Energetic Analysis of a Vapor Compression Refrigeration System Using HC290 As an Alternative to HCFC22

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The aim of this research is to analyze experimentally a mechanical vapor-compression refrigeration system using the hydrocarbon propane (R290) as an alternative to R22, in order to reach the requirements of the commercial refrigeration market, which demands alternatives to *hydroclorofluorcarbons (HCFCs)*. The study was made in a small tank commercially used in milk refrigeration and designed to operate with refrigerant HCFC22. This paper shows the influences of the factors: temperature of the fluid inside the tank (water instead of milk) and temperature of the cooling air at the condenser, on the performance of the vapor compression cycle. The following parameters were determined: evaporating pressure, condensing pressure, compression work, refrigeration capacity per unit mass of refrigerant and coefficient of performance of the cycle. Experimental results showed that HC290 can be used in systems originally designed to HCFC22 leading to better energetic performance and less environmental pollution.