


ELECTRONIC SPACE PRODUCTS INTERNATIONAL

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MATERIAL SAFETY DATA SHEET
I PRODUCT IDENTIFICATION

Trade Name: Titanium Nitride **Chemical Family:** Metal Nitride
Molecular Formula: TiN **CAS #:** 25583-20-4

II HAZARDOUS INGREDIENTS

Hazardous Components	%	OSHA/PEL	ACGIH/TLV	Sec. 302	Sec. 304	Sec. 313
Titanium Nitride	0-100	N/E	N/E	No	No	No

HMIS Ratings (0-4): Health: 3 Flammability: 2 Reactivity: 2 **Protective Equipment:** goggles, gloves, apron, respirator

III PHYSICAL DATA

Boiling Point:	N/A	Melting Point:	2950 °C
Specific Gravity:	5.22 g/cc	Vapor Pressure:	N/A
Vapor Density:	N/A	Solubility in H₂O:	Essentially insoluble
Appearance and Odor:	Yellow powder or pieces, no odor.	% Volatile:	N/A

IV FIRE AND EXPLOSION HAZARDS DATA

Flash Point: N/A
Explosive Limits: Lower: N/A Upper: N/A

Autoignition Temperature: N/A

Extinguishing Media: Use extinguishing media suitable for surrounding material and type of fire.

Special Fire Fighting Procedures: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.

Unusual Fire & Explosion: May emit toxic fumes of titanium oxide and nitrogen oxide under fire conditions. Powder is highly flammable.

V HEALTH HAZARD INFORMATION

Effects of Exposure:

To the best of our knowledge the chemical, physical and toxicological properties of titanium nitride have not been thoroughly investigated and recorded yet.

Titanium compounds are generally considered to be physiologically inert. There are no reported cases in the literature where titanium as such has caused human intoxication. The dusts of titanium or most titanium compounds such as titanium oxide may be placed in the nuisance category (Sax, Dangerous Properties of Industrial Materials, eighth edition).

The details of the toxicity of nitrides as a group are unknown. However, many nitrides react with moisture to evolve ammonia. This gas is an irritant to mucous membranes.

Acute Effects:

Inhalation: May cause irritation to the respiratory system and mucous membranes of the nose and throat. Ammonia gas may cause irritation to the nose and throat, dyspnea, bronchial spasms, chest pain, pulmonary edema and pink frothy sputum.

Ingestion: Considered to have low toxicity by ingestion. Ammonia gas may cause nausea, vomiting and burns.

Skin: May cause irritation. Ammonia gas may cause irritation and chemical burns.

Eye: May cause moderate irritation. Ammonia gas may cause severe irritation and chemical burns.

Chronic Effects:

Inhalation: May cause pulmonary edema. Repeated or prolonged exposure to ammonia gas may cause swelling of mouth and throat to the point of asphyxiation, permanent injury and death.

Ingestion: No chronic health effects recorded.

Skin: Repeated or prolonged exposure to ammonia gas may cause tissue damage.

Eye: Repeated or prolonged exposure to ammonia gas may cause irreversible damage to the conjunctiva, cornea and lens.

Routes of Entry: Inhalation, skin, eye.

Target Organs: May affect the respiratory system, skin and eyes.

Medical Conditions Generally Aggravated by Exposure: Persons with preexisting eye or skin conditions or impaired pulmonary function may be more susceptible to the effects of this product.

Carcinogenicity: NTP: No

IARC Monographs: No

OSHA Regulated: No

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Remove victim to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

INGESTION: If swallowed, wash out mouth with water provided person is conscious. Call a physician.

SKIN: Wash with soap and water and a large volume of water. Seek medical assistance as necessary, especially if irritation develops or persists.

EYE: Flush with copious amounts of water for 15 minutes. Consult a physician if irritation persists.

VI REACTIVITY DATA

Stability: Stable

Conditions to Avoid: Moisture, heat

Incompatibility (Material to Avoid): Strong oxidizing agents, strong acids.

Hazardous Decomposition Products: Thermal decomposition may produce oxides of titanium and nitrogen.

Hazardous Polymerization: Will not occur

VII SPILL OR LEAK PROCEDURES

Steps to Be Taken in Case Material Is Released or Spilled: Utilize recommended protective clothing and equipment. Spills should be swept up and placed in containers. Avoid generation of dust. If dust is generated, use appropriate respiratory protection. Spill area can be washed with water. Collect wash water for approved disposal. Keep from entering water or ground water.

Waste Disposal Method: Dispose of in accordance with all Federal, State and Local Environmental Regulations.

VIII SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type): Work ambient concentrations should be monitored and if the recommended exposure limit is exceeded, a NIOSH/MSHA approved dust respirator should be worn.

Ventilation: Use local exhaust or other means to control airborne dust.

Protective Gloves: Compatible chemical resistant gloves

Eye Protection: Chemical safety goggles

Other Protective Clothing or Equipment: Chemically resistant clothing is recommended to minimize skin contact.

IX SPECIAL PRECAUTIONS

Precautions to Be Taken in Handling and Storage: Avoid breathing dust. Avoid getting in eyes or on skin. Wash thoroughly after handling. Store in a dry place away from excessive heat. Avoid contact with moisture. Reseal containers immediately after use. Store away from food and beverages.

Work Practices: Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly

before eating or smoking. Do not blow dust off clothing or skin with compressed air. Maintain eyewash capable of sustained flushing, safety drench shower and facilities for washing.

The above information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. ESPI shall not be held liable for any damage resulting from handling or from contact with the above product.

Issued by: S. Dierks
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