

## Danfoss technology helps to provide outstanding results in temperature control and energy efficiency in a dual temperature ammonia/CO<sub>2</sub> fluid refrigeration system

Flanagan Foodservice is a leading distribution service company located in Kitchener, Ontario - Canada. For over 30 years, Flanagan Foodservice has provided a “customized approach to distribution” delivering sound growth and expansion of their business.

To keep up with growing demand, a new 6,000 square metres addition doubles the size of the current facility, featuring state of the art CO<sub>2</sub> refrigeration technology, and creating the first facility in Canada to implement this technology

A dual temperature ammonia/CO<sub>2</sub> fluid refrigeration package system refrigerates the 360 kW at -15°C of 4,200 m<sup>2</sup> of freezer space and 120 kW at -28°C of 450 m<sup>2</sup> of Ice Cream freezer supplied by Mayekawa Canada.

Flanagan describes the project as “exciting”, as innovative technology will help to drive the performance of the plant. The system utilises only natural refrigerants: ammonia and carbon dioxide, that have minimal (0 and 1 respectively) global warming potential. Besides that, it is more energy efficient than corresponding systems using traditional fluids like propylene glycol.

Quinn Vo, Mayekawa Corporate Engineer, along with Canadian, Japanese and U.S. counterparts, engineered the system that runs on top of the refrigerated building at Flanagan. Mr. Vo and his colleagues followed the start up of the systems closely, where Danfoss technology helped to provide outstanding results in temperature control.

A cross-divisional effort within Danfoss supplied the well known ICF valve stations feeding CO<sub>2</sub> to the evaporators, flooded shell and tube NH<sub>3</sub>/CO<sub>2</sub> exchangers as well as variable frequency drives and pressure transmitters which run the NH<sub>3</sub> screw compressors and CO<sub>2</sub> pumps. The use of ICM motorized valves in the ICF assembly played a key role in maintaining a stable liquid supply.

The Danfoss frequency converters allow for full balance in the load control of the NH<sub>3</sub>/CO<sub>2</sub> system, meeting the challenges of the flow and the thermal dynamics of CO<sub>2</sub>.



Solutions such as the ICF which was introduced in 2006 have exceeded the requirements of high CO<sub>2</sub> pressure systems, with 52 bar rating on a 40 bar CO<sub>2</sub> system design. Furthermore, the need for compact solutions that deliver fewer potential leaks and reliable performance, makes ICF ideal for OEMs and end-users, as a single product platform operates for both natural refrigerants in use at Flanagan

For more information regarding this case-study please visit:  
[www.flanagan.ca](http://www.flanagan.ca)  
[www.mycomcanada.com](http://www.mycomcanada.com)