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TECHNIQUE FOR THE COMPUTATIONAL DETERMINATION OF THE HYDRAULIC RESISTANCE OF A GAS-DISPERSED FLOW

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The aim of this work is to determine the hydraulic resistance of a gas-dispersed flow in a horizontal channel with a minimum of empirical data. Assuming the gas-dispersed flow energy balance as a sum of two terms: the carrier gas energy and the particle energy, a relation for hydraulic resistance determination in Gasterstadt's form is obtained. To find the particle drag and relative velocity appearing in this relation, use is made of the results of a numerical solution of the problem of the motion of particles in a horizontal channel in Lagrangian variables with account for the interaction of the particles with the channel walls and with one another. The effect of the particles on the carrier gas parameters is neglected. A verification of the proposed technique using various empirical relationships reported in the literature has shown that the calculated and the experimental results are in satisfactory agreement. The proposed technique may be used in the development and design of engineering systems with gas-dispersed flows.

Keywords: *gas-dispersed flow, hydraulic resistance, particle, collision, channel wall, numerical calculation, verification.*

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