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CFD ANALYSIS ON PRESSURE DROP OF DIMPLE JACKETED HEAT EXCHANGER IN CHEMICAL POST-PROCESSING INTEGRATED EQUIPMENT

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ABSTRACT: Chemical Post-Processing Integrated Equipment (CPPIE) is a new kind of high efficiency and energy conservation equipment, which can deal with crystallization, filtration, washing and drying of the chemical products production. Dimple Jacketed Heat Exchanger (DJHE) is adopted for heat transfer in CPPIE. In this paper, the structure of DJHE in CPPIE is introduced. Three-dimensional model of DJHE is built numerically and the pressure drop of DJHE are analysed by Fluent6.3 with the standard k-ε turbulent model. The geometrical parameters of dimple distribution, such as arrangements and intervals, are investigated. The simulation results turn out that jacketed heat exchanger with dimples has a higher pressure, and to a certain extent, more dimples higher pressure drop. In addition, the pressure drop results of different arrangements and intervals of dimples in DJHE are compared on square and triangular arranged structures. This work can reduce the uncertain design of DJHE for further engineering applications of CPPIE.