

ABSTRAK

Steam ejector adalah alat yang digunakan memindahkan fluida dari tekanan tinggi ke rendah. *Steam ejector* memanfaatkan fluida bertekanan tinggi yang dialirkan pada *nozzel* menuju *expanding pipe*, menjadi fluida bertekanan rendah untuk menghilangkan gas yang tidak terkondensasi pada kondensor turbin. Salah satu faktor yang dapat mempengaruhi performa dari *steam ejector* adalah faktor geometri. Dalam penelitian ini, akan dilakukan pengujian mengenai pengaruh geometri *convergent mixing chamber* pada *steam ejector* dengan variasi panjang *convergent mixing chamber* terhadap kinerjanya.

Penelitian dilakukan menggunakan fluida kerja *refrigerant - 22* dengan variasi pengujian *convergent length* 40 mm, *convergent length* 60 mm, dan *convergent length* 80 mm dengan variasi *primary pressure* 90 psi – 110 psi dan *secondary pressure* 65 psi – 85 psi. Pengujian dilakukan secara eksperimental sehingga dapat melihat pengaruh suhu lingkungan performa *steam ejector*.

Hasil dari pengujian menunjukkan bahwa peningkatan *primary pressure* akan menurunkan nilai *entrainment ratio* dan menurunkan *coefficient of performance* (COP) pada *steam ejector*. Sedangkan peningkatan *secondary pressure* akan meningkatkan nilai *entrainment ratio* dan meningkatkan *coefficient of performance* (COP) pada *steam ejector*. Pada pengujian ini didapatkan nilai *entrainment ratio* optimum pada *convergent length* 60 mm dengan *primary pressure* 95 psi terhadap *secondary pressure* 85 psi sebesar 0,99. Dan nilai *coefficient of performance* maksimum didapatkan pada *convergent length* 60 mm dengan *primary pressure* 90 psi terhadap *secondary pressure* 85 psi sebesar 1,78.

Kata Kunci : *Coefficient of performance, Convergent mixing chamber, Entrainment ratio, Steam ejector*

ABSTRACT

Steam ejector is a device used to move fluid from high to low pressure. The steam ejector utilizes high-pressure fluid that flows through the nozzle to the expanding pipe, becoming a low-pressure fluid to remove non-condensed gas in the turbine condenser. One of the factors that can affect the performance of the steam ejector is the geometry factor. In this study, a test will be conducted on the effect of the geometry of the convergent mixing chamber on the steam ejector with variations in the length of the convergent mixing chamber on its performance.

The research was conducted using refrigerant - 22 working fluid with variations in the test of convergent length of 40 mm, convergent length of 60 mm, and convergent length of 80 mm with variations of primary pressure 90 psi - 110 psi and secondary pressure 65 psi - 85 psi. The test was carried out experimentally so that it could see the effect of the ambient temperature on the performance of the steam ejector.

The results of the test show that an increase in primary pressure will reduce the value of the entrainment ratio and reduce the coefficient of performance (COP) on the steam ejector. While the increase in secondary pressure will increase the value of the entrainment ratio and increase the coefficient of performance (COP) on the steam ejector. In this test, the optimum entrainment ratio value at a convergent length of 60 mm with a primary pressure of 95 psi against a secondary pressure of 85 psi is 0.99. And the maximum coefficient of performance is obtained at a convergent length of 60 mm with a primary pressure of 90 psi against a secondary pressure of 85 psi of 1.78.

Keywords: Coefficient of performance, Convergent mixing chamber, Entrainment ratio, Steam ejector