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Waitrose installs HFO chillers in South London store

Continuing its leading role in the field of environmentally responsible refrigeration, Waitrose is carrying out an energy assessment in a working store of chillers running on fourth generation low global warming potential HFO refrigerants.

Believed to be the world's first supermarket installation of a packaged chiller using HFO refrigerant, the Italian-made Geoclima chillers are based on Frascold reciprocating compressors and operate on refrigerant HFO R1234ze from Honeywell.

They were comprehensively tested in the Geoclima factory before being supplied by Klima-Therm to the Waitrose store in Bromley, south-east London.

The two air-cooled HFO machines, each rated at 180kW, will provide chilled water as a condensing medium for the in-store integral cases running on propene.

Initial comparisons to a same-size store in Canterbury running identical systems but using R290 propane as the refrigerant show a 20% reduction in energy consumption for the HFO machines.

If the trial is successful as anticipated, Waitrose plans to adopt the ground-breaking HFO solution as part of its refrigeration platform for future stores, along with the continued use of hydrocarbons and tri-generation energy centres where appropriate.



Jim Burnett of Waitrose said: "We believe the HFO solution shows great promise, as it combines good efficiency with very low global warming potential. This is obviously a highly desirable profile in a refrigerant. If the ongoing monitoring of energy continues to prove successful, we plan to include HFO-based chillers in our choice of refrigeration platforms for stores in the future."

Tim Mitchell of Klima-Therm said: "The focus at the moment is on HFO R1234ze, as the refrigerant is already available at commercial levels. In the longer term, we are also interested in the potential of HFO R1234yf, which has an even lower GWP and potential

other benefits. This is one for the future, but it is in our sights.”

Giuseppe Galli, managing director of Frascold, said: “From a compressor engineering point of view, the properties and operating characteristics of HFOs are a very good match for traditional refrigerants, but obviously without the environmental penalty of high GWP HFCs. Our policy is to provide solutions for all of the mainstream refrigerant alternatives, which include hydrocarbons, CO₂ and now HFOs.”

Tests carried out by Frascold with its eight-cylinder reciprocating compressors W40168Y running on HFO R1234ze indicate a loss of capacity of around 24 percent compared with R134a across various application conditions. However, mean power absorbed is almost 27 percent less, giving an overall Coefficient of Performance (COP) actually better than R134a across a range of applications and conditions.

Frascold’s research and development team believe that performance with HFOs can be significantly improved with further optimisation. This could include refinements to the valve plate design, motor sizing and reducing pressure losses through the compressor.

Waitrose won two major industry awards last year for its new refrigeration platform based on the hydrocarbons propane R290 and propene R1270, which also uses heat recovery to harness waste heat and redirect it into the store to improve comfort conditions for customers and staff.

The team behind this HFO initiative also supplied a number of the hydrocarbon roof-top chillers used in these award winning-systems; the chillers were manufactured by Geoclima using compressors by Frascold, with supply, commissioning and maintenance by Klima-Therm.
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