

**MATERIAL SAFETY DATA SHEET****I PRODUCT IDENTIFICATION**

**Trade Name:** Niobium **Synonyms:** Columbium  
**Chemical Nature:** Metal **Formula:** Nb  
**CAS #:** 7440-03-1

**II HAZARDOUS INGREDIENTS**

<b>Hazardous Components</b>	<b>%</b>	<b>OSHA/PEL</b>	<b>ACGIH/TLV</b>	<b>Sec. 302</b>	<b>Sec. 304</b>	<b>Sec. 313</b>
Niobium	0-100	N/E	N/E	No	No	No

**Occupational Exposure Limits:** 15 mg/m<sup>3</sup> for inert or nuisance dust.

**HMIS Hazard Ratings:** Health: 0 **Flammability:** 0 **Reactivity:** 0

**III PHYSICAL DATA**

<b>Boiling Point 760 mm Hg:</b>	5127 °C	<b>Melting Point:</b>	2468 °C
<b>Specific Gravity (Water=1):</b>	8.57 gm/cc	<b>Vapor Density:</b>	N/A
<b>Vapor Pressure (mm Hg):</b>	N/A	<b>% Volatiles:</b>	N/A
<b>Appearance and Odor:</b>	Lustrous, steel gray metal, no odor.	<b>Solubility in H<sub>2</sub>O:</b>	Insoluble

**IV FIRE AND EXPLOSION HAZARDS DATA**

**Autoignition Temperature:** Solid metal will not ignite. High surface area material such as 5 micron powder may autoignite at room temperature.

**Extinguishing Media:** Dolomite, dry powder for metal fires, sand, graphite, soda ash, sodium chloride.

**Special Fire Fighting Procedures:** Isolate burning material. It is advisable to allow fires to burn out, keeping the fire from spreading. Wear reflective heat resistant suit. Small fires can be controlled by smothering with dry table salt or using Type D dry-powder fire extinguishing materials.

**Unusual Fire and Explosion Hazards:** Do not spray water on burning fines, chips or powder as a violent explosion may result. The hazard increases with finer particles. Carbon dioxide is not effective in extinguishing burning niobium.

**V HEALTH HAZARD INFORMATION**

**Effects of Exposure:**

**Acute Effects:**

**Inhalation:** May cause irritation of the mucous membranes. Inhaled particles may be retained in the lungs.

**Ingestion:** Metallic niobium has a low order of toxicity due to poor absorption from stomach and intestines.

**Skin:** May cause irritation.

**Eye:** May cause transient, mechanical irritation.

**Chronic Effects:** Chronic eye exposure may cause conjunctivitis. Niobium crosses the placental barrier in animals.

**Corrosive:** No      **Carcinogen:** No      **Sensitizer:** No

#### **EMERGENCY AND FIRST AID PROCEDURES:**

**INHALATION:** Remove from exposure immediately. Perform artificial respiration if needed. Get medical attention.

**INGESTION:** If vomiting occurs, keep head lower than hips to help prevent aspiration. Get medical attention, if needed.

**SKIN:** Wash with soap or mild detergent and large amounts of water. Get medical attention, if needed.

**EYES:** Wash eyes immediately with large amounts of water, lifting upper and lower lids. Get medical attention immediately.

#### **VI REACTIVITY DATA**

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**Stability:** Stable

**Conditions to Avoid:** None reported.

**Incompatibility (materials to avoid):** Niobium metal is rapidly dissolved by hydrofluoric acid or hydrofluoric-nitric acid mixtures. Niobium ignites in cold fluorine, and above 200 °C will react exothermically with chlorine, bromine, and halocarbons such as carbon tetrachloride, carbon tetrafluoride and freons.

**Hazardous Decomposition Products:** The above reaction with incompatible materials will generate hazardous reaction products such as flammable hydrogen, toxic fumes of nitrogen oxides or corrosive niobium halide vapors.

**Hazardous Polymerization:** Will not occur

#### **VII SPILL OR LEAK PROCEDURES**

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**Steps to be taken in case material is released or spilled:** Collect spilled material in appropriate container for disposal.

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

#### **VIII SPECIAL PROTECTION INFORMATION**

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**Respiratory Protection:** Wear appropriate NIOSH-approved respirator if dust or fume exposure levels are exceeded.

**Ventilation:** Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

**Protective Gloves:** Chemical resistant gloves

**Eye Protection:** Safety goggles

**Other Protective Clothing or Equipment:** Wear appropriate chemical resistant clothing.

#### **IX SPECIAL PRECAUTIONS**

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**Precautions To Be Taken During Handling & Storage:** Store and handle in accordance with all current regulations and standards. Store away from incompatible substances, such as oxidizers and mineral acids. Use methods to minimize dust. Machining of niobium may result in fine turnings, chips or dust. Any material with a dimension of less than .001" is flammable. Keep away from any source of ignition. Do not accumulate large quantities of fines or machining residues. Dispose of these materials daily.

**Work Practices:** Implement engineering and work practice controls to reduce and maintain concentration of exposure. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating or smoking. Provide and emergency eye wash fountain and quick drench shower in the immediate work area. Do not blow dust off clothing or skin with compressed air.

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