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The Gas-Solid Flow Characteristics of Cyclones

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Abstract

Cyclones have been widely used as separation devices during pneumatic conveying. The pipelines and cyclones inlet are connected by diameter change joints. The inlet cross section area is always larger than the pipeline. This results in the velocity of gas becoming lower than particle velocity when the gas-particles flow into the cyclone. The gas-solid flow in cyclones are investigated using FLUENT-EDEM method. The results show that the existence of particles had major effects on the gas flow of the cyclone within the inlet and conical separation parts. The tangential, axial, and radial velocities are only slightly changed when solid gas ratio at the same gas velocity/particle velocity ratio, while the velocities increase with the increasing of gas velocity/particle velocity ratios under the same solid gas ratio. The cyclone pressure drop decreases at a low solid gas ratio, and is maintained at an almost constant level with the high solid gas ratio. However, with the lower solid gas ratio, the particle strands are not clear, and the particle strand is found to become clearer and

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