

Designing a Low Speed Wind Tunnel for Investigating Effects of Blockage Ratio on Heat Transfer of a Non-Circular Tube

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Abstract : Effect of blockage ratio on heat transfer from non-circular tube is studied experimentally. For doing this experiment a suction type low speed wind tunnel with test section dimension of $14 \times 14 \times 40$ and velocity in range of 7-20 m/s was designed. The blockage ratios varied between 1.5 to 7 and Reynolds number based on equivalent diameter varies in range of 7.5×10^3 to 17.5×10^3 . The results show that by increasing blockage ratio from 1.5 to 7, drag coefficient of the cam shaped tube decreased about 55 percent. By increasing Reynolds number, Nusselt number of the cam shaped tube increases about 40 to 48 percent in all ranges of blockage ratios.

Keywords : wind tunnel, non-circular tube, blockage ratio, experimental heat transfer, cross-flow

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