MATERIAL SAFETY DATA SHEET

I PRODUCT IDENTIFICATION

Trade Name: Inconel

II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No.</th>
<th>%</th>
<th>OSHA/PEL</th>
<th>ACGIH/TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>7429-90-5</td>
<td>0.00</td>
<td>N/E</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td>Manganese</td>
<td>7439-96-5</td>
<td>0.35</td>
<td>5 mg/m³</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td>Carbon</td>
<td>7440-44-0</td>
<td>0.08</td>
<td>5 mg/m³</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>7439-98-7</td>
<td>0.35</td>
<td>15 mg/m³</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td>Chromium</td>
<td>7440-47-3</td>
<td>14 - 23</td>
<td>1.0 mg/m³</td>
<td>0.5 mg/m³</td>
</tr>
<tr>
<td>Nickel</td>
<td>7440-02-0</td>
<td>50 - 72</td>
<td>1.0 mg/m³</td>
<td>1.0 mg/m³</td>
</tr>
<tr>
<td>Cobalt</td>
<td>7440-48-4</td>
<td>1</td>
<td>1.0 mg/m³</td>
<td>0.1 mg/m³</td>
</tr>
<tr>
<td>Niobium</td>
<td>7440-03-1</td>
<td>3.15 - 5.5</td>
<td>5 mg/m³</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td>Silicon</td>
<td>7440-21-3</td>
<td>0.35 - 0.5</td>
<td>15 mg/m³</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td>Copper</td>
<td>7440-03-1</td>
<td>0.3 - 0.5</td>
<td>1.0 mg/m³</td>
<td>1.0 mg/m³</td>
</tr>
<tr>
<td>Titanium</td>
<td>7440-32-6</td>
<td>0.4 - 1.15</td>
<td>15 mg/m³</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td>Iron</td>
<td>7439-89-6</td>
<td>5 - 22</td>
<td>10 mg/m³</td>
<td>5 mg/m³</td>
</tr>
</tbody>
</table>

III PHYSICAL DATA

Boiling Point: N/E or N/A
Specific Gravity: 5 - 10 g/cc
% Volatiles: N/A
Appearance and Odor: Solid metallic silver metal, odorless

IV FIRE AND EXPLOSION HAZARDS DATA

Flash Point (method used): N/A
Autoignition Temperature: No Data
Flammable Limits: UEL: N/A  LEL: N/A
Extinguishing Media: Use suitable extinguishing media for surrounding materials and type of fire.
Special Fire Fighting Procedures: Firefighters must wear full face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes.
Unusual Fire and Explosive Hazards: None, this product is a noncombustible material.

V HEALTH HAZARD INFORMATION

Effects of Exposure:

To the best of our knowledge the chemical, physical and toxicological properties of inconel alloy have not been thoroughly investigated and reported. In its solid form, this material has no known toxicological properties other than causing allergic reactions in individuals sensitive to the metals contained in it. User generated dusts or fumes may cause irritation to skin and eyes.

Chronic Effects: Chronic exposure could cause dermatitis or conjunctivitis. Excessive inhalation of user generated fumes from...
welding may pose long-term health effects.

**Medical Conditions Aggravated by Exposure:** None known

**Carcinogenicity (Nickel):** NTP: Yes    IARC: Yes    OSHA: No

**EMERGENCY AND FIRST AID PROCEDURES:**

**INHALATION:** Remove from exposure. If severe respiratory irritation persists, seek medical attention.

**INGESTION:** While ingestion of large enough quantities to cause health effects is unlikely, consult a physician if it occurs.

**SKIN:** Wash with water and a mild detergent. If rash develops seek medical attention.

**EYES:** Flush with water for at least 15 minutes. If irritation persists seek medical attention.

**VI  REACTIVITY DATA**

**Stability:** Stable.

**Conditions to Avoid:** None known

**Incompatibility:** Reacts with strong acids to generate hydrogen gas.

**Hazardous Decomposition Products:** Metallic oxides, chromates, fluorides, carbon monoxide, ozone, oxides of nitrogen, phosgene. Dusts and fume generate hydrogen gas.

**Hazardous Polymerization:** Will not occur

**VII  SPILL OR LEAK PROCEDURES**

**Steps to Be Taken If Spilled or Released:** (For dusts or powders) wear appropriate respiratory and protective equipment. Sweep or vacuum up spill using a high efficiency absolute particulate (HEPA) air filter and place in a closed container. Take care not to raise dust.

**Waste Disposal Method:** In accordance with Local, State and Federal Waste Disposal Regulations.

**VIII  SPECIAL PROTECTION INFORMATION**

**Respiratory Protection:** NIOSH approved dust/mist/fume respirators. Use an air supplied respirator when welding in a confined space.

**Ventilation Requirements:** Use local exhaust ventilation to keep airborne concentrations of dust and fumes below the TLV.

**Gloves:** Gloves and barrier creams may be necessary to prevent skin sensitization and dermatitis.

**Eye/Face Protection:** Safety glasses should always be worn when grinding or cutting. Face shields should be worn with proper eye protection when welding or burning.

**Other Clothing or Equipment:** Protective gear suitable to prevent contamination.

**IX  SPECIAL PRECAUTIONS**

**Work Practices:** Use industrial hygiene air monitoring to ensure that your use of material does not create exposures which exceed recommended limits. Wash thoroughly after handling and before eating or smoking. Do not blow dust off clothing or skin with compressed air.

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

**Date:** March 2002