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DEVELOPMENT OF RATIONAL TECHNOLOGY OF HEATING FOR TWO-CELL THERMAL HEATERS OF PAJ «ELECTROMETALLURGY PLANT OF «DNEPROSPETSSTALL′»

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There is carried out the analysis of quality for heating of metallic purveyances for thermal treatment at existent technology of heating for double-chamber pusher of thermal furnaces natural gas. There is offered rational technology of their heating with combining of two fuel constituents with different heating value realization of which allows to increase the volume consumption of combustion foods at all cycle of thermal treatment and, consequently, to decrease the unevenness of the temperature field on length of the heated purveyances.

Keywords: double-chamber pusher thermal furnace, technology of heating, combining of fuel constituents

Introduction. The wide range of change for thermal power of thermal furnaces of different type at realization of the multi-stage temperature-temporal modes of treatment of metal in a great deal predetermines requirements to incineration of gaseous fuel for its different periods.

On PAJ «Electrometallurgy plant «Dneprospetsstall′» for annealing and tempering of the cast electrodes, got on device of semi continuous casting of special steels, two-cell thermal heaters is applied. Charge, consisting of 5-6 electrodes in the special accessory and put in metallic troops, it is feed up from two parties in the working chamber of furnace with use the coupled light carts and close its steel-lined dampers with a sandy breech-block. In every chamber it is located for nine burners of ГНП-4 type. Moving away of burning foods is carried out from an opposite in relation to the burners of side furnace through channels, executed in a blank wall, and also through fume-collect channels - at the level of bottom from the side of burners.

For control of temperature of furnace in the crown of every working chamber it is set for three thermopairs. In addition, these furnaces are equipped by the systems of temperature adjusting, correlations «fuel-air» and stabilizing of pressure in every working chamber.

Raising of task. A purpose in this work is research of thermal work two-cell thermal heaters and development of rational technology of their heating.

Basic part of researches. On the first stage there is studied distribution of temperature on length of working chamber and its intercommunication with the thermal loading and pressure in a furnace.

It is set as a result of the executed researches, that, the temperature field in the working chamber of furnace is non-stationary. Gradient of temperature at the

beginning of heating of metal is 80-100 °C, and in the period of self-control goes down to 20-30 [(1)], C.

However gradients of temperature on volume charge of metal were considerably below, that it can be explained by more perfect system of heating. Evenness of admission of warmth to the metal in the furnaces of this type is provided by the up-diffused admission of warming gases in the working chamber of furnace.

Elongation of period of self-control is inadvisable both from position of increase of expense of fuel and impairment of quality of heat treatment of metal. Character of change of pressure is in the working chamber of furnace, in spite of the existent system of automatic control, practically fully repeats periodicity of change of the thermal loading and renders insignificant influence on distribution of temperature on length of furnace.

At diminishing of by volume expense of burning foods at the end of period of self-control there is a decline of pressure in a furnace at the level of charge to the values below of atmospheric size. As a result, there are leak-in of cold atmospheric air through the unclosenesses of sandy breech-block of dampers, that results in cooling of extreme areas of charge.

On results the executed measuring it is possible to conclude about the necessity of stabilization of the gas-dynamic mode of furnace by the increase of by volume expense of burning foods due to the change of technology of heating. Deciding the set problem is possible by passing to heating of furnaces with the separate serve of fuel constituents (high-calorific natural and low-caloric black-furnace gases) and combining of them immediately in front of burners.

Conclusion. There is worked out method of heating of thermal furnaces of chamber type, including a separate serve natural and black-furnace gases and also surplus air with the change of the tricked into thermal power depending on the set temperature-temporal mode, different that the by volume expense of warming smoke gases is supported by the permanent way of substituting for part of black-furnace gas equivalent on volume foods of combustion of natural gas a quantity at the deficit of heat or by the corresponding giving of surplus air.