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A Correlation for Particle Velocities in Pneumatic Conveying

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Abstract

The particle velocity data to develop a correlation for predicting the particle velocity as a function of experimental parameters and physical properties of the solids were obtained from electrostatic signals generated in pneumatic conveying of solids through a non-conductive section of piping in our laboratory. The cross-correlation of two signals was used as the measurement technique. Three different data sets under a wide spectrum of conditions were employed in the analysis. Comparison of the correlations developed was made with a recent correlation developed using data obtained by the use of high speed video camera on single particles. In comparing these correlations a single unifying correlation was elusive. The data obtained for the cross-correlations included data that was taken on a system operating up to 40 bars of pressure. This particle velocity data remained unique in the analysis.

Keywords: Particle velocities, pneumatic conveying, experimental, electrostatic measurements, correlation

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