



CUSTOMER INSIGHT:
PRECISION REFRIGERATION

Gaining Competitive Advantage through Improved Energy Efficiency and Reduced Environmental Impact

climalife



“As a leading UK manufacturer of commercial refrigeration products, Precision Refrigeration is doing its utmost to protect the environment and improve the energy efficiency of its products.

Whether it be reducing heat loss from our factory building, using recycled packaging or using more environmentally-friendly materials, sustainability is always at the forefront of our thought processes.”

(Nick Williams, Managing Director, Precision Refrigeration)



Summary: Optimising Temperature Performance and Energy Consumption

Every minute of the day, in every city, town and village in the world, businesses are dependent upon effective refrigeration to meet the needs of their customers. It's an industry being challenged to reduce its environmental impact - and Honeywell has responded by offering

OEMs a new generation of refrigerants capable of delivering ultra-low GWP (Global Warming Potential) combined with enhanced energy efficiency.

The technology - based on new Hydro-Fluoro-Olefins (HFO) - has been incorporated into the company's

Solstice™ range together with already-commercial pure HFOs like Solstice yf and Solstice ze. Two of the HFO blends have been recently specified in a comparative freezer counter test by UK-based Precision Refrigeration, one of the country's most innovative commercial refrigeration companies.

Solstice product	Type	Alternative to	GWP	Ashrae class	Performance (vs alternative)	Applications	Status
N40	HFO blend	R404A	~1300	A1	Better efficiency than R404A	LT refrigeration	Available for testing
L40			<300	A2L			

Headline results:

- Solstice N40 offers better refrigeration performance than R404A with lower energy consumption
- Solstice N40 offers a significant reduction in Global Warming Potential (GWP) over R404A
- Solstice N40 provides a non-flammable solution with a faster pull-down time than both R404A and R290 (propane) and a similar discharge temperature to R290

Background: Flexible, Reliable and Greener Customer Support

Precision has one of the lowest carbon footprints in the industry and sees its environmental commitment as a key competitive advantage as it serves to meet the refrigeration needs of some of the most demanding customers around the world.

From gastronomic cabinets and counters to blast chillers and bottle coolers, Precision's product line-up is installed in a variety of foodservice establishments including restaurants, hotels, bars, fast food chains and production kitchens.

In line with its environmental commitments, Precision continuously investigates greener ways of working, so when Climalife UK introduced Honeywell's Solstice™ range as a more sustainable alternative to R404A for freezer products, the company agreed to run a comparative test.

Freezer Counter Test: Implementation and Outcomes

The objective was to evaluate the temperature performance and energy consumption of a standard Precision LCU323 three door freezer counter cabinet (representative of many other models) using R404A as baseline vs. Solstice L40, Solstice N40 and R290 at climate class 4 (30°C and 55% R.H.). The cabinet was commissioned to achieve as close as possible to an L1 temperature class. Temperature performance and energy consumption was tested to EN153 over a 24hour period, with the cabinet empty of product and the door closed.

The tests focused on four areas:

- Pull-down time: the quicker the time, the greater the energy saved (lower running costs)
- Recovery time after defrost: similar benefits to pull-down time

- Maximum Discharge temperature: impacts on life of compressor and whole-life performance of equipment – the most critical test from Precision's perspective
- Energy consumption: measured in kWh over 24 hours

The results are summarized in the table on the next page and confirm that Solstice N40 exceeds the refrigeration performance of R404A, delivers improved energy consumption and a similar discharge temperature to R290. Solstice N40 also exhibits lower recovery time after defrost and significantly better pull-down time.

Further optimization can be expected with gas charge expansion valve adjustments.



In addition to the energy efficiency and performance benefits, Solstice™ N40 also possesses a much lower GWP than R404A - around a 65% reduction

	Pulldown time (min)	Recovery time after defrost (min)	Max Tdis (°C)	kWh usage over 24 hours
R404A	78	29	85	11.44
Solstice L40	92	36	84	11.32
Solstice N40	65	24	75	10.70
R290	82	25	73	9.80

Comparison vs R404A

	Pulldown time (min)	Recovery time after defrost (min)	Max Tdis (°C)	kWh usage over 24 hours
Solstice L40	118 %	124 %	99 %	99 %
Solstice N40	83 %	83 %	88 %	88 %
R290	105 %	86 %	86 %	86 %

Refrigerant charges used for the trials - R404A – 250g; Solstice N40 – 180g; Solstice L40 – 160g; R290 – 90g.

Feedback: Creating A Sustainable Approach for Customers

“Ensuring that we remain at the forefront of technologies that mitigate our impact on the environment is important not just for Precision but also for

our customers, who can trust our equipment to remain at the leading edge of a lower carbon future.”

Andy Fysh (Production Director) and Steve Goldsmith (Refrigeration Engineer), Precision Refrigeration

Sector Perspective: Serving up Sustainable Refrigeration

Restaurants, hotels and fast food outlets are under intense scrutiny to improve the energy efficiency and sustainability of their refrigeration systems and advances such as Honeywell’s Solstice range have an important part to play in creating a

more sustainable and lower carbon future. Solstice is technology proven to deliver outstanding results across key metrics linked to energy efficiency, temperature, cost of operation and overall Coefficient of Performance (COP).

Solstice N40 is 100% non-ozone depleting, possesses low toxicity (ASHRAE class A) and is non-flammable (ASHRAE class 1), which makes it significantly safer in use than alternatives such as hydrocarbons and ammonia.

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