



Material Safety Data Sheet

1. Product & Company Identification and identification of the substance/mixture

Product:	Solder Tin, lead free, diameter 1 mm
Manufacturer:	Conrad Electronic SE
Address:	Klaus-Conrad-Str. 1, D-92240 Hirschau
Telephone:	+49 (0) 9604 / 40 - 8988
Date of issue:	27.03.2017

2. Hazards Identification

2.1. Classification of the substance or mixture

Considered a hazardous mixture according to Reg. (EC) No 1272/2008 and their amendments. Not classified as Dangerous Goods for transport purposes.

Chemwatch Hazard Ratings

	Min	Max	
Flammability	0	_____	0 = Minimum
Toxicity	1	■_____	1 = Low
Body Contact	0	_____	2 = Moderate
Reactivity	2	■_____	3 = High
Chronic	0	_____	4 = Extreme

Classification according to regulation (EC) No 1272/2008 [CLP] [1]

H413 - Chronic Aquatic Hazard Category 4

Legend: 1. Classified by Chemwatch; 2. Classification drawn from EC Directive 67/548/EEC - Annex I ; 3. Classification drawn from EC Directive 1272/2008 – Annex VI

2.2. Label elements

CLP label elements Not Applicable

Signal Word Not Applicable

Hazard statement(s)

H413 May cause long lasting harmful effects to aquatic life.

Supplementary statement(s)

Not Applicable

Precautionary statement(s) Prevention

P273 Avoid release to the environment.

Precautionary statement(s) Response

Not Applicable

Precautionary statement(s) Storage

Not Applicable



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Precautionary statement(s) Disposal

P501 Dispose of contents/container in accordance with local regulations.

2.3. Other hazards

Inhalation may produce health damage*.

Cumulative effects may result following exposure*.

REACH – Art. 57-59: The mixture does not contain Substances of Very High Concern (SVHC) at the SDS print date.

3. Composition / Information On Ingredients

3.1. Substances

See 'Composition on ingredients' in Section 3.2

3.2. Mixtures

1. CAS No 2. EC No 3. No 4. No	%[weight]	Name	Classification according to regulation (EC) No 1272/2008 [CLP]
1. 7440-31-5 2. 231-141-8 3. Not Available 4. 01-2119486474-28-XXXX	99.3	tin	Not Applicable
1. 7440-50-8 2. 231-159-6 3. Not Available 4. 01-2119480154-42-XXXX, 01-2119480184-39-XXXX, 01-2119475516-31-XXXX	0.7	copper	Not Applicable

Legend: 1. Classified by Chemwatch; 2. Classification drawn from EC Directive 67/548/EEC - Annex I ; 3. Classification drawn from EC Directive 1272/2008 - Annex VI 4. Classification drawn from C&L



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4. First Aid Measures

4.1. Description of first aid measures

GENERAL:

If skin or hair contact occurs:

- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

In case of burns:

- Immediately apply cold water to burn either by immersion or wrapping with saturated clean cloth.
- DO NOT remove or cut away clothing over burnt areas. DO NOT pull away clothing which has adhered to the skin as this can cause further injury.
- DO NOT break blister or remove solidified material.
- Quickly cover wound with dressing or clean cloth to help prevent infection and to ease pain.
- For large burns, sheets, towels or pillow slips are ideal; leave holes for eyes, nose and mouth.
- DO NOT apply ointments, oils, butter, etc. to a burn under any circumstances.
- Water may be given in small quantities if the person is conscious.
- Alcohol is not to be given under any circumstances.
- Reassure.
- Treat for shock by keeping the person warm and in a lying position.
- Seek medical aid and advise medical personnel in advance of the cause and extent of the injury and the estimated time of arrival of the patient.

If this product comes in contact with the eyes:

- Wash out immediately with fresh running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Seek medical attention without delay; if pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
- DO NOT attempt to remove particles attached to or embedded in eye .
- Lay victim down, on stretcher if available and pad BOTH eyes, make sure dressing does not press on the injured eye by placing thick pads under dressing, above and below the eye.
- Seek urgent medical assistance, or transport to hospital.
- Particulate bodies from welding spatter may be removed carefully.
- DO NOT attempt to remove particles attached to or embedded in eye.
- Lay victim down, on stretcher if available and pad BOTH eyes, make sure dressing does not press on the injured eye by placing thick pads under dressing, above and below the eye.
- Seek urgent medical assistance, or transport to hospital.
- If dust is inhaled, remove from contaminated area.



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- Encourage patient to blow nose to ensure clear breathing passages.
- Ask patient to rinse mouth with water but to not drink water.
- Seek immediate medical attention.

IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.

- For advice, contact a Poisons Information Centre or a doctor.
- Urgent hospital treatment is likely to be needed.
- In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.
- If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the SDS should be provided. Further action will be the responsibility of the medical specialist.
- If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the SDS.

Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:

- INDUCE vomiting with fingers down the back of the throat, ONLY IF CONSCIOUS. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

NOTE: Wear a protective glove when inducing vomiting by mechanical means.

EYE CONTACT

If this product comes in contact with the eyes:

- Wash out immediately with fresh running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Seek medical attention without delay; if pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
- DO NOT attempt to remove particles attached to or embedded in eye.
- Lay victim down, on stretcher if available and pad BOTH eyes, make sure dressing does not press on the injured eye by placing thick pads under dressing, above and below the eye.
- Seek urgent medical assistance, or transport to hospital.
- Particulate bodies from welding spatter may be removed carefully.
- DO NOT attempt to remove particles attached to or embedded in eye.
- Lay victim down, on stretcher if available and pad BOTH eyes, make sure dressing does not press on the injured eye by placing thick pads under dressing, above and below the eye.
- Seek urgent medical assistance, or transport to hospital.



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SKIN CONTACT

If skin or hair contact occurs:

- Flush skin and hair with running water (and soap if available).
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In case of burns:

- Immediately apply cold water to burn either by immersion or wrapping with saturated clean cloth.
- DO NOT remove or cut away clothing over burnt areas. DO NOT pull away clothing which has adhered to the skin as this can cause further injury.
- DO NOT break blister or remove solidified material.
- Quickly cover wound with dressing or clean cloth to help prevent infection and to ease pain.
- For large burns, sheets, towels or pillow slips are ideal; leave holes for eyes, nose and mouth.
- DO NOT apply ointments, oils, butter, etc. to a burn under any circumstances.
- Water may be given in small quantities if the person is conscious.
- Alcohol is not to be given under any circumstances.
- Reassure.
- Treat for shock by keeping the person warm and in a lying position.
- Seek medical aid and advise medical personnel in advance of the cause and extent of the injury and the estimated time of arrival of the patient.

INHALATION

- If dust is inhaled, remove from contaminated area.
- Encourage patient to blow nose to ensure clear breathing passages.
- Ask patient to rinse mouth with water but to not drink water.
- Seek immediate medical attention.

INGESTION

- IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.
- For advice, contact a Poisons Information Centre or a doctor.
- Urgent hospital treatment is likely to be needed.
- In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.
- If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the SDS should be provided. Further action will be the responsibility of the medical specialist.
- If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the SDS.



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Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:

- INDUCE vomiting with fingers down the back of the throat, ONLY IF CONSCIOUS. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

NOTE: Wear a protective glove when inducing vomiting by mechanical means.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11

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

Treat symptomatically.

Copper, magnesium, aluminium, antimony, iron, manganese, nickel, zinc (and their compounds) in welding, brazing, galvanising or smelting operations all give rise to thermally produced particulates of smaller dimension than may be produced if the metals are divided mechanically. Where insufficient ventilation or respiratory protection is available these particulates may produce "metal fume fever" in workers from an acute or long term exposure.

- Onset occurs in 4-6 hours generally on the evening following exposure. Tolerance develops in workers but may be lost over the weekend. (Monday Morning Fever)
- Pulmonary function tests may indicate reduced lung volumes, small airway obstruction and decreased carbon monoxide diffusing capacity but these abnormalities resolve after several months.
- Although mildly elevated urinary levels of heavy metal may occur they do not correlate with clinical effects.
- The general approach to treatment is recognition of the disease, supportive care and prevention of exposure.
- Seriously symptomatic patients should receive chest x-rays, have arterial blood gases determined and be observed for the development of tracheobronchitis and pulmonary edema.

[Ellenhorn and Barceloux: Medical Toxicology]

5. Firefighting Measures

5.1. Extinguishing media

DO NOT use halogenated fire extinguishing agents.

Metal dust fires need to be smothered with sand, inert dry powders.

DO NOT USE WATER, CO₂ or FOAM.

Use DRY sand, graphite powder, dry sodium chloride based extinguishers, G-1 or Met L-X to smother fire.

Confining or smothering material is preferable to applying water as chemical reaction may produce flammable and explosive hydrogen gas.

5.2. Special hazards arising from the substrate or mixture

Fire Incompatibility

Reacts with acids producing flammable / explosive hydrogen (H₂) gas



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5.3. Advice for firefighters

Fire Fighting

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves in the event of a fire.
- Prevent, by any means available, spillage from entering drains or water courses.
- Use fire fighting procedures suitable for surrounding area.

Fire/Explosion Hazard

- DO NOT disturb burning dust. Explosion may result if dust is stirred into a cloud, by providing oxygen to a large surface of hot metal.
- DO NOT use water or foam as generation of explosive hydrogen may result.
- With the exception of the metals that burn in contact with air or water (for example, sodium), masses of combustible metals do not represent unusual fire risks because they have the ability to conduct heat away from hot spots so efficiently that the heat of combustion cannot be maintained - this means that it will require a lot of heat to ignite a mass of combustible metal.
- May emit poisonous fumes.
- May emit corrosive fumes.
- Explosions can occur with coils of foil that have been submerged or partially submerged in water for an extended period of time. Water can penetrate between the layers of foil, react with the aluminum surface and generate heat and hydrogen gas. When the coils are removed from the cooling effects of the water, rapid temperature increases can occur causing steam explosions which result in the rupture of the coils and discharge of debris. Coils of foil may be a potential hazard under the following conditions:
 - Coil has been annealed (annealing removes residual oil that could prevent penetration of water)
 - Foil is very thin gauge (5-9 µm thickness which increases surface area)
 - Coil has been immersed for an extended period of time (several hours or more)
 - Wetted coil has recently been removed from the cooling effects of the water

In such situations, the coils should be isolated (30 meters from any personnel) for at least 72 hours as soon as possible after removal from the water.



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6. Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures

See section 8

6.2. Environmental precautions

See section 12

6.3. Methods and material for containment and cleaning up

Minor Spills

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Control personal contact with the substance, by using protective equipment.

Major Spills

- Do not use compressed air to remove metal dusts from floors, beams or equipment
- Vacuum cleaners, of flame-proof design, should be used to minimise dust accumulation.
- Use non-sparking handling equipment, tools and natural bristle brushes.
- Provide grounding and bonding where necessary to prevent accumulation of static charges during metal dust handling and transfer operations
- Cover and reseal partially empty containers.

If molten:

- Contain the flow using dry sand or salt flux as a dam.
- All tooling (e.g., shovels or hand tools) and containers which come in contact with molten metal must be preheated or specially coated, rust free and approved for such use. Allow the spill to cool before remelting scrap.

Moderate hazard:

- CAUTION: Advise personnel in area.
- Alert Emergency Services and tell them location and nature of hazard.
- Control personal contact by wearing protective clothing.

6.4. Reference to other sections

Personal Protective Equipment advice is contained in Section 8 of the SDS.



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7. Handling And Storage

7.1. Precautions for safe handling

Safe handling

- Develop work practices and procedures that prevent particulate from coming in contact with worker skin, hair, or personal clothing.
- If work practices and/or procedures are ineffective in controlling airborne exposure or visual particulate from deposition on skin, hair, or clothing, provide appropriate cleaning/washing facilities.
- Procedures should be written that clearly communicate the facility's requirements for protective clothing and personal hygiene. These clothing and personal hygiene requirements help keep particulate from being spread to non-production areas or from being taken home by the worker.

For molten metals:

- Molten metal and water can be an explosive combination. The risk is greatest when there is sufficient molten metal to entrap or seal off water. Water and other forms of contamination on or contained in scrap or remelt ingot are known to have caused explosions in melting operations. While the products may have minimal surface roughness and internal voids, there remains the possibility of moisture contamination or entrapment.

Fire and explosion protection

- See section 5

Other information

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry area protected from environmental extremes.
- Store away from incompatible materials and foodstuff containers.

7.2. Conditions for safe storage, including any incompatibilities

Suitable container

- Bulk bags: Reinforced bags required for dense materials.
- CARE: Packing of high density product in light weight metal or plastic packages may result in container collapse with product release Heavy gauge metal packages / Heavy gauge metal drums

Storage incompatibility

- Chips, fines and dust are considerably more reactive in the presence of:
 - Water - slowly generates flammable/explosive hydrogen gas and heat (generation rate is greatly increased with smaller particles (e.g., fines and dusts).
 - Heat - oxidise at a rate dependent upon temperature and particle size.
 - Strong oxidisers - violent reaction with considerable heat generation; an react explosively with nitrates (e.g., ammonium nitrate and fertilizers containing nitrate) when heated or molten.
 - Acids and alkalis - reacts to generate flammable/explosive hydrogen gas; generation rate is greatly increased with smaller particles (e.g., fines and dusts).
- The material is described as an electropositive metal.



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- The activity or electromotive series of metals is a listing of the metals in decreasing order of their reactivity with hydrogen-ion sources such as water and acids. In the reaction with a hydrogen-ion source, the metal is oxidised to a metal ion, and the hydrogen ion is reduced to H₂. The ordering of the activity series can be related to the standard reduction potential of a metal cation.
- Many metals may incandesce, react violently, ignite or react explosively upon addition of concentrated nitric acid.

7.3. Specific end use(s)

See section 1.2

8. Exposure Controls / Personal Protection

8.1. Control parameters

DERIVED NO EFFECT LEVEL (DNEL)

Not Available

PREDICTED NO EFFECT LEVEL (PNEC)

Not Available

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
EU Directive 91/322/EEC Indicative Occupational Exposure Limit Values (IOELVs)	tin	Tin (inorganic compounds as Sn) (6)	2 mg/m ³	Not Available	Not Available	Not Available
EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs)	tin	Tin and inorganic tin compounds	2 mg/m ³	Not Available	Not Available	Not Available
UK Workplace Exposure Limits	copper	Copper fume / Copper dusts and mists (as Cu)	0.2 mg/m ³ / 1 mg/m ³	2 mg/m ³	Not Available	Not Available



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EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
tin	Tin	6 mg/m ³	67 mg/m ³	400 mg/m ³
copper	Copper	3 mg/m ³	33 mg/m ³	200 mg/m ³

Ingredient	Original IDLH	Revised IDLH
tin	Unknown mg/m ³ / 400 mg/m ³ / Unknown ppm	25 mg/m ³ / 100 mg/m ³
copper	N.E. mg/m ³ / N.E. ppm	100 mg/m ³

8.2. Exposure controls

8.2.1. Appropriate engineering controls

- Metal dusts must be collected at the source of generation as they are potentially explosive.
- Avoid ignition sources.
- Good housekeeping practices must be maintained.
- Dust accumulation on the floor, ledges and beams can present a risk of ignition, flame propagation and secondary explosions.

8.2.2. Personal protection



Eye and face protection

- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task.

Skin protection

See Hand protection below

Hands/feet protection

The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.



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The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.

Personal hygiene is a key element of effective hand care.

- Protective gloves eg. Leather gloves or gloves with Leather facing

Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.

- Polychloroprene.
- Nitrile rubber.
- Butyl rubber.

Body protection

See Other protection below

Other protection

- Overalls.
- P.V.C. apron.
- Barrier cream.

Thermal hazards

Not Available

Respiratory protection

Particulate. (AS/NZS 1716 & 1715, EN 143:000 & 149:001, ANSI Z88 or national equivalent)

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	P1 Air-line*	- -	PAPR-P1
up to 50 x ES	Air-line**	P2	PAPR-P2
up to 100 x ES	-	P3	-
		Air-line*	-
100+ x ES	-	Air-line**	PAPR-P3

* - Negative pressure demand

** - Continuous flow

A (All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide (HCN), B3 = Acid gas or hydrogen cyanide (HCN), E = Sulfur dioxide (SO₂), G = Agricultural chemicals, K = Ammonia (NH₃), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds (below 65 degC)



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- Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
- Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended.
- Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
- Use approved positive flow mask if significant quantities of dust becomes airborne.
- Try to avoid creating dust conditions.

8.2.3. Environmental exposure controls

See section 12

9. Physical And Chemical Properties

9.1. Information on basic physical and chemical properties

Appearance: Massive form of the metal.

Massive or bulk metals (as opposed to dispersed or divided metals) are characterised by having a well-ordered infinite lattice of metal atoms. Massive metals exist in various forms, including sheets, rods, ingots, foils, pellets, wire or on occasion, dusts.

Physical state:	Solid
Relative density (Water = 1):	Not Available
Odour:	Not Available
Partition coefficient n-octanol / water:	Not Available
Odour threshold:	Not Available
Auto-ignition temperature (°C):	Not Available
pH (as supplied):	Not Available
Decomposition temperature:	Not Available
Melting point / freezing point (°C):	Not Available
Viscosity (cSt):	Not Available
Initial boiling point and boiling range (°C):	Not Available
Molecular weight (g/mol):	Not Available
Flash point (°C):	Not Available
Taste:	Not Available
Evaporation rate:	Not Available
Explosive properties:	Not Available
Flammability:	Not Available
Oxidising properties:	Not Available



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Upper Explosive Limit (%):	Not Available
Surface Tension (dyn/cm or mN/m):	Not Applicable
Lower Explosive Limit (%):	Not Available
Volatile Component (%vol):	Not Available
Vapour pressure (kPa):	Not Available
Gas group:	Not Available
Solubility in water (g/L):	Not Applicable
pH as a solution (1%):	Not Available
Vapour density (Air = 1):	Not Available
VOC g/L:	Not Available

9.2. Other information

Not Available

10. Stability And Reactivity

10.1. Reactivity

See section 7.2

10.2. Chemical stability

- Unstable in the presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

10.3. Possibility of hazardous reactions

See section 7.2

10.4. Conditions to avoid

See section 7.2

10.5. Incompatible materials

See section 7.2

10.6. Hazardous decomposition products

See section 5.3



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11. Toxicological Information

11.1. Information on toxicological effects

Inhaled

The material is not thought to produce either adverse health effects or irritation of the respiratory tract following inhalation (as classified by EC Directives using animal models). Nevertheless, adverse systemic effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

Metals which form part of massive metals and their alloys, are "locked" into a metal lattice; as a result they are not readily bioavailable following inhalation. Mechanical processing of massive metals (e.g. cutting, grinding) may cause irritation of the upper respiratory tract. Additional health effects from elevated temperature processing (e.g., welding) can cause metal fume fever (nausea, fever, chills, shortness of breath and malaise), reduced ability of the blood to carry oxygen (methaemoglobin) and the accumulation of fluid in the lungs (pulmonary oedema).

The inhalation of small particles of metal oxide results in sudden thirst, a sweet, metallic foul taste, throat irritation, cough, dry mucous membranes, tiredness and general unwellness. Headache, nausea and vomiting, fever or chills, restlessness, sweating, diarrhoea, excessive urination and prostration may also occur.

Ingestion

Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.

Metals which form part of massive metals and their alloys, are "locked" into a metal lattice; as a result they are not readily bioavailable following ingestion. Secondary processes (e.g. change in pH or intervention by gastrointestinal microorganisms) may allow certain substances to be released in low concentrations.

Tin salts are not very toxic. However, at high concentration, nausea, vomiting and diarrhoea can occur.

Skin Contact

Skin contact is not thought to produce harmful health effects (as classified under EC Directives using animal models). Systemic harm, however, has been identified following exposure of animals by at least one other route and the material may still produce health damage following entry through wounds, lesions or abrasions.

Particles and foreign bodies produced by high speed processes may penetrate the skin. Even after the wound heals persons with retained foreign bodies may experience sharp pain with movement or pressure over the site. Discolouration or a visible mass under the epidermis may be obvious. Numbness or tingling ("pins and needles"), with decreased sensation, may be the result of a foreign body pressing against nerves.

Open cuts, abraded or irritated skin should not be exposed to this material

Eye

This material can cause eye irritation and damage in some persons.

Contact with the eye, by metal dusts, may produce mechanical abrasion or scratches on the cornea - these injuries usually are minor. However foreign body penetration of the eyeball may produce infection or result in permanent visual damage.

High-speed machines (such as drills and saws) can produce white-hot particles of metal that resemble sparks. Any of these white-hot particles can enter the unprotected eye and become embedded deep within it.

Corneal abrasions caused by particles and foreign bodies usually cause pain, tearing, and a feeling that there is something in the eye. They may also cause redness (due to inflamed blood vessels on the surface of the eye) or, occasionally, swelling of the eye and eyelid. Vision may become blurred. Light may be a source of irritation or may cause the muscle that constricts the pupil to undergo a painful spasm.



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Chronic

Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified by EC Directives using animal models); nevertheless exposure by all routes should be minimised as a matter of course.

Metallic dusts generated by the industrial process give rise to a number of potential health problems. The larger particles, above 5 micron, are nose and throat irritants.

Solder, Lead Free, Diameter 1 mm	TOXICITY	IRRITATION
	Not Available	Not Available

tin	TOXICITY	IRRITATION
	dermal (rat) LD50: >2000 mg/kg[1]	Not Available
	Oral (rat) LD50: >2000 mg/kg[1]	

copper	TOXICITY	IRRITATION
	dermal (rat) LD50: >2000 mg/kg[1]	Not Available
	Inhalation (rat) LC50: 0.733 mg/l/4hr[1]	
	Inhalation (rat) LC50: 1.03 mg/l/4hr[1]	
	Inhalation (rat) LC50: 1.67 mg/l/4hr[1]	
	Oral (rat) LD50: 300-500 mg/kg[1]	

Legend: 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

TIN

No significant acute toxicological data identified in literature search.

COPPER

For copper and its compounds (typically copper chloride):

Acute toxicity: There are no reliable acute oral toxicity results available. In an acute dermal toxicity study (OECD TG 402), one group of 5 male rats and 5 groups of 5 female rats received doses of 1000, 1500 and 2000 mg/kg bw via dermal application for 24 hours. The LD50 values of copper monochloride were 2,000 mg/kg bw or greater for male (no deaths observed) and 1,224 mg/kg bw for female. Four females died at both 1500 and 2000 mg/kg bw, and one at 1,000 mg/kg bw.

WARNING: Inhalation of high concentrations of copper fume may cause "metal fume fever", an acute industrial disease of short duration. Symptoms are tiredness, influenza like respiratory tract irritation with fever.

Acute Toxicity: Data not available to make classification

Skin Irritation/Corrosion: Data not available to make classification

Serious Eye: Data not available to make classification

Damage/Irritation: Data not available to make classification



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Respiratory or Skin sensitisation:	Data not available to make classification
Mutagenicity:	Data not available to make classification
Carcinogenicity:	Data not available to make classification
Reproductivity:	Data not available to make classification
STOT - Single Exposure:	Data not available to make classification
STOT - Repeated Exposure:	Data not available to make classification
Aspiration Hazard:	Data not available to make classification

12. Ecological Information

12.1. Toxicity

Ingredient	Endpoint	Test Duration (hr)	Species	Value	Source
tin	LC50	96	Fish	>0.0124mg/L	2
tin	EC50	48	Crustacea	0.00018mg/L	5
tin	EC50	72	Algae or other aquatic plants	>0.0192mg/L	2
tin	EC50	72	Algae or other aquatic plants	>0.0192mg/L	2
tin	NOEC	168	Crustacea	<0.005mg/L	2
copper	LC50	96	Fish	0.0028mg/L	2
copper	EC50	48	Crustacea	0.001mg/L	5
copper	EC50	72	Algae or other aquatic plants	0.013335mg/L	4
copper	BCF	960	Fish	200mg/L	4
copper	EC50	96	Crustacea	0.001mg/L	5
copper	NOEC	96	Crustacea	0.0008mg/L	4

Legend: Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

May cause long-term adverse effects in the aquatic environment.

Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.

Wastes resulting from use of the product must be disposed of on site or at approved waste sites.

For Metal:

Atmospheric Fate - Metal-containing inorganic substances generally have negligible vapour pressure and are not expected to partition to air.

Environmental Fate: Environmental processes, such as oxidation, the presence of acids or bases and microbiological processes, may transform insoluble metals to more soluble ionic forms.



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Environmental processes may enhance bioavailability and may also be important in changing solubilities.

Aquatic/Terrestrial Fate: When released to dry soil, most metals will exhibit limited mobility and remain in the upper layer; some will leach locally into ground water and/ or surface water ecosystems when soaked by rain or melt ice. A metal ion is considered infinitely persistent because it cannot degrade further.

Tin may exist as either divalent (TinII) or tetravalent (TinIV) cations under environmental conditions. TinII prevails in oxygen-poor water and will readily precipitate as a sulfide or as a hydroxide in alkaline water. Tin(IV) readily breaks down in water through hydrolysis, and can precipitate as a hydroxide. In general, tin(IV) would be expected to be the only stable ionic species in the weathering cycle.

DO NOT discharge into sewer or waterways.

12.2. Persistence and degradability

Ingredients:

Persistence: Water/Soil: No Data available for all ingredients

Persistence: Air: No Data available for all ingredients

12.3. Bioaccumulative potential

Ingredients:

Bioaccumulation: No Data available for all ingredients

12.4. Mobility in soil

Ingredients:

Mobility: No Data available for all ingredients

12.5. Results of PBT and vPvB assessment

Relevant available data:

P: Not Available

B: Not Available

T: Not Available

PBT Criteria fulfilled?

P: Not Available

B: Not Available

T: Not Available

12.6. Other adverse effects

No data available



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13. Disposal Considerations

13.1. Waste treatment methods

Product / Packaging disposal

Recycle wherever possible or consult manufacturer for recycling options.

Consult State Land Waste Management Authority for disposal.

Metal scrap recycling operations present a wide variety of hazards, including health hazards associated with chemical exposures and safety hazards associated with material processing operations and the equipment used in these tasks. Many of these metals do not pose any hazard to people who handle objects containing the metal in everyday use. In cases where employees could be exposed to multiple hazardous metals or other hazardous substances at the same time or during the same workday, employers must consider the combined effects of the exposure in determining safe exposure levels.

The recycling of scrap metals is associated with illness and injury. The most common causes of illness were poisoning (e.g., lead or cadmium poisoning), disorders associated with repeated trauma, skin diseases or disorders, and respiratory conditions due to inhalation of, or other contact with, toxic agents.

DO NOT allow wash water from cleaning or process equipment to enter drains.

It may be necessary to collect all wash water for treatment before disposal.

In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.

Where in doubt contact the responsible authority.

Waste treatment options

Not Available

Sewage disposal options

Not Available

14. Transport Information

Labels Required:

Marine Pollutant: NO

HAZCHEM: Not Applicable

Land transport (ADR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

14.1. UN number

Not Applicable

14.2. UN proper shipping name

Not Applicable

14.3. Transport hazard class(es)

Class: Not Applicable

Subrisk: Not Applicable

14.4. Packing group

Not Applicable



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14.5. Environmental hazard

Not Applicable

14.6. Special precautions for user

Hazard identification (Kemler): Not Applicable

Classification code: Not Applicable

Hazard Label: Not Applicable

Special provisions: Not Applicable

Limited quantity: Not Applicable

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

14.1. UN number

Not Applicable

14.2. UN proper shipping name

Not Applicable

14.3. Transport hazard class(es)

ICAO/IATA Class: Not Applicable

ICAO / IATA Subrisk: Not Applicable

ERG Code: Not Applicable

14.4. Packing group

Not Applicable

14.5. Environmental hazard

Not Applicable

14.6. Special precautions for user

Special provisions: Not Applicable

Cargo Only Packing Instructions: Not Applicable

Cargo Only Maximum Qty / Pack: Not Applicable

Passenger and Cargo Packing Instructions: Not Applicable

Passenger and Cargo Maximum Qty / Pack: Not Applicable

Passenger and Cargo Limited Quantity Packing Instructions: Not Applicable

Passenger and Cargo Limited Maximum Qty / Pack: Not Applicable



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Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

14.1. UN number

Not Applicable

14.2. UN proper shipping name

Not Applicable

14.3. Transport hazard class(es)

IMDG Class: Not Applicable

IMDG Subrisk: Not Applicable

14.4. Packing group

Not Applicable

14.5. Environmental hazard

Not Applicable

14.6. Special precautions for user

EMS Number: Not Applicable

Special provisions: Not Applicable

Limited Quantities: Not Applicable

Inland waterways transport (ADN): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

14.1. UN number

Not Applicable

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 hazard

Not Applicable

14.6. Special precautions for user

Classification code: Not Applicable

Special provisions: Not Applicable

Limited quantity: Not Applicable

Equipment required: Not Applicable

Fire cones number: Not Applicable

14.7. Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable



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15 Regulatory Information

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

TIN (7440-31-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs)

European Trade Union Confederation (ETUC) Priority List for REACH Authorisation

EU Directive 91/322/EEC Indicative Occupational Exposure Limit Values (IOELVs)

European Union - European Inventory of Existing Commercial Chemical Substances (EINECS) (English)

European Customs Inventory of Chemical Substances ECICS (English)

COPPER (7440-50-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS

European Customs Inventory of Chemical Substances ECICS (English)

UK Workplace Exposure Limits (WELs)

European Union - European Inventory of Existing Commercial Chemical Substances (EINECS) (English)

This safety data sheet is in compliance with the following EU legislation and its adaptations - as far as applicable - : 98/24/EC, 92/85/EC, 94/33/EC, 91/689/EEC, 1999/13/EC, Commission Regulation (EU) 2015/830, Regulation (EC) No 1272/2008 and their amendments.

15.2. Chemical safety assessment

For further information please look at the Chemical Safety Assessment and Exposure Scenarios prepared by your Supply Chain if available.

ECHA SUMMARY

Ingredient	CAS number	Index No	ECHA Dossier
tin	7440-31-5	Not Available	01-2119486474-28-XXXX

Harmonisation (C&L Inventory)	Hazard Class and Category Code(s)	Pictograms Signal Word Code(s)	Hazard Statement Code(s)
1	Not Classified	Wng, GHS09, GHS02, GHS06, GHS05, GHS03, GHS08, Dgr	H319, H335, H302, H315, H331, H311, H372, H228, H260, H334
2	Eye Irrit. 2, STOT SE 3, Acute Tox. 4, Aquatic Chronic 4, STOT RE 1, Flam. Sol. 1, Flam. Sol. 2, Skin Irrit. 2, Resp. Sens. 1	Wng, GHS09, GHS02, GHS06, GHS05, GHS03, GHS08, Dgr	H319, H335, H302, H315, H331, H311, H372, H228, H260, H334

Harmonisation Code 1 = The most prevalent classification. Harmonisation Code 2 = The most severe classification.



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Ingredient	CAS number	Index No	ECHA Dossier
copper	7440-50-8	Not Available	01-2119480154-42-XXXX, 01-2119480184-39-XXXX, 01-2119475516-31-XXXX

Harmonisation (C&L Inventory)	Hazard Class and Category Code(s)	Pictograms Signal Word Code(s)	Hazard Statement Code(s)
1	Not Classified	GHS09, Dgr, GHS06, GHS08, Wng, GHS02, GHS07, GHS09, GHS08, Dgr, GHS09, GHS08, Dgr	H371, H315, H319, H335, H228, H300, H317, H330, H372, H361, H302, H332, H351, H360, H373, H302, H332, H351, H360, H373
2	Acute Tox. 4, Aquatic Acute 1, Aquatic Chronic 2, Aquatic Chronic 3, Acute Tox. 3, STOT SE 2, Skin Irrit. 2, Eye Irrit. 2, STOT SE 3, Aquatic Chronic 1, Aquatic Chronic 4, Flam. Sol. 2, Flam. Sol. 1, Acute Tox. 2, Skin Sens. 1, STOT RE 1, STOT RE 2, Repr. 2	GHS09, Dgr, GHS06, GHS08, Wng, GHS02	H371, H315, H319, H335, H228, H300, H317, H330, H372, H361
1	Acute Tox. 4, Carc. 2, Repr. 1A, STOT RE 2, Aquatic Chronic 2	GHS07, GHS09, GHS08, Dgr	H302, H332, H351, H360, H373
2	Acute Tox. 4, Carc. 2, Repr. 1A, STOT RE 2, Aquatic Chronic 2	GHS09, GHS08, Dgr	H302, H332, H351, H360, H373

Harmonisation Code 1 = The most prevalent classification. Harmonisation Code 2 = The most severe classification.



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National Inventory	Status
Australia - AICS	Y
Canada - DSL	Y
Canada - NDSL	N (copper; tin)
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	Y
Japan - ENCS	N (copper; tin)
Korea - KECI	Y
New Zealand - NZIoC	Y
Philippines - PICCS	Y
USA - TSCA	Y

Legend:

Y = All ingredients are on the inventory

N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)



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16. Other Information

Full text Risk and Hazard codes

- H228 Flammable solid.
- H260 In contact with water releases flammable gases which may ignite spontaneously.
- H300 Fatal if swallowed.
- H302 Harmful if swallowed.
- H311 Toxic in contact with skin.
- H315 Causes skin irritation.
- H317 May cause an allergic skin reaction.
- H319 Causes serious eye irritation.
- H330 Fatal if inhaled.
- H331 Toxic if inhaled.
- H332 Harmful if inhaled.
- H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- H335 May cause respiratory irritation.
- H351 Suspected of causing cancer.
- H360 May damage fertility or the unborn child.
- H361 Suspected of damaging fertility or the unborn child.
- H371 May cause damage to organs.
- H372 Causes damage to organs through prolonged or repeated exposure.
- H373 May cause damage to organs through prolonged or repeated exposure.

Other information

Ingredients with multiple cas numbers

Name	CAS No
copper	7440-50-8, 133353-46-5, 133353-47-6, 195161-80-9, 65555-90-0, 72514-83-1

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.



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For detailed advice on Personal Protective Equipment, refer to the following EU CEN Standards:

EN 166 Personal eye-protection

EN 340 Protective clothing

EN 374 Protective gloves against chemicals and micro-organisms

EN 13832 Footwear protecting against chemicals

EN 133 Respiratory protective devices

Definitions and abbreviations

PCTWA: Permissible Concentration-Time Weighted Average

PCSTEL: Permissible Concentration-Short Term Exposure Limit

IARC: International Agency for Research on Cancer

ACGIH: American Conference of Governmental Industrial Hygienists

STEL: Short Term Exposure Limit

TEEL: Temporary Emergency Exposure Limit

IDLH: Immediately Dangerous to Life or Health Concentrations

OSF: Odour Safety Factor

NOAEL :No Observed Adverse Effect Level

LOAEL: Lowest Observed Adverse Effect Level

TLV: Threshold Limit Value

LOD: Limit Of Detection

OTV: Odour Threshold Value

BCF: BioConcentration Factors

BEI: Biological Exposure Index

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