

# ACCELERATE

## ADVANCING CLEAN COOLING

## Transcritical System in Super-Warm Abu Dhabi Exceeds Energy Expectations

Epta's FTE system consumes 40%-50% less energy than an R404A system in a first-of-its-kind supermarket installation.

— By Tine Stausholm and Pilar Aleu



**T**ranscritical CO<sub>2</sub> refrigeration systems have traditionally not been considered a good choice for a desert country like the United Arab Emirates (U.A.E), where ambient temperatures can reach up to 51°C (123.8°F).

After all, at such high temperatures, the transcritical system would be expected to enter less-efficient transcritical mode.

Yet, on April 24, 2019, Italian manufacturer Epta installed a transcritical CO<sub>2</sub> refrigeration system incorporating its Full Transcritical Efficiency (FTE) technology at a 7,000m<sup>2</sup> (75,347ft<sup>2</sup>) supermarket in the brand new My City Centre Masdar shopping mall in Masdar City, Abu Dhabi, the capital of the U.A.E.

This is considered the first installation of transcritical CO<sub>2</sub> in an Arabian (Persian) Gulf country, according to Epta.

How has the system fared, energy-wise? Better than expected, said Andrea Cavalet, Contracting & After Sales Director, Epta U.A.E.

The reason for this is the FTE system. Launched at the EuroShop trade show in Dusseldorf, Germany, in March 2017, the system helps to improve the efficiency of CO<sub>2</sub> refrigeration systems and overcome the challenge of an installation in a desert climate.

Based on simulations, Epta expected the FTE technology to enable energy savings of up to 25% in the transcritical system compared to a standard R404A system in the Abu Dhabi area. But the energy savings turned out to be 40%-50% better in an analysis of electrical consumption data conducted from May to September in 2019, said Cavalet.

Despite operating at "extreme temperatures," the store "has performed exceptionally well, in line with the reliability of the FTE system installed worldwide," Cavalet noted. The system has been supported by preventive maintenance performed on site by "trained Epta engineers," he added.

The customer, My City Centre Masdar, "is totally satisfied [with] the reliability of the system and the energy efficiency showed," said Cavalet.

### SIMPLE DESIGN

The FTE technology, according to Epta, is based on a very simple design, whereby a low-pressure liquid receiver is used to flood medium-temperature cabinets with liquid CO<sub>2</sub>, eliminating superheat and allowing the evaporation temperature of the cabinets – and, ultimately, the efficiency of the system – to increase.

Over the past three years, FTE systems have been widely installed in Europe and the rest of the world, and were brought to North America following Epta's acquisition of Kysor Warren last year.

In February of 2020, at the most recent EuroShop, Epta unveiled an updated version of FTE called FTE 2.0; it also introduced an entirely new technology called the Extreme Temperature Efficiency (ETE) system, which further supports transcritical operations at ambient temperatures higher than 40°C (104°F). (See "[Transcritical CO<sub>2</sub> in Climates Above 40°C? No Problem, Says Epta](#)," *Accelerate* Special Issue #110.)

Epta has not installed other transcritical CO<sub>2</sub> systems yet in the Arabian Gulf, though "different customers showed interest and studies are ongoing," said Cavalet. ■ TS & PA

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