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ABSTRACT

In systems involving heat transfer, a condenser is a device or unit used to condense a substance from its gaseous to its liquid state, typically by cooling it. In so doing, the latent heat is given up by the substance, and will transfer to the condenser coolant. Condensers are typically heat exchangers which have various designs and come in many sizes ranging from small to very large industrial-scale units used in plant processes. Air cooled condensers are used in small units like household refrigerators, deep freezers, water coolers, window air-conditioners, split air-conditioners, small packaged air-conditioners etc. These are used in plants where the cooling load is small and the total quantity of the refrigerant in the refrigeration cycle is small. Air cooled condensers are also called coil condensers as they are usually made of copper or aluminum coil. Air cooled condensers occupy a comparatively larger space than water cooled condensers. In this work heat transfer by convection in air cooled condensers is studied and improved. The assessment has been carried out on an air-cooled finned-tube condenser of a vapour compression cycle for air conditioning system. Heat transfer analysis and CFD analysis is done on the condenser to evaluate the better design. Instead of circular cross section elliptical cross-sectional pipes are incorporated in our design and its efficiency is been calculated.

2.3 CFD Analysis of Condensing Heat

Transfer Through Minichannels

2.4 Design And Flow Analysis Of

Condenser With Elliptical CFD