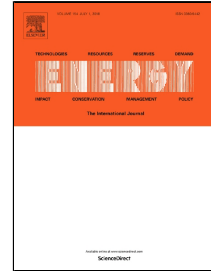


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# Investigation of the ejector nozzle in refrigeration system

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## Abstract

This study presents a model for quantifying the performance of primary nozzles within the context of ejectors in the refrigeration systems. The effects of real and ideal gas properties are compared and two equations for the two-phase speed of sound are tested against experimental data for vapor nozzles working with R245fa, N<sub>2</sub> and R141b and also a two-phase nozzles processing CO<sub>2</sub>. Results show that the predicted performance of ejector nozzles based on the ideal gas assumptions can be greatly different from that based on the real fluid properties. For the two-phase nozzle the value of the speed of sound is important as it was found to be because errors in this lead to large differences in the nozzle performance and even predictions of nozzle efficiency values greater than one. It is expected that this paper and the study described within will be useful for those wishing to model or design ejector nozzles and contributes to the further understanding of related investigations, especially on the two-phase nozzle.

**Keyword:** Ejector nozzle; Real fluid properties; Ideal gas assumption; Heat capacity ratio; Speed of sound

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