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CIRCULATION OF THE METAL MELT IN THE INDUCTION CHANNEL FURNACE AT A PHASE CONTROL OF SUPPLY VOLTAGE

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Abstract

A mathematical model that describes the coupled electromagnetic and hydrodynamic processes in an induction channel furnace is presented. The model is a system of equations of magnetic hydrodynamics, which includes integro-differential equations for the electromagnetic field at applied voltages at the furnace inductors and equations of hydrodynamics in the form of Navier-Stokes equations for stationary turbulent flow using the $k-\varepsilon$ turbulence model. Using the example of a two-phase channel furnace, the influence of the phase angle between the voltages supplying the furnace inductors on the structure and intensity of the liquid metal flow in the channels is considered. The values of this angle which provide the maximum flow rate of transit melt flow in the channels are determined. References 3, figures 3.

Key words: induction channel furnace, power supply system, mathematical modelling.

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