

Opt

for better

Waitrose supermarkets gained nearly 9% energy savings by transitioning its R-404A refrigeration systems to low global warming potential (GWP).

Opteon™ XP40
(Refrigerant R-449A)



Opteon™

A British supermarket chain opts for a better way to do business. Waitrose, with over 346 shops in the UK, was looking for a new approach to improve energy efficiency and decrease its carbon footprint.

In 2010, Waitrose published its Carbon Plan, which documents the company's approach to reducing emissions. Indirect and direct emissions from refrigeration systems in Waitrose shops are a significant contributor to excess

emission, making this area a prime target for improvement.

Also contributing to Waitrose's reduction in emissions will be the European F-gas regulation (EU 517/2014), which came into force on 1 January 2015. Starting in 2020, this regulation will ban the use of refrigerants with a GWP of 2,500 or more—e.g., R-404A and R-507A—in all new equipment and for service in systems with a charge of more than 40T CO₂e (more than 10.2 kg of R-404A).



Opting for low GWP

The Chemours Company is supporting Waitrose's decision to opt for better by transitioning its R-404A refrigeration systems to low GWP Opteon™ XP40 refrigerant.

By retrofitting the refrigeration systems in one of its stores in Devon, Waitrose gained up to 9% in energy savings, providing the business with a significant opportunity to lower its CO₂e emissions. This project is also the first major commercial rollout in the UK of HFO (hydrofluoroolefin) based blend technology for replacement of R-404A in existing equipment.

Opting for lower power consumption

In October 2014, Chemours commercially launched the Opteon™ low GWP portfolio of refrigerants to help meet increasingly stringent global HFC regulations, while maintaining and improving performance compared with incumbent products.

Opteon™ XP40, the company's flagship low GWP refrigerant, was introduced as an ideal replacement for R-404A. Opteon™ XP40 is a HFO-based blend with a GWP of just 1,397, which is well below the GWP threshold stated

in the F-gas regulation¹. Major compressor manufacturers have now approved Opteon™ XP40 for use as an R-404A replacement, and XP40 can be found in their compressor-selection software. The performance of Opteon™ XP40 is very similar to R-404A, with a significant reduction in power consumption under a wide range of operating conditions, making it an ideal candidate for retrofitting existing systems.

Opteon™ XP40 Properties

ASHRAE number	R-449A
Lubricant	POE
Boiling point	-46.0 °C (-50.7 °F)
Safety classification	A1
Temperature glide	~4 K (~7 °R)

The decision was taken to retrofit a typical Waitrose store in Holsworthy, Devon, from R-404A to Opteon™ XP40. The refrigeration system consisted of two high-temperature packs and one low-temperature pack, which were manufactured by Space Cooling Systems in 2004.

¹Global warming potential; Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report as specified in EU 517/2014.

All packs use Copeland Scroll compressors. The low-temperature pack was connected to six in-store cabinets and one cold store. The high-temperature packs were connected to a total of 18 cabinets and three refrigerated counters in the store and three cold rooms for storage.

Opting for better operation and energy performance

The energy consumption of the refrigeration systems was measured for two weeks before the retrofit and then for three weeks after the retrofit had been completed. ColdService (part of the EPTA Group) performed the retrofit and the first retrofit took place overnight on 12 July 2015. The other two packs were retrofitted on consecutive nights, without causing any disruption to the trading floor during the store's opening hours. ColdService followed the Opteon™ XP40 retrofit guidelines, and no components or oil changes were required, making the retrofit fast and straightforward.

Analysis of the energy-consumption data was performed by Emerson Climate Technologies, Retail Solutions, which revealed that at equivalent ambient temperatures during the monitoring period, the high-temperature packs' energy consumption was reduced by 8.7%. With the low-temperature pack, the

energy consumption was reduced by 3.0%. This equates to a 6.6% total reduction in energy consumption.

Opting for an easy retrofit

"No component changes, no oil changes, and similar system-operating parameters made the retrofit very straightforward and fast once the R-404A had been recovered. The good cooling performance and lower energy consumption makes Opteon™ XP40 an ideal retrofit option for R-404A systems," said Paul Blanch, Senior Manager, Emerson Climate Technologies, Retail Solutions.

The reduction in energy consumption and the 64% reduction in the GWP of Opteon™ XP40 compared with R-404A offer a significant opportunity for Waitrose to lower its CO₂e emissions and help achieve the target set out in its Carbon Plan.

Danny Ryan, the refrigeration manager at Waitrose who's leading the project, commented, "Reducing our CO₂e emissions is a key target, so retrofitting existing R-404A systems with a lower GWP refrigerant is a key part of our strategy. Opteon™ XP40 has helped achieve this by not only reducing the direct emissions of the refrigerant, but also by reducing the energy consumption of the systems."



**For more information on the Opteon™
family of low GWP products, visit opteon.com**



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