

## Numerical model of the trajectory of fine $Al_2O_3$ powder in a plasma flow

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**The paper presents a study of the tracing of a spherical  $Al_2O_3$  particle in a thermal plasma flow. Based on a two-dimensional non-stationary numerical model, the results of calculations of the trajectory of motion of the sprayed powder are presented for the main numerical of the drag coefficient of particles. The developed non-stationary model allows to take into account the mutual influence of the particle flow, the transport gas and the plasma flow generated by the DC plasma torch. The ranges of applicability of the models are presented. The dependence of the drag coefficient of a single particle in a non-isothermal flow on the relative Reynolds number has been clarified. A comparative analysis of the numerical model for calculating the trajectory of a particle with full-scale tests showed the correspondence of the calculated and experimental data.**

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

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