



Prioritizing Leak Tightness During Commercial Refrigeration Equipment Installation



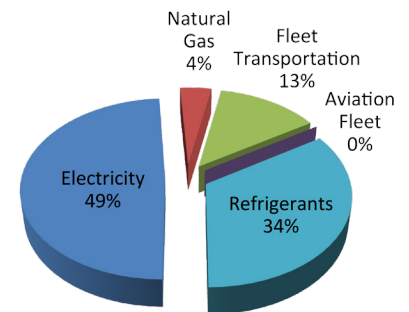
Food retail stores can save a significant amount of money and reduce impacts to the environment by ensuring that commercial refrigeration equipment is leak-tight when installed. The typical food retail store refrigeration system leaks an estimated 25% — or approximately 1,000 pounds — of refrigerant annually. In addition to being expensive, this leakage has significant implications for the environment, since most refrigerants are ozone-depleting substances or greenhouse gases, or both. According to several studies, refrigerant leaks can account for more than one third of a typical food retail store's annual greenhouse gas footprint (see the graphic at right).

Why Prioritize Leak Tightness During Equipment Installation?

There are a number of reasons why food retail stores should prioritize leak tightness during commercial refrigeration equipment installation, including the following:

- **Leaks are expensive.** Ensuring leak tightness saves money, since new refrigerant must be purchased to replace refrigerant that is leaked. It is estimated that if every food retail store in the country reduced its refrigeration system's leak rate to the GreenChill Partner average, the industry would save approximately \$96 million every year on reduced refrigerant costs. Ensuring leak tightness at the time of installation means that a refrigerant system will begin generating cost savings the moment it becomes operational.
- **Leaks harm the ozone layer, or contribute to climate change, or both.** Most commercial refrigeration systems in the U.S. use hydrochlorofluorocarbon (HCFC) or hydrofluorocarbon (HFC) refrigerants. When leaked, HCFC refrigerants contribute to ozone depletion. In addition, these refrigerants are very strong greenhouse gases, with potencies of as much as 1,800 times that of carbon dioxide in terms of their global warming potential. While HFC refrigerants do not contribute to ozone depletion, they are more potent greenhouse gases than HCFCs — the most commonly used HFC refrigerants are nearly 4,000 times stronger than carbon dioxide in terms of global warming potential. Regardless of the refrigerant used in commercial refrigeration equipment, the bottom line is that if the refrigerant does not leak, it cannot contribute to ozone depletion or climate change.
- **Prioritizing leak tightness at installation sends a clear message to technicians and employees.** Prioritizing leak-tight installations from the moment the refrigeration equipment is brought into the store sends a clear message to the company's technicians and employees that the company is committed to reducing refrigerant leakage. Making this commitment clear and evident at the onset helps ensure that leak tightness remains an important issue for a company's technicians and employees, as there will be additional opportunities to ensure that equipment is leak-tight during ongoing operations and maintenance.
- **Waiting until leaks become a problem before addressing them only makes the problem bigger.** Leaks in refrigeration equipment get worse over time, as the area through which the refrigerant leaks gradually increases in size. The larger the size of the leak, the more refrigerant is wasted. At the time of installation, leaks can be identified using hydrogen or helium gas to test the system, before the system is charged with refrigerant, meaning no refrigerant is wasted before leaks are addressed.

Breakdown of Greenhouse Gas Emissions in a Typical Food Retail Store, by Source



Source: Verisae. 2008. Measuring Your Carbon Footprint. FMI Sustainability Task Force Meeting, January 16, 2008.

GreenChill Partners

Food Retailers

ACME Markets	Jewel-Osco
Albertsons Intermountain West	King Kullen
Bel Air Markets	Lucky/Albertsons Southern California
BJ's Wholesale Club	McQuade's Marketplace
Bottom Dollar	Meijer
Brookshire Grocery Company	Nob Hill Foods
Buehler's Fresh Foods	Price Chopper
Cub Foods	Publix Super Markets
Dorothy Lane Market	Raley's
Down to Earth	Reid's
Farm Fresh Food & Pharmacy	Shaw's/Star Market
Food Lion	Shop 'n Save, St. Louis
Food Source	Shoppers Food & Pharmacy
Fresh & Easy Neighborhood Market	Sprouts Farmers Market
Giant Eagle	Stater Bros. Supermarkets
Hannaford	SUPERVALU
Hanover Co-op Food Stores	Sweetbay
Harris Teeter	Target
Harveys	Weis Markets
Hornbacher's	Whole Foods Market
Hy-Vee	Wild by Nature

Advanced Refrigeration Technology Manufacturers

Dow Chemical	Kysor/Warren
Hillphoenix	Zero Zone
Hussmann	

Chemical Manufacturers

Arkema	ICOR International
ARNEG	Mexichem Fluor
DuPont	National Refrigerants
Honeywell	

GreenChill Best Practices for Ensuring Leak-Tight Installations

In 2008, the EPA GreenChill Partnership launched a collaborative effort with its advanced refrigeration technology manufacturing and food retailer Partners to develop a guidance document on leak-tight testing during equipment installations. This GreenChill Best Practices Guideline: Ensuring Leak-Tight Installations of Commercial Refrigeration Equipment, which was co-authored by experts from GreenChill Partner companies (including Farm Fresh/Supervalu, Hill Phoenix, Hussmann, Kysor Warren, and Zero Zone) and the EPA, was peer reviewed by a broad range of commercial refrigeration stakeholders and piloted in GreenChill Partner stores. The guideline describes a process for testing a refrigeration system for leaks immediately after installation, which includes the following steps:

- Pre-check and preparation procedures
- Pressure testing procedures and standards
- Stair-step evacuation procedures and standards
- Charging the system with refrigerant
- Final check procedures
- The full guideline is available at www2.epa.gov/greenchill/greenchill-best-practices-guideline-ensuring-leak-tight-installations-commercial

EPA's GreenChill Advanced Refrigeration Partnership

The **GreenChill Partnership** is made up of industry leaders in green refrigeration technology and environmental stewardship. GreenChill is a cooperative alliance with the supermarket industry to support and promote green technologies, strategies, and practices that protect the ozone layer, reduce greenhouse gas emissions, and save money. GreenChill Partners in the food retail industry have refrigerant emissions rates nearly 50% lower than the EPA-estimated industry average.

The GreenChill Partnership researches advanced technology and servicing practices and provides Partners with tools that can be used to attain corporate environmental goals. Partners also benefit from the opportunity to share information on environmental best practices and increased publicity for their commitments to their environmental goals.

For additional information on the **GreenChill Partnership**, please contact:

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www2.epa.gov/greenchill