



HANNAFORD SUPERMARKET WATERTOWN, NY

CASE STUDY #3, AUGUST 2016

System Type: Frozen coffin cases	Refrigerant: R-290 (propane)	GWP: 3
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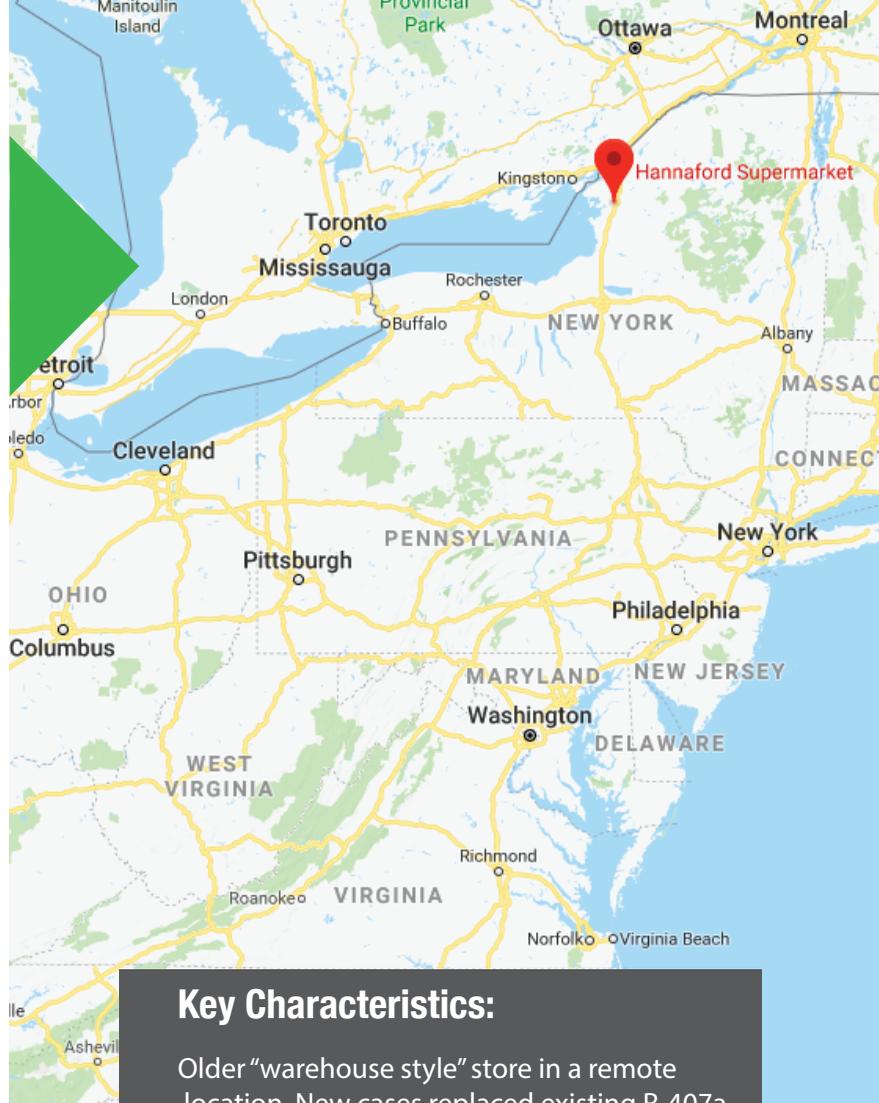
Store Size: 52,180 sq ft

ASHRAE Climate Zone: 6

Utility Provider: National Grid

Average Electricity Cost: \$0.08/kWh

System & Charge: Each 6' case has 85g of R-290



HANNAFORD BROS., WATERTOWN, NY

SYSTEM BASICS

System: R-290 (propane) Frozen coffin cases with each case having an 85g charge of R-290.

System location: Cases on sales floor in the frozen section.

System capacity: Capacity is 1,314 Btu/hr and 5.5 kWh / 24 hr at 77°F ambient temperature.

Hannaford decided to replace old R-407A frozen coffin case from 1992), previously converted from R-22. The new R-290 cases are from an Irish company, Novum, which has a recent but growing U.S. presence.

This is the first installation of R-290 frozen cases at a Hannaford store, and their installation was seen as an opportunity to pilot these cases and evaluate the performance of propane self-contained equipment.

Key Characteristics:

Older “warehouse style” store in a remote location. New cases replaced existing R-407a cases that were at end-of-life. These new R-290 coffin cases have a removable and replaceable refrigerant cassette.

A spare cassette is kept on-site, allowing service contractors to easily keep the cases online, very desirable given the remote location.

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Because the store is geographically remote, the easily replaceable refrigeration cassette was also a very desirable feature (a back-up is kept on-site).

These frozen coffin cases have doors on top, which is typical for frozen coffin cases at Hannaford. Due to the limit of 150 grams of R-290 per system, the new cases are very well insulated.

These are self-contained units, with on-board controls and the option to install temperature monitoring/alarming from the full-store system. The vertical frozen cases were also replaced around the same time, but with conventional remote cases connected to an R-407a rack system.

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✉ info@nasrc.org www.nasrc.org

WHAT HANNAFORD SAYS

ENERGY & PERFORMANCE EXPECTATIONS

This Hannaford store does not have access to any submetered electricity data; however, the store believes it is saving money, given the inherent energy efficiency of these cases.

The cases have automated controls, doors, and are very well insulated (a fundamental characteristics given their less-than-150-gram charge size).

Sound pressure at one meter is 43.3 db(A), which Hannaford finds to be very satisfactory.

See photo below of the Novum Grand Cayman coffin freezer case that Hannaford chose.

“The hot gas defrost system is a unique, innovative approach. We chose this equipment because it uses a natural refrigerant. We wanted to get familiar with this type of equipment to see if it could have broader application, and to see how it would impact our greenhouse gas (GHG) and average global warming potential (GWP) metrics. Because this store has an older format, frozen coffin cases are still appropriate.

The equipment cost is higher than conventional coffins(as expected, since these cases are fully self-contained), but the installation cost is lower since the only connection is electrical. The manufacturer provided technical support for the installation. These cases have been reliable, efficient, are holding temperature, and have fully met our expectations.”

The North American Sustainable Refrigeration Council is a 501(c)(3) nonprofit dedicated to advancing natural refrigerants and creating a more sustainable future for retail food refrigeration. Learn more at <http://nasrc.org>

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