

Effect of Prandtl Number on Flow and Heat Transfer Across a Confined Equilateral Triangular Cylinder

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Abstract : The paper reports 2-D numerical study used to investigate the effect of changing working fluids with Prandtl numbers 0.71, 10 and 50 on the flow and convective heat transfer across an equilateral triangular cylinder placed in a horizontal channel with its apex facing the flow. Numerical results have been generated for fixed blockage ratio of 50% and for three Reynolds numbers of 50, 75, and 100 for each Prandtl numbers respectively. The studies show that for above range of Reynolds numbers, the overall drag coefficient is insensitive to the Prandtl number changes while as the heat transfer characteristics change drastically with changing Prandtl number of the working fluid. The results generated are in complete agreement with the previous literature available.

Keywords : Prandtl number, Reynolds number, drag coefficient, flow and isothermal patterns

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