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The study of the volume fraction of key component in the second phase of the portion mixing by means of the device of gravity type

Anna Kapranova and Ivan Verloka Yaroslavl State Technical University, Russia

Statement of the Problem: The process of mixing of bulk components is one of the main stages of their processing. Obtaining quality mixtures of bulk materials with unequal content of their volume fractions is actual problem for a variety of industries. Portion method of mixing of bulk components can be successfully implemented in the apparatus of gravity type using the additional mixing drums with a spiral coiling of brush elements. The study of mechanics of behavior of the rarefied flows of mixed materials in the working volume of the device of gravity type can be performed on the basis of stochastic approach. The purpose of this study is the research of the volume fraction of key component in the second phase of the portion mixing by means of the device of gravity type.

Methodology & Theoretical Orientation: On the basis of the stochastic approach, the model of spreading of particles of bulk materials after interaction with brush elements is proposed as well as method of evaluating the volume fraction of a key component after the shock dispersion of the bulk components at the initial stage of batch mix.

Findings: The results of stochastic modeling in the form of sets of non-equilibrium distribution functions for the number of particles of each of the granular material depending on the corners of their spreading after impact on inclined flat bump-stop allow revealing the conditions for obtaining the most homogeneous mixture at the second stage of the batch mixing.

Conclusion & Significance: The results obtained depend on constructive-regime parameters of apparatus of gravity type, physicomechanical properties of mixed materials. Results could be used as the basis for development of an evaluation method for the degree of homogeneity of the granular mixture in the engineering method of calculation of specified device parameters.

Biography

Anna Kapranova is the Head of Department of Theoretical Mechanics and Strength of Materials at Yaroslavl State Technical University, Yaroslavl, Russia.

kapranova_anna@mail.ru

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