

# SDS- SAFETY DATA SHEET

This Safety Data Sheet complies with the U.S.  
OSHA Hazard Communication Standard 29 CFR 1910.1200



## 1. IDENTIFICATION

**Product Identity / Trade Name:** Titanium and Titanium Alloys

**Product Use:** Aerospace, Medical, and Industrial Applications

**Manufacturer:** OrthoEssentials  
10 Lippincott Lane, Suite 6 Mount Holly, NJ 08060

**Information Phone:** (860) 582-9111

**Emergency Phone:** (860) 582-9111

**Date of Preparation:** October 29, 2015

## 2. HAZARD(S) IDENTIFICATION

Solid metallic products are generally classified as "articles" and do not constitute a hazardous material in their solid form. During processing, dusts and fumes generated have the following hazards:

**Classification:**

Physical	Health
Combustible Dust	Non-Hazardous

**Hazards not otherwise classified:** None

**Symbol(s):** None required.

**Signal word**

**Warning!**

**Hazard statement(s)**

May form combustible dust concentrations in air during processing.

**Precautionary statement(s):** None

## 3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical name	CAS No.	Weight %
Titanium	7440-32-6	50-99
Molybdenum	7439-98-7	0-37
Vanadium	7440-62-2	0-37
Chromium	7440-47-3	0-18
Niobium	7440-03-1	0-15
Zirconium	7440-67-7	0-15
Tin	7440-31-5	0-8
Aluminum	7429-90-5	0-6
Silicon	7440-21-3	0-3

The specific identity and/or exact percentage have been withheld as a trade secret.

#### 4. FIRST-AID MEASURES

**Ingestion:** If dust is swallowed, seek medical attention.

**Inhalation:** If overexposed to dust or fumes remove victim to fresh air and get medical attention.

**Eye Contact:** Flush eyes thoroughly with water, holding open eyelids. Get medical attention if irritation persists.

**Skin Contact:** Wash exposed skin with soap and water. If skin irritation occurs: Get medical attention. Launder contaminated clothing before reuse.

**Most important symptoms/effects, acute and delayed:** Eye and skin contact with dust may cause mechanical irritation. May cause gastrointestinal effects if swallowed. Excessive exposure to welding fumes, gases or dust may cause irritation of eyes, nose or throat. Inhalation of fumes may result in metal fume fever (metallic taste in mouth, dryness and irritation of throat, chills and fever).

**Indication of immediate medical attention and special treatment, if necessary:** Immediate medical attention is generally not required.

#### 5. FIRE-FIGHTING MEASURES

**Suitable (and unsuitable) extinguishing media:**

Not flammable in the form as distributed. Use any media that is appropriate for the surrounding fire.

Finely divided particles, dusts or pieces resulting from processing of this product may burn or ignite. Use dry sand, dry graphite, or inert gas to smother the fire. Do not use water or CO<sub>2</sub> on burning metal as an explosion may occur.

**Specific hazards arising from the chemical:**

Very fine, high surface area material resulting from grinding, buffing, polishing, or similar processes of this product may ignite and burn. Fine particles resulting from processing of this product may form combustible dust-air mixtures. Settled dust presents a fire hazard. Re-suspension of the dust into the air by vibration, traffic, material handling, etc. in high concentrations in the presence of an ignition source could result in a dust explosion. Minimize the generation and accumulation of dust.

Burning may produce the following hazardous decomposition products: Titanium dioxide an IARC Group 2B carcinogen. Vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>) affects eyes, skin, respiratory system.

**Special protective equipment and precautions for fire-fighters:** Firefighters should wear full emergency equipment and NIOSH approved positive pressure self-contained breathing apparatus for all fires involving chemical products.

#### 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment, and emergency procedures:** Wear appropriate protective clothing and equipment (see section 8). Avoid contact with skin, eyes or clothing. Do not breathe dust or fume.

**Environmental precautions:** Avoid release into the environmental. Report releases as required by local, state and federal authorities.

**Methods and materials for containment and cleaning up:** Pick up material and place into a container for disposal or reprocessing. If dust is present, wet down and collect in a manner to minimize the generation of airborne dusts or vacuum with a high efficiency vacuum cleaner. If a vacuum is used, explosion proof equipment is required. Non-sparking tools should be used. 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 concentrations. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air.).

#### 7. HANDLING AND STORAGE

**Precautions for safe handling:** Avoid contact with eyes, skin and clothing. Avoid creating and breathing dusts. Wear protective clothing and equipment as described in Section 8. Use only with adequate ventilation. Launder

contaminated clothing before re-use. Wash thoroughly with soap and water after handling. Minimize the generation and accumulation of dust. Keep dust away from open flames, hot surfaces and sources of ignition. Follow good housekeeping practices to keep surfaces, including areas overhead such as piping, drop ceilings, ductwork, etc. free from settled dust. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres.

Empty containers retain product residues. Follow all SDS precautions in handling empty containers

**Conditions for safe storage, including any incompatibilities:** Store in a dry location. Keep away from Acids, Oxidizing Agents, Halogens.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Exposure guidelines:

Chemical Name	ACHIH TLV	OSHA PEL
Titanium	None established	None established
Molybdenum	10 mg/m <sup>3</sup> TWA (inhalable) 3 mg/m <sup>3</sup> TWA (respirable)	15 mg/m <sup>3</sup> TWA (total dust)
Vanadium	None established	None established
Chromium	0.5 mg/m <sup>3</sup> TWA inhalable fraction	1.0 mg/m <sup>3</sup> TWA
Niobium	None established	None established
Zirconium	5 mg/m <sup>3</sup> TWA 10 mg/m <sup>3</sup> Ceiling	5 mg/m <sup>3</sup> TWA
Tin	2 mg/m <sup>3</sup> TWA	2 mg/m <sup>3</sup> TWA
Aluminum	1 mg/m <sup>3</sup> TWA (respirable)	15 mg/m <sup>3</sup> TWA (total dust) 5 mg/m <sup>3</sup> TWA (respirable)
Silicon	None established	15 mg/m <sup>3</sup> TWA (total dust) 5 mg/m <sup>3</sup> TWA (respirable)

**Appropriate engineering controls:** Use local exhaust or general ventilation as required to minimize exposure to dust and fumes; and to maintain the concentration of contaminants below occupational applicable limits.

### Individual protection measures, such as personal protective equipment:

**Respiratory protection:** Use NIOSH approved respirator if exposure limits are exceeded or where dust/fume exposures are excessive. Selection of respiratory protection depends on the contaminant type, form and concentration. Select and use respirators in accordance with OSHA 1910.134 and good industrial hygiene practice.

**Skin protection:** Wear protective gloves. Fire/flame resistant/retardant clothing may be appropriate during hot work with the product.

**Eye protection:** Safety glasses with side shields.

**Other:** Protective clothing as needed to prevent contamination of personal clothing. Thermal protection as needed when working with heated material.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance (physical state, color, etc.):** Silver-gray metal.

**Odor:** No Odor

<b>Odor threshold:</b> Not applicable	<b>pH:</b> Not applicable
<b>Melting point/freezing point:</b> 1660 °C / 3020 °F	<b>Boiling Point:</b> Not applicable
<b>Flash point:</b> Not applicable	<b>Evaporation rate:</b> Not applicable
<b>Flammability (solid, gas):</b> Not applicable	
<b>Flammable limits: LEL:</b> Not applicable	<b>UEL:</b> Not applicable
<b>Vapor pressure:</b> Not applicable	<b>Vapor density:</b> Not applicable
<b>Relative density:</b> 4.47	<b>Solubility(ies):</b> Not soluble

<b>Partition coefficient: n-octanol/water:</b> Not applicable	<b>Auto-ignition temperature:</b> Not applicable
<b>Decomposition temperature:</b> Not applicable	<b>Viscosity:</b> Not applicable

## 10. STABILITY AND REACTIVITY

**Reactivity:** Not normally reactive.

**Chemical stability:** Stable.

**Possibility of hazardous reactions:** None expected.

**Conditions to avoid:** Avoid dust formation.

**Incompatible materials:** Acids, Oxidizing Agents, Halogens.

**Hazardous decomposition products:** Extreme heat from fire or processing (e.g. welding, brazing, machining, etc.) may produce toxic or irritating airborne particulate, including metal and metallic oxide fumes. Reaction with water, steam, acids, etc. can evolve hydrogen, which is highly dangerous fire and explosion hazard.

## 11. TOXICOLOGICAL INFORMATION

### Routes of exposure:

**Ingestion:** None expected under normal use conditions. May cause gastrointestinal effects if swallowed.

**Inhalation:** Excessive exposure to fumes, gases or dust may cause irritation of nose or throat. Inhalation of dusts / fumes may result in metal fume fever (metallic taste in mouth, dryness and irritation of throat, chills and fever).

**Eye:** Dust particles or filings may cause abrasive injury to the eyes.

**Skin:** May cause mechanical irritation or abrasions.

**Chronic:** Long-term overexposure to dust may cause lung damage (fibrosis) with symptoms of coughing, shortness of breath and diminished breathing capacity.

**Carcinogenicity:** None of the components are listed as a carcinogen or potential carcinogen by OSHA, NTP or IARC.

### Numerical measures of toxicity:

Titanium: Oral rat LD50 > 5000 mg/kg

Molybdenum: Oral rat LD50 > 2000 mg/kg, Inhalation rat LC50 > 3.92 mg/L, Dermal rat LD50 > 2000 mg/kg

Vanadium: Oral rat LD50 > 2000 mg/kg; Inhalation rat LC50 > 5.05 mg/L/ 4 hr.

Chromium: Oral rat LD50 > 5000 mg/kg

Niobium: Oral rat LD50 >2000 mg/kg; Dermal rat LD50 >2000 mg/kg

Zirconium: Oral rat LD50 > 5000 mg/kg, Inhalation rat LC50 > 4.3 mg/L/4 hr.

Tin: Oral rat LD50 >2000 mg/kg; Dermal rat LD50 >2000 mg/kg, Inhalation rat LC50 4.75 mg/L/4 hr.

Aluminum: Oral rat LD50 > 15900 mg/kg, Inhalation rat LC50 > 0.888 mg/L

Silicon: Oral rat LD50 > 5000 mg/kg, Inhalation rat LC50 > 2.08 mg/L, Dermal rabbit LD50 > 5000 mg/kg

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity:

Titanium: 96 hr. LC50 *Oncorhynchus mykiss* >100 mg/L

Molybdenum: 96 hr. LC50 *Pimephales promelas* 609.1 mg/L

Vanadium: 96 hr. LC50 *Danio rerio* 16.5 mg/L

Zirconium: 96 hr. LC50 *Danio rerio* >100 mg/L, 48 hr. EC50 *daphnia magna* >100 mg/L

Tin: 96 hr. LC50 *Pimephales promelas* >12.4 ug/L

Aluminum: 96 hr. NOEC *Lepomis cyanellus* > 50 mg/L

**Persistence and degradability:** Biodegradation is not applicable to inorganic compounds.

**Bioaccumulative potential:** No data available

**Mobility in soil:** No data available.

**Other adverse effects:** No data available.

## 13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable local, state/provincial and federal regulations. Local regulations may be more stringent than regional and national requirements. It is the responsibility of the waste generator to determine the toxicity and physical characteristics of the material to determine the proper waste identification and disposal in compliance with applicable regulations.

**14. TRANSPORT INFORMATION**

**DOT Hazardous Materials Description:** Not Regulated

**15. REGULATORY INFORMATION**

**SARA Section 311/312 Hazard Categories:** Not Applicable (manufactured articles)

**SARA Section 313:** This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 (Toxic Chemical Release Reporting):

	<b>CAS No.</b>	<b>Weight-%</b>	<b>SARA 313 - Threshold Values %</b>
Chromium	7440-47-3	0-18	1.0
Aluminum	7429-90-5	0-6	1.0

**SARA 311/312 Hazard Categories**

<b>Acute health hazard</b>	<b>No</b>
<b>Chronic Health Hazard</b>	<b>No</b>
<b>Fire hazard</b>	<b>Yes</b>
<b>Sudden release of pressure hazard</b>	<b>No</b>
<b>Reactive Hazard</b>	<b>No</b>

**CWA (Clean Water Act)**

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42): None

**CERCLA**

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

<b>Chemical Name Hazardous Substances RQs</b>	<b>Chemical Name Hazardous Substances RQs</b>
Chromium	5000 lbs.

**US State Regulations**

**California Proposition 65**

This product contains the following Proposition 65 chemicals: None

**INTERNATIONAL INVENTORIES**

TSCA	Complies
DSL/NDSL	Complies
EINECS/ELINCS	Complies
ENCS	Complies
IECSC	Complies
KECL	Complies
PICCS	Complies
AICS	Complies

**Legend:**

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory  
**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List

**EINECS/ELINCS** - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances  
**ENCS** - Japan Existing and New Chemical Substances  
**IECSC** - China Inventory of Existing Chemical Substances  
**KECL** - Korean Existing and Evaluated Chemical Substances  
**PICCS** - Philippines Inventory of Chemicals and Chemical Substances  
**AICS** - Australian Inventory of Chemical Substances

## 16. OTHER INFORMATION

**Date Previous Revision:** June 19<sup>th</sup>, 2015

**Date This Revision:** October 29<sup>th</sup>, 2015

**Revision Summary:** Changed all sections. Updated format to GHS.

**The information provided in this safety data sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.**