Section 1 – Product Identification

Product Identifier
Product Name: Fly Ash
Synonyms: Flyash, Pozzolanic Ash, Coal Ash, Class C Fly Ash, Class F Fly Ash
Product Form: Solid Blend: Powder
Intended Use of Product: Fly ash is used as a supplementary cementitious material in the manufacture of concrete and blended cement. It may also be used as a constituent in portland cement manufacture as well as asphalt and other construction products.

Name, Address and Telephone of Responsible Party
Holcim (US) Inc.
24 Crosby Drive
Bedford, MA 01730
(888) 646-5246

Emergency Contact Information:
CHEMTREC: 1-800-424-9300

Section 2 – Hazards Identification

Classification of the Substance or Mixture
Classification (GHS-US)
- Skin Corrosive 2
- Eye Damage 2A
- Carcinogen 2

Label Elements
Hazard Pictograms

Signal Word
Danger

Hazard Statements
- Harmful if swallowed or inhaled
- Causes serious eye irritation
- Causes skin irritation
- Causes damage to organs (respiratory system) through prolonged or repeated exposure.
- Suspected of causing cancer through prolonged or repeated inhalation

Precautionary Statements

Prevention
Do not breathe dust.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Do not handle until all safety precautions have been read and understood.
Avoid release to the environment.

Response
If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.
If in eyes: Rinse cautiously with clean water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
If on skin: Wash with plenty of water. If skin irritation occurs: Get medical advice/attention.
If swallowed: Call a poison center/doctor if you feel unwell. Rinse mouth.
Take off contaminated clothing and wash it before reuse.

Storage
Store in an appropriate container or containment structure.

Disposal
Dispose of contents/container in accordance with local/state/national regulations.

Other Hazards
Exposure may aggravate those with pre-existing eye, skin or respiratory conditions or illness.
Section 3 – Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Component/Ingredient</th>
<th>CAS #</th>
<th>Percent Present (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica dioxide (Amorphous)</td>
<td>7631-86-9</td>
<td>55 - 65</td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>1344-28-1</td>
<td>20 - 25</td>
</tr>
<tr>
<td>Iron Oxide</td>
<td>1309-37-1</td>
<td>3 - 7</td>
</tr>
<tr>
<td>Calcium oxide</td>
<td>305-78-8</td>
<td>3 - 7</td>
</tr>
<tr>
<td>Gypsum (Calcium Sulfate)</td>
<td>13397-24-5</td>
<td>1 - 5</td>
</tr>
<tr>
<td>Crystalline Silica (Quartz)</td>
<td>14808-60-7</td>
<td>&lt; 1 - 5</td>
</tr>
<tr>
<td>Magnesium oxide</td>
<td>1309-48-4</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Titanium Oxide</td>
<td>13463-67-7</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Carbon</td>
<td>7440-44-0</td>
<td>&lt; 1 - 5</td>
</tr>
</tbody>
</table>

Other Components
Fly ash is a by-product of coal combustion and as such may contain variable trace amounts of various different elements depending on the natural source of the coal. These may include arsenic, antimony, lead, nickel, manganese, chromium, boron, beryllium, selenium, cadmium, mercury, vanadium, uranium and other metals in trace (<0.1%) amounts.

Section 4 – First Aid Measures

Description of First Aid Measures

Eyes  Rinse eyes and under lids cautiously with clean water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Skin   Remove contaminated clothing. Remove solid particles from skin, but avoid creating dust. Wash with plenty of water. If skin irritation occurs: Get medical advice/attention.

Inhalation Remove person to fresh air away from dust and keep comfortable for breathing. If coughing persists, obtain medical attention.

Ingestion Do not induce vomiting. If subject is conscious, rinse the mouth with water to remove any material and drink plenty of water to dilute any swallowed material. Do not give drink or attempt to force water to an unconscious person. Get medical advice/attention.

Important Symptoms and Effects (Acute and Delayed)

Eyes  Causes serious eye irritation and may scratch eye surface due to particle abrasion.

Skin   Causes skin irritation if exposed to moisture on skin creating redness and itching.

Inhalation May irritate nose and throat if dust is inhaled. Prolonged or repeated inhalation of respirable dust may lead to lung damage or disease.

Ingestion May cause irritation of mouth, throat, stomach and digestive tract if swallowed.

Recommendations for Immediate Medical Care or Special Treatment
Seek immediate medical attention for inhalation of large quantities of dust or exposure of wet material over large areas of skin.

Section 5 – Fire Fighting Measures

General Fire Hazards  None. Material is not considered flammable or combustible.

Extinguishing Media  Use water or water spray to extinguish any fires involving this material.

Extinguishing Media to Avoid  None.

Hazard of Combustion  None.

Fire Fighting Recommendations  Firefighters should always wear full protective gear to fight any fire. Refer to Section 9 for flammability information.
Section 6 – Accidental Release Measures

Precautions
Avoid creating dust. Prevent material from entering sewers, drains, ditches or waterways.

Personal Protection
Wear respiratory protection and protective eyewear/clothing to avoid eye or skin contact.

Emergency Procedures
Ventilate area and avoid creating dust. Remove unnecessary persons from area.

Containment Procedures
Barricade solid material to prevent additional spillage.

Clean Up Procedures
Scoop or vacuum up spilled material while avoiding dust creation. Place in approved container.

Section 7 – Handling and Storage

Safe Handling Practices
Avoid contact with skin or eyes. Avoid breathing dust. Use only in well ventilated areas. Wear appropriate personal protective equipment to prevent eye or skin contact and use respiratory protection equipment if dusty or in poorly ventilated areas.

Safe Storage Measures
Store in well-ventilated areas away from moisture and incompatible materials. If stored in containers, keep containers closed when not in use.

Incompatible Materials
Water/moisture exposure will cause material to generate heat. Keep away from fluoride compounds, strong acids, aluminum and oxidizers.

Section 8 – Exposure Controls & Personal Protection

Exposure Limits for Individual Components

<table>
<thead>
<tr>
<th>Component</th>
<th>OSHA PEL</th>
<th>ACGIH TLV</th>
<th>NIOSH REL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica dioxide (Amorphous)</td>
<td>80 mg/m^3 (% SiO_2)</td>
<td>None</td>
<td>6 mg/m^3</td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>15 mg/m^3 (T)</td>
<td>1 mg/m^3 (R) (as Al metal &amp; insoluble compounds)</td>
<td>Not established</td>
</tr>
<tr>
<td>Iron Oxide</td>
<td>10 mg/m^3 (as fume)</td>
<td>5 mg/m^3 (R)</td>
<td>5 mg/m^3 (dust/fume as Fe)</td>
</tr>
<tr>
<td>Calcium oxide</td>
<td>5 mg/m^3</td>
<td>2 mg/m^3</td>
<td>2 mg/m^3</td>
</tr>
<tr>
<td>Gypsum (Calcium Sulfate)</td>
<td>15 mg/m^3 (T); 5 mg/m^3 (R)</td>
<td>10 mg/m^3 (T)</td>
<td>10 mg/m^3 (T); 5 mg/m^3 (R)</td>
</tr>
<tr>
<td>Crystalline Silica (Quartz)</td>
<td>10 mg/m^3 (R) /(% SiO_2 + 2) 0.025 mg/m^3 (R)</td>
<td>0.05 mg/m^3 (R)</td>
<td></td>
</tr>
<tr>
<td>Magnesium oxide</td>
<td>15 mg/m^3</td>
<td>10 mg/m^3 (I)</td>
<td>Not established</td>
</tr>
<tr>
<td>Titanium Oxide</td>
<td>15 mg/m^3</td>
<td>10 mg/m^3 (T)</td>
<td>Not established</td>
</tr>
<tr>
<td>Carbon</td>
<td>15 mg/m^3 (T); 5 mg/m^3 (R)</td>
<td>Not established</td>
<td>Not established</td>
</tr>
</tbody>
</table>

Exposure Controls

Engineering Controls
Use outdoors in well-ventilated areas. Otherwise employ natural or mechanical ventilation to maintain exposure within applicable limits.

Personal Protection

Face and Eyes
Safety glasses with side shields or protective goggles should be worn while using this product. For extremely dusty conditions, non-vented goggles or goggles with indirect venting are recommended. Avoid contact lens wear when using this product.

Body
Long sleeved shirts and trousers should be worn while using this material. Avoid direct contact with skin. If working in dusty conditions, impervious over garments are recommended.

Respiratory
If exposure levels cannot be maintained below acceptable limits, suitable particulate-filtering facemasks or respirators approved by MSHA/NIOSH should be worn in accordance with the user’s respiratory protection program and OSHA/MSHA guidelines.

Hands
Protective gloves with wrist/arm cuffs should be worn to avoid direct contact with skin.

Section 9 – Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Solid, powder, fine granules</td>
</tr>
<tr>
<td>Appearance &amp; Color</td>
<td>Tan/grey/off-white powder</td>
</tr>
<tr>
<td>Odor</td>
<td>None</td>
</tr>
<tr>
<td>pH</td>
<td>&gt;11 (in water)</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>&gt;1000°C</td>
</tr>
<tr>
<td>Solubility (Water)</td>
<td>Negligible (&lt;5%)</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Melting Point</td>
<td>Not determined</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>2.2 – 3.2</td>
</tr>
<tr>
<td>Flash Point/Method</td>
<td>None. Not flammable.</td>
</tr>
<tr>
<td>Auto Ignition Temperature</td>
<td>Not determined</td>
</tr>
<tr>
<td>Lower Flammability Limit</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Upper Flammability Limit</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Octanol/H2O Coefficient</td>
<td>Not determined</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Freezing Point</td>
<td>Solid at room temperature</td>
</tr>
<tr>
<td>Explosion Risk: Static</td>
<td>Not considered a hazard</td>
</tr>
<tr>
<td>Explosion Risk: Shock</td>
<td>Not considered a hazard</td>
</tr>
</tbody>
</table>
Section 10 – Stability and Reactivity

Reactivity
Reacts with water to create heat and calcium hydroxide.

Chemical Stability
Stable at standard temperature and pressures.

Hazardous Reactions
None. Hazardous polymerization will not occur.

Conditions to Avoid
Moisture or wetting may cause exothermic heating as product cures.

Incompatible Materials
Avoid contact with strong acids, aluminum and oxidizers.

Decomposition Hazards
Reacts with water to form calcium hydroxide which can irritate/damage skin.

Section 11 – Toxicological Information

Product: Fly Ash

Acute Toxicity
Not classified.

LD50/LC50 Data
Not classified.

Skin Corrosion/Irritation
Causes skin irritation if exposed to moisture on skin.

Critical Eye Damage/Irritation
May cause serious eye injury due to chemical burns or mechanical irritation.

Respiratory or Skin Sensitization
Not reported/no data available.

Germ Cell Mutagenicity
Not reported/no data available.

Teratogenicity
Not reported/no data available.

Carcinogenicity
Material contains variable amounts of crystalline silica, which may cause lung cancer through repeated or prolonged exposure to dust.

Specific Organ Toxicity (Single Exposure)
Not reported/no data available.

Specific Organ Toxicity (Repeated Exposure)
May cause damage/disease to lungs through repeated or prolonged exposure.

Reproductive Toxicity
Not reported/no data available.

Aspiration Respiratory Hazard
Material contains variable amounts of crystalline silica, which may cause serious lung disease (silicosis) through repeated or prolonged exposure to dust.

Symptoms: Inhalation
Irritation of nose and throat. Coughing, sneezing and mucous discharge.

Symptoms: Skin Contact
Redness and itching. Extended contact may lead to mild chemical burns.

Symptoms: Eye Contact
Redness and itching. Extended contact may lead to corneal abrasion/ulceration.

Symptoms: Ingestion
Not considered a primary exposure route. Irritation of mouth and throat.

Other Toxicological Information
No additional data available.

Components

<table>
<thead>
<tr>
<th>Silica dioxide (Amorphous)</th>
<th>Oral LD50 Rat &gt;5000 mg/kg</th>
<th>Oral LD50 Rat &gt;5000 mg/kg</th>
<th>Oral LD50 Rat &gt;5000 mg/kg</th>
<th>Oral LD50 Rat &gt;5000 mg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Oxide</td>
<td>Oral LD50 Rat &gt;5000 mg/kg</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Iron Oxide</td>
<td>Oral LD50 Rat &gt;10000 mg/kg</td>
<td>Group 3</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Calcium oxide</td>
<td>Oral LD50 Rat 500 mg/kg</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Gypsum (Calcium Sulfate)</td>
<td>Oral LD50 Rat &gt;2000 mg/kg</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Crystalline Silica (Quartz) (refer to Section 16 for more information)</td>
<td>Oral LD50 Rat &gt;22,500 mg/kg</td>
<td>Group 1</td>
<td>Known</td>
<td>Not listed</td>
</tr>
<tr>
<td></td>
<td>LC50 Carp &gt;10,000 mg/L (72 hr)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium oxide</td>
<td>Oral LD50 Rat 810 mg/kg</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Titanium Oxide</td>
<td>Oral LD50 Rat &gt;12 g/kg</td>
<td>Group 2B</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Carbon</td>
<td>Oral LD50 Rat &gt;2 g/kg</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

Section 12 – Ecological Information

General Ecotoxicity
Not classified. Product may have long-term adverse aquatic organism impact.

Persistence and Degradability
Not reported/no data available.

Bioaccumulation Potential
Not reported/no data available.

Mobility in Soil to Groundwater
Not reported/no data available.

Environmental Fate
Not reported/no data available.

Other Environmental Precautions or Information
Avoid release to the environment. Prevent material from entering sewers, drains, ditches or waterways.
Section 13 – Disposal Considerations

**Disposal Methods**
Dispose as an inert, non-metallic mineral in accordance with applicable federal, state, and local regulations.

**Special Considerations**
Avoid creation or breathing dust during disposal. Avoid contact with skin and eyes.

**Other Disposal Information**
Prevent material from entering sewers, drains, ditches or waterways.

Section 14 – Transport Information

**Proper Shipping Name**
N/A – not regulated.

**Hazard Class**
N/A – not regulated.

**UN Shipping ID Number**
N/A – not regulated.

**Packing Group**
N/A – not regulated.

**Environmental/IMDG Codes**
N/A – not regulated.

Section 15 – Regulatory Information

**Federal**
This product contains one or more chemical components or ingredients that may require identification and/or reporting under SARA Section 302, SARA Section 311/312/313, CERCLA and/or TSCA. An examination of the components of this product should be conducted by a qualified environmental professional to determine if such identification or reporting is required by federal law.

- Components: Silica (Crystalline), Silica dioxide (Amorphous), Aluminum oxide, Calcium oxide, Titanium oxide, Iron oxide

**State**
This product contains one or more chemical components or ingredients that are included or listed on the hazardous substances lists for one or more of the following states: California, Maine, Minnesota, New Jersey, Pennsylvania and Rhode Island. An examination of the components of this product should be conducted by a qualified environmental or safety and health professional to determine the specific requirements for those states.

- Components: Silica (Crystalline) Silica dioxide (Amorphous), Aluminum oxide, Calcium oxide, Titanium oxide, Iron oxide

The state of California requires the following statement (Proposition 65) in regards to this material:

- WARNING! This product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

Section 16 – Other Information

**Date of last revision:** April 30, 2015
**Prepared and reviewed by:** Holcim (US) Inc. Occupational Safety & Health

**Additional information regarding crystalline silica:**
The major concern is silicosis, caused by the inhalation and retention of respirable (extremely small) crystalline silica dust particles. Silicosis can exist in several forms. Chronic or ordinary silicosis (often referred to as simple silicosis) is the most common form of silicosis, and can occur after many years of exposure to relatively low concentrations of airborne respirable crystalline silica dust. Complicated silicosis or progressive massive fibrosis (PMF) may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease secondary to the lung disease. Acute silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis can be fatal.

IARC: The overall IARC evaluation was that "crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1)." The IARC evaluation noted that "carcinogenicity was not detected in all industrial circumstances studies. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs."

NTP: The National Toxicology Program (NTP), in its Thirteenth Annual Report on Carcinogens, classified "silica, crystalline (respirable)" as a known human carcinogen.

OSHA: Crystalline silica (quartz) is not regulated as a human carcinogen by the Occupational Safety and Health Administration.
Other important information:
While the information provided in the safety data sheet is believed to provide a useful summary of the hazards of fly ash, the information in this document cannot anticipate and provide all of the information that might be needed in every situation. Inexperienced product users should obtain proper training before using this product.

The data furnished in this sheet do not address hazards that may be posed by other materials when mixed with fly ash. Users should review other relevant material safety data sheets before working with this product.

The information presented in the Safety Data Sheet is based on current knowledge and publications and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not be interpreted as guaranteeing any specific property of the product.

SELLER MAKES NO WARRANTY, EXPRESSED OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY HOLCIM (US) INC., EXCEPT THAT THE PRODUCT SHALL CONFORM TO CONTRACTED SPECIFICATIONS.

--END OF SAFETY DATA SHEET--