



Opteon™ XL20 (R-454C) The optimal solution for commercial refrigeration

Efficiency, Safety and Ease of Use
for Retail



Denner supermarket

The Denner supermarket channel is recognized as a leader in the discount sector in Switzerland, with a solid presence of 860 stores. The company is focused on a sustainable growth strategy, investing in environmentally friendly refrigeration technologies designed to optimize operational efficiency. Thanks to a lean organizational structure and highly efficient processes, Denner is able to optimize business costs. The savings obtained are reinvested to offer customers excellent value for money.

In the Campascio store, Denner has recently embarked on a project of both technological and aesthetic renewal. The central objective was to find the optimal combination for the central refrigeration system and the furniture. With the entry into force of the European FGas 2024/573 regulation, the choice of refrigerant has become crucial to the company's strategy. As a result, Denner decided not to limit himself to the currently most popular solutions, but to explore new alternatives, in order to make strategic and sustainable decisions in the long term.



The choice for Opteon™ XL20 (R-454C):

Opteon™ XL20 (R-454C) is a hydrofluoroolefin (HFO)-based refrigerant designed to provide optimal efficiency and reliability in the refrigeration industry. In the context of organized distribution, attention to environmental sustainability has become an indispensable priority. With a Global Warming Potential (GWP) of less than 150, Opteon™ XL20 (R-454C) presents itself as an effective alternative to reduce CO₂ equivalent emissions, in full compliance with the recently updated F-Gas Regulation.

Store managers are increasingly looking for solutions that deliver high performance, ease of use, and cost control. Opteon™ XL20 (R-454C) is designed to maintain the ease of use of traditional refrigerants, while offering cost-effective installation and maintenance, without compromising on performance.

The advantages of Opteon™ XL20 (R-454C) over alternatives:

In the evaluation of the technologies available for the centralized refrigeration system, the need to reduce the Global Warming Potential (GWP) of the refrigerant used, as prescribed by F-Gas Regulation 2024/573, was considered. This process led to the identification of two potential solutions: a system based on transcritical CO₂ (R-744) or the adoption of Opteon™ XL20 (R-454C).

The comparative analysis showed that Opteon™ XL20 (R-454C) offers several advantages, including:

- Safety in design, operation and maintenance
- Low GWP below 150, in favor of environmental sustainability
- Design compatible with current systems
- High charge limits, even in public environments, in compliance with EN 378, with the possibility of charging more than 57 kg through dedicated analyses
- High energy efficiency, with a medium-temperature COP of 2.70*
- Low working pressures and moderate temperatures on compressors, increasing system lifetime and reliability

Compared to the centralized R-744 (CO₂) system, Opteon™ XL20 (R-454C) has been estimated to offer a significant cost reduction and a substantial improvement in energy efficiency, estimating a 20% increase in COP in summer conditions. These evaluations led the company to opt for the Opteon™ XL20 (R-454C) HFO-based solution for medium-temperature distribution, while maintaining plug-in systems for the refrigerated counters.

**EN12900 conditions for commercial medium temperature cooling, 3 K subcooling*

The implementation of the system with Opteon™ XL20 (R-454C):

In the renovation project of the store, the company made use of the collaboration of qualified partners for the design and installation of the system, as well as for the supply of high-quality refrigerants. The refrigerated furniture provided by Pastorfrigor includes display counters for meats, cold cuts and cheeses at medium temperature, as well as low temperature counters for frozen foods, all equipped with LED lighting and display cases. In addition, two cold rooms serving the supermarket use Opteon™ XL20 refrigerant (R-454C).

Pastorfrigor stands out for its production capacity, with three operating units and a research center involving 200 employees. Among these, a team of mechanical designers and expert laboratory technicians works in four UNI certified thermodynamic rooms. The company is dedicated to constantly improving the performance and thermodynamic characteristics of its products, a commitment that constitutes a fundamental value of Pastorfrigor. The meticulous selection of the most suitable refrigerant for each specific need allows us to achieve particularly ambitious environmental sustainability goals.

The installation of the system was taken care of by ComoFrigor, using safe practices and certified methods to ensure optimal performance of the system. Founded in 1965, ComoFrigor is a historic company in the refrigeration sector, with a specialization in the sale and repair of refrigeration systems and cabinets for the commercial and industrial market. This long path of experience allows ComoFrigor to guarantee reliable and high quality solutions, responding to the specific needs of the sector.



The design and construction of the condensing unit was entrusted to Italia Refrigerazione. Under the guidance of Ing. Ponzo, this company has selected Opteon™ XL20 (R-454C) as the key refrigerant for the production of energy-efficient, low-GWP condensing units and refrigeration units. The condensing unit produced for this project is capable of providing 10 kW of capacity at medium temperature and is accompanied by PED/EN 378 technical documentation.

Opteon™ XL20 (R-454C) refrigerant was supplied by GeneralGas to ensure high quality and dedicated services. With its team of experts, GeneralGas is able to identify refrigerants that allow to:

- Contain initial renovation / new construction expenses
- Preserving existing safety certification of the system
- Maximizing energy efficiency especially in hot weather and at times of the year with higher power demand
- Facilitate maintenance and recovery of replaced gases

The simplified procedures of General Gas' innovative Smart 378 and RAC Genius Pro platforms allow you to adopt HFO solutions with GWP>150 such as Opteon™ XL20 (R-454C) effectively.

Companies Involved:

- **Pastorfrigor**, Str. Gabannone 4, 15030 Terruggia AL
- **Comofrigor s.n.c.**, Via Fittavolo, 22042 San Fermo della Battaglia (CO)
- **Italia Refrigerazione s.r.l.**, Via Variante di Cancelliera, Ariccia (RM)
- **GeneralGas s.r.l.**, Via Aosta 5, 20063 Cernusco Sul Naviglio (MI)
- **Chemours Italy s.r.l.**, Centro Direzionale Colleoni, 20864 Agrate Brianza (MB)



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the future tomorrow deserves.

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