

ENGINEERING
TOMORROW



Case Story | Food & Beverage Decarbonization

How we helped a **leading Food&Bev manufacturer** reach their **decarbonization number**

As companies committed to building a sustainable future for our planet, we're all on the road to net zero. Whether our target is 2030, 2050 or somewhere in between, one thing is certain. Getting there will require working together to develop innovative solutions that can reduce our carbon footprint without compromising quality and consumer safety.

Total energy savings
of

30%

compared to initial
design

Danfoss has worked with refrigeration since 1933. Since the day we produced our very first compressor, we've been developing innovative solutions for keeping food and beverages cool. We're convinced innovation will play a key role on our collective decarbonization journey. Which is why we're partnering with the food and beverage industry to make cooling equipment more energy efficient. As in this case, where we used our knowledge and components to design a next-generation cooler that helped a leading food and beverage manufacturer shrink its carbon footprint.



Improved cooler design reduces energy consumption by 22%

Our customer's existing fleet of bottle coolers accounted for nearly half its carbon footprint. We used one of those coolers to create a performance baseline. We then began replacing key components within the cooler to improve its performance and efficiency.

We fitted the cooler with the **Danfoss ERC 112 refrigeration controller**, specifically designed for glass door merchandisers. The ERC includes advanced functionality, such as adaptive defrost capabilities, light and fan controls and an advanced ECO mode that sets the most energy-efficient operating conditions.

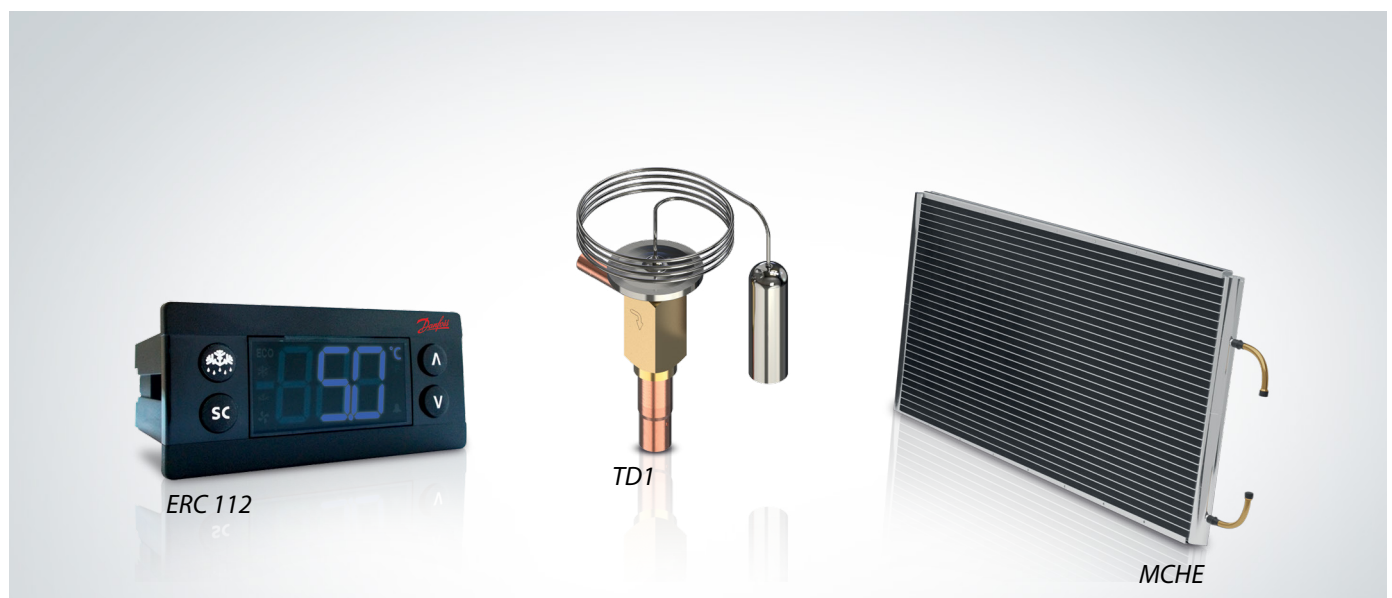
Next, we replaced the capillary tube with our **TD1 thermostatic expansion valve**, which can adapt to varying

cooling conditions to enable efficient superheat control. The TD1 also has a reduced recovery and pull-down time (when compared with capillary tubes) and can reduce cooling cycles in real-world conditions (not just in the lab).

Then, we installed our **Micro Channel Heat Exchanger (MCHE)** instead of the round fin and tube heat exchanger. The MCHE provides a better capacity, which increases efficiency. Finally, we installed three ECM fans to provide a better and more consistent airflow.

After we made the modifications, we put our new design to the test. And the results were noteworthy: the steady state energy consumption test showed a **22% reduction*** in energy consumption.

** Tested and proven in Danfoss' Application Development Center*



Advanced algorithms and settings create 10% additional energy savings

The next phase of the project was to test the impact of the ERC's advanced algorithms and settings. The ERC includes automatic fan control, which cycles the fan when the compressor is off to equalize temperature internally. The ERC's ECO mode manages the cooler's lighting and temperature

to maximize energy savings. By enabling these features, the Danfoss team was able to cut energy consumption by an additional 10%* from the new baseline, for **total energy savings of 30%** compared to the initial design.

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Additional savings possible with IoT

The Danfoss team also has Alsense®, a leading IoT cloud solution for the food industry, that allows the company to monitor its cooling units 24/7 and provide instant performance data that the team can use to minimize failures, enhance energy and operational efficiency, and reduce the need for maintenance and technical visits.

According to Eduardo Cruz, Global Segment Director Commercial Refrigeration, the project shows the value of taking a holistic (end-to-end) approach to decarbonization. "This pilot highlights the importance of looking at the entire solution design," he says. "It demonstrates not only how our

individual components can improve efficiency, but how they can work together to improve the entire system's efficiency and performance. The Danfoss controller, heat exchanger and expansion valves all work in tandem to produce these exceptional results."

"We have now confirmed with hard data, that the use of our components can increase performance, and provide the needed edge to comply with the latest energy efficiency requirements while providing the best experience to the final end-user customers," he concludes.



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Let's work together to reduce your carbon footprint

Our experts are ready to help you meet your net zero targets. Let's talk about how we can reduce the environmental impact of your cooling equipment.

