



Prioritizing Leak Tightness During Commercial Refrigeration Retrofits



To meet our obligations under the Montreal Protocol, the United States is phasing out production of hydrochlorofluorocarbon-22 (HCFC-22), an ozone-depleting substance. Many food retailers are adapting to future HCFC-22 supply constraints by transitioning away from this refrigerant. Retrofitting HCFC-22-based commercial refrigeration systems to use substitute refrigerants is one transition option. Because most of these substitute refrigerants are potent greenhouse gases, it is important that food retailers use the retrofitting process as an opportunity to tighten system leaks.

Benefits of Prioritizing Leak Tightness

- **Cost savings:** A typical supermarket's refrigeration system holds a refrigerant charge of about 4,000 pounds and has an average annual leak rate of about 25%. Thus, on average, leaks cause a supermarket to emit approximately 1,000 pounds of refrigerant every year. Losing large quantities of refrigerant through leaks is expensive because of the need to replace the lost refrigerant. Tightening leaks can therefore produce cost savings. If every supermarket in the country joined GreenChill and reduced refrigerant emissions to the current GreenChill average, the industry would save an estimated \$108 million annually.
- **Reduced impact on the environment:** Although hydrofluorocarbons (HFCs), the key substitutes, are not ozone-depleting substances, they are potent greenhouse gases, which can contribute to climate change when emitted. In order to achieve environmental benefits for both climate change and the ozone layer, it is critical to ensure leak tightness when retrofitting.

Information Resources for Tightening Leaks

Food retailers can obtain information on best practices for ensuring leak tightness during refrigeration system retrofits from several sources:

- EPA's **GreenChill Best Practices Guideline for Commercial Refrigeration Retrofits**, a peer-reviewed guideline that provides best practices for retrofitting refrigeration systems that use HCFC-22 to HFC substitute refrigerants. This guideline, which was co-authored by experts from several GreenChill Partner companies (including Arkema, DuPont, Honeywell, and INEOS Fluor) and the EPA, includes a list of system conversion procedures that a typical food retailer would likely undertake to retrofit equipment that was originally designed to use HCFC-22. Throughout this list of procedures, EPA identifies environmental best practices to ensure leak tightness. Appendix 2 of the guideline has conversion checklists for specific HFC substitute chemicals that also identify opportunities for verifying leak tightness.

More information on the contents of this guideline is available on the reverse side of this fact sheet. The full guideline is available at www2.epa.gov/sites/production/files/documents/retrofit_guideline_august_2011.pdf.

- EPA recently hosted a Webinar on **Environmental Best Practices for Retrofits**. The Webinar included presentations from representatives from four food retailers describing their experiences in retrofitting their stores' refrigeration systems with ones that use HFCs, including measures they took to ensure leak tightness throughout the process. Presentation materials from this Webinar and others are available at www2.epa.gov/greenchill/events-and-webinars under "Past Event Information."

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	

EPA's GreenChill Best Practices Guideline for Commercial Refrigeration Retrofits

EPA developed this guideline to offer fact-based, objective information on best practices for retrofitting refrigeration systems that use HCFC-22 to HFC substitute refrigerants. The document can assist a wide range of stakeholders in the food retail industry, including strategic decision-makers, store managers, and technicians involved in the conversion process.

The guideline includes the following information:

- Reasons to consider retrofitting refrigeration equipment that uses HCFC-22.
- Descriptions of HFC retrofit options currently available to food retailers.
- Descriptions of factors that should be considered when assessing substitute chemicals.
- Current best practices for transitioning to HFC substitutes and improving leak tightness.
- Recovery techniques and disposal and reclamation options for HCFC-22.
- Case studies that describe real-life examples of retrofits in the field.

The guideline is available at

www2.epa.gov/sites/production/files/documents/retrofit_guideline_august_2011.pdf.

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:

GreenChill@epa.gov, or Tom Land at (202) 343-9185

www2.epa.gov/greenchill