



Material Safety Data Sheet

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21-March-12

Revision Number
9

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	Titanium Metal Powder
UN-No	UN3089
Recommended use	Production of titanium metal components.
Manufactured by	International Titanium Powder - a Cristal Global Company 940 South Frontage Road, Suite 2000 Woodridge, Illinois 60517 Telephone: 815-431-4340 - - Control Room
Company Switchboard Number	815-834-2112 (non emergency)
Other Information	e-mail contact: cldemille@cristalglobal.com
Emergency Telephone Number	Chemtrec: 1-800-424-9300

2. HAZARDS IDENTIFICATION

Emergency Overview
EXTREMELY sensitive to ignition. Minimum Ignition Energy (ASTM E 2019) = <3mJ.
In response to a spill, responders should refer to Emergency Response Guide 170 only.

Appearance
Silver or black metal powder

Physical State
Solid

Odor
Odorless

Potential Health Effects

Acute Toxicity

Skin	Irritating to skin.
Inhalation	May cause irritation of respiratory tract.
Ingestion	May be harmful if swallowed.
Eyes	Irritating to eyes.

Chronic Toxicity

Chronic effects None specifically known. Acute effects dominate.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Formula Ti

Chemical Name	CAS-No.	Weight %
Titanium	7440-32-6	100

4. FIRST AID MEASURES

General Advice	Call 911 or emergency medical service. Move victim to a safe isolated area.
Eye contact	Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.
Skin contact	Wash off immediately with soap and plenty of water. Remove and wash contaminated clothing before re-use. In the event of skin reaction to metal powder, contact a physician.
Inhalation	If not breathing, give artificial respiration. Administer oxygen if breathing is difficult. Seek immediate medical attention/advice. Move to fresh air.
Ingestion	Immediate medical attention is required.
Notes to physician	None.
Protection of First-aiders	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. FIRE-FIGHTING MEASURES

Flammable Properties	Contact with water in a fire event will evolve flammable hydrogen gas. Most fire extinguishing media will cause hydrogen evolution. When the fire is put out, hydrogen may accumulate in poorly ventilated or confined areas and result in flash fire or explosion if ignited. Dusts or fumes may form explosive mixtures in air. May be ignited by heat, sparks or flames. Containers may explode when heated.
Flash Point	Not applicable
Instructions to Firefighters	Do NOT use A-B-C fire extinguisher. Do NOT use halon type fire extinguisher. Do NOT use water, carbon dioxide or dry chemical extinguisher.
Suitable Extinguishing Media	Class D extinguishing agents on fines, dust or molten metal. Dry sand. Sodium chloride powder.
Hazardous Combustion Products	In the event of fire, can produce flammable and toxic gases on contact with water.
Sensitivity to Static Discharge	Powder particulates are EXTREMELY sensitive to ignition. Minimum Ignition Energy = <3mJ. Take precautionary measures against static discharge.
Protective Equipment and Precautions for Firefighters	As in any fire, wear self-contained breathing apparatus and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Keep people away from spill/leak. Remove all sources of ignition. Ensure adequate ventilation. Use personal protective equipment.
Methods for Containment	Prevent further spillage if safe to do so. Prevent material from entering water ways. Clean up as soon as practical.
Methods for Cleaning Up	DO NOT VACUUM. There are reports of titanium dust explosion even when using an explosion-proof vacuum. Cover spill with inert material (i.e. dry sand or earth), then place in a metal waste container with a sealing lid. Use non-sparking tools and equipment. Shovel or sweep up. Take precautionary measures against static buildup.
Other information	Refer to protective measures listed in Sections 7 and 8. Refer to Section 13 for disposal considerations. See Section 12 for additional information. In response to a spill, responders should refer to Emergency Response Guide 170 only.

7. HANDLING AND STORAGE

Handling	Fine dust dispersed in air may ignite. Handle under inert gas, protect from moisture. Keep away from heat, sparks and open flame. No smoking. Keep away from oxidizing materials (e.g. peroxide, bleach, acids). DO NOT VACUUM. Take precautionary measures against static discharges. Humidity >50% will help prevent electrostatic buildup.
Storage	Keep in a dry, cool and well-ventilated place. Keep away from oxidizing materials (e.g. peroxide, bleach, acids). Keep dry and under an inert atmosphere (argon) in the container. Clean up any spilled material immediately. Keep all sources of ignition away from spill. In the event of fire, powder must not be exposed to water. Be aware that building sprinkler systems may contribute to material hazard in the event of a spilled powder fire. An H-3 Occupancy rating is required for storage of flammable solids in quantities greater than 125 pounds based on the International Building Code (IBC) and the International Fire Code (IFC).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures	Ensure adequate ventilation, especially in confined areas. Do not use portable fans as this may create or spread dust.
Personal Protective Equipment	
Eye/Face Protection	Safety glasses with side shields or goggles or face shield.
Skin and Body Protection	Wear fire/flammable resistant/retardant clothing. Leather gloves.
Respiratory Protection	If exposure limits are exceeded or irritation is experienced, MSHA/NIOSH 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.
Electrostatic Protection	Guidance for appropriate electrostatic protection (i.e. footwear) is available in NFPA 484 and in OSHA Directive Number CPL-03-00008.
Hygiene Measures	Handle in accordance with good industrial hygiene and safety practice. Prevent contact with skin eyes and clothing. Do not eat, drink or smoke when using this product. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Silver or black metal powder	Odor	Odorless
Physical State	Solid	pH	Not applicable
Flash Point	Not applicable	Autoignition Temperature	(Powder cloud) 480 °C / 896 °F
Minimum Ignition Energy (mJ)	<3	Boiling Point/Range	3287 °C / 5949 °F
Melting Point/Range	1662 °C / 3024 °F	Flammability Limits in Air	Highly flammable
Explosion Limits	No data available	Evaporation Rate	Not applicable
Water Solubility	Insoluble in water	Vapor Density	Not applicable
Vapor Pressure	Not applicable	Explosive Properties	Kst = 9 bar.m/s (5-7% AD) Kst = 92 bar.m/s (15-25% AD) AD = Apparent Density
Bulk Density	0.23 - 0.32 g/cm ³ (5-7% AD) 0.68 - 1.14 g/cm ³ (15-25% AD) AD = Apparent Density		
VOC Content(%)	Not applicable		

10. STABILITY AND REACTIVITY

Stability	Stable in air. Will burn if ignited.
Incompatible Products	Oxidizing agents. Acids. Halogens. Halides. Metal oxides.
Conditions to avoid	Keep away from open flames, hot surfaces and sources of ignition. Avoid materials which can cause static discharge. Prior to filling or dispensing from container, ground the container liner and the container. Avoid dust formation.
Hazardous decomposition products	Metal oxide fumes.
Hazardous Reactions	May liberate hydrogen gas in contact with water in the presence of a fire.
Hazardous Polymerization	Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Product information Powder is irritating to the skin and eyes on contact. Inhalation will cause irritation to the lungs and mucous membrane. Irritation to the eyes will cause watering and redness. Reddening, scaling and itching are characteristics of skin inflammation.

Chronic effects None specifically known. Acute effects dominate.

Carcinogenicity Not carcinogenic.

Target organ effects Eyes. Skin. Respiratory system.

12. ECOLOGICAL INFORMATION

Ecotoxicity effects None known.

Persistence and degradability Persistent and not biodegradable.

Bioaccumulation/Accumulation Material may have some potential to bioaccumulate.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods If the product is to be disposed 'as received', it is considered to be a hazardous waste having the characteristic of ignitability. Dispose in accordance with local regulations.

Contaminated packaging Clean with water. Reuse or recycle resulting washing effluents. Empty containers should be taken for local recycling, recovery or waste disposal. Dispose of in accordance with local regulations.

US EPA Waste Number D001

Chemical Name	California Hazardous Waste Status
Titanium	Ignitable (powder)

14. TRANSPORT INFORMATION

DOT

Proper Shipping Name Metal powder, flammable, n.o.s.
Hazard Class 4.1
UN-No UN3089
Packing Group II

15. REGULATORY INFORMATION

International Inventories

USA (TSCA)	Complies
Canada (DSL)	Complies
European Union (EINECS)	Complies
Japan (ENCS)	Complies
China (IECSC)	Complies
Korea (KECL)	Complies
Philippines (PICCS)	Complies
Australia (AICS)	Complies
New Zealand (NZIoC)	Complies

Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories

Acute Health Hazard No

Chronic Health Hazard	No
Fire Hazard	Yes
Sudden Release of Pressure Hazard	Yes
Reactivity Hazard	Yes

Clean Water Act

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)

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CERCLA

This product, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

U.S. State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical Name	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Titanium		X			

Other International Regulations

Canada

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class

Division 4 - Flammable Solid



16. OTHER INFORMATION

HMIS Rating

Health Hazard	1
Flammability Hazard	3
Physical Hazard	1
Personal Protection	F

Revision Date 21-March-12

Reason for revision Added reference to Emergency Response Guide 170 in Sections 2 and 6.

Disclaimer

The information provided on this MSDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

End of MSDS