

Safety Data Sheet

Section 1

Identification of the Substance and of the Supplier

1.1 Product Identifier

Product Name/Identification:	CFB Bed Ash
Synonyms:	Circulating Fluidized Bed Coal Ash, Pozzolan
Product Code:	Not Applicable
Formula:	UVCB Substance

1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advices Against

Relevant Identified Uses:	Cement Replacement, Concrete Additive, Inert Filler
Uses Advised Against:	Any uses not meeting appropriate engineering specifications

1.3 Details of the Supplier of the SDS

Manufacturer/Supplier:	Charah Solutions, Inc.
Street Address:	12601 Plantside Drive
City, State and Zip Code:	Louisville, KY 40299
Customer Service Telephone:	502-245-1353
Website Address:	www.charah.com

1.4 Emergency Telephone Numbers


Emergency Phone Number:	877-314-7724
Hours Available:	M-F, 8:00 am – 5:00 pm (ET)
24 Hour Emergency Phone Numbers:	(800) 424-9300 (24-hour response by Chemtrec)

**Section 2
Hazards Identification**
2.1 Classification of the Substance

GHS Classification(s) according to OSHA Hazard Communication Standard (29 CFR 1910.1200):

- STOT-SE Category 3
- STOT-RE Category 2
- Skin Corrosion Category 1A
- Eye Damage Category 1

2.2 Label Elements

Labelling according to 29 CFR 1910.1200 Appendices A, B and C*	
Hazard Pictogram(s):	
Signal word:	Danger
Hazard Statement(s):	Causes severe skin burns and eye damage. May cause respiratory irritation. May cause damage to lungs after repeated/prolonged exposure via inhalation.
Precautionary Statement(s):	Do not breathe dust. Wash thoroughly after handling. Wear protective gloves, eye protection and protective clothing. Use outdoors or in a well ventilated area. <u>If in eyes:</u> Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention. <u>If on skin (or hair):</u> Take off immediately all contaminated clothing. Rinse skin with water/shower. <u>If swallowed:</u> Rinse mouth. Do NOT induce vomiting. <u>If inhaled:</u> Remove person to fresh air and keep comfortable for breathing. <u>If exposed or concerned:</u> Get medical attention. Immediately call a poison center or doctor if you feel unwell. Wash contaminated clothing before reuse. Store in a secure area. Dispose of product in accordance with local/national regulations..

* Fly ash and other coal combustion products (CCPs) are UVCB substances (substance of unknown or variable composition or biological). Various CCPs, noted as Ashes; Ash; Ash residues; Ashes, residues, bottom; Bottom ash; Bottom ash residues; Waste solids, ashes under TSCA are defined by the US EPA as: "The residuum from the burning of a combination of carbonaceous materials. The following elements may be present as oxides: aluminum, calcium, iron, magnesium, nickel, phosphorus, potassium, silicon, sulfur, titanium, and vanadium." Ashes including fly ash and fluidized bed combustion ash are identified by CAS number 68131-74-8. The exact composition of the ash is dependent on the fuel source and flue additives composed of a large number of constituents. The classification of the final substance is dependent on the presence of specific identified oxides as well as other trace elements.

2.3 Other Hazards

Listed Carcinogens:

- Respirable Crystalline Silica

IARC: [Yes] **NTP:** [Yes] **OSHA:** [No] **Other:** [No]

Section 3 Composition/Information on Ingredients

<i>Substance</i>	<i>CAS No.</i>	<i>Percentage (%)</i>	<i>GHS Classification</i>
<i>Aluminosilicates</i>	<i>Various: See note 1</i>	<i>30-60</i>	<i>Single Exposure STOT, Category 3</i>
<i>Crystalline Silica</i>	<i>14808-60-7</i>	<i><10</i>	<i>Repeat Dose STOT, Category 2</i>
<i>Silica, crystalline respirable (RCS)</i>	<i>14808-60-7</i>	<i>See note 2</i>	<i>Repeat Dose STOT, Category 2</i>
<i>Calcium oxide (CaO)</i>	<i>1305-78-8</i>	<i>40</i>	<i>Skin Irritant Category 2 Eye irritant Category 2B</i>
<i>Manganese dioxide (MnO₂)</i>	<i>1313-13-9</i>	<i><2</i>	<i>Skin Irritant Category 2 Eye irritant Category 2B</i>
<i>Phosphorus pentoxide (P₂O₅)</i>	<i>1314-56-3</i>	<i><2</i>	<i>Skin Irritant Category 2 Eye irritant Category 2B</i>
<i>Potassium oxide (K₂O)</i>	<i>12136-45-7</i>	<i><2</i>	<i>Skin Irritant Category 2 Eye irritant Category 2B</i>
<i>Magnesium sulfate</i>	<i>7487-88-9</i>	<i><2</i>	<i>Skin Irritant Category 2 Eye irritant Category 2B</i>

1. Aluminosilicates may be in the form of mullite (CAS#1302-93-8); aluminosilicate glass, or pozzolans (CAS#71243-67-9). The form is dependent on the source of the coal and or the process used to create the CCP. Pulverized coal combustion would be more likely to create high levels of pozzolans. Aluminosilicates may have inclusions of calcium, titanium, iron, potassium, phosphorus, magnesium and other metal oxides.
2. RCS in the CCP has not been determined.

Section 4 First Aid Measures

4.1 Description of First Aid Measures

Inhalation:	If product is inhaled and irritation of the nose or coughing occurs, remove person to fresh air. Get medical advice/attention if respiratory symptoms persist.
Skin Contact:	If skin exposure occurs, wash with soap and water.

Eye Contact:	If product gets into the eye, rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Seek medical attention/advice if irritation occurs or persists.
Ingestion:	No specific first aid measures are required.

4.2 Most Important Health Effects, Both Acute and Delayed

Acute effects: Direct exposure may cause respiratory irritation, eye irritation and skin irritation. The product dust can dry and irritate the skin and cause dermatitis and can irritate eyes and skin through mechanical abrasion.

Chronic effects: Chronic exposure may cause lung damage from repeated exposure. Chronic inhalation of dusts containing respirable crystalline silica may result in silicosis.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

Seek first aid or call a doctor or Poison Control Center if contact with eyes occurs and irritation remains after rinsing.

Section 5 Firefighting Measures

5.1 Extinguishing Media

Suitable Extinguishing Media:	Product is not flammable. Use extinguishing media appropriate for surrounding fire.
Unsuitable Extinguishing Media:	Do not use a heavy water stream. Use of heavy stream of water may spread fire. Application of water stream to hot product may cause frothing and increase fire intensity.

5.2 Special Hazards Arising From the Substance or Mixture

Fire Hazard	Product is not considered flammable but may burn at high temperatures.
Explosion Hazard	None.
Reactivity	Hazardous reactions will not occur under normal conditions.
Hazardous Combustion Products:	None known.

5.3 Advice for Firefighters

Special Protective Equipment and Precautions for Firefighters:	As with any fire, wear self-contained breathing apparatus (NIOSH approved or equivalent) and full protective gear.
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Other Information: Refer to Section 9 for flammability properties.

Section 6
Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

Personal precautions/Protective Equipment:	See Section 8.2.2 Personal Protective Equipment. Avoid all contact with skin, eyes, or clothing. For concentrations exceeding Occupational Exposure Levels (OELs), use a self-contained breathing apparatus (SCBA).
Emergency procedures:	Use scooping, water spraying/flushing/misting or ventilated vacuum cleaning systems to clean up spills. Do not use pressurized air.

6.2 Environmental precautions

Environmental precautions:	Prevent contamination of drains or waterways and dispose according to local and national regulations.
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6.3 Methods and Material for Containment and Cleaning Up

Methods and materials for containment and cleaning up:	<p><u>For Containment:</u> Scoop or vacuum the product to recover it. Vacuum must be fitted with HEPA filter to prevent release of particulates during clean-up.</p> <p><u>For Clean-up:</u> Do not use brooms or compressed air to clean surfaces. Use dust collection vacuum and extraction systems.</p> <p>Large spills of dry product should be removed by a vacuum system. Dampened material should be removed by mechanical means and recycled or disposed of according to local and national regulations.</p>
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See Sections 8 and 13 for additional information on exposure controls and disposal.

Section 7 Handling and Storage

7.1 Precautions for Safe Handling

Practice good housekeeping. Use adequate exhaust ventilation, dust collection and/or water mist to maintain airborne dust concentrations below permissible exposure limits (note: respirable crystalline silica dust may be in the air without a visible dust cloud).

Do not permit dust to collect on walls, floors, sills, ledges, machinery, or equipment. Maintain and test ventilation and dust collection equipment. In cases of insufficient ventilation, wear a NIOSH approved respirator for silica dust when handling or disposing dust from this product. Avoid contact with skin and eyes. Wash or vacuum clothing that has become dusty. Avoid eating, smoking, or drinking while handling the material.

7.2 Conditions for safe storage, including any incompatibilities

Technical Measures: Comply with applicable regulations.

Storage Conditions: Store in a dry, cool and well-ventilated place. Keep/Store away from incompatible materials. Minimize dust produced during loading and unloading.

Incompatible Materials: Strong acids. Strong bases. Strong oxidizers.

Section 8
Exposure Controls/Personal Protection
8.1 Control Parameters

OCCUPATIONAL EXPOSURE LIMITS					
SUBSTANCE		OSHA PEL TWA (mg/m ³)	NIOSH REL TWA (mg/m ³)	ACGIH TLV TWA (mg/m ³)	CA - OSHA PEL (mg/m ³)
Calcium oxide		5	2	2	2
Particulates Not Otherwise Regulated	Total	15	15	-	10
	Respirable	5	5	-	5
Crystalline Silica	Total Quartz	0.05	0.05	-	0.3
	Respirable Crystalline Silica	0.05	0.05	0.025 (α-quartz & cristobalite)	0.1
	Cristobalite	0.05	0.05	0.025 (α-quartz & cristobalite)	0.05 (respirable)
Manganese dioxide (as manganese compounds)	Total	5 (Ceiling)	1 3 (STEL)	0.1	0.2
	Respirable	-	-	0.02	-

8.2 Exposure Controls

Appropriate Engineering Controls: Ensure adequate ventilation, especially in confined areas. Maintain the ambient workplace atmosphere below the occupational exposure limit(s). Use general and local exhaust ventilation and dust collection systems as necessary to minimize exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of potential exposure. Ensure all federal, state, and local regulations are observed.

8.2.1 Personal Protective Equipment (PPE)

Respiratory protection:	Wear a NIOSH approved particulate respirator if exposure to airborne particulates is unavoidable and where occupational exposure limits may be exceeded. If airborne exposures are anticipated to exceed applicable PELs or TLVs, a self-contained breathing apparatus or airline respirator is recommended.
Eye and face protection:	If eye contact is possible, wear protective glasses with side shields and/or face shields. Avoid contact lenses.
Hand and skin protection:	Wear gloves and protective clothing. Wash hands with soap and water after contact with material.

Section 9 Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

Property: Value	Property: Value
Appearance (physical state, color, etc.): Fine tan/gray particulate	Upper/lower flammability or explosive limits: Not applicable
Odor: Odorless ¹	Vapor Pressure (Pa): Not applicable
Odor threshold: Not applicable	Vapor Density: Not applicable
pH (25 °C): 7-12 ²	Specific gravity or relative density: 2.2 - 2.8
Melting point/freezing point (°C): Not applicable	Water Solubility: Slight
Initial boiling point and boiling range (°C): Not applicable	Partition coefficient: n-octane/water: Not determined
Flash point (°C): Not determined	Auto ignition temperature (°C): Not applicable
Evaporation rate: Not applicable	Decomposition temperature (°C): Not determined
Flammability (solid, gas): Not combustible	Viscosity: Not applicable

¹ The use of urea or aqueous ammonia injected into the flue gas to reduce nitrogen oxides (NOx) emissions may result in the presence of ammonium sulfate or ammonium bisulfate in the ash at less than 0.1%. When ash containing these substances becomes wet under high pH (>9), free ammonia gas may be released resulting in objectionable/nuisance ammonia odor and potential exposure to ammonia gas especially in confined spaces.

² This is a typical range. There are rare cases where fly ash has pH in water of less than 7.

9.2 Other Information

No additional information available.

Section 10 Stability and Reactivity

10.1 Reactivity:	The material is an inert, inorganic material primarily composed of elemental oxides.
10.2 Chemical stability:	The material is stable under normal use conditions.
10.3 Possibility of hazardous reactions:	The material is a relatively stable, inert material; however, when ash containing ammonia becomes wet under high pH (>9), free ammonia gas may be released resulting in an objectionable/nuisance ammonia odor and potential exposure to ammonia gas especially in confined spaces.
10.4 Conditions to avoid:	Product can become airborne in moderate winds. Dry material should be stored in silos. Materials stored out of doors should be covered or maintained in a damp condition.
10.5 Incompatible materials:	Strong acids. Strong bases. Strong oxides.
10.6 Hazardous decomposition products:	None known.

Section 11 Toxicological Information

11.1 Information on Toxicological Effects

Endpoint	Data
Acute oral toxicity	LD50 > 2000 mg/kg Component Data: Quartz: LD50 > 5000 mg/kg (rat) Calcium oxide: LD50 > 2500 mg/kg (rat)
Acute dermal toxicity	No data available on product. Component data: Quartz: LD50 > 5000 mg/kg (rat) Calcium oxide: LD50 > 2500 mg/kg (rat)
Acute inhalation toxicity	No data available on product. May cause burns or irritation of the respiratory tract.
Skin corrosion/irritation	Based on ash components and final product pH, the product may be corrosive and cause severe skin burns.
Eye damage/irritation	Based on ash components and final product pH, the product may be corrosive and cause severe skin burns.
Respiratory/skin sensitization	Not a respiratory or dermal sensitizer.
Germ cell mutagenicity	Not mutagenic in <i>in vitro</i> and <i>in vivo</i> assays with or without metabolic activation.
Carcinogenicity	NTP: Probable carcinogen OSHA: Not listed as a carcinogen IARC Monographs: Group 1 Carcinogen California Proposition 65: Known carcinogen
Reproductive toxicity	An animal study with a CCP has indicated some effects on male and female reproductive organs and parameters without a clear dose response, while studies with other CCPs have not shown reproductive effects. Therefore, there is not enough evidence available to classify according to reproductive toxicity. No developmental toxicity has been observed in available animal studies.
STOT-SE	No specific target organ toxicity after a single exposure to the substance is expected; however, presence as a nuisance dust may result in respiratory irritation.
STOT-RE	NOAEL = 200 mg/kg/day (males) on the basis of biochemical and histopathological effects; target organ is the liver; using GHS criteria, no classification with respect to STOT-RE is required based on this data. Repeated inhalation exposures to high levels of respirable crystalline silica may result in lung damage (i.e., silicosis).

Section 12 Ecological Information

12.1 Toxicity

Coal Ash CAS# 68131-74-8	
Toxicity to fish	LC50 >100 mg/L
Toxicity to invertebrates	Data indicates that the test substance is not toxic to <i>Daphnia magna</i> (EC50 undetermined).
Toxicity to algae and plants	EC50 = 10 mg/L

12.2 Persistence and Degradability

Not relevant for inorganic materials.

12.3 Bioaccumulative Potential

No data available.

12.4 Mobility in Soil

No data available.

12.5 Results of PBT and vPvB Assessment

No data available.

12.6 Other Adverse Effects

None known.

Section 13 Disposal Considerations

See Sections 7 and 8 above for safe handling and use, including appropriate hygienic practices.

Dispose of all waste product and containers in accordance with federal, state and local regulations.

Section 14 Transport Information

Regulatory entity: U.S. DOT	Shipping Name:	Not Regulated
	Hazard Class:	Not Regulated
	ID Number:	Not Regulated
	Packing Group:	Not Regulated

Section 15 Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Mixture

- **TSCA Inventory Status**

All components are listed on the TSCA Inventory.

- **California Proposition 65**

The following substances are known to the State of California to be carcinogens and/or reproductive toxicants:

- Respirable crystalline silica
- Titanium dioxide (airborne particles)

- **State Right-to-Know (RTK)**

Component	CAS	MA ^{1,2}	NJ ^{3,4}	PA ⁵	RI ⁶
Ammonium bisulfate	7803-63-6	No	Yes	No	No
Ammonium sulfate	7783-20-2	Yes	No	Yes	No
Calcium oxide	1305-78-8	Yes	Yes	Yes	No
Calcium sulfate	7778-18-9	Yes	Yes	Yes	No
Iron oxide	1309-37-1	Yes	Yes	Yes	No
Magnesium oxide	1309-48-4	No	Yes	No	No
Phosphorus pentoxide (or phosphorus oxide)	1314-56-3	Yes	Yes	Yes	No
Potassium oxide	12136-45-7	No	Yes	No	No
Silica-crystalline (SiO ₂), quartz	14808-60-7	Yes	Yes	Yes	No
Titanium dioxide	13463-67-7	Yes	Yes	Yes	No

¹ Massachusetts Department of Public Health, no date

² 189th General Court of The Commonwealth of Massachusetts, no date

³ New Jersey Department of Health and Senior Services, 2010a

⁴ New Jersey Department of Health, 2010b

⁵ Pennsylvania Code, 1986

⁶ Rhode Island Department of Labor and Training, no date

- **Coal ash is not a SARA 313 substance.**

Coal ash is required for SARA Tier II (311/312) reporting when in sufficient quantities. Trace elements in coal ash should be considered in TRI reporting.

Section 16 Other Information, Including Date of Preparation or Last Revision

16.1 Indication of Changes

Date of preparation or last revision: January 2, 2023.

16.2 Abbreviations and Acronyms

- ACGIH: American Conference of Industrial Hygienists
- ANSI: American National Standards Institute
- CA: California
- CAA: Clean Air Act
- CAS: Chemical Abstract Services
- CCP: Coal Combustion Product
- CFB: Circulating Fluidized Bed
- CFR: Code of Federal Regulations
- CWA: Clean Water Act
- EPA: Environmental Protection Agency
- GHS: Globally Harmonized System of Classification and Labelling
- HMIS: Hazardous Materials Identification System
- IARC: International Agency for Research on Cancer
- LC50: Concentration resulting in the mortality of 50 % of an animal population
- LD50: Dose resulting in the mortality of 50 % of an animal population
- LEL: Lower explosive limit
- MA: Massachusetts
- NA: Not Applicable
- NJ: New Jersey
- NOEC: No observed effect concentration
- NIOSH: National Institute of Occupational Safety and Health
- NOx: Nitrogen oxides
- NTP: US National Toxicology Program
- OEL: Occupational Exposure Limit
- OSHA: Occupational Safety and Health Administration
- PA: Pennsylvania
- Pa: Paschal
- PBT: Persistent, Toxic and Bioaccumulative
- PEL: Permissible exposure limit
- PPE: Personal Protective Equipment
- REL: Recommended exposure limit
- RI: Rhode Island
- RCS: Respirable Crystalline Silica
- RTK: Right-to-Know
- SARA: Superfund Amendments and Reauthorization Act
- SCBA: Self-contained breathing apparatus
- SDS: Safety Data Sheet
- STEL: Short-term exposure limit
- STOT-RE: Specific target organ toxicity-repeated exposure
- STOT-SE: Specific target organ toxicity-single exposure
- TLV: Threshold limit value
- TSCA: Toxic Substances Control Act
- TWA: Time-weighted average
- UEL: Upper explosive limit
- UVCB: Unknown or Variable Composition/Biological
- U.S.: United States
- U.S. DOT: United States of Department of Transportation
- vPvB: Very Persistent and Very Bioaccumulative

16.3 Other Hazards

Table 1: CFB Bed Ash

Hazardous Materials Identification System (HMIS)						
Degree of hazard (0= low, 4 = extreme)						
Health:	3*	Flammability:	0	Reactivity:	1	Personal protection: -

* Chronic Health Effect

DISCLAIMER:

This SDS has been prepared in accordance with the Hazard Communication Rule 29 CFR 1910.1200. Information herein is based on data considered to be accurate as of date prepared. No warranty or representation, express or implied, is made as to the accuracy or completeness of this data and safety information. No responsibility can be assumed for any damage or injury resulting from abnormal use, failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.