

Performance Study of Double Corrugated Cross-Flow Air-Cooled Plate Heat Exchangers

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Experimental study on a cross-flow air-cooled plate heat exchanger (PHE) was performed. The two types of PHEs were manufactured with single-wave plates and double-wave plates in parallel. Cooling air flows through the PHEs in a crosswise direction against internal cooling water. The heat exchanger aims to substitute open-loop cooling towers with closed-loop water circulation, which guarantees cleanliness and compactness. In this study, prototype single-wave and double-wave PHEs were designed and tested in a laboratory scale experiments. From the tests, the double-wave PHE shows approximately 50 % enhanced heat transfer performance compared to the single-wave PHE. However, the double-wave PHE costs 30 % additional pressure drop. For the commercialization, a wide channel design for air flow would be essential for reliable performance.