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Material Safety Data Sheet

Titanium Dioxide

Section 1 - Chemical Product and Company Identification

MSDS Name : Titanium Dioxide

Synonyms : Titanium White

Chemical Formula : TiO_2

Company Identification : Tradeasia International Pte Limited
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Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent (%)
13463-67-7	Titanium Dioxide	86 – 97
7631-86-9	Silicon dioxide	0 - 15
21645-51-2	Aluminium hydroxide	0 - 10
1314-23-4	Zirconium dioxide	0 - 2

Section 3 - Hazards Identification

Physical state Solid

Appearance White Powder

Emergency overview CAUTION
May cause eye, skin and respiratory tract irritation.

OSHA regulatory status This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

Potential health effects

Routes of exposure Inhalation. Eye contact. Skin contact.

Eyes Dust may irritate the eyes.

Skin Dust may irritate skin. Skin irritation occurs on contact with moist or wet skin.

Inhalation	May cause respiratory tract irritation. Dust may irritate throat and respiratory system and cause coughing.
Ingestion	May cause discomfort if swallowed.
Target Organs	Eyes. Skin. Respiratory system
Chronic effects	Dusts or powder may irritate the respiratory tract, skin and eyes. Frequent inhalation of fume/dust over a long period of time may increase the risk of developing lung diseases although epidemiological studies among titanium dioxide workers could not demonstrate this.
Signs and symptoms	Upper respiratory tract irritation. Coughing. Irritation of eyes and mucous membranes. Skin irritation.
Potential environmental effects	The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Section 4 - First Aid Measures

First aid procedures

Eye contact	Immediately rinse eyes with water. Remove any contact lenses, and continue flushing eyes with running water for at least 15 minutes. Hold eyelids apart to ensure rinsing of the entire surface of the eye and lids with water. Get immediate medical attention.
Skin Contact	Flush skin thoroughly with water. Get medical attention if irritation develops or persists.
Inhalation	Move to fresh air. Get medical attention if any discomfort continues.
Ingestion	Rinse mouth thoroughly. Do not induce vomiting without advice from poison control center. Never give anything by mouth to an unconscious person. If ingestion of a large amount does occur, call a poison control center immediately.
Notes to physician	Treat symptomatically.
General advice	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

Section 5 - Fire and Explosion Data

Flammable properties	This product is not flammable.
Extinguishing media	
Suitable extinguishing media	Use fire-extinguishing media appropriate for surrounding materials.
Unsuitable extinguishing media	No restrictions known.
Protection of firefighters	
Protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.
Fire fighting equipment/instructions	Firefighters should wear full protective clothing including self contained breathing apparatus. Move containers from fire area if you can do so without risk. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.
Specific methods	In the event of fire, cool tanks with water spray. Move container from fire area if it can be done without risk.

Section 6 - Accidental Release Measures

Personal precautions	Avoid inhalation of dust and contact with skin and eyes. Wear appropriate protective equipment and clothing during clean-up. Local authorities should be advised if significant spillages cannot be contained.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not contaminate water.
Methods for containment	Collect and dispose of spillage as indicated in Section 13 of the MSDS. Prevent entry into waterways, sewer, basements or confined areas.
Methods for cleaning up	Avoid dust formation. Collect powder using special dust vacuum cleaner with particle filter or carefully sweep into closed container. For waste disposal, see Section 13 of the MSDS.
Other information	Clean up in accordance with all applicable regulations.

Section 7 - Handling and Storage

Handling:

Avoid inhalation of dust and contact with skin and eyes. Use only with adequate ventilation. Use Personal Protective Equipment recommended in section 8 of the MSDS. Wash thoroughly after handling. Observe good industrial hygiene practices.

Storage:

Titanium dioxide is a stable chemical compound that does not decompose during storage but can pick up moisture from the environment if not stored properly effecting product performance. Store indoors in a dry place, away from rain and wet floors. Use on a first-in first-out basis from receipt of the shipment.

Section 8 - Exposure Controls, Personal Protection

Engineering controls	Ventilate as needed to control airborne dust. Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of dust.
Personal protective equipment	
Eye / face protection	Wear dust-resistant safety goggles where there is danger of eye contact.
Skin protection	Risk of contact: Wear protective gloves. Wear appropriate clothing to prevent repeated or prolonged skin contact.
Respiratory protection	When engineering controls are not sufficient to lower exposure levels below the applicable exposure limit, use a NIOSH approved respirator for dusts. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever work place conditions warrant a respirator's use. Seek advice from local supervisor.
General hygiene considerations	Do not breathe dust. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

Section 9 - Physical and Chemical Properties

Appearance	:	White powder
Color	:	White
Odor	:	Odorless
Physical state	:	Solid
Form	:	Powder
pH	:	5 - 8.5 (10% slurry)
Melting Point	:	3326 - 3362 °F (1830 - 1850 °C)
Boiling point	:	4532 - 5432 °F (2500 - 3000 °C)
Specific gravity	:	4.1 Approx. (@ 20°C)
Solubility (water)	:	Insoluble
Bulk density	:	600 kg/m³ Approx. (@ 20°C)

Section 10 – Chemical Stability and Reactivity Infoemation

Chemical Stability	:	Material is stable under normal conditions.
Conditions to avoid	:	Avoid dust formation.
Incompatible materials	:	None known.
Hazardous decomposition products	:	No hazardous decomposition products are known.
Possibility of hazardous reactions	:	Hazardous polymerization does not occur.

Section 11 - Toxicological Information

Toxicological data

Components	**Test Results**
Aluminium hydroxide (21645-51-2)	Acute Oral LD50 Rat: > 5000 mg/kg

Acute effects	May cause discomfort if swallowed.
Local effects	Dusts may irritate the respiratory tract, skin and eyes.
Sensitization	Not a skin sensitizer.

Chronic effects	Frequent inhalation of dust over a long period of time may increase the risk of developing chronic lung diseases and skin irritation.
Carcinogenicity	Suspected of causing cancer. IARC has classified TIO2 as 2B Possibly carcinogenic to humans. However, the only evidence of carcinogenicity is in rats exposed to very high concentrations. Two major epidemiology studies among titanium dioxide workers in the US and in EUROPE could not demonstrate an elevated lung cancer risk.

ACGIH Carcinogens

Aluminium hydroxide (CAS 21645-51-2)	A4 Not classifiable as a human carcinogen.
Titanium dioxide (CAS 13463-67-7)	A4 Not classifiable as a human carcinogen.
Zirconium dioxide (CAS 1314-23-4)	A4 Not classifiable as a human carcinogen.

IARC Monographs. Overall Evaluation of Carcinogenicity

Silicon dioxide (CAS 7631-86-9)	3 Not classifiable as to carcinogenicity to humans.
Titanium dioxide (CAS 13463-67-7)	2B Possibly carcinogenic to humans.

Epidemiology	None known.
Mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Neurological effects	None known.
Reproductive effects	None known.
Teratogenicity	None known.
Symptoms and target organs	Dusts or powder may irritate the respiratory tract, skin and eyes. Coughing. Frequent inhalation of dust over a long period of time increases the risk of developing lung diseases.
Further information	No other specific acute or chronic health impact noted.

Section 12 - Ecological Information

Ecotoxicity	The product is not expected to be hazardous to the environment.☐

Environmental effects	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Persistence and degradability	The degradability of the product has not been stated.
Bioaccumulation / Accumulation	Bioaccumulation is unlikely to be significant because of the low water solubility of this product.
Mobility in environmental media	The product is insoluble in water and will sediment in water systems.

Section 13 - Disposal Considerations

Waste codes	Not regulated.
Disposal instructions	Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal. Dispose of this material and its container to hazardous or special waste collection point. Do not allow this material to drain into sewers/water supplies.
Waste from residues / unused products	Dispose of in accordance with local regulations.
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied.

Section 14 - Transportation Information

DOT	Not regulated as dangerous goods. ☐
IATA	Not regulated as dangerous goods.☐
IMDG	Not regulated as dangerous goods.
TDG	Not regulated as dangerous goods.

Section 15 - Regulatory Information

US federal regulations	This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA Hazardous Substances - Not applicable.☐

TSCA Section 12(b) Export Notification(40 CFR 707, Subpt. D)

Not regulated

CERCLA (Superfund) reportable quantity (lbs) (40 CFR 302.4)

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - No Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No
Section 302 extremely hazardous substance (40 CRF 355, Appendix A)	No
Section 311/312 (40 CFR 370)	No
Drug Enforcement Administration (DEA) (21 CFR 1308.11-15)	Not controlled
WHMIS status	Controlled
WHMIS classification	D2A - Other Toxic Effects-VERY TOXIC

Section 16 - Other Information

Recommended use	White pigment for applications in coatings, inks, fibers, plastics, paper, glass, vitreous enamels, and ceramics.
Further information	Nanoparticle Statement- The average primary particle size of this product is larger than the nanoparticle size range as described by ISO/TC 229 and should not be considered as manufactured nanoparticles or nanomaterials. As with other particulate materials there will be a distribution of particle sizes around the average and a small portion of these may

	be covered by the nanoparticle definition. In this product, the primary particle size is in the 200-300 nm range. However, the primary particle size does not represent the size of particles in this product as supplied since these tend to aggregate or agglomerate into larger particles.
HMIS® ratings	Health: 1 Flammability: 0 Physical hazard: 0
NFPA ratings	Health: 1 Flammability: 0 Instability: 0
Disclaimer	The information in the sheet was written based on the best knowledge and experience currently available.