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# An experimental study on hydrodynamic and thermal performance of stainless steel wire mesh blocks in a vertical channel

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## Abstract

This paper reports the hydrodynamic and thermal performance of stainless steel wire mesh blocks in a vertical channel, for different aspect ratios. Commercially available stainless steel wire meshes are arranged side by side to act as a porous block. Convective heat transfer experiments in a vertical channel using an isothermal flat plate are conducted for a Reynolds number range of 60 to 2380. The plate is sandwiched with wire mesh block on either side so that the assembly completely fills the channel. The pressure drops across the filled region are measured for the velocity range discussed. The plate temperature is measured under steady state conditions. The effect of mesh block thickness on the hydrodynamic and thermal performance is analyzed, keeping the porosity fixed. Plain channel experiments are also conducted under similar conditions for purposes of comparison. The novelty of the present study is that a simple and cost effective method without any permanent bonding is developed for different mesh block thicknesses and overall performance studied. This

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