SECTION 1 IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

<table>
<thead>
<tr>
<th>Trade name</th>
<th>Magnesium Aluminate Spinel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms</td>
<td>Spinel DBM AF, Spinel DBM, AHPA Spinel, AHPA Spinel AF</td>
</tr>
<tr>
<td>Use</td>
<td>High Tech Industrial Applications</td>
</tr>
<tr>
<td>Company</td>
<td>Sasol North America Inc - Ceralox</td>
</tr>
<tr>
<td>Address</td>
<td>7800 S. Kolb Road, Tucson, AZ 85756-9215</td>
</tr>
<tr>
<td>Telephone</td>
<td>CHEMTREC North America Transportation Emergency (24-hr) (800) 424-9300</td>
</tr>
<tr>
<td></td>
<td>CHEMTREC World Wide (703) 527-3887</td>
</tr>
<tr>
<td></td>
<td>Other Emergencies (24-hr) (520) 294-5203</td>
</tr>
<tr>
<td></td>
<td>MSDS and Product Information (8:00am-4:30pm MST) (520) 294-5201</td>
</tr>
<tr>
<td></td>
<td>Health and Safety Information (8:00am-4:00pm MST) (520) 547-4930</td>
</tr>
<tr>
<td>E-mail address</td>
<td><a href="mailto:info@us.sasol.com">info@us.sasol.com</a></td>
</tr>
</tbody>
</table>

SECTION 2 HAZARDS IDENTIFICATION

Emergency Overview

Appearance  white powder

Odour       odourless

Precautions CAUTION! MAY CAUSE EYE, SKIN AND RESPIRATORY IRRITATION. Product dust may be irritating to eyes, skin and respiratory system. Handle in accordance with good industrial hygiene and safety practice.

Environmental precautions Product is an inorganic solid that is not bioavailable to aquatic biota and non-toxic. The methods for determining biodegradability are not applicable to inorganic substances.

Potential Health Effects

Eyes         Irritating to eyes.

Skin        May cause skin irritation and/or dermatitis. High standards of skin care and personal hygiene should be exercised at all times.

Inhalation  Irritating to respiratory system.

Ingestion   Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.
Magnesium Aluminate Spinel

(See Section 11 for Toxicological Information)

SECTION 3 COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium aluminum oxide</td>
<td>12068-51-8</td>
<td>&gt;99</td>
</tr>
</tbody>
</table>

See Section 8 for Exposure Guidelines and Section 15 for Regulatory Classifications.

SECTION 4 FIRST AID MEASURES

Eye contact: Rinse immediately with plenty of water for at least 15 minutes. If eye irritation persists, consult a specialist.

Skin contact: Wash off with plenty of water. Take off all contaminated clothing immediately. If skin irritation persists, call a physician. Wash contaminated clothing before re-use.

Inhalation: Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration. Call a physician immediately.

Ingestion: If swallowed, call a poison control centre or doctor immediately. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.

SECTION 5 FIRE-FIGHTING MEASURES

FLAMMABLE PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash point</td>
<td>not applicable</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>not applicable</td>
</tr>
<tr>
<td>Flammable limits in air % by volume</td>
<td>Lower explosion limit: not applicable</td>
</tr>
<tr>
<td>Fire/explosion</td>
<td>This is an inert material and will not produce a dust explosion. Non-flammable material</td>
</tr>
</tbody>
</table>

Suitable extinguishing media: The product is not flammable.

Protective equipment and precautions for firefighters: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Further information: Do not allow run-off from fire fighting to enter drains or water courses.
SECTION 6  ACCIDENTAL RELEASE MEASURES

Methods and materials for containment and cleaning up
Clean up promptly by scoop or vacuum. Dispose of only in accordance with local, state, and federal regulations.

SECTION 7  HANDLING AND STORAGE

Safe handling advice
Handle in accordance with good industrial hygiene and safety practice.

Storage/Transport pressure
Ambient

Load/Unload temperature
Ambient

Further information on storage conditions
Keep containers dry and tightly closed to avoid moisture absorption and contamination.

SECTION 8  EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING MEASURES
Air contaminant levels should be controlled below the PEL or TLV for this product (see Exposure Guidelines).

PERSONAL PROTECTIVE EQUIPMENT

Eyes
Safety glasses with side-shields

Skin
Wear suitable protective clothing, gloves and eye/face protection.

Inhalation
In case of mist, spray or aerosol exposure wear suitable personal respiratory protection and protective suit.
Magnesium Aluminate Spinel

EXPOSURE GUIDELINES

<table>
<thead>
<tr>
<th>Components</th>
<th>Exposure limit(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium aluminum oxide</td>
<td>OSHA PEL 15 mg/m³</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 5 mg/m³</td>
</tr>
<tr>
<td></td>
<td>ACGIH TLV (8-hour) 10 mg/m³</td>
</tr>
<tr>
<td></td>
<td>ACGIH TLV (8-hour) 1 mg/m³</td>
</tr>
</tbody>
</table>

This material is a highly milled or spray dried alumina. The ACGIH TLV is for Aluminum metal and insoluble compounds.

PEL= Permissible Exposure Limits
TLV= Threshold Limit Value
EL= Excursion Limit

TWA= Time Weighted Average (8 hr.)
STEL= Short Term Exposure Limit (15 min.)
WEEL= Workplace Environmental Exposure Level

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance: powder
Colour: white
Odour: odourless
Form: solid

Boiling point/boiling range: not applicable
Vapour density: None.
Water solubility: insoluble
Viscosity: not applicable

Melting point/range: 2,135 °C 3,875 °F
Specific gravity: 3.60
pH: 5 - 9

Evaporation rate: not applicable
Surface area: 5 - 40 m²/g
Particle size: 0.5 - 50 µm
SECTION 10   STABILITY AND REACTIVITY

Conditions to avoid  None.

Hazardous decomposition products  None.

Materials to avoid  None.

Hazardous polymerisation  None.

SECTION 11   TOXICOLOGICAL INFORMATION

Additional Remarks  The product itself has not been tested.

Eyes  Primary irritation (rabbit): 7 - 10 (Maximum score is 110.)

Skin  Primary irritation (rabbit): 0.4 - 0.7 (Maximum score is 8.0.) animals exposed for approximately 6 hours/day for 5 days showed no signs of skin irritation

Inhalation  Rats survived exposure to an aerosol of a similar product at a concentration of > 5 mg/l for four hours. This product may contain particles whose diameters are less than 1 micron. Direct injection of laboratory animals with finer alumina particles has resulted in production of pulmonary fibrosis, a scarring of the tissue of the lung. To our knowledge, these effects have not been reported in humans. The human health significance of these animal studies is questionable given the unrealistic level and manner of exposure involved.

Ingestion  Acute oral toxicity  LD50 (rat): > 5,000 mg/kg

CARCINOGENICITY

Contains no ingredient listed as a carcinogen

SECTION 12   ECOLOGICAL INFORMATION

Aquatic toxicity  Product is an inorganic solid that is not bioavailable to aquatic biota and non-toxic.

Biodegradation  The methods for determining biodegradability are not applicable to inorganic substances.
SECTION 13 DISPOSAL CONSIDERATIONS

Waste Code  Any unused product or empty containers may be disposed of as non-hazardous in accordance with state and federal requirements. Re-evaluation of the product may be required by the user at the time of disposal, since the product uses, transformations, mixtures, contamination, and spillage may change the classification. If the resulting material is determined to be hazardous, please dispose in accordance with state and federal (40 CFR 262) hazardous waste regulations.

Disposal methods  Dispose of only in accordance with local, state, and federal regulations.

Empty containers  Empty containers and original plastic liners may contain product residue. Handling of empty containers and liners should be in a manner to minimize dust generation. Safe handling procedures as outlined in the MSDS should be followed at all times. Consult the appropriate official for information regarding disposal requirements.

SECTION 14 TRANSPORT INFORMATION

DOT  Not regulated.

IATA  Not regulated.

IMDG  Not regulated.

SECTION 15 REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

OSHA Hazards  Non-hazardous substance

TSCA Inventory Listing

Components  CAS-No.
Magnesium aluminate  12068-51-8

SARA 302 Status

Components  CAS-No.  Weight percent
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 311/312 Classification  Non-hazardous substance
Magnesium Aluminate Spinel

SARA 313 Chemical Components

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

US. EPA CERCLA Hazardous Substances (40 CFR 302)

<table>
<thead>
<tr>
<th>Components</th>
<th>Reportable Quantity</th>
<th>Weight percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

INTERNATIONAL REGULATIONS

WHMIS Classification

WHMIS hazardous composition: No ingredients are hazardous according to the CPR criteria.

European Union

The product does not need to be labelled in accordance with EC directives or respective national laws. Directive 96/82/EC does not apply

Australian Inventory of Chemical Substances (AICS) Listing

Listed

Japanese Minister of International Trade and Industry (MITI) Inventory Listing

Listed

Canadian Domestic Substance List (DSL) Inventory Listing

Not listed

Canadian Non-Domestic Substance Listing (NDSL)

Listed

European Inventory of Existing Commercial Chemical Substances (EINECS) Listing

Listed

Philippines Inventory List (PICCS)

Not listed

Korean Inventory List

Listed

China Inventory List

Not listed

Please note: The names and CAS numbers which are used for this product in the stated inventories may deviate from the information which is listed in Section 3.

STATE REGULATIONS

California Prop. 65
## Components

<table>
<thead>
<tr>
<th>None</th>
<th>CAS-No.</th>
</tr>
</thead>
</table>

### SECTION 16 OTHER INFORMATION

#### HAZARD RATINGS

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Physical Hazard/Instability</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMIS®</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>NFPA</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

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