

WEBCO INDUSTRIES, INC.
P.O. Box 100
Sand Springs, OK 74063



Safety Data Sheet

Section 1: Product and Company Identification		
Product Name: Titanium Alloy Tubing		
Site: Webco Industries, Inc. Mannford, OK.	Approved SDS: Date Prepared: 02/23/2016	SDS No: 1
Supplier: Webco Industries - Mannford 501 Foster Road Mannford, OK 74044		
Webco Industries – Kellyville 18256 Hwy 66 Kellyville, OK 74039		
Both Locations: Phone: (918) 245-2211		
Product Use: Titanium Tubing		

Section 2: Hazard(s) Identification			
Titanium Products as sold by Webco are not hazardous per OSHA GHS 29 CFR 1910.1200. However, individual customer processes, (such as welding, sawing, brazing, grinding, abrasive blasting, and machining) may result in the formation of fumes, dust (combustible or otherwise), and/or particulate that may present the following hazards			
2(b) Signal word, hazard statement(s), symbols and precautionary statement(s):			
Hazard Symbol	Hazard Classification	Signal Word	Hazard Statement(s)
	Carcinogenicity – 2 Reproductive Toxicity – 2 Specific Target Organ Toxicity (STOT) Repeat Exposure - 1	Danger	When product is subjected to welding, burning, melting, sawing, brazing, grinding, buffing, polishing, or other similar heat-generating processes, the following potentially hazardous airborne particles and/or fumes may be generated: titanium dioxide an IARC Group 2B carcinogen, Hexavalent Chromium (Chromium VI) may cause lung, nasal, and/or sinus cancer Vanadium pentoxide (V2O5) affects eyes, skin, respiratory system, zinc, copper, magnesium, or cadmium fumes may cause metal fume fever, Soluble molybdenum compounds such as molybdenum trioxide may cause lung irritation.
	Acute Toxicity – Oral – 4 Skin Sensitization – 1		
NA	Eye Irritation – 2B		

Precautionary Statement(s):		
Prevention	Response	Storage/Disposal
<p>Do not handle until all safety precautions have been read and understood.</p> <p>Avoid breathing dusts/fume/gas/mist/vapor/spray.</p> <p>Wear protective gloves / protective clothing / eye Protection / face protection.</p> <p>Do not eat, drink or smoke when using this product.</p>	<p>If inhaled: Remove person to fresh air and keep comfortable for breathing.</p> <p>If exposed, concerned or feel unwell: Get medical advice/attention.</p> <p>If in eyes: Rinse cautiously with water for several minutes.</p> <p>Remove contact lenses, if present and easy to do. Continue Rinsing. If eye irritation persists: Get medical attention.</p> <p>If on skin: Wash with plenty of water. If irritation or rash occurs: Get medical attention. Take off and wash contaminated clothing before reuse.</p> <p>If swallowed: Call a poison center or physician if you feel unwell. Rinse mouth.</p>	<p>Dispose of contents in accordance with federal, state and local regulations.</p>
<p>2(c) Hazards not otherwise classified: None Known</p> <p>2(d) Unknown acute toxicity statement (mixture): None Known</p>		
<p>Emergency Overview: WARNING: THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO CAUSE CANCER</p>		
<p>Potential Health Effects: Titanium products in their usual physical form do not pose a health hazard. Inhalation of metal dust and fume may result from further processing of the material by the user, particularly during welding, burning, grinding, and machining activities and should be evaluated by an industrial hygienist.</p>		
<p>Chronic Health Hazards: Individuals with chronic diseases or disorders should consult a Physician regarding workplace exposure to ingredients.</p> <p>The National Toxicology Program NTP and International Agency for Research on Cancer (IARC) consider (1) chromium and certain chromium compounds to be known human carcinogens, (2) nickel and certain nickel compounds to be probable human carcinogens.</p>		
<p>Medical Conditions Generally Aggravated by Exposure:</p> <p>Aluminum (Al) Long-term excessive inhalation exposure to Al dusts or fumes has been associated with a fibrotic lung condition known as Shaver’s disease; however, the evidence of this is not conclusive since affected workers were exposed to other substances (such as silica) as well. Symptoms of this condition may include shortness of breath, cough, and fatigue.</p> <p>Chromium (Cr) Chromium metal and its divalent and trivalent compounds are of low toxicity. Adverse reactions on the skin may include dermatitis for a Cr-sensitive individual. Long-term excessive inhalation exposure to ferrochromium alloys may cause lung changes in workers exposed to these alloys. Exposure to Chromium metal does not give rise to pulmonary fibrosis or pneumoconiosis. Chromium metal and trivalent chromium (Cr⁺³) compounds are not classifiable as human carcinogens. However, welding, torch cutting, brazing or perhaps grinding of the chromium metal in titanium alloy products may generate airborne concentrations of hexavalent chromium,</p>		

(Cr⁺⁶), a confirmed human carcinogen. IARC lists hexavalent chromium compounds as Group 1 (sufficient evidence for carcinogenicity in humans). NTP lists certain hexavalent chromium compounds as Group 1 (known to be carcinogenic). The American Conference of Governmental Industrial Hygienists (ACGIH) lists hexavalent chromium compounds as A1.

Columbium (Nb)

Columbium interferes with calcium as an activator of enzyme systems.

Copper (Cu)

Excessive inhalation exposure to Cu fume may cause irritation of the eyes, nose, and throat and a flu-like illness called metal fume fever. Signs and symptoms of metal fume fever include fever, muscle aches, nausea, chill, dry throat, cough and weakness. Cu fume may also produce a metallic or sweet taste. Long-term excessive exposure to Cu fume may cause discoloration of the skin and hair.

Iron (Fe)

Long-term excessive inhalation exposure to iron oxide fumes or dust has been associated with a benign lung condition known as siderosis. No physical impairment of lung function has been linked to siderosis.

Molybdenum (Mo)

Molybdenum compounds are highly toxic. Some evidence of liver dysfunction with hyperbilirubinemia has been reported in workmen chronically exposed in a Soviet Mo-Cu plant. In addition signs of gout have been found in factory workers and among inhabitants of Mo-rich areas of Armenia. The main features were joint pains in the knees, hands, feet, articular deformities, erythema, and edema of the joint areas. May cause lung irritation.

Nickel (Ni)

Ni fumes and dusts are respiratory irritants and excessive exposure may cause severe inflammation of the lungs. Prolonged and repeated skin contact with nickel and its compounds may cause an allergic dermatitis. The resulting skin rash is often referred to as "nickel itch". Ni and its compounds may also produce eye irritation, particularly on the inner surfaces of the eyelids. Studies have linked nickel and certain nickel compounds to an increased incidence of cancer of the respiratory system.

Silicon (Si)

This is considered to be nuisance particulate by the American Conference of Governmental Industrial Hygienists (ACGIH)

Titanium (Ti)

Elemental titanium and titanium dioxide is of a low order of toxicity. Excessive exposure in humans may result in slight changes in the lungs.

Vanadium (V)

Vanadium compounds are poorly absorbed through the gastrointestinal system. Inhalation exposures to vanadium and vanadium compounds result primarily in adverse effects on the respiratory system. Chronic exposure to Vanadium Pentoxide (V2O5) dust and fumes may cause severe irritation of the eyes, skin, upper respiratory tract, emphysema, tracheitis, pulmonary edema, bronchial pneumonia, and systemic poisoning. Signs and symptoms of overexposure include conjunctivitis, nasopharyngitis, cough, dyspnea, palpitation, lung changes, chronic bronchitis, skin pallor, greenish-black tongue and an allergic skin rash.

Zirconium (Zr)

Zirconium compounds can affect the body if they are inhaled or if they come in contact with the eyes or skin. Skin rash has been reported from exposure to zirconium-containing deodorants. Zirconium compounds have been reported to cause radiographic changes in animals due to pulmonary retention. Zirconium hexachloride may be irritating to the mucous membranes of the respiratory tract. Zirconium may cause granulomas of the skin.

Section 3: Composition Information on Ingredients

Ingredient	CAS No.	% Weight
Titanium	7440-32-6	50-100
Aluminum	7429-90-5	0-40
Molybdenum	7439-98-7	1-15
Chromium	7440-47-3	0-10
Niobium (Columbium)	7440-03-1	0-10
Vanadium	7440-62-2	0-10
Zirconium	7440-67-7	0-10
Tin	7440-31-5	0-5
Copper	7440-50-8	0-5
Iron	7439-89-6	0-5
Silicon	7440-21-3	0-1
Nickel	7440-02-0	0-0.9

Notes

- Commercial titanium products contain small amounts of various elements in addition to those specified. These small quantities frequently referred to as "trace" or "residual" elements, generally originate in the raw materials used and/or are alloying metals. Individual trace elements vary in concentration by weight, and may additionally include; boron, calcium, columbium (niobium), molybdenum, sulfur, titanium, and vanadium
- Percentages are expressed as typical ranges or maximum concentrations of trace elements for the purpose of communicating the potential hazards of the finished product.

No permissible exposure limits (PEL) or threshold limit values (TLV) exist for the product over all. The above listing is a summary of elements found in Webco products. Various grades of titanium alloy will contain different combinations of these elements and/or trace materials.

Section 4: First Aid Measures

Eye Contact:

For contact with dusts, fumes or particulate, flush eyes with water for 15 minutes. Eye injuries from solid particles should be treated by a physician immediately as with any foreign object.

Skin Contact (Most important symptoms and effects, both acute and delayed):

May cause allergic skin reaction. For skin contact with dusts or powders, wash immediately with soap and water. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area. In case of allergic skin reaction see a physician.

Inhalation:

Remove from excessive exposure levels. If excessive amounts of smoke, fume, or particulate are inhaled during processing, remove to fresh air and consult a qualified health professional.

Ingestion:

This product is not considered to be an ingestion hazard, however if excessive amounts of dust or particulates are swallowed, treat symptomatically and supportively. IF SWALLOWED: Call a poison center or Doctor/physician if you feel unwell. Rinse mouth.

Notes to Physician:

Inhalation of metal fume or metal oxides may produce an acute febrile state, with cough, chills, weakness, and general malaise, nausea, vomiting, muscle cramps, and remarkable leukocytosis. Treatment is symptomatic

Section 5: Fire-fighting Measures

Flash Point:

Titanium Metal – Not Applicable

Auto-ignition:

N/A

LEL:

N/A

UEL:

N/A

Extinguishing Media:

Not flammable in the form of this product as distributed, flammable as finely divided particles or pieces resulting from processing of this product. Smother with salt (NaCl) or class D dry powder fire extinguisher.

Unsuitable extinguishing media: Do not spray water on burning metal as an explosion may occur. This explosive characteristic is caused by the hydrogen and steam generated by the reaction of water with the burning material.

Specific hazards arising from the chemical:

Intense heat. Very fine, high surface area material resulting from grinding, buffing, polishing, or similar processes of this product may ignite spontaneously at room temperature. WARNING: Fine particles resulting from grinding, buffing, polishing, or similar processes of this product may form combustible dust-air mixtures. Keep particles away from all ignition sources including heat, sparks, and flame. Prevent dust accumulations to minimize combustible dust hazard.

Hazardous combustion products:

Products Titanium dioxide an IARC Group 2B carcinogen, Hexavalent Chromium (Chromium VI) may cause lung, nasal, and/or sinus cancer. Vanadium pentoxide (V₂O₅) affects eyes, skin, respiratory system, zinc, copper, magnesium, or cadmium fumes may cause metal fume fever. Soluble molybdenum compounds such as molybdenum trioxide may cause lung irritation.

Protective equipment and precautions for firefighters:

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH approved (or equivalent) respirator and full protective gear.

Section 6: Accidental Release Measures

Precautions if Material is Spilled or Released - Emergency response is unlikely unless in the form of combustible dust. Avoid inhalation, eye, or skin contact of dusts by using appropriate precautions outlined in this SDS (see section 8). Fine turnings and small chips should be swept or vacuumed and placed into appropriate disposable containers. Keep fine dust or powder away from sources of ignition. Scrap should be reclaimed for recycling. Prevent materials from entering drains, sewers, or waterways.

Fire and Explosion Hazards- Some customer processes may generate combustible dust that may require specific precautions when cleaning spills or releases of dust.

Environmental Precautions – Some grades of titanium alloy may contain reportable quantities of alloying elements. See Section 15 for additional information

Section 7: Handling and Storage

Conditions for safe storage, including any incompatibilities:

Advice on safe handling - Very fine, high surface area material resulting from grinding, buffing, polishing, or similar processes of this product may ignite spontaneously at room temperature. **WARNING:** Fine particles resulting from grinding, buffing, polishing, or similar processes of this product may form combustible dust-air mixtures. Keep particles away from all ignition sources including heat, sparks, and flame. Prevent dust accumulations to minimize combustible dust hazard.

Storage Conditions - Keep chips, turnings, dust, and other small particles away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity).

Incompatible materials - Dissolves in hydrofluoric acid. Ignites in the presence of fluorine. When heated above 200°C, reacts exothermically with the following: Chlorine, bromine, halocarbons, carbon tetrachloride, carbon tetrafluoride, and freon.

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Section 8: Exposure Controls/Personal Protection

Ingredient:	PEL-OSHA (TWA)	TLV-ACGIH (TWA)
TITANIUM	15 Mg/M ³ , Titanium Dioxide, total dust	10 Mg/M ³ , Titanium Dioxide, total dust
IRON	10MG/M ³ FeO ₂ fume	5 Mg/M ³ FeO ₂ fume
NICKEL**	1 Mg/M ³ metal and insoluble compounds	1.5 Mg/M ³ metal Inhalable fraction 0.1 Mg/M ³ soluble compounds 0.2 Mg/M ³ insoluble compounds
CHROMIUM**	1 Mg/M ³ metal Al-2.5 µg/m ³ /PEL-5.0 µg/m ³ (as Cr ⁺⁶)	0.5 Mg/M ³ metal and Cr (⁺³) 0.01 mg/m ³ , Cr(⁺⁶) insoluble compounds
MOLYBDENUM	5 Mg/M ³ , soluble Mo compounds 15 Mg/M ³ , insoluble compounds, total dust	3 Mg/M ³ , respirable fraction 10 Mg/M ³ , inhalable fraction
COPPER	1 Mg/M ³ Dust 0.1 MG/M ³ fume	1 Mg/M ³ Dust 0.2 Mg/M ³ fume
TIN	TWA: 2 Mg/M ³ TWA: 2 Mg/M ³ Sn except Tin hydride	TWA: 2 Mg/M ³ , elemental and inorganic compounds
SILICON	15 Mg/M ³ TOTAL 5 Mg/M ³ Resp. DUST	10 Mg/M ³ Resp. Dust
NIOBIUM (COLUMBIUM)	5 Mg/M ³ Resp. fraction (not Regulated)	5 Mg/M ³ Resp. fraction (not Regulated)
ALUMINUM	15 Mg/M ³ TOTAL 5 Mg/M ³ RESP. DUST	1 Mg/M ³ respirable fraction
VANADIUM	0.5 Oxide Dust (ceiling) Ceiling: 0.1 mg/M ³ V2O5 fume	0.05 Oxide Dust resp. Dust and fume

ZIRCONIUM	TWA: 5 mg/m ³ Zr (vacated) STEL: 10 mg/m ³ (vacated) STEL: 10 mg/m Zr	STEL: 10 mg/m ³ STEL: 10 mg/m ³ Zr TWA: 5 mg/m ³ TWA: 5 mg/m ³ Zr
Health Hazard Information: **DESIGNATED TOXIC CHEMICALS CONTAINED IN THIS PRODUCT ARE SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF THE EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW ACT OF 1986 (40CFR372).		
Eye/Face Protection: When airborne particles may be present, appropriate eye protection is recommended. For example, tight-fitting goggles, foam-lined safety glasses or other protective equipment that shield the eyes from particles.		
Skin and Body Protection: Fire/flame resistant/retardant clothing may be appropriate during hot work with the product. Cut-resistant gloves and/or protective clothing may be appropriate when sharp surfaces are present.		
Respiratory Protection: When particulates/fumes/gases are generated and if exposure limits are exceeded or irritation is experienced, proper approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.		
Ventilation: Ventilation should be sufficient to maintain exposure below the applicable limits.		

Section 9: Physical and Chemical Properties

Appearance and Odor: GRAY TO SILVER / NO ODOR
Boiling Point: N/A
Melting Point: 2800-3000 °F / 1540 - 1670 °C
Solubility in Water (% by weight): N/A
Evaporation Rate: N/A
Specific Gravity (H₂O = 1): 4.5
PH: N/A
% Volatiles by Volume (at 20°C): N/A

Section 10: Stability and Reactivity

Stability:

Stable under normal conditions

Avoid:

Stable under normal conditions of use, storage & transport. At temperatures above the melting point may liberate fumes containing oxides of iron and alloying elements.

Incompatibility materials:

Dissolves in hydrofluoric acid, Ignites in the presence of fluorine: When heated above 200°C, reacts exothermically with the following. Chlorine, bromine, halocarbons, carbon tetrachloride, carbon tetrafluoride, and freon.

Hazardous Decomposition of By-Products:

When product is subjected to welding, burning, melting, sawing, brazing, grinding, buffing, polishing, or other similar heat-generating processes, the following potentially hazardous airborne particles and/or fumes may be generated: titanium dioxide an IARC Group 2B carcinogen. Hexavalent Chromium (Chromium VI) may cause lung, nasal, and/or sinus cancer. Vanadium pentoxide (V2O5) affects eyes, skin, respiratory system. Soluble molybdenum compounds such as molybdenum trioxide may cause lung irritation.

Hazardous Polymerization:

Will not occur

Avoid:

Dust formation and dust accumulation

Section 11: Toxicological Information

- Inhalation:** Not an expected route of exposure for product in massive form.
- Eye contact:** Not an expected route of exposure for product in massive form.
- Skin Contact:** Nickel or Cobalt containing alloys may cause sensitization by skin contact.
- Ingestion:** Not an expected route of exposure for product in massive form.

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Titanium 7440-32-6	> 5000 mg/kg bw	-	-
Aluminum 7429-90-5	15,900 mg/kg bw	-	> 1 mg/L
Molybdenum 7439-98-7	> 2000 mg/kg bw	> 2000 mg/kg bw	> 5.10 mg/L
Zirconium 7440-67-7	5000 mg/kg bw	-	>4.3 mg/L
Vanadium 7440-62-2	> 2000 mg/kg bw	-	-
Niobium (Columbium) 7440-03-1	-	> 2000 mg/kg bw	-
Chromium 7440-47-3	> 3400 mg/kg bw	-	> 5.41 mg/L
Copper 7440-50-8	481 mg/kg bw	>2000 mg/kg bw	>5.11 mg/L
Tin 7440-31-5	> 2000 mg/kg bw	> 2000 mg/kg bw	> 4.75 mg/L
Iron 7439-89-6	98,600 mg/kg bw	-	> 0.25 mg/L
Silicon 7440-21-3	> 5000 mg/kg bw	> 5000 mg/kg bw	> 2.08 mg/L
Nickel 7440-02-0	> 9000 mg/kg bw	-	-

Information on toxicological effects:

Symptoms: Nickel or Cobalt containing alloys may cause sensitization by skin contact.

Delayed and immediate effects as well as chronic effects from short and long-term exposure Acute toxicity:

Acute toxicity	Product not classified.
Skin corrosion/irritation	Product not classified.
Serious eye damage/eye irritation	Product not classified.
Sensitization	Nickel or cobalt -containing alloys may cause sensitization by skin contact.
Germ cell mutagenicity	Product not classified.
Carcinogenicity	Product not classified

Chemical Name	ACGIH	IARC	NTP	OSHA
Nickel 7440-02-0		Group 1 Group 2B	Known Reasonably Anticipated	X
Chromium 7440-47-3		Group 3		
Reproductive toxicity: Product not classified.				
STOT – single exposure: Product not classified.				
STOT – repeated exposure: Causes disorder and damage to the respiratory track if inhaled.				
Aspiration hazard: Product not classified.				

Section 12: Ecological Information

Ecotoxicity:

This product as shipped is not classified for aquatic toxicity. This product contains a chemical which is listed as a severe marine pollutant according to DOT

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganism	Crustacea
Titanium 7440-32-6	The 72 h EC50 of titanium dioxide to <i>Pseudokirchnerella subcapitata</i> was 61 mg of	The 96 h LC50 of titanium dioxide to <i>Cyprinodon variegatus</i> was greater than	The 3 h EC50 of titanium dioxide for activated sludge were greater than 1000 mg/L.	The 48 h EC50 of titanium dioxide to <i>Daphnia Magna</i> was greater than 1000 mg of TiO ₂ /L.
Iron 7439-89-6	-	The 96 h LC50 of 50% iron oxide black in water to <i>Danio rerio</i> was greater than 10,000 mg/L.	The 3 h EC50 of iron oxide for activated sludge was greater than 10,000 mg/L.	The 48 h EC50 of iron oxide to <i>Daphnia magna</i> was greater than 100 mg/L.
Nickel 7440-02-0	NOEC/EC10 values range from 12.3 µg/l for <i>Scenedesmus accuminatus</i> to 425 µg/l for <i>Pseudokirchneriella subcapitata</i> .	The 96h LC50s values range from 0.4 mg Ni/L for <i>Pimephales promelas</i> to 320 mg Ni/L for <i>Brachydanio rerio</i> .	The 30 min EC50 of nickel for activated sludge was 33 mg Ni/L.	The 48h LC50s values range from 0.013 mg Ni/L for <i>Ceriodaphnia dubia</i> to 4970 mg Ni/L for <i>Daphnia magna</i> .
Chromium 7440-47-3	-	-	-	-
Manganese 7439-96-5	The 72 h EC50 of manganese to <i>Desmodesmus subspicatus</i> was 2.8 mg	The 96 h LC50 of manganese to <i>Oncorhynchus mykiss</i> was greater than 3.6 mg of Mn/L	The 3 h EC50 of manganese for activated sludge was greater than 1000 mg/L.	The 48 h EC50 of manganese to <i>Daphnia magna</i> was greater than 1.6 mg/L.
Molybdenum 7439-98-7	The 72 h EC50 of sodium molybdate dihydrate to <i>Pseudokirchneriella subcapitata</i> was 362.9 mg of Mo/L.	The 96 h LC50 of sodium molybdate dihydrate to <i>Pimephales promelas</i> was 644.2 mg/L	The 3 h EC50 of molybdenum trioxide for activated sludge was 820 mg/L.	The 48 h LC50 of sodium molybdate dihydrate to <i>Ceriodaphnia dubia</i> was 1,015 mg/L. The 48 h LC50 of sodium

Silicon 7440-21-3	The 72 h EC50 of sodium metasilicate pentahydrate to Pseudokirchnerella subcapitata was greater than	-	-	-
Aluminum 7429-90-5	The 96-h EC50 values for reduction of biomass of Pseudokirchneriella subcapitata in AAP-Medium at pH 6, 7, and 8 were estimated as 20.1, 5.4, and 150.6 µg/L, respectively,	The 96 h LC50 of aluminum to Oncorhynchus mykiss was 7.4 mg of Al/L at pH 6.5 and 14.6 mg of Al/L at pH 7.5	-	The 48-hr LC50 for Ceriodaphnia dubia exposed to Aluminium chloride increased from 0.72 to greater than 99.6 mg/L with water hardness increasing from 25 to 200 mg/L.
Copper 7440-50-8	The 72 h EC50 values of copper chloride to Pseudokirchneriella subcapitata ranged between 30 µg/L (pH 7.02, hardness 250 mg/L CaCO ₃ , DOC 1.95 mg/L) and 824 µg/L	The 96-hr LC50 for Pimephales promelas exposed to Copper sulfate ranged from 256.2 to 38.4 µg/L with water hardness increasing from 45 to 255.7 mg/L.	The 24 h NOEC of copper chloride for activated sludge ranged from 0.32 to 0.64 mg of Cu/L.	The 48 h LC50 values for Daphnia magna exposed to copper in natural water ranged between 33.8 µg/L (pH 6.1, hardness 12.4 mg/L CaCO ₃ , DOC 2.34 mg/L) and 792 µg/L (pH 7.35, hardness 139.7 mg/L)
Tin 7440-31-5	The 72 h EC50 of tin chloride pentahydrate to Pseudokirchnerella subcapitata was 9,846 µg of Sn/L	The 7 d LOEC of tin chloride pentahydrate to Pimephales promelas was 827.9 µg of Sn/L	-	The 7 d LC50 of tin chloride pentahydrate to Ceriodaphnia dubia was greater than 3,200 µg of Sn/L.
Vanadium 7440-62-2	The 72 h EC50 of vanadium pentoxide to Desmodesmus subspicatus was 2,907 µg of V/L.	The 96 h LC50 of vanadium pentoxide to Pimephales promelas was 1,850 µg of V/L .	The 3 h EC50 of sodium metavanadate for activated sludge was greater than 100 mg/L.	The 48 h EC50 of sodium vanadate to Daphnia magna was 2,661 µg of V/L.
Niobium (Columbium) 7440-03-1	-	-	-	-

Other adverse effects: This product as shipped is not classified for environmental endpoints. However, when subjected to sawing or grinding, particles may be generated that are classified for aquatic acute or aquatic chronic Toxicity.

Environmental Fate: N/A

Section 13: Disposal Considerations
SPILLS AND DISPOSAL PROCEDURES: Spills: Not applicable to product in the solid state

Waste Disposal Method: Metals may be reclaimed. Dispose of in a landfill in accordance with all local, state, and federal regulations.	
Chemical Name	RCRA – D Series Wastes
Chromium 7440-47-3	5.0 mg/L regulatory level

Section 14: Transport Information
DOT – Not regulated

Section 15: Regulatory Information

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

US Federal

SARA 311 and 312 Hazard Categories:

Immediate (Acute) Health Hazard:	No
Delayed (Chronic) Health Hazard:	No
Fire Hazard:	No
Reactivity:	No
Sudden Release of Pressure:	No

Superfund Amendments and Reauthorization Act of 1986 (SARA), Title III

SECTION 311/312 HAZARD CATEGORIES: Immediate Health Effect, Delayed Health Effect

This product contains the following EPCRA Section 313 chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right – To – Know Act of 1986 (40 CFR 372):

SECTION 313 REPORTABLE INGREDIENTS:

Chemical Name	CAS Number	Concentration (% by weight)	SARA 313- Threshold Values %
Chromium	7440-47-3	0-10	1.0
Copper	7440-50-8	0.0 – 5.0	1.0
Nickel	7440-02-0	0.0 – 0.9	0.1

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)

Chemical Name	CWA – Reportable Quantities	CWA – Toxic Pollutants	CWA – Priority Pollutants	CWA – Hazardous Substances
Nickel 7440-02-0		X	X	
Chromium 7440-47-3		X	X	
Copper 7440-50-8		X	X	

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)

Chemical Name	Hazardous Substances RQs
Nickel 7440-02-0	100 lb
Chromium 7440-47-3	5000 lb
Copper 7440-50-8	5000 lb

US State Regulations**California Proposition 65**

This product contains the following Proposition 65 chemicals

Chemical Name	California Proposition 65
Nickel – 7440-02-0	Carcinogen

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Titanium 7440-32-6	X		
Aluminum 7429-90-5	X	X	X
Molybdenum 7439-98-7	X	X	X
Zirconium 7440-67-7	X	X	X
Vanadium 7440-62-2	X	X	X
Chromium 7440-47-3	X	X	X
Tin 7440-31-5	X	X	X
Copper 7440-50-8	X	X	X
Silicon 7440-21-3	X	X	X
Nickel 7440-02-0	X	X	X

Ozone Depleting Substances: N/A
Volatile Organic Compounds (VOC): N/AN/A
US State Regulation: N/A
Canadian Regulation: N/A
European Regulation: N/A
Other Regulation: N/A
MITI:

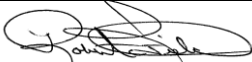
Section 16: Other Information	
Document Author: Robert Field	Document Manager: Bob Watson

Reason for Change:


Revision:	Sec/Para Changed	Change Made:	Date:
1	N/A	Updated to comply with GHS	02/23/2016

Approvals:

First Approver's signature

Name: Robert Field Title: Safety / Risk Manager	
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Second Approver's Signature

Name: Marie K. Martin Title: Environmental Manager	
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