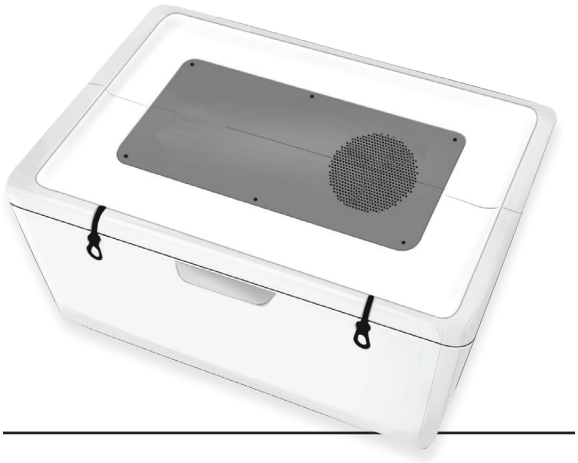
Brief

Actively Cooled Container for Micro Fulfillment

Actively Cooled Containers for Curbside and Last Mile Delivery

As the grocery industry ramps up at warp speed to manage the explosive growth of this segment, the challenges are vast. Refrigerated/frozen warehouse storage spaces are expensive and energy intensive. Retrofitting existing buildings is costly or prohibited, and building new warehouse space requires massive upfront capital. Speed to market needs to be quick to keep up with the demand, yet time to scale is prohibitive.

Phononic's thermoelectric cooling technology solves the challenges grocers are now facing as the segment explodes. Phononic's actively cooled refrigerated and frozen containers provide the perfect temperature to cool and freeze curbside and delivery containers, maximize internal volume and maintain cold chain integrity through the entire process.



Features

Simple, scalable and sustainable cooling technology for curbside and the last mile, offering unmatched ROI and flexibility for an exploding segment.

Individual features:

Strong ROI: Reduce start-up capital and time to market without risking future scale

Flexible: OPEX and CAPEX based on real time demand; allows for flexibility in scaling as demand fluctuates

Demand based energy savings: Cool or freeze only the number of customer orders needed based on demand, not an entire cooler or warehouse

Versatile: One common system solves multiple use cases: Curbside [Manual, Semi Automated, Automated]; Delivery and Unassisted delivery; Hub and Spoke

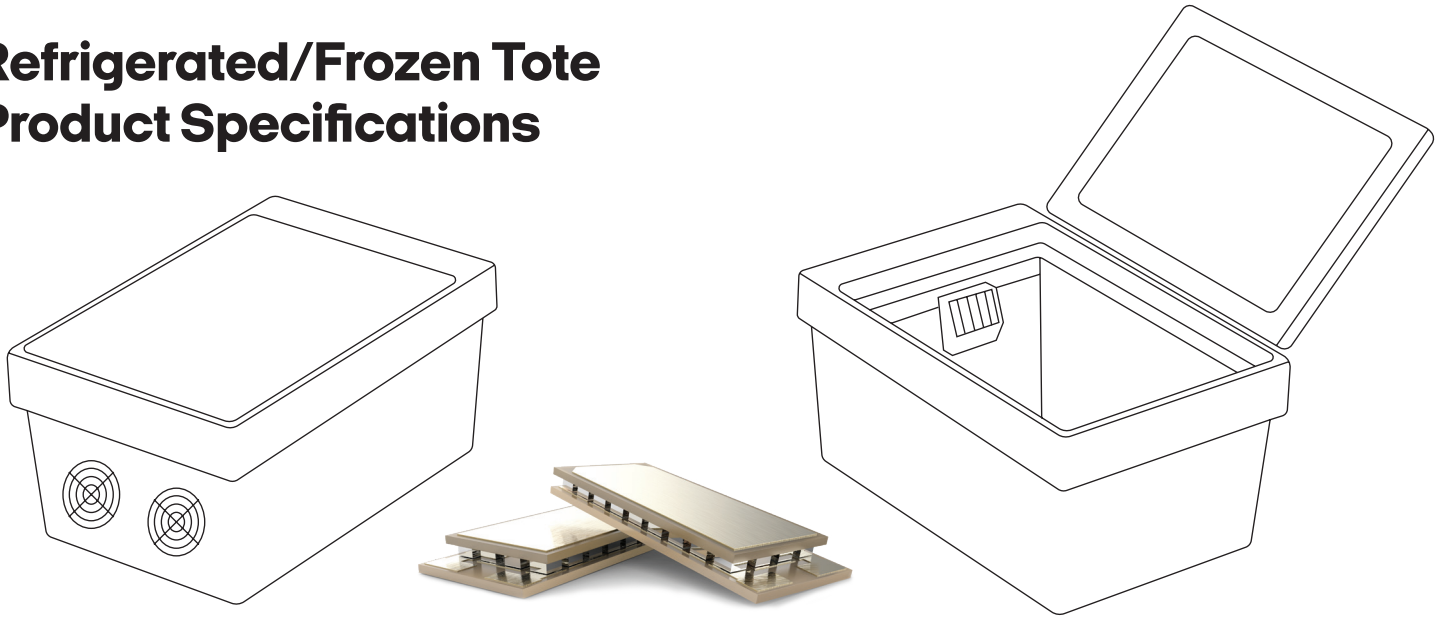
Scalable: Kick off with one container or grow to 3000 in a single warehouse or back room without cooling rooms, freezer warehouses or tri-temp trucks

Capacity: The elimination of the compressor combined with Phononic's patented technology maximizes internal volume while keeping the container compact

Location agnostic: Ramp up for any space: Large grocery, club, small market, discount store or fully automated warehouse

Maintain documented cold chain/IOT: Temperature monitored by IOT system to document cold chain; reduce errors and keep customers' complete orders together including ambient and chilled products

Refrigerated/Frozen Tote Product Specifications



Requirement requirement	Fridge	Freezer
Weight	26.0 lbs.	27.5 lbs.
Sound	< 45 dBA	40 dBA
Pull down time @ 24°C [75.2°F]	< 1.5 hrs.	2.3 hrs.
Stability and set point	3.3°C setpoint, ~0.5°C stability	-18°C setpoint, 0.42°C stability
Pull down energy consumption	~110W	270W avg
Steady state energy consumption	~30W	120 W avg
Internal volume	30L	27.9L
Environmental conditions	Short periods of rain /snow	Short periods of rain /snow

Decrease Labor Cost

Reduce process flow by 50%

- **Reduce picking time –** Customer's chilled and frozen groceries are only touched one-time vs. multiple times in current system
- **Reduce order fulfillment time –** Associate only goes to one location to find the customer order; chilled, frozen and ambient items kept in one location
- **Advanced staging –** Because the containers are chilled/frozen, the entire customer order can be staged at the door when the customer is on the way or during the pickup window vs. waiting for the customer to arrive, decreasing customer holding time by more than 50%