

Numerical study of a spherical particle drag coefficient in the thermal plasma flow of DC plasma torch

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The paper presents a study of the drag coefficient of a spherical Al_2O_3 particle in a thermal plasma flow. An unsteady model of the interaction of a fine particle in a rectangular channel with a laminar compressible non-isothermal flow has been developed. An analysis of the influence of boundary conditions on the simulation results is performed. Based on the results of a parametric study, the functional dependences of the drag coefficient and the Nusselt number necessary for simulation of plasma coating technology are determined.

Keywords: thermal plasma, DC plasma torch, drag coefficient, Nusselt number, numerical simulation.

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