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Numerical Study on Enhancement of Heat Transfer by Turbulence

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Abstract : This paper scrutinizes the influences of turbulence on heat transport rate, Nusselt number. The subject matter of this investigation also deals with the improvement of heat transfer efficiency of the swirl flow obtained by rotating a twisted tape in a circular pipe. The conditions to be fulfilled to observe the impact of Reynolds number and rotational speed of twisted tape are: a uniform temperature on the outer surface of the pipe, the magnitude of velocity of water varying from 0.1 m/s to 0.7 m/s in order to alter Reynolds number and a rotational speed of 200 rpm to 600 rpm. The gyration of twisted tape increase by 17%. It is also observed that heat transfer is exactly proportional to inlet gauge pressure and reciprocally proportional to increase of twist ratio.

Keywords : swirl flow, twisted tape, twist ratio, heat transfer
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