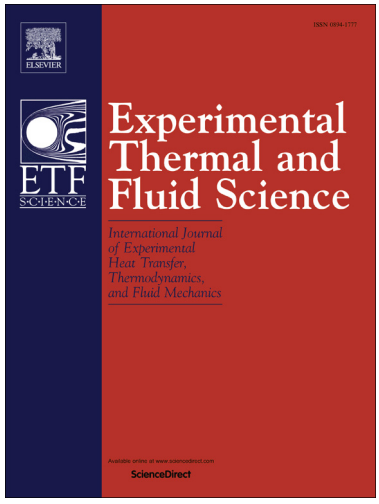

Experimental exergy analysis for shell and tube heat exchanger made of corrugated shell and corrugated tube

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Experimental exergy analysis for shell and tube heat exchanger made of corrugated shell and corrugated tube

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Abstract: Corrugated shell and corrugated tube were employed instead of smooth shell and smooth tube through a shell and tube heat exchanger in this paper. Distinct arrangements of concave and convex type of corrugated tubes were investigated. Exergy loss due to simultaneous employing of corrugated tubes as the inner and outer tube (shell) of a shell and tube heat exchanger has not been investigated before. Indeed, previous studies have focused on only thermal characteristics of corrugated tubes and the effect of corrugations on exergetic characteristics has not been probed. Hence, in the present work exergetic parameters were experimentally studied for a shell and tube heat exchanger made of corrugated shell and corrugated tube. Said parameters were evaluated for different arrangements of corrugated tubes. Corrugated tubes were produced by means of a special machine which was developed for this purpose. The results showed that, corrugations causes increment of both exergy loss and NTU. If both tube and shell are corrugated, the exergy loss and NTU increase about 17% - 81% and 34% - 60% respectively. Maximum exergy loss was observed for heat exchanger made of convex corrugated tube and concave corrugated shell.

***Keywords*:** Corrugated tube; Exergy loss; Number of thermal units; Heat exchanger;