SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
Product name: Duracem® F

1.2. Relevant identified uses of the substance or mixture and uses advised against
Use of the substance/mixture: Building and Road Construction.

1.3. Details of the supplier of the safety data sheet
Ash Grove Cement Company
11011 Cody
Overland Park, KS 66210
T 913-451-1686

1.4. Emergency telephone number
Emergency number: CHEMTREC 800-424-9300

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture
GHS-US classification
- Skin corrosion 1A
- Serious Eye Damage 1
- Skin Sensitization 1
- Carcinogenicity 1A
- Specific Target Organ Toxicity After Single Exposure 3
- Specific Target Organ Toxicity After Repeated Exposure 1

2.2. Label elements
GHS-US labelling
- Hazard pictograms (GHS-US)
- GHS05
- GHS07
- GHS08

Signal word (GHS-US): Danger
Hazard statements (GHS-US):
- Causes severe skin burns and eye damage. May cause an allergic skin reaction. May cause cancer. May cause respiratory irritation. Causes damage to lungs through prolonged or repeated exposure.

Prevention statements (GHS-US):
- Wash hands thoroughly after handling. Wear protective gloves and clothing as well as eye and face protection. Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area. Do not breathe dusts. Do not eat, drink or smoke when using this product.

Response statements (GHS-US):
- If exposed or concerned: Get medical advice/attention. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a doctor.

Storage statements (GHS-US):
- Store to prevent dust generation. Store to keep dry before use.

Disposal statements (GHS-US):
- Dispose of contents and container in accordance with all local, state and federal regulations.

Supplemental Information:
Read and Follow all precautions listed in the Safety Data Sheet available on request or at ashgrove.com. Additional information on the selection and use of respirators can be found in the NIOSH Respirator Selection Logic (DHHS [NIOSH] Publication No. 2005-100) and the NIOSH Guide to Industrial Respiratory Protection (DHHS [NIOSH] Publication No. 87-116) available at http://www.cdc.gov/niosh/docs/87-116/.

This product contains greater than 0.1% crystalline silica. Crystalline silica has been linked to cancer, silicosis, and other lung problems in conditions of prolonged airborne over-exposure.

Keep product dry until use. Avoid contact with bleed water from wet product. Clothing saturated with wet product can result in delayed, serious alkali skin burns.

2.3. Other hazards
Other hazards not contributing to the classification: Not applicable.

2.4. Unknown acute toxicity (GHS-US)
62% of the mixture consists of ingredient(s) of unknown acute toxicity.
Duracem® F
Safety Data Sheet

SECTION 3: Composition/information on ingredients

3.1. Substances
Not applicable.

3.2. Mixture

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement, portland, chemicals</td>
<td>(CAS No) 65997-15-1</td>
<td>65 - 75</td>
<td>Skin Irrit. 2, H315, Eye Dam. 1, H318, Eye Dam. 1, H318, Skin Sens. 1, H317, STOT SE 3, H335</td>
</tr>
<tr>
<td>Ashes, residues</td>
<td>(CAS No) 68131-74-8</td>
<td>20 - 30</td>
<td>Not classified</td>
</tr>
<tr>
<td>Gypsum (Ca(SO4).2H2O)</td>
<td>(CAS No) 13397-24-5</td>
<td>1 - 6</td>
<td>Not classified</td>
</tr>
<tr>
<td>Magnesium oxide</td>
<td>(CAS No) 1309-48-4</td>
<td>1 - 5</td>
<td>Not classified</td>
</tr>
<tr>
<td>Calcium oxide</td>
<td>(CAS No) 1305-78-8</td>
<td>0.5 - 2.5</td>
<td>Acute Tox. 4 (Oral), H302, Eye Dam. 1, H315, Eye Dam. 1, H318, STOT SE 3, H335</td>
</tr>
<tr>
<td>Quartz</td>
<td>(CAS No) 14808-60-7</td>
<td>0.1 - 1.5</td>
<td>Acute Tox. 4 (Oral), H302, Carc. 1A, H350, STOT RE 1, H372</td>
</tr>
<tr>
<td>Chromium, ion (Cr 6+)</td>
<td>(CAS No) 18540-29-9</td>
<td>20 ppm - 40 ppm</td>
<td>Skin Sens. 1, H317, Carc. 1A, H350</td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Get immediate medical advice/attention.

First-aid measures after skin contact: In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing. Wash contaminated clothing before reuse. Get immediate medical advice/attention.

First-aid measures after eye contact: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a doctor.

First-aid measures after ingestion: If swallowed, do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get immediate medical advice/attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation: May cause respiratory tract irritation.

Symptoms/injuries after skin contact: Causes severe skin burns. Symptoms may include redness, pain, blisters. Do not allow product to harden around any body part or allow continuous, prolonged contact with skin. May cause sensitisation by skin contact.

Symptoms/injuries after eye contact: Causes serious eye damage. May cause burns. Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva.

Symptoms/injuries after ingestion: May be harmful if swallowed. May cause stomach distress, nausea or vomiting.

4.3. Indication of any immediate medical attention and special treatment needed

Symptoms may not appear immediately. In case of accident or if you feel unwell, seek medical advice immediately (show the label or SDS where possible).

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Treat for surrounding material.

5.2. Special hazards arising from the substance or mixture

Fire hazard: Product does not burn; however its packaging may. Products of combustion may include, and are not limited to: oxides of carbon.

5.3. Advice for firefighters

Firefighting instructions: Keep upwind of fire. Wear full fire fighting turn-out gear (full Bunker gear) and respiratory protection (SCBA).

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures: Use personal protection recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Avoid contact with skin and eyes.

6.2. Methods and material for containment and cleaning up

For containment: Contain spill, then place in a suitable container. Do not flush to sewer or allow to enter waterways. Use appropriate Personal Protective Equipment (PPE).

Methods for cleaning up: Vacuum or sweep material and place in a disposal container. Provide ventilation.

6.3. Reference to other sections

No additional information available.
SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling: Avoid contact with skin and eyes. Avoid generating and breathing dust. Do not swallow. Good housekeeping is important to prevent accumulation of dust. The use of compressed air for cleaning clothing, equipment, etc. is not recommended. Handle and open container with care.

Hygiene measures: Launder contaminated clothing before reuse. Wash hands before eating, drinking, or smoking.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Keep out of the reach of children. Avoid any dust buildup by frequent cleaning and suitable construction of the storage area. Do not store in an area equipped with emergency water sprinklers. Clean up spilled material promptly.

7.3. Specific end use(s)

No additional information available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Substance (CAS number)</th>
<th>USA ACGIH TWA (mg/m³)</th>
<th>USA OSHA TWA (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz (14808-60-7)</td>
<td>ACGIH TWA (mg/m³)</td>
<td>OSHA PEL (TWA) (mg/m³)</td>
</tr>
<tr>
<td></td>
<td>0.025 mg/m³ (respirable fraction)</td>
<td>(30)/(%SiO2 + 2) mg/m³ TWA, (total dust)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(250)/(%SiO2 + 5) mppcf TWA, (respirable fraction)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cement, portland, chemicals (65997-15-1)</th>
<th>USA ACGIH TWA (mg/m³)</th>
<th>USA OSHA TWA (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 mg/m³ (respirable fraction)</td>
<td>5 mg/m³ (respirable fraction)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Calcium oxide (1305-78-8)</th>
<th>USA ACGIH TWA (mg/m³)</th>
<th>USA OSHA TWA (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 mg/m³</td>
<td>5 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gypsum (Ca(SO4).2H2O) (13397-24-5)</th>
<th>USA ACGIH TWA (mg/m³)</th>
<th>USA OSHA TWA (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10 mg/m³</td>
<td>15 mg/m³ TWA (total dust)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 mg/m³ TWA (respirable fraction)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Magnesium oxide (1309-48-4)</th>
<th>USA ACGIH TWA (mg/m³)</th>
<th>USA OSHA TWA (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10 mg/m³</td>
<td>15 mg/m³ TWA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chromium, ion (Cr 6+) (18540-29-9 0)</th>
<th>USA OSHA TWA (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 µg/m³</td>
</tr>
</tbody>
</table>

8.2. Exposure controls

Appropriate engineering controls: Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, etc.) below recommended exposure limits.

Hand protection: Wear suitable gloves.

Eye protection: Wear approved eye protection (properly fitted dust- or splash-proof chemical safety goggles) and face protection (face shield).

Skin and body protection: Wear suitable protective clothing.

Respiratory protection: A NIOSH approved dust mask or filtering facepiece is recommended in poorly ventilated areas or when permissible exposure limits may be exceeded. Respirators should be selected by and used under the direction of a trained health and safety professional following requirements found in OSHA’s respirator standard (29 CFR 1910.134) and ANSI’s standard for respiratory protection (Z88.2).

Environmental exposure controls: Maintain levels below Community environmental protection thresholds.

Other information: Handle according to established industrial hygiene and safety practices.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state: Powder.

Appearance: Fine powder.

Colour: Gray

Odour: No odour.
**Duracem® F**

**Safety Data Sheet**


<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odour threshold</td>
<td>No data available.</td>
</tr>
<tr>
<td>pH</td>
<td>12 - 13 (Highly alkaline when wet.)</td>
</tr>
<tr>
<td>Relative evaporation rate (butylacetate=1)</td>
<td>No data available.</td>
</tr>
<tr>
<td>Melting point</td>
<td>No data available.</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No data available.</td>
</tr>
<tr>
<td>Boiling point</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Self ignition temperature</td>
<td>No data available.</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available.</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not flammable.</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>No data available.</td>
</tr>
<tr>
<td>Relative vapour density at 20 °C</td>
<td>No data available.</td>
</tr>
<tr>
<td>Relative density</td>
<td>2.9 - 3.1 (Water = 1)</td>
</tr>
<tr>
<td>Solubility</td>
<td>Slight. (0.1 - 1.0%)</td>
</tr>
<tr>
<td>Log Pow</td>
<td>No data available.</td>
</tr>
<tr>
<td>Log Kow</td>
<td>No data available.</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available.</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>No data available.</td>
</tr>
<tr>
<td>Explosive limits</td>
<td>No data available.</td>
</tr>
</tbody>
</table>

**SECTION 10: Stability and reactivity**

**10.1. Reactivity**

No dangerous reaction known under conditions of normal use. An alkali reaction from components of portland cement will corrode aluminum.

**10.2. Chemical stability**

Stable under normal storage conditions. Keep dry in storage.

**10.3. Possibility of hazardous reactions**

No dangerous reaction known under conditions of normal use. Do not mix with other chemicals.

**10.4. Conditions to avoid**

Moisture – product must be kept dry until ready to use.

**10.5. Incompatible materials**

None known.

**10.6. Hazardous decomposition products**

None known.

**SECTION 11: Toxicological information**

**11.1. Information on toxicological effects**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz (14808-60-7)</td>
<td></td>
</tr>
<tr>
<td>LD50 oral rat 500 mg/kg</td>
<td></td>
</tr>
<tr>
<td>Calcium oxide (1305-78-8)</td>
<td></td>
</tr>
<tr>
<td>LD50 oral rat &gt;2000 mg/kg</td>
<td></td>
</tr>
<tr>
<td>Magnesium oxide (1309-48-4)</td>
<td></td>
</tr>
<tr>
<td>LD50 oral rat &gt;5000 mg/kg</td>
<td></td>
</tr>
<tr>
<td>Ashes, residues (68131-74-8)</td>
<td></td>
</tr>
<tr>
<td>LD50 oral rat &gt;2000 mg/kg</td>
<td></td>
</tr>
<tr>
<td>Duracem® F</td>
<td></td>
</tr>
<tr>
<td>ATE (oral) &gt;2000 mg/kg, rat 4hr</td>
<td></td>
</tr>
<tr>
<td>ATE (dermal) No data available.</td>
<td></td>
</tr>
<tr>
<td>ATE (inhalation) No data available.</td>
<td></td>
</tr>
</tbody>
</table>

Skin corrosion/irritation: Causes severe skin burns.

VOC content: No data available.
Serious eye damage/irritation: Causes serious eye damage.
Respiratory or skin sensitisation: May cause an allergic skin reaction.
Germ cell mutagenicity: Based on available data, the classification criteria are not met.
Carcinogenicity: May cause cancer.

Quartz (14808-60-7)
| IARC group | 1 - Carcinogenic to humans |
| National Toxicity Program (NTP) Status | 2 - Known Human Carcinogens |

Chromium, ion (Cr 6+) (18540-29-9)
| IARC group | 1 - Carcinogenic to humans |
| National Toxicity Program (NTP) Status | 2 - Known Human Carcinogens |

Reproductive toxicity: Based on available data, the classification criteria are not met.
Specific target organ toxicity (single exposure): May cause respiratory irritation.
Specific target organ toxicity (repeated exposure): Causes damage to lungs through prolonged or repeated exposure. (Respirable crystalline silica in the form of quartz or cristobalite from occupational sources is listed by the International Agency for Research on Cancer (IARC) and National Toxicology Program (NTP) as a lung carcinogen. Prolonged exposure to respirable crystalline silica has been known to cause silicosis, a lung disease, which may be disabling. While there may be a factor of individual susceptibility to a given exposure to respirable silica dust, the risk of contracting silicosis and the severity of the disease is clearly related to the amount of dust exposure and the length of time (usually years) of exposure.)

Aspiration hazard: Based on available data, the classification criteria are not met.
Symptoms/injuries after inhalation: Causes serious eye damage. May cause burns. Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva.
Symptoms/injuries after skin contact: May be harmful if swallowed. May cause stomach distress, nausea or vomiting.

SECTION 12: Ecological information

12.1. Toxicity
Ecology - general: No ecological consideration when used according to directions. Do not flush to sewer or allow to enter waterways.

Ashes, residues (68131-74-8)
EC50 Water flea 140 - 2000 mg/L (Exposure time: 24 h - Species: Daphnia magna)

Calcium oxide (1305-78-8)
LC50 fishes 1 1070 mg/l (Exposure time: 96 h - Species: Cyprinus carpio [static])

Chromium, ion (Cr 6+) (18540-29-9)
LC50 fishes 1 36.2 mg/L (Exposure time: 96 h - Species: Pimephales promelas)
LC50 fishes 2 7.6 mg/L (Exposure time: 96 h - Species: Oncorhynchus mykiss)

12.2. Persistence and degradability
Duracem® F
Persistence and degradability: No data available.

12.3. Bioaccumulative potential
Duracem® F
Bioaccumulative potential: No data available.

Calcium oxide (1305-78-8)
BCF fish 1 (no bioaccumulation)

12.4. Mobility in soil
Duracem® F
Ecology - soil: No data available.

12.5. Other adverse effects
Other adverse effects: No data available.
SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations: This material must be disposed of in accordance with all local, state, provincial, and federal regulations.

SECTION 14: Transport information

In accordance with DOT:

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Additional information

Other information: No supplementary information available.

SECTION 15: Regulatory information

15.1. US Federal regulations

Quartz (14808-60-7)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Cement, portland, chemicals (65997-15-1)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Calcium oxide (1305-78-8)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Magnesium oxide (1309-48-4)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ashes, residues (68131-74-8)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Chromium, ion (Cr 6+) (18540-29-9)
Listed on SARA Section 313 (Specific toxic chemical listings) (Chromium Compounds)
SARA Section 313 - Emission Reporting 0.1%

15.3. US State regulations

Duracem® F
State or local regulations: This product contains Crystalline Silica, Quartz and may also contain trace amounts of other chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

SOURCE AGENCY CARCINOGEN CLASSIFICATIONS:

IARC (I) | International Agency for Research on Cancer.
--- | ---
1 - Carcinogenic to humans;
2A - Probably carcinogenic to humans;
2B - Possibly carcinogenic to humans;
3 - Not classifiable;
4 - Probably not carcinogenic to humans.

NTP (N) | National Toxicology Program.
--- | ---
1 - Evidence of Carcinogenicity;
2 - Known Human Carcinogens;
3 - Reasonably anticipated to be Human Carcinogen;
4 - Substances delisted from report on Carcinogens;
5 - Twelfth Report - items under consideration.

SECTION 16: Other information


NFPA health hazard: 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

NFPA fire hazard: 0 - Materials that will not burn.

NFPA reactivity: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.