

CFD-SIMULATION OF WORKFLOWS IN MICROJET BURNERS WITH ASYMMETRIC FUEL DISTRIBUTION

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The work is devoted to the study of operating processes in stabilizer burners with jet immersion of fuel into the stream of blowing away oxidizing agent, provided that it is fed from only one of the lateral surfaces of the flameholders. These burner devices are oriented to operation at relatively high values of the excess air ratio, which is characteristic for their operation in industrial furnaces, dryers, and the like.

The purpose of the work. Establishment of regularities of the influence of construction parameters on working processes in microjet burners of stabilizer type with asymmetric fuel distribution.

Results. Data on flow characteristics and mixture formation in one-sided fuel supply burners were obtained on the basis of computer modeling. Effects on the working processes of burners considered of such constructive parameters as the length of the flap L_3 on the end surface of the flameholder, the relative step of gas supply holes S/d and the distance between the gas supply holes and the break-away edge of the stabilizers.

According to the results of the performed studies, in particular, it has been shown that with the increase of the length of the flaps of L_3 the length of the reverse flows behind the flameholder significantly rises and the average concentration of methane in the circulation zone behind the stabilizer increases, last one responsible for the stability of the combustion process

The extreme nature of the dependence of the level of average concentration of methane in the zone of reverse flows on the value S/d is established. It is shown that the levels of average concentration of methane required in this zone for the stable combustion are observed at certain values of this relative step S/d .

Conclusions. The influence on the patterns of flow and the mixture formation in burner devices of the stabilizer type with asymmetric fuel supply of a number of constructive parameters has been established. It is shown that the necessary characteristics of the work processes of the burner considered can be provided by selecting the appropriate values of these parameters.