1. Identification

1.1 Product Identifier
Description: Ceramic shapes and parts manufactured from Alumina (96%, 99% and 99.8%).
Contains: Aluminum oxide (CAS 1344-28-1)
Synonyms: 998, AP35

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 Advice**: 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.
6.3 Methods and material for containment and cleaning up
Recover product. Place into appropriate container for disposal.

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&lt;sup&gt;R&lt;/sup&gt;, 15&lt;sup&gt;T&lt;/sup&gt;</td>
</tr>
<tr>
<td>United States (ACGIH)</td>
<td>1&lt;sup&gt;T&lt;/sup&gt;</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>10&lt;sup&gt;I&lt;/sup&gt;, 4&lt;sup&gt;R&lt;/sup&gt;</td>
</tr>
<tr>
<td>Switzerland</td>
<td>3&lt;sup&gt;R&lt;/sup&gt;</td>
</tr>
<tr>
<td>Sweden</td>
<td>5&lt;sup&gt;I&lt;/sup&gt;, 2&lt;sup&gt;R&lt;/sup&gt;</td>
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<tr>
<td>Spain</td>
<td>10&lt;sup&gt;I&lt;/sup&gt;, 5&lt;sup&gt;R&lt;/sup&gt;</td>
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<tr>
<td>Russia</td>
<td>6</td>
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<tr>
<td>Portugal</td>
<td>10</td>
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<tr>
<td>Poland</td>
<td>2</td>
</tr>
<tr>
<td>Norway</td>
<td>2</td>
</tr>
<tr>
<td>New Zealand</td>
<td>10&lt;sup&gt;R&lt;/sup&gt;</td>
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<tr>
<td>Netherlands</td>
<td>10</td>
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<tr>
<td>Mexico</td>
<td>10</td>
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<tr>
<td>Malaysia</td>
<td>10</td>
</tr>
<tr>
<td>Korea</td>
<td>10</td>
</tr>
</tbody>
</table>

* Milligrams of substance per cubic meter of air
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<tr>
<td></td>
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<tr>
<td>Japan</td>
<td>0.5R</td>
</tr>
<tr>
<td>Italy</td>
<td>1</td>
</tr>
<tr>
<td>Iceland</td>
<td>10</td>
</tr>
<tr>
<td>Hungary</td>
<td>6R</td>
</tr>
<tr>
<td>Greece</td>
<td>10</td>
</tr>
<tr>
<td>Germany</td>
<td>4¹, 1.5R</td>
</tr>
<tr>
<td>France</td>
<td>10R</td>
</tr>
<tr>
<td>Estonia</td>
<td>4</td>
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<tr>
<td>Denmark</td>
<td>5¹, 2R</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>0.1</td>
</tr>
<tr>
<td>China</td>
<td>4</td>
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<tr>
<td>Belgium</td>
<td>-</td>
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<tr>
<td>Austria</td>
<td>5</td>
</tr>
</tbody>
</table>

I: Inhalable dust, R: Respirable dust, T: Total dust

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

- **Physical state**: Solid
- **Color**: Ivory or white
- **Odor**: Not applicable
- **Odor threshold**: Not applicable
- **pH**: Not applicable
- **Melting point**: 2000°C
Freezing point: Not applicable
Initial boiling point: Not applicable
Boiling range: Not applicable
Flash point: Not applicable
Evaporation rate: Not applicable
Flammability: Not applicable
Upper explosive limit: Not applicable
Lower explosive limit: Not applicable
Vapor pressure: Not applicable
Vapor density: Not applicable
Relative density: 3.60 to 3.950 g/cm³
Solubility: Not applicable
Partition coefficient: Not applicable
Auto-ignition temperature: Not applicable
Decomposition temperature: Not applicable

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
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
OSHA Non-hazardous
TSCA Listed
CERCLA Reportable Quantity No
SARA Title III Section 302 Extremely Hazardous Substances: None
Section 304 Emergency Release Reporting: None
Section 311/312 Hazardous Categories: Immediate (acute)
Section 313 Toxic Categories: None

Clean Air Act of 1990 – Title VI
This material does not contain nor was it manufactured using ozone depleting chemicals.

United States - State Regulations
California Proposition 65 Not listed
Cal-OSHA Workplace Airborne Contaminant Listed
Connecticut Carcinogen Substances Not listed
Florida Essential Chemical List Not listed
Idaho Air Contaminant Listed
Illinois Toxic Substances Disclosure to Employees List Listed
Maine Chemicals of High Concern Not listed
Massachusetts Right To Know List Listed
Massachusetts Hazardous Substance Code F9
Michigan Critical Materials List Not listed
Minnesota Hazardous Substances Listed
New Jersey Right To Know Hazardous Substances List Listed
New York List of Hazardous Substances Not listed
Ohio Extremely Hazardous Substances List Not listed
Pennsylvania Right To Know Hazardous Substance Listed
Rhode Island Hazardous Substances List Listed
Texas Air Contaminant with Health Effects Screening Level Listed
Washington Air Contaminant Listed
Washington Persistent Bioaccumulative Toxins Not listed
Wyoming Process Safety Management – Highly Hazardous Chemicals Not listed

International Regulations
TSCA Listed
EINECS/ELINCS Listed on EINECS
DSL/NDSL Listed on DSL
PICCS Listed
ENCS  Listed, 1-23
IECSC  Listed
AICS  Listed
KECL  Listed, KE-01012
MITI  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
ENCSC  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
MITI  Japanese Ministry of Trade and Industry

Updates
The most current version of this Safety Data Sheet is available at this URL:
http://www.mcdanelceramics.com/pdf/MSDS_McD_Alumina.pdf

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.