

Effect of Aspect Ratio and Bifurcation Angle on Single Phase Flow in Branched Structure MCHE

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The introduction of microchannel heat exchangers (MCHE) has revolutionized the cooling technology which has led to miniaturization of devices. MCHEs are highly preferred in many applications because of their characteristic large heat transfer area to unit volume leading to higher efficiency compared to conventional heat exchangers. Due to their compactness, they are mainly used in electronic cooling; in recent times their application is extended to the medical field for cooling scanning equipment. However, the small channel size increases pressure drop. Present study focuses on optimizing the performance of the MCHEs by carrying out single phase flow analysis in ANSYS (Fluent) with different aspect ratios (AR) between 0.25 – 10, and at different bifurcation angles 30, 45 and 60, 70 degrees. Results so far show that pressure drop decreases and heat transfer increases with increase in AR.