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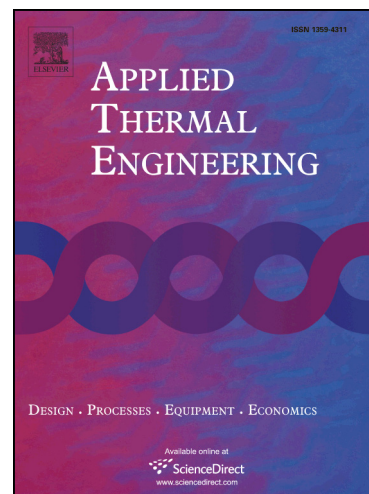
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Exergy based optimization and experimental evaluation of plate fin heat exchanger

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ABSTRACT

High performance of heat exchangers is important for helium refrigeration and liquefaction systems as they constitute major part of cold-box. This study represents optimization of plate fin heat exchanger (PFHX) design parameters for cryogenic application using exergy analysis. Design of PFHX particularly for helium liquefaction should satisfy contrasting requirement such as high thermal performance with minimum pressure drop. Since factual requirement for PFHX core geometrical parameters are of contradictory nature and no single solution can fully satisfy all objectives simultaneously. A parametric study performed to evaluate the effect of core geometrical parameters on overall thermal performance. Results so obtained theoretically are validated experimentally and also with past published work. This study is particularly useful for PFHX designers in evaluating set of optimal salient geometrical design parameters.

Keywords: Exergy analysis, Helium Liquefier, Plate fin heat exchanger, Refrigerator.

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