



Prior to 1996 and the end of CFC's, supermarket low-temp refrigeration was designed around R-502. After 1996, equipment suppliers developed around R-22 and also R-404A. Now, there is renewed scrutiny on the horizon for HCFC usage. Retrofit of the R-22 designed 'rack' systems is starting. Those in the supermarket sector that want to get ahead of the curve have begun this process. Just like we did a decade ago, our industry is faced with choosing a refrigerant that will satisfy many demands both environmental and economic, which are really one in the same.

Supervalu Inc. (*Bigg's, Sav-a-lot, Scotts, Hornbachers, Cub Foods, Farm Fresh, Shop'n Save, Shoppers Food and Pharmacy*) worked with ICOR International, Inc. at a Biggs supermarket in Florence, KY.

A medium and a low temperature racks were selected for a retrofit from R-22. After reviewing the job specifics, One Shot<sup>®</sup> was selected for the replacement refrigerant. For an R-22 retrofit, it is necessary to replace the power elements on the expansion valve from R-22 charge to R-404A elements. With the other medium and low temperature refrigerant applications like R-502, R-404A, R-408A, R-402A&B, or R-507, the existing power element is used.

It was decided to replace the elements leading up to the time of conversion. Our experienced had been to do the retrofit and element change simultaneously. This 'premature' exchange proved problematic. The R-404A elements used with the R-22 system required the low temp valves to be adjusted (opened). After the conversion the valves had to be adjusted again. Retrospectively the Bigg's personnel commented they would wait the next time.

Below is a synopsis of the test and following the unredacted information supplied by the Supervalu control system with comments.

**> Bigg's Supermarket, Florence, KY converted a medium and low temperature rack systems from R-22 to One Shot<sup>®</sup>. George Ronn, Manager, EPA Compliance & System Controls for Supervalu Inc. (parent of Bigg's), supplied ICOR with a preliminary assessment of the project. Below are the conclusions and excerpts of the data recorded on Supervalu's energy management system.**

***Initial conclusions:***

***We have experienced no problems with mineral oil return, migration, or separation in either of these two racks. In fact, we had a significant amount of oil return to the racks from the evaporators after the conversion took place.***

*One of the most satisfying pieces in this project is the improvement in capacity, and the reduction in the number of compressors needed to maintain the suction pressure target and product integrity. This will definitely translate into lower energy costs for compressor operation.*

**Rack A (low temp) with R-22 ran primarily between 70% and 95% of capacity. After the conversion to One Shot the rack capacity ran more consistently between 60% and 90% with more extended run periods between 35% and 50%**

**Rack C (medium temp) (see below) with R22, ran in 50% to 80% capacity range the bulk of the time. With One Shot you can see the capacity demand requirements are much more stable and are consistently below 50%. The blip was the result of the Smoked Meat case going down.**

