

Sustainable Strategies in Cold Storage

Mascaró Morera
Serveis Logistics
choose Opteon™



Opteon™



Energy Efficiency is a term that is gaining more and more importance, especially in the context of global carbon reduction targets to fight climate change.

Refrigerant gases are among the many application areas that refrigerated transport and industrial systems consider when evaluating environmental impact and cost/benefits. The current trend is to ensure that the gases incorporated into the system design meet long-term standards and environmental protection regulations.

The Essential Role of Low GWP Refrigerants

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

The European Regulation 517/2014 F-Gas came into force to reduce the use of HFC gases that generate emissions contributing to the greenhouse effect and requires systems that use gases with low GWP.

The current generation of low GWP refrigerants have been designed to be versatile between applications, offering the greatest synergy between technologies. This means that specific types of installations are not bound to using one type of refrigerant. And now there is greater potential to use a refrigerant with different types of equipment and components, and **achieve the lowest possible Total Equivalent Warming Impact (TEWI).**

Reducing the environmental impact and carbon footprint is becoming increasingly important. In a sector as essential as refrigerated distribution, energy efficiency and the reduction of emissions, both direct and indirect, are very important factors when planning companies' environmental and sustainable development strategies.



Continuous Cooperation

MASCARÓ MORERA is a leading company in the Spanish refrigerated distribution sector, headquartered in Alaior (Menorca) with offices in Mallorca, Barcelona, Valencia, Alicante, Antequera and Madrid, with a new warehouse facility located in Ribarroja del Turia. The company has a team made up of 260 people prepared to offer transportation and distribution services for both general, refrigerated, and frozen cargo.



Building Strong Partnerships

To carry out their vision for a next generation energy efficient distribution center, it has partnered with **Radajofran Refrigeración, S.L.**, a company with more than 30 years of experience at the forefront of the latest trends in refrigeration systems and applicable regulations.

The management of **Marcaró Morera**, advised by **Radajofran Refrigeración, S.L.**, and after several meetings studying the technological possibilities, always keeping in mind environmental sustainability and energy savings, opted for **Opteon™ XL20 (R-454C)** refrigerant for this project. The main differentiating factors that contributed to making this choice were not limited to its low GWP of less than 150, and exemption from the Spanish fluorinated gas tax, but in equal measure regarded its improved safety of working with an A2L classified refrigerant that is non-toxic and has lower flammability, and ease of installation.

In the opinion of **José Fco. Torres Verdú**, manager of **Radajofran Refrigeration**, "**Opteon™ XL20** is the best option for this project since it offers a series of characteristics that make it the most suitable, such as the simplicity of the technology used, the considerable reduction in emissions that represent a reduction in the carbon footprint, the superior energy efficiency and, also very important, not being subject to the Fluorinated Gas Tax". In addition, "it is a refrigerant for the future, which due to its very low GWP value, complies with current and future regulations".

A New Installation

Description of the new devices:

The installation consists of the refrigeration of three loading and unloading rooms at 7 °C/+45 °C, a cold room at 0 °C/+45 °C and a freezing room at -20 °C/+45 °C, in direct expansion. Several isolated rooms are constructed in an open plan building for this process.

The total volume for refrigeration is more than 11,000 m³, and a refrigeration capacity of 516 kW is installed for this purpose.

All components are approved to work with A2L refrigerants, complying with the most demanding environmental and safety regulations.

The system utilizes 500 kg of the new generation refrigerant **Opteon™ XL20 (R-454C)** supplied by **KIMIKAL, S.L.**



Three well differentiated areas:

Refrigeration service	Volume (m ³)	Consignment Temp. (°C)	Required performance (W)
Loading & Unloading Rooms	8.841,18	+7	375.000
Low Temperature Room	1.151,28	-20	48.600
Medium Temperature Room	1.559,03	0	76.400

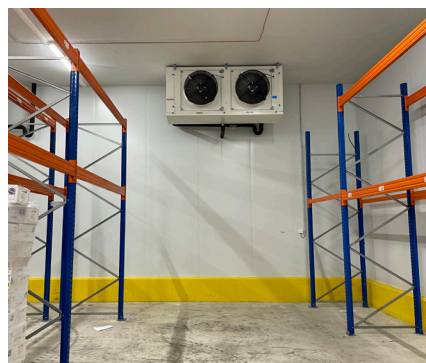
LOADING AND UNLOADING ROOMS:

- 3 Ecotop 6MK-50X AWM A2L Compactos Frigoríficos condensing units, with a power of 74 kW each
- 2 Ecotop 4MI-30X AWM A2L Compactos Frigoríficos condensing units, with a power of 40 kW each
- 13 Frimetal A2L (PIM-2575 and PIM-1900) ceiling-mounted evaporators
- Electronic expansion valves Alco EX5-U21 INOX 800618
- Solenoid valves Castel 1 1/8 S 1099/9 and 1 3/8 S 1079/11



LOW TEMPERATURE ROOM:

- 2 Ecopack 6MM-30X AWM A2L Compactos Frigoríficos condensing units, with a power of 23 kW each
- 2 Frimetal A2L FRL 2340E cubic evaporators
- Electronic expansion valves Alco EX5-U21 INOX 800618
- Solenoid valves Castel 1 1/8 S 1099/9



MEDIUM TEMPERATURE ROOM:

- 2 Ecopack 4MH-25X AWM A2L Compactos Frigoríficos condensing units, with a power of 35 kW each
- 2 Frimetal A2L FHFHGGFRB 2650E cubic evaporators
- Electronic expansion valves Alco EX5-U21 INOX 800618
- Solenoid valves Castel 1 1/8 S 1099/9

Compliance with safety regulations

Following the specifications of the Refrigeration Installations Safety Regulation (RSIF, RD 553/2019) for refrigeration installations with A2L refrigerants, the installation is equipped with:

- KO-55323B double locked-in alarm kit
- 9 A2L AKO-57624 detectors
- Gas2/4C AKO-55724 alarm unit

The location of the units outdoors and not in an enclosed area means that additional safety measures are not required.

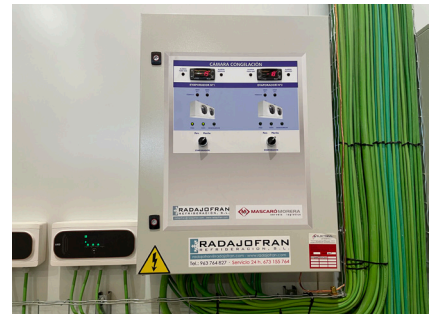
The Voice of the Customer

According to **Manuel Muñoz**, representative of **Mascaró Morera** in Valencia, "we are very satisfied with the results. This installation was a challenge due to the use of a class A2L refrigerant, but the safety and ease with which the work has been carried out gives us great confidence. In addition, it is a more energy efficient solution, which will allow us considerable savings and a significant reduction in our emissions".

The resulting integrated refrigeration system has fully met the high expectations of the customer since its start of operation in January 2023. All environmental and sustainability expectations have been met in terms of energy efficiency and emissions reduction, as well as safety and reliability.

Opteon™ Efficient Economy

Beyond their low-GWP credentials, Opteon™ XL A2L refrigerants, as long-term solutions, are being developed to move towards increasingly stringent emissions targets and deliver clear system efficiency advantages. Their versatility and thermodynamic performance ensure that these refrigerants can significantly reduce life cycle costs and emissions in commercial and industrial refrigeration applications, all without compromising refrigeration performance or safety.



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