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STUDY OF ENERGYEFFICIENCY FOR HEAT WORT OF CHAMBER FURNACES WITH ROLLOUT BOTTOM

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There have been presented results of study heat work for the chamber furnaces with rollout bottom. It has been established necessity for experimental confirmation of the rise possibility for energy efficiency of mentioned technological object with use of the spatial electric field.

Keywords: chamber furnace, rollout bottom, energyefficiency, heat balance, spatial electric field

Modern economic terms put the powerful industrial production of Ukraine in hard frames. At the impetuous increase of cost of power resources and world tendency to providing by energy carriers in a necessary volume foreground task for the managers of industrial plants is applying of progressive recourse saving energy effective technologies and measures in industry. For the Ukrainian economy such task is especially actual, as the state provides the necessities by own resources only on 53 %.

One of the most items of consumption of fuel in black and color metallurgy is on a furnace for thermal treatment of metal. The analysis of structure of prime cost of finite production of metallurgical plant cost shows that its considerable part is folded charges on fuel and energy resources. As in the prospect of a few decades it does not follow to expect dump of heater furnaces in domestic practice, innovative decisions in relation to the increase of energy effectiveness of the mentioned thermal aggregates acquire a primary value.

Chamber furnaces are by the main type of aggregates for heating and thermal treatment of large forged pieces and castings in metallurgy and engineer. However the these aggregates have considerable losses of warmth with combustion products and unevenness of distribution of warmth within the limits of charge. As a result it brings excessive of fuel and energy resources and an increase to finite prime cost.

By main reason of excessive of power resources is insufficient utilization of warmth of combustion products (loss folds 70-75 % energies). Application of devices of regenerative or recuperative type gives capacity to use the warmth of burning foods for heating of air which goes to the burners and for heating of fuel. But to the question of more effective use of heat energy within the limits of the working volume of furnace, its concentration in the places of location of purveyances and decline due to it of consumption of natural gas on heating of metal it is not spared audience research, therefore it is needed to demand further researches in this direction.

In the casting workshop of LTD «ZTMC» for thermal treatment of castings a chamber furnace is set with rollout bottom. At the determine of heat balance of the mentioned furnace took into account the chemical warmth of fuel, warmth which is brought with by air, a warmth of metal oxidization exothermic reactions, consumption of warmth on heating of metal and transporting devices, and also warmth, that lose with burning foods and warmth is the accumulated by fettle of furnace.

It is set that the main part of losses of heat energy in the working area of stove is folded a warmth, that lose with burning foods (37.7 %).

The searches of ways of decision of the higher considered problems of more effective use of thermal energy within the limits of the working volume of furnace/ There are resulted to development of method of increase of power efficiency of chamber furnaces by means of the use of spatial electric field. The analysis of the preliminary carried out experimental researches showed that influence of electric field on the process of distribution of warmth in heater chambers was irrefutable and gives a considerable money economy. A task to carry out the real experiment on an operating furnace in the terms of LTD. «ZTMC» with the purpose of reduction of consumption of natural fuel by means of the offered method is put in further researches.