**ON THE CALCULATION OF CONVECTIVE HEAT RECOVERY UNDER MUTUAL-ACTION OF A JET WITH A LIMITING SURFACE**

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***Abstract:*** A method for calculating convective heat transfer in the interaction of a single circular jet with a flat surface is proposed. The concepts “energodynamic potential of the flow” and “energodynamic power of the flow” are introduced, allowing to determine the intensity of convective heat transfer at the “gas-solid” boundary. The differences of the proposed definitions from the existing ones are given: heat flux density and heat flux.

When calculating the heat transfer, it was proposed to divide the jet when interacting with the flat surface into two parts: before the interaction - the jet part, after - the fan flow.

The method for calculating convective heat transfer under jet heating, in which the Reynolds criterion calculated by the characteristics of the gas at the nozzle exit is decisive, is not entirely correct; It is proposed to use criteria specific to the fan flow. Characteristic values ​​for the fan flow are the initial average velocity of the fan flow Uvp, the distance from the critical point of the jet (the point of intersection of the vertical axis of the jet with the surface) to the current coordinate of the radius.

*Keywords: jet heating, “attacking” jet, fan flow, convective heating, numerical simulation, convective heat transfer, fields of velocity, Reynolds criterion. energy-dynamic potential, energy-dynamic power.*

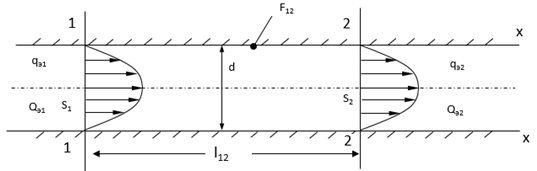


Fig. 1 - The movement of a liquid or gas inside a pipe of circular cross section

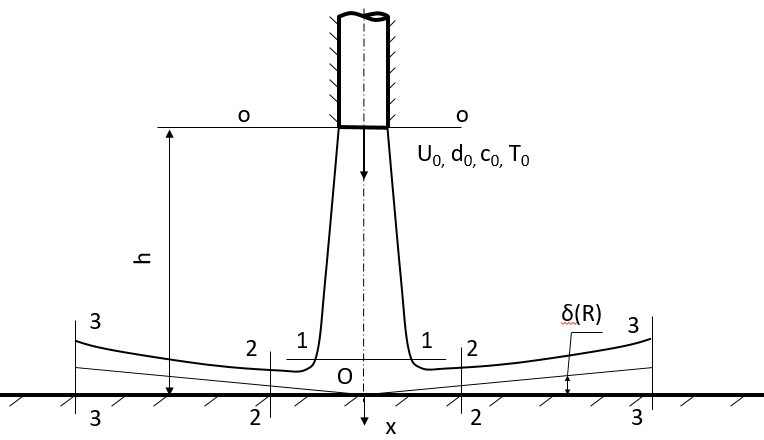


Fig. 2 – Calculated flow pattern when the jet hits a flat surface

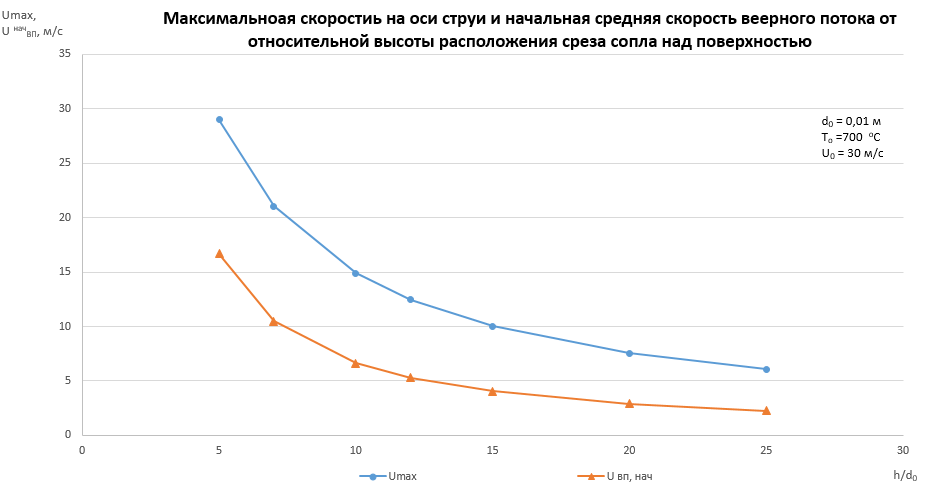
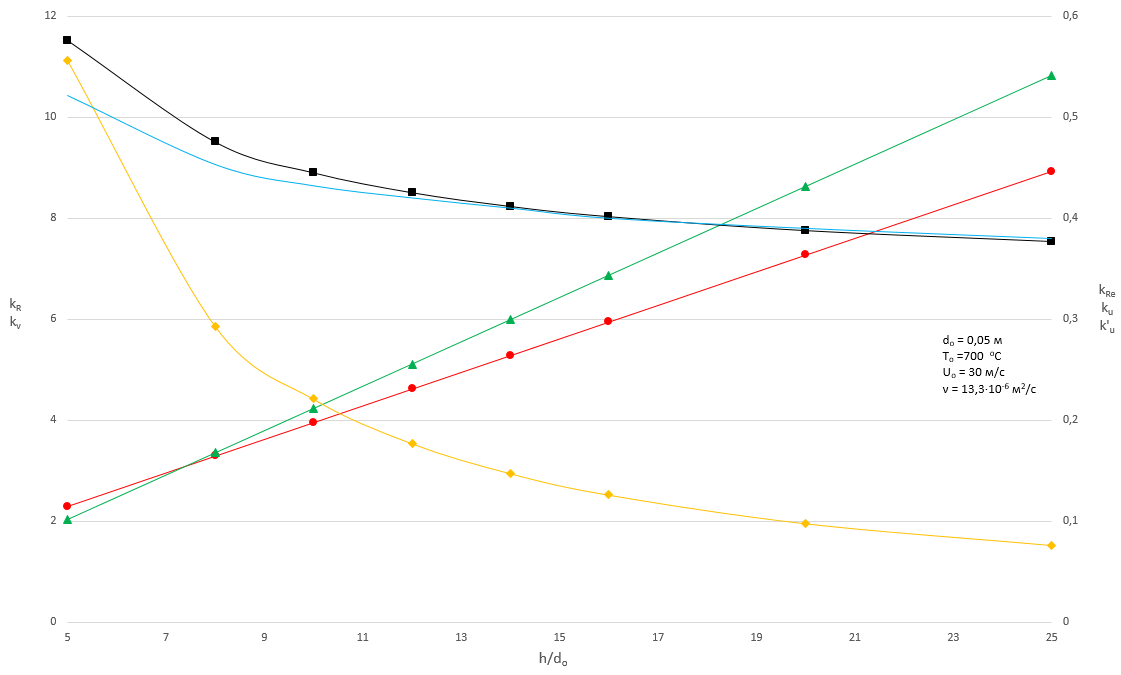


Fig. 3 - The change in the maximum velocity on the jet axis on the main plot and the initial average over the cross section of the velocity of the fan flow depending on the distance h/do



Fig. 4 - Change of initial hydraulic diameter of fan section flow height of the jet part of the flow



kv

kR

kRe

k’u

ku

Fig. 5 - Dependence of the ratio of expansion coefficients of the jet , jet injection , speeds for any section , speeds for any section except h/do = 0 , Reynolds criteria from h/do.

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