ABSTRAK

Steam ejector merupakan alat yang memanfaatkan *waste heat* yang nantinya diubah menjadi fluida bertemperatur dan bertekanan rendah namun performanya dinilai kurang optimal. Dikarenakan alat ini tidak memiliki bagian yang bergerak pengoptimalan geometrinya mempengaruhi nilai *entrainment ratio. Convergent length* pada *mixing chamber* merupakan salah satu geometri *ejector* yang di dalamnya terjadi fenomena aliran, dimana fenomena itu berpengaruh terhadap *entrainment ratio.*

Pada penelitian ini simulasi dilakukan dengan *Computational Fluid Dynamics* (CFD) agar fenomena aliran dapat terlihat. CFD memiliki fitur untuk menampilkan karakteristik dari suatu aliran dengan memperlihatkan kontur tekanan, temperatur, dan kecepatan. Variasi yang digunakan adalah *convergent length, primary pressure,* dan, *secondary pressure.*

Bertambah panjangnya *convergent length* meningkatkan *entrainment ratio*, namun *convergent length* memiliki panjang optimal sesuai dengan lokasi *shock* di *mixing chamber.* Disatu sisi tingginya nilai *entrainment ratio* dikarenakan *secondary flow* langsung tertarik oleh *primary flow* pada daerah dekat mulut *nozzle* sehingga *secondary mass flow rate* sangatlah besar.

Kata kunci : CFD, Convergent length, Entrained Duct, Shock, Steam ejector.

ABSTRACT

Steam ejector is a tool that utilizes waste heat which is later converted into a low-temperature and low-pressure fluid but it has low performance. Since this tool has no moving parts, the optimization of the geometry affects the entrainment ratio value. Convergent length in the mixing chamber is one of the ejector geometries in which a flow phenomenon occurs, where the phenomenon affects the entrainment ratio.

In this study, the simulation was carried out using Computational Fluid Dynamics (CFD) in order that the flow phenomenon could be seen. CFD has a feature to display the characteristics of a flow with pressure, temperature, and velocity contours. The variations used are convergent length, primary pressure, and, secondary pressure

Increasing the length of the convergent length increases the entrainment ratio, but the convergent length has an optimal length according to the location of the shock in the mixing chamber. On the other hand, the high value of the entrainment ratio is caused by secondary flow directly entrained in the area near the nozzle mouth so that the secondary mass flow rate is very large.

Keywords : CFD, Convergent length, Entrained Duct, Shock, Steam ejector.