

ABSTRAK

Steam ejector merupakan sistem refrigerasi yang ramah lingkungan, karena menggunakan panas buang sebagai fluida kerjanya. *Steam ejector* memiliki beberapa kelebihan yaitu perawatannya yang mudah dan biaya operasi yang rendah. Sehingga performa *ejector* menjadi sangat penting. Dalam hal ini salah satu geometri yang berpengaruh terhadap performa *ejector* adalah *diffuser*. Perubahan *diffuser length* pada *outlet ejector* mempunyai efek signifikan terhadap aliran yang keluar dari *ejector* dan performa *ejector*, karena adanya perubahan laju aliran yang menyebabkan tekanan *ejector* menjadi tinggi dan *back pressure* pada *outlet ejector* dapat dikurangi.

Penelitian pada *steam ejector* ini dilakukan dengan metode *eksperimental*. Tujuannya untuk mengetahui performa pada *steam ejector* berdasarkan nilai *entrainment ratio* dan *coefficient of performance* (COP). Panjang *diffuser length* yang digunakan dalam penelitian ini yaitu *diffuser length* 50 mm, 70 mm, 90 mm dengan variasi *primary pressure* dan *secondary pressure*.

Hasil penelitian menunjukkan semakin panjang *diffuser length* nilai *entrainment ratio* akan meningkat, dan semakin panjang *diffuser length* tidak menghasilkan nilai *coefficient of performance* (COP) yang tinggi. *Diffuser length* 90 mm memberikan nilai *entrainment ratio* tertinggi senilai 0.97 dan *diffuser length* 50 mm memberikan nilai *coefficient of performance* (COP) tertinggi senilai 1.83, tetapi setelah nilai optimum tercapai nilai *entrainment ratio* dan *coefficient of performance* (COP) akan turun.

Kata kunci: *steam ejector*, *entrainment ratio*, *coefficient of performance* (COP), *diffuser length*.

ABSTRACT

Steam ejector is an environmentally friendly refrigeration system because it uses waste heat as its working fluid. Steam ejectors have several advantages, namely easy maintenance and low operating costs. Therefore, the performance ejector becomes very important. In this case, one of the geometries that affect the performance ejector is the diffuser. The change of diffuser length at the outlet ejector has a significant effect on the flow coming out of the ejector and performance, due to changes in the flow rate which causes the ejector pressure to be high and the backpressure at the ejector outlet can be reduced.

The research on the steam ejector was carried out using the experimental method. The goal was to determine the performance of the steam ejector based on the value of the entrainment ratio and coefficient of performance (COP). The diffuser length used in this study was the diffuser length of 50 mm, 70 mm, 90 mm with variations of primary pressure and secondary pressure.

The results showed that the longer the diffuser length the value of the entrainment ratio will increase, and the longer the diffuser length does not produce a high coefficient of performance (COP). The diffuser length 90 mm gives the entrainment ratio highest value of 0.97 and the diffuser length 50 mm provides the coefficient of performance highest (COP) value of 1.83, but after the optimum value is reached the values entrainment ratio and coefficient of performance (COP) will decrease.

Keywords: steam ejector, entrainment ratio, coefficient of performance (COP), diffuser length.