



**LEAD FREE SOLDER ALLOYS : TIN - SILVER - COPPER - ALLIAGES SN-AG-CU**

## SAFETY DATA SHEET

(REACH regulation (EC) n° 1907/2006 - n° 2020/878)

### SECTION 1 : IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

#### 1.1. Product identifier

Product name : LEAD FREE SOLDER ALLOYS : TIN - SILVER - COPPER

Product code : ALLIAGES SN-AG-CU.

Product type : Sn95.5Ag3.8Cu0.7 - Sn96.5Ag3Cu0.5 - Sn99Ag0.3Cu0.7

UFI : QYK0-50MH-V00T-C8NX

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

Soft soldering

#### Use descriptor system (REACH) :

SU 3 Industrial uses : uses of substances as such or in preparations at industrial sites

PC 38 Welding and soldering products (with flux coatings or flux cores), flux products

#### 1.3. Details of the supplier of the safety data sheet

Registered company name : MBO.

Address : Rue de la Fonderie.21800.Chevigny-Saint-Sauveur.FRANCE.

Telephone : 00 33 3 80 46 12 58. Fax : 00 33 3 80 46 66 59.

admin@mbosolder.com

www.mbosolder.com

#### 1.4. Emergency telephone number : +33 (0)1 45 42 59 59.

Association/Organisation : INRS / ORFILA <http://www.centres-antipoison.net>.

### SECTION 2 : HAZARDS IDENTIFICATION

#### 2.1. Classification of the substance or mixture

##### In compliance with EC regulation No. 1272/2008 and its amendments.

This mixture does not present a physical hazard. Refer to the recommendations regarding the other products present on the site.

This mixture does not present a health hazard with the exception of possible occupational exposure thresholds (see paragraphs 3 and 8).

This mixture does not present an environmental hazard. No known or foreseeable environmental damage under standard conditions of use.

#### 2.2. Label elements

##### In compliance with EC regulation No. 1272/2008 and its amendments.

Additional labeling :

EUH210

Safety data sheet available on request.

#### 2.3. Other hazards

The mixture does not contain substances classified as 'Substances of Very High Concern' (SVHC)  $\geq 0.1\%$  published by the European Chemicals Agency (ECHA) under article 57 of REACH: <http://echa.europa.eu/fr/candidate-list-table>

The mixture fulfils neither the PBT nor the vPvB criteria for mixtures in accordance with annexe XIII of the REACH regulations EC 1907/2006.

The mixture does not contain substances  $\geq 0.1\%$  with endocrine disrupting properties in accordance with the criteria of the Delegated Regulation (EU) 2017/2100 of the Commission or Regulation (EU) 2018/605 of the Commission.

It is recommended to wear safety glasses, protective gloves, to wash hands after use and to work with a good ventilation of area, and suitable fumes extraction system locally installed.

The product could cause burns during soldering.

**LEAD FREE SOLDER ALLOYS : TIN - SILVER - COPPER - ALLIAGES SN-AG-CU****SECTION 3 : COMPOSITION/INFORMATION ON INGREDIENTS****3.2. Mixtures****Composition :**

Identification	(EC) 1272/2008	Note	%
CAS: 7440-31-5 EC: 231-141-8 REACH: 01-2119486474-28-0033  TIN		[1]	95.50 - 99.00 %
CAS: 7440-22-4 EC: 231-131-3 REACH: 01-2119555669-21-0025  SILVER		[1]	0.30 - 3.80 %
CAS: 7440-50-8 EC: 231-159-6 REACH: 01-2119480154-42-0002  COPPER		[1]	0.50 - 0.70 %

**Specific concentration limits:**

Identification	Specific concentration limits	ATE
CAS: 7440-22-4 EC: 231-131-3 REACH: 01-2119555669-21-0025  SILVER		inhalation: ATE = 5.16 mg/l 4h

**Information on ingredients :**

[1] Substance for which maximum workplace exposure limits are available.

**SECTION 4 : FIRST AID MEASURES**

As a general rule, in case of doubt or if symptoms persist, always call a doctor.

NEVER induce swallowing by an unconscious person.

**4.1. description of first aid measures****In the event of exposure by inhalation :**

Take affected persons into fresh air. If irritation persists, get medical attention.

**In the event of splashes or contact with eyes :**

Wash thoroughly with fresh, clean water for 15 minutes holding the eyelids open.

If there is any redness, pain or visual impairment, consult an ophthalmologist.

**In the event of splashes or contact with skin :**

Watch out for any remaining product between skin and clothing, watches, shoes, etc.

Immediately wash with water and soap and rinse thoroughly.

If skin irritation persists, get medical attention.

If burns should occur from molten metal, treat for burn and get medical assistance if necessary.

**In the event of swallowing :**

Seek medical attention, showing the label.

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

No data available.

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

No data available.



**LEAD FREE SOLDER ALLOYS : TIN - SILVER - COPPER - ALLIAGES SN-AG-CU**

**SECTION 5 : FIREFIGHTING MEASURES**

Non-flammable.

**5.1. Extinguishing media**

**Suitable methods of extinction**

In the event of a fire, use :

- dry chemical agents
- sprayed water or water mist
- foam

**Unsuitable methods of extinction**

In the event of a fire, do not use :

- water jet

**5.2. Special hazards arising from the substance or mixture**

A fire will often produce a thick black smoke. Exposure to decomposition products may be hazardous to health.

Do not breathe in smoke.

In the event of a fire, the following may be formed :

- metal oxides, metal dust

Molten metal reacts violently with oxidising agents.

**5.3. Advice for firefighters**

Wear full body protective clothing and appropriate self-contained breathing apparatus.

Cool adjacent containers with water spray.

**SECTION 6 : ACCIDENTAL RELEASE MEASURES**

**6.1. Personal precautions, protective equipment and emergency procedures**

Consult the safety measures listed under headings 7 and 8.

**For non first aid worker**

Keep persons without protective equipment away from danger area.

**For first aid worker**

First aid workers will be equipped with suitable personal protective equipment (See section 8).

**6.2. Environmental precautions**

Prevent any material from entering drains or waterways.

**6.3. Methods and material for containment and cleaning up**

Retrieve the product by mechanical means (sweeping/vacuuming).

**6.4. Reference to other sections**

No data available.

**SECTION 7 : HANDLING AND STORAGE**

Requirements relating to storage premises apply to all facilities where the mixture is handled.

**7.1. Precautions for safe handling**

Always wash hands after handling.

The workplace must be ventilated and fumes must be captured at the emission source.

Due to its high density, the product is heavy. Avoid the fall of the product.

Wear protective shoes and gloves.

**Fire prevention :**

Prevent access by unauthorised personnel.

**Recommended equipment and procedures :**

For personal protection, see section 8.

Observe precautions stated on label and also industrial safety regulations.

**LEAD FREE SOLDER ALLOYS : TIN - SILVER - COPPER - ALLIAGES SN-AG-CU****Prohibited equipment and procedures :**

No smoking, eating or drinking in areas where the mixture is used.

**7.2. Conditions for safe storage, including any incompatibilities**

No data available.

**Storage**

On spool, in original cardboard, at room temperature, keep away from inclemency. During 24 months

**Packaging**

Always keep in packaging made of an identical material to the original.

**7.3. Specific end use(s)**

No data available.

**SECTION 8 : EXPOSURE CONTROLS/PERSONAL PROTECTION****8.1. Control parameters****Occupational exposure limits :**

- European Union (2019/1831, 2017/2398, 2017/164, 2009/161, 2006/15/CE, 2000/39/CE, 98/24/CE) :

CAS	VME-mg/m <sup>3</sup>	VME-ppm	VLE-mg/m <sup>3</sup>	VLE-ppm	Notes
7440-22-4	0.1	-	-	-	-

- ACGIH TLV (American Conference of Governmental Industrial Hygienists, Threshold Limit Values, 2010) :

CAS	TWA	STEL	Ceiling	Definition	Criteria
7440-31-5	2 mg/m <sup>3</sup>				
7440-22-4	0.1 mg/m <sup>3</sup>	-	-	-	-
7440-50-8	0.2 mg/m <sup>3</sup>	-	-	-	-

- Germany - AGW (BAuA - TRGS 900, 08/08/2019) :

CAS	VME	VME	Excess	Notes
7440-22-4		0.1 E mg/m <sup>3</sup>		8(II)

- France (INRS - ED984 / 2020-1546) :

CAS	VME-ppm	VME-mg/m <sup>3</sup>	VLE-ppm	VLE-mg/m <sup>3</sup>	Notes	TMP No
7440-22-4	-	0.1	-	-	-	-

- UK / WEL (Workplace exposure limits, EH40/2005, Fourth Edition 2020) :

CAS	TWA	STEL	Ceiling	Definition	Criteria
7440-22-4	0.1 mg/m <sup>3</sup>				
7440-50-8	0.2 mg/m <sup>3</sup>	-	-	-	-

**Derived no effect level (DNEL) or derived minimum effect level (DMEL):**

SILVER (CAS: 7440-22-4)

**Final use:**

Exposure method:  
Potential health effects:  
DNEL :

**Workers.**

Inhalation.  
Long term systemic effects.  
0.1 mg of substance/m<sup>3</sup>

**Final use:**

Exposure method:  
Potential health effects:  
DNEL :

**Consumers.**

Ingestion.  
Long term systemic effects.  
1.2 mg/kg body weight/day

Exposure method:  
Potential health effects:  
DNEL :

Inhalation.  
Long term systemic effects.  
0.04 mg of substance/m<sup>3</sup>

TIN (CAS: 7440-31-5)



**LEAD FREE SOLDER ALLOYS : TIN - SILVER - COPPER - ALLIAGES SN-AG-CU**

**Final use:**

Exposure method:  
Potential health effects:  
DNEL :

**Workers.**

Dermal contact.  
Short term systemic effects.  
133.3 mg/kg body weight/day

Exposure method:  
Potential health effects:  
DNEL :

Dermal contact.  
Long term systemic effects.  
133.3 mg/kg body weight/day

Exposure method:  
Potential health effects:  
DNEL :

Inhalation.  
Short term systemic effects.  
11.75 mg of substance/m3

Exposure method:  
Potential health effects:  
DNEL :

Inhalation.  
Long term systemic effects.  
11.75 mg of substance/m3

**Final use:**

Exposure method:  
Potential health effects:  
DNEL :

**Consumers.**

Ingestion.  
Short term systemic effects.  
80 mg/kg body weight/day

Exposure method:  
Potential health effects:  
DNEL :

Ingestion.  
Long term systemic effects.  
80 mg/kg body weight/day

Exposure method:  
Potential health effects:  
DNEL :

Dermal contact.  
Short term systemic effects.  
80 mg/kg body weight/day

Exposure method:  
Potential health effects:  
DNEL :

Dermal contact.  
Long term systemic effects.  
80 mg/kg body weight/day

Exposure method:  
Potential health effects:  
DNEL :

Inhalation.  
Short term systemic effects.  
3.476 mg of substance/m3

Exposure method:  
Potential health effects:  
DNEL :

Inhalation.  
Long term systemic effects.  
3.476 mg of substance/m3

**Predicted no effect concentration (PNEC):**

SILVER (CAS: 7440-22-4)

Environmental compartment:  
PNEC :

Soil.  
0.794 mg/kg

Environmental compartment:  
PNEC :

Fresh water.  
0.04 µg/l

Environmental compartment:  
PNEC :

Sea water.  
0.86 µg/l

Environmental compartment:

Fresh water sediment.

**LEAD FREE SOLDER ALLOYS : TIN - SILVER - COPPER - ALLIAGES SN-AG-CU**

PNEC :	438.13 mg/kg
Environmental compartment: PNEC :	Marine sediment. 438.13 mg/kg
Environmental compartment: PNEC :	Waste water treatment plant. 25 µg/l

**8.2. Exposure controls****Personal protection measures, such as personal protective equipment**

Pictogram(s) indicating the obligation of wearing personal protective equipment (PPE) :



Use personal protective equipment that is clean and has been properly maintained.

Store personal protective equipment in a clean place, away from the work area.

Never eat, drink or smoke during use. Remove and wash contaminated clothing before re-using. Ensure that there is adequate ventilation, especially in confined areas.

**- Eye / face protection**

Avoid contact with eyes.

Before handling powders or dust emission, wear mask goggles in accordance with standard EN166.

**- Hand protection**

Wear suitable protective gloves in the event of prolonged or repeated skin contact.

Type of gloves recommended :

- cotton

**- Body protection**

Suitable type of protective clothing :

- protective work clothing

- protective shoes

Work clothing worn by personnel shall be laundered regularly.

After contact with the product, all parts of the body that have been soiled must be washed.

**- Respiratory protection**

Avoid inhaling dust.

Independent breathing apparatus for respiratory protection :

It is recommended to set up a fumes exhaust system closer to their emission. In case of insufficient ventilation, wear suitable respiratory equipment. In case of formation of vapors, wear suitable respiratory equipment with filter.

**- Thermal risks**

The product could cause burns during soldering.

**SECTION 9 : PHYSICAL AND CHEMICAL PROPERTIES****9.1. Information on basic physical and chemical properties****Physical state**

Physical state : Solid.

**Colour**

Unspecified

**Odour**

Odour threshold : Not stated.

**Melting point**

Melting point/melting range : Not specified.

**Freezing point**

Freezing point / Freezing range : Not stated.

**LEAD FREE SOLDER ALLOYS : TIN - SILVER - COPPER - ALLIAGES SN-AG-CU****Boiling point or initial boiling point and boiling range**

Boiling point/boiling range : Not specified.

**Flammability**

Flammability (solid, gas) : Not stated.

**Lower and upper explosion limit**

Explosive properties, lower explosivity limit (%) : Not stated.

Explosive properties, upper explosivity limit (%) : Not stated.

**Flash point**

Flash point interval : Not relevant.

**Auto-ignition temperature**

Self-ignition temperature : Not specified.

**Decomposition temperature**

Decomposition point/decomposition range : Not specified.

**pH**

pH : Not relevant.

pH (aqueous solution) : Not stated.

**Kinematic viscosity**

Viscosity : Not stated.

**Solubility**

Water solubility : Insoluble.

Fat solubility : Not stated.

**Partition coefficient n-octanol/water (log value)**

Partition coefficient: n-octanol/water : Not stated.

**Vapour pressure**

Vapour pressure (50°C) : Not relevant.

**Density and/or relative density**

Density : &gt; 1

**Relative vapour density**

Vapour density : Not stated.

**9.2. Other information**

Density (Sn95.5Ag3.8Cu0.7) : 7.4 @ 20°C

Solidus / Liquidus temperature (Sn95.5Ag3.8Cu0.7) : E 217°C

Density (Sn96.5Ag3Cu0.5) : 7.4 @ 20°C

Density (Sn99Ag0.3Cu0.7) : 7.3 @ 20°C

Solidus / Liquidus temperature (Sn96.5Ag3Cu0.5) : 217°C / 219°C

Solidus / Liquidus temperature (Sn99Ag0.3Cu0.7) : 217°C / 228°C

**9.2.1. Information with regard to physical hazard classes**

No data available.

**9.2.2. Other safety characteristics**

No data available.

**SECTION 10 : STABILITY AND REACTIVITY****10.1. Reactivity**

The product is stable under normal conditions of use and storage, but reacts with strong oxidisers.

**10.2. Chemical stability**

This mixture is stable under the recommended handling and storage conditions in section 7.

**10.3. Possibility of hazardous reactions**

Reaction with strong oxidizers.



**LEAD FREE SOLDER ALLOYS : TIN - SILVER - COPPER - ALLIAGES SN-AG-CU**

**10.4. Conditions to avoid**

Avoid :

- formation of dusts

Dusts can form an explosive mixture with air.

**10.5. Incompatible materials**

The product reacts with strong acids, especially with oxidisers acids.

**10.6. Hazardous decomposition products**

No hazardous decomposition under normal conditions of use.

**SECTION 11 : TOXICOLOGICAL INFORMATION**

**11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008**

No data available.

**11.1.1. Substances**

**Acute toxicity :**

COPPER (CAS: 7440-50-8)

Oral route : LD50  $\geq$  300 mg/kg  
Species : Rat

Inhalation route (n/a) : LC50  $\geq$  0.733 mg/l  
Species : Rat

SILVER (CAS: 7440-22-4)

Oral route : 2000 < LD50  $\leq$  5000 mg/kg  
Species : Rat

Dermal route : 2,000 < LD50  $\leq$  5000 mg/kg  
Species : Rat

Inhalation route (n/a) : LC50 = 5.16 mg/l  
Species : Rat  
Duration of exposure : 4 h

TIN (CAS: 7440-31-5)

Oral route : 2000 < LD50  $\leq$  5000 mg/kg  
Species : Rat

Dermal route : 2,000 < LD50  $\leq$  5000 mg/kg  
Species : Rat

Inhalation route (Dusts/mist) : LC50 > 4.75 mg/l  
Species : Rat  
Duration of exposure : 4 h

**Reproductive toxicant :**

SILVER (CAS: 7440-22-4)

No toxic effect for reproduction

**11.1.2. Mixture**

No toxicological data available for the mixture.





**LEAD FREE SOLDER ALLOYS : TIN - SILVER - COPPER - ALLIAGES SN-AG-CU**

**SECTION 12 : ECOLOGICAL INFORMATION**

**12.1. Toxicity**

Do not allow product to reach ground water, water source or sewage system.

**12.1.1. Substances**

TIN (CAS: 7440-31-5)

Crustacean toxicity :

EC50 = 1.303 mg/l

Species : Ceriodaphnia dubia

SILVER (CAS: 7440-22-4)

Fish toxicity :

NOEC = 0.13 mg/l

Species : Menidia beryllina

Duration of exposure : 28 days

Crustacean toxicity :

NOEC = 0.001 mg/l

Duration of exposure : 7 days

Algae toxicity :

NOEC = 0.0012 mg/l

Duration of exposure : 14 days

**12.1.2. Mixtures**

No aquatic toxicity data available for the mixture.

**12.2. Persistence and degradability**

**12.2.1. Substances**

COPPER (CAS: 7440-50-8)

Biodegradability :

no degradability data is available, the substance is considered as not degrading quickly.

**12.3. Bioaccumulative potential**

**12.3.1. Substances**

SILVER (CAS: 7440-22-4)

Bioaccumulation :

BCF = 70

**12.4. Mobility in soil**

No data available.

**12.5. Results of PBT and vPvB assessment**

No data available.

**12.6. Endocrine disrupting properties**

No data available.

**12.7. Other adverse effects**

No data available.

**SECTION 13 : DISPOSAL CONSIDERATIONS**

Proper waste management of the mixture and/or its container must be determined in accordance with Directive 2008/98/EC.

**13.1. Waste treatment methods**

Do not pour into drains or waterways.

**Waste :**

Waste management is carried out without endangering human health, without harming the environment and, in particular without risk to water, air, soil, plants or animals.

Recycle or dispose of waste in compliance with current legislation, preferably via a certified collector or company.

Do not contaminate the ground or water with waste, do not dispose of waste into the environment.



**LEAD FREE SOLDER ALLOYS : TIN - SILVER - COPPER - ALLIAGES SN-AG-CU**

**Soiled packaging :**

- Empty container completely. Keep label(s) on container.
- Give to a certified disposal contractor.

**SECTION 14 : TRANSPORT INFORMATION**

Exempt from transport classification and labelling.

**14.1. UN number or ID number**

-

**14.2. UN proper shipping name**

-

**14.3. Transport hazard class(es)**

-

**14.4. Packing group**

-

**14.5. Environmental hazards**

-

**14.6. Special precautions for user**

-

**SECTION 15: Regulatory information**

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

**- Classification and labelling information included in section 2:**

The following regulations have been used:

- EU Regulation No. 1272/2008 amended by EU Regulation No. 2021/643 (ATP 16)
- EU Regulation No. 1272/2008 amended by EU Regulation No. 2021/849 (ATP 17)

**- Container information:**

No data available.

**- Particular provisions :**

No data available.

**15.2. Chemical safety assessment**

No data available.

**SECTION 16 : OTHER INFORMATION**

We cannot anticipate any and all conditions and situations under which the information and our products or the combination of both with others will be used. We do not assume any liability in the safety and suitability of our products alone or in combination with others. Users must make their own tests to determine the safety and suitability of each product used alone or with other products for their own use.

Except any previous written agreement, our products are sold without guarantee and customers must assume all liability for any loss or damage suffered by themselves or by third parties, either from handling or use of our products alone or with others. In case of any difference or variation seen during the use of the products we request that you contact our technical department.

**Abbreviations :**

- LD50 : The dose of a test substance resulting in 50% lethality in a given time period.
- LC50 : The concentration of a test substance resulting in 50% lethality in a given period.
- EC50 : The effective concentration of substance that causes 50% of the maximum response.
- NOEC : The concentration with no observed effect.
- REACH : Registration, Evaluation, Authorization and Restriction of Chemical Substances.
- ATE : Acute Toxicity Estimate
- DNEL : Derived No-Effect Level
- PNEC : Predicted No-Effect Concentration
- UFI : Unique formulation identifier.
- STEL : Short-term exposure limit



**LEAD FREE SOLDER ALLOYS : TIN - SILVER - COPPER - ALLIAGES SN-AG-CU**

TWA : Time Weighted Averages

TMP : French Occupational Illness table

TLV : Threshold Limit Value (exposure)

AEV : Average Exposure Value.

ADR : European agreement concerning the international carriage of dangerous goods by Road.

IMDG : International Maritime Dangerous Goods.

IATA : International Air Transport Association.

ICAO : International Civil Aviation Organisation

RID : Regulations concerning the International carriage of Dangerous goods by rail.

PBT: Persistent, bioaccumulable and toxic.

vPvB : Very persistent, very bioaccumulable.

SVHC : Substances of very high concern.