



Material Safety Data Sheet

Section I

Manufacturing Name: G. O. Carlson, Inc.
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* During Normal Business Hours – 08:00 AM to 05:00 PM Eastern Standard Time.

Product Name: Titanium and Titanium Alloys

Section II – Hazardous Ingredients

C 30, C40, C55, C70, C40 Pd, C 30 Pd

Chemical Components			OSHA PEL	ACGIH TLV
Primary Metals	% Weight	C.A.S. Nbr	(mg/m ³)	(mg/m ³)
Titanium	99	7440-32-6	---	(1) (as titanium dioxide)

(1) < 1% quartz, 15 mg/m³ of total dust or 5 mg/m³ respirable dust.

Titanium Products as shipped are inert. But, due to down stream processing such as welding, burning, grinding, heating and machining, metal fumes and gases may be generated, which may be dangerous to your health.

Section III – Physical Data

⇒ Boiling Point (° F): N/A (not applicable)
⇒ Vapor Pressure (mmHg @ 20° C): N/A
⇒ Vapor Density (Air = 1): N/A
⇒ Solubility in Water: N/A
⇒ Specific Gravity (H₂O = 1): Approximately 4.3 – 4.6
⇒ Percent Volatile by Volume: N/A
⇒ Evaporative Rate (Ethyl Ether = 1): N/A
⇒ PH Information: N/A
⇒ Appearance and Odor: Odorless solid with metallic lustre. Available plates, discs, heads and slabs.

Section IV – Fire and Explosion Hazard Data

- ⇒ Flash Point (°F): N/A Method Used: N/A
- ⇒ Flammability Limits (%/Vol):
 - + LEL: N/A
 - + UEL: N/A
- ⇒ Auto-Ignition Temperature (°F): N/A
- ⇒ Extinguishing Media: No fire or explosion hazards.
- ⇒ Special Fire-Fighting Instructions: N/A
- ⇒ Unusual Fire & Explosion Hazards: N/A

Section V – Reactivity Data

- ⇒ Stability (conditions to avoid): Stable
- ⇒ Incompatibility (materials to avoid): None
- ⇒ Hazardous Decomposition Products: Metal fumes and certain noxious gases, such as CO, may be produced during welding or burning operations. Acid pickling of product may result in the formation of hexavalent chromium, which is a hazardous waste and suspect carcinogen. See Section VI and X for further information.
- ⇒ Hazardous Polymerization: Will not occur.

Section VI – Health Hazard Data

- ⇒ Primary Route(s) of Entry: Inhalation, skin contact.
- ⇒ Effects of Exposure: No toxic effects would be expected from its inert form. Prolonged, repeated exposure to fumes or dust generated during heating, cutting, brazing or welding may cause adverse health effects associated with the following constituents
 - + Inhalation:
 - Titanium (as titanium dioxide): Generally considered to be in the nuisance dust category. May cause irritation of eyes, nose and/or throat in high concentrations.

Note: Some constituents pose more potential hazards than others, depending upon their inherent toxicity and concentration.

 - + Eye Contact: May cause irritation.
 - + Ingestion: May cause irritation of the mouth and throat.

Section VII – Emergency & First Aid Procedures

- ⇒ Inhalation: Seek medical attention, if necessary.
 - ⇒ Skin Contact: If irritation develops, remove contaminated clothing immediately and wash contaminated skin with soap or mild detergent and water for five minutes. If irritation persists, seek medical attention.
 - ⇒ Eyes: In case of contact, immediately wash eyes with large amounts of water for fifteen minutes, occasionally lifting the lower and upper lids. Seek medical attention, if necessary.
 - ⇒ Ingestion: Seek medical attention, if necessary.
- MSDS – Titanium and Titanium Alloys (continued)**

Section VIII – Personnel Protection Information

For welding, burning, grinding and cutting operations, local exhaust ventilation should be provided. If fumes or dust cannot be controlled with exhaust ventilation, an appropriate NIOSH-approved respirator should be used to prevent excessive inhalation exposure.

- ⇒ Gloves: Gloves may be necessary to prevent skin sensitization and dermatitis.
- ⇒ Eye Protection: Approved safety glasses or goggles should be worn when working with dusty metals.

Section IX – Spill or Leak Procedures

- ⇒ Action to take for spills (use appropriate safety equipment): N/A
- ⇒ Waste Disposal Method: N/A

Section X – Special Protection Information

- ⇒ Ventilation: As described in the *Industrial Ventilation Manual* produced by the American Conference of Governmental Industrial Hygienists, shall be provided in areas where exposure are above the permissible exposure limits or threshold limit values specified by OSHA or other local, state and federal regulations.
- ⇒ Respiratory Protection: A properly fitted, NIOSH-approved dust-fume respirator should be worn during welding or burning whenever welding fumes exceed the threshold limit value (TLV) or other recommended limits, in accordance with the OSHA Respiratory Protection Standard (29 CFR 1910.134).

Section XI – Special Precautions

- ⇒ Precautions to be taken in handling and storage: None
- ⇒ DOT Information:
 - + Hazard Material Proper Shipping Name: N/A
 - + Hazard Class: N/A
 - + Identification Number: N/A
- ⇒ EPA Hazardous Waste Number: N/A

Additional Information:

During welding, precautions should be taken for airborne contaminants and noxious gases that may originate from the welding process or from components of the welding rod. Of special concern are silica or silicates, or both; fluorides; copper; manganese; carbon monoxide and nitrogen oxides. Arc and sparks generated when welding with this product could be a source of ignition for combustible and flammable materials.

While the information and recommendations set forth on this data sheet are believed to be accurate as of the present date, G. O. Carlson, Inc. makes no warranty with respect thereto and disclaims all liability from reliance thereon.