



Coborn's Selects Solstice[®] N40 for New, Next-Gen Grocery Store

R-448A Refrigerant Offers Lasting, Cost-Effective Solution

THE CHALLENGE

Globally, HFC and HCFC refrigerants – including R-22 – are being phased out due to their high global warming potential (GWP) and ozone depleting potential (ODP). Coborn's Inc., which owns 52 supermarkets and 120 retail locations across the Midwest region of the United States, wanted to evaluate various refrigeration systems for a new store build – including transcritical CO₂ and hydrofluoro-olefin (HFO)-based systems. The chosen system had to satisfy several key requirements, including reduced GWP, budget constraints, staying power, proven performance, easy installation and serviceability.

THE SOLUTION

After seriously evaluating a CO₂ transcritical system and related concerns about the high cost of CO₂ refrigeration design, equipment and maintenance, Coborn's instead selected a conventional system utilizing Honeywell's Solstice[®] N40 refrigerant (R-448A). This innovative, reduced-GWP solution satisfies all of the requirements listed above – and more.

Staying Ahead of Regulations

With HFC and HCFC refrigerants like R-22 being phased out due to their high global warming potentials (GWPs), grocery chains everywhere have been seeking viable, lower-GWP alternatives for new builds and retrofits that will help them stay ahead of changing regulations.

Coborn's, Inc., is no exception. With 52 supermarkets and 120 stand-alone retail locations across the Midwest – including Minnesota, the Dakotas, Iowa, Illinois and Wisconsin – it started getting ahead of the regulatory curve years ago by replacing R-22 and R-404A with Honeywell's Genetron Performax[®] LT (R-407F). This HFC product offers a lower GWP of 1674 and excellent energy efficiency, and is a near drop-in replacement for retrofit projects.

Evaluating Newer Technologies

In early 2016, Coborn's embarked on an exciting project to build a 45,000-square-foot, next-generation supermarket in Isanti, Minn. Named Coborn's Marketplace, at least 50 percent of the floor space would be dedicated to fresh food offerings, requiring an expansive, state-of-the-art refrigeration system. Key system requirements included the ability to:

- Meet budget constraints
- Offer a lower GWP with regulatory staying power
- Deliver proven refrigeration performance
- Support easy installation
- Ensure easy serviceability and low maintenance



Refrigeration valves on the medium temp refrigeration rack.

Solstice® N40 (R-448A) benefits include:

- A lower carbon footprint via a low GWP with no noticeable performance tradeoffs
- Smooth, fast and cost-effective installation compared to CO₂ transcritical systems
- Compatibility with conventional equipment, making serviceability easy
- Greatest ease of retrofit without making expensive equipment changes
- Reliable and excellent refrigeration performance, keeping foods consistently cold and safe
- Long-term regulatory compliance, reducing exposure to regulatory changes

Since the Isanti project was a new build, Coborn's and its contractor – St. Cloud Refrigeration Inc. (SCR) – thought it would be the perfect opportunity to evaluate two newer technologies not on the U.S. EPA phase-out list:

- 1) A CO₂ transcritical system, which would offer an attractive GWP of only 1. However, the team was concerned about the high cost of CO₂ design and equipment, and about serviceability issues related to a low industry-wide inventory of parts and a small pool of trained technicians.
- 2) A conventional system utilizing Honeywell's Solstice N40 refrigerant (R-448A), a long-term hydrofluoro-olefin (HFO) blend solution. Compared with R-404A, for example, this product offers a 68% lower GWP of 1273 and demonstrates 5-16% lower energy consumption in medium-and low-temperature refrigeration.

Selecting Solstice® N40

After completing a cost-benefit analysis, the team decided to install the conventional refrigeration system with Solstice N40. Estimates showed that the cost of a CO₂ transcritical design and equipment would be 20-30 percent greater than the cost of a conventional system utilizing Solstice N40.

"The decision to go with a Solstice N40 refrigerant system was easy because it was significantly more cost effective than CO₂ and offered terrific energy efficiency," said Chris Braun, project manager for Construction, Refrigeration and Maintenance, Coborn's. "In addition, we had very good experience with Honeywell products and technical support, so we were confident the system would perform."

Braun stated that besides staying on budget with Solstice N40, Coborn's could stay on time with the project build. "We were familiar with the technology so there was virtually no learning curve and we did not need to worry about delays related to unique CO₂ system designs, parts and materials. While we went far down the road to evaluate CO₂, for us the timing wasn't right, we were concerned about serviceability, and the sheer cost was prohibitive."

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— Chris Braun, project manager for Coborn's

Installing with Ease

Coborn's was able to break ground on its Marketplace store in February 2016 and open to the public in August 2016, an amazingly short time given the size of the store. The refrigeration system powered by Solstice N40 serves both medium- and low-temperature applications across the fresh produce, meat, deli and bakery spectrum. This includes two Zero Zone racks and approximately 110 display cases and eight walk-in freezers. Also served are a variety of unique venues, including a brick oven pizzeria, veggie prep service, car wash and convenience store.

Coborn's contracted SCR to install the system due to a successful history of strong teamwork. SCR, established in 1957, serves hundreds of companies in the upper Midwest and specializes in supermarket refrigeration.

According to Dave Behrens, SCR supermarket sales representative, "As a refrigeration company, we want to recommend what's best for each customer and for Coborn's, we saw Solstice N40 fitting into a wide realm of requirements – from satisfying GWP regulations coming down the pipe, to delivering great energy efficiency, to being cost-effective," he said. "It's compatible with existing systems and therefore a great choice for retrofits and new builds."

Scott Fitch, SCR construction manager, concurs. "Coborn's Marketplace was a fast-track installation but the experience was smooth and seamless, taking our team only about eight weeks to finish," he said. "We had no issues with compatibility or startup, and are not anticipating problems with serviceability either. To date, the Zero Zone systems are running reliably and

we have actually noticed some better pulldown and recovery time compared to R-404A that allows us to achieve case temperatures faster."

Behrens and Fitch said they would not hesitate to recommend Solstice N40 to other companies for new builds and retrofits. "Overall, we're seeing Solstice N40 becoming a pretty natural and flexible selection and we'd definitely recommend it to companies that want to stay with conventional refrigeration systems," Fitch said.

Design and installation of Zero Zone display cases and equipment was also smooth. According to Carl Petersen, Zero Zone marketing and advertising manager, "Because Coborn's chose a conventional system with a drop-in refrigerant like Solstice N40, they did not need to invest in customized parts and equipment. Our Zero Zone industry leading refrigeration systems and display cases fit nicely into their design and budget."

Topping the List

Coborn's is steadily growing across the Midwest, and plans to continue to use Solstice N40 for both new builds and retrofits as it proactively addresses regulatory change.

"We needed a cost-effective, high-performance refrigeration solution, and Solstice N40 delivers, topping the list of refrigerant alternatives," Braun said. "We're extremely satisfied with this product and look forward to working with Honeywell, SCR and Zero Zone in the future as we seek to bring fresh, healthy foods to our customers."



The team from Zero Zone, SCR and Coborn's make final adjustments to the low-temperature rack system.



The refrigeration system uses the reclaim heat benefit from using Solstice N40.

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