ABSTRACT

This research aims to study the effect of the presence of an internal heater and other variations of properties - properties. Problem-solving efforts in this research study will be conducted through the use of simulation-based method of Computational Fluid Dynamic (CFD).

CFD-based simulations which take into account the pattern of fluid flow simultaneously capable of presenting detailed information about what is happening in the fluidized bed dryer. A detailed description of the particle distribution profile, flow velocity, concentration at any point in the fluidized bed dryer provide alternative solutions to determine the condition fluidization in a fluidized bed dryer.

Geometry of fluidized bed dryer is used with long tubular cylindrical fluidized bed dryer 1370 mm, 152 mm diameter cylinder and use heater bundle in it. Materials used in this study of pulverized coal with coal type Buckheart where the particle size is considered monodispers with particle size of 1.43 mm with supervictial velocity 1.1 m/s. The methodology includes several steps performed are: create a model of its geometry and grid, determine the model, operating conditions, boundary conditions, parameters, and hydrodynamics in a fluidized bed dryer.

From the results obtained by the simulation of airflow patterns in the fluidized bed without internal heater is more stable than the fluidized bed which uses an internal heater and the fluidized bed which uses an internal heater showed no significant increase bed height before and after the air flowed while fluidized bed without internal heater expanded bed of 390 mm to 454 mm.

Keywords: CFD, coal, fluidized bed dryer, hydrodynamic