SIMULATION OF COMBUSTION PROCESS IN CEMENT KILN BASED ON CFD

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Abstract

This research was committed to study combustion process in kiln theoretically with the use of CFD. Combustion process have dependent factors, such as the geometry of the nozzle, coal feed rate, air feed rate, quality of coal, etc. In this research, the main factor that we considered is the effect of air-coal rate dynamic to the combustion process with the boundary of geometry of nozzle and quality of coal. The use of CFD is the best alternative to study this phenomenon because it is supported by applied theories and devices that capable to make some simulations ofcombusting model accurately and holistically. By doing this experiment we can make 3D simulations of temperature distribution and know air to fuel ratio that can produce such a fine combustion process.

The best ratio between axial and radial is 1:4 which provide average temperature as high as 1265,1783 K. Combustion process done fast at the first half of the kiln, and the other half was only the heat transfer of the heat of combustion in the first half of the kiln.

Key words: combustion, CFD, air to fuel ratio, temperature distribution
(HALAMAN INI SENGAJA DIKOSONGKAN)