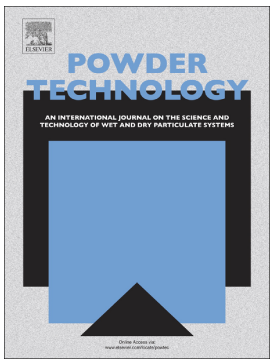

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An Experimental Investigation on the Effect of Particle Size into the Flowability of Fly Ash

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Abstract

In this paper, physical properties and flow properties of fly ash collected from seven fields of Electro-Static precipitator (ESP) hoppers of a coal fired thermal power plant have been investigated by using Powder Flow Tester operating based on Jenike's methodology. It was experimentally observed that the fly ash from different ESP hoppers have different flow properties. Various powder flow properties, such as cohesion, unconfined yield strength, angle of internal friction and wall friction angle were found to have power law variation with median particle size. Critical particle size, which caused a change in the flow properties of fly ash from cohesive to easy flowing, was experimentally evaluated and validated. Hopper half angle and critical outlet opening trends were determined for different fly ash samples to achieve mass flow condition for discharge. Additionally, two power law models were also developed for estimating hopper half angle and critical outlet openings using powder flow properties.

Keywords: Fly ash, powder flow properties, hoppers, critical particle size, wall friction