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Intensification of Heat Transfer in a Double Tube Heat Exchanger with Nano-Fluids and Trapezoidal Cut Twisted Tape - A Numerical Study

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Double tube heat exchanger, Passive method, Trapezoidal twisted tube, Thermal performance factor

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Abstract

The heat transfer enhancement is normally demanded in industries for heating, cooling and evaporation in the equipment^{€™}s like air conditioning, radiators and refrigerators etc. The passive, active or combination of them usually employed for intensification of heat transfer in such heat exchangers. In this study, we focus on an innovative passive technique. The dual approach is to increase the conductivity of the suspended nano-particles such as titanium dioxide, beryllium oxide or beryllia, zinc oxide and copper oxide in the water. The flow

resistance is offered by inserting the twisted tape with trapezoidal cut. The objective of the numerical study is to investigate the thermal and flow fields by utilizing various types of nano-fluids with and without twisted tape in the double tube heat exchanger. The finite volume method is employed to solve the continuity, momentum and energy equations.

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