MATERIAL SAFETY DATA SHEET

SECTION 1. IDENTITY

Product: BETA III TITANIUM ALLOY (SOLIDS)

Chemical Family: Titanium Alloy

Supplier:

Address:

Telephone: (510) 623-6996

Date Prepared: August 31, 1998

SECTION 2. INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Components</th>
<th>Wt%</th>
<th>CAS. NO.</th>
<th>OSHA Exposure Limits (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molybdenum, Mo</td>
<td>10.00-13.00</td>
<td>7439-98-7</td>
<td>10, insoluble dust</td>
</tr>
<tr>
<td>Tin, Sn</td>
<td>3.75-5.25</td>
<td>7440-31-5</td>
<td>2, as SnO₂</td>
</tr>
<tr>
<td>Titanium, Ti</td>
<td>74.25-81.75</td>
<td>7440-32-6</td>
<td>10 as TiO₂ dust</td>
</tr>
<tr>
<td>Zirconium, Zr</td>
<td>4.50-7.50</td>
<td>7440-67-7</td>
<td>5</td>
</tr>
</tbody>
</table>

SECTION 3. PHYSICAL DATA

- Boiling Point @ 760 mm Hg: Above 2000°C
- Specific Gravity (H₂O = 1): 5.06
- Freezing/Melting Point: Above 1500°C
- Solubility (weight % in water): Insoluble
- Bulk Density: 0.183 lb/in.³, solids
- % Volatile by Volume: Nonvolatile
- Vapor Pressure: 0 @ 20°C
- Appearance and Color: Silver-grey metal, Orderless
SECTION 4. REACTIVITY DATA

Stability: Stable
Hazardous Polymerization: Will not occur
Conditions to avoid: See Section 9, Discussion of pyrophoric nature of machining fines.
Incompatibility (Material to Avoid): Titanium base alloys are rapidly dissolved by hydrofluoric acid or hydrofluoric-nitric acid mixtures. Titanium based alloys will ignite in cold fluorine and above 200°C will react exothermally with chlorine, bromine, and halo carbons such as carbon tetrachloride, carbon tetrafluoride and Freons™.
Hazardous Decomposition Products: This alloy will not decompose. However, reactions with incompatible materials will generate reaction products such as flammable hydrogen, toxic fumes of nitrogen oxide or corrosive halide vapors.

SECTION 5. FIRE AND EXPLOSION HAZARD DATA

Ignition Point: Solid metal will not ignite. High surface material such as 5 micron powder may auto ignite at room temperature.
Minimum Explosible Concentration (g/m3): N. Av.
Extinguishing Media: Dry table salt or type D fire extinguisher.
Fire Fighting Procedure: Isolate burning material. It is advisable to allow fire 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 material.
Unusual Fire 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 Titanium alloys.

SECTION 6. HEALTH HAZARD DATA

Occupational Exposure Limits: None known. Exposure limits for individual elements shown in Section 2.
Routes Of Entry
Inhalation: No
Ingestion: No
Skin Absorption: No
Skin/Eye Contact: None
Target Organs: None
Toxicity Data: This alloy has no known toxicity in metallic form.
Corrosive: No
Carcinogen: No
Sensitizer: No
Acute Effects From Exposure: None
Chronic Effects From Exposure: None known.
SECTION 7. EMERGENCY AND FIRST AID PROCEDURES

Inhalation: Remove to clean atmosphere  
Eye Contact: Normal procedures for foreign object  
Skin Contact: Not Applicable  
Ingestion: Not Applicable

SECTION 8. EMPLOYER PROTECTION

Respiratory Protection: Wear appropriate NIOSH-approved respirator when generation dust or fumes. Have adequate ventilation for grinding operations.

Protective Clothing: Use of gloves is advisable to avoid cuts.

Eye Protection: Use normal precautions.

SECTION 9. SPECIAL PROCEDURES

Precautions To Be Taken During Handling And Storage: Machining of Titanium alloys may result in fine turnings, chips or dust. Any material with a dimension less than 0.001 inch is flammable. Keep fines away from any source of ignition.

Other Precautions: Do not accumulate large quantities of fines or machining residues. FIRE HAZARD. Dispose of these materials daily.

SECTION 10. ENVIRONMENTAL PROTECTION

Spill or Leak Procedures: No special Procedure.

Waste Disposal: Fine, non-recyclable scrap should be burned in small quantities under controlled conditions. The resulting metallic oxides are inert and may be deposited in a landfill.

Environmental Hazards: None

SECTION 11. TRANSPORTATION REQUIREMENTS

Department Of Transportation Classification: Not hazardous by D.O.T. regulations.