



ELECTRONIC SPACE PRODUCTS INTERNATIONAL

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MATERIAL SAFETY DATA SHEET

I PRODUCT IDENTIFICATION

Trade Name:	Hafnium Nitride	Chemical Family:	Metal nitride
Formula:	HfN	CAS #:	25817-87-2
Molecular Weight:	192.50		

II HAZARDOUS INGREDIENTS

<u>Hazardous Component</u>	<u>%</u>	<u>OSHA/PEL</u>	<u>ACGIH/TLV</u>
Hafnium Nitride	100	0.05 mg/m ³ (as Hf)	0.05 mg/m ³ (as Hf)

HMIS Hazard Rating (0-4): Health: 3 Flammability: 2 Reactivity: 2

III PHYSICAL DATA

Boiling Point:	N/E or N/A	Melting Point:	3305 °C
Vapor Pressure:	No data	Density gm/cc:	11.7
Solubility in Water:	Insoluble	% Volatile by Volume:	N/E or N/A
Appearance and Odor:	Yellow-brown crystalline solid, ammonia odor in moist air.		

IV FIRE AND EXPLOSION HAZARDS DATA

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

Autoignition Temperature: N/A

Extinguishing Media: DO NOT USE WATER. Use class D or other metal extinguishing agent.

Special Firefighting Procedures: Firefighters must wear a full face, self-contained breathing apparatus and full protective clothing to prevent contact with skin and eyes. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.

Unusual Fire and Explosion Hazards: Contact with acids may generate flammable hydrogen gas. Reacts with moist air to

liberate ammonia gas which can form explosive mixtures with air.

V HEALTH HAZARD INFORMATION

Effects of Exposure:

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

Hafnium is a poison by unspecified route. It is poorly soluble in water and thus is not absorbed efficiently by ingestion. Many hafnium compounds are poisons.

Ammonia gas is a human poison by an unspecified route. Poison by inhalation, ingestion, and possibly other routes. An eye, mucous membrane, and systemic irritant by inhalation. Mutation data reported. (Sax, Dangerous Properties of Industrial Materials, eighth edition)

Acute Effects:

Inhalation: May cause irritation to the nose, throat and mucous membranes. 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, ingestion, skin, eye

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

Medical Conditions Generally Aggravated by Exposure: Pre-existing lung and skin disorders.

Carcinogenicity: NTP: No **IARC Monographs:** No **OSHA Regulated:** Yes

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Remove victim to fresh air. Seek medical attention. Give oxygen if breathing is difficult.

INGESTION: Do not induce vomiting. Seek medical attention.

SKIN: Remove contaminated clothing; brush material off skin. Wash affected area with soap and water. Seek medical attention.

EYES: Flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention.

VI REACTIVITY DATA

Stability: Stable

Conditions to Avoid: Moisture

Incompatibility (Material to Avoid): Water, steam, moisture and strong oxidizing agents.

Hazardous Decomposition Products: Ammonia gas, hydrogen gas, and oxides of nitrogen.

Hazardous Polymerization: Will not occur

VII SPILL OR LEAK PROCEDURES

Steps to Be Taken in Case Material Is Released or Spilled: Wear a self-contained breathing apparatus and full protective clothing. Isolate the area where the spill occurred and insure that proper ventilation is available. Vacuum up spill using a high efficiency particulate absolute (HEPA) filter and place in a closed container for proper disposal. Take care not to raise dust.

Waste Disposal Method: Dispose of in accordance with applicable Federal, State and Local regulations.

VIII SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type): Wear NIOSH-approved respirator.

Ventilation: Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Handle in an inert gas such as argon. Use local exhaust to maintain exposure below TLV. Mechanical exhaust is not recommended.

Protective Gloves: Butyl or polycarbonate gloves

Eye Protection: Safety glasses or goggles

Other Protective Equipment: Protective gear suitable to prevent contamination.

IX SPECIAL PRECAUTIONS

Precautions to Be Taken in Handling and Storage: Store in an inert atmosphere. Store in a tightly sealed containers in a cool, dry area. Wash hands and face thoroughly after handling.

Other Precautions: Hafnium nitride may be moisture sensitive, handle and store under argon or other inert gas.

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 and 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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