

Smart refrigerated storage solutions

Condis Supermarkets
Choose Opteon™



Opteon™

Energy efficiency is a term gaining more and more significance, especially against the backdrop of global carbon reduction targets to fight climate change. It is particularly applied when describing the best use of energy resources and how the energy solutions we choose to invest in contribute to overall energy efficiency.

Refrigerant gases are among the many application areas the energy industry look at when evaluating environmental impact and cost benefits. The current trend is to ensure that gases incorporated into system design today are compliant longer-term and meet environmental protection standards.

The essential role of low-GWP refrigerants

We know that when dealing with new-generation refrigerants with low-GWP, indirect emissions resulting from the electricity consumption of refrigeration systems are a far greater contributor to climate change than the GWP of the refrigerant itself,* making energy efficiency a vital factor when selecting a low GWP solution.

EU F-Gas Regulation 517/2014 came into effect to phase out HFC gases which generate emissions that contribute to the greenhouse effect and require systems to use gases with lower Global Potential Warming.

The current generation of low-GWP refrigerants are designed to be versatile between applications, offering greater synergy between technologies. This means specific types of installations are not tied to using one type of refrigerant. And now there is increased potential to use a refrigerant in different types of equipment and components to achieve the **lowest possible Total Equivalent Warming Impact**.

Sustainability in action

CONDIS SUPERMERCATS, SA shares this vision. The introduction of **energy efficiency measures and sustainable development is a high priority for the business**. Founded in 1961 in Catalonia, they have over 550 outlets in Catalonia, 56 in Madrid-Central Zone and 13 in Andorra. They have been a long-term adopter of sustainable energy solutions, for example by installing over 3,000sqm of solar panels on the roof of the Central Logistics Warehouse in Montcada in Reixac. And they also focus on improving the efficiency of their refrigerated facilities **by integrating refrigerant technologies that optimize performance**.



Power in partnership

CONDIS, working with installation partners DECOFRIO, started the project by reviewing comparative studies of alternative solutions. They opted to work with Chemours, choosing their **Opteon™ XL20 (R-454C)** refrigerant, to achieve compliance through ambitious environmental objectives and benefit from **Opteon's** simple installation and maintenance.

In the words of **Iban Delgado, CEO at DECOFRIO S.L.**: *"the installation has not been different from those we have executed using fluorinated refrigerants to date, and we are very satisfied with the results. Since its installation in April, there have been no operational issues, and we have saved on emissions plus tax rate. The safety and ease of handling of Opteon™ R-454C helped us implement this installation similarly to legacy HFC refrigerants. We only had to consider that the system components were approved for use with the R-454C. **It is a real solution and the most economical for our client**".*

THE NEW INSTALLATION CONSISTS OF:

- A refrigeration rack based on three Bitzer compressors model 4NES-14Y, of 14 HP each and dedicated to MT refrigerated services, capable of supplying 80,7kW of refrigeration capacity, with an evaporating temperature of $-7\text{ }^{\circ}\text{C}$ and a condensing temperature of $45\text{ }^{\circ}\text{C}$. One additional 23HP compressor model 4GE-23Y, can provide 15,710W for addressing Low Temperature (LT) needs, at an evaporating temperature of $-25\text{ }^{\circ}\text{C}$ and a condensing temperature of $+45\text{ }^{\circ}\text{C}$.
- A radial type condenser model RAD63V-2132HA, approved for A2L refrigerants with an exchange surface of 414.5 m^2 , equipped with 3 radial type fans of $630\text{ mm}\varnothing$ and capable to supply 179.0 kW refrigeration power.
- Evaporators approved for A2L use and dispatched as follows:



Refrigerated warehouse (MT):

Four ceiling-type Lu-Ve evaporators, model CD50H 9604 E7 with an exchange surface of 54.40 m^2 , 2 fans of $500\text{ mm}\varnothing$, and a performance of 17.4 kW .



Fruits warehouse (MT):

One cubic type Lu-Ve evaporator, model F35HC 218 E6, with an exchange surface of 37.90 m^2 , 3 fans of $350\text{ mm}\varnothing$ and a performance of 12 kW .

Frozen warehouse (LT):

One cubic type evaporator, model E50HC 6922E9L, with an exchange surface of 55.40m², 2 fans of 500 mmØ and a performance of 15,7kW.

- Electronic valves insure an accurate system regulation.



The following safety measures were implemented in order to comply with the **Spanish Regulation on Safety for Refrigeration Plants and Facilities (RSIF), R.D 553/2019:**

- Locked man and leakage alarm equipment without batteries, providing both acoustic and visual alarm, installed next to the access door in rooms with a temperature lower than + 5 °C (in compliance with RSIF).
- Installation of locked man alarm equipment with and without battery and leakage alarm, with acoustic and visual alarm, installed next to the access door in the frozen storage room (in compliance with RSIF).
- Installation of permanent leak detectors in the machinery room (compliant with RSIF).
- Installation of a forced ventilation system in the machinery room with an independent electrical panel. The system acts as under general stop button, temperature, leakage, or machinery room door opening.

THE SURFACES AND NEEDS WERE:

Refrigeration service	Volume (m ³)	Consignment Temp. (°C)	Required performance (W)
Refrigeration warehouse	1.870,30	0° / +2°	69.200
Fruits warehouse	144,00	+4° / +6°	10.800
Frozen warehouse	351,22	-20° / -22°	14.400



Efficient economics

Beyond their low-GWP credentials, Opteon™ XL A2L refrigerants, as long-term solutions, are developed to move toward increasingly stringent emissions goals and provide clear advantages in system efficiency. Their versatility and thermodynamic performance ensure that these refrigerants can significantly lower lifecycle costs and emissions in Commercial Refrigeration applications, all without compromising on cooling performance or safety. Opteon™ XL20, for example, has the lowest 10-year lifecycle costs in Commercial Refrigeration of any low-GWP gas.

Opteon™ XL20 (R-454C) was commercially launched in Spain by KIMIKAL SL as distribution partner of CHEMOURS in February 2019 and has quickly become a leading choice for many low-GWP applications.

**To calculate the indirect emissions for each technology, the energy consumption figures were then converted to CO₂ equivalent emissions using CO₂ Factor kgCO₂e/kWh values. For the refrigerants with a GWP of >10, the direct emissions were calculated using the refrigerant system charge with an annual loss rate for each technology assumed.*



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