DuPont™ ISCEON® MO99™

CASE HISTORY

Source Refrigeration: Successful Completion of a Complete Supermarket R-22 Refrigerant Conversion Using ISCEON® MO99™ (R-438A)

Background

Source Refrigeration and HVAC, Inc., based in Anaheim, California, specializes in commercial refrigeration, EMS, HVAC and Environmental Services throughout the U.S. Bryan Beitler, Vice President and Chief Engineer, Source Refrigeration, describes his recent conversion experience with DuPont™ ISCEON® MO99™. Source Refrigeration was part of product testing for MO99™. Bryan explained, "We had 3–4 months' experience with MO99™ in our test center prior to the conversion. That experience gave us a comfort level as well as valuable information about the new refrigerant. The testing period simulated conditions in different seasons of the year—and provided functional data about how MO99™ performed as compared to R-22.

Bryan decided to use MO99™ in a supermarket conversion in early 2009. He felt comfortable that the targeted store would be a good match for the use of MO99™ on low- and medium-temperature refrigeration as well as AC systems. Bryan said, "I am fairly experienced with retrofits and have worked with DuPont in the past. The results of the MO99™ product testing gave us the confidence that this would be a winning project."

ISCEON® MO99™ is a retrofit refrigerant that combines the pressure-enthalpy characteristics of R-22 with mineral oil compatibility in a unique refrigerant that can be used to replace R-22 in air conditioning and refrigeration equipment covering a wide range of evaporator temperatures.

Project Details

The ISCEON® MO99™ conversion was on a 10-year-old system in a major supermarket chain located in Diamond Bar, California. The retrofit involved the stores' low- and medium-temperature racks, a single compressor medium-temperature multiplex system, and two open drive AC compressor systems. Only the meat cases were emptied to avoid issues with product spoilage. Dry ice was used for all other open fixtures and door cases.

We elected to change the oil as part of the conversion process. Bryan explained, "It isn't required, however, most systems of this vintage have never had their oil changed and most R-22 low-temp systems tend to be hard on the oil, so we have adopted this as one of our standard operating procedures with R-22 systems. We also updated the oil separation system, and ensured that all filters were clean."

In a conversion using ISCEON® MO99™, the steps to complete the process include recovering the R-22, replacing critical seals, charging the refrigerant, restarting and monitoring the system for potential leaks.

The retrofit involved Sporlan® expansion valves and Copeland® compressors, 2D, 3D and 4D models. Each system was evacuated for an hour prior to restarting. Total refrigerant charge size was 2,600 pounds. Bryan said, "We made minor control adjustments, but the existing valves were okay. The retrofit was a good experience all around. The customer was happy and there was minimal store disruption."

Results

Bryan was pleased with the outcome of the retrofit. He said, "The overall performance of MO99™ was better than R-22. We found that the energy performance was equal to R-22 in our testing, and compressor discharge temperatures were consistently lower. This is a positive for our customers since low-temp applications demonstrated improved energy efficiency and medium-temp had the same level of energy efficiency. If the system is running cooler, then they will save on maintenance costs long-term."

Conclusion

Bryan said, "The retrofit was very simple and the functionality was quite similar to R-22. The scheduling and timing was great and we've had no operational issues since the retrofit. We had confidence that MO99™ would work, and it did."

For more information on DuPont™ ISCEON®, or other DuPont Refrigerants, please contact your local representative.

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