



A First for France

Axima Réfrigération pioneers direct expansion supermarket systems, powered by low-GWP A2L Opteon™ XL20 (R-454C) from Chemours.



When it comes to complying with the standards of the European F-gas regulation, the supermarket industry has the potential to go beyond simply reducing its carbon footprint related to refrigerant leakage. By opting for Chemours Opteon™ XL20 (R-454C) refrigerant with its very low GWP score of 148 (according to AR4), Terre Y Fruits has opted not only for an ecological approach to refrigeration, but for better overall energy efficiency coupled with greater robustness of its cold storage equipment, to safely address the increasingly frequent summer heat waves in Europe.

A Stakeholder in Sustainability

Terre Y Fruits is a chain of local produce and delicatessen shops present in France through outlets in Indre-et-Loire (37) and the surrounding area. Acting in partnership with local growers and producers, Terre Y Fruits focuses on fresh regional and seasonal produce for a varied offer combining quality fruits and vegetables with a varied selection of meat, charcuterie, seafood, dairy products, and drinks. The brand is committed to building a respectful, inclusive, and ethical supply chain for its suppliers, customers, and the environment. Building on this ethos, the company takes a holistic approach to its own ecological footprint – and seeks solutions which create meaningful positive impact far beyond the confines of their stores.

While the refrigeration installations in several of its other locations were already operating with the refrigerant Opteon™ XP40 (R-449A), Terre Y Fruits wanted a truly holistic eco-efficient installation for its new shop in Ballan-Miré, south of Tours, that would be highly sustainable over the long term, and represent a tangible leap forward in energy efficiency.



Finding a balanced and pragmatic solution to a new refrigeration system required the weighing of numerous factors, not only the GWP-rating of the charge. To achieve a truly ecological solution, the need was identified for a system which offered very low GWP, great overall energy efficiency, and reliability to protect the store's valuable inventory, at a cost which allowed for continued operation with efficient margins for end customers.

Turnkey Solutions to Sustainable Refrigeration

Acting as project consultant, Axima Réfrigération presented Terre Y Fruits with a palette of refrigerant technologies adapted to the specifics of the Ballan-Miré supermarket project, including an R-454C solution and a CO₂ solution for comparison. The latter proved to be cost-prohibitive and complex, adding an estimated 15% to the budget of the new system, while the R-454C solution from Chemours boasted excellent overall performance on both economic and ecological metrics, all while costing the same to implement as the legacy R-449A solution. The effective balance of ecological credentials, cost-savings and reliability offered by Opteon™ XL20 refrigerants makes a strong case for taking a critical look at legacy refrigeration systems.



According to Crystal MAYEUR, Innovation Project Manager, Axima Réfrigération France:

“The ground-breaking installation of a direct expansion system in a grocery store, using an A2L refrigerant, Opteon™ XL20 (R-454C), marks a key milestone for Axima Refrigeration. The success of this unique project allows us to continue developing these virtuous, low-carbon solutions for the benefit of our customers. Our increasing experience with R-454C has allowed us to overcome various technical challenges, while fully respecting all regulatory guidelines for safety and ecology pertaining to A2L class refrigerants being used in sales areas.”

512 m² of Commercial Surface Requiring 25 kW of Positive Cooling

In order to meet the Ballan-Miré supermarket's cooling requirements, Axima Réfrigération installed:

- 2 Bitzer condensing units, of 14 kW each, running on R-454C placed outside the building with each unit containing less than 20 kg of refrigerant. The installation is equipped with a module facilitating power savings and monitoring of compressor operating data with the MyBitzer® application.
- 15 linear meters of A2L-compatible and CE-certified refrigeration units located in the sales area, supplied with direct expansion at an evaporation temperature of -8 °C with a rating of 6.3 kW.
- 2 positive cold rooms with A2L-compatible and CE-certified evaporators supplied with direct expansion at evaporation temperatures of -2 °C and -10 °C for a total rating of 18 kW.

The installation has been split into 2 parallel yet independent systems, in order to obtain R-454C unit charge sizes aligned with EN378 standards. As an added advantage, this configuration offers redundancy and ease of maintenance. The R-454C included the cold storage units, refrigeration production, and all safety elements fully meet current regulations. The refrigerant itself was supplied by Gazechim Froid.

Security as a Standard

In addition to providing reliable equipment which delivers excellent performance, Axima is committed to ensuring the safety of the installations it undertakes. In order to meet Terre Y Fruit's requirements in this respect, Axima produced a detailed DESP (Directive équipements sous pression 97/23/CE) dossier, ensured compliance with the maximum load per circuit as prescribed by the NF EN378 standard, and put in place all relevant safety elements such as leak detection complete with audible and visual alarms, as well as isolation valves where required. Axima also ensures the provision of a regulatory risk assessment for any refrigeration installation, whatever the refrigerant used.



A Pioneering Project

With extreme climate events occurring ever more frequently, the need for ecological refrigeration solutions is clear – not only in terms of impact during leakages, but in more complete terms; taking into account the cost of energy to run systems, as well as their reliability – which directly impacts the reputational and financial damage stemming from lost inventory. Terre Y Fruits, together with Axima Réfrigération, are proving that A2L refrigerants have what it takes to redraw industry norms, and offer impactful and affordable solutions in the next generation of cold technology.



According to Louis Bisciogol, Business Development Manager at Chemours France:

“This new installation is a decisive step in the adoption of A2L refrigerants and in particular Opteon™ XL20 (R-454C) in commercial refrigeration on centralised systems with direct expansion in the sales area – a trend that is set to accelerate as more than ever the carbon footprint and the cost of energy are at the heart of the concerns of food retail players.”

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