Safety Data Sheet
Dense Ceria Stabilized Zirconia Ceramic

SECTION 1: Identification

Product identifier

Product name: Dense Ceria Stabilized Zirconia Ceramic
Substance name: Ceria Stabilized Zirconia
Other names / synonyms: Ceria Stabilized Zirconia Ceramic, CSZ

Recommended use of the chemical and restrictions on use
Technical Ceramic Components

Supplier’s details

Name: Superior Technical Ceramics
Address: 600 Industrial Park Road
          St. Albans, Vermont 05478
          USA
Telephone: 802-527-7726
Fax: 802-527-1181

Emergency phone number(s)
802-527-7726

SECTION 2: Hazard identification

This product is considered an article and does not pose any health hazard under normal use. The health effects listed below may be relevant when dust is generated during machining or other processing conditions.

Classification of the substance or mixture
Not a hazardous substance or mixture.

GHS label elements, including precautionary statements
Not a hazardous substance or mixture.

Other hazards which do not result in classification
Not a hazardous substance or mixture.

SECTION 3: Composition/information on ingredients

Components

1. Zirconium oxide
   Concentration: 89 - 99 %
   Other names / synonyms: Zirconium oxide
   CAS no.: 1314-23-4
2. Cerium oxide
Concentration 0 – 10 %
Other names / synonyms Cerium Oxide
CAS no. 12055-23-1

3. Hafnium Oxide
Concentration 0 - 1 %
Other names / synonyms Hafnium Oxide
CAS no. 12055-23-1

SECTION 4: First-aid measures
Description of necessary first-aid measures
General advice Hazard is principally that of a nuisance dust only as a byproduct of machining. Coughing or shortness of breath may occur in cases of excessive inhalation.
If inhaled Move to fresh air and consult with local medical personnel if discomfort persists.
In case of skin contact Wash affected area with soap and water and consult with local medical personnel if irritation persists.
In case of eye contact Flush with tepid water for a minimum of 15 minutes and consult with local medical personnel if discomfort persists.
If swallowed Administer water to dilute, but not if person is unconscious. Consult with local medical personnel if discomfort persists.

SECTION 5: Fire-fighting measures
Suitable extinguishing media Use any means suitable for extinguishing surrounding fire.
Special protective actions for fire-fighters Use protective clothing and breathing equipment appropriate for the surrounding fire and to protect against the dust that may be dispersed in the air.

SECTION 6: Accidental release measures
Methods and materials for containment and cleaning up Any dust from machining should be wet mopped or dry vacuumed.

SECTION 7: Handling and storage
Precautions for safe handling Any dust from machining should be wet mopped or dry vacuumed.
SECTION 8: Exposure controls/personal protection

Control parameters

Products Not Specifically Listed By Substance

1. Inert or Nuisance Dust, Total dust*
   PEL (Inhalation): 15 mg/m3 (OSHA)
   OSHA Annotated Table Z-3, www.osha.gov

2. Inert or Nuisance Dust, Respirable fraction*
   PEL (Inhalation): 5 mg/m3 (OSHA)
   OSHA Annotated Table Z-3, www.osha.gov

*All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Table Z1

Appropriate engineering controls
Local or general exhaust ventilation recommended.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection
Safety goggles in the presence of airborne dust.

Skin protection
Polymer gloves for prolonged dust exposure.

Respiratory protection
NIOSH/MSHA approved respirator for dust when exposure limit is exceeded.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance/form</td>
<td>White, Light Yellow or Tan Solid</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>N/A</td>
</tr>
<tr>
<td>pH</td>
<td>N/A</td>
</tr>
<tr>
<td>Melting point</td>
<td>2200ºC (4000ºF)</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>N/A</td>
</tr>
<tr>
<td>Flash point</td>
<td>N/A</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>N/A</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>N/A</td>
</tr>
<tr>
<td>Upper/lower flammability limits</td>
<td>N/A</td>
</tr>
<tr>
<td>Upper/lower explosive limits</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapor density</td>
<td>N/A</td>
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<tr>
<td>Relative density</td>
<td>6.2 g/cc</td>
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<tr>
<td>Solubility(ies)</td>
<td>N/A</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>N/A</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>N/A</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>N/A</td>
</tr>
<tr>
<td>Viscosity</td>
<td>N/A</td>
</tr>
</tbody>
</table>
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Explosive properties: N/A
Oxidizing properties: N/A

SECTION 10: Stability and reactivity

Chemical stability
Stable

SECTION 11: Toxicological information

No Applicable Information Found

SECTION 12: Ecological information

No Applicable Information Found

SECTION 13: Disposal considerations

Disposal of the product
This material is not hazardous per 40 CFR 261. Consultation with federal, state and local officials is recommended before disposal.

SECTION 14: Transport information

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

SECTION 15: Regulatory information

US FEDERAL

TSCA
CAS# 1314-23-4 Zirconium Oxide is listed on the TSCA inventory.
CAS# 1306-38-3 Cerium Oxide is listed on the TSCA inventory.
CAS# 12055-23-1 Hafnium Oxide is listed on the TSCA inventory.

SARA Section 302 Extremely Hazardous Substances
Substance Not Listed.

Section 313
Substance Not Listed.

OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.

US STATE
No Applicable Information Found

California Prop 65
No components on list.

SECTION 16: Other information

Further information/disclaimer
Although reasonable care has been taken to provide accurate and current information in preparation of this document, Superior Technical Ceramics extends no warranties, makes no representation and assumes no responsibility for any loss, damage, or injury of any kind which may result from reliance of information provided in this document by any person.

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