



Valmarket, a Carrefour affiliate, chooses Opteon™ for sustainable refrigeration

Reliability, energy efficiency and ease of installation with the low GWP refrigerant Opteon™ XL20 (R-454C) for the future of the Valsassina store.



THE COMPANY

The Carrefour supermarket and hypermarket chain is among the biggest retail groups in the world and the second largest in Europe. It operates in 30 countries with a network of more than 12,000 stores including hypermarkets, shopping malls, markets and affiliated brands.

In Italy, medium-sized franchised stores account for 80% of the prestigious French brand's total presence, and are often located in high-density urban areas and as well as rural areas, and covers covering large swathes of the country. It is a human-scale supermarket with surface areas ranging between 200 and 1000 m², focused on proximity, a wide range of products, freshness, and speed of purchase, and is in contact with breeders and farmers to promote the local economy and procurement.

With their focus on respecting the cold chain and environmental sustainability objectives, Carrefour Markets require appropriate refrigeration system management. This is why Valmarket, a Carrefour affiliate, chose Opteon™ to have an energy-efficient, reliable and versatile refrigeration system.



THE OBJECTIVES

The organized distribution sector has undertaken a global transformation in order to continue operating while respecting the environment. Fresh and frozen product storage accounts for a significant amount of energy consumption in stores. Choosing an efficient and reliable refrigerant like Opteon™ XL20 (R-454C) therefore allows waste and electricity costs to be reduced. Opteon™ XL20 complies with the recently revised F-Gas Regulation. Thanks to its very low global warming potential (GWP), it can be used to replace systems with older generation refrigerants such as R-404A and R-507. Store owners are looking for a long-term solution like this that delivers performance along with ease of use and cost containment.

Opteon™ XL20 (R-454C) is a blend of HFOs (hydrofluoroolefins) that provides the required efficiency, with a GWP of less than 150, 96% lower than that of R-404A. It is therefore a sustainable alternative in terms of CO₂ equivalent emissions and is completely safe to use according to the EN 378 standard.

The purpose of this study is to show the benefits of a system designed using a low GWP refrigerant such as Opteon™ XL20 (R-454C) which ensures:

- Optimal management of product storage temperature
- Easy installation and maintenance
- Improvement in energy efficiency
- Reduction in direct equivalent CO₂ emissions

THE SYSTEM

In updating its systems, the Carrefour brand store chose Opteon™ XL20 (R-454C) as the refrigerant fluid for its fresh and frozen product storage and display systems.

The supermarket has a sales area of approximately 700 m², with a delicatessen counter selling fresh meat, cured meats and dairy products, plus fruit and vegetable displays, refrigerated display cases for fresh and frozen products and three cold storage rooms.

The new system consists of:

- Pastorfrigor refrigerated displays
- Italia Refrigerazione units
 - Bitzer semi-hermetic compressors
 - Frigomec liquid receiver Safety fans and GVZ sensor
 - Electronic controls from Copeland
- Antonio Seveso air condenser



Operating Conditions Average Temperature serving 3 cold rooms and 33 m of counters:

- Cooling capacity: 40 kW
- Nominal power: 16 kW
- Evaporation temperature: -10 °C
- Condensing temperature: +2 °C
- Operating temperature: +2 °C



Operating Conditions Low Temperature serving 12 m of counters:

- Cooling capacity: 13.5 kW
- Nominal power: 8.5 kW
- Evaporating temperature: -30 °C
- Condensation temperature: +2°C
- Operating temperature: -20 °C



DISCUSSION AND CONCLUSIONS

The system design was entrusted to Alfa Projekt, one of the most renowned engineering companies in the large-scale retail sector. The supply and installation of the new system were commissioned from Comofrigor, which boasts decades of experience in the creation of refrigeration systems. The work was carried out to perfection, using components certified for the use of Opteon™ XL20 (R-454C) and suitable for A2L category refrigerants.

The installation and start-up stages proved to be similar to older generation systems, ensuring ease of installation and maintenance. The Opteon™ XL20 (R-454C) refrigerant has demonstrated its efficiency and ease of use, and proven suitable for ensuring the performance needed to store the products sold by Valmarket, a Carrefour affiliate, while at the same time reducing the environmental impact.

THE CUSTOMER'S VOICE

Stefano Beccari, director of Comofrigor s.n.c, was able to verify the qualities of the Opteon™ XL20 (R-454C) low GWP refrigerant, which make it easy to use compared to the low GWP alternatives currently offered on the market.

Stefano commented: "This refrigerant allows us to offer supermarket and local shop owners an effective solution. It has allowed Valmarket to maintain a simple and easy-to-manage system which has made our work more effective and has fully satisfied the customer."



Andrea Bossi of Alfa Projekt also expressed his pragmatism regarding the choice of refrigerant: "Every supermarket has its own peculiarities and the refrigeration system must be designed to achieve the best thermodynamic and energy performance. This kind of technological solution that uses R-454C is definitely an excellent choice for systems of this kind."

THE COMPANIES INVOLVED

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Alfa Projekt s.r.l.
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GeneralGas s.r.l.
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