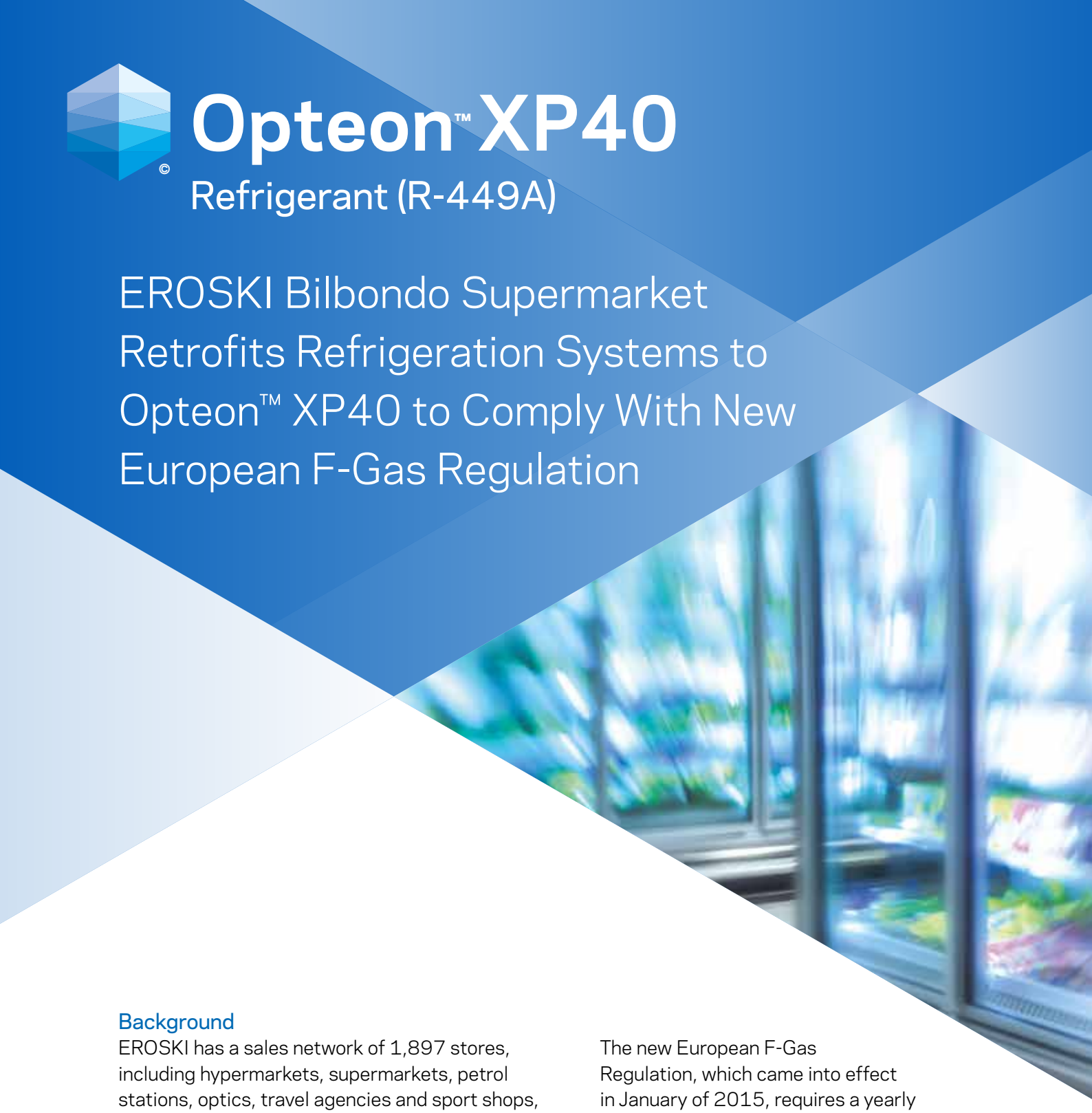
Opteon™ XP40

Refrigerant (R-449A)

EROSKI Bilbondo Supermarket Retrofits Refrigeration Systems to Opteon™ XP40 to Comply With New European F-Gas Regulation



Background

EROSKI has a sales network of 1,897 stores, including hypermarkets, supermarkets, petrol stations, optics, travel agencies and sport shops, as well as a staff of 33,832 workers in Spain. Since its beginning, EROSKI has carried out many social initiatives, most of them related to the promotion of healthy lifestyles, consumer education, environmental protection and solidarity.

The new European F-Gas Regulation, which came into effect in January of 2015, requires a yearly reduction in HFCs to cut F-gas emissions by two-thirds by 2030 compared to 2014 levels. The introduction of this regulation led EROSKI to make the decision to retrofit its supermarket refrigeration systems to a low global warming potential (GWP) refrigerant alternative.

Chemours™

Low GWP

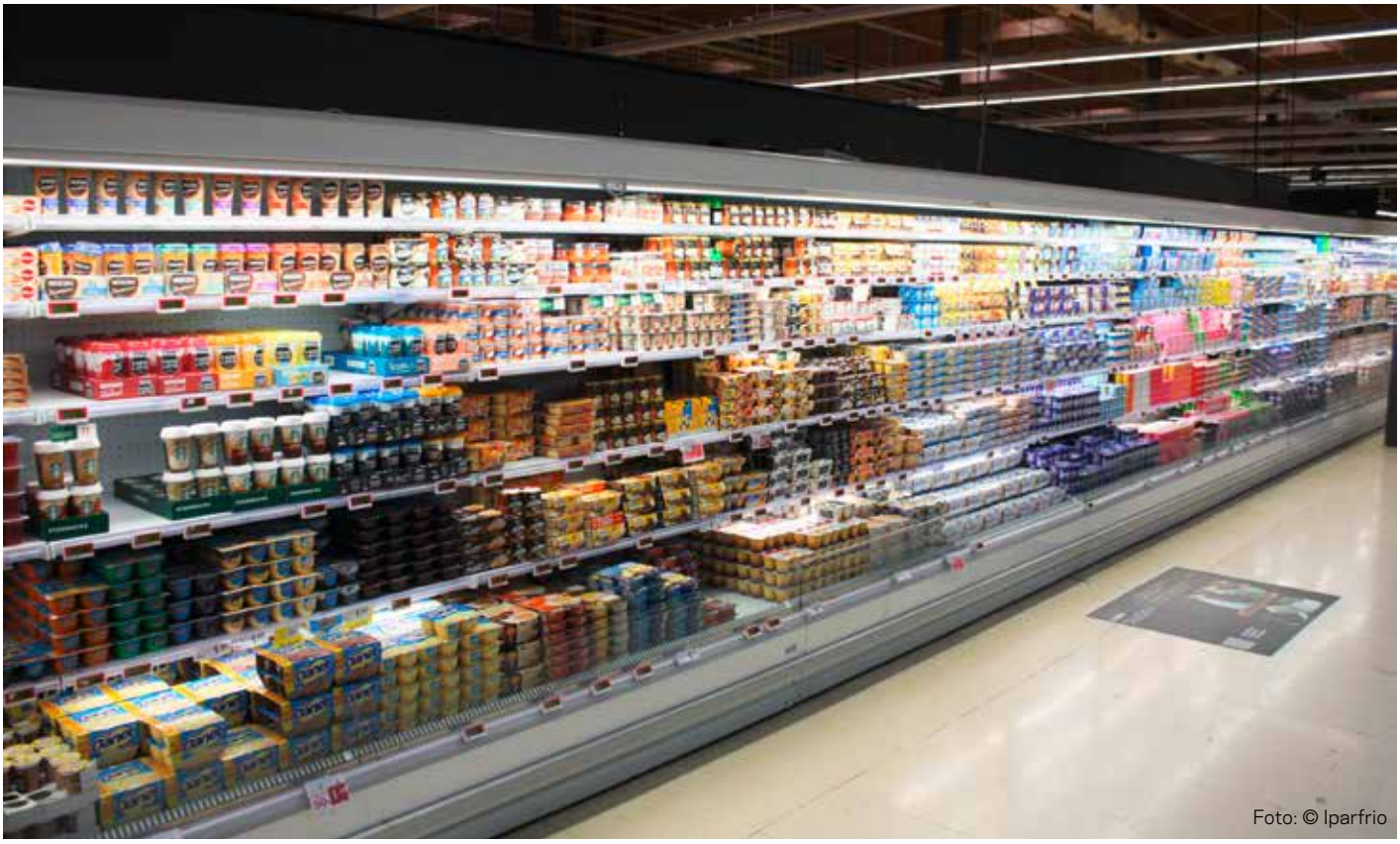


Foto: © Iparfrio

The 37,000 m^2 supermarket, located in Basauri, Vizcaya, was considered to be the pilot centre for EROSKI's project launch to retrofit its old R-404A refrigeration systems to Opteon™ XP40 (R-449A) from Chemours.

Compared to the previously used R-404A, Opteon™ XP40 has a 65% lower GWP and allows up to 12% reduction in energy consumption. Due to its high GWP, R-404A is imposed with high taxes in Spain. Retrofitting to Opteon™ XP40 not only allows EROSKI to reduce their environmental impact, but also to save money due to lower taxes and energy consumption.

Opteon™ XP40 Refrigerant

Opteon™ XP40, the company's flagship low GWP refrigerant, is a low GWP hydrofluoro-olefin (HFO)-based refrigerant. It was developed to replace R-404A/R-507A in positive displacement, direct expansion (DX) low- and medium-temperature systems.

It can be used for both retrofit of existing R-404A/R-507A equipment, as well as a suitable replacement option in new equipment. Opteon™ XP40 offers improved energy efficiency and environmental properties versus R-404A/R-507A*, with an AR5 GWP of 1,282 (vs. 3,943 for R-404A). Opteon™ XP40 refrigerant also has a zero ozone depletion potential (ODP).

Opteon™ XP40 Properties	
ASHRAE Number	R-449A
Lubricant	POE
Boiling Point	-46.0 °C (-50.7 °F)
Safety Classification	A1
Temperature Glide	~4 K (~7 °R)

** GWP value is given in accordance with the IPCC Fifth Assessment Report (AR5). With respect to the EU 517/2014 (F-Gas) Regulation, the IPCC Fourth Assessment Report (AR4) is valid, which gives GWP values of R-404A = 3,922 and Opteon™ XP40 = 1,397.*

Overview of Refrigeration System and Conversion to Opteon™ XP40

EROSKI enlisted Iparhotz/Iparfrio, a Spanish refrigeration installation and service company, and Kimikal, the official Spanish distributor of Opteon™, to help with the retrofit.

The retrofit was conducted on the medium- and low-temperature systems. The DX medium-temperature (MT) system consisted of five newly installed Bitzer screw compressors HSK6461-60 40P, whereas the DX low-temperature (LT) system was comprised of four newly installed Bitzer screw compressors HSN5363-30 40P.

The retrofit was completed in a single night after operating hours, in order to not disrupt the centre's commercial activity. Adjustments were made the next day to ensure that the proper settings were in place to provide optimum system performance.


Foto: © Iparfrio

The tables below provide operational data measured at similar ambient conditions for the system prior to, as well as after, the retrofit.

Table 1: Comparison of DX MT system parameters before and after retrofit

Compressor	5 Bitzer screw compressors HSK6461-60 40P	
Condenser	Discharge (FRIMETAL CFN 371 and ERSAIRE ECA08P9P08-B4) Oil (FRIMETAL CFN113 and ERSAIRE ECA 08P7L03A)	
	R-404A	R-449A
Discharge pressure	15.6 bar	15.0 bar
Suction pressure	3.0 bar	2.5 bar
Suction temperature	-14 °C (7 °F)	-14 °C (7 °F)
Discharge temperature	76 °C (169 °F)	81 °C (178 °F)
Returns situation	No returns	No returns
Oil level	Okay	Okay
Refrigerant level	Okay	Okay
Oil temperature	38 °C (100 °F)	40 °C (104 °F)

Table 2: Comparison of DX LT system parameters before and after retrofit

Compressor	4 Bitzer screw compressors HSN5363-30 40P	
Condenser	Discharge (FRIMETAL CFN-345) Oil (FRIMETAL CFN113)	
	R-404A	R-449A
Discharge pressure	17.0 bar	15.4 bar
Suction pressure	1 bar	0.6 bar
Suction temperature	-3 °C (27 °F)	-8 °C (18 °F)
Discharge temperature	66 °C (151 °F)	76 °C (169 °F)
Returns situation	No returns	No returns
Oil level	Okay	Okay
Refrigerant level	Okay	Okay
Oil temperature	38 °C (100 °F)	40 °C (104 °F)

Conclusion

EROSKI expects to see the benefits of improved energy efficiency when they compare energy use to the previous system in the coming months. "Environmental consciousness is a key value for our company," said Esther Arando, Maintenance Manager for EROSKI. "The combined low GWP and energy efficiency of Opteon™ XP40 allowed us to not only retrofit our R-404A systems with a more sustainable refrigerant, but to improve performance as well."

"The ease of the retrofit from a technical aspect was impressive," said Eugenio Poso, Technical Support for Iparhotz/Iparfrio. "Our goal is to never disrupt the business of our customers, and the ability to retrofit overnight played a big part in the success of the installation." Emilio Paradela, Kimikal Commercial Director, added that he "found Opteon™ XP40 to be the best solution for commercial refrigeration, because of the ease of the retrofit and its energy efficiency performance in both old and new systems."

The success of the EROSKI Bilbondo supermarket retrofit has encouraged other customers of Iparhotz/Iparfrio to begin to make the change to Opteon™. Over the past year, over 150 supermarkets have worked with Iparhotz/Iparfrio and Kimikal to transition their refrigeration systems to Opteon™ XP40.

For more information on the Opteon™ family of refrigerants or other refrigerants from Chemours, visit **opteon.com**

The information set forth herein is furnished free of charge and based on technical data that Chemours believes to be reliable. It is intended for use by persons having technical skill, at their own risk. Because conditions of use are outside our control, Chemours makes no warranties, expressed or implied, and assumes no liability in connection with any use of this information. Nothing herein is to be taken as a license to operate under, or a recommendation to infringe, any patents or patent applications.

© 2016 The Chemours Company FC, LLC. Opteon™ and any associated logos are trademarks or copyrights of The Chemours Company FC, LLC. Chemours™ and the Chemours Logo are trademarks of The Chemours Company.

C-10987 (8/16)