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ENERGY SAVINGS WITH THE EFFECT OF MAGNETIC FIELD USING R290/600A MIXTURE AS SUBSTITUTE FOR CFC12 AND HFC134A

ABSTRACT

This paper presents an experimental study on the replacement of CFC12 and HFC134a by the new R290/R600a refrigerant mixture as drop-in replacement refrigerant with and without the effect of magnetic field. Without any modification to the system components drop-in experimental tests were performed on a vapour compression refrigeration system with a reciprocating compressor, which was originally designed to operate with CFC12. The test results with no magnets showed that the refrigerant R290/R600a had 19.9-50.1% higher refrigerating capacity than R12 and 28.6-87.2% than R134a. The mixture R290/R600a consumed 6.8-17.4% more energy than R12. The coefficient of performance of R290/R600a mixture increases from 3.9-25.1% than R12 at lower evaporating temperatures and 11.8-17.6% at higher evaporating temperatures. The effect of magnetic field force reduced the compressor energy consumption by 1.5-2.5% than with no magnets. The coefficient of performance of the system was higher in the range 1.5-2.4% with the effect of magnetic field force. The R290/600a (68/32 by wt.%) mixture can be considered as an excellent alternative refrigerant for CFC12 and HFC134a systems

KEYWORDS

[hydrocarbon mixture](#), [alternative refrigerants](#), [ozone layer depletion](#), [global warming](#), [magnetic field](#)

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