

## Chapter 14

# Characterization and Development of Geldart's Fluidizing Velocity Profile of Sand Particles for the Application in Fluidized Bed Combustor (FBC)

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**Abstract** The objective of this study is to fully utilize the local sand retrieved from Pahang river as a bed material in FBC. The proposed work will study through experiments to deduce a new classification of local river sand in a fluidized bed based on the minimum fluidization velocity of inert particles according Geldart's classification operated at five different temperatures: 55, 82, 108, 124 and 148 °C respectively. River sand was chosen as a fluidizing medium due to its characteristics that can withstand high operating temperature of more than 1000 °C. Apart from that, its cheap cost and availability make it preferred choice for the operation. The results show that the minimum fluidizing velocity of the sand,  $U_{mf}$  was found increasing as the temperature increased for the sands operated at low temperature, but maintaining almost at the same value, for the sands operated higher operating temperature respectively. The findings agree well with the reported trend by previous authors, in which their results based on the bed operated at combustion temperature which is above 800 °C. Thus, it can be conclude that the local sands, will exhibits the same trend for the application of fluidized bed combustor.

**Keywords** Fluidized bed combustor · Geldart's classification · Sand particles

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