DIPARTIMENTO DI INGEGNERIA INDUSTRIALE

Dottorato di Ricerca in Ingegneria Meccanica

XIV Ciclo N.S. (2013-2015)

Abstract

"ANALISI SPERIMENTALE DELLE PRESTAZIONI ENERGETICHE DEI FLUIDI FRIGORIFERI TIPO "HFO" CANDIDATI ALLA SOSTITUZIONE DELL'R134a"

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Abstract

The present experimental work was born from the need to expand the knowledge on the new type of refrigerant fluids, the HFO, representing the fourth generation of fluorinated refrigerants, born in response to the directives before the Kyoto Protocol and subsequently with the entry into force of the new Regulation in the European field (F-gas Regulation) requiring the reduction of greenhouse gases, including HFCs are also included. The on HFO-based technology offers interesting promises as regards energy efficiency and environmental impact. The primary characteristic of the HFO is the global warming potential (GWP) extremely low. In spite of other fluids, comparable yields of 'R134a are obtainable without significant modifications of' hardware plant, as some of the main thermodynamic properties (boiling point, critical point, the vapor density of the liquid and density) of HFO are very similar to those of R134a. In fact, the knowledge of the chemical-physical properties of a fluid refrigerant is of fundamental importance to be able to properly size the mechanical components used in the reverse cycle of the vapor compression. This allows you to assess whether or not to introduce new fluids on existing plants, and how they might be amended if necessary to make the drop-in. For both fluids and even after the two mixtures were made tests according to UNI ISO 15502 using an experimental system a refrigerating machine samsung RT 59QBPN, energy class A + two compartments, one from 342 liters for fresh food, and that for frozen from 131 l. Three types of tests are identified: pull-down, the endurance tests twenty-four hours at -18 ° C and -26 ° C. At first we have to check the performance of the 'system with R134a .All data were acquired using LabView and analyzed using a MatLab program. Once extracted the main thermodynamic properties of the cycle and performances relating to 'R134a, it was made the drop-in with the then R1234ze with R1234yf, and finally were tested mixtures. Though . performance of 'R1234yf are very similar to those of R134a performance parameters of' HFO1234ze slightly exceed those the traditional R134a, also diminish both the TEWI that 'LCCP, which is why you might think as a valid candidate for a next use in domestic refrigeration systems. Even better the performance following the drop-in first goes to a R134a HFOyf-mixture and subsequently with the R134a-HFOze. In summary, they have obtained for the first mixture a decrease in consumption (≈16%) of TEWI (≈16.5%) and LCCP (≈16%). It remains to evaluate the performance in other types of applications.