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CFD analysis of a continuous powder dryer with inclined metal sheets

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Abstract: A continuous powder dryer of inclined metal sheets was designed and simulated using computational fluid dynamics. This dryer suggests an alternative for the drying of lactose in the pharmaceutical and food industry where there are high control requirements for moisture content. The dryer was designed to process the granular material over a wide range of particle sizes. The dryer dimensions are calculated by the particle entrainment theory to obtain the terminal particle velocity. CFD simulations were performed by feeding the air in the front and the back of the metal sheets with inclination angles of 40°, 50°, and 60° angles. The results of these simulations indicate that the velocity profiles with the best contact air-solid were obtained using the configuration of 60° inclination angle.

Keywords: CFD, simulations, drying, tower.

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