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# More Food Markets Using Dow Performance Fluids For Secondary Loop Refrigeration

MIDLAND, MICH—(January 26, 2009)— With unstable energy prices and an expectation by the public that businesses will behave in more socially responsible ways, The Dow Chemical Company has seen demand for DOWFROST<sup>TM</sup> Heat Transfer Fluid for secondary loop refrigeration grow by approximately 120% during 2008. 2009 promises to be just as busy, as larger food markets are conserving energy and protecting the environment by incorporating the use of DOWFROST<sup>TM</sup> Heat Transfer Fluids in secondary loop refrigeration systems.

Supermarkets utilizing secondary loop refrigeration technology can minimize energy consumption and environmental impact. Secondary loop refrigeration began to grow in popularity about ten years ago. But with energy prices soaring and attention on the need to reduce the amount of greenhouse gas emissions in mind, more stores are using the more efficient and environmentally friendly secondary loop system for in-store refrigeration. Most stores that have not adopted secondary loop refrigeration so far, are seriously considering it, as revealed in results of a survey of the industry released by Dow Performance Fluids in January 2009.

## **DOWFROST**<sup>TM</sup> Fluid In Supermarket Applications

With traditional direct expansion technology, a centrally located set of compressors (known as a

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rack) and condensers are used to cool and distribute refrigerant to the food display cases where it is vaporized inside evaporator coils. Secondary loop refrigeration systems that contain DOWFROST<sup>TM</sup> Inhibited Propylene Glycol based Heat Transfer Fluids do not require primary refrigerant to be distributed to display cases. This eliminates the need for numerous connections, expansion valves and refrigeration coils, thus reducing the amount refrigerant used and potentially leaked into the environment. The secondary loop approach utilizes a smaller charge of refrigerant (as compared to a more traditional direct expansion system) and all refrigerant is confined to a relatively small section of the store. This is because the refrigerant is used to cool a secondary coolant made from propylene glycol (DOWFROST<sup>TM</sup> Heat Transfer Fluid from The Dow Chemical Company) which in turn is distributed to food display cases to provide the necessary refrigeration.

## **Chemistry Contributes**

Secondary loop refrigeration systems containing DOWFROST heat transfer fluid are used to cool meat, dairy, produce, and other medium temperature food items. DOWFROST<sup>TM</sup> inhibited propylene glycol (USP grade) heat transfer fluid is normally diluted 30% to 40% using distilled, deionized or other suitably pure water and is designed to be environmentally friendly. The mixture has no known impact on the ozone layer or contribution to global warming. DOWFROST<sup>TM</sup> Fluids comply with the United States Department of Agriculture (USDA) and Food and Drug Administration (USFDA) regulations for use in applications where contact with food or beverage products could occur. When properly installed and maintained, the proprietary inhibitors in the fluid are designed to help extend performance and eliminate corrosion problems. The fluid has low pressure pumpability at temperatures down to 0° F.

In addition to cutting refrigerant emissions, these types of systems also allow improvement of display case cooling performance and protection of food quality. The secondary loop system provides more evenly distributed, and more constant temperature refrigeration to chilled food display cases throughout the stores at equivalent or lower operating energy expenses.

The primary refrigerant charge volume requirements is 65%-85% lower and the more compact direct expansion loop helps reduce the number of valves, fittings and connections, all of which are potential leak sources. Further, studies show that on average, secondary loop systems have up to 50% lower annual maintenance costs primarily because of reduced refrigerant losses compared to more traditional systems.

### **Sustainable Development**

Market facing institutions like supermarkets are adopting themes of sustainable development in their operations and are using the new policies in their advertising. Now, sustainability is a priority. Reduce, reuse, and recycle are the three "R's" of the environment as the retail world works on all three to steer business practices in a "greener" direction.

In the "reduce" category, one well known grocer will use one truck to haul two trailers, wherever possible. In 2007 alone, this company saved 200,000 gallons of fuel and drove one million miles fewer. This is the same impact as taking 320 cars off the road. The company also saves energy with fluorescent lighting in its new and remodeled stores. By making the lighting conversion, the same company saved enough electricity to power 470 homes for one year.

For "reuse," stores like Wal-Mart offer customers the chance to switch to reusable shopping bags, a better choice than paper or plastic bags. For "recycle," another well known retailer recycled 3 million pounds of plastic bags and wrapping materials during 2007.

Other food companies and manufacturing companies, like Dow, are joining the EPA sponsored GreenChill Advanced Refrigeration Partnership. The GreenChill Advanced Refrigeration Partnership is an EPA cooperative alliance with the supermarket industry to promote advanced technologies, strategies and practices that reduce emissions of stratospheric ozone-depleting substances and greenhouse gases.

GreenChill partners in the food retail business have refrigerant emissions rates nearly 50 percent lower than the EPA-estimated industry average. Since launching in November 2007, the

GreenChill Advanced Refrigeration Partnership has prevented emissions of 2.5 million metric tons of carbon dioxide equivalent, equal to the annual emissions of almost 500,000 cars. The EPA works with GreenChill partners to transition to using only non-ozone-depleting refrigerants, reduce refrigerant charges, reduce greenhouse gas emissions and promote the adoption of advanced refrigeration technology, which reduces supermarkets' impact on the earth's ozone layer and climate change. The Dow Chemical Company is a proud member of GreenChill.

### **About Dow**

With annual sales of \$54 billion and 46,000 employees worldwide, Dow is a diversified chemical company that combines the power of science and technology with the "Human Element" to constantly improve what is essential to human progress. The Company delivers a broad range of products and services to customers in around 160 countries, connecting chemistry and innovation with the principles of sustainability to help provide everything from fresh water, food and pharmaceuticals to paints, packaging and personal care products. References to "Dow" or the "Company" mean The Dow Chemical Company and its consolidated subsidiaries unless otherwise expressly noted. More information about Dow can be found at <a href="https://www.dow.com">www.dow.com</a>.