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HY-VEE Urbandale, Iowa

Refrigeration strategy reduces HFC charge by more than 65%, results in 23% energy savings

The new Hy-Vee Urbandale, Iowa, store features the company's first full-service restaurant, take out chef creations, a sushi bar with seating, a coffee shop/lounge area, authentic Italian gelato, a fruit and juice bar, an oatmeal bar for breakfast, oven fired pizzas, a large wine and spirits shop, a cooking demonstration area and convenience services, such as an in-store pharmacy and bank. The store also boasts an innovative refrigeration system designed to achieve the store's energy saving and sustainability objectives.

Challenge

True to its mission to **"Make lives easier, healthier, happier."**, when Hy-Vee began planning its new store in Urbandale, Iowa, they set out to make it the company's most innovative store ever. Hy-Vee sought the very best in all store elements, including its convenience services, high-quality products and broad food selection, as well as in its equipment, establishing innovation, energy efficiency and the lowering of their carbon footprint as key criteria.

case study

Solution

TerraChill CO₂ System: A natural refrigeration solution

Based on a successful relationship that has spanned decades, Hy-Vee contacted Hussmann to work with them on their new Urbandale store. The Hy-Vee team challenged Hussmann to develop the right refrigeration solutions that would align with its objectives to be both innovative and environmentally conscious.

Hussmann's TerraChill CO₂ refrigeration system met the requirements. The system uses pumped liquid CO₂, a naturally occurring refrigerant, as its secondary cooling media and a smaller amount of R404A as its primary refrigerant. By utilizing a natural refrigerant, the TerraChill reduces the HFC charge and lowers Hy-Vee's carbon footprint.

CO₂ is an efficient refrigerant for both low temperature and medium temperature applications. It is not corrosive and will not freeze when operating at low temperatures, making it an ideal choice for a full range of temperature applications.

"Low temp CO₂ systems are gaining in popularity," said Jon Scanlan, Director-Refrigeration & Energy Management, Hy-Vee, Inc. "Medium temp CO₂ systems are something you don't see as often. We spent some time discussing the option with Hussmann and walked through all the 'what if' scenarios. We liked the innovation, the reduction in refrigerant charge and the positive impact using the system would have on our carbon footprint."

High efficiency display cases

The Hussmann team selected high efficiency meat, beverage, produce and deli merchandisers where possible. The display cases employ higher efficiency evaporator coils that require less compressor energy. High efficiency fan motors on unit coolers and cases further increase Hy-Vee's energy savings.



Hussmann's TerraChill CO₂ system reduces HFC refrigerant charge by more than 65%, resulting in a positive impact on Hy-Vee's carbon footprint.



EcoVision Doors with EcoShine II LED lights lower energy consumption and enhance merchandising with uniform product visibility and excellent product color quality.

Medium temperature doors and LED lighting reduce energy use, enhance merchandising

Hussmann EcoVision doors were installed on the store's medium temperature dairy and deli cases. EcoVision doors reduce refrigeration energy use by up to 80% compared to open cases. Heat is not required in the door or frame, keeping energy costs low. The doors also help to maintain more consistent product temperatures, resulting in less product waste. Using Hussmann EcoShine II LED lighting, rather than fluorescent lighting in the cases, allows Hy-Vee to achieve additional energy savings. With consideration of the reduction in energy use provided by the EcoVision doors, Hussmann application engineers optimized the store's refrigeration system to ensure maximum savings for Hy-Vee.

The ultra-thin door frame and French-style design of the EcoVision doors offer excellent visibility and easy product access for Hy-Vee customers. EcoShine II LED lights mounted on the door frame provide full and uniform case illumination and excellent product color quality.

Results

Hy-Vee's new Urbandale, Iowa, store is not only its largest, but also its most innovative. The store design, complete with a full-service restaurant, specialty products and convenience services, has created an optimal shopping experience for its customers.

The total HFC refrigerant charge of the Hussmann TerraChill CO₂ system installed in the store is 2000 lbs vs the approximately 6000 lbs charge normally required for a comparable new store using a central direct expansion system. With high efficiency cases and fan motors, and EcoShine II LED lighting, the store is realizing an energy savings of more than 23% compared to a standard non-sub cooled rack system. Hussmann EcoVision doors are further reducing energy use.

"The refrigeration strategy, with the TerraChill CO₂ system, is a key element in helping us achieve our innovation, energy efficiency and sustainability objectives," said Scanlan.