Customer Case Study

Quercy Réfrigération reinvents refrigeration for Primever Group in Châteaurenard thanks to Orbia's Klea® Edge™ 485A fluid, an efficient alternative to transcritical CO_2

Châteaurenard, June 2025 - Primever Group entity specializing in fresh produce logistics, has just taken a technological step forward by working with Quercy Réfrigération to modernize its refrigeration warehouse. This partnership marks a turning point in approach to operations and energy consumption for industrial refrigeration in hot weather.

A statement of failure: transcritical CO_2 in trouble

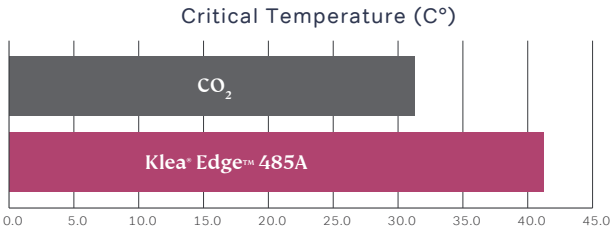
The initial cooling system at the Châteaurenard site was based on transcritical CO_2 technology from a leading European supplier. While this solution, renowned for its environmental qualities, seemed promising, operation proved complex and unstable. The site suffered from:

- Frequent breakdowns and recurrent compressor failures.
- CO_2 leakage problems, particularly in summer.
- High power consumption in hot weather.
- Watering requirements to cool the gases, implying unjustified water consumption.

As the reliability of the installation had become critical for the logistics business, Primever Group approached Quercy Réfrigération for a more sustainable solution.

A breakthrough innovation: retrofitting CO_2 to R-485A fluid, with the collaboration of manufacturer Orbia Fluor & Energy Materials

Rather than condemning the existing installation, Quercy Réfrigération proposed an unprecedented retrofit replacing the original fluid with Klea® Edge™ 485A refrigerant. R-485A is a refrigerant blend, none of whose components are PFAS. As can be seen from the figure below, the critical temperature of R-485A is over 10C higher then that of CO_2 allowing operation in more efficient subcritical mode for nearly all of a typical operating year.



The operating pressure was also lowered more than 10 bar, limiting the risk of leakage and releasing refrigerant & reducing stress on system components (heat exchangers, compressors, expansion valves, seals, etc.).

Energy efficiency improved by more than 20% since the system was able to operate in subcritical mode and R-485A's inherently superior refrigerant properties. Total estimated savings due to the reduced energy consumption is 78,000 Euro/year, giving an estimated payback of less than 1 year.

Klea® Edge™ solution at the Châteaurenard site:

- Operating pressure lowered by over 10 bar, limiting the risk of refrigerant leakage and stress on components.
- An energy efficiency improvement of more than 20% was demonstrated at high ambient temperatures (37°C), leading to an estimated annual energy cost savings of greater than 70,000 euros.
- No water consumption needed as no auxiliary external evaporative cooling is required on the system's gas coolers.
- Fewer breakdowns, so less loss of goods.
- Rapid return on investment, with an intervention time of just three days of uninterrupted refrigeration.
- Easier maintenance.

The switchover to R-485A went off without a hitch, with lower energy consumption while maintaining storage temperatures from the very first days of commissioning.

Results and customer feedback

The Primever Group site confirms a clear improvement in refrigeration stability and a tangible reduction in electrical consumption, with electrical meter readings enabling a reliable comparative study. The site's technical teams also noted that the equipment was easier to handle, and much less complex to operate than the original transcritical system.

Primever Group's technical manager confides:

If we had known about this solution earlier, we probably wouldn't have replaced our CO_2 installation. Retrofitting with R-485A fluid would have sufficed.

A step forward for the entire industry

The initiative led by Quercy Réfrigération opens up new prospects for sites already equipped with CO_2, particularly those suffering from summer constraints. The still little-known R-485A fluid could well become a choice alternative for making existing installations more reliable, without the need for major equipment modifications.

A concrete example of pragmatic innovation, at the crossroads of energy performance, water conservation and operational simplicity, this collaboration reinforces Quercy's reputation as a player at the cutting edge of sustainable industrial refrigeration and Orbia's reputation as a provider of innovative refrigerant solutions.

About Quercy

Quercy Réfrigération designs, installs, and optimizes innovative, sustainable, and efficient industrial refrigeration solutions. Our mission: to guarantee the quality and safety of our customers' products while reducing their energy footprint.

More about Orbia Fluor & Energy Materials

Orbia's Fluor & Energy Materials (F&EM) business is the world's largest integrated manufacturer and supplier of refrigerants for the refrigeration and air conditioning industry.

From raw material extraction to our manufacturing centers in Mexico, the United Kingdom, the United States, and Japan, with in-depth expertise in technical support and product development, our "mine-to-market" philosophy guarantees high reliability and security in supply and service to our customers.

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