

Honeywell Genetron® Performax™ LT



CUSTOMER INSIGHT:
ROSSETTO GROUP SPA

Cool, Green and Energy Efficiency

Honeywell

GRUPPO ALIMENTARE
rossetto
365 giorni di grande risparmio

“We are committed to investing in technology that reduces our energy consumption and lowers the impact that we have on the environment.”

Giuseppe Rossetto, Rossetto Group



Summary:

Investing in a Low Carbon Future

Family-owned businesses often feel closer to their customers and for Rossetto Group in Italy, which owns 20 stores in the north of the country, this responsibility extends to ensuring that the supermarket chain minimizes its impact on the environment. As with all supermarkets, refrigeration systems are vital for day-to-day operation... but they also consume a lot of energy, which translates not only into cost for the business but also into unwelcome carbon emissions. So when the refrigeration specialist company General Gas introduced to the Italian market a new generation refrigerant developed by Honeywell Genetron® Performax™ LT – that promised a ‘greener’ approach, Rossetto was keen to explore the opportunity with its refrigeration partner Scar Refrigerazione.

Results:

- The performance of the system is the same as when using R-22
- 100 % non-Ozone depleting...ODP compliant and the best alternative to R22
- 50% lower direct emissions than when using the traditional alternative to R22, 404A
- >10% lower energy consumption than when using 404A as replacement refrigerant
- Much lower costs than when using other alternative refrigerant

This retrofit installation proved that Genetron Performax LT is the best performing reduced GWP (Global Warming Potential) refrigerant for supermarket operations, offering impressive results in both low temperature (LT) and medium tempera-

ture (MT) applications. Genetron Performax LT is shown to possess a higher capacity and efficiency and a GWP that is nearly 50% lower than R-404A, the traditional alternative to R22, delivering outstanding results across key metrics linked to emissions, energy efficiency and running costs. It is also perfectly in tune with the stated aims of the EU 20-20-20 energy and emissions reduction program.

For R-22 retrofits, Genetron Performax LT delivers the same performance while improving the environmental properties significantly. Performance can actually be improved when a proper regulation is done during retrofit.

Background: Sharing the Benefits of a Greener Environment

The business philosophy of the Rossetto Group is to look to the future while taking account of the past. This ensures that it remains very close to its customers, reflecting their needs in terms of products, services and meeting wider environmental concerns.

This focus on the environment has resulted in significant investment in

energy efficiency projects, including the installation of photovoltaic panels in some stores in order to generate clean energy.

Working with its partner, Scar Refrigerazione, Rossetto decided to replace the existing R22 refrigerant in units and cold stores at its supermarket in Rovigo to explore the potential for energy saving and lower emissions

promised by the installation of Genetron Performax LT. This was seen as particularly important because refrigeration at the store accounted for around 40 % of the total energy bill.

The project was to be monitored online by Scar using Climacheck software, which measures system pressure, temperature and energy consumption.

Installation: Creating Financial and Environmental Advantage

The Rossetto installation was undertaken in two steps and included the following equipment:

	Conversion MT1	Conversion MT2	Conversion LT1	Conversion LT2
Compressor (number)	Bitzer 6J-33.2Y (x3)	Bitzer 6J-33.2Y (x3)	Bitzer 6J-22.2Y (x3)	Bitzer 6J-22.2Y (x3)
Condenser ¹	ACCS 340 4 axial fans, Ø 800 mm	ACCS 340 4 axial fans, Ø 800 mm	ACCS 150 4 axial fans, Ø 630 mm	ACCS 150 4 axial fans, Ø 630 mm
Refrigeration capacity	127kW -12/45/0/20	127kW -12/45/0/20	28kW -36/45/0/20	28kW -36/45/0/20
Condenser heat rejection	179kW	179kW	54kW	54kW
Equipment	Multideck SA/FO ² , 46 m Rearcounter, 7.5 m Serve-over counter and island, 20 m Multideck FV ³ 16.8 m	Multideck SA/FO ² , 36 m Multideck CA/PO ⁴ , 6.25 m Serve-over counter and island, 26.5 m Multideck FV ³ 15 m	Frozen island, open, 45 m, electric defrost	Frozen island, open, 36 m, electric defrost
Cold rooms	448 m ³	430 m ³	130 m ³ (electric defrost)	110 m ³ (electric defrost)

¹Alfa Laval - Artec, ²Dairy, ³Fruit and Vegetables, ⁴Meat

Il the direct expansion systems were converted from the original R22 to Genetron® Performax™ LT, a near drop-in installation that required no adaptation to the stainless steel and copper pipework, which meant lower costs of retrofit than compared to other options. Adjustments were:

- Change of oil to POE
- Two valves were installed to improve sub-cooling (small, around 30°C).

Store:

- Iper Rossetto Giaccano
- Place: Via Scavazza n° 1769, Rovigo RO 45020 (North Italy), inside CC. Il Faro
- Original installation: 1996
- Sales area: 2750 m²
- Sales and warehousing area: 4000 m²
- Energy fee: 0.135 €/kWh
- Electricity for refrigeration is 35–45 % of total store bill.

- Summer ambient temperature: 26°C-50% +/-2°C +/-10%
- Refrigeration system: direct expansion with R22, mechanical thermostatic valves without subcooling
- Annual operations leak rate <10 %
- Charge: 200 kg (LT) and 300 kg (MT) per each of the four system in the store
- Refrigeration cases from Detroit

Results:

The results from the project are very encouraging. Performance of the system equipped with Genetron® Performax™ LT improved versus the original with R22. Also, Genetron Performax LT is easier to detect when leaking than R22; finally, it is non-ozone depleting substance.

Conversion was done in two steps:

- May 15, 2011: packs MT1 and LT2

Data with 407F was monitored as from May 18, 2011, as well as with R22 for the other two packs, MT2 and LT1

- June 5, 2011: packs MT2 and LT1

Climacheck system was used for data collection. For the purpose of comparison, values of energy consumption of R22 after the second retrofit have been estimated considering the effect of ambient tempera-

ture on the system performance by means of a correction ratio kWh/temperature, using the average kW/h for the specific refrigeration pack pre-retrofit. Pack LT1 and pack MT2 were used for this calculation.

- Avg ratio kWd/T pre-retrofit 19,77*
- Avg kWd/T post-retrofit 15,52*

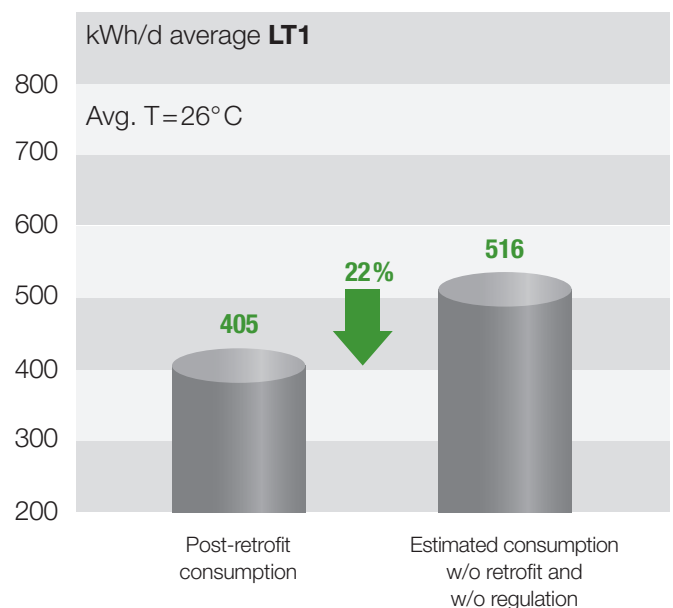
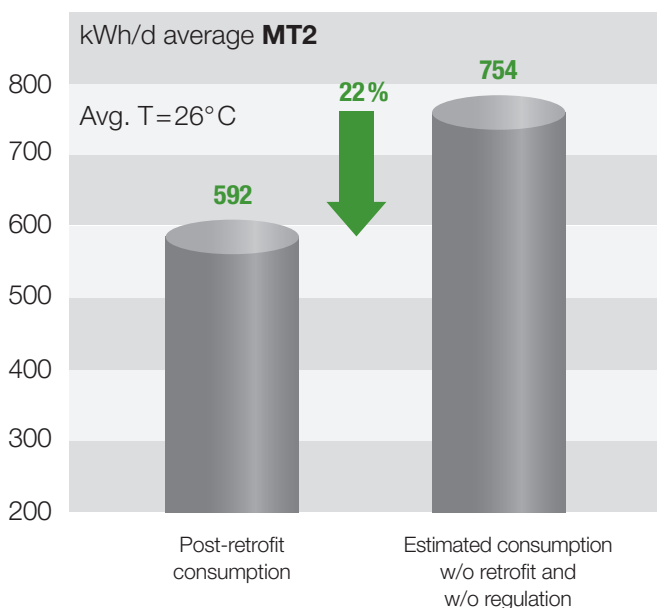
* Average factor taken from daily readings during the pre-retrofit and post-retrofit periods.

Formula used for consumption of a specific date post-retrofit is:

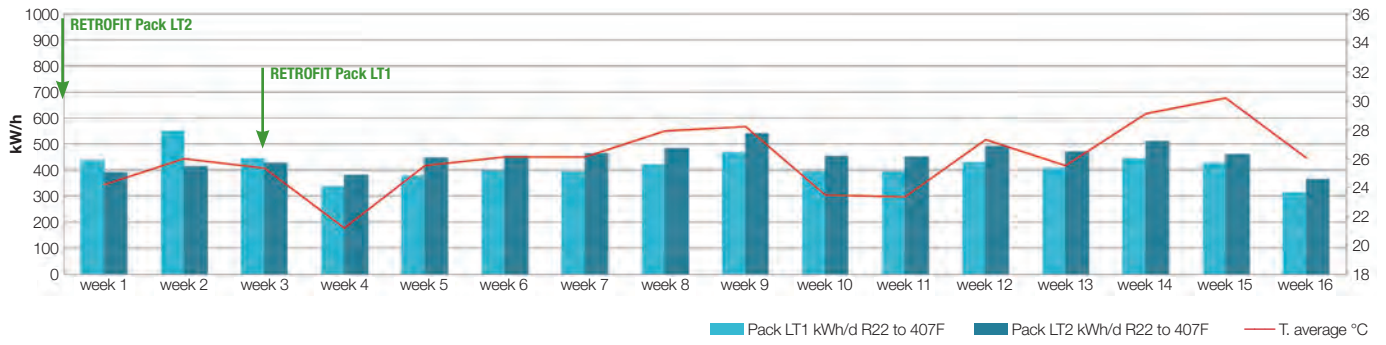
$$\text{kWh/d} = (\text{measured consumption that day}) \times \frac{\text{average (kWh/d from 05.06.11)}}{(\text{kWh/d from 18.05.11 to 05.06.11})}$$

Data recording can be observed in the graphs below.

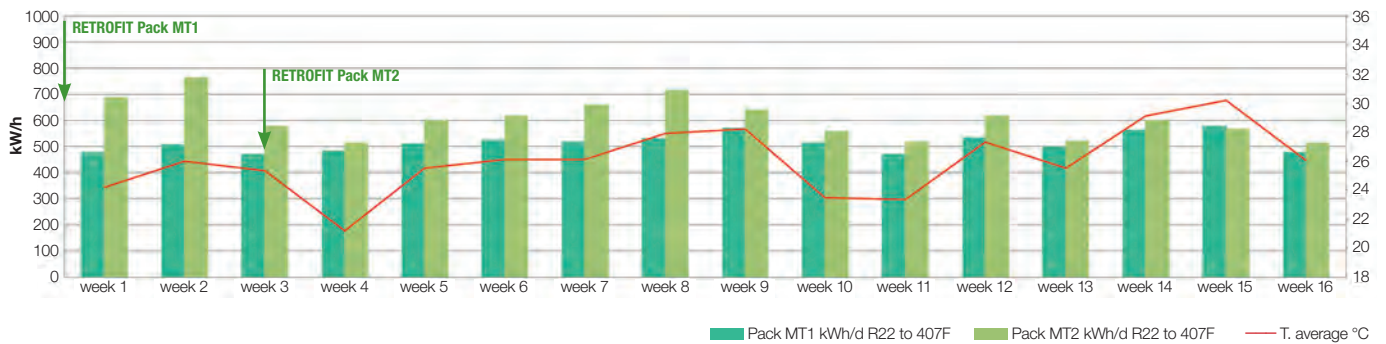
The results of such comparisons lead to the following savings



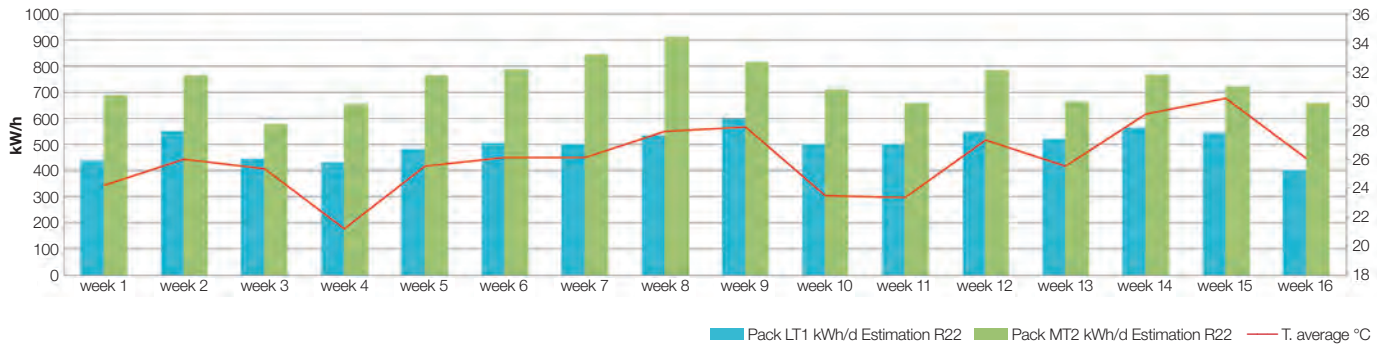
Packs LT1 and LT2



Packs MT1 and MT2

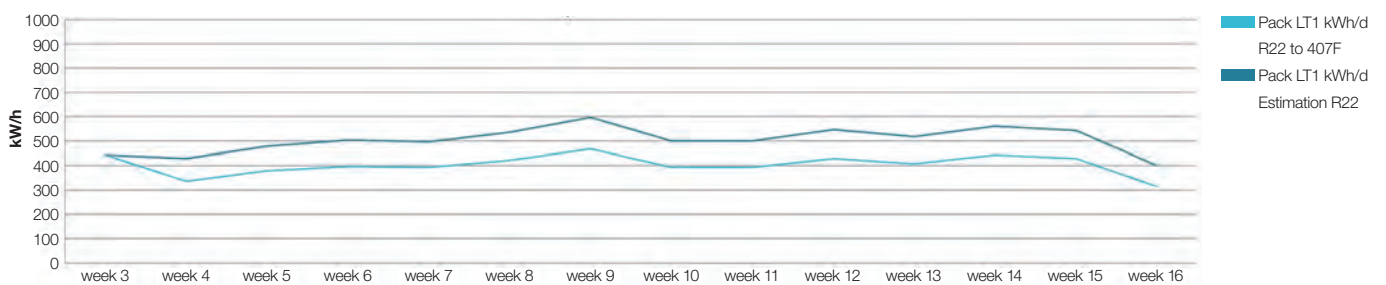


Packs LT1 and MT2 estimated with R22

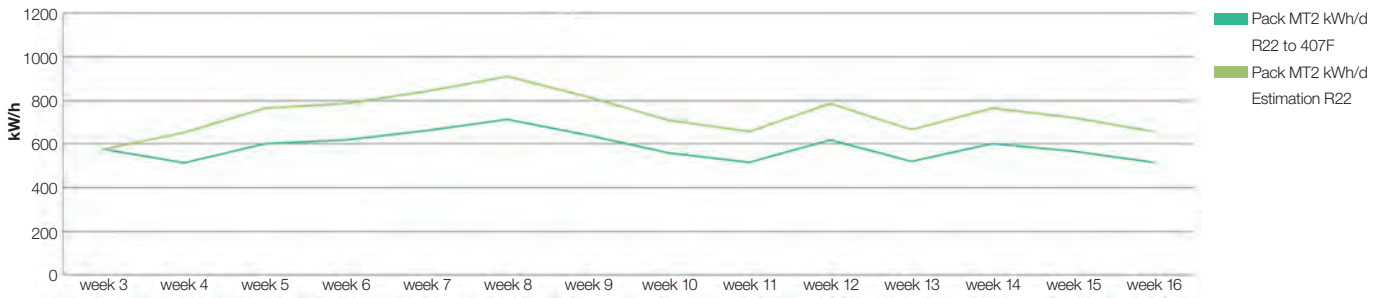


Comparison between Genetron® Performax™ LT and R22 in a LT and MT pack are shown below.

LT1 - Genetron® Performax™ LT and R22



MT2 - Genetron® Performax™ LT and R22



Feedback: Cool Technology for a Greener World

“Through careful monitoring, we have been able to establish that Genetron® Performax™ LT is delivering the levels

of performance we require while helping us to meet our environmental and cost reduction goals.”

Giuseppe Rossetto,
Rossetto Group, Italy

“By using Genetron Performax LT I could save time and money during the conversion, which was an over-

night operation. The fact of not changing valves nor piping, while ensuring performance, was a key issue.”

Alberto Agostino,
Scar Refrigerazione

Sector Perspective: Rolling Out the Retail Benefits of Genetron Performax LT

Genetron Performax LT is proven to be the best performing GWP refrigerant for supermarket installations, offering impressive results in both low temperature (LT) and medium

temperature (MT) applications. It also offers the best combination of capacity, efficiency and mass flow in meeting R22 performance in supermarket retrofits, when compared to

R404A and R407A. It complies with ODP requirements and is 100 % non-ozone depleting.

For further information on Honeywell Genetron® Performax™ LT visit www.genetronperformaxlt.co.uk

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