

**Titanium Alloys**

SDS Revision Date: 02/08/2022

**1. Identification****1.1. Product identifier****Product Identity**

Titanium Alloys: CP, 3 - 2 . 5, 6 . 4

**Alternate Names**

Titanium Alloys: CP, 3 - 2 . 5, 6 . 4, MSDS # : 600

**1.2. Relevant identified uses of the substance or mixture and uses advised against****Intended use**

See Technical Data Sheet.

**Application Method**

See Technical Data Sheet.

**1.3. Details of the supplier of the safety data sheet****Company Name**TW Metals, LLC  
707 Eagleview Blvd  
Suite 200  
Exton, PA 19341**Emergency****CHEMTREC (USA)**

(800) 424-9300

**2. Hazard(s) identification****2.1. Classification of the substance or mixture**

Skin Sens. 1;H317

May cause an allergic skin reaction.

Resp. Sens. 1;H334

May cause allergy or asthma symptoms of breathing difficulties if inhaled.

**2.2. Label elements**

Using the Toxicity Data listed in section 11 and 12 the product is labeled as follows.

**Danger**

H317 May cause an allergic skin reaction.

H334 May cause allergic or asthmatic symptoms or breathing difficulties if inhaled.

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**[Prevention]:**

- P261 Avoid breathing dust / fume / gas / mist / vapors / spray.
- P272 Contaminated work clothing should not be allowed out of the workplace.
- P280 Wear protective gloves / eye protection / face protection.
- P285 In case of inadequate ventilation wear respiratory protection.

**[Response]:**

- P302+352 IF ON SKIN: Wash with plenty of soap and water.
- P304+341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P313 Get medical advice / attention.
- P321 Specific treatment (see information on this label).
- P333+313 If skin irritation or a rash occurs: Get medical advice / attention.
- P342+311 If experiencing respiratory symptoms: Call a POISON CENTER or doctor / physician.
- P363 Wash contaminated clothing before reuse.

**[Storage]:**

No GHS storage statements

**[Disposal]:**

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

## 3. Composition/information on ingredients

This product contains the following substances that present a hazard within the meaning of the relevant State and Federal Hazardous Substances regulations.

Ingredient/Chemical Designations	Weight %	GHS Classification	Notes
Titanium CAS Number: 0007440-32-6	50 - 75	Not Classified	[1]
Molybdenum CAS Number: 0007439-98-7	10 - 25	Not Classified	[1][2]
Vanadium CAS Number: 0007440-62-2	10 - 25	Not Classified	[1]
Chromium compounds (as Cr (III)) CAS Number: 0007440-47-3	5 - 10	Skin Sens. 1;H317 Resp. Sens. 1;H334 Eye Irrit. 2;H319 Aquatic Chronic 4;H413	[1][2]
Niobium CAS Number: 0007440-03-1	5 - 10	Not Classified	[1]
Zirconium CAS Number: 0007440-67-7	5 - 10	WaterReact. 1;H260 Pyr. Sol. 1;H250	[1][2]
Aluminum (Al) CAS Number: 0007429-90-5	1 - 5	Flam. Sol. 1;H228 WaterReact. 2;H261	[1][2]
Tin CAS Number: 0007440-31-5	1 - 5	Not Classified	[1][2]
Silicon CAS Number: 0007440-21-3	1 - 5	Not Classified	[1][2]

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In accordance with paragraph (i) of §1910.1200, the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

[1] Substance classified with a health or environmental hazard.

[2] Substance with a workplace exposure limit.

[3] PBT-substance or vPvB-substance.

\*The full texts of the phrases are shown in Section 16.

## 4. First aid measures

### 4.1. Description of first aid measures

<b>General</b>	In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person.
<b>Inhalation</b>	Remove to fresh air, keep patient warm and at rest. If breathing is irregular or stopped, give artificial respiration. If unconscious place in the recovery position and obtain immediate medical attention. Give nothing by mouth.
<b>Eyes</b>	Immediately flush the eyes with large amounts of water for at least 15 minutes, alternately lifting the upper and lower eyelids. After 5 minutes, if appropriate, remove contact lenses and continue flushing the eyes for an additional 15 minutes. Call a physician at once.
<b>Skin</b>	Remove contaminated clothing. Wash skin thoroughly with soap and water or use a recognized skin cleanser.
<b>Ingestion</b>	Do not induce vomiting. Get medical attention.

### 4.2. Most important symptoms and effects, both acute and delayed

<b>Overview</b>	<p>Titanium alloys in their solid state present no inhalation, ingestion or contact health hazard. However, inhaling dusts, fumes or mists which may be generated during certain manufacturing procedures (burning, melting, welding, sawing, brazing, grinding and machining) may be hazardous to your health. Dusts may also be irritating to the unprotected skin or eyes.</p> <p>ACUTE EFFECTS: Excessive exposure to dusts / fumes may cause irritation of eyes, 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).</p> <p>CHRONIC EFFECTS: Prolonged inhalation of fumes or dusts may cause a variety of adverse health effects to the respiratory system, including (but not necessarily limited to) lesions of the mucous membrane, bronchitis, pneumonia and cancers of the nasal cavity and respiratory tract.</p> <p>POTENTIAL HEALTH EFFECTS/MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Any pre-existing chronic respiratory condition (asthma, chronic bronchitis, emphysema).</p> <p>ROUTES OF ENTRY: Inhalation (dusts / fumes / mists), Contact with Skin and Eyes (dusts / mists), Ingestion (dusts).</p> <p>See section 2 for further details.</p>
<b>Inhalation</b>	May cause allergy or asthma symptoms of breathing difficulties if inhaled.
<b>Skin</b>	May cause an allergic skin reaction.

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### 5. Fire-fighting measures

#### 5.1. Extinguishing media

Do not use water. Use carbon dioxide or dry chemical extinguishing agents.

#### 5.2. Special hazards arising from the substance or mixture

Hazardous decomposition: Titanium oxides, Hydrogen.

Avoid breathing dust / fume / gas / mist / vapors / spray.

#### 5.3. Advice for fire-fighters

Water applied to hot titanium may evolve hydrogen gas causing an explosion.

Nonflammable at low temperatures but will burn at high temperatures.

ERG Guide No. ----

### 6. Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

Put on appropriate personal protective equipment (see section 8).

#### 6.2. Environmental precautions

Do not allow spills to enter drains or waterways.

Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

#### 6.3. Methods and material for containment and cleaning up

No special procedures needed.

### 7. Handling and storage

#### 7.1. Precautions for safe handling

Minimize activities which may generate dusts, mists or fumes. Keep areas well ventilated. Use suitable equipment to move materials.

See section 2 for further details. - [Prevention]:

#### 7.2. Conditions for safe storage, including any incompatibilities

Handle containers carefully to prevent damage and spillage.

Incompatible materials: Acids, Oxidizing Agents, Halogens.

See section 2 for further details. - [Storage]:

#### 7.3. Specific end use(s)

No data available.

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## 8. Exposure controls and personal protection

### 8.1. Control parameters

#### Exposure

CAS No.	Ingredient	Source	Value
0007429-90-5	Aluminum (Al)	OSHA	TWA 15 mg/m3 (total) TWA 5 mg/m3 (resp)
		ACGIH	TWA: 1.0 mg/m3 Revised 2008,
		NIOSH	TWA 10 mg/m3 (total) TWA 5 mg/m3 (resp)
		Supplier	No Established Limit
0007439-98-7	Molybdenum	OSHA	TWA 15 mg/m3 [*Note: The PEL also applies to other insoluble molybdenum compounds (as Mo).]
		ACGIH	TWA: 3 mg/m3 (insoluble respirable) 10 mg/m3 (insoluble inhalable)
		NIOSH	no established RELs
		Supplier	No Established Limit
0007440-03-1	Niobium	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit
0007440-21-3	Silicon	OSHA	TWA 15 mg/m3 (total) TWA 5 mg/m3 (resp)
		ACGIH	No Established Limit
		NIOSH	TWA 10 mg/m3 (total) TWA 5 mg/m3 (resp)
		Supplier	No Established Limit
0007440-31-5	Tin	OSHA	TWA 2 mg/m3 [*Note: PEL also applies to other inorganic tin compounds (as Sn) except tin oxides.]
		ACGIH	TWA: 2 mg/m3 (inhalable) Metal and tin oxide as Sn.
		NIOSH	TWA 2 mg/m3 [*Note: The REL also applies to other inorganic tin compounds (as Sn) except tin oxides.]
		Supplier	No Established Limit
0007440-32-6	Titanium	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit
0007440-47-3	Chromium compounds (as Cr (III))	OSHA	TWA 1 mg/m3 [*Note: The PEL also applies to insoluble chromium salts.]
		ACGIH	TWA: 0.5 mg/m3 (inhalable) metal, A4
		NIOSH	TWA 0.5 mg/m3
		Supplier	No Established Limit
18540-29-9	Chromium (VI) inorganic compounds, insoluble	OSHA	TWA 0.005 mg/m3
		ACGIH	TWA 0.0002 mg/m3 (inhalable) STEL 0.0005 mg/m3 (inhalable)
		NIOSH	TWA 0.0002 mg/m3
		Supplier	No Established Limit
0007440-62-2	Vanadium	OSHA	No Established Limit
		ACGIH	No Established Limit

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		NIOSH	No Established Limit
		Supplier	No Established Limit
0007440-67-7	Zirconium	OSHA	TWA 5 mg/m3
		ACGIH	TWA: 5 mg/m3 STEL: 10 mg/m3
		NIOSH	TWA 5 mg/m3 ST 10 mg/m3 [*Applies to all zirconium compounds (as Zr) except Zirconium tetrachloride.
		Supplier	No Established Limit

### Carcinogen Data

CAS No.	Ingredient	Source	Value
0007429-90-5	Aluminum (Al)	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		ACGIH	A4 – Not Classifiable as a Human Carcinogen.
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0007439-98-7	Molybdenum	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0007440-03-1	Niobium	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0007440-21-3	Silicon	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0007440-31-5	Tin	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0007440-32-6	Titanium	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0007440-47-3	Chromium compounds (as Cr (III))	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		ACGIH	A4 – Not Classifiable as a Human Carcinogen.
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: Yes; Group 4: No;
18540-29-9	Chromium (VI) inorganic compounds, insoluble	OSHA	Select Carcinogen: Yes
		NTP	Known: Yes
		ACGIH	A1 – Confirmed Human Carcinogen
		IARC	Group 1: Yes; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0007440-62-2	Vanadium	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0007440-67-7	Zirconium	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;

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## 8.2. Exposure controls

- Respiratory**           Wear NIOSH approved dust / mist / fume respirator when welding or burning this metal.
- Eyes**                    Face shields (welding or burning), Safety glasses (cutting or grinding).
- Skin**                     Use appropriate protective clothing such as welding aprons and gloves when welding or burning.
- Engineering Controls**   Provide adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and any vapor below occupational exposure limits suitable respiratory protection must be worn.
- Other Work Practices**   Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

See section 2 for further details. - [Prevention]:

## 9. Physical and chemical properties

<b>Appearance</b>	Metal Solid
<b>Odor</b>	Odorless
<b>Odor threshold</b>	Not determined
<b>pH</b>	Not Measured
<b>Melting point / freezing point</b>	Not Measured
<b>Initial boiling point and boiling range</b>	NA
<b>Flash Point</b>	Nonflammable
<b>Evaporation rate (Ether = 1)</b>	Not Measured
<b>Flammability (solid, gas)</b>	Not Applicable
<b>Upper/lower flammability or explosive limits</b>	<b>Lower Explosive Limit:</b> Not Measured <b>Upper Explosive Limit:</b> Not Measured
<b>Vapor pressure (Pa)</b>	NA
<b>Vapor Density</b>	NA
<b>Specific Gravity</b>	4.46 - 4.54
<b>Solubility in Water</b>	Insoluble
<b>Partition coefficient n-octanol/water (Log Kow)</b>	Not Measured
<b>Auto-ignition temperature</b>	NA
<b>Decomposition temperature</b>	Not Measured
<b>Viscosity (cSt)</b>	Not Measured

### 9.2. Other information

No other relevant information.

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## 10. Stability and reactivity

### 10.1. Reactivity

Hazardous Polymerization will not occur.

### 10.2. Chemical stability

Stable under normal circumstances.

### 10.3. Possibility of hazardous reactions

No data available.

### 10.4. Conditions to avoid

No data available.

### 10.5. Incompatible materials

Acids, Oxidizing Agents, Halogens.

### 10.6. Hazardous decomposition products

Titanium oxides, Hydrogen.

## 11. Toxicological information

### Acute toxicity

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation Vapor LC50, mg/L/4hr	Inhalation Dust/Mist LC50, mg/L/4hr	Inhalation Gas LC50, ppm
Titanium - (7440-32-6)	No data available	No data available	No data available	No data available	No data available
Molybdenum - (7439-98-7)	No data available	No data available	No data available	No data available	No data available
Vanadium - (7440-62-2)	No data available	No data available	No data available	No data available	No data available
Chromium compounds (as Cr (III)) - (7440-47-3)	422.00, Rat - Category: 4	No data available	No data available	No data available	No data available
Niobium - (7440-03-1)	No data available	No data available	No data available	No data available	No data available
Zirconium - (7440-67-7)	No data available	No data available	No data available	No data available	No data available
Aluminum (Al) - (7429-90-5)	No data available	No data available	No data available	No data available	No data available
Tin - (7440-31-5)	No data available	No data available	No data available	No data available	No data available
Silicon - (7440-21-3)	No data available	No data available	No data available	No data available	No data available

Note: When no route specific LD50 data is available for an acute toxin, the converted acute toxicity point estimate was used in the calculation of the product's ATE (Acute Toxicity Estimate).



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Classification	Category	Hazard Description
Acute toxicity (oral)	---	Not Applicable
Acute toxicity (dermal)	---	Not Applicable
Acute toxicity (inhalation)	---	Not Applicable
Skin corrosion/irritation	---	Not Applicable
Serious eye damage/irritation	---	Not Applicable
Respiratory sensitization	1	May cause allergy or asthma symptoms of breathing difficulties if inhaled.
Skin sensitization	1	May cause an allergic skin reaction.
Germ cell mutagenicity	---	Not Applicable
Carcinogenicity	---	Not Applicable
Reproductive toxicity	---	Not Applicable
STOT-single exposure	---	Not Applicable
STOT-repeated exposure	---	Not Applicable
Aspiration hazard	---	Not Applicable

## 12. Ecological information

**12.1. Toxicity**

The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and GHS and is not classified as dangerous for the environment but contains substance(s) dangerous for the environment. See section 3 for details

**Aquatic Ecotoxicity**

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l
Titanium - (7440-32-6)	Not Available	Not Available	Not Available
Molybdenum - (7439-98-7)	Not Available	Not Available	Not Available
Vanadium - (7440-62-2)	Not Available	Not Available	Not Available
Chromium compounds (as Cr (III)) - (7440-47-3)	77.50, Pimephales promelas	1.20, Daphnia magna	580.00 (72 hr), Chlorella pyrenoidosa
Niobium - (7440-03-1)	Not Available	Not Available	Not Available
Zirconium - (7440-67-7)	Not Available	Not Available	Not Available
Aluminum (Al) - (7429-90-5)	Not Available	Not Available	Not Available
Tin - (7440-31-5)	Not Available	Not Available	Not Available
Silicon - (7440-21-3)	Not Available	Not Available	Not Available

**12.2. Persistence and degradability**

There is no data available on the preparation itself.

**12.3. Bioaccumulative potential**

Not Measured

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## 12.4. Mobility in soil

No data available.

## 12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

## 12.6. Other adverse effects

No data available.

## 13. Disposal considerations

### 13.1. Waste treatment methods

Observe all federal, state and local regulations when disposing of this substance.

## 14. Transport information

	<b>DOT (Domestic Surface Transportation)</b>	<b>IMO / IMDG (Ocean Transportation)</b>	<b>ICAO/IATA</b>
<b>14.1. UN number</b>	Not Applicable	Not Regulated	Not Regulated
<b>14.2. UN proper shipping name</b>	Not Regulated	Not Regulated	Not Regulated
<b>14.3. Transport hazard class(es)</b>	<b>DOT Hazard Class:</b> Not Applicable	<b>IMDG:</b> Not Applicable <b>Sub Class:</b> Not Applicable	<b>Air Class:</b> Not Applicable
<b>14.4. Packing group</b>	Not Applicable	Not Applicable	Not Applicable
<b>14.5. Environmental hazards</b>			
<b>IMDG</b>	Marine Pollutant: Yes;		
<b>14.6. Special precautions for user</b>	No further information		

## 15. Regulatory information

<b>Regulatory Overview</b>	The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented.
<b>Toxic Substance Control Act ( TSCA)</b>	All components of this material are either listed or exempt from listing on the TSCA Inventory.
<b>WHMIS Classification</b>	D2A
<b>US EPA Tier II Hazards</b>	<b>Fire:</b> No <b>Sudden Release of Pressure:</b> No <b>Reactive:</b> No <b>Immediate (Acute):</b> Yes <b>Delayed (Chronic):</b> No
<b>EPCRA 311/312 Chemicals and RQs (lbs):</b>	

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Chromium compounds (as Cr (III)) ( 5,000.00)

### EPCRA 302 Extremely Hazardous:

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

### EPCRA 313 Toxic Chemicals:

Aluminum (Al)

Chromium compounds (as Cr (III))

Vanadium

### New Jersey RTK Substances (>1%):

Aluminum (Al)

Chromium compounds (as Cr (III))

Molybdenum

Silicon

Tin

Titanium

Vanadium

Zirconium

### Pennsylvania RTK Substances (>1%):

Aluminum (Al)

Chromium compounds (as Cr (III))

Molybdenum

Silicon

Tin

Vanadium

Zirconium

## 16. Other information

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

The full text of the phrases appearing in section 3 is:

H228 Flammable solid.

H250 Catches fire spontaneously if exposed to air.

H260 In contact with water releases flammable gases which may ignite spontaneously.

H261 In contact with water releases flammable gases.

H317 May cause an allergic skin reaction.

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H319 Causes serious eye irritation.

H334 May cause allergic or asthmatic symptoms or breathing difficulties if inhaled.

H413 May cause long lasting harmful effects to aquatic life.

Not Classified Not Classified

The information contained herein is furnished without warranty of any kind. The above information is believed to be correct but does not purport to be all inclusive and should be used only as a guide. Users should make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

End of Document