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MICRO-JET BURNERS WITH ECHELONED FLAME STABILIZERS

The effective methods of burning gaseous fuels include micro-jet combustion in the flame stabilizer system [1-6]. When designing micro-jet burners, it is important to study various methods of influencing on the flow of working processes in these devices.

This paper is devoted to studies that relate to one of these methods, which consists in using the echeloned arrangement of flame stabilizers (that is, their displacement relative to each other downstream by a certain amount — the displacement step). Different types of echeloned stabilizer lattices are considered, namely, staircase echeloned and comb echeloned lattices. The use of staircase echeloning is focused on the formation of the temperature fields of the required special profile in the combustion zone, and the use of comb lattices is associated with the need to reduce pressure losses in the burner devices. For these stabilizer lattices, the flow patterns were investigated under cold flow conditions and during combustion. Comparisons were also made with the corresponding data for the non-echeloned lattices. Studies have shown that with the echeloned arrangement of flame stabilizers, in contrast to their non echeloned location, there is a certain asymmetry of the flow relative to the axis of the burner channel, and accordingly a redistribution of air flow is observed in the channels of the stabilizer lattice. According to the data of computer simulation, the fact of lesser turbulence in the flow behind the staircase-

echeloned lattice of stabilizers is established compared with the situation when the ends of the stabilizers are located in one plane. This fact is of great importance for the design of burners. The less turbulence causes a somewhat lower pressure loss in the burners with an echeloned arrangement of flame stabilizers compared to a non- echeloned arrangement.

Studies have shown that the structure of the flow of fuel and oxidant in an echeloned lattice has a number of specific features that are significantly different from the non-echeloned arrangement of flame stabilizers. These patterns are important information for creating micro-jet burners with an echeloned arrangement of flame stabilizers.

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