

عنوان مقاله:

Experimental evaluation of transient heat transfer performance of an automotive condenser designed for R₇₄₄ refrigerant

محل انتشار:

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خلاصه مقاله:

As alternatives for future refrigeration, heat pumping, air conditioning, or even power generation plants are emerging due to the regulatory changes, R₇₄₄ (carbon dioxide) is considered as a serious alternative to be the successor of other Halogenated Hydrocarbons Refrigerants (HHR) for the AC-system of vehicles. This paper investigates the heat transfer performance of R₇₄₄ through a subcritical vehicular condenser, designed and manufactured for the first product based on NP0\ platform (Iranian vehicle), at different operating conditions in terms of refrigerant mass flow rate and wind velocity. The experiments carried out in order to investigate the effect of mass flow rate, the R₇₄₄ inlet temperature was observed to have sudden fluctuations. At the condenser outlet, for the smallest mass flow rate, the least variation of temperature was observed. It was also found out that for higher air velocities through the condenser, the stabilized temperature after the condenser was lower. The results show that the performance of the designed and manufactured automotive condenser based on R₇₄₄ refrigerant is acceptable which makes it a suitable candidate for automotive applications. As alternatives for future refrigeration, heat pumping, air conditioning, or even power generation plants are emerging due to the regulatory changes, R₇₄₄ (carbon dioxide) is considered as a serious alternative to be the successor of other Halogenated Hydrocarbons Refrigerants (HHR) for the AC-system of vehicles. This paper investigates the heat transfer performance of R₇₄₄ through a subcritical vehicular condenser, designed and manufactured for the first product based on NP0\ platform (Iranian vehicle), at different operating conditions in terms of refrigerant mass flow rate and wind velocity. The experiments carried out in order to investigate the effect of mass flow rate, the R₇₄₄ inlet temperature was observed to have sudden fluctuations. At the condenser outlet, for the smallest mass flow rate, the least variation of temperature was observed. It was also found out that for higher air velocities through the condenser, the stabilized temperature after the condenser was lower. The results show that the performance of the designed and manufactured automotive condenser based on R₇₄₄ refrigerant is acceptable which makes it a suitable candidate for automotive applications.

کلمات کلیدی:

automotive, condenser, R₇₄₄, HVAC, high pressure, wind tunnel

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