The latest refrigerant for **stationary refrigeration**

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Supermarkets around the world are coming under intense scrutiny to prove their credentials when it comes to environmental impact and sustainability. Honeywell has responded by developing a new refrigerant blend - Genetron Performax LT – which is delivering outstanding results across key metrics linked to global warming potential, energy efficiency and running costs.

A typical application is commercial refrigeration in supermarkets. It is well-suited to low- and medium-temperature commercial refrigeration applications such as supermarket freezer cases, display cases, cold rooms, reach-in coolers and ice machines.

Superior by design

Performax LT consists of a highly efficient mixture of conventional hydrofluorocarbons (R-32, R-125 and R-134a). Its official ASHRAE designation is R-407F. This is a new refrigerant blend of the R-407 series which is superior to comparable blends used for this purpose such as R-407A. This refers to energy efficiency, environmental protection as well as to aspects like performance.

Aside from pure functionality, cost saving and safety are further factors which count today.

Refrigeration represents an important cost in the running of supermarkets, both in terms of capital cost and running cost. It is also an important contributor to the overall supermarket carbon footprint. For this reason, the retail sector is looking for refrigerants that can help reduce supermarket refrigeration energy consumption and corresponding emissions.

Consumers, but also governmental authorities pay attention especially to the global warming potential (GWP) or total equivalent warming impact (TEWI) when chemicals are used. These values measure the impact on the world climate when a special substance or blend is released to the atmosphere. Today it is important that companies use fluids with a low GWP value in their daily work. Not at least, this has a certain reputation effect for consumers.

Apart from TEWI, energy efficiency is something companies watch very closely too. Each per cent of energy savings can have a huge impact on a bottom line.

Case study: ASDA

ASDA has made a public commitment through its Sustainability 2.0 strategy to reduce the environmental impact both its own operations and those of its supply chain.

The ambitious goals for 2015 (compared to 2005 levels) include:

- Reducing energy consumption in existing stores by 35%
- Reducing new store carbon emissions by 60%
- Reducing overall carbon footprint by 10%
- Removing 20 million metric tons of CO_2 from its global supply chain
- Reducing 60% of emissions from its transport fleet

Honeywell's refrigerant Performax LT will help towards meeting these ambitious goals. Comprehensive tests are ongoing, first results are available. Performax LT shows significant advantages compared to conventional solutions.

The figures are convincing: the GWP of Performax LT is by more than 50% lower in comparison to R-404A and still by approximately 15% lower in comparison to R-407A.

Energy savings depend on application, operating and ambient conditions. Between 5 and 15% in energy savings can be obtained. These were obtained under laboratory tests.

Honeywell is cooperating with ASDA and several other partners in order to obtain scientifically evaluated data from the field.

The ASDA store in Hunts Cross, Liverpool, had two identical medium temperature systems. The refrigerant used was R-404A. The project team then converted one of the two systems to R-407A and documented performance and energy consumption of both systems for 12 months.

In September 2010, the second system was converted to Genetron Performax LT. All measurement data were precisely recorded and evaluated in order to compare the different refrigerants.

The results proved Genetron Performax LT to be the best performing refrigerant currently available for supermarket installations. The R-404A system consumed 7% more energy versus the R-407A system. The Genetron Performax LT system consumed 13% less power than the R-407A system and around 20% less than the original R-404A system.

From this, the following conclusion can be made: if conventional systems are converted to Genetron Performax LT, up to 15% of energy costs and 10% of running costs as well as up to 40% of CO_2 emissions can be saved.

Genetron Performax LT can be used for new commercial installation and also to retrofit existing R-404A and R-22 installations. Conversion of existing R-404A installations requires only minor adjustment to expansion valve. Conversion of existing R-22 installation requires only a single oil change, and no adjustment to the expansion valve.

The conversion can be done very quickly without disruption to trade. At ASDA, for example, the conversion was done over the weekend. The start-up was trouble-free. The retrofitting cost is paid off in few months by energy savings.

ASDA Hunts Cross test results