

# BURNING MIXTURES OF NATURAL GAS WITH AIR ON THE SURFACE OF THE HEAT RECUPERATING MATRIX

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**Abstract:** Experiments were performed to study the combustion of mixtures of natural gas and air on the surface of the flat heat recuperating permeable matrix of highly porous metal foam. Recuperating matrix is an assembly of bars of highly porous metallic chromalloy foam and heat exchangers (heat-conducting elements) in the form of stainless steel plates. Introduction of heat-conducting elements to the design of matrix made it possible to provide additional heat recovery from the combustion products to the matrix. The temperature of the surface of the matrix with the introduction of heat exchangers has increased by more than 200 K, the maximum value of the radiation flux density from its surface increased by a factor of 1.7. Sustainable mode of surface combustion on heat recuperating matrix was implemented in a wider range of values of burning specific power compared to a typical porous matrix, namely, in the range from 15 to 100 W/cm<sup>2</sup>. The concentration of carbon monoxide in combustion products in the heat recuperating matrix decreased more than twice and the concentration of nitrogen oxides decreased by a factor of 1.5

**Keywords:** surface burning; permeable matrix; heat transfer

## References

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