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PERFORMANCE ENHANCEMENT STUDY OF VAPOUR COMPRESSION REFRIGERATION CYCLE USING ALUMINIUM MICRO CHANNEL CONDENSER

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Abstract

Heating, Ventilating, Air Conditioning & Refrigerating (HVACR) industries are searching for ways to increase performance, energy efficiency and durability of equipments in a sustainable way while reducing the cost of manufacturing. HVACR industry consumes nearly one third of the total world's energy and it is very significant during the days of energy crises, as the reserve stock of coal, oil and natural gas are very limited. This search has put the focus on substituting the copper tubes that have been in use for nearly a century with extruded aluminium tubes and other aluminium components and advanced micro channel technology for condenser which provides higher performance, smaller size and capabilities not found in traditional fin tube heat exchangers. The integral brazing of the high performance fins, combined with the low profile flat tubes, provides both higher performance and lower air side pressure drop. The micro channel tubes have very high heat transfer surface area and performance characteristics. Also with the micro channel technology refrigerant charge in the system reduces and thus the impact of refrigerant on the environment like Global Warming Potential (GWP), Ozone Depleting Potential (ODP) and Carbon emission are reduced.

Keywords: Refrigeration, micro channel heat exchangers, flat tube.