

Heat transfer enhancement in a channel with a built-in rectangular cylinder

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A two dimensional numerical investigation of the unsteady laminar flow pattern and forced convective heat transfer in a channel with a built-in rectangular cylinder is presented. The channel in the entrance region has a length to plate spacing of ten. The computations were made for several Reynolds number and two rectangular cylinder aspect ratios. Hydrodynamic behavior and heat transfer results are obtained by solution of the complete Navier-Stokes and energy equation. The results show that these flow exhibits laminar self-sustained oscillations for Reynolds numbers above the critical one. This study show that oscillatory separated flows result in a significant heat transfer enhancement but also in a significant pressure drop increase. © 1995 Springer-Verlag.