Heat exchange efficiency in porous structural elements of liquid-propellant rocket engines

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The article addresses to a new method of heat transfer enhancement using porous gauze materials. The work covers the principle of iterchannel coolant transpiration which combined high intensity of heat exchange inherent in highly heat-conducting porous materials and low hydraulic losses. The article presents the experimental results of hydraulic resistance for one- and two – dimensional coolant filtering. The authors formulate generalizing criterion equation of heat exchange for two dimensional coolant flow through a porous gauze martial. Optimal material parameters are defined. The article demonstrates high efficiency of porous heat exchange path with interchannel coolant transpiration in composition to plain and finned paths.

Keywords: *hydraulic resistance, heat exchange, porous gauze materials, heat transfer enhancement.*

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