

# Technical Datasheet 9.0

## COSHH – Safety Data Sheet for PFA/Fly Ash and FBA (including Cenospheres)

### Compiling Organisation: UK Quality Ash Association\*

\* The UK Quality Ash Association is not a producer of PFA and FBA, but a trade association representing the interests of the UK coal fired power station operators. This safety data sheet represents the combined knowledge/safety information available at the time of publication.

Under the REACH regulations Article 31 it is the responsibility of the producer of a substance to provide a safety data sheet if a substance is considered dangerous. However, it is not necessary to supply a Safety Data Sheet if the substances / preparations are supplied in the UK and not classified as dangerous. PFA and FBA are considered **non-hazardous**, see 2 and 16 below.

It is still necessary to comply with COSHH requirements, which this Safety Data sheet aims to achieve.

### Chemical safety data sheets

Safety data sheets provide information on products that help users of those products to make a risk assessment. They describe the hazards the substances present, and give information on handling, storage and emergency measures in case of accident.

A safety data sheet is not a risk assessment. You should use the information it contains to help make your own assessment. As well as receiving products you may supply them to others. If you do, you must pass on information (as safety data sheets) to those whom you supply.

### 1) Identification of substance and the company undertaking:

**Product:** Pulverised Fuel Ash (PFA) or Fly Ash, as it is known in many countries and Furnace Bottom Ash (FBA) produced by coal fired power station.

**Company:** *This information will be required from the supplier or producer of the material*

Address:

Telephone:

### 2) Hazards Identification

PFA and FBA are not considered to be hazardous, but should be handled in accordance with good occupational hygiene and safety practices. They do **NOT** require a REACH Safety Data Sheet (SDS). A Substance Information Sheet (SIS) for "Ashes (Residues) – coal" is available on request.

### 3) Composition/Information on ingredients

**Chemical Composition:** PFA and FBA are composed of inorganic material with a small proportion of carbon particles resulting from the incomplete combustion of the parent fuel, coal. PFA is extracted from the flue

gases discharged from the combustion furnace of a coal-fired power station by electrostatic and mechanical processes. FBA is extracted by a hydraulic process from the base of the furnace.

PFA is a fine grey powder with virtually no odour. FBA is a semi vitrified granular material ranging in colour from dark grey to black with virtually no odour.

**Hazardous Components:** PFA and FBA are not considered to have any hazardous components that will affect existing patterns of production, handling, storage and use.

### 4) First Aid Measures

**Skin:** Wash contaminated areas of the body with soap and water as soon as is reasonably practical.

**Eyes:** If the substance has entered the eyes then irrigate with emergency eye wash solution (if available) or clean water for up to 15 minutes. Obtain medical advice if any pain or redness persists.

**Inhalation:** If inhalation of the dust causes irritation of the nose or coughing remove the patient into fresh air. Keep warm and at rest. Carefully remove any excess dust from nasal passages and rinse mouth with water until clear. If symptoms persist obtain medical advice.

**Ingestion:** There are no known adverse affects. Wash mouth out with water and give water to drink. Do not induce vomiting.

In all cases should exposure be excessive or symptoms develop seek medical attention.

### 5) Fire Fighting Measures

There are no risks of fire or explosion as the product is identified as non-combustible.

### 6) Accidental Release Measures

**Environmental Precautions:** Prevent entry into drains and watercourses.

**Clean up methods:** Large spills of dry material should be removed by a vacuum system. Conditioned (dampened) material should be removed by mechanical means where possible and be recycled or disposed of in a licensed site.

Applying a fine water spray can reduce the potential for dust blow.

### 7) Handling and Storage

Avoid creating airborne dust wherever possible. Where dust is generated then engineering control measures should be considered (water sprays) to maintain the airborne dust concentration as low as is reasonably practical.

Avoid prolonged skin contact especially where the product is dampened. Wear protective clothing, for example goggles, gloves, overalls and boots. Change heavily contaminated clothing as soon as possible; launder before re-use. Good housekeeping practices as well as high standards of personal hygiene should be maintained.

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The use of respiratory equipment must be strictly in accordance with the manufacturer's recommendations and any statutory requirements governing its selection and use.

**Storage in dry form:** Keep in containers or silos or in sealed bags.

**Storage in conditioned, lagoon or with added water:** When stored in stockpiles keep exposed surfaces damp and cover small stockpiles with protective sheeting.

**Handling:** Avoid creating airborne dust wherever possible. Where dust is generated then engineering dust control measures should be considered to maintain the airborne dust to as low as is reasonably practicable.

**Transporting in dry form:** Transport in sealed tankers or similar units.

**Transporting in conditioned, lagoon or with added water:** In open vehicles with exposed surfaces protected with sheeting.

**Classification and Transport:** PFA and FBA are not classified as dangerous under the Classification Packaging and Labelling of Dangerous Substances Regulations. They are not classified dangerous for road, rail, sea or air transport.

### 8) Exposure controls/Personal Protection

**Exposure limits:** Relevant UK Occupational Exposure Standards as published in HSE Guidance Notes EH40 are:

Pulverised Fuel Ash (PFA), fly ash and Furnace Bottom Ash are:

Total Inhalable dust 10 mg/m<sup>3</sup> 8hr TWA

Respirable dust 4 mg/m<sup>3</sup> 8hr TWA

**Control Measures:** Engineering control measures such as enclosing transfer chutes and pipes, should be used wherever practicable to prevent and control dust generation and exposure. Conditioning and dampening the dust can also reduce exposure.

**Protective clothing:** To prevent eye and skin irritation, where contact can occur, then goggles, gloves, overalls, and boots should be worn. Change heavily contaminated clothing as soon as possible and launder before reuse. Wash any contaminated underlying skin with soap and water.

**Respiratory precautions:** If operations are such that the airborne dust levels are likely to exceed the concentrations quoted above, then suitable respiratory protection should be worn. The highest possible dust concentration should be estimated or measured and the appropriate equipment selected. The use of respiratory equipment must be strictly in accordance with the manufacturer's instructions and the statutory requirements governing its selection and use.

### 9) Physical and Chemical Properties

**Appearance:** PFA is a fine grey powder and FBA is a semi vitrified granular material ranging in colour from dark grey to black with virtually no odour.

#### Physical Properties

Odour	Virtually none
Particle Density (Specific Gravity)	1.8 to 2.4
Solubility in water:	Less than 2%
Bulk density:	1.1 to 1.7 g/cm <sup>3</sup>
Alkalinity - pH:	9 to 12 when damp
Boiling point/boiling range:	N/A
Melting point/melting range:	N/A
Flash point:	N/A
Flammability & auto flammability:	N/A
Oxidising properties:	N/A
Vapour pressure:	N/A
Dielectric Constant:	1.9 – 2.6
EC Number Ash Residues (coal)	931 322 8
Cenospheres	300-212-6
CAS number: Ash (residues)	68131-74-8
Cenospheres	93924-19-7
ACX number:	X1014150-5

#### Basic oxide composition

Component	Typical % by weight
SiO <sub>2</sub>	45 to 51 %
Al <sub>2</sub> O <sub>3</sub>	27 to 32 %
Fe <sub>2</sub> O <sub>3</sub>	7 to 11 %
CaO	1 to 5 %
MgO	1 to 4%
K <sub>2</sub> O	1 to 5%
Na <sub>2</sub> O	0.8 to 1.7 %
TiO <sub>2</sub>	0.8 to 1.1%
SO <sub>3</sub> *	0.3 to 1.3%
Cl	0.05 to 0.15 %

Note: \* Water soluble.

The figures for SiO<sub>2</sub> do not refer to free silica but to silicon present as silicates of varying compositions.

### 10) Stability and Reactivity

PFA and FBA is predominantly an inert glassy material containing a small amount of neutral salts and some lime.

**Conditions to avoid:** Dry material can become airborne in moderate winds. Dry materials shall be stored in silos.

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Materials stored out of doors should be maintained in a damp condition.

Materials to avoid: None

Hazardous decomposition products: None

### 11) Toxicological Information

**Eyes:** Due to the reaction with moisture in the eye irritation of the conjunctiva occurs if dust remains in contact with the eye.

**Skin:** Dry PFA will have little effect on the skin. However, when moist it is alkaline and prolonged or repeated contact can cause abrasion and irritant dermatitis.

**Ingestion:** There are no known adverse effects following ingestion.

**Inhalation:** After 60 years of exposure experience there is no clinical evidence of a significant risk of harm to the respiratory tract or lungs.

### 12) Ecological Information

Mobility, persistence and degradability, bio-accumulation potential and aquatic toxicity

PFA has no known Eco Toxic effects in the existing patterns of production, handling, storage and use. Fresh materials have been shown to have some Boron Phytotoxicity, but this rapidly diminishes with weathering and amelioration.

### 13) Disposal Considerations

PFA and FBA are classed as 'Controlled Wastes' in the UK and have no special requirements for their disposal at appropriately licensed facilities. They are included in the European Waste Catalogue (Code No. 10 01 02) but are not hazardous materials as determined by EC

Hazardous Waste List (Directive 94/904/EC). They are also 'Green List' materials for transfrontier shipment.

### 14) Transport Information

Category under CPL regulations: Non-hazardous.

### 15) Regulatory Information

Chemical Safety Assessment: Being carried out

**Hazard Label Data:** This product is NOT classified as dangerous for supply in the UK. PFA and FBA are governed by the following legislative requirements:

**EC Directives:** 94/3/EC, the European Waste Catalogue

**Statutory Instruments:** Health and Safety at Work Act, 1974. Consumer protection Act, 1987. Environment Protection Act, 1990. Control of Substances Hazardous to Health, 1994. Waste Management – The Duty of Care. Personal Protective Equipment at Work Regulations, 1992.

**Guidance notes:** Occupational Exposure Limits, EN/40.

### 16) Other Information

HSE, Pulverised Fuel Ash, Criteria Document for an Occupational Exposure Limit, HMSO c20 11/92, ISBN 0 11 886391 6

UK REACH Competent Authority Information Leaflet 13 – REACH and SDS – Sept. 2010

See <http://www.ukqaa.org.uk> for contact details and further information.

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This product(s) is supplied by the members of the UKQAA on the understanding it will be used in the manner and for the purpose(s) specified in the UKQAA datasheet(s), the user having taken all precautions stipulated. If you have purchased the product for supply to a third party for use at work, it is your duty to take all necessary steps to ensure that any person handling or using the product is provided with the information on this sheet.

If you are an employer, it is your duty to inform your employees and others who may be affected of any hazards described in this sheet and any precautions that should be taken. In circumstances where products are to be used outside the jurisdiction of the United Kingdom such usage must be in conformity with national standards or those described on this sheet, whichever are more stringent.

Note: Section headings conform to REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency. Annex II.

In general usage the term 'fly ash' is used for pulverized coal ash but it can also cover ash from burning other materials. Such 'fly ash' may have significantly differing properties and might not offer the same advantages as ash from burning pulverized coal. UKQAA datasheets only refer to PFA (including cenospheres) / fly ash / FBA produced from the burning of predominantly coal in power stations.

Information provided in this document is intended for those who will evaluate its significance and take responsibility for its use and application. UKQAA will accept no liability (including that for negligence) for any loss resulting from the advice or information contained in this document. It is up to the user to ensure they obtain the latest version of this document as the UKQAA continually revises and updates its publications. Advice should be taken from a competent person before taking or refraining from any action as a result of the comments in this guide which is only intended as a brief introduction to the subject.