EXPERIMENTAL ANALYSIS OF JET EJECTOR BY FORCED DRAUGHT

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ABSTRACT

A jet compressor uses a jet of primary fluid to induce a peripheral secondary flow often against back pressure. Expansion of primary jet produces a partial vacuum near the secondary flow inlet creating a rapid re-pressurization of the mixed fluids followed by a diffuser to increase the pressure at the exit. Using the geometrical design parameters obtained by solving the governing equations, a CFD analysis is made using the FLUENT software to evaluate the optimum entrainment ratio that could be achieved for a given set of operating conditions, where the entrainment ratio (ER) is the ratio of the mass flow rate of the secondary fluid (propelled stream) to the primary fluid (motive fluid). In this paper a jet compressor's performance analysis is made using irreversibility characteristics .the various losses that occurs in different regions of jet compressor are quantified. Effort is made to increase the efficiency of jet compressor by reducing the losses based on minimization of entropy method. In order to match the ER that is achievable theoretically, an effort is made to force (charge) the propelled stream using a blower. So that the momentum difference between the motive and the propelled fluid is minimized. Experimental results obtained using the forced draft system is found to match the results obtained from the FLUENT analysis.

KEYWORDS: Ejector, Efficiency, Forced Draught