

# Substance Identity Profile (SIP) for FBC Ash

## Substance Sameness Checking

### Fluidized Bed Combustion (FBC) Ash

Reference in RIP 3.10 from REACH	UVCB subtype where the source is chemical or mineral and the process is a synthesis / refinement.
Name	Ashes from fluidized Bed combustion coal fired Power stations with and without co-combustion of secondary fuels (biomass; other fuels – to be verified in view of ecotoxicological and toxicological tests)
Other names	FBC Ash, Fluidized Bed Fly and Bottom Ash
EC number	931-257-5
CAS Number	N/A
Description	The residuum from the burning and desulfurization processes in Fluidized Bed Combustion boilers. The substance consists mainly of following oxides: silicon, aluminum, iron, calcium, titanium, sodium, potassium, magnesium and phosphorous and calcium sulphate as a residuum of desulfurization process.
Origin	<p>Fired raw-materials: hard coal, lignite</p> <p>Coal results from natural process of plant growth and decay, accumulation of debris both vegetal and mineral, with some sorting and stratification and accomplished by chemical, biological, bacteriological and metamorphic action over million of years. The organic chemical materials are produced at combustion while produce heat. Mineral matter remains as the residue and it is called ash.</p> <p>Secondary fuel:</p> <ul style="list-style-type: none"> <li>- biomass: wood herbaceous by-products from agriculture, etc up to the amount of 30% by mass</li> <li>- others – to be verified in view of ecotoxicological and toxicological tests</li> </ul> <p>Possible desulfurization material: limestone, etc.</p>
Process	<p>For the combustion process coal and co-combustion material is fed into a boiler. Depending on the situation the coal and/or co-combustion material is milled together or fed separately. In addition desulfurization agents may be added.</p> <p>These materials are mixed together inside the boiler and from the so called “bed” that is suspended on jet on air and it is very similar to boiling liquid. This is where the name fluidized comes from because it resembles a liquid.</p> <p>If desulfurization agents are added the desulphurization takes place in the boiler.</p>

	The combustion takes place at temperatures of 800 to appr. 950°C. FBC Ash (both of fly ash and bottom ash) is produced inside the boiler. FBC fly ash is carried along with the flue gas and leaves the furnace in the upper part of the boiler. It is mostly collected in electrostatic precipitators or mechanically by separation in fabric filters. FBC bottom ash is collected at the bottom of the boiler and is representing the coarser part of the ash. FBC fly ash and bottom ash may be mixed and extracted together as FBC-ash.
Chemical composition	Chemical composition of FBC Ash is reported as the mass percent of following components:

Component	Min.	Max.
CaO (total)	0,5	48
SO <sub>3</sub>	1	30
CaCO <sub>3</sub>	0	10
SiO <sub>2</sub>	10	76
Al <sub>2</sub> O <sub>3</sub>	3	38
Fe <sub>2</sub> O <sub>3</sub>	0,2	27
TiO <sub>2</sub>	0,2	8
MgO	0	25
Na <sub>2</sub> O	0,01	4
K <sub>2</sub> O	0,2	8
P <sub>2</sub> O <sub>5</sub>	0,1	10,5

Content of heavy trace metals (compounds of very high concern) in above mentioned substance is limited to be lower than 0.1% in sum.