



Sustainable Solutions in Refrigerated Storage

BRIVIO & VIGANO ESPAÑA
choose Opteon™ XL20 (R-454C)



THE ESSENTIAL ROLE OF LOW-GWP REFRIGERANTS

Energy Efficiency is a factor that is gaining more and more importance, especially in the context of global objectives to reduce the carbon footprint to fight climate change.

Refrigerant gases are among the many application areas that the energy industry considers when evaluating environmental impact and costs/benefits. The current trend is to ensure that the gases incorporated in the system design meet long-term standards and environmental protection regulations.

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

European Regulation F-Gas III 573/2024 came into force to reduce the use of HFC gases that generate emissions that contribute to the greenhouse effect and requires systems that use low-GWP gases.

The current generation of low GWP Opteon™ XL line of refrigerants have been designed to be versatile between applications, offering the greatest synergy between technologies. This means that specific installation types are not subject 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)**.



GREAT TEAMWORK

"The main activity of the Company, in addition to the conservation of products at controlled temperatures, such as fruits and vegetables, fresh products and meat, is their transportation and distribution throughout the national territory by use of an extensive network and a logistics platform, made up of proprietary warehouses and operational transit points. With headquarters in Madrid, we operate throughout Spain with warehouses in Barcelona and Seville."

BRIVIO & VIGANO ESPAÑA has a warehouse in the Madrid Transport Center (CTM), in the province of Madrid, where it carries out the activity of a distribution warehouse for fruit and vegetable products and proposed the expansion and modernization of the existing facilities, always thinking about sustainability, safety and compliance with regulations.

The power of association

To carry out this project they have relied on the industrial refrigeration installation and maintenance company **COREFRI S.L.** With more than 20 years of experience in the sector, Corefri has positioned itself at the forefront of the latest technology in refrigeration systems following most recent regulations.

The management of **BRIVIO & VIGNANO**, advised by **COREFRI** and the other collaborating companies, has studied the technological options that would allow for a high improvement in sustainability and energy consumption. After careful evaluation they the team has opted for a solution based on **Opteon™ XL20 (R-454C)**. As it is an A2L refrigerant with a GWP of less than 150, it is a simple installation to carry out, safe, like those previously carried out, and is also exempt from the Spanish fluorinated gas tax.



According to **Javier López and Francisco Valenzuela**, technical management of **COREFRI**, "After having studied all the possible technologies, we have seen that the Opteon™ XL20 is the best option for this project since it has a series of characteristics that make it the most suitable, such as, simplicity in its use; a considerable reduction in both direct and indirect emissions, which translates into a significant reduction in the carbon footprint; superior energy efficiency and, also very important, that this product is not subject to the Fluorinated Gas Tax in Spain", in addition, "it is a very long-term refrigerant, which, due to its very low GWP value, complies with regulations current and future."

A NEW INSTALLATION

New system requirements

The developer's service requirements for the planned refrigeration installation are as follows:

- 4 distinct Chambers: Refrigeration from 0 to 10°C, for storage of fruits and vegetables.

Depending on the capacity of the industry, the storage and treatment needs for refrigerated products are determined.

SERVICE	LONG (m)	WIDTH (m)	SURFACE (m ²)	VOLUME (m ³)	TEMPERATURE (°C)	POWER (W)
CHAMBER 1	32,86	21,30	699,92	4019,52	0-10°C	136740,93
CHAMBER 2	38,97	20,90	814,47	4886,84	0-10°C	156616,20
CHAMBER 3	22,30	21,10	470,53	2823,18	0-10°C	76551,24
CHAMBER 4	16,47	21,10	347,52	2085,12	0-10°C	59004,97

The following calculation data are taken to carry out the refrigeration installation:

- Design outside temperature: 45°C
- Outdoor relative humidity: 60%
- Indoor relative humidity: 90%
- Condensing air temperature: +48°C

The installation system chosen has been selected based on the refrigeration needs of the industry, its construction characteristics, the current situation of refrigerant gases and the customer's needs.

Description of the new system components

▪ Compression system:

The compression system for positive services will be direct, using a direct expansion refrigeration plant manufactured by ARCTIC, S.A, with semi-hermetic screw compressors driven by three-phase motors.

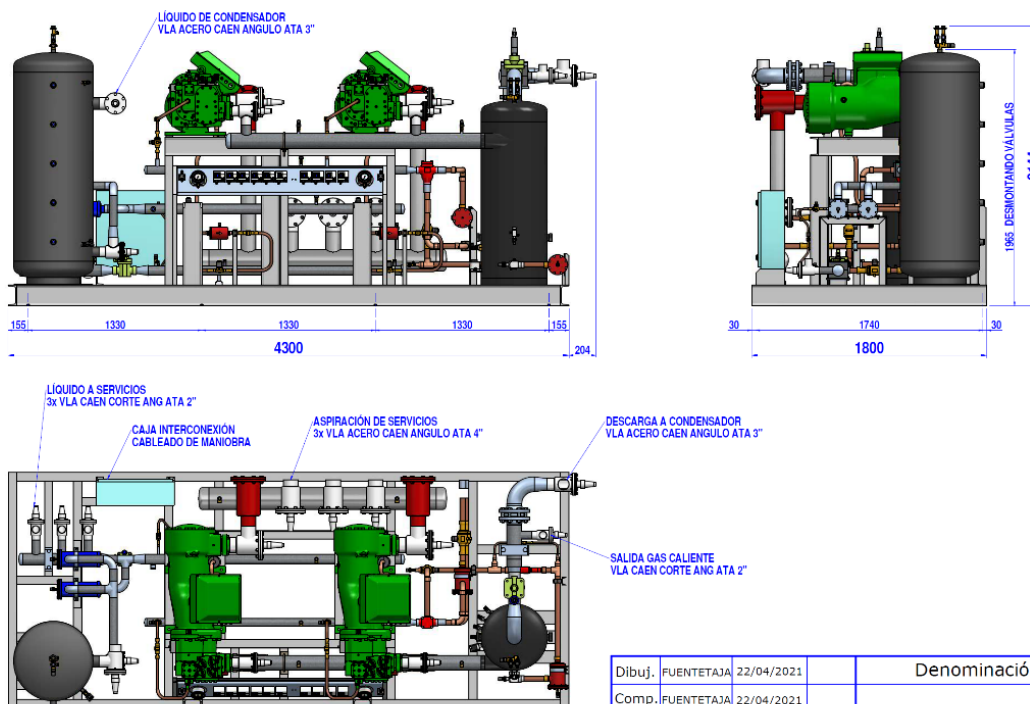
- Work regime: -10/+50 °C
- Refrigerant: R-454C
- Refrigerant charge: 990 Kg

N# COMPRESSORS	2
BRAND	BITZER
MODEL	HSK 8581-160Y
TOTAL COOLING CAPACITY	500kW
EVAPORATION TEMPERATURE	-10 °C
CONDENSATION TEMPERATURE	+50 °C

- **Condensation:** The condensation system is handled by incorporating two helical-type air condensers, located on the roof with EC electronic radial fans. Manufactured by **INTERSAM, S.L.**
- **Evaporation:** Cold room's evaporators manufactured by **INTERSAM, S.L.** have been used.
- **Control and regulation:** The control and regulation of the refrigeration plant, will be carried out through automation, which ensures the control of compressors and services. Electrical panel manufactured by **VIDAL AUTOMATIZACIÓN Y CONTROL S.L.**

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

To fulfill all services requirements, 990 kg of **Opteon™ XL20 (R-454C)** supplied by **KIMIKAL, S.L.** have been used.



Dibuj.	FUENTETAJA	22/04/2021	Denominación	Nº de Plano
Comp.	FUENTETAJA	22/04/2021	CENTRAL 2x HSK8581-160Y	CD-221047
Revis.	FUENTETAJA	27/04/2021		Hoja 1/2
			COREFRI	Peso Neto aprox.: 3000 Kg
			Industrial de refrigeración española s.a.	ESC:

Compliance with safety regulations

Following the specifications of the Safety Regulation of Refrigeration Facilities (RSIF, RD 553/2019) for refrigeration facilities with A2L refrigerants, the facility is equipped with:

- Locked person alarm kits
- A2L Detectors AKO-57624

The machinery room complies with all additional ventilation, leak detection and lighting measures indicated in the RSIF.

MAKING THE RIGHT CHOICE

For the customer, this facility meets their current and future needs. This installation was a challenge due to its location and characteristics, as well as the use of a class A2L refrigerant, but the safety and ease with which the work has been carried out gives a lot of confidence. It is a very energy efficient solution, which will allow considerable savings and a significant reduction in the carbon footprint.

Opteon™ Efficient Economy



Beyond their low-GWP credentials, **Opteon™ XL** refrigerants, as long-term solutions, are developed to move towards increasingly stringent emissions targets and deliver clear system efficiency benefits. 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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