



Opteon™

Revolutionizing
Commercial Refrigeration
with Opteon™ XL20 (R-454C)





During the last few years, the HVACR industry has faced significant changes. With the enactment of international regulations such as the Kigali Amendment to the Montreal Protocol, higher environmental protection objectives have been established, and refrigerant equipment manufacturers and end users have been searching for more eco-friendly solutions, without compromising efficiency.

Chemours, FB Refrigeración, and Novafríos are three renowned companies in the HVACR industry that are committed to reaching such goals. **Together, they successfully installed the first commercial refrigeration system using Opteon™ XL20 (R-454C) refrigerant in Latin America.** The project was conducted in one of the largest supermarket chains in Colombia.

FB is a leading company in the manufacture of refrigeration equipment in Latin America. **Novafríos** is a contractor specializing in providing installation and maintenance solutions for refrigeration systems, and **Chemours** is the world leader in the development of heat transfer fluids.

Due to the very low GWP and higher energy efficiency of Opteon™ XL20 (R-454C) refrigerant, it is included in the tax rebate program, resulting in additional savings in capital cost.

Background

The largest supermarket chain in Colombia was faced with the need to reduce its environmental impact and power consumption. FB Refrigeration, Novafriós, and Chemours teamed up to achieve this by conducting a thorough analysis of the supermarket's existing system conditions and replacing the aging R-22 system with a new one designed to operate with **Opteon™ XL20 (R-454C)**. The performance of this new refrigerant is very similar to that of HCFCs, and HFC alternatives, but with an ASHRAE safety classification of A2L: Mildly Flammable.

The Solution Proposed

FB and Novafriós were responsible for the engineering, design, installation, and supervision of the project.

The system proposed included two condensing units from FB's new EcoFlex line, specifically designed to operate with **Opteon™ XL20 (R-454C)** refrigerant. These units feature the latest technology in the market, including the Copeland fixed/digital scroll compressors for the medium temperature unit. The low temperature unit used a digital compressor and an enhanced vapor injection (EVI) system. The new FB line of FIEL evaporators, with high efficiency and ease of service, is compatible with **Opteon™ XL20 (R-454C)**, R-404A/R-507/R-449A/R-448A, and R-744 refrigerants.

Electronic expansion valves and leak detectors were installed to address the high efficiency showcases and evaporators.

The Results

Installation of the system with the new **Opteon™ XL20 (R-454C)** refrigerant was straightforward and effortless. Components, equipment, controls, and the basic refrigeration mechanical cycle are the same as R-22, enabling a fast learning curve for technicians installing and maintaining the units.



The reduction in power consumption was approximately 35% compared to the old system.*

*Based on customer data

Opteon™ XL20: The optimal balance of safety, sustainability, efficiency and cost.



Lower investment cost (CAPEX)*



Lower operating costs by using energy-efficient refrigerants (OPEX)*



Technology similar to existing equipment, ease of installation and maintenance*



Reliability assurance for the equipment and preservation of refrigerated products*



Lower total environmental impact (Total Equivalent Warming Impact) (TEWI)*

**Compared to R-22 Refrigerant*

Conclusion

The new refrigerant use and management regulations are posing challenges and opportunities. The refrigeration industry has invested millions of dollars in developing more environmentally friendly technologies such as **Opteon™ XL20 (R-454C)** refrigerant, and newer energy-efficient equipment such as FB's EcoFlex units, featuring the latest compression, automation, and control technology.

There are many alternatives in the market today; it is critical to select the option that provides the best Total Cost of Ownership (TCO), as the business competitiveness depends on it.

The TCO includes the system investment and equipment operating costs, such as preventive and corrective maintenance, labor, parts, and one of the most relevant, the energy cost, a fixed expense.

The proposed solution enabled the company to have a lower environmental footprint as the direct impact was reduced by using a refrigerant with ultra-low GWP and the indirect impact was reduced by achieving significant reduction in its power consumption.

Note: For projects using A2L refrigerants in the US market, refrigeration equipment and systems must comply with the relevant Building Codes and Standards.



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