



Experimental study on heat transfer of water in tubes with V-shape nozzle and helical-tape inserts in transient regime

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Abstract

Forced convective of water in horizontal tubes with V-shape nozzle and helical-tape tube inserts has been studied experimentally. The transient flow regime has been used for the tests. Experimental results are validated with existing well established correlation. The turbulators were placed in two different arrangements: converging V-shape nozzle with helical-tape, referred to as (CR-H) array and diverging V-shape nozzle with helical-tape, (DR-H) array. Two correlations for the Nusselt number based on the experiment are introduced for practical use. It is found that the insertion of turbulators has enhanced the Nusselt number for the (DR-H) arrangement up to 521%, and for the (CR-H) arrangement up to 355%, although using the turbulators cause a significant increase in pressure drop.

Key-Words: Heat transfer enhancement, V-shape nozzle turbulator, Helical-tape, Nusselt number, Transient regime, Pressure drop

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