

## Supporting the fruit distribution industry's environmental vision with Solstice® L40X (R-455A)

“Solstice L40X enables us to plan ahead, safe in the knowledge that this refrigerant technology not only complies with F-Gas Regulations, but also enables us to build systems that are more environmentally-friendly, more energy efficient and in line with the investment strategy of our customers.”

*Benoit Duparc, Managing Director  
Quercy Refrigeration*

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Case Study

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**When fresh fruit exporter Ortolan needed a refrigeration system for its short-term storage warehouse, it turned to Quercy Refrigeration to develop and install a sustainable solution. Quercy has gained a reputation for design excellence and a ‘zero leak’ commitment to their customers, using F-Gas-compliant refrigerants. It had established a strong partnership with Ortolan over a number of years, helping to ensure that fresh fruit – notably apples, pears and kiwis – are stored in optimal conditions at the company’s site in southwest France, ready for distribution around the world.**

**Incoming F-Gas regulations mean that Ortolan has had to move away from high global warming potential (GWP) refrigerants, such as R-404A . Quercy had already worked with the company to introduce Genetron Performax® LT (R-407F) as a lower GWP retrofit solution for the long-term storage warehouse (six cold rooms).**

**When a new system was required for the short-term storage warehouse, Quercy used its specialist sector knowledge and worked with refrigerant distributor Climalife to define a solution fit for the future using a fluorinated refrigerant that would deliver the required performance at the lowest possible GWP, and at a competitive cost. The solution was Honeywell’s Solstice® L40X (R-455A), a hydrofluoroolefin.**

### The Needs

- Design and install a new medium-temperature system for Ortolan’s short-term storage warehouse for apples
- Identify and install an F-Gas Regulation-compliant refrigerant system as a long-term solution
- Achieve investment cost comparable to Ortolan’s R-407F system, with a similar capacity range
- Meet environmental goals by using a refrigerant with lowest possible GWP while simultaneously improving comparative system energy efficiency
- Deliver key performance criteria, even in relatively high temperature ambient conditions to ensure product quality

### The Solution

Quercy designed a direct expansion installation with reciprocating compressor for two cold rooms each of 1,000 m<sup>3</sup>, capable of delivering higher capacity performance with a significantly lower GWP than the predecessor technology. With the emphasis placed on Quercy’s commitment to a 5-year ‘zero leak’ period, careful consideration was given to the quality of the evaporators (Stefani), controllers (from Carel, which had previously integrated Solstice L40X into their products) and condensers (Guentner). The refrigerant charge was 110 kg of Solstice L40X , distributed by Climalife.

### The Benefits

- Solstice L40X supports Ortolan’s environmental goals by offering the lowest GWP of all refrigerant alternatives which Ortolan and Quercy considered for this project, taking into account the capacity required, the charge size involved and the Total Cost of Ownership of the equipment
- Solstice L40X showed higher expected energy efficiency than the alternatives considered by Ortolan and Quercy for this project
- Solstice L40X also presents a very low flammability risk (A2L), which allows for higher refrigerant charges than hydrocarbons (A3)
- Solstice L40X is a perfect match for the Quercy design, enabling a rapid cooling cycle, effective management of the glide and no discharge (despite sometimes relatively high ambient temperatures)



Solstice L40X (R-455A)



## Quercy – Delivering ‘zero leak’ refrigeration systems through quality and innovation

Quercy Refrigeration, and its Managing Director Benoit Duparc, are proud of their ‘zero leakage’ commitment and work closely with component manufacturers to ensure the highest system quality. The company increasingly uses Inox (stainless steel) for pipework, a material that offers superior jointing effectiveness over copper.

This approach, together with its innovative and patented automatic hygrometry (cold room humidity) management system, has seen Quercy meet the needs of over 180 sites in the fresh fruit processing market, with new references every month. It also fully leverages the performance of low F-Gas compliant HFO-based refrigerants, such as Solstice L40X.

### System considerations:

- A CO<sub>2</sub>-based system was not an option for Ortolan because apples cannot stand more than a few percents of CO<sub>2</sub> during conservation. Any leak of CO<sub>2</sub> would result in exceeding such concentration limits in the cold room within a few minutes, cause apple flesh to turn brown resulting in a lost crop.
  - Comparison of the power consumption of similar installations using glycol water showed the capital expenditure cost would far outweigh any energy efficiency gains in installations with less than 10,000 m<sup>3</sup> storage capacity
  - Propane (R-290) would deliver an energy efficient solution, but its high flammability makes the system cost prohibitive and raises safety concerns
  - While the short-term warehouse refrigeration system had originally been designed with R-448A in mind, the increasing focus on GWP led Quercy to recommend an option with GWP below 150 that would provide the same system capacity while improving energy efficiency
- Solstice L40X, with a GWP of 148 (IPCC4) / 146 (IPCC5), provided the perfect fit.

“Our business is founded on innovation, quality and partnership and so when the opportunity to use Solstice L40X presented itself we could see it would be a good fit for Ortolan, given the company’s commitment to the environment and energy efficiency. The cooling cycle is very fast with Solstice L40X, so that we were able to increase the evaporation temperature from ~ -7 °C up to ~ -4 °C. With each degree increase, our customer can achieve significant energy savings.”

*Benoit Duparc, Managing Director,  
Quercy Refrigeration*

“Operating in the fresh fruit market, we feel a strong connection with the environment, so being able to use a refrigerant that is more eco-friendly and energy efficient while delivering the level of performance we required makes good sense on every level.”

*Jean-Pierre Piazza, Technical Manager,  
Ortolan*



### The Solstice L40X Advantage

- Solstice L40X (R-455A) is a zeotropic blend refrigerant which is designed for low-, medium- and high-temperature applications in new systems. Its low GWP of only 146 makes it an F-Gas-ready solution. It also provides a close capacity match to R-404A and, compared to a propane (R-290) refrigerant, extends the capacity by 20 %, improves energy efficiency and offers a similar coefficient of performance (COP). It also does not present the same flammability risk as R-290 (A3).
- Solstice L40X delivers excellent cooling performance in low temperature applications and can be used across many segments of the HVACR industry. These include plug-in type cabinets, condensing units, waterloop systems and monoblocks for cold rooms and freezer rooms, heat pumps, and chillers.

#### For more information

[www.honeywell-refrigerants.com/europe](http://www.honeywell-refrigerants.com/europe)

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