Professional use spec. : Industrial
For professional use only
Use of the substance/mixture : Soldering
Function or use category : Soldering agent

1.2.2 Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Coining, Inc.
15 Mercedes Drive
Montvale, NJ 07645
Tel: +1(201)7914020
www.coininginc.com
martin.oud@ametek.com

1.4. Emergency Telephone Number

Emergency Number : CHEMTREC: 800-424-9300 for US/703-527-3887 outside US
For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, call
CHEMTREC-Day of Night.

SECTION 2: Hazards identification

2.1. Classification of the Substances or Mixture

Classification according to Directive 67/548/EEC, Regulation (EC)No1272/2008-CLP
Not classified

Adverse physicochemical, human health and environmental effects

No additional information available.

2.2. Label Elements

Labeling according to Directive 67/548/EEC, Regulation (EC)No1272/2008-CLP

No labeling applicable

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

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3.2. Mixture

Name	Product Identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Tin	(CAS No) 7440-31-5 (EC no) 231-141-8	50-100	Solid Not Classified
Silver	(CAS No) 7440-22-4 (EC no) 231-131-3	0-10	Solid Not Classified
Indium	(CAS No) 7440-74-6 (EC no) 231-180-0	0-100	Solid Not Classified
Bismuth	(CAS No) 7440-69-9 (EC no) 231-177-4	0.5-95	Solid Not Classified
Copper	(CAS No) 7440-50-8 (EC no) 231-159-6;918-168-7	0.1-10	Solid Not Classified
Antimony	(CAS No) 7440-36-0 (EC no) 231-146-5	0.1-10	Solid Not Classified
Germanium	(CAS No) 7440-56-4 (EC no) 231-164-3	0-1	Solid Not Classified

Full text of H- and EUH-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show there label where possible).
- First-aid measures after inhalation : When symptoms occur; go into open air and ventilate suspected area.
- First-aid measures after skin contact : Removal of solidified molten material from skin requires medical assistance. Cool skin rapidly with cold water after contact with molten product
- First-aid measures after eye contact : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- First-aid measures after ingestion : Rinse mouth. Do NOT induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries : Under normal conditions of use not expected to present a significant hazard. Under milling, or physical alteration metal dusts may be produced that cause irritation of the respiratory tract, skin, and may be harmful. Molten material may release toxic and irritating fumes.
- Symptoms/injuries after inhalation : Not expected to be a primary route of exposure. The primary acute health hazard associated with this product would be the potential for exposure to fumes during metal processing operations. Inhalation of dusts and fumes can cause metal fume fever. Symptoms can include a metallic or sweet taste in the mouth, sweating, shivering, headache, throat irritation, fever, chills, thirstiness, muscle aches, nausea, vomiting, weakness, fatigue, and shortness of breath.

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Symptoms/injuries after skin contact	: Skin contact is not considered a potential route of exposure. The primary acute health hazard associated with this product would be the potential for exposure to fumes during metal processing operations. Where possible allow molten material to solidify naturally. Removal of solidified molten material from skin requires medical assistance.
Symptoms/injuries after eye contact	: Not expected to be a primary route of exposure. Dust generated from material cutting may cause a slight irritation. Slivers may be generated, which could cause mechanical irritation or injure the eye.
Symptoms/injuries after ingestion	: Ingestion is not considered a potential route of exposure.
Chronic symptoms	: Tin: Has been shown to increase incidence of sarcoma in animal tests. Chronic exposure to tin dusts and fume may result in "stannosis", a mild form of pneumoconiosis. 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. Antimony: Exposure to dusts and fumes may result in irritation eyes, skin, nose, throat, mouth; cough; dizziness; fainting; dyspnea (breathing difficulty); nausea, vomiting, diarrhea, stomach cramps; insomnia; anorexia; unable to smell properly. Copper: Overexposure to fumes may cause metal fume fever (chills, muscle aches, nausea, fever, dry throat, cough, weakness, and lassitude); metallic or sweet taste; discoloration of skin and hair. Tissue damage of mucous membranes may follow chronic dust exposure.

4.3. Indication of any immediate medical attention and special treatment needed

If medical advice is needed, have product container or label at hand.

SECTION 5: Fire fighting measures

5.1. Extinguishing media

Suitable extinguishing media	: Does not burn. Use extinguishing media appropriate for surrounding fire
Unsuitable extinguishing media	: None known.

5.2. Special hazards arising from the substance or mixture

Fire hazard	: Dust, chips, or ribbons can be ignited more easily, by an ignition source, by improper machining, or by spontaneous combustion if finely divided and damp
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5.3. Advice for firefighters

Firefighting instructions	: Exercise caution when fighting any chemical fire.
Protection during firefighting	: Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures	: Handle in accordance with good industrial hygiene and safety practice.
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6.1.1. For non-emergency personnel

Protective equipment	: Use appropriate personal protection equipment (PPE)
Emergency procedures	: Evacuate unnecessary personnel.

6.1.2. For emergency responders

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Protective equipment : Equip cleanup crew with proper protection.

Emergency procedures : Ventilate area

6.2. Environmental precautions

Avoid release to the environment

6.3. Methods and material for containment and clean up

For containment : If metal is in molten form, allow cooling and collecting as a solid. If the metal is in solid form collect for remelting purposes.

Methods for cleaning up : Clear up spills. Immediately and dispose of waste safely.

6.4 Reference to other sections

See heading 8, exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Hygiene measures : Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a dry, cool and well-ventilated place.

Incompatible products : Strong acids. Strong bases. Strong oxidizers.

7.3. Specific end use(s)

Soldering.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Tin (7440-31-5)		
Austria	MAK (mg/m ³)	4 mg/m ³
Belgium	Limit value (mg/m ³)	2 mg/m ³
Cyprus	OEL TWA (mg/m ³)	2 mg/m ³
Italy – Portugal – USA ACGHI	ACGIH TWA (mg/m ³)	2 mg/m ³
Spain	VLA-ED (mg/m ³)	2 mg/m ³
Finland	HTP-arvo (8h) (mg/m ³)	2 mg/m ³
Ireland	OEL (8 hours ref) (mg/m ³)	2 mg/m ³
Malta	OEL TWA (mg/m ³)	2 mg/m ³
Poland	NDS (mg/m ³)	2 mg/m ³
Portugal	OEL TWA (mg/m ³)	2 mg/m ³

Silver (7440-22-4)		
Austria	MAK (mg/m ³)	0.1 mg/m ³
Belgium	Limit value (mg/m ³)	0.1 mg/m ³
Bulgaria	OEL TWA (mg/m ³)	0.1 mg/m ³
Cyprus	OEL TWA (mg/m ³)	0.1 mg/m ³
France	VME (mg/m ³)	0.1 mg/m ³ (indicative limit)
Germany	TRGS 900 Occupational exposure limit value (mg/m ³)	0.1 mg/m ³

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Italy – Portugal – USA ACGHI	ACGIH TWA (mg/m ³)	0.1 mg/m ³
Italy	OEL TWA (mg/m ³)	0.1 mg/m ³
Latvia	OEL TWA (mg/m ³)	0.5 mg/m ³
Spain	VLA-ED (mg/m ³)	0.1 mg/m ³
The Netherlands	MAC TGG 8H (mg/m ³)	0.1 mg/m ³
United Kingdom	WEL TWA (mg/m ³)	0.1 mg/m ³
United Kingdom	WEL STEL (mg/m ³)	0.3 mg/m ³ (calculated)
Czech Republic	Expoziční limity (PEL) (mg/m ³)	0.1 mg/m ³
Denmark	Grænseværdie (langvarig) (mg/m ³)	0.01 mg/m ³
Finland	HTP-arvo (8h) (mg/m ³)	0.1 mg/m ³
Hungary	AK-érték	0.1 mg/m ³
Hungary	CK-érték	0.4 mg/m ³
Ireland	OEL (8 hours ref) (mg/m ³)	0.1 mg/m ³
Lithuania	IPRV (mg/m ³)	0.1 mg/m ³
Poland	NDS (mg/m ³)	0.05 mg/m ³
Romania	OEL TWA (mg/m ³)	0.1 mg/m ³
Slovakia	NPHV (priemerná) (mg/m ³)	0.1 mg/m ³
Sweden	nivågränsvärde (NVG) (mg/m ³)	0.1 mg/m ³
Portugal	OEL TWA (mg/m ³)	0.1mg/m ³

Indium (7440-74-6)		
Austria	MAK (mg/m ³)	0.2 mg/m ³
Belgium	Limit value (mg/m ³)	0.1 mg/m ³
Italy – Portugal – USA ACGHI	ACGIH TWA (mg/m ³)	0.1 mg/m ³
Spain	VLA-ED (mg/m ³)	0.1 mg/m ³
United Kingdom	WEL TWA (mg/m ³)	0.1 mg/m ³
United Kingdom	WEL STEL (mg/m ³)	0.3 mg/m ³
Denmark	Grænseværdie (langvarig) (mg/m ³)	0.1 mg/m ³
Finland	HTP-arvo (8h) (mg/m ³)	0.1 mg/m ³
Ireland	OEL (8 hours ref) (mg/m ³)	0.1 mg/m ³
Ireland	OEL (15 min ref) (mg/m ³)	0.3 mg/m ³
Lithuania	IPRV (mg/m ³)	0.1 mg/m ³
Sweden	nivågränsvärde (NVG) (mg/m ³)	0.1 mg/m ³
Portugal	OEL TWA (mg/m ³)	0.1 mg/m ³

Bismuth (7440-69-9)		
Bulgaria	OEL TWA (mg/m ³)	5.0 mg/m ³
Latvia	OEL TWA (mg/m ³)	0.5 mg/m ³
Lithuania	IPRV (mg/m ³)	0.5 mg/m ³

Copper (7440-50-8)		
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Austria	MAK (mg/m ³)	0.4 mg/m ³
Belgium	Limit value (mg/m ³)	1 mg/m ³
Bulgaria	OEL TWA (mg/m ³)	0.1 mg/m ³
France	VLE (mg/m ³)	2 mg/m ³
France	VME (mg/m ³)	1 mg/m ³
Italy – Portugal – USA ACGHI	ACGIH TWA (mg/m ³)	0.2 mg/m ³
Latvia	OEL TWA (mg/m ³)	0.5 mg/m ³
Spain	VLA-ED (mg/m ³)	1 mg/m ³
The Netherlands	MAC TGG 8H (mg/m ³)	0.1 mg/m ³
United Kingdom	WEL TWA (mg/m ³)	1 mg/m ³
United Kingdom	WEL STEL (mg/m ³)	2 mg/m ³
Czech Republic	Expoziční limity (PEL) (mg/m ³)	0.1 mg/m ³
Denmark	Grænseværdie (langvarig) (mg/m ³)	0.1 mg/m ³
Finland	HTP-arvo (8h) (mg/m ³)	0.1 mg/m ³
Hungary	AK-érték	0.1 mg/m ³
Hungary	CK-érték	0.4 mg/m ³
Ireland	OEL (8 hours ref) (mg/m ³)	1 mg/m ³
Ireland	OEL (15 min ref) (mg/m ³)	2 mg/m ³
Lithuania	IPRV (mg/m ³)	0.2 mg/m ³
Romania	OEL TWA (mg/m ³)	0.50mg/m ³
Romania	OEL STEL (mg/m ³)	1.50 mg/m ³
Slovakia	NPHV (priemerná) (mg/m ³)	0.1 mg/m ³
Slovakia	NPHV (Hraničná) (mg/m ³)	0.2 mg/m ³
Sweden	nivågränsvärde (NVG) (mg/m ³)	0.2 mg/m ³
Portugal	OEL TWA (mg/m ³)	1mg/m ³

Antimony (7440-36-0)		
Austria	MAK (mg/m ³)	5 mg/m ³
Belgium	Limit value (mg/m ³)	0.5 mg/m ³
Bulgaria	OEL TWA (mg/m ³)	0.5 mg/m ³
France	VME (mg/m ³)	0.5 mg/m ³
Italy – Portugal – USA ACGHI	ACGIH TWA (mg/m ³)	0.5 mg/m ³
Latvia	OEL TWA (mg/m ³)	0.2 mg/m ³
Spain	VLA-ED (mg/m ³)	0.5 mg/m ³
United Kingdom	WEL TWA (mg/m ³)	0.5 mg/m ³
United Kingdom	WEL STEL (mg/m ³)	1.5 mg/m ³ (calculated)
Czech Republic	Expoziční limity (PEL) (mg/m ³)	0.5 mg/m ³
Denmark	Grænseværdie (langvarig) (mg/m ³)	0.5 mg/m ³
Finland	HTP-arvo (8h) (mg/m ³)	0.5mg/m ³
Hungary	AK-érték	0.5mg/m ³
Hungary	CK-érték	2 mg/m ³
Ireland	OEL (8 hours ref) (mg/m ³)	0.5 mg/m ³
Lithuania	IPRV (mg/m ³)	0.5 mg/m ³

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Poland	NDS (mg/m ³)	0.5 mg/m ³
Romania	OEL TWA (mg/m ³)	0.20 mg/m ³
Romania	OEL STEL (mg/m ³)	0.50 mg/m ³
Slovakia	NPHV (Hraničná) (mg/m ³)	0.5 mg/m ³
Sweden	nivågränsvärde (NVG) (mg/m ³)	0.25 mg/m ³
Portugal	OEL TWA (mg/m ³)	0.5 mg/m ³

Germanium (7440-56-4)		
Romania	OEL TWA (mg/m ³)	2.0 mg/m ³
Romania	OEL STEL (mg/m ³)	5.0 mg/m ³
Lithuania	IPRV (mg/m ³)	2.0 mg/m ³

8.2. Exposure controls

Appropriate engineering controls : Ensure adequate ventilation, especially in confined areas.

Personal protective equipment : Protective goggles. Insulated gloves



Hand protection : If material is hot, wear thermally resistant protective gloves.

Eye protection : During metal processing, chemical goggles or safety glasses.

Respiratory protection : During metal processing, wear approved mask.

Other information : When using, do not eat, drink or smoke.

SECTION 9: Physical and chemical properties

9.1. Information on basis physical and chemical properties

Physical state	: Solid
Appearance	: Preforms, squares, rings, discs
Color	: Metallic
Odor	: Odorless
Odor threshold	: Not applicable
pH	: Neutral
Relative evaporation rate (butylacetate=1)	: Not applicable
Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available

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Flash point	: No data available
Self ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: No data available
Relative vapor pressure at 20°C	: No data available
Relative density	: No data available
Solubility	: Insoluble
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Explosive limits	: No data available

9.2 Other information

No other information available

SECTION 10: Stability and reactivity

10.1 Reactivity

Hazardous reactions will not occur under normal conditions.

10.2 Chemical stability

Stable under normal conditions. Dust, chips or ribbons can be ignited more easily, by an ignition source, by improper machining, or by spontaneous combustion if finely divided and damp.

10.3 Possibility of hazardous reactions

Hazardous polymerization will not occur.

10.4 Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

10.5 Incompatible materials

Strong acids. Strong base. Strong oxidizers.

10.6. Hazardous decomposition products

Metal oxides.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity : Not classified

Silver (7440-22-4)	
LD50 oral rat	>2000 mg/kg

Irritation : Not classified

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Corrosivity	: Not classified
Sensitization	: Not classified
Repeated dose toxicity	: Not classified
Carcinogenicity	: Not classified
Mutagenicity	: Not classified
Toxicity for reproduction	: Not classified

SECTION 12: Ecological information

12.1 Toxicity

Copper (7440-50-8)	
LC50 fishes 1	0.0068 (0.0068-0.0156)mg/l (Exposure time: 96 h-Species: Pimephales promelas)
EC50 Daphnia 1	0.03mg/l (Exposure time: 48h-Species: Daphnia magna [Static])
EC50 other aquatic organisms 1	0.0426 (0.0426-0.0535)mg/l (Exposure time:72 h-Species: Pseudokirchneriella subcapitata [Static])
LC50 fish 2	0.3mg/l (Exposure time: 96h –species: Pimephales promelas [Static])
EC50 other aquatic organisms 2	0.031(0.031-0.054) mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata [Static])

Silver (7440-22-4)	
LC50 fishes 1	0.00155 (0.00155-0.00293)mg/l (Exposure time: 96 h-Species: Pimephales promelas [Static])
EC50 Daphnia 1	0.00024mg/l (Exposure time: 48h-Species: Daphnia magna [Static])
LC50 fish 2	0.0062mg/l (Exposure time: 96h –species: Oncorhynchus mykiss [flow-through])

12.2 Persistence and degradability

Soldering Alloys	
Persistence and degradability	Not established

Copper (7440-50-8)	
Persistence and degradability	Not readily biodegradable.

12.3 Bioaccumulative potential

Soldering Alloys	
Bioaccumulative potential	Not established

12.4 Mobility in soil

No additional information available.

12.5 Results of PBT and vPvB assessment

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No additional information available.

12.6 Other adverse effects

Other information : Avoid release to the environment.

SECTION 13: Disposal information

13.1 Waste treatment methods

Waste disposal recommendations : Scrap metal alloy usually has value. Contact commercial reclaimer for recycling. Otherwise, dispose of waste material in accordance with all local, regional, national and international regulations.

SECTION 14: Transport information

14.1. UN number

Not regulated for transport.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

Not applicable.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Other information : No supplementary information available.

14.6. Special precaution for user

14.6.1. Overland transport

Not regulated for transport.

14.6.2. Air transport

Not regulated for transport.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

Authorizations and/or restrictions on use (Annex XVII):

Contains no REACH candidate substances.

15.1.2. National regulations

No additional information available.

15.2 Chemical safety assessment

No chemical safety assessment has been carried out.

SECTION 16: Other information

Other information : This Safety Data Sheet has been established in accordance with the applicable European Union legislation. Classification in accordance with calculation methods of regulation (EC)1272/2008 CLP/EC 1999/45 DPD.

Full text of H- and EUH-phrases:

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Acute Tox.1 (Inhalation: dust, mist)	Acute toxicity (inhalation: dust, mist) Category 1
Acute Tox.2 (Dermal)	Acute toxicity (dermal) Category 2
Acute Tox.3 (Oral)	Acute toxicity (oral) Category 2
Aquatic Acute 1	Hazardous to the aquatic environment-Acute Hazard Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment-Chronic Hazard Category 1
Aquatic Chronic 3	Hazardous to the aquatic environment-Chronic Hazard Category 3
Carc.2	Carcinogenicity Category 2
Eye Irrit. 2	Serious eye damage/eye irritation Category 2
Flam. Sol. 1	Flammable solids Category 1
Pyr. Sol. 1	Pyrophoric solids Category 1
Skin Corr. 1A	Skin corrosion/irritation Category 1A
Skin Sens. 1	Skin sensitization Category 1
STOT RE 1	Specific target organ toxicity (repeated exposure) Category 1
STOT Se 3	Specific target organ toxicity (single exposure) Category 3
H228	Flammable solid
H250	Catches fire spontaneously if exposed to air
H300	Fatal if swallowed
H310	Fatal in contact with skin
H314	Causes severe skin burns and eye damage
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H330	Fatal if inhaled
H335	May cause respiratory irritation
H351	Suspected of causing cancer
H372	Causes damage to organs through prolonged or repeated exposure
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

SDS EU CLP (REACH ANNEX II)

This information is based on our current knowledge and is intended to describe the product for the purpose of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

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