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SAFETY DATA SHEET

Section 1- IDENTIFICATION

COMPOSITION	PRODUCT NAME
Ti	**Titanium**

SUPPLIER:	RECOMMENDED USE:	EMERGENCY TELEPHONE NUMBERS
Plasmaterials, Inc. **1270-B Quarry Lane** **Pleasanton, CA 94566** **Ph: 925-447-4030**	**Laboratory Chemicals** **Scientific Research**	**US: 800-424-9300** **International: 001-703-527-3887**

Section 2- HAZARD(S) IDENTIFICATION

Classification:
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable Solids: Category 1	**Pyrophoric Solids:** Category 1

Self-heating Substances and Mixtures: Category 1

LABEL ELEMENTS: Signal Word: Danger

HAZARD STATEMENTS

-H228: Flammable solid
-H251: Self-heating; may catch fire
-The material as sold in solid form is generally not considered hazardous. However, if the process involves grinding, melting, cutting or any other process that causes a release of dust or fumes, hazardous levels of airborne particulate could be generated.

PRECAUTIONARY STATEMENTS

-P210: Keep away from heat/sparks/open flames/hot surfaces – No Smoking
-P235 + P410: Keep cool. Protect from sunlight.
-P240: Ground/bond container and receiving equipment.
-P241: Use explosion-proof electrical/ventilating/lighting equipment
-P280: Wear protective gloves/protective clothing/eye protection/face protection.
-P370+P378: In case of fire, use appropriate media to extinguish.
-P407: Maintain air gap between stacks/pallets
-P420: Store away from other materials
-P501: Dispose of contents/container to an approved waste disposal plant.

Hazards not otherwise classified (HNOC):
-None identified.

Section 3- COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	CAS-No	Weight %
Titaniun	7440-32-6	<=100

Section 4- FIRST AID MEASURES

GENERAL ADVICE: Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. Show this safety data sheet to the physician in attendance.

INHALATION: Remove victim from exposure to fresh air. Give oxygen if breathing is difficult. If not breathing, give artificial respiration. Call a physician if symptoms develop or persist.

SKIN CONTACT: Wash off with soap and plenty of water while removing all contaminated clothes and shoes. Seek medical attention if irritation develops or persists.

EYE CONTACT: Do not rub eyes. Flush eyes with plenty of water, lifting upper and lower lids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops or persists.

INGESTION: Rinse mouth with water. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur. If ingestion of a large amount occurs, call a poison control center immediately.

MOST IMPORTANT SYMPTOMS/EFFECTS: Direct contact with eyes may cause temporary irritation.

INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED: Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital.

Section 5- FIREFIGHTING MEASURES

Suitable Extinguishing Media:	**Unsuitable Extinguishing Media:**
Water fog, Foam, Dry Chemical Powder, Carbon Dioxide (CO2), dry sand, sodium chloride powder, graphite powder or Met-L-X powder	Do not use water jet as an extinguisher as this will spread the fire.

Specific Hazards Arising from the Chemical:
Gases hazardous to health may be formed during fire

Protective Equipment & Precautions for Firefighters:
As in any fire, Firefighters must wear full face, self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective clothing to prevent contact with skin and eyes.

Fire Fighting Instructions:
In case of fire and/or explosion, do not breathe fumes. Move containers from fire area if you can do so without risk. Use water spray to cool unopened containers.

Specific Methods:
Use standard firefighting procedures and consider the hazards of other involved materials.

General Fire Hazards:
Flammable solid. Self-heating; may catch fire.

Section 6- ACCIDENTAL RELEASE MEASURES

Personal Precautions: Keep unnecessary personnel away. Evacuate personnel to safe areas and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Ensure adequate ventilation. Avoid dust formation. Avoid breathing vapors, mist or gas. Local authorities should be advised if significant spillages cannot be contained. For personal protection see section 8.

Environmental Precautions: Prevent further leakage or spillage if safe to do so. Do not let product discharge into drains, water courses or onto the ground.

Methods for Containment & Clean Up:
Eliminate all ignition sources: no smoking, flares, sparks or flames in immediate area. Take precautionary measures against static discharge. Use only non-sparking tools. Stop the flow of material, if this is without

risk.
Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Following product recovery, flush area with water.
Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal according to local regulations. Never return spills to original containers for re-use. For waste disposal, see Section 13.

Section 7- HANDLING AND STORAGE

Handling: Provide adequate precautions, such as electrical grounding and bonding, or inert atmosphere. Do not handle, store or open near an open flame, sources of ignition or sources of heat. Protect material from direct sunlight. When using do not smoke. Explosion-proof general and local exhaust ventilation. Keep cool. Wear appropriate personal protection equipment. Observe good industrial hygiene practices. Wash hands thoroughly after handling. Use care in handling/storage.

Storage: Keep away from heat, sparks and open flame. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container in a well-ventilated place. Store away from other materials. Maintain air gap between stacks/pallets. Keep in an area equipped with sprinklers.

Section 8- EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines:
Components with Workplace Control Parameters: Contains no substances with occupational exposure limit values.
Appropriate Engineering Controls: Explosion-proof general and local exhaust ventilation. General industrial hygiene practice.

Personal Protective Equipment:
Eye/Face Protection: Safety glasses with side shields or goggles. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).
Skin and Body Protection: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.
Wear suitable protective clothing. Wear appropriate thermal protective clothing when necessary. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory Protection: Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dusk masks. In case of insufficient ventilation, wear suitable respiratory equipment. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
General Hygiene: When using do not smoke. Always observe good personal hygiene measures such as washing after handling the material and before eating, drinking and/or smoking.
Control of Environmental Exposure: No special environmental precautions required.

Section 9- PHYSICAL AND CHEMICAL PROPERTIES

Appearance:
- **Physical State/Form:** Solid
- **Color:** Silver, Grey

Odor: No data available
Odor Threshold: No data available
pH: No data available
Melting Point/Range: 1,677°C / 3,050.6°F
Initial Boiling Point/Range: 3,277°C / 5,930.6°F
Flash Point: No data available
Evaporation Rate: No data available
Flammability (solid, gas): Flammable solid
Flammability Limits:
- **Upper:** No data available
- **Lower:** No data available

Explosive Limits:
Upper: No data available
Lower: No data available
Vapor Pressure: No data available
Vapor Density: No data available
Relative Density: 4.507 g/cm3
Solubility (Water): No data available
Partition coefficient; n-octanol/water: No data available
Auto Ignition Temperature: 1,200°C / 2.192°F
Decomposition Temperature: No data available
Viscosity: No data available
Explosive Properties: No data available
Oxidizing Properties: No data available
Molecular Weight: 47.88 g/mol

Section 10- STABILITY AND REACTIVITY

Reactive Hazard: Stable and non-reactive under normal conditions of use, storage and transport

Stability: Stable under recommended storage conditions.

Possibility of Hazardous Reactions: No data available

Conditions to Avoid: Heat, flames and sparks. Contact with incompatible products.

Incompatible Materials: Strong oxidizing agents, strong acids, chlorinated solvents, halogens, carbon dioxide (CO2), aluminum, oxygen, combustible material

Hazardous Decomposition Products:
Hazardous decomposition products formed under fire conditions – Titanium/Titanium Oxides
Other decomposition products - No data available

Section 11- TOXICOLOGICAL INFORMATION

Toxicological Effects:
Acute Toxicity: No information available
Inhalation: No information available.
Dermal: No information available
Ingestion: Expected to be a low ingestion hazard
Skin Corrosion/Irritation: Prolonged skin contact may cause temporary irritation
Serious eye damage/irritation: Direct contact with eyes may cause temporary irritation
Respiratory or Skin Sensitization: No information available
Carcinogenicity: This product is not considered to be a carcinogen by IARC, ACGIH, NTP or OSHA.
-IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen.
-ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen
-NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen.
-OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen.
Germ Cell Mutagenic Effects: No information available
Reproductive Effects: No information available
Development Effects: No information available
STOT – single exposure: No information available
STOT – repeated exposure: No information available
Aspiration Hazard: No information available
Additional Information:
-RTECS: Not available
-To the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated.

Section 12- ECOLOGICAL INFORMATION

Toxicity: No information available
Persistence and Degradability: No information available
Bioaccumulation/Accumulation: No information available
Mobility in Soil: No information available
Results of PBT and vPvB assessment: PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.
Other Adverse Effects: No information available

Section 13- DISPOSAL CONSIDERATIONS

Waste Disposal Methods: Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dispose of contaminated packaging as unused product.

Section 14- TRANSPORT INFORMATION

DOT: Not regulated as dangerous goods

IATA:

UN-No: UN1352
Proper Shipping Name: Titanium powder, wetted with 25% or more water (a visible excess of water must be present) (a) mechanically produced: particle size less than 53 microns; (b) chemically produced: particle size less than 840 microns
Hazard Class: 4.1
Packing Group: II
Environmental Hazards: No
ERG Code: 3L
Special Precautions for User: Read safety instructions, SDS and emergency procedures before handling.
Other Information:
Passenger and Cargo Aircraft: Allowed with restrictions
Cargo Aircraft Only: Allowed with restrictions

IMDG:

UN-No: UN1352
Proper Shipping Name: Titanium powder, wetted with not less than 25% water (a visible excess of water must be present) (a) mechanically produced: particle size less than 53 microns; (b) chemically produced: particle size less than 840 microns
Hazard Class: 4.1
Packing Group: II
EMS-No: F-A, S-J
Environmental Hazards:
Marine Pollutant: No
Special Precautions for User: Read safety instructions, SDS and emergency procedures before handling.

IATA/ IMDG:

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.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D): Not regulated

U.S. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050): Not regulated

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302

SARA 304 Emergency Release Notification: Not regulated

SARA Hazard Categories:

- **Immediate Hazard:** No
- **Delayed Hazard:** No
- **Fire Hazard:** Yes
- **Pressure Hazard:** No
- **Reactive Hazard:** No

SARA 313 (TRI Reporting): This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313

SARA 311/312 Hazardous Chemical: Yes

CERCLA Hazardous Substance List (40 CFR 302.4): Not listed

HMIS Rating (USA):

- **Health Hazard:** 0
- **Chronic Health Hazard:**
- **Flammability:** 0
- **Physical Hazard:** 0

National Fire Protection Association (USA):

- **Health Hazard:** 0
- **Fire Hazard:** 0
- **Reactivity Hazard:** 0

US California Proposition 65: This product does not contain any chemicals known to the State of California to cause cancer, birth defects or any other reproductive harm.

US New Jersey Right-to-Know Act:

Component	CAS No.	Revision Date
Titanium	7440-32-6	2007-03-01

US Pennsylvania RTK – Hazardous Substances:

Component	CAS No.	Revision Date
Titanium	7440-32-6	2007-03-01

Section 16- OTHER INFORMATION

The above information is accurate to the best of our knowledge. However, since data, safety standards and government regulations are subject to change, the conditions of handling and use, or misuse are beyond our control, Plasmaterials, Inc. makes no warranty, either expressed or implied, with respect to the completeness or continuing accuracy of the information contained herein and disclaims all liability for reliance thereon. Users should satisfy themselves that they have all current data relevant to their particular use.

The information in this SDS was obtained from sources, which we believe are reliable. However, the information is provided without any representation or warranty, expressed or implied, regarding the accuracy or correctness.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

REVISION: 01-01-2026