



Refrigeration

Save money by using strip curtains & sliding doors

Strip curtains and glass doors are becoming standard features on refrigeration cases in supermarkets because a typical supermarket spends \$0.50 to \$0.60 of every energy dollar on refrigeration. The expense is slightly lower for liquor stores, convenience stores, and grocery stores. Improvements in refrigeration system efficiency in these facilities can save enough money to make a significant contribution to bottom-line profitability. In supermarkets, grocery, and liquor stores, the fastest and easiest way to cut refrigeration costs is to reduce cold air spillage from refrigerator cases. The following products do this very efficiently.

Plastic Curtains

Plastic strip curtains provide a barrier between the refrigerator case and the external environment and reduce the heat gain, which is caused by infiltration of warm air into refrigerated spaces. With less air infiltration, frost accumulation on evaporators and product is reduced. This reduces energy use both by compressors and by defrost systems. Savings in the range of 20% to 30% can be achieved depending on operating hours, temperature differences and other variables.

If a business has walk-in coolers or large refrigerated rooms, clear plastic strip doors can be used to cover doorways and loading docks. Since they are designed to allow normal traffic flow, they save energy without affecting productivity. Strip doors may cut compressor use by as much as 10%. Strip curtains cost about \$15 to \$25 per linear foot.

Glass Doors

Glass door assemblies are available for retrofitting commercial open multi-deck display cases of the type used for frozen foods and ice cream. These systems typically consist of a factory sealed multipane glass and a thermofilm system that can be applied to most commercially available display cases. These doors reduce the cold spillover from refrigerator cases and reduce power consumption of the compressors by as much as 40% to 60%. A typical 12-foot long, five-deck frozen food case could require around 30,000 kilowatt hours per year of compressor energy. Retrofitting with glass doors could reduce this by as much as 15,000 kilowatt hours per year. The doors also improve the temperature condition in aisles adjacent to the cases.

Because the refrigeration load is greatly reduced with the doors, some modifications are usually required to compressor operation to avoid problems with over capacity on the compressor side. Typically, it is necessary to install smaller compressors or to recircuit the refrigerant system to match compressor capacity to the load. It may be necessary to adjust or install new expansion valves and to reset compressor pressure cut-in, cut-out settings. A number of manufacturers provide glass door assemblies for refrigerator cases. Costs are in the range of \$200 to \$250 per linear foot.

High-Efficiency Refrigeration Equipment

High-efficiency refrigeration equipment use special energy saving features such as high EER compressors, high-efficiency fan motors, extra casing insulation, and improved operating controls. Commercial refrigeration equipment includes reach-in and specialty cabinets and walk-in coolers and freezers.

Small retail food stores consume more electric power per square foot than any other type of retail store, with annual energy consumptions per square foot of sales area ranging from 50 to 120 kWh/square foot. Typically, compressors consume 35 to 40 percent; case fans and lights, 9 percent; and case anti-sweat heaters, 6 percent.

Display case and walk-in cooler equipment should be selected with EER ratings near 11.0. Freezers which have a defrost cycle should be equipped with hot gas defrost. This method uses heat generated at the compressor to evaporate condensation from the evaporation coil instead of electric resistance heating. As a rule of thumb, compressor heat recovery is capable of producing about 5 gallons of 140° water per hour with 60° supply water.

Refrigeration equipment with energy saving features (discussed above) as well as a heat reclamation to make hot water, will enjoy a longer, more reliable life than conventional equipment by virtue of the reduced operating hours and demand on the equipment. Use of this equipment should result in paybacks in less than two years. Increased reliability will also ensure product life and quality, enhancing store sales.