

A Turbo Expander Development For Domestic Refrigeration Appliances

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Abstract

The expansion process in domestic refrigeration appliances is realized using capillary tubes. The isentropic expansion in a turbine permits to reduce the irreversibilities created by the capillary tube throttling process and to generate mechanical work. This paper presents the possibilities of using turbo expanders in domestic refrigeration appliances. Calculations are performed to determine the cycle improvement and the mechanical work generated as a function of the subcooling and the superheating in the liquid vapor heat exchanger.

Mechanical work can be used to drive a fan avoiding the electrical consumption for no-frost appliances. Comparisons are performed for usual no-frost systems with fan driven by electrical motors and fan driven by a turbo expander.