

# Pressure Drop and Heat Transfer Analysis for Fluid Flow through Micro and Mini Channel

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**Abstract:** For the heat exchanging applications, heat transfer enhancement is become major hurdle and it is the need of today's world. As we know day by day miniaturization, energy efficiency and cost effectiveness are becoming essential goals to stand in today's competitive world. Hence, it becomes necessary to remove high heat flux from highly compact systems such as high-performance computer chips, laser diodes and nuclear fusion and fission reactors for ensuring their consistent performance with long life. Micro-channels and mini-channels are naturally well suited for this task, as they provide large heat transfer surface area per unit fluid flow volume. Hence, facilitating very high heat transfer rate. Use of micro-channels can be explored in various applications i.e. turbine blades, rocket engine, hybrid vehicle, hydrogen storage, refrigeration cooling, thermal control in microgravity and capillary pump loops. Heat flux removal requirement varies significantly based on the type of application. Heat dissipation requirement will continue to rise with more advancement in technologies and further reduction in the size of these applications. Considering facts, it can be concluded that microchannel heat sinks seem to be the plausible solution of twenty first century cooling problems. In the recent years' micro channel heat exchangers have been applied in refrigeration and air conditioning because they provide larger heat transfer area per unit volume and they are smaller and lighter than those obtained from conventional heat exchanger. We know that micro channel heat exchanger is more effective for a performance enhancement than cross fin and tube heat exchanger in residential air-conditioner. And micro channel heat exchanger helps to reduce refrigerant quantities in residential air-conditioner systems for the purpose of replacing all aluminum parallel flow heat exchangers as a heat exchanger for all kinds of air conditioner, the improvement of anti-corrosion technology and degree of flexibility for product application should be done. This paper deals with the review of rigorous behavior of micro-channel heat transfer rate, fluid flow visualizations in the micro-channel and their application in industries.

**Keywords:** Microchannel Heat Exchanger, Air conditioning, Electronic cooling, cooling Capacity, Coefficient of Performance

