

**Section 1: IDENTIFICATION**

<b>Product Name:</b>	Low Alpha & Ultra Low Alpha Tin Anodes
<b>Synonyms:</b>	Not available.
<b>Product Use:</b>	Used in the form of discs, pellets or customized anode shapes for electroplating of low alpha particle emitting tin in the manufacture of microelectronic components.
<b>Restrictions on Use:</b>	Not available.
<b>Manufacturer/Supplier:</b>	Teck Advanced Materials Inc. 13670 Danielson Street Suite H & I Poway, CA 92064
<b>Phone Number:</b>	858-391-2935
<b>Emergency Phone:</b>	250-364-4214
<b>Date of Preparation of SDS:</b>	May 16, 2024

**Section 2: HAZARD(S) IDENTIFICATION****GHS INFORMATION**

**Classification:** Not hazardous according to OSHA criteria (29 CFR 1910.1200).  
Not hazardous according to WHMIS 2015 criteria.

**LABEL ELEMENTS**

**Hazard** None.

**Pictogram(s):**

**Signal Word:** None.

**Hazard** Not applicable.

**Statements:**

**Precautionary Statements**

**Prevention:** Not applicable.

**Response:** Not applicable.

**Storage:** Not applicable.

**Disposal:** Not applicable.

**Hazards Not Otherwise Classified:** Not applicable.

**Ingredients with Unknown Toxicity:** 100% of this product mixture consists of ingredient(s) of unknown acute toxicity.

**Emergency Overview:** A lustrous silvery-white metal that does not burn in bulk but may form explosive mixtures if dispersed in air as a fine powder. Contact with acids or alkalis may generate flammable hydrogen gas. Do NOT use water or foam in fire fighting. Apply dry chemical, sand or special dry powder extinguishing media. Tin is relatively non-toxic and does not pose an immediate hazard to the health of emergency response personnel or to the environment in an emergency situation.

**Potential Health Effects:** Metallic tin is relatively non-toxic to humans. Chronic inhalation of tin or tin oxides may cause a benign pneumoconiosis called stannosis. This form of pneumoconiosis produces progressive x-ray changes of the lungs as long as exposure exists, but there is no evidence of disability and no special complicating factors. Tin is not listed as a carcinogen by OSHA, NTP, IARC, ACGIH or the EU (see Toxicological Information, Section 11).

**Potential Environmental Effects:** Since tin is not soluble, it will have minimal direct toxic effects. However, its processing or extended exposure in the environment may result in the formation of compounds that can potentially be toxic to aquatic and terrestrial organisms. Contamination of soil and water should therefore be avoided (see Ecological Information, Section 12).

This material is not considered hazardous by the OSHA Hazard Communication Standard, (29 CFR 1910.1200).

This material is not considered hazardous by the Hazardous Products Regulations.

### Section 3: COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient(s)	Common name / Synonyms	CAS No.	% wt./wt.
Tin	Not available.	7440-31-5	99.99 - 100

**Impurities / Stabilizing additives:** None known.

### Section 4: FIRST-AID MEASURES

<b>Inhalation:</b>	As supplied, the material does not pose an inhalation hazard. If dust or fume is inhaled: Call a poison center or doctor if you feel unwell.  <b>Acute and delayed symptoms and effects:</b> Inhalation of dust may cause respiratory irritation. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.
<b>Eye Contact:</b>	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a poison center or doctor if you feel unwell.  <b>Acute and delayed symptoms and effects:</b> May cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision. Hot liquid product may cause serious thermal burns on direct contact.
<b>Skin Contact:</b>	If on skin: Wash with plenty of water. Call a poison center or doctor if you feel unwell.  <b>Acute and delayed symptoms and effects:</b> Dust may cause mechanical skin irritation. Signs/symptoms may include localized redness, swelling, and itching. Hot liquid product may cause serious thermal burns on direct contact.
<b>Ingestion:</b>	If swallowed: Call a poison center or doctor if you feel unwell. If vomiting occurs naturally, have victim lean forward to reduce the risk of aspiration. Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.  <b>Acute and delayed symptoms and effects:</b> May cause gastrointestinal irritation. Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

**General Advice:** In case of accident or if you feel unwell, seek medical advice immediately (show the label or SDS where possible).

**Note to Physicians:** Symptoms may not appear immediately.

## Section 5: FIRE-FIGHTING MEASURES

### FLAMMABILITY AND EXPLOSION INFORMATION

As supplied, this material is not flammable or combustible by OSHA/WHMIS criteria. Small particles generated during further processing, handling or by other means, may form combustible dust concentrations in air.

**Sensitivity to Mechanical Impact:** This material is not sensitive to mechanical impact.

**Sensitivity to Static Discharge:** As supplied, this material is not sensitive to static discharge. In the form of dust, this material is sensitive to static discharge and may form explosive mixtures with air.

### MEANS OF EXTINCTION

**Suitable Extinguishing Media:** Dry chemical, CO<sub>2</sub>, dry sand, dolomite, graphite, or powdered sodium chloride. Apply extinguishing media carefully to avoid creating airborne dust. Move containers from fire area if you can do it without risk.

**Unsuitable Extinguishing Media:** DO NOT use water, carbon dioxide, foam or Halons, especially for fires involving molten metal.

**Products of Combustion:** Tin oxides.

**Protection of Firefighters:** Fire may produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may cause pollution. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection. Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

## Section 6: ACCIDENTAL RELEASE MEASURES

**Emergency Procedures:** Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).

**Personal Precautions:** Do not touch or walk through spilled material. Use personal protection recommended in Section 8. Prevent dust accumulation (to minimize explosion hazard).

**Environmental Precautions:** Keep out of drains, sewers, ditches, and waterways.

**Methods for Containment:** Do not flush to sewer or allow to enter waterways.

**Methods for Clean-Up:** Sweep up and shovel into suitable containers for disposal. Cleaning methods (e.g. compressed air) which can generate potentially combustible dust clouds should not be used.

**Other Information:** See Section 13 for disposal considerations.

## Section 7: HANDLING AND STORAGE

### Handling:

If anodes are to be remelted they should be THOROUGHLY DRIED before being added to a molten bath. Otherwise, entrained moisture could expand explosively and spatter molten metal out of the bath. Do not swallow. See Section 8 for information on Personal Protective Equipment. Minimize dust generation and accumulation. Combustible dust clouds may be created where operations produce fine material (dust). Avoid significant deposits of material, especially on horizontal surfaces, which may become airborne and form combustible dust clouds and may contribute to secondary explosions.

### Storage:

Store copper in a dry, covered area. Store away from incompatible materials. See Section 10 for information on Incompatible Materials. Keep out of the reach of children. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces.

## Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

### Exposure Guidelines

#### Component

Tin [CAS No. 7440-31-5]

**ACGIH:** 2 mg/m<sup>3</sup> (TWA); Inhalable particulate matter (2019); For Tin, as Sn, Metal and Tin, as Sn, Oxide and Inorganic compounds, except tin hydride

**OSHA:** 2 mg/m<sup>3</sup> (Inorganic compounds, except oxides, as Sn) (TWA);

**TWA:** Time-Weighted Average

**Engineering Controls:** Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapour, gas, etc.) below recommended exposure limits.

### PERSONAL PROTECTIVE EQUIPMENT (PPE)



**Eye/Face Protection:** Wear safety glasses. If product is hot, wear full face-shield. Indirect vented, dust-tight goggles are required if dust or fume is generated when handling this product. Use equipment for eye protection that meets the standards referenced by CSA Standard CAN/CSA-Z94.3:20 and OSHA regulations in 29 CFR 1910.133 for Personal Protective Equipment.

**Hand Protection:** Wear protective gloves. If product is hot, thermally protective gloves are recommended. Consult manufacturer specifications for further information.

**Skin and Body Protection:** Wear protective clothing. Clothing with full length sleeves and pants should be worn.

**Respiratory Protection:**

If engineering controls and ventilation are not sufficient to control exposure to below the allowable limits then an appropriate NIOSH/MSHA approved air-purifying respirator that meets the requirements of CSA Standard CAN/CSA-Z94.4-18, with particulate filter, or self-contained breathing apparatus must be used. Supplied air breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air-purifying respirators.

**General Hygiene Considerations:**

Handle according to established industrial hygiene and safety practices. Consult a competent industrial hygienist to determine hazard potential and/or the PPE manufacturers to ensure adequate protection. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration.

**Section 9: PHYSICAL AND CHEMICAL PROPERTIES**

<b>Appearance:</b>	Silvery-white lustrous metal.
<b>Colour:</b>	Silvery-white.
<b>Odour:</b>	Odourless.
<b>Odour Threshold:</b>	Not available.
<b>Physical State:</b>	Solid.
<b>pH:</b>	Not available.
<b>Melting Point / Freezing Point:</b>	232 °C (449.6 °F)
<b>Initial Boiling Point:</b>	2507 °C (4544.6 °F)
<b>Boiling Range:</b>	Not available.
<b>Flash Point:</b>	Not available.
<b>Evaporation Rate:</b>	Not available.
<b>Flammability (solid, gas):</b>	See Section 5. Small particles generated during further processing, handling or by other means, may form combustible dust concentrations in air.
<b>Lower Flammability Limit:</b>	190 mg/m <sup>3</sup>
<b>Upper Flammability Limit:</b>	Not available.
<b>Vapor Pressure:</b>	1 mmHg at 1083 °C (1981.4 °F)
<b>Relative Vapor Density:</b>	Negligible at 20 °C (68 °F).
<b>Relative Density:</b>	7.3 (Water = 1)
<b>Solubilities:</b>	Insoluble in water.

<b>Partition Coefficient: n-Octanol/Water:</b>	Not available.
<b>Auto-ignition Temperature:</b>	630 °C (1166 °F) (metallic Sn dust in air)
<b>Decomposition Temperature:</b>	Not available.
<b>Kinematic Viscosity:</b>	Not available.
<b>Percent Volatile, wt. %:</b>	Not available.
<b>VOC content, wt. %:</b>	Not available.
<b>Density:</b>	Not available.
<b>Coefficient of Water/Oil Distribution:</b>	Not available.
<b>Particle Characteristics:</b>	Not available.

### Section 10: STABILITY AND REACTIVITY

<b>Reactivity:</b>	Contact with incompatible materials. Sources of ignition. Metallic tin may generate hydrogen gas when dissolving in strong mineral acids.
<b>Chemical Stability:</b>	Anodes are stable and not considered reactive under normal temperatures and pressures. Hazardous polymerization or runaway reactions will not occur.
<b>Possibility of Hazardous Reactions:</b>	Metallic tin surfaces slowly oxidize in air, especially in the presence of moisture.
<b>Conditions to Avoid:</b>	Contact with incompatible materials. Sources of ignition.
<b>Incompatible Materials:</b>	Strong acids. Strong oxidizers. Halogens. Potassium permanganate. Chlorine trifluoride. Powdered tin reacts violently or explosively with fused ammonium nitrate below 200 °C (392 °F) as well as with carbon tetrachloride in the presence of water vapour.
<b>Hazardous Decomposition Products:</b>	High temperature operations such as oxy-acetylene cutting, electric arc welding or overheating of a molten bath will generate tin oxide fume which, on inhalation in sufficient quantity, can produce metal fume fever, a transient influenza-like illness.

### Section 11: TOXICOLOGICAL INFORMATION

#### EFFECTS OF ACUTE EXPOSURE

##### Product Toxicity

<b>Oral:</b>	Not available.
<b>Dermal:</b>	Not available.
<b>Inhalation:</b>	Not available.

##### Component Toxicity

Component	CAS No.	LD <sub>50</sub> oral	LD <sub>50</sub> dermal	LC <sub>50</sub>
Tin	7440-31-5	Not available.	Not available.	Not available.

**Likely Routes of Exposure:** Eye contact. Skin contact. Inhalation. Ingestion.

**Target Organs:** Skin. Eyes. Gastrointestinal tract. Respiratory system.

### Symptoms (including delayed and immediate effects)

**Inhalation:** Inhalation of dust may cause respiratory irritation. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

**Eye:** May cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision. Hot liquid product may cause serious thermal burns on direct contact.

**Skin:** Dust may cause mechanical skin irritation. Signs/symptoms may include localized redness, swelling, and itching. Hot liquid product may cause serious thermal burns on direct contact.

**Ingestion:** May cause gastrointestinal irritation. Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

**Skin Sensitization:** Not available.

**Respiratory Sensitization:** Not available.

**Medical Conditions Aggravated By Exposure:** Not available.

### EFFECTS OF CHRONIC EXPOSURE (from short and long-term exposure)

**Target Organs:** Skin. Eyes. Gastrointestinal tract. Respiratory system. Lungs.

**Chronic Effects:** Prolonged or repeated contact may dry skin and cause irritation. Inhalation of Tin powder may result in a benign pneumoconiosis (stannosis) characterized by progressive X-ray changes of the lung while exposure continues, but without any distinctive fibrosis or scarring of the lungs and without any evidence of disability.

**Carcinogenicity:** This product does not contain any carcinogens or potential carcinogens above reportable thresholds as listed by ACGIH, IARC, OSHA, or NTP.

**Mutagenicity:** Not available.

**Reproductive Effects:** Not available.

#### Developmental Effects

**Teratogenicity:** Not available.

**Embryotoxicity:** Not available.

**Toxicologically Synergistic Materials:** Not available.

## Section 12: ECOLOGICAL INFORMATION

<b>Ecotoxicity:</b>	Not available.
<b>Persistence / Degradability:</b>	Not available.
<b>Bioaccumulation / Accumulation:</b>	Not available.
<b>Mobility in Environment:</b>	Not available.
<b>Other Adverse Effects:</b>	Not available.

### Section 13: DISPOSAL CONSIDERATIONS

**Disposal Instructions:** Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

### Section 14: TRANSPORT INFORMATION

#### U.S. Department of Transportation (DOT)

<b>Proper Shipping Name:</b>	Not regulated.
<b>Class:</b>	Not applicable.
<b>UN Number:</b>	Not applicable.
<b>Packing Group:</b>	Not applicable.
<b>Placard(s):</b>	Not applicable.

#### Canada Transportation of Dangerous Goods (TDG)

<b>Proper Shipping Name:</b>	Not regulated.
<b>Class:</b>	Not applicable.
<b>UN Number:</b>	Not applicable.
<b>Packing Group:</b>	Not applicable.
<b>Placard(s):</b>	Not applicable.

#### IATA Dangerous Goods Regulations Classification

<b>Proper Shipping Name:</b>	Not regulated.
<b>Class:</b>	Not applicable.
<b>UN Number:</b>	Not applicable.
<b>Packing Group:</b>	Not applicable.
<b>Placard(s):</b>	Not applicable.
<b>Marine Pollutant:</b>	No.

#### International Maritime Dangerous Goods Code (IMDG) Classification

<b>Proper Shipping Name:</b>	Not regulated.
<b>Class:</b>	Not applicable.
<b>UN Number:</b>	Not applicable.
<b>Packing Group:</b>	Not applicable.
<b>Placard(s):</b>	Not applicable.





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Marine Pollutant: No.

**International Maritime Solid Bulk Cargoes (IMSBC) Code Classification**

Proper Shipping Name: Not regulated.

Class: Not applicable.

UN Number: Not applicable.

Packing Group: Not applicable.

Placard(s): Not applicable.

Marine Pollutant: No.

IMO MARPOL V Classification: Not Harmful to the Marine Environment.

**Section 15: REGULATORY INFORMATION**

**Chemical Inventories**

**US (TSCA)**

The components of this product are in compliance with the chemical notification requirements of TSCA.

**Canada (DSL)**

The components of this product are in compliance with the chemical notification requirements of the NSN Regulations under CEPA, 1999.

**Federal Regulations**

**United States**

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**SARA Title III**

No components are listed.

**State Regulations**

**Massachusetts**

US Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

**Component**

Tin

**CAS No.**

7440-31-5

**RTK List**

Listed.

**New Jersey**

US New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

**Component**

**CAS No.**

**RTK List**



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Tin

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SHHS

**Note:** SHHS = Special Health Hazard Substance

**Pennsylvania**

US Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

**Component**

**CAS No.**

**RTK List**

Tin

7440-31-5

Listed.

**California**

**California Prop 65:** This product does not contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

**Section 16: OTHER INFORMATION**

**Acronyms:**

ACGIH: American Conference of Governmental Industrial Hygienists

C: Celsius, F: Fahrenheit

CAA: Clean Air Act

CAS: Chemical Abstracts Service

CSA: Canadian Standards Association

CEPA: Canadian Environmental Protection Act

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act

DOT: Department of Transport

EHS: Extremely Hazardous Substances

EPCRA: Emergency Planning and Community Right-to-Know Act

IARC: International Agency for Research on Cancer

IMO: International Maritime Organization

LD50: Lethal Dose 50%

LC50: Lethal Concentration 50%

NIOSH: National Institute for Occupational Safety and Health

NTP: National Institute for Occupational Safety and Health

MSHA: Mine Safety and Health Administration

OSHA: Occupational Safety and Health Administration

RCRA: Resource Conservation and Recovery Act

RTK: Right to Know

RQ: Reportable Quantity

SARA: Resource Conservation and Recovery Act

TSCA: Toxic Substances Control Act

TPQ: Threshold Planning Quantities

WHMIS: Workplace Hazardous Materials Information System

wt.: Weight

**Disclaimer:**

Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. Teck Advanced Materials Inc. extends no warranty and assumes no responsibility for the accuracy of the content and expressly disclaims all liability for reliance thereon. This safety data sheet provides guidelines for the safe handling and processing of this product; it does not and cannot advise on all possible situations. Therefore, your specific use of this product should be evaluated to determine if additional precautions are required. Individuals exposed to this product should read and understand this information and be provided pertinent training prior to working with this product.



**SAFETY DATA SHEET**

**Low Alpha & Ultra Low Alpha Tin Anodes**

Date of Preparation: May 16, 2024

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**Version:** 5

**GHS SDS Prepared for:** Teck Advanced Materials Inc.

**Phone:** 858-391-2935