

Improvement On Particulate Mixing Through Inclined Slotted Swirling Distributor In A Fluidized Bed: An Experimental Study

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ABSTRACT

Previous studies show that excellent particulate mixing in a fluidized bed can reduce the operating cost during fluidization. Therefore, this paper investigates enhancement of particulate mixing in a fluidized bed by using novel inclined slotted swirling distributor. To reduce the cost of pumping power, small size, low pressure blower is used in the study. Moreover, Geldart group B bed materials with different bed aspect ratios and distributor designs viz., perforated plate, circular edged slots (90°) and novel swirling (45°) distributors are used. The novel distributor with 45° inclined slots was found to be effective at enhancing the circulation rate. Swirling flow pattern of the bed materials in a clock-wise direction is obvious in shallow bed, and two-layer transversal-lateral circulation motions are observed in deep bed. It can be concluded from the study that excellent particulate mixing as per rotated distributors is made possible by novel swirling-type distributor without the implementation of electric motor and mechanical rotation.

KEYWORDS: Swirling fluidized bed; Slotted distributor; Swirling distributor; Swirling flow; Transversal mixing; Lateral mixing

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