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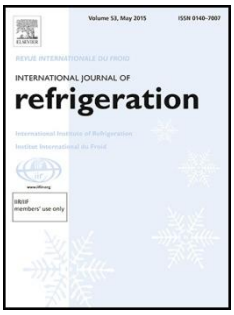

Title: A critical review linking ejector flow phenomena with component- and system-level performance

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A CRITICAL REVIEW LINKING EJECTOR FLOW PHENOMENA WITH COMPONENT- AND SYSTEM-LEVEL PERFORMANCE

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Highlights

- Review of numerical modeling and visualization techniques for ejector flows.
- Ejector models limited by ideal gas flow, normal shock, and isentropic efficiency assumptions.
- Numerical models require more advanced modeling of turbulence and effects of phase change.
- Schlieren/PIV visualization techniques needed for validation of numerical models.
- Passive chiller development must be driven by fundamental ejector research.

ABSTRACT

This paper provides a critical review of ejector technology for chiller applications, combining an understanding of ejector fluid flow fundamentals with cycle applications. An ejector is a passive momentum-transfer device that requires no external mechanical input or moving parts. The progression of studies on ejectors from the early 1940s to the present from analytical and numerical modeling to visualization studies of the ejector itself are discussed. Included is an assessment of the most recent computational models. Suggestions for future research include improved computational modeling of shock phenomena and the effects of two-phase flow in ejectors. Application of ejectors in chillers is also reviewed, with an emphasis on the basic ejector-based chiller cycle and the development of passive systems that require zero mechanical input for operation. Important connections are made between ejector component- and system-level studies that would together lead to improved overall system performance.