1. Identification

1.1 Product Identifier

**Description**  Ceramic shapes and parts manufactured from Yttria Stabilized Zirconium Oxide.

**Contains**  Zirconium oxide (CAS 1314-23-4)

**Synonyms**  Z105, Z15, Z28

1.2 Relevant identified uses of the substance or mixture and uses advised against

**Recommended use**  Consult the supplier

**Uses advised against**  Users are recommended to seek further advice

1.3 Supplier’s details

**McDanel Advanced Ceramic Technologies**
510 Ninth Avenue
Beaver Falls, Pa 15010-0560

1.4 Emergency phone number

**McDanel**  +1-724-843-8300

2. Hazards identification

2.1 Classification of the substance or mixture

**GHS Classification**
Not classified as hazardous

**REGULATION (EC) No 1272/2008**
Not classified

**Classification according to Directive 67/548/EEC or 1999/45/EC**
Not classified

2.2 Label elements

**Symbol(s)**  Not applicable

**Signal word**  None

**Hazard Statements**
None

**Precautionary statements**
In circumstances where dust may be generated from machining or disposal:

- **P261** – Avoid breathing dust/fume/gas/mist/vapors/spray
- **P280** – Wear eye protection/face protection
- **P285** – In case of inadequate ventilation wear respiratory protection
- **P305 + P351 + P338** – If in eyes, rinse cautiously with water for several minutes
- **P302 + P352** – If on skin, wash with plenty of soap and water

2.3 Other information

This product is an article, a monolithic material.
3. Composition/information on ingredients

3.1 Substances
This product is a monolithic material.

4. First aid measures

4.1 Description of first aid measures
In circumstances where dust may be generated from machining or disposal:

- **Eye Contact**: Rinse cautiously with water for several minutes. Remove contact lenses if present, and easy to do. Continue rinsing.
- **Skin Contact**: Wash skin with soap and water.
- **Ingestion**: Rinse mouth.
- **Inhalation**: Move to fresh air.
- **General Advise**: If symptoms persist, call a physician. Show this safety data sheet to doctor in attendance.

4.2 Most important symptoms and effects, both acute and delayed
No information available

4.3 Indication of any immediate medical attention and special treatment needed

**Notes to physician**
Treat symptomatically

5. Fire-fighting measures

5.1 Extinguishing media

**Suitable extinguishing media**
The product itself does not burn. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Extinguishing media which must not be used for safety reasons**
None known

5.2 Special hazards arising from the substance or mixture

**Special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases**
Not applicable

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Wear personal protective equipment when machining.

6.2 Environmental precautions
No special environmental precautions required.
## 7. Handling and storage

### 7.1 Precautions for Safe Handling

In circumstances where dust may be generated from machining or disposal:

**Handling**

Provide appropriate exhaust ventilation at places where dust is formed.

**General Hygiene Considerations**

Handle in accordance with good industrial hygiene and safety practice.

**Exposure scenario**

No information available

### 7.2 Conditions for safe storage, including any incompatibilities

Keep in a dry place.

### 7.3 Specific end use(s)

No information available

## 8. Exposure controls/personal protection

### 8.1 Control parameters

**Exposure limits**

Applies to circumstances where dust may be generated from machining or disposal.

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Occupational exposure limit (mg/m³)*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TWA – 8 hour</td>
</tr>
<tr>
<td>United States (PEL)</td>
<td>5</td>
</tr>
<tr>
<td>United States (ACGIH)</td>
<td>5</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>5</td>
</tr>
<tr>
<td>Switzerland</td>
<td>5</td>
</tr>
<tr>
<td>Spain</td>
<td>5</td>
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<tr>
<td>Portugal</td>
<td>5</td>
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<td>Poland</td>
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<td>Norway</td>
<td>5</td>
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<td>Mexico</td>
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<tr>
<td>Ireland</td>
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<td>Finland</td>
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<tr>
<td>Denmark</td>
<td>5</td>
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<tr>
<td>Canada</td>
<td>5</td>
</tr>
<tr>
<td>Austria</td>
<td>5</td>
</tr>
</tbody>
</table>

* Milligrams of substance per cubic meter of air
TWA (Time Weighted Average): The average level of exposure over a specified time period.
STEL (Short Term Exposure Level): The maximum exposure level permitted during a short period of time.

8.2 Exposure controls

Engineering controls
Ensure adequate ventilation in circumstances where dust may be generated from machining or disposal, especially in confined areas.

Personal protective equipment
In circumstances where dust may be generated from machining or disposal:

Eye Protection	Safety glasses with side-shields.
Skin Protection	No special protective equipment required.
Hand Protection	No special protective equipment required.
Respiratory Protection	When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Environmental exposure controls
Avoid dust formation

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Solid</td>
</tr>
<tr>
<td>Color</td>
<td>White</td>
</tr>
<tr>
<td>Odor</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not applicable</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Melting point</td>
<td>2500°C</td>
</tr>
<tr>
<td>Freezing point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Initial boiling point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Boiling range</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Upper explosive limit</td>
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</tr>
<tr>
<td>Lower explosive limit</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Relative density</td>
<td>5.75 to 5.95 g/cm³</td>
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<tr>
<td>Solubility</td>
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</tr>
<tr>
<td>Partition coefficient</td>
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</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
10. Stability and reactivity

10.1 Reactivity
None under normal processing

10.2 Chemical Stability
Stable under normal conditions

10.3 Possibility of Hazardous Reactions
None under normal processing

10.4 Conditions to Avoid
No known conditions to avoid

10.5 Incompatible materials
No incompatible materials known

10.6 Hazardous Decomposition Products
None under normal processing

11. Toxicological information

11.1 Information on toxicological effects
Note: The information provided solely pertains to dust exposure.

Acute toxicity
- Acute oral toxicity: Conclusive but not sufficient for classification
- Acute dermal toxicity: Conclusive but not sufficient for classification
- Acute inhalation toxicity: Conclusive but not sufficient for classification

Chronic toxicity
- Irritation: Conclusive but not sufficient for classification
- Corrosivity: Conclusive but not sufficient for classification
- Sensitization: Conclusive but not sufficient for classification
- Mutagenic effects: Conclusive but not sufficient for classification
- Carcinogenic effects: This substance has no evidence of carcinogenic properties
- Reproductive effects: Conclusive but not sufficient for classification
- Developmental effects: Conclusive but not sufficient for classification
- Aspiration hazard: Conclusive but not sufficient for classification

12. Ecological information

12.1 Toxicity
Not water endangering.

12.2 Persistence and degradability
The product is not readily biodegradable.

12.3 Bioaccumulative potential
The product is not bioaccumulating.

12.4 Mobility in soil
Not applicable, due to the form of the product.

12.5 Results of PBT and vPvB assessment
This product does not contain any PBT or vPvB substances.

12.6 Other adverse effects
None known

13. Disposal considerations

13.1 Waste treatment methods

Waste from residue/unused products
Disposal should be in accordance with applicable regional, national and local laws and regulations. Avoid dust formation.

Contaminated packaging
Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

Note: Not classified as dangerous according to transport regulations.

DOT (US) Not regulated
IMDG/IMO Not regulated
RID Not regulated
ADR Not regulated
ICAO Not regulated
IATA Not regulated

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Note: Regulations apply to dust.

United States Federal Regulations
OSHANon-hazardous
TSCAListed
CERCLA Reportable Quantity No
SARA Title III Section 311/312 Hazardous Categories: Immediate (acute)
Section 313 Toxic Categories: None

United States - State Regulations
Massachusetts Right To Know List Listed
Rhode Island Right To Know List Listed
International Regulations

TSCA Listed
EINECS/ELINCS Listed on EINECS
DSL/NDSL Listed on DSL
PICCS Listed
ENCs Listed
IECSC Listed
AICS Listed
KECL Listed

16. Other information including information on preparation and revision of the SDS

Prepared by: Allura Jiles
Revision date: 5/20/2015

Key

Occupational Exposure Limits
PEL Permissible exposure limit
ACGIH American Conference of Governmental industrial Hygienists

Transportation Regulations
IMDG International Maritime Dangerous Goods (UN)
IMO International Maritime Organization (UN)
RID European Agreement Concerning the International Carriage of Dangerous Goods by Rail
ADR European Agreement Concerning the International Carriage of Dangerous Goods by Road
ICAO International Civil Aviation Organization
IATA International Air Transport Association

Chemical Regulations
EINECS European Inventory of Existing Chemical Substances
ELINCS European List of Notified Chemical Substances
DSL Canadian Domestic Substances List
NDSL Canadian Non-Domestic Substances List
PICCS Philippines Inventory of Chemicals and Chemical Substances
ENCs Japan Existing and New Chemical Substances
IECSC China Inventory of Existing Chemical Substances
AICS Australian Inventory of Chemical Substances
KECL Korean Existing and Evaluated Chemical Substances
TSCA United States Toxic Substances Control Act Section 8(b) Inventory

Updates
The most current version of this Safety Data Sheet is available at this URL:

Disclaimer
The information contained in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe
handling, use, transportation and disposal, and is not to be considered a warranty or quality specification. McDanel Advanced Ceramic Technologies assumes no liability to any user based upon use of product or reliance upon the information contained in this Safety Data Sheet.