

Product: Spherical Titanium Powder (Fine)**(1) IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY UNDERTAKING**Identification of the substance or preparation

TRADE/MATERIAL NAME: Spherical Titanium Powder (Fine)
CHEMICAL NAME: Ti powder (0-25 µm, 25-45 µm, 0-45 µm)
SYNONYMS: Titanium Powder, CP Ti Grade 1 Powder, Commercially Pure Titanium Powder

Use of the substance/preparation: Powder metallurgy parts manufacturing, including metal injection molding, rapid prototyping, laser sintering; Coatings using plasma spray, cold spray.

Company/undertaking identification: AP&C Advanced Powders and Coatings Inc.
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(2) HAZARDS IDENTIFICATION (EC)

This substance is classified as dangerous according to Directive 67/548/EEC and its amendments.

Classification: F, R11

Physical/Chemical Hazards: Flammable

(3) COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>PERCENT</u>	<u>EC NUMBER</u>	<u>EC CLASSIFICATION</u>
<u>Titanium</u>	7440-32-6	99.5 -99.8	231-142-3	F, R11 (see section 16 for full text of the R-Phrases)

(4) FIRST AID MEASURES

Eye contact: Immediately flush eyes gently and thoroughly, including under the eyelids, with clean running water for 20 minutes.

Skin contact: Wash thoroughly with soap and water. Remove and properly dispose or launder contaminated clothing before wearing it again. Clean material from shoes and equipment. Seek medical attention.

Inhalation: Remove victim to fresh air. Restore and/or support breathing as needed. Seek medical attention.

Ingestion: Call poison control centre. Never give anything by mouth to someone is unconscious or convulsing. A professional decision about whether or not to induce vomiting is required. Seek medical attention.

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- Suitable extinguishing media: Use approved Class D extinguisher or smother with dry sand, dry clay or dry limestone.
- Not suitable as extinguishing media: Do not use water, dry chemical, CO₂, or halon.
- Special protective equipment for fire-fighters: Wear appropriate protective equipment and self-contained breathing apparatus (SBCA).

(6) ACCIDENTAL RELEASE MEASURES

- Personal precautions: Immediately contact emergency personnel. Remove all sources of ignition. Keep unnecessary personnel away. Use suitable protective equipment. Do not touch or walk through spilt material.
- Environmental precautions: Keep spilt material away from drains and runoff, ground-water and soil.
- Methods for clean-up: Do not use compressed air to clean spills. Use non-sparking tools to clean up. Do not push powder long distances across the floor. Keep in small piles away from each other. Place collected material into non-sparking or anti-static containers, containing large quantities of sand, or other appropriate heat dissipation materials. The use of plastic bags is not recommended, due to potential for static electricity build-up (inside plastic bags).

(7) HANDLING AND STORAGE

- Handling: Keep powder away from open flames and other sources of ignition. Try to maintain humidity above 50% to prevent electrostatic build-up. Maintain a supply of "coarse" (rock-type) salt and/or "Class D" (for metal fires) fire extinguisher located near processing and storage areas. No smoking in area. Use non-sparking metal tools and equipment. Keep work areas clean and free of waste.
- Storage: Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Comply with local fire prevention and building codes for the storage of these materials.

(8) EXPOSURE CONTROLS/PERSONAL PROTECTION

- Exposure limit values: Not available
- Occupational exposure controls: Install and operate general and/or local exhaust ventilation systems of sufficient power to maintain airborne concentration below the defined or recommended limit.
- Respiratory protection: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the material, and the safe working limits of the selected respirator.

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<u>Hand protection:</u>	Non-static gloves when skin abrasion is possible. For hygienic reasons, rubber gloves should not be worn more than 2 hours.
<u>Eye protection:</u>	Safety glasses with side shields or goggles when potential exposure exists.
<u>Skin protection:</u>	Wear fire-resistant clothing when handling materials.

(9) PHYSICAL AND CHEMICAL PROPERTIES

<u>General Information :</u>	Appearance – Solid metallic powder, grey Odour – None
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Important health, safety and environmental information:

pH:	Not applicable.
Boiling point:	3260°C
Flash point:	Not available.
Explosive properties:	Fine dust clouds may form explosive mixtures with air.
Oxidising properties:	Not expected.
Vapour pressure:	Not applicable.
Relative density:	4.5 (H ₂ O=1)
Solubility:	Not available.
Water solubility:	Insoluble.
Partition coefficient:	Not applicable.
Viscosity:	Not applicable.
Vapour density:	Not applicable.
Evaporation rate:	Not applicable.

Other Information:

Melting point:	1675°C
Auto-ignition temperature:	480°C very fine particles in cloud form.

(10) STABILITY AND REACTIVITY

This product is stable under normal storage conditions.

<u>Conditions to avoid:</u>	Static electricity, heat or ignition source
<u>Materials to avoid:</u>	Combustible materials, acid, oxidising agents, halogenated hydrocarbons
<u>Hazardous decomposition products:</u>	None

(11) TOXICOLOGICAL INFORMATION

No scientific evidence was found of a health hazard from the inhalation of titanium powder in concentration of air that does not exceed 10 mg/m³ total dust containing less than 1% quartz. The toxicity of titanium has been found

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to be relatively inert. Skin contact with titanium powders may cause physical abrasion. Eye contact has shown particulate irritation. This product is not considered carcinogenic, mutagenic, or teratogenic.

(12) ECOLOGICAL INFORMATION

No known significant effects or critical hazards.

(13) DISPOSAL CONSIDERATIONS

The generation of waste should be avoided or minimised whenever possible. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Disposal of this product, and any by-product should at all times comply with the requirements of environmental protection and waste disposal legislation and any national, regional and local authority requirements. Contaminated packaging materials, cleaning tissues, disposable gloves, and other contaminated materials should be disposed off in the same manner as the product itself.

(14) TRANSPORT INFORMATION

UN Number: UN 3089
Shipping Name: Metal powders, flammable, n.o.s. (Spherical Titanium Powder < 45 µm)
Class: 4.1
Packing Group: II
Label:



(15) REGULATORY INFORMATION

EU REGULATIONS

Hazard Symbol:



Risk phrases: R11 – Highly flammable

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Safety phrases:

- S16 - Keep away from sources of ignition - No smoking.
- S22 - Do not breathe dust.
- S23 - Do not breathe fumes.
- S33 - Take precautionary measures against static discharges.
- S36/37 - Wear suitable protective clothing and gloves.
- S38 - In case of insufficient ventilation, wear suitable respiratory equipment.
- S43 - In case of fire, use sand.
- S51 - Use only in well-ventilated areas.
- S60 - This material and its container must be disposed of as hazardous waste.

CANADIAN REGULATIONS

WHMIS Classification: Class B-4 – Flammable Solids

WHMIS Symbol:



(16) OTHER INFORMATION

NFPA Classification:



Full Text of R-phrases in Section 2 & 3: R11 – Highly Flammable

Full Text of classification in Section 2 & 3: F – Highly Flammable

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Notice:

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with

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caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.