

EFFECTS OF DIMPLE CONE ANGLES ON HEAT TRANSFER AND PRESSURE DROP IN A DIMPLE JACKETED HEAT EXCHANGER

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ABSTRACT A Dimple Jacket Heat Exchanger (DJHE) is designed for the Chemical Post-Processing Integrated Equipment (CPPIE) to enhance the heat transfer performance during chemical reaction, crystallization and drying processes. In this paper, a 3D model of a DJHE is established. Dynamic variation of temperature inside the DJHE is compared with experimental data to validate the accuracy of the numerical method. Then, by choosing one dimple from the whole DJHE as the research object, the effects of different dimple cone angles on heat transfer and pressure drop characteristics are analyzed with the validated method. The results show that the dimple cone angle has an obvious effect on the heat transfer and pressure drop performance. This work can reduce the uncertain design of DJHE, and it can also be referred by similar research works on dimple surfaces.