



Fluidised bed combustion

Fluidised bed combustion (FBC) is a combustion technology used to burn solid fuels¹.

In its most basic form, fuel particles are suspended in a hot, bubbling fluidity bed of ash and other particulate materials (sand, limestone etc.) through which jets of air are blown to provide the oxygen required for combustion or gasification. The resultant fast and intimate mixing of gas and solids promotes rapid heat transfer and chemical reactions within the bed. FBC plants are capable of burning a variety of low-grade solid fuels, including most types of coal, coal waste and woody biomass, at high efficiency and without the necessity for expensive fuel preparation (e.g., pulverising). In addition, for any given thermal duty, FBCs are smaller than the equivalent conventional furnace, so may offer significant advantages over the latter in terms of cost and flexibility.

FBC reduces the amount of sulfur emitted in the form of SO_x emissions. Limestone is used to precipitate out sulfate during combustion, which also allows more efficient heat transfer from the boiler to the apparatus used to capture the heat energy (usually water tubes). The heated precipitate coming in direct contact with the tubes (heating by conduction) increases the efficiency. Since this allows coal plants to burn at cooler temperatures, less NO_x is also emitted. However, burning at low temperatures also causes increased polycyclic aromatic hydrocarbon emissions. FBC boilers can burn fuels other than coal, and the lower temperatures of combustion (800 °C / 1500 °F) have other added benefits as well. Solid biofuel (Wood fuel) is produced from a wide range of sources of biomass. Biomass as sourced will usually require some treatment before it is a fuel suitable for combustion in specific heat plant. Once treated it is often referred to as wood fuel as wood is the most common source of biomass for producing solid biofuels.

¹ Wikipedia