Combustion Simulation of Sludge in Fluidized Bed Incinerator

The combustion process of sludge, biomass and other fuel particles fed into a fluidized bed incinerator is represented by simulating the particle (sludge, sand) behavior, compressible gas flows, radiation fields and chemical reactions. The sludge combustion process is modeled in three stages: water evaporation, devolatilization (pyrolysis) and fixed carbon (char) combustion. The concentrations of reactive gases such as Oxygen (O_2), water vapor (H_2O), carbon dioxide (CO_2), carbon monoxide (CO), methane (CH_4) and hydrogen (H_2) produced and extinguished during the combustion process are also simulated numerically.

Particle Temperature   Drying Rate of Sludge

Gas Flow Velocity   Gas Temperature O_2 Concentration