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# Investigation of heat and hydraulic efficiency of the channels with spherical protrusions and ring rolling in the laminar, transitive and turbulent flow regimes

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*The paper presents some results of the experimental study on a friction factor and some heat transfer characteristics in the channels with discrete roughness, which can be in the form of corrugated tubes and tubes with spherical grooves. There are three regimes of these processes: the laminar, transitional and turbulent flow regimes. The performance of these types of roughness is also considered.*

**Keywords:** heat transfer enhancement, thermal and hydraulic efficiency, discrete roughness, ring rolling, spherical protrusions.

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