SAFETY DATA SHEET

MATERIAL: FLY ASH

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

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

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.

Hazards 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 **(T= Total Respirable, R=Respirable fraction, I=Inhalable-aerosol)**

Component	OSHA PEL	ACGIH TLV	NIOSH REL
Silica dioxide (Amorphous)	80 mg/m3 / (% SiO2)	None	6 mg/m3
Aluminum Oxide	15 mg/m3 (T) 5 mg/m3 (R) (as Al)	1 mg/m3 (R) (as Al metal & insoluble compounds)	Not established
Iron Oxide	10 mg/m3 (as fume)	5 mg/m3 (R)	5 mg/m3 (dust/fume as Fe)
Calcium oxide	5 mg/m3	2 mg/m3	2 mg/m3
Gypsum (Calcium Sulfate)	15 mg/m3 (T); 5 mg/m3 (R)	10 mg/m3 (T)	10 mg/m3 (T); 5 mg/m3 (R)
Crystalline Silica (Quartz)	10 mg/m3 (R) /(% SiO2 + 2) 30 mg/m3 (T) /(% SiO2 + 2)	0.025 mg/m3 (R)	0.05 mg/m3 (R)
Magnesium oxide	15 mg/m3	10 mg/m3 (I)	Not established
Titanium Oxide	15 mg/m3	10 mg/m3 (T)	Not established
Carbon	15 mg/m3 (T); 5 mg/m3 (R)	Not established	Not established

Exposure Controls

Engineering Controls	Use outdoors in well-ventilated areas. Otherwise employ natural or mechanical ventilation to maintain exposure within applicable limits.
Personal Protection	Avoid contact with skin or eyes. Avoid creating or breathing dust.
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 contract 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

Physical State	Solid, powder, fine granules	**Specific Gravity**	2.2 – 3.2
Appearance & Color	Tan/grey/off-white powder	**Flash Point/Method**	None. Not flammable.
Odor	None	**Auto Ignition Temperature**	Not determined
pH	>11 (in water)	**Lower Flammability Limit**	Not applicable
Boiling Point	>1000^{o}C	**Upper Flammability Limit**	Not applicable
Solubility (Water)	Negligible (<5%)	**Octanol/H2O Coefficient**	Not determined
Evaporation Rate	Not applicable	**Viscosity**	Not applicable
Melting Point	Not determined	**Freezing Point**	Solid at room temperature
Vapor Density	Not applicable	**Explosion Risk: Static**	Not considered a hazard
Vapor Pressure	Not applicable	**Explosion Risk: Shock**	Not considered a hazard

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	**Toxicity**	**Carc: IARC**	**Carc: NTP**	**Carc: OSHA**
Silica dioxide (Amorphous)	Oral LD50 Rat >5000 mg/kg Inhalation LC50 Rat >2.2 mg/L (1 hr) Dermal LD50 Rabbit >2000 mg/kg	Group 3	Not listed	Not listed
Aluminum Oxide	Oral LD50 Rat >5000mg/kg	Not listed	Not listed	Not listed
Iron Oxide	Oral LD50 Rat >10000 mg/kg	Group 3	Not listed	Not listed
Calcium oxide	Oral LD50 Rat 500 mg/kg	Not listed	Not listed	Not listed
Gypsum (Calcium Sulfate)	Oral LD50 Rat >2000 mg/kg	Not listed	Not listed	Not listed
Crystalline Silica (Quartz) (refer to Section 16 for more information)	Oral LD50 Rat >22,500 mg/kg LC50 Carp >10,000 mg/L (72 hr)	Group 1	Known	Not listed
Magnesium oxide	Oral LD50 Rat 810 mg/kg	Not listed	Not listed	Not listed
Titanium Oxide	Oral LD50 Rat >12 g/kg	Group 2B	Not listed	Not listed
Carbon	Oral LD50 Rat >2g/kg	Not listed	Not listed	Not listed

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.

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