

NUMERICAL INVESTIGATIONS ON PARTICLE SEGREGATION IN PNEUMATIC CONVEYING WITH A CHANGE OF ELBOW RADIUS

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Pneumatic conveying of gas- particle mixture is presented in a wide branch of industries. Transporting system consists of many elements, especially with horizontal or vertical pipes, as well as various types of elbows, divider, valves, inlets and outlets.

In systems of pneumatic transport of pulverized materials uncontrolled segregation of particles is present. The reason for its formation is the main purpose of the centrifugal force when changing the direction of flow as well as the force of gravity. The prospect of pneumatic transport system is primarily determined by the design of the entire system, therefore it is not always possible to get a different location of individual sections of the transport. However, there are often some opportunities for such a modification of an existing or designed system, to improve transport conditions.

One of the elements which has a major influence on the regularity of the transport process is the elbow. In this elbow there is a change of direction of the gas-particle flow by 90 degrees. There was analyzed a case of changing the flow direction from vertical to horizontal, followed by a straight section of pipe. The effect of changes a relation of the radius of curvature to the diameter of the pipeline on the coefficient of heterogeneity. This coefficient is the ratio of maximum to average concentration of particles in a given cross section.