Material Safety Data Sheet

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Emergency Phone Numbers:
CHEMTREC: 800-424-9300
POISON CENTER: 800-562-8236

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Section 1:
Product Identification

Chemical Name(s) and Synonym(s): Hafnium Oxide  Formula: HfO2
Chemical Family: Metal Oxide  Chem. Abstract No: 12055-23-1
Cal. Molecular Weight: 210.49

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Section 2:
Ingredients/ Summary of Hazards

<table>
<thead>
<tr>
<th>Ingredient(s)</th>
<th>CAS #</th>
<th>%</th>
<th>TLV</th>
<th>OSHA PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hafnium Oxide</td>
<td>12055-23-1</td>
<td>99</td>
<td>0.5mg(Hf)/m³</td>
<td>0.5mg(Hf)/m³</td>
</tr>
</tbody>
</table>

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Section 3:
Physical Data

Boiling Point (°C): 5400  Density (gm/cc): 9.68 @ 20C
Vapor Pressure: 0@20C  % Volatile by Volume: non volatile
Evaporation Rate: N/A  Melting Point (°C): 2758
Solubility w/ Water: Insoluble
Reaction w/ Water: None
Appearance/Odor: Odorless, white powder, pieces and/or tablets.

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Section 4:
Fire and Explosion Hazard Data

Flashpoint/Method: N/A  Auto ignition Temp (°C): N/A
Flammability: Non flammable  Extinguishing Media: ( ) Water  ( ) Foam  ( ) Class D Extinguisher
( ) Dry Chemical  ( ) CO²  ( ) Other

Special Fire Fighting Procedures: Wear NIOSH/ MSHA approved self-contained breathing apparatus and full protective clothing.
Usual Fire and Explosion Hazards: None Known

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Section 5:
Health Hazard Data

Toxicity Data: nontoxic
Route(s) of Entry: Inhalation, Skin, & Ingestion

**Effects of Overexposure (acute and chronic)**

**Inhalation:** May cause irritation to the nose, throat and mucous membranes.
**Dermal/ Eye Contact:** May be irritating.
**Ingestion:** Considered to be non-toxic due to poor absorption.
**Medical Conditions generally aggravated by exposure:** None.

**Emergency and First Aid Procedures:**

**Ingestion:** Induce vomiting, contact physician.
**Inhalation:** Remove to fresh air. Administer oxygen and contact physician.
**Skin:** Brush material off skin and wash affected area with soap and water.
**Eyes:** Irrigate with water for 15 minutes.

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Section 6:
Reactivity Data

**Stability:** (x) stable    ( ) unstable
**Conditions Contributing to instability:** None
**Incompatibility (materials to avoid):** None
**Hazardous Decomposition Products:** None
**Hazardous Polymerization:** Will not occur
**Conditions to Avoid:** None Known

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Section 7:
Spill or Leak Procedures

**Steps to be taken in case material is released or spilled:** Wearing full protective clothing, isolate the area and insure proper ventilation. Vacuum up spill and place in container for proper disposal.
**Waste Disposal Method:** In accordance with regulations.

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Section 8
Special Protective Information

**Respiratory Protection:** (specify type) NIOSH/MSHA approved respirator
**Protective Gloves:** Recommended
**Eye Protection:** Safety glasses with side shields
**Other Protective Equip:** Maintain sink, safety shower and eyewash fountain in work area. Wear full protective clothing at all times.
Section 9
Special Precautions and Transportation Regulations

Precautions to be taken in handling and storing: Store in tightly closed containers in a cool, dry place. Wash hands and face thoroughly after handling and before eating.

Transportation Requirements: Non hazardous by D.O.T. regulations.
DOT Class:
UN Number:
IMCO Class:
Other:
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N/ D = Do Data Found  N/ A= Not Applicable

Revised: 08/08/05