Coogee Titanium Ti6-4

Coogee Titanium Pty Ltd

Chemwatch Hazard Alert Code: **3**

Chemwatch: **72-6947**
Version No: **8.1**
Safety Data Sheet according to WHS Regulations (Hazardous Chemicals) Amendment 2020 and ADG requirements

Issue Date: **23/12/2022**
Print Date: **12/12/2023**
L.GHS.AUS.EN.E

SECTION 1 Identification of the substance / mixture and of the company / undertaking

Product Identifier

Product name	Coogee Titanium Ti6-4
Chemical Name	Not Applicable
Synonyms	Ti6-4 (Titanium, Aluminum, Vanadium)
Proper shipping name	METAL POWDER, FLAMMABLE, N.O.S. (contains titanium)
Chemical formula	Not Applicable
Other means of identification	Not Available

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Powder metallurgy parts manufacturing, including metal injection molding, rapid prototyping, laser sintering; Coatings using plasma spray, cold spray

Details of the manufacturer or supplier of the safety data sheet

Registered company name	**Coogee Titanium Pty Ltd**
Address	Unit 4, 25 Agosta Dr Laverton North VIC 3026 Australia
Telephone	+61 3 8369 9600
Fax	+61 3 8639 9611
Website	http://www.coogee.com.au/
Email	titanium@coogee.com.au

Emergency telephone number

Association / Organisation	**Coogee Chemicals**
Emergency telephone numbers	**1800 800 655**
Other emergency telephone numbers	**Not Available**

SECTION 2 Hazards identification

Classification of the substance or mixture

HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.

Poisons Schedule	Not Applicable
Classification [1]	Flammable Solids Category 1
Legend:	*1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI*

Label elements

Hazard pictogram(s)	
Signal word	**Danger**

Hazard statement(s)

H228	Flammable solid.

Supplementary statement(s)

Not Applicable

Precautionary statement(s) Prevention

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P240	Ground and bond container and receiving equipment.

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Precautionary statement(s) Response

P370+P378	In case of fire: Use dry agent to extinguish.

Precautionary statement(s) Storage

Not Applicable

Precautionary statement(s) Disposal

Not Applicable

SECTION 3 Composition / information on ingredients

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
7440-32-6	>60	titanium
7429-90-5	0-7	aluminium powder uncoated
7440-62-2	0-5	vanadium
Legend:	*1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L; * EU IOELVs available*	

SECTION 4 First aid measures

Description of first aid measures

Eye Contact	If this product comes in contact with the eyes: ▸ Wash out immediately with fresh running water. ▸ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. ▸ Seek medical attention without delay; if pain persists or recurs seek medical attention. ▸ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel. ▸ **DO NOT** attempt to remove particles attached to or embedded in eye . ▸ Lay victim down, on stretcher if available and pad **BOTH** eyes, make sure dressing does not press on the injured eye by placing thick pads under dressing, above and below the eye. ▸ Seek urgent medical assistance, or transport to hospital. For THERMAL burns: ▸ Do NOT remove contact lens ▸ Lay victim down, on stretcher if available and pad **BOTH** eyes, make sure dressing does not press on the injured eye by placing thick pads under dressing, above and below the eye. ▸ Seek urgent medical assistance, or transport to hospital.
Skin Contact	If skin or hair contact occurs: ▸ Flush skin and hair with running water (and soap if available). ▸ Seek medical attention in event of irritation. In case of burns: ▸ Immediately apply cold water to burn either by immersion or wrapping with saturated clean cloth. ▸ **DO NOT** remove or cut away clothing over burnt areas. **DO NOT** pull away clothing which has adhered to the skin as this can cause further injury. ▸ **DO NOT** break blister or remove solidified material. ▸ Quickly cover wound with dressing or clean cloth to help prevent infection and to ease pain. ▸ For large burns, sheets, towels or pillow slips are ideal; leave holes for eyes, nose and mouth. ▸ **DO NOT** apply ointments, oils, butter, etc. to a burn under any circumstances. ▸ Water may be given in small quantities if the person is conscious. ▸ Alcohol is not to be given under any circumstances. ▸ Reassure. ▸ Treat for shock by keeping the person warm and in a lying position. ▸ Seek medical aid and advise medical personnel in advance of the cause and extent of the injury and the estimated time of arrival of the patient. For thermal burns: ▸ Decontaminate area around burn. ▸ Consider the use of cold packs and topical antibiotics. For first-degree burns (affecting top layer of skin) ▸ Hold burned skin under cool (not cold) running water or immerse in cool water until pain subsides. ▸ Use compresses if running water is not available. ▸ Cover with sterile non-adhesive bandage or clean cloth. ▸ Do NOT apply butter or ointments; this may cause infection. ▸ Give over-the counter pain relievers if pain increases or swelling, redness, fever occur. For second-degree burns (affecting top two layers of skin) ▸ Cool the burn by immerse in cold running water for 10-15 minutes. ▸ Use compresses if running water is not available. ▸ Do NOT apply ice as this may lower body temperature and cause further damage. ▸ Do NOT break blisters or apply butter or ointments; this may cause infection. ▸ Protect burn by cover loosely with sterile, nonstick bandage and secure in place with gauze or tape. To prevent shock: (unless the person has a head, neck, or leg injury, or it would cause discomfort): ▸ Lay the person flat. ▸ Elevate feet about 12 inches. ▸ Elevate burn area above heart level, if possible. ▸ Cover the person with coat or blanket. ▸ Seek medical assistance. For third-degree burns Seek immediate medical or emergency assistance.

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	In the mean time: ▸ Protect burn area cover loosely with sterile, nonstick bandage or, for large areas, a sheet or other material that will not leave lint in wound. ▸ Separate burned toes and fingers with dry, sterile dressings. ▸ Do not soak burn in water or apply ointments or butter; this may cause infection. ▸ To prevent shock see above. ▸ For an airway burn, do not place pillow under the person's head when the person is lying down. This can close the airway. ▸ Have a person with a facial burn sit up. ▸ Check pulse and breathing to monitor for shock until emergency help arrives.
Inhalation	▸ If fumes or combustion products are inhaled remove from contaminated area. ▸ Lay patient down. Keep warm and rested. ▸ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. ▸ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. ▸ Transport to hospital, or doctor. ▸ If dust is inhaled, remove from contaminated area. ▸ Encourage patient to blow nose to ensure clear breathing passages. ▸ Ask patient to rinse mouth with water but to not drink water. ▸ Seek immediate medical attention.
Ingestion	▸ If swallowed do **NOT** induce vomiting. ▸ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. ▸ Observe the patient carefully. ▸ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. ▸ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink. ▸ Seek medical advice.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5 Firefighting measures

Extinguishing media

Metal dust fires need to be smothered with sand, inert dry powders.
DO NOT USE WATER, CO2 or FOAM.
▸ **DO NOT** use halogenated fire extinguishing agents.

Special hazards arising from the substrate or mixture

Fire Incompatibility	Minimum ignition energy: 20mJ ▸ Reacts with acids producing flammable / explosive hydrogen (H2) gas ▸ Keep dry ▸ **NOTE:** May develop pressure in containers; open carefully. Vent periodically. Avoid creating dust - may present dust explosion hazard. Dry dust can be electrostatically charged by turbulence, pneumatic transport, pouring, in exhaust ducts and during transport.

Advice for firefighters

Fire Fighting	Allow fire to burn out. ▸ Alert Fire Brigade and tell them location and nature of hazard. ▸ Wear breathing apparatus plus protective gloves.
Fire/Explosion Hazard	▸ **DO NOT** disturb burning dust. Explosion may result if dust is stirred into a cloud, by providing oxygen to a large surface of hot metal. Decomposes on heating and produces toxic fumes of: metal oxides ▸ Reacts with acids producing flammable / explosive hydrogen (H2) gas
HAZCHEM	4Y

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	Use flame proof vacuum. ▸ Remove all ignition sources. ▸ **DO NOT** touch or walk through spilled material.
Major Spills	· Do not use compressed air to remove metal dusts from floors, beams or equipment · Vacuum cleaners, of flame-proof design, should be used to minimise dust accumulation. · Use non-sparking handling equipment, tools and natural bristle brushes. If molten: ▸ Contain the flow using dry sand or salt flux as a dam. ▸ All tooling (e.g., shovels or hand tools) and containers which come in contact with molten metal must be preheated or specially coated, rust free and approved for such use. ▸ Clear area of personnel and move upwind. ▸ Alert Fire Brigade and tell them location and nature of hazard. Sweep shovel to safe place.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

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SECTION 7 Handling and storage

Precautions for safe handling

Safe handling	‣ Avoid all personal contact, including inhalation. ‣ Wear protective clothing when risk of overexposure occurs. Avoid creating dust - may present dust explosion hazard. Dry dust can be electrostatically charged by turbulence, pneumatic transport, pouring, in exhaust ducts and during transport.
Other information	Store under an inert gas. eg: argon **FOR MINOR QUANTITIES:** ‣ Store in an indoor fireproof cabinet or in a room of noncombustible construction. ‣ Provide adequate portable fire-extinguishers in or near the storage area.

Conditions for safe storage, including any incompatibilities

Suitable container	‣ **CARE**: Packing of high density product in light weight metal or plastic packages may result in container collapse with product release ‣ Heavy gauge metal packages / Heavy gauge metal drums For low viscosity materials and solids: Drums and jerricans must be of the non-removable head type. Where a can is to be used as an inner package, the can must have a screwed enclosure.
Storage incompatibility	‣ Avoid strong acids, bases. ‣ Avoid reaction with oxidising agents ‣ WARNING: Avoid or control reaction with peroxides. All *transition metal* peroxides should be considered as potentially explosive. ‣ Many metals may incandesce, react violently, ignite or react explosively upon addition of concentrated nitric acid. Metals exhibit varying degrees of activity. Reaction is reduced in the massive form (sheet, rod, or drop), compared with finely divided forms. ‣ Many metals in elemental form react exothermically with compounds having active hydrogen atoms (such as acids and water) to form flammable hydrogen gas and caustic products. ‣ Elemental metals may react with azo/diazo compounds to form explosive products. ‣ Finely divided metal powders develop pyrophoricity when a critical specific surface area is exceeded; this is ascribed to high heat of oxide formation on exposure to air. ‣ Safe handling is possible in relatively low concentrations of oxygen in an inert gas. ‣ Keep dry ‣ Reacts slowly with water. ‣ **CAUTION** contamination with moisture will liberate explosive hydrogen gas, causing pressure build up in sealed containers. ‣ Reacts violently with caustic soda, other alkalies - generating heat, highly flammable hydrogen gas. ‣ If alkali is dry, heat generated may ignite hydrogen - if alkali is in solution may cause violent foaming

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	aluminium powder uncoated	Aluminium (metal dust)	10 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	aluminium powder uncoated	Aluminium, pyro powders (as Al)	5 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	aluminium powder uncoated	Aluminium (welding fumes) (as Al)	5 mg/m3	Not Available	Not Available	Not Available

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
titanium	30 mg/m3	330 mg/m3	2,000 mg/m3
vanadium	3 mg/m3	5.8 mg/m3	35 mg/m3

Ingredient	Original IDLH	Revised IDLH
titanium	Not Available	Not Available
aluminium powder uncoated	Not Available	Not Available
vanadium	Not Available	Not Available

MATERIAL DATA

Exposure controls

Appropriate engineering controls	For large scale or continuous use: ‣ Spark-free, earthed ventilation system, venting directly to the outside and separate from usual ventilation systems ‣ Provide dust collectors with explosion vents Metal dusts must be collected at the source of generation as they are potentially explosive. ‣ Avoid ignition sources.
Individual protection measures, such as personal protective equipment	
Eye and face protection	‣ Safety glasses with side shields ‣ Chemical goggles. [AS/NZS 1337.1, EN166 or national equivalent] ‣ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants.
Skin protection	See Hand protection below

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Hands/feet protection	The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application. ‣ Protective gloves eg. Leather gloves or gloves with Leather facing ‣ Wear physical protective gloves, e.g. leather. ‣ Wear safety footwear.
Body protection	See Other protection below
Other protection	· During repair or maintenance activities the potential exists for exposures to toxic metal particulate in excess of the occupational standards. Under these circumstances, protecting workers can require the use of specific work practices or procedures involving the combined use of ventilation, wet and vacuum cleaning methods, respiratory protection, decontamination, special protective clothing, and when necessary, restricted work zones. ‣ Overalls. ‣ Eyewash unit. ‣ Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity. ‣ For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets).

Respiratory protection

Type -P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

· Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
· The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
· Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended.
· Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
· Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU)
· Use approved positive flow mask if significant quantities of dust becomes airborne.
· Try to avoid creating dust conditions.

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Metallic powder; insoluble in water.

Physical state	Divided Solid	**Relative density (Water = 1)**	4.43
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not Available
pH (as supplied)	Not Applicable	**Decomposition temperature (°C)**	Not Available
Melting point / freezing point (°C)	1605-1660	**Viscosity (cSt)**	Not Applicable
Initial boiling point and boiling range (°C)	Not Available	**Molecular weight (g/mol)**	Not Applicable
Flash point (°C)	Not Available	**Taste**	Not Available
Evaporation rate	Not Available	**Explosive properties**	Not Available
Flammability	Not Available	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Available	**Surface Tension (dyn/cm or mN/m)**	Not Applicable
Lower Explosive Limit (%)	Not Available	**Volatile Component (%vol)**	Not Applicable
Vapour pressure (kPa)	Not Applicable	**Gas group**	Not Available
Solubility in water	Immiscible	**pH as a solution (1%)**	Not Applicable
Vapour density (Air = 1)	Not Available	**VOC g/L**	Not Applicable

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	‣ Unstable in the presence of incompatible materials. ‣ Product is considered stable.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 Toxicological information

Information on toxicological effects

Inhaled	The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation of dusts,

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	or fumes, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress. Inhalation of dusts, generated by the material during the course of normal handling, may be damaging to the health of the individual. Inhalation may result in heavy coughing and shortness of breath (respiratory depression) followed by pallor, loss of appetite and increased or decreased red cell count. Human systemic effects may cause bronchiolar constriction, asthma, cough, dyspnea, sputum and conjunctivitis irritation. Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled. If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures. Inhalation of freshly formed metal oxide particles sized below 1.5 microns and generally between 0.02 to 0.05 microns may result in "metal fume fever". Symptoms may be delayed for up to 12 hours and begin with the sudden onset of thirst, and a sweet, metallic or foul taste in the mouth.
Ingestion	Accidental ingestion of the material may be damaging to the health of the individual. Human vanadium poisoning symptoms are for the most part restricted to the conjunctivae and respiratory system, no evidence being found of disturbances of the gastrointestinal tract, kidneys, blood or central nervous system. Acute poisoning in animals by ingestion of vanadium compounds causes nervous disturbances, paralysis of legs, respiratory failure, convulsions, bloody diarrhea and death Rats orally poisoned by vanadium salts show immediate distress, with a haemorrhagic exudate from nose, marked diarrhea, paralysis of the hind limbs, laboured respiration, convulsions (sometimes with asphyxia) and death. Acute toxic responses to aluminium are confined to the more soluble forms.
Skin Contact	The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting. Contact with aluminas (aluminium oxides) may produce a form of irritant dermatitis accompanied by pruritus. Though considered non-harmful, slight irritation may result from contact because of the abrasive nature of the aluminium oxide particles. Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
Eye	Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may cause transient discomfort characterised by tearing or conjunctival redness (as with windburn). Slight abrasive damage may also result. Contact with the eye, by metal dusts, may produce mechanical abrasion or foreign body penetration of the eyeball.
Chronic	On the basis, primarily, of animal experiments, concern has been expressed by at least one classification body that the material may produce carcinogenic or mutagenic effects; in respect of the available information, however, there presently exists inadequate data for making a satisfactory assessment. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems. Chronic exposure to aluminas (aluminium oxides) of particle size 1.2 microns did not produce significant systemic or respiratory system effects in workers. Epidemiologic surveys have indicated an excess of nonmalignant respiratory disease in workers exposed to aluminum oxide during abrasives production. Occupational exposure to aluminium compounds may produce asthma, chronic obstructive lung disease and pulmonary fibrosis. Long-term overexposure may produce dyspnoea, cough, pneumothorax, variable sputum production and nodular interstitial fibrosis; death has been reported. Vanadium compounds are considered to have variable toxicity. Vanadium compounds act chiefly as an irritant to the conjunctivae and respiratory tract. Metallic dusts generated by the industrial process give rise to a number of potential health problems. The larger particles, above 5 micron, are nose and throat irritants.

Coogee Titanium Ti6-4	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
titanium	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: >2000 mg/kg[1]	Not Available
aluminium powder uncoated	**TOXICITY**	**IRRITATION**
	Inhalation(Rat) LC50: >2.3 mg/l4h[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: >2000 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]
vanadium	**TOXICITY**	**IRRITATION**
	Inhalation(Rat) LC50: >5.05 mg/l4h[1]	Not Available
	Oral (Rat) LD50: >2000 mg/kg[1]	
Legend:	*1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances*	

TITANIUM & ALUMINIUM POWDER UNCOATED	No significant acute toxicological data identified in literature search.

Acute Toxicity	✗	**Carcinogenicity**	✗
Skin Irritation/Corrosion	✗	**Reproductivity**	✗
Serious Eye Damage/Irritation	✗	**STOT - Single Exposure**	✗
Respiratory or Skin sensitisation	✗	**STOT - Repeated Exposure**	✗
Mutagenicity	✗	**Aspiration Hazard**	✗

Legend: ✗ *– Data either not available or does not fill the criteria for classification*
✔ *– Data available to make classification*

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SECTION 12 Ecological information

Toxicity

Coogee Titanium Ti6-4

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

titanium

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	72h	Algae or other aquatic plants	13mg/l	2
EC50	48h	Crustacea	>100mg/l	2
LC50	96h	Fish	>100mg/l	2
NOEC(ECx)	48h	Crustacea	<=1mg/l	2

aluminium powder uncoated

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	72h	Algae or other aquatic plants	0.017mg/L	2
EC50	48h	Crustacea	0.736mg/L	2
EC50	96h	Algae or other aquatic plants	0.005mg/L	2
LC50	96h	Fish	0.078-0.108mg/l	2
NOEC(ECx)	48h	Crustacea	>100mg/l	1

vanadium

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	72h	Algae or other aquatic plants	0.989mg/L	2
EC50	48h	Crustacea	0.349mg/L	2
LC50	96h	Fish	0.62mg/L	2
NOEC(ECx)	72h	Algae or other aquatic plants	0.017mg/L	2

Legend: *Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data*

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
	No Data available for all ingredients	No Data available for all ingredients

Bioaccumulative potential

Ingredient	Bioaccumulation
	No Data available for all ingredients

Mobility in soil

Ingredient	Mobility
	No Data available for all ingredients

SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area.

- **DO NOT** allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- Recycle wherever possible.
- Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.

SECTION 14 Transport information

Labels Required

Marine Pollutant	NO
HAZCHEM	4Y

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Land transport (ADG)

14.1. **UN number or ID number**	3089
14.2. **UN proper shipping name**	METAL POWDER, FLAMMABLE, N.O.S. (contains titanium)
14.3. **Transport hazard class(es)**	Class: 4.1 Subsidiary Hazard: Not Applicable
14.4. **Packing group**	II
14.5. **Environmental hazard**	Not Applicable
14.6. **Special precautions for user**	Special provisions: Not Applicable Limited quantity: 1 kg

Air transport (ICAO-IATA / DGR)

14.1. **UN number**	3089
14.2. **UN proper shipping name**	Metal powder, flammable, n.o.s. (contains titanium)
14.3. **Transport hazard class(es)**	ICAO/IATA Class: 4.1 ICAO / IATA Subsidiary Hazard: Not Applicable ERG Code: 3L
14.4. **Packing group**	II
14.5. **Environmental hazard**	Not Applicable
14.6. **Special precautions for user**	Special provisions: A3 A803 Cargo Only Packing Instructions: 448 Cargo Only Maximum Qty / Pack: 50 kg Passenger and Cargo Packing Instructions: 445 Passenger and Cargo Maximum Qty / Pack: 15 kg Passenger and Cargo Limited Quantity Packing Instructions: Y441 Passenger and Cargo Limited Maximum Qty / Pack: 5 kg

Sea transport (IMDG-Code / GGVSee)

14.1. **UN number**	3089
14.2. **UN proper shipping name**	METAL POWDER, FLAMMABLE, N.O.S. (contains titanium)
14.3. **Transport hazard class(es)**	IMDG Class: 4.1 IMDG Subsidiary Hazard: Not Applicable
14.4. **Packing group**	II
14.5 **Environmental hazard**	Not Applicable
14.6. **Special precautions for user**	EMS Number: F-G, S-G Special provisions: Not Applicable Limited Quantities: 1 kg

14.7.1. Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

14.7.2. Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
titanium	Not Available
aluminium powder uncoated	Not Available
vanadium	Not Available

14.7.3. Transport in bulk in accordance with the IGC Code

Product name	Ship Type
titanium	Not Available
aluminium powder uncoated	Not Available
vanadium	Not Available

SECTION 15 Regulatory information

Continued...

Safety, health and environmental regulations / legislation specific for the substance or mixture

titanium is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

aluminium powder uncoated is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

vanadium is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

Additional Regulatory Information

Not Applicable

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No (titanium; aluminium powder uncoated; vanadium)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	No (titanium; aluminium powder uncoated; vanadium)
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - FBEPH	Yes
Legend:	*Yes = All CAS declared ingredients are on the inventory* *No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.*

SECTION 16 Other information

Revision Date	23/12/2022
Initial Date	15/12/2016

SDS Version Summary

Version	Date of Update	Sections Updated
7.1	01/11/2019	One-off system update. NOTE: This may or may not change the GHS classification
8.1	23/12/2022	Classification review due to GHS Revision change.

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

Definitions and abbreviations

- PC—TWA: Permissible Concentration-Time Weighted Average
- PC—STEL: Permissible Concentration-Short Term Exposure Limit
- IARC: International Agency for Research on Cancer
- ACGIH: American Conference of Governmental Industrial Hygienists
- STEL: Short Term Exposure Limit
- TEEL: Temporary Emergency Exposure Limit。
- IDLH: Immediately Dangerous to Life or Health Concentrations
- ES: Exposure Standard
- OSF: Odour Safety Factor
- NOAEL: No Observed Adverse Effect Level
- LOAEL: Lowest Observed Adverse Effect Level
- TLV: Threshold Limit Value
- LOD: Limit Of Detection
- OTV: Odour Threshold Value
- BCF: BioConcentration Factors
- BEI: Biological Exposure Index

Continued...

- DNEL: Derived No-Effect Level
- PNEC: Predicted no-effect concentration

- AIIC: Australian Inventory of Industrial Chemicals
- DSL: Domestic Substances List
- NDSL: Non-Domestic Substances List
- IECSC: Inventory of Existing Chemical Substance in China
- EINECS: European INventory of Existing Commercial chemical Substances
- ELINCS: European List of Notified Chemical Substances
- NLP: No-Longer Polymers
- ENCS: Existing and New Chemical Substances Inventory
- KECI: Korea Existing Chemicals Inventory
- NZIoC: New Zealand Inventory of Chemicals
- PICCS: Philippine Inventory of Chemicals and Chemical Substances
- TSCA: Toxic Substances Control Act
- TCSI: Taiwan Chemical Substance Inventory
- INSQ: Inventario Nacional de Sustancias Químicas
- NCI: National Chemical Inventory
- FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

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