

Hoja de datos de seguridad

1. Identificación

Identificador del producto	TI ALEACIONES DE TANTIO CON VANADIO
Número SOS	341
Version, #	06
Fecha de revisión	27 de octubre de 2015.
Otros medios de identificación	apellido
Uso recomendado	Forjas de titanio y fundiciones aeroespaciales
Stanford Advanced Materials Dirección: 23661 Birchwood Dr., Lake Forest, CA 92630 U.S.A. Tel: (949) 407-8904 Fax: (949) 812-6690	

Emergencia Información (949) 407 - 8904
(Este número de teléfono está disponible 24 horas al día, 7 días a la semana.)

Sitio web www.samaterials.com

2. Identificación de peligro(s)

Clasificación

Este producto se considera peligroso según 29 CFR 1910.1200, (Comunicación de Peligros).

- Potenciales efectos en la salud
- Las siguientes declaraciones resumen los efectos para la salud generalmente esperados en casos de sobreexposición. Las situaciones específicas del usuario deben ser evaluadas por un individuo cualificado. Se puede encontrar información adicional sobre salud en la Sección 11.

El efecto de inhalación de este producto puede ser peligroso. Este producto genera polvo de humos.

Peligros físicos No clasificado.

Peligros para la salud No clasificado.

Peligros ambientales No clasificado.

- Polvo combustible

Elementos de etiqueta

Símbolo de Peligro Ninguna.

Palabra de advertencia

Declaración de peligro La mezcla no cumple con los criterios de clasificación. Puede formar polvo combustible

Precautionary statement	
Prevention	Prevent dust accumulation to minimize explosion hazard.
Response	In case of fire: Use appropriate media to extinguish.
Storage	Store away from incompatible materials. Store in a dry place.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental information	None.
Specific hazards	Non-combustible as supplied. Small chips, fine turnings, and dust from processing may be readily ignitable. Explosion/fire hazards may be present when (See Sections 5, 7 and 10 for additional information): • Dust or fines are dispersed in air. • Dust and fines are in contact with certain metal oxides (e.g., rust, copper oxide). A thermite reaction, with considerable heat generation, can be initiated by a weak ignition source. Thermite reactions can also occur with oxides of lead, copper, iron, bismuth and certain other metals. • Dust and fines in contact with water can generate flammable/explosive hydrogen gas. These gases could present an explosion hazard in confined or poorly ventilated spaces. • Contact of molten metal with water or moisture can result in a rapid generation of steam which may produce a violent splattering of molten metal. Health effects from mechanical processing (e.g., cutting, grinding): Dust: Can cause irritation of the eyes, skin and upper respiratory tract. Acute overexposures: Can cause headache and sore joints. Additional health effects from elevated temperature processing (e.g., welding, melting): Dust and fumes: Can cause irritation of the eyes, skin and respiratory tract. Can cause inflammation of the eyes and eyelids (conjunctivitis). Acute overexposures: Can cause metal fume fever and the accumulation of fluid in the lungs. The substance has delayed effects.

3. Composition/information on ingredients

Composition comments Complete composition is provided below and may include some components classified as non-hazardous.

Mixtures

Chemical name	Common name and synonyms	CAS number	%
Titanium		7440-32-6	55 - 95
Vanadium		7440-62-2	1 - 15
Chromium		7440-47-3	0 - 11
Aluminum		7429-90-5	3 - 8
Molybdenum		7439-98-7	0 - 5
Zirconium		7440-67-7	0 - 5
Tin		7440-31-5	0 - 3
Iron		7439-89-6	0 - 2
Copper		7440-50-8	0 - 2

Additional Information Additional compounds which may be formed during processing are listed in Section 8.

4. First-aid measures

Eye contact	Dust and fumes from processing: Rinse eyes with plenty of water or saline for at least 15 minutes. Consult a physician.
Skin contact	Dust and fume from processing or contact with lubricant/residual oil: Wash with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.
Inhalation	Dust and fumes from processing: Remove to fresh air. Check for clear airway, breathing, and presence of pulse. If breathing is difficult, provide oxygen. Loosen any tight clothing on neck or chest. Provide cardiopulmonary resuscitation for persons without pulse or respirations. Consult a physician.
Ingestion	Not relevant, due to the form of the product.

Most important symptoms/effects, acute and delayed	Health effects from mechanical processing (e.g., cutting, grinding): Dust: Can cause irritation of the eyes, skin and upper respiratory tract. Acute overexposures: Can cause headache and sore joints.
Medical conditions aggravated by exposure	Additional health effects from elevated temperature processing (e.g., welding, melting): Dust and fumes: Can cause irritation of the eyes, skin and respiratory tract. Acute overexposures: Can cause the accumulation of fluid in the lungs. Effects can be delayed up to 24 hours. See Section 11 of the SDS for additional information on health hazards.
Indication of immediate medical attention and special treatment needed	Dust and fume from processing: Asthma, chronic lung disease, and skin rashes.
General information	Provide general supportive measures and treat symptomatically.
	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Use Class D extinguishing agents on fines, dust or molten metal. Use gentle surface application of Class D extinguishing agent or dry inert granular material (e.g., sand) to cover and ring the burning material.
Unsuitable extinguishing media	DO NOT USE water spray, carbon dioxide, foam or standard dry chemical extinguishers unless the fire involves only the oily residues from the machining process. These fire extinguishing agents will react with the burning material.
Specific hazards arising from the chemical	May be a potential hazard under the following conditions: • Dust clouds may be explosive. Even a minor dust cloud can explode violently. Dust accumulation on the floor, ledges and beams can present a risk of ignition, flame propagation and secondary explosions. • Dust and fines in contact with certain metal oxides (e.g., rust, copper oxide). A thermite reaction, with considerable heat generation, can be initiated by a weak ignition source. Finely divided metals (e.g., powders or wire) may have enough surface oxide to produce thermite reactions/explosions. Thermite reactions can also occur with oxides of lead, copper, iron, bismuth and certain other metals.
Special protective equipment and precautions for firefighters	Firefighters should wear NIOSH approved, positive pressure, self-contained breathing apparatus and full protective clothing when appropriate.
Fire fighting equipment/instructions	Move containers from fire area if you can do so without risk. Apply extinguishing media carefully to avoid creating airborne dust. If impossible to extinguish, protect surroundings and allow fire to burn itself out.
General fire hazards	Castings and ingots are not combustible under ordinary conditions. Small chips, fine turnings, and dust from processing may be readily ignitable. Grinding or polishing this material in the absence of oxygen, such as under water, can result in a finely divided material that is ignitable. Dry titanium fines collected in cyclones have ignited spontaneously when allowed to fall freely through air. Sump fines can spontaneously ignite when dried.

Explosion data	
Sensitivity to mechanical impact	Not sensitive.
Sensitivity to static discharge	Take precautionary measures against static discharges when there is a risk of dust explosion.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Use personal protection recommended in Section 8 of the SDS.
Personal precautions, protective equipment and emergency procedures	
For emergency responders	Use personal protection recommended in Section 8 of the SDS.
Evacuation procedures	None necessary.
Methods and materials for containment and cleaning up	Collect scrap for recycling.

7. Handling and storage

Handling	Avoid contact with sharp edges or heated metal. Avoid generating dust. Use personal protection recommended in Section 10 of the SDS.
Storage	Store away from incompatible materials (see Section 10 of the SDS). Store in accordance with local/regional/national/international regulation.

Requirements for Processes Which Generate Dusts or Fines

Use water based coolants during machining, grinding, sanding or drilling. Operations producing dust should be equipped with a dust collection system discharging into a water-type dust collector. Maintain humidity above 50% to prevent an electrostatic build up. Use non-sparking handling equipment per NFPA 484 and 654. Prohibit smoking. Store wet and keep away from heat and open flame.

Good housekeeping practices must be maintained. Do not use compressed air to remove settled material from floors, beams or equipment.

8. Exposure controls/personal protection

Exposure guidelines

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit. At this time, the other constituents have no known exposure limits.

Occupational exposure limits

U.S. - OSHA Components

Components	Type	Value	Form
Aluminum (CAS 7429-90-5)	TWA	5 mg/m3 15 mg/m3	Respirable fraction Total dust
Chromium (CAS 7440-47-3)	TWA	1 mg/m3	
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0.1 mg/m3	Fume.
Molybdenum (CAS 7439-98-7)	TWA	15 mg/m3	Total dust.

Compounds Formed During Processing

Compounds Formed During Processing	Type	Value	Form
Aluminum oxide (non-fibrous) (CAS 1344-28-1)	TWA	5 mg/m3 15 mg/m3	Respirable fraction. Total dust.
Chromium (II) compounds	TWA	0.5 mg/m3	(as Cr)
Chromium (III) compounds	TWA	0.5 mg/m3	(as Cr)
Chromium (VI) compounds, certain water insoluble forms	TWA	0.0025 mg/m3	Action Level as Cr(VI))
Chromium (VI) compounds	TWA	0.0025 mg/m3	Action Level as Cr(VI)
Iron oxide (CAS 1309-37-1)	TWA	10 mg/m3	Fume.
Molybdenum insoluble compounds	TWA	15 mg/m3	Total dust.
Vanadium pentoxide (CAS 1314-62-1)	Ceiling	0.5 mg/m3	(respirable dust)

Residuals

Residuals	Type	Value	Form
Oil mist, mineral (CAS 8012-95-1)	TWA	5 mg/m3	Mist.

U.S. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Compounds Formed During Processing	Type	Value	Form
Chromium (VI) compounds, certain water insoluble forms	TWA	0.005 mg/m3	as Cr(VI)
Chromium (VI) compounds, water soluble forms	TWA	0.005 mg/m3	
Chromium (VI) compounds	TWA	0.005 mg/m3	as Cr(VI)

U.S. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
Tin (CAS 7440-31-5)	PEL	2 mg/m3	
Compounds Formed During Processing	Type	Value	Form
Titanium dioxide (CAS 13463-67-7)	TWA	15 mg/m3	Total dust.
Vanadium pentoxide (CAS 1314-62-1)	Ceiling	0.5 mg/m3	Respirable dust.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Compounds Formed During Processing	Type	Value	Form
Residuals	Type	0.1 mg/m3 Value	Fume. Form
Oil mist, mineral (CAS 8012-95-1)	PEL	5 mg/m3	Mist.
ACGIH Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m3 0.2 mg/m3	(Dust and Mist) Fume
Compounds Formed During Processing	Type	Value	Form
Aluminum oxide (non-fibrous) (CAS 1344-28-1)	TWA	1 mg/m3	Respirable fraction, as Al
Chromium (VI) compounds, water soluble forms	TWA	0.05 mg/m3	(as Cr)
Chromium (VI) compounds	TWA	0.05 mg/m3	Soluble compounds as Cr
Titanium dioxide (CAS 13463-67-7)	TWA	10 mg/m3	Total dust
Vanadium pentoxide (CAS 1314-62-1)	TWA	0.05 mg/m3	(inhalable fraction)
US ACGIH Threshold Limit Values: Short Term Exposure Limit (STEL): mg/m3			
Components	Type	Value	
Zirconium (CAS 7440-67-7)	STEL	10 mg/m3	
Compounds Formed During Processing	Type	Value	
Zirconium compounds	STEL	10 mg/m3	
US ACGIH Threshold Limit Values: Time Weighted Average (TWA): mg/m3, non-standard units			
Components	Type	Value	Form
Aluminum (CAS 7429-90-5)	TWA	1 mg/m3	Respirable fraction.
Chromium (CAS 7440-47-3)	TWA	0.5 mg/m3	
Tin (CAS 7440-31-5)	TWA	2 mg/m3	
Zirconium (CAS 7440-67-7)	TWA	5 mg/m3	
Compounds Formed During Processing	Type	Value	Form
Chromium (III) compounds	TWA	0.5 mg/m3	
Chromium (VI) compounds, certain water insoluble forms	TWA	0.01 mg/m3	(as Cr)
Chromium (VI) compounds	TWA	0.01 mg/m3	Insoluble compounds as Cr
Iron oxide (CAS 1309-37-1)	TWA	5 mg/m3	Respirable fraction.
Molybdenum insoluble compounds	TWA	3 mg/m3	Respirable fraction.
Vanadium pentoxide (CAS 1314-62-1)	TWA	10 mg/m3 0.05 mg/m3	Inhalable fraction. Inhalable fraction.
Zirconium compounds	TWA	5 mg/m3	
Residuals	Type	Value	Form
Oil mist, mineral (CAS 8012-95-1)	TWA	5 mg/m3	Inhalable fraction.
Alcoa Components	Type	Value	Form
Aluminum (CAS 7429-90-5)	TWA	3 mg/m3	Respirable fraction

Alcoa Components	Type	Value	Form
Compounds Formed During Processing	Type	10 mg/m3 Value	Total dust Form
Aluminum oxide (non-fibrous) (CAS 1344-28-1)	TWA	3 mg/m3	Respirable fraction.
Chromium (VI) compounds Residuals	TWA Type	10 mg/m3 0.25 µg/m3 Value	Total dust. Form
Oil mist, mineral (CAS 8012-95-1)	TWA	0.5 mg/m3	(8 Hour)
General	Personnel who handle and work with molten metal should utilize primary protective clothing like polycarbonate face shields, fire resistant tapper's jackets, neck shades (snoods), leggings, spats and similar equipment to prevent burn injuries. In addition to primary protection, secondary or day-to-day work clothing that is fire resistant and sheds metal splash is recommended for use with molten metal. Synthetic materials should never be worn even as secondary clothing (undergarments).		
	If the product is coated with oil, wear oil-resistant gloves to avoid skin contact. Minimize breathing oil vapors and mist. Remove oil contaminated clothing; launder or dry-clean before reuse. Remove oil contaminated shoes and thoroughly clean and dry before reuse. Cleanse skin thoroughly after contact, before breaks and meals, and at the end of the work period. Oil coating is readily removed from skin with waterless hand cleaners followed by a thorough washing with soap and water.		
Appropriate engineering controls	Dust and fumes from processing: Use with adequate explosion-proof ventilation designed to handle particulates to meet the limits listed in Section 8, Exposure Guidelines.		
Individual protection measures, such as personal protective equipment			
Eye/face protection	Wear safety glasses with side shields (or goggles). Molten metal: Tinted safety glasses or face shield. Wear a face shield when working with molten material.		
Skin protection			
Hand protection	Wear appropriate gloves to avoid any skin injury. The need for personal protective equipment (gloves) should be based upon a hazard assessment and recommendations from health / safety professionals. The most suitable glove must be chosen in consultation with the gloves supplier, who can inform about the breakthrough time of the glove material.		
Other	The need for personal protective equipment should be based upon a hazard assessment and recommendations from health / safety professionals.		
Respiratory protection	Dust and fumes from processing: Use NIOSH-approved respiratory protection as specified by an Industrial Hygienist or other qualified professional if concentrations exceed the limits listed in Section 8. Suggested respiratory protection: P95.		
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.		
General hygiene considerations	Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke.		
Control parameters	Follow standard monitoring procedures.		
Environmental exposure controls	No special environmental precautions required.		

9. Physical and chemical properties

Form	Solid, various shapes and sizes.
Color	Gray.
Odor	Odorless
Odor threshold	Not applicable
pH	Not applicable
Density	4.56 g/cm3 Titanium
Melting point/freezing point	2800.4 - 3200 °F (1538 - 1760 °C)
Initial boiling point and boiling range	Not determined
Flash point	Not applicable

Material name: TITANIUM ALLOYS WITH VANADIUM

341 Version #: 08 Revision date: 10-27-2015 Issue date: 05-28-2015

3DS US

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: tasa de evaporación No es aplicable.

• Inf No es aplicable.

lamabilidad (sólido, gas) aplicable.

Superior / 1, ower flamma, capacidad o exP, losive! imitación Fl 轴 límite de habilidad • - superior • No aplicable (%)

Límite de inflamabilidad - inferior No aplicable (%)

Propiedades Dust ⚡ ¡Los dioses pueden ser! • explosivo: tJ, en condiciones de seguridad. '

explosivas • Propiedades de explosión de polvo Fuerte explosión.

clase St No aplicable No

Presión de vapor Densidad aplicable No

de vapor Relativa ⚡ determinado

densidad Solubili 如 es) Insoluble

Gravidad específica No determinado

Coeficiente de partición No aplicable

• Temperatura de auto-ignición No aplicable

Temperatura de descomposición No aplicable No

'1 / iscosidad. aplicable

10. Estabilidad y

reactividad R, eactivi, ty El producto es estable, e y no-r ⚡ activo en el normal c; : condiciones o{ uso, st9rage y tral') deporte.

Estabilidad química • Estable • bajo condiciones normales de uso, almacenamiento y transporte.

Posibilidad de reacciones peligrosas No se produce una polimerización peligrosa.

Condiciones a evitar Finos de titanio seco recogidos en ciclones se han encendido espontáneamente cuando se permite caer libremente a través del aire. Los incendios de sumidero pueden encenderse de forma espontánea cuando se secan. . • .

Materiales incompatibles A temperaturas anormalmente altas, los baños de descalcificación de ácidos minerales y sales alcalinas fundidas pueden causar reacciones violentas. Las superficies de titanio que se han tratado con ácido nítrico, particularmente con ácido nítrico rojo que contiene 10-20% de tetróxido de nitrógeno, se vuelven piróforas y pueden ser explosivas. Grandes formas de titanio se encenderán espontáneamente en cor.itact con |oxígeno líquido: •,

Las reacciones termitas pueden ocurrir con óxidos de plomo, cobre, hierro, bismuto y ciertos otros metales.



11. Información toxicológica

Efectos para la salud asociados con los ingredientes

Titanio: generalmente considerado biológicamente en 𐄂

Polvo y humos de cromo: Puede causar irritación de los ojos, la piel y las vías respiratorias. Cromo metálico y cromo trivalenteN: clasificables en cuanto a su carcinogenicidad tq humanos por la IARC.

Polvo/finas y humos de aluminio: bajo riesgo para la salud por inhalación. Generalmente se considera biológicamente inerte (fresado, corte, molienda).

Polvo de molibdeno y humos: Puede causar irritación de las membranas mucosas, la piel y el acto respiratorio 'tr'. Acueie sobreexposición: Puede causar dolor de cabeza, dolor de espalda y dolores en las articulaciones. Sobreexposición crónica: Puede causar deformidades de las articulaciones, trastornos sanguíneos, daño renal, daño pulmonar y daño hepático.

Estaño (polvo o humo): sobreexposición crónica: puede causar enfermedad pulmonar benigna (estannosis).

Polvo/niebla de cobre: Puede causar irritación de los ojos, las membranas mucosas, la piel y las vías respiratorias. Sobreexposición crónica: puede causar reducción en el número de glóbulos rojos (anemia), anormalidades de la piel (cambios de pigmentación) y decoloración del cabello.

Algunos • productos se suministran W, ith un recubrimiento de aceite o ha¥ residual 'aceite de la fabricación! El proc ⚡ss. Aceite: ¡9 causas irritadas! en la piel. Contacto con la piel (prolongado o repetido): puede causar dermatitis.



Health effects associated with compounds formed during processing

The following could be expected if welded, remelted or otherwise processed at elevated temperatures:

Titanium dioxide: Can cause irritation of eyes and respiratory tract. Chronic overexposures: Can cause chronic bronchitis. IARC/NTP: Listed as possibly carcinogenic to humans by IARC (Group 2B).

Vanadium pentoxide: Can cause irritation of eyes, skin and respiratory tract. Skin contact (prolonged or repeated): Can cause sensitization and dermatitis. Acute overexposures: Can cause inflammation of the eyes and eyelids (conjunctivitis), bronchitis and fluid in the lungs (pulmonary edema). Effects can be delayed up to 3 days. Chronic overexposures: Can cause kidney damage, blindness, asthma and emphysema. IARC/NTP: Listed as possibly carcinogenic to humans by IARC (Group 2B).

Hexavalent chromium compounds (Chromium VI): Can cause irritation of eye, skin and respiratory tract. Skin contact: Can cause irritant dermatitis, allergic reactions and skin ulcers. Chronic overexposures: Can cause perforation of the nasal septum, respiratory sensitization, asthma, the accumulation of fluid in the lungs (pulmonary edema), lung damage, kidney damage, lung cancer, nasal cancer and cancer of the gastrointestinal tract. IARC/NTP: Listed as "known to be a human carcinogen" by the NTP. Listed as carcinogenic to humans by IARC (Group 1).

Alumina (aluminum oxide): Low health risk by inhalation. Generally considered to be biologically inert.

Molybdenum trioxide: Can cause irritation of eyes, mucous membranes and upper respiratory tract. Chronic overexposures: Can cause reduction in the number of red blood cells (anemia), predisposition to gout, thyroid function changes, liver damage and lung damage. Additional information: Studies with experimental animals by inhalation have found lung cancer.

Zirconium compounds: Skin contact (prolonged or repeated): Can cause lumps on the skin (granulomas).

Tin compounds, inorganic (dust or fume): Can cause irritation of eyes, skin and respiratory tract.

Iron oxide: Chronic overexposures: Can cause benign lung disease (siderosis). Ingestion: Can cause irritation of gastrointestinal tract, bleeding, changes in the pH of the body fluids (metabolic acidosis) and liver damage.

Copper fume: Can cause irritation of the eyes, mucous membranes, and respiratory tract. Acute overexposures: Can cause metal fume fever (nausea, fever, chills, shortness of breath and malaise).

If the product is heated well above ambient temperatures or machined, oil vapor or mist may be generated.

Oil vapor or mist: Can cause irritation of respiratory tract. Acute overexposures: Can cause bronchitis, headache, central nervous system effects (nausea, dizziness and loss of coordination) and drowsiness (narcosis).

Information on likely routes of exposure

Eye contact	Dust and fumes from processing: Can cause irritation. Additional health effects from elevated temperature processing (e.g., welding): Dust and fumes: Can cause inflammation of the eyes and eyelids (conjunctivitis).
Skin contact	Dust from processing: Can cause irritation. Prolonged or repeated skin contact may cause lumps on the skin (granulomas). Additional health effects from elevated temperature processing (e.g., welding): Prolonged or repeated skin contact may cause sensitization and allergic contact dermatitis. Contact with residual oil/oil coating: Prolonged or repeated skin contact may cause dermatitis.
Inhalation	Dust: Can cause irritation of the upper respiratory tract. Acute exposure: Can cause headache and sore joints. Chronic overexposures: Can cause deformities of the joints, blood disorders and kidney damage. Additional health effects from elevated temperature processing (e.g., welding): Dust and fumes: Can cause irritation of the respiratory tract. Acute exposure: Can cause the accumulation of fluid in the lungs (pulmonary edema). Effects can be delayed for several days. Chronic overexposures: Can cause chronic bronchitis, respiratory sensitization, nasal cancer and lung cancer.
Ingestion	Not relevant, due to the form of the product.
Symptoms related to the physical, chemical and toxicological characteristics	Health effects from mechanical processing (e.g., cutting, grinding): Dust: Can cause irritation of the eyes, skin and upper respiratory tract. Acute overexposures: Can cause headache and sore joints. Additional health effects from elevated temperature processing (e.g., welding): Dust and fumes: Can cause irritation of the eyes, skin and respiratory tract. Can cause inflammation of the eyes and eyelids (conjunctivitis). Acute overexposures: Can cause the accumulation of fluid in the lungs. Effects can be delayed for several days.

Information on toxicological effects

Components	Species	Test Results
Aluminum (CAS 7429-90-5)		
Acute		
Inhalation		
LC50	Rat	> 2.3 mg/l 7.6 mg/l
Oral		
LD50	Rat	> 2000 mg/kg
Acute toxicity	Not classified. Based on available data, the classification criteria are not met.	
Skin corrosion/irritation	Non-corrosive.	
Serious eye damage/eye irritation	Based on available data, the classification criteria are not met.	
Respiratory or skin sensitization	Not classified. Based on available data, the classification criteria are not met.	
Respiratory sensitization	Not classified. Based on available data, the classification criteria are not met.	
Skin sensitization	Not classified. Based on available data, the classification criteria are not met.	
Germ cell mutagenicity	Based on available data, the classification criteria are not met.	
Neurological effects	Not classified. Based on available data, the classification criteria are not met.	
Pre-existing conditions aggravated by exposure	Dust from processing: Asthma, chronic lung disease, and skin rashes.	
Carcinogenicity	Not classified. Based on available data, the classification criteria are not met.	
ACGIH Carcinogens		
Aluminum (CAS 7429-90-5)	Not classifiable as a human carcinogen. A4	
Chromium (CAS 7440-47-3)	Not classifiable as a human carcinogen. A4	
Chromium (III) compounds (CAS Varies)	Not classifiable as a human carcinogen. A4	
Chromium (VI) compounds (CAS Varies)	A1 Confirmed human carcinogen.	
Molybdenum (CAS 7439-98-7)	A3 Confirmed animal carcinogen with unknown relevance to humans.	
Oil mist, mineral (CAS 8012-95-1)	A2 Suspected human carcinogen.	
Titanium dioxide (CAS 13463-67-7)	Not classifiable as a human carcinogen. A4	
Zirconium (CAS 7440-67-7)	Not classifiable as a human carcinogen. A4	
Zirconium compounds (CAS Varies)	Not classifiable as a human carcinogen. A4	
IARC Monographs. Overall Evaluation of Carcinogenicity		
Chromium (CAS 7440-47-3)	3 Not classifiable as to carcinogenicity to humans.	
Chromium (III) compounds (CAS Varies)	3 Not classifiable as to carcinogenicity to humans.	
Chromium (VI) compounds (CAS Varies)	1 Carcinogenic to humans.	
Titanium dioxide (CAS 13463-67-7)	2B Possibly carcinogenic to humans.	
US. National Toxicology Program (NTP) Report on Carcinogens		
Chromium (VI) compounds (CAS Varies)	Known To Be Human Carcinogen.	
Oil mist, mineral (CAS 8012-95-1)	Known To Be Human Carcinogen.	
US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)		
Chromium (VI) compounds (CAS Varies)	Cancer	
Reproductive toxicity	Not classified. Based on available data, the classification criteria are not met.	
Routes of exposure	Inhalation. Skin contact. Eye contact.	
Specific target organ toxicity - single exposure	Not classified. Based on available data, the classification criteria are not met.	
Specific target organ toxicity - repeated exposure	Not classified. Based on available data, the classification criteria are not met.	
Aspiration hazard	Not classified. Based on available data, the classification criteria are not met.	
12. Ecological information		
Ecotoxicity	Not expected to be harmful to aquatic organisms.	

Components		Species	Test Results
Chromium (CAS 7440-47-3)			
Aquatic			
Crustacea	EC50	Water flea (<i>Daphnia magna</i>)	0.01 - 0.7 mg/l, 48 hours
Fish	LC50	Carp (<i>Cyprinus carpio</i>)	14.3 mg/l, 96 hours
Copper (CAS 7440-50-8)			
Aquatic			
Crustacea	EC50	Water flea (<i>Daphnia magna</i>)	0.036 mg/l, 48 hours
Fish	LC50	Fathead minnow (<i>Pimephales promelas</i>)	0.0319 - 0.0544 mg/l, 96 hours
Iron (CAS 7439-89-6)			
Aquatic			
Crustacea	LC50	Cockle (<i>Cerastoderma edule</i>)	100 - 330 mg/l, 48 hours
		Common shrimp, sand shrimp (<i>Crangon crangon</i>)	33 - 100 mg/l, 48 hours
Fish	LC50	Channel catfish (<i>Ictalurus punctatus</i>)	> 500 mg/l, 96 hours
Molybdenum (CAS 7439-98-7)			
Aquatic			
Fish	LC50	Rainbow trout, donaldson trout (<i>Oncorhynchus mykiss</i>)	800 mg/l, 96 hours
Persistence and degradability		No data is available on the degradability of this product.	
Bioaccumulative potential		No data available on bioaccumulation.	
Mobility in soil		No data available.	
Other adverse effects		None known.	

13. Disposal considerations

Disposal instructions	Reuse or recycle material whenever possible. Keep scrap separate from other metal scrap. If reuse or recycling is not possible, disposal must be made according to local or governmental regulations.
Waste codes	RCRA Status: Not federally regulated in the U.S. if disposed of "as is." RCRA waste codes other than described here may apply depending on use of the product. Status must be determined at the point of waste generation. Refer to 40 CFR 261 or state equivalent in the U.S. TCLP testing is recommended for chromium in a waste disposal scenario.
Waste from residues / unused products	If reuse or recycling is not possible, disposal must be made according to local or governmental regulations.
Contaminated packaging	Dispose of in accordance with local regulations.

14. Transport information

General Shipping Information

Basic Shipping Information

ID number	-
Proper shipping name	Not regulated
Hazard class	-
Packing group	-

General Shipping Notes

- When "Not regulated", enter the proper freight classification, SDS Number and Product Name onto the shipping paperwork.

Disclaimer

This section provides basic classification information and, where relevant, information with respect to specific modal regulations, environmental hazards and special precautions. Otherwise, it is presumed that the information is not available/not relevant

15. Regulatory information

US federal regulations	In reference to Title VI of the Clean Air Act of 1990, this material does not contain nor was it manufactured using ozone-depleting chemicals. This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. Electrical equipment should meet National Fire Protection Association (NFPA) requirements for locations where material is processed.
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T Artículo 12 b) Notificación de exposición; (40 CFR 1,07, SubP, t. D)
Compuestos de cromo (VI) (GAS varía) 0,1 % Exportación Anual No requerido.
Lista de sustancias peligrosas de CERCLA (40 CFR 302.4)
Cromo (GAS 7440c47-3)

Listado.
Listado.

Substancias específicamente reguladas por la OSHA (29 CFR 1910.1001-1050)
Compuestos de cromo (VI) (GAS varía) Cáncer
Irritación ocular

Ley de Enmiendas y Reautorización de Superfondos de 1986 (SARA)

Peligro de la sección 311/312

Peligro inmediato - Sí
Peligro retrasado - Sí
Peligro de incendio - No
Peligro de presión - No
Riesgo de reactividad - No

Si las partículas/humos generados durante el procesamiento. Si los partículas/humos generados durante el procesamiento.

SARA 302 Substancia extremadamente peligrosa

Nombre químico	Número CAS	Reportable cantidad	Cantidad de planificación umbral	Cantidad de planificación umbral, valor	Cantidad de planificación umbral, valor superior
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Ninguno

SARA 311/312 Peligros
químico

: Descargo de responsabilidad El usuario de este SDS debe verificar la información de concentración específica de la sustancia en relación con: informes regulatorios. Las concentraciones enumeradas pueden cubrir una gama de formulaciones y variaciones de lotes de proceso.

Ley de Enmiendas y Reautorización de Superfondos de 1986 (SARA)

SARA 313 (TRI reportinSJ)

Nombre químico	Número CAS	% por wt.
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Vanadio

711 - 40 - 62	1, - 15
7440 - 47 - 3	0 / 11
7429 - 90 - 5	3 - 8
7440 - 50 - 8	0 - 2

: Regulaciones estatales de EE. UU.,

Propuesta 65 de Estados Unidos de California

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposición 65): Este material no se sabe que contenga ningún producto químico actualmente.

Inventarios internacionales

País(es) o región	Nombre del inventario	En inventario (sí/no)*
Australia	Inventario australiano de sustancias químicas (AICS)	Sí
Canadá	Inventario canadiense de sustancias químicas (ICES)	Ye
Canadá	Lista de sustancias no domésticas (NDSL)	?
China Eurc;	Inventario de sustancias químicas existentes en China (IECSC)	No
ipe	Inventario Europeo de sustancias químicas comerciales existentes (EINECS)	Sí
Europa Japa	Lista Europea de Sustancias Químicas Notificadas (ELINCS)	Sí:
Korea		No
Nueva Zelanda	Inventario de Nueva Zelanda	No
Filipinas		S
		í Sí
		Sí. Sí.

(PICCS),

Inventario de la Ley de Control de Sustancias Tóxicas de Estados Unidos y Puerto Rico (TSCA)

Sí. Sí.

*Un "Sí" indica que todos los componentes de este producto cumplen con los requisitos de inventario administrados por el país o los países reguladores.

Un "No" indica que uno o más componentes del producto no están enumerados o exentos de la lista en la administración de inventario. dirigido por el/los consejo(s) rector(es).

Nombre del material: ALEACIONES DE TITANIO CON VANADIO

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16. Otra información, incluida la fecha de preparación o última revisión

Estado de
SDS

27 de octubre de 2015: Cambio(s) en la Sección: 15 y

16.

- Octubre : 2, 2015: Ch 押 ge(s) en S 的 acción: 1 和 y 16.

28 de mayo de 2015: Nuevo formato.

¿Febrero? , 2015: Cambio(s) en la Sección: 1, 2, 4, 10, 11 y 15.

12 de octubre de 2007: Revisado periódicamente de acuerdo con la política de Alcoa. Cambio(s)

en Section: 1, 2, 3, 4, 5, 7, 8, 10, 11, 12, 13, 14 and 15.

- 23 de junio de 2004: Cambio(s) en la Sección: 1, 2, 3, 5, 8 and 1:2,

20 de agosto de 2001: Cambio(s) en la Sección: 1, 2, 3, 7 y 8. Incluye productos previamente

cubiertos por

Howmet SDS 401 y 402.

Fecha de origen: 26 de enero de 1984

- Control de materiales de bus peligrosos Cotnmi 廿
- ee • Preparador: Jim Perriello

• ~~Medline~~ ~~SDS~~ ~~Chemical~~ ~~Product~~ ~~Information~~ ~~System~~

Fecha de revisión

27 de octubre de 2015.

Versión#

06

Información de
revisión , , ,

Identificación: Restricciones recomendadas

Identificación del peligro (s):

Almacenamiento • Identificación del peligro

(s): Símbolos del GHS

Composición I Información sobre los ingredientes: la divulgación sobrepasa

. Fire-fighting medidas: medios de extinción adecuados

controles de exposición / por 的 Protección nal:

Protección ocular/ facial Propiedades físicas y químicas:

Propiedades múltiples Propiedades físicas y químicas:

Forma

, • Estabilidad 13ª reactividad: Posibilidad de peligro 氏 lous

reactions Información normativa: • Descargo de responsabilidad

• Información regulatoria: regulaciones

Federales de los Estados Unidos

Otra información, incluida la fecha de preparación o última revisión: Otra información 2

GHS: Clasificación

Disclaimer de
responsabilidad

La información en la hoja fue escrita sobre la base de los conocimientos y la experiencia disponibles actualmente.

Otra información

- Guía de Valores de Exposición Ocupacional 2015, compilada por la Conferencia Americana de Higienistas Industriales Gubernamentales (ACGIH).
- Guía de bolsillo de NIOSH para el CL; Lemical Hazards, U.S. Department of Health and Human Services, September 2005.
- expub, Expert Publishing, LLC., www.expub.com,
- Ariel, Compañía 3E, www.3Ecompany.com

Clave/Leyenda:

ACGIH American Conference of Industrial Hygienists
Gubernamentales AICS

CAS Inventario australiano de sustancias químicas
Servicios Abstractos Químicos
CERCLA Comprehensive Environmental Response, Compensation, and
Responsibility Act CFR (Ley de Responsabilidad, Compensación y
Responsabilidad Ambientales Integrales de CERCLA) Código Federal
R! regulaciones,
CP. R cardio resuscitación ulmonar
DOT Departamento de Transporte
DSL Lista de sustancias tóxicas, (Canada)
CE. Concentración Efectiva
ED Dosis Efectiva

EINECS Inventario Europeo de Substancias Químicas Comerciales
Existentes ENCS Japón - Substancias químicas existentes y
nuevas

EWC Catálogo Europeo de
Residuos EPA Agencia de Protección
Ambiental

IAF= International Agency for Research and Development búsqueda en

Caric LC Concentrado letal

LD Dosis letales

MAK Concentración máxima en el lugar de trabajo (Alemania) límite de trabajo
concentración de Arbeitsplatz. NDSL Supuestas no domésticas, Lst (Canadá)

NIOSH Instituto Nacional de Seguridad y Salud Ocupacional

NTP Programa Nacional de Toxicología

OE, L Exposición ocupacional Límite

la OSHA PIN de la Administración de Seguridad y
Salud Ocupacional Número de identificación del
producto

PMCC Copa Cerrada Pensky Marten

RCRA Ley de conservación y recuperación de
recursos SARA Ley de Enmiendas y Reautorización
de Superfondos

SIMDUT System of Information sur les Matières Dangereuses Utilisées au

Travail STEL Límite de exposición a corto plazo

TCLP Programa de lixiviación de productos químicos tóxicos

LDG transporte de mercancías peligrosas

TLV Valor límite umbral

TSCA Ley de control de
sustancias tóxicas TWA

Tiempo Medio ponderado

WHMIS Sistema de Información sobre Materiales

Peligrosos en el Lugar de Trabajo m/rh límite, cm

centímetro, mm milímetro r. en pulgadas,

g. gramo, kg kilogramo, libra libra, µg

micrograma, partes por millón en ppm, pies de

pie

... Fin del SDS ...

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