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INCREASING THE ENERGY EFFICIENCY OF INDUCTION HEATING COMPLEXES FOR ELECTRODE PRODUCTS MANUFACTURING

The modern development of the ferrous and non-ferrous metallurgical industry is characterized by increasing requirements for the quality of electrode products with a simultaneous decrease in their cost price.

To a large extent, the quality of carbon and bottom blocks is determined at the stage of production of blanks by the method of pressing with simultaneous electrothermal treatment, primarily due to the stabilization of the temperature field of massive mouthpieces and the formation of the appropriate surface temperature distribution of the block blanks.

The efficiency of the electric heating of the mouthpiece can be increased on the basis of theoretical and experimental studies of temperature fields, characteristics and new constructive solutions of inductors installed on the mouthpieces, taking into account the peculiarities of the temperature control system during the pressing of blanks.

These theoretical and experimental studies require the development of connected mathematical models of the complex interaction of electromagnetic and thermal fields, methods of their calculation, algorithms and computer programs, which will allow to optimize the design parameters of in-

ductors and temperature regimes of pressing, to ensure the improvement of the quality of blanks of blast furnace and floor blocks with simultaneous reduction of energy consumption.

The use of research results in engineering practice at enterprises of the electrode industry will allow to increase the efficiency of operation of unique equipment for the manufacture of furnace and furnace blocks, to ensure the introduction of energy-saving technological modes and to reduce the cost of production, which is relevant for modern electrode production.

The development and implementation into production of an improved system for controlling the modes of induction electric heating of the mouthpiece of the press for the production of carbon and bottom blocks will ensure the stabilization of temperature modes of pressing, the reduction of the interval of temperature run-up in the mouthpiece and the uniform distribution of the temperature field on the surface of the blanks of the blocks, will allow to improve the quality of products and reduce energy costs by 15...18%.