



SAFETY DATA SHEET

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006 as amended by Regulation (EC) No 1272/2008 and Commission Regulation (EU) No 453/2010.

Issuing Date
21-April-11

Revision Date
06-May-13

Revision Number
3.1

1. PRODUCT AND COMPANY IDENTIFICATION

Product identifier

Product Name Titanium Metal Briquettes

Recommended use Production of titanium metal components.

Uses advised against For industrial use only.

Supplier's details

Company PRODUCTION:
Cristal Metals Inc.
1501 Titanium Drive
Ottawa, IL 61350
Telephone: 815-431-4340- - control room

SAMPLES/ R&D:
Cristal Metals Inc.
20634 Gaskin Drive
Lockport, IL 60441

For further information, please contact:

E-mail Address regulatory.query@cristal.com

Emergency Telephone Number	(24/7)
Europe	SGS: + 32 (0)3-575-5555

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

Symbol(s) F - Highly flammable

REGULATION (EC) No 1272/2008

Aspiration toxicity	Not classified
Acute oral toxicity	Not classified
Acute dermal toxicity	Not classified
Skin corrosion/irritation	Not classified
Serious eye damage/eye irritation	Not classified
Respiratory sensitization	Not classified
Skin sensitization	Not classified
Germ cell mutagenicity	Not classified
Carcinogenicity	Not classified
Reproductive toxicity	Not classified
Specific target organ systemic toxicity (single exposure)	Not classified
Specific target organ systemic toxicity (repeated exposure)	Not classified
Acute aquatic toxicity	Not classified

Chronic aquatic toxicity	Not classified
Ozone	Not applicable
Flammable solids .	Category 2



Signal Word: Warning.

Other hazards

Inhalation

The dust may be irritating to the respiratory system.

Skin

Irritating to skin.

Eyes

Irritating to eyes.

Ingestion

Harmful if swallowed.

Hygiene Measures

Do not eat, drink or smoke when using this product. Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday. Prevent contact with skin eyes and clothing.

General Hazards

EXTREMELY sensitive to ignition. Minimum ignition Energy: < 3mJ (ASTM E-2019).

Powder may present an explosion and deflagration hazard risk when dispersed and ignited in air.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No.	EC No.	Weight %	Classification	Annex VI - Harmonized	Self-Classification
Titanium	7440-32-6	231-142-3	100	R11	Flammable Solids - Category 2	

4. FIRST AID MEASURES

Description of necessary first-aid measures

General Advice

Call 112 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.

Ingestion

Immediate medical attention is required.

Inhalation

If not breathing, give artificial respiration. Administer oxygen if breathing is difficult. Seek immediate medical attention/advice. Move to fresh air.

Protection of First-aiders

Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

Most important symptoms/effects

Skin, eye and respiratory irritation.

Indication of immediate medical attention and special treatment needed

Notes to physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES**Extinguishing media - large fires**

Suitable Extinguishing Media Dry sand. Class D extinguishing agents on fines, dust or molten metal. Sodium chloride powder.

Extinguishing media which must not be used for safety reasons Do not use halon type extinguisher. DO NOT use A-B-C fire extinguisher. Do not use water, carbon dioxide or dry chemical extinguisher.

Special hazards arising from the substance or mixture

Specific hazards arising from the chemical Powder particulates are EXTREMELY sensitive to ignition. Minimum Ignition Energy: < 3mJ. Take precautionary measures against static discharge.

Special Exposure Hazards Arising from the Substance/Preparation Including Combustion Products and Gases Dusts or fumes may form explosive mixtures in air. Contact with water in a fire event will evolve flammable hydrogen gas. May be ignited by heat, sparks or flames. Containers may explode when heated. 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.

Special protective equipment for firefighters As in any fire, wear self-contained breathing apparatus and full protective gear.

6. ACCIDENTAL RELEASE MEASURES**Personal precautions, protective equipment and emergency procedures**

Personal Precautions Use personal protective equipment (see Section 8). Ensure adequate ventilation. Remove all sources of ignition. Keep people away from spill/leak.

Other information Refer to protective measures listed in Sections 7 and 8. See Section 12 for additional information. Refer to Section 13 for disposal considerations.

Environmental Precautions Prevent further leakage or spillage if safe to do so. Use dyking to prevent run-off from entering waterways.

Methods and materials for containment and cleaning up

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 (e.g. dry sand or earth), then place in a metal waste container with sealing lid. Use non-sparking tools and equipment. Shovel or sweep up. Take precautionary measures against static buildup. Clean up as soon as practical.

7. HANDLING AND STORAGE**Precautions for safe handling**

Handling Finely divided powder may ignite in the presence of a spark or flame. Airborne dust is EXTREMELY sensitive to ignition - minimize dust formation. Minimum Ignition Energy to ignite airborne dust (ASTM E 2019) = <3mJ. This is equivalent to static pick-up from walking across a floor. Take precautionary measures against static discharges. Keep away from heat, sparks and open flame. No smoking. Keep away from oxidizing materials (e.g. peroxide, bleach, acids). Humidity >50% will help prevent electrostatic buildup.

Hygiene Measures Do not eat, drink or smoke when using this product. Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday. Prevent contact with skin eyes and clothing.

Conditions for safe storage, including any incompatibilities

Storage Keep in a dry, cool and well-ventilated place. Clean up any spilled material immediately. Keep all sources of ignition away from spill. In the event of fire, product must not be exposed to water. Be aware that building sprinkler systems may contribute to material hazard in the event of a fire.

An H-3 Occupancy rating is required for storage of flammable solids in quantities greater than 57 kg based on the International Building Code (IBC) and the International Fire Code (IFC).

Specific end uses

Specific uses Take precautions against the discharge of static electricity during powder handling operations.

Exposure scenario No information available.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

Exposure limits Listed below.

Chemical Name	Austria	Switzerland	Poland	Norway	Ireland
Titanium			NDSch: 30 mg/m ³ NDS: 10 mg/m ³		

Derived No Effect Level (DNEL) No information available.

Predicted No Effect Concentration (PNEC) No information available.

Exposure controls

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 protection Safety glasses with side-shields or goggles or face shield.

Hand protection Leather gloves.

Skin and body protection Fire resistant clothing.

Respiratory protection If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection with HEPA filtration 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.

Hygiene Measures Do not eat, drink or smoke when using this product. Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday. Prevent contact with skin eyes and clothing.

Environmental exposure controls None.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Silver metal briquette, and powder
Odor	Odorless
pH	Not applicable
Vapor Pressure	Not applicable
Vapor Density	Not applicable
Viscosity	Not applicable
Boiling Point/Range	3287 °C / 5949 °F
Melting Point/Range	1662 °C / 3024 °F
Decomposition Temperature	No information available
Explosive Properties	Kst Value = 9 bar.m/s
Flash Point	Not applicable
Oxidizing Properties	Not applicable
Evaporation Rate	Not applicable
Flammability (solid, gas)	Highly flammable
Water Solubility	Insoluble in water
Solubility in other solvents	No information available
Bulk Density	2.2 - 3.0 g/cm ³
VOC Content(%)	Not applicable
Partition coefficient: n-octanol/water	No information available
Autoignition Temperature	(Powder cloud) 480 °C / 896 °F
Molecular Weight	47.867 g/mol
Additional Notes:	Minimum Ignition Energy (MIE): <3 mJ

10. STABILITY AND REACTIVITY

Stability Dry powder is stable in air. Will burn if ignited.

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.

Materials to avoid Acids. Halogens. Oxidizing agents. Halides. Metal oxides.

Hazardous decomposition products Metal oxide fumes.

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.

Component information

Chronic effects

Carcinogenicity Not carcinogenic.

Sensitisation Not a sensitiser.

Mutagenic effects Not a mutagen.

Reproductive toxicity Not a reproductive toxin.

Developmental toxicity Not a developmental toxin.

Target organ effects Eyes. Skin. Respiratory system.

Endocrine disruptor information This product does not contain any known or suspected endocrine disruptors.

12. ECOLOGICAL INFORMATION

Toxicity

Ecotoxicity effects None known.

Persistence and degradability Persistent and not biodegradable.
Bioaccumulative Potential Titanium metal is expected to be bioaccumulative.

Mobility Not mobile (inorganic metal).

PBT and vPvB assessment Not PBT and not vPvB.

13. DISPOSAL CONSIDERATIONS

Waste treatment

Waste from residues/unused products If the product is to be disposed 'as received' it is considered to be a hazardous waste having the characteristic of ignitability. Dispose of 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.

EWC Waste Disposal No 10 08 04 (Wastes from other non-ferrous thermal metallurgy).

14. TRANSPORT INFORMATION**IMDG/IMO**

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

RID

UN-No	UN3089
Proper Shipping Name	Metal powder, flammable, n.o.s.
Hazard Class	4.1
Packing Group	II
Classification Code	F3
Description	UN3089, Metal powder, flammable, n.o.s. (Titanium), 4.1, PG II

ADR

UN-No	UN3089
Proper Shipping Name	Metal powder, flammable, n.o.s.
Hazard Class	4.1
Classification Code	F3

ICAO

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

IATA

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

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

15. REGULATORY INFORMATION

This product is classified as dangerous in accordance with Directives 67/548/EEC and 1999/45/EC.

Symbol(s) F - Highly flammable

S-phrase(s)

S43E - In case of fire, use dry sand (never use water).
S16 - Keep away from sources of ignition - No smoking.
S33 - Take precautionary measures against static discharges.

International Inventories

Special Note: Approved for use in Japan, but not listed on ENCS inventory.

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

Legend

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

PICCS - Philippines Inventory of Chemicals and Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

AICS - Australian Inventory of Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

Chemical safety assessment Hazardous.

16. OTHER INFORMATION

Revision note

Reason for revision Section 1

Disclaimer

The information provided in this document 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. The REACH registration number(s) referred to in sections 1 & 3 cover the volumes of the substance(s) that are placed on the European Economic Area (EEA) market by Cristal entities. EEA importers of the substances in Cristal products may have their own registration obligations under Regulation (EC) 1907/2006 (REACH).

End of Data Sheet