

Safety Data Sheet **TIN METAL (Foil, Granules)**

SDS no. CZ2E7RES • Version 1.0 • Date of issue: 2023-03-01

SECTION 1: Identification

GHS Product identifier

Product name TIN METAL (Foil, Granules)

Recommended use of the chemical and restrictions on use

Tin plated steel containers for food preservation, tin alloys (brasses and bronzes, bell metal, Babbitt metal, die casting alloy, pewter, phosphor bronze, type, and White metal), soldering alloys for electrical/electronic and general industrial applications, specialized alloys such as dental amalgams, titanium alloys used in aircraft engineering, niobium-tin and indium-tin alloys used in superconducting cables and magnets and indium-tin oxide for metallic photonic crystals, low-melting alloys for fire control, organ pipes, tin alloys are important in the production of coatings by electroplating and hot tinning (the most important of these are tin-zinc, tin-nickel, tin-cobalt, and tin-copper), tin coatings (applied to most metal surfaces by electrodeposition, while in hot-dipping, molten tin wets and adheres readily to clean iron, steel, copper, and copper-base alloys), corrosion-resistant coatings (for lead or zinc and steel), cladding, tinned wire (all copper wire that is to be rubber covered), collapsible tubes, anodes for electron plating, manufacture of chemicals (tin salts), block tin (used to coat copper cooking utensils and lead sheet, or to line lead pipe for distilled water, beer, carbonated beverages, and some chemicals), powder metallurgy applications, exothermic welding, catalysts, colours, stabilizer, cast and wrought forms, window glass manufacture (Pilkington process) and transportation applications.

Supplier's details

Name ChemSupply Australia Pty Ltd
Address 38-50 Bedford Street
5013 Gillman South Australia
Australia

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Emergency phone number

CHEMCALL 1800 127 406 (Australia) / +64-4-917-9888 (International)

SECTION 2: Hazard identification

General hazard statement

Not classified as dangerous goods according to the Australian Dangerous Goods Code (ADG).

Classified as non-Hazardous according to the Globally Harmonised System of classification and labelling of Chemicals (GHS) including Work, Health and Safety regulations, Australia.

Classification of the substance or mixture

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GHS classification in accordance with: UN GHS revision 7

Not a hazardous substance or mixture.

GHS label elements, including precautionary statements

Not a hazardous substance or mixture.

Other hazards which do not result in classification

Not a hazardous substance or mixture.

SECTION 3: Composition/information on ingredients

Mixtures

Molecular weight: 118.69

Components

Component	Concentration
TIN (CAS no.: 7440-31-5; EC no.: 231-141-8)	100 - 100 % (weight)
CLASSIFICATIONS: No data available. HAZARDS: No data available.	

SECTION 4: First-aid measures

Description of necessary first-aid measures

General advice	First Aid Facilities: Maintain eye wash and normal washroom facilities.
If inhaled	If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.
In case of skin contact	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water.
In case of eye contact	If in eyes wash out immediately with water.
If swallowed	If swallowed, do NOT induce vomiting.

Most important symptoms/effects, acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

Indication of immediate medical attention and special treatment needed, if necessary

Treat symptomatically based on judgement of doctor and individual reactions of the patient.

SECTION 5: Fire-fighting measures

Suitable extinguishing media

Use fire extinguishing media appropriate for surrounding environment. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Specific hazards arising from the chemical

Irritating and/or highly toxic fumes and gases, tin/tin oxides.

Special protective actions for fire-fighters

Fire fighters should wear full protective clothing and self-contained breathing apparatus (SCBA) operated in positive pressure mode. Fight fire from safe location.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing vapours, mist or gas. For personal protection see section 8.

Methods and materials for containment and cleaning up

Sweep up and shovel. Keep in suitable, closed containers for disposal.

SECTION 7: Handling and storage

Precautions for safe handling

Avoid ingestion and inhalation of dust/granules/foil. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure. Minimize dust generation and accumulation. Keep containers closed when not in use. Use in designated areas with adequate ventilation. Keep away from incompatibles such as oxidizing agents, acids, alkalis.

Conditions for safe storage, including any incompatibilities

Store in tightly closed containers, in a cool, dry, well-ventilated area away from incompatible substances. Separated from oxidising agents.

SECTION 8: Exposure controls/personal protection

Control parameters

CAS: 7440-31-5

TIN

AU/SWA (Australia): 2 mg/m³ TWA inhalation; NIOSH: 2 mg/m³; except tin oxides REL inhalation; 0.1 mg/m³ except Cyhexatin REL inhalation;

Appropriate engineering controls

Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, gas, etc.) below recommended exposure limits. If the engineering controls are not sufficient to maintain concentrations of vapours/mists below the exposure standards, suitable respiratory protection must be worn.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

The use of a face shield, chemical goggles or safety glasses with side shield protection as appropriate. Must comply with Australian Standards AS 1337 and be selected and used in accordance with AS 1336.

Skin protection

Clean impervious clothing should be worn. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals.

Hand Protection: Normally not required but if in doubt ensure hand protection should comply with AS 2161, Occupational protective gloves - Selection, use and maintenance.

Body protection

Suitable protective workwear, e.g. cotton overalls buttoned at neck and wrist is recommended. Chemical resistant apron is recommended where large quantities are handled.

Respiratory protection

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If engineering controls are not effective in controlling airborne exposure then an approved respirator with a replaceable vapor/ mist filter should be used. Refer to relevant regulations for further information concerning respiratory protective requirements. Reference should be made to Australian Standards AS/ NZS 1715, Selection, Use and Maintenance of Respiratory Protective Devices; and AS/NZS 1716, Respiratory Protective Devices, in order to make any necessary changes for individual circumstances.

SECTION 9: Physical and chemical properties

Basic physical and chemical properties

Physical state	Solid
Appearance	Almost silver-white to gray, lustrous, malleable metal; cubic (gray); tetragonal (white); rhomboidal (tin brittle); granules, foil, or powder. At -40 °C crumbles to gray amorphous powder (gray tin); slowly changes back above 20 °C to white tin; brittle at 200 °C.
Color	No data available.
Odor	Odourless.
Odor threshold	No data available.
Melting point/freezing point	231.9 °C.
Boiling point or initial boiling point and boiling range	2270 °C; 2507 °C; 2602 °C.
Flammability	No data available.
Lower and upper explosion limit/flammability limit	Flammable Limits - Lower: > 99.99 % (powder).
Flash point	No data available.
Explosive properties	The finely divided dust may form flammable/explosive mixtures with air. It may present a dust explosion hazard in the presence of an ignition source. Minimum explosible concentration: 0.19 g/l. Particle size and air concentration determine reactivity. ; Tin reacts violently or explosively with fused ammonium nitrate below 200 °C.; Contact of metallic tin with turpentine may cause fires and explosions. Dust Cloud: 630 °C; Dust Layer: 430 °C.
Auto-ignition temperature	No data available.
Decomposition temperature	No data available.
Oxidizing properties	No data available.
pH	No data available.
Kinematic viscosity	Viscosity: 1.85 mPa.s (cP) @ 240 °C.
Solubility	Solubility in Water: Insoluble in water. Solubility in Organic Solvents: Soluble in hydrochloric acid, sulfuric acid, aqua regia, alkali; slightly soluble in dilute nitric acid.
Partition coefficient n-octanol/water (log value)	No data available.
Vapor pressure	1.3332 hPa at 1492 °C.
Evaporation rate	No data available.
Density and/or relative density	Specific Gravity: 7.265 (white); 5.769 (gray).
Relative vapor density	No data available.

Particle characteristics

No data available.

Supplemental information regarding physical hazard classes

Surface Tension: 544 mN/m (@ 231.9 °C).

Further safety characteristics (supplemental)

Other Information: Tin has two allotropic forms at normal pressure; at -40 °C crumbles to gray amorphous powder (gray tin; alpha); slowly changes back above 20 °C to white tin (beta); brittle @ 200 °C.

Transformation temp: (beta in equilibrium with alpha) 13.2 °C.

Resistivity of white tin: 11.0 µ-Ohm cm @ 0 °C; 15.5 µ-Ohm cm @ 100 °C; 20.0 µ-Ohm cm @ 200 °C; 22.0 µ-Ohm cm @ mp (solid); 45.0 µ-Ohm cm @ mp (liquid).

SECTION 10: Stability and reactivity

Reactivity

Stable under normal conditions of storage and handling.

Reacts with incompatible materials

Chemical stability

Stable against air and water under normal temperatures, pressures and conditions of handling and storage. Powder oxidizes, especially in the presence of air and moisture. At high temperatures, it burns with an intensive white flame and forms tin oxide.

Possibility of hazardous reactions

Possibility of hazardous reactions: Reacts with strong oxidants. Tin reacts violently or explosively with fused ammonium nitrate below 200 °C. In the presence of water, cupric nitrate and tin foil, on prolonged and intimate contact, will produce flaming and sparking. Sodium peroxide and potassium peroxide, potassium dioxide, oxidize tin with incandescence. Reacts violently with strong acids and some extinguishing agents such as bicarbonate powder and carbon dioxide. Reactive with alkalis. The violent reaction between tin and bromine is controlled in halocarbon solutions. Tin /begins to burn at 100 °C in fluorine. Reaction with chlorine trifluoride, in the presence of carbon, is violent. Reacts violently with bromine trifluoride. Tin reacts violently with Iodine Bromide. When heated in Chlorine, Tin reacts, producing light and much heat. Interaction with carbon tetrachloride, in the presence of water vapour, is violent. Interaction with disulfur dichloride is violent. Reaction with sulfur is vigorous and accompanied by incandescence. Contact of metallic tin with turpentine may cause fires and explosions. The reaction between tin and tellurium attains incandescence. Experiments involving explosions of molten tin and water are described. The finely divided dust may form flammable/explosive mixtures with air. It may present a dust explosion hazard in the presence of an ignition source, when exposed to heat or by spontaneous chemical reaction with Br₂, BrF₃, S, Cl₂, ClF₃, Cu(NO₃), K₂O₂.

Conditions to avoid

Excess heat, flames, ignition sources, dust generation and incompatible materials. Powder is air and moisture sensitive.

Incompatible materials

Oxidizing agents (sodium peroxide and potassium peroxide, potassium dioxide, fused ammonium nitrate below 200 °C, cupric nitrate, in the presence of water), strong acids (generation of hydrogen) (nitric acid, hydrochloric acid), strong bases, halogens and halogen trifluorides (fluorine at 100 °C, heat + chlorine, tin chloride, carbon tetrachloride, in the presence of water vapour, bromine, chlorine trifluoride in the presence of carbon, disulfur dichloride), sulfur, some extinguishing agents such as bicarbonate powder and carbon dioxide, tellurium, turpentine, water + heat, mixtures with air in the presence of an ignition source.

Hazardous decomposition products

Toxic and/or irritating fumes and gases, tin/tin oxides.

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity

May be harmful if swallowed. Ingested metallic tin exhibits only moderate toxicity due to poor absorption from the digestive tract and rapid tissue turnover. Ingestion of large doses of powdered tin may cause gastrointestinal irritation, nausea, cramps, vomiting, and diarrhoea (which may be from irritant or astringent action on the stomach), but not permanent injury. Inorganic tin salts, which may form with corrosion depending on a number of factors, including the presence of oxidising agents (oxygen, nitrate) and acids, may cause nausea, vomiting and diarrhoea, may interfere with various enzyme systems and may cause systemic effects on the central nervous system, heart and liver, if ingested in concentrations in excess of 300-500 mg/kg.

Inhalation of tin dust may cause irritation, due to mechanical action, to nose, throat and respiratory tract, with coughing. Inhaled dust or fumes may cause benign, symptomless pneumoconiosis (stannosis). This form of pneumoconiosis produces distinctive progressive x-ray changes of the lung as long as exposure persists, but there is no distinctive fibrosis, no evidence of disability, and no special complicating factors. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count.

Skin corrosion/irritation

May cause mild skin irritation, resulting in redness and itchiness.

Serious eye damage/irritation

Dust may cause eye irritation due to mechanical action, with redness and pain. Granules and foil may cause eye damage due to mechanical action.

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available.

Carcinogenicity

No data available.

Reproductive toxicity

Tin [resp/skin]: animal-possible increase in subtle neurological & skeletal deformities (from: <qt>Reproductive Hazards of the Workplace<qt> by Linda M. Frazier, MD, MPH & Marvin L. Hage, MD).

Summary of evaluation of the CMR properties

No data available.

Specific target organ toxicity (STOT) - single exposure

No data available.

Specific target organ toxicity (STOT) - repeated exposure

No data available.

Aspiration hazard

No data available.

Additional information

Chronic Effects: Prolonged and/or repeated contact may cause irritation and/or dermatitis. Chronic exposure to dust or fumes may have effects on the lungs, resulting in a benign pneumoconiosis (stannosis). This form of pneumoconiosis produces distinctive progressive x-ray changes of the lung as long as exposure persists, but there is no distinctive fibrosis, no evidence of disability, and no special complicating factors.

SECTION 12: Ecological information

Toxicity

No data available.

Persistence and degradability

No data available.

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Bioaccumulative potential

No data available.

Mobility in soil

No data available.

Results of PBT and vPvB assessment

No data available.

Endocrine disrupting properties

No data available.

Other adverse effects

No data available.

SECTION 13: Disposal considerations

Disposal methods

Product disposal

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers.

Other disposal recommendations

Do not discharge this material into waterways, drains and sewers.

SECTION 14: Transport information

ADG (Road and Rail)

Not dangerous goods

IMDG

Not dangerous goods

IATA

Not dangerous goods

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

Australia SUSMP

Poison Schedule: NS

New Jersey Right To Know Components

Common name: TIN

CAS number: 7440-31-5

Pennsylvania Right To Know Components

Chemical name: Tin

CAS number: 7440-31-5

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Canadian Domestic Substances List (DSL)

Chemical name: Tin

CAS: 7440-31-5

SECTION 16: Other information

Further information/disclaimer

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