Cost Reduction through Integral Display Case Technology

Emerson Climate Technologies GmbH assigned the Institut für Luft- und Kältetechnik (ILK) to execute an energy comparison and a life cycle cost analysis (LCC analysis) for two different supermarket refrigeration systems at the Munich, Barcelona and Gothenburg sites. The first concept is a traditional refrigeration system comprising a compressor pack using semi-hermetic compressors with the refrigerant R744 (CO_2). The second concept is known as Integral Display Case Technology and comprises refrigeration cabinets with an integrated refrigeration system using the refrigerant R290 (propane). In this second system, the dissipation of heat from the refrigeration process takes place via an external brine circuit.

While the difference in energy consumption between the two systems was marginal, the lifecycle cost difference of around 46,900 euros is significant. The integrated refrigeration system, powered by propane, only accounts for about 86 percent of the traditional plant's life-cycle costs. In addition, the total annual cost of this plant is approximately 4,500 euros lower.

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