

Linde Kältetechnik: revolutionary breakthrough in normal refrigeration area

About four years ago, Linde Kältetechnik GmbH & Co. KG fitted out the first supermarket with CO₂ direct evaporation for deep-freeze applications. This innovative concept was so impressive that, in the meantime, 47 supermarkets in Europe are using CO₂ deep-freeze systems. One of the advantages of CO₂ deep-freeze units is the prevention of ozone-damaging effects, while at the same time reducing the greenhouse effect caused by refrigeration systems (EU objective in the Kyoto protocol was to reduce annual greenhouse gas emissions by about 8 %).

Linde Kältetechnik has been carrying out intensive research. With the use of CO₂ as a direct evaporation system also in the area of normal refrigeration, the company has achieved a world first.

The world's first pilot project, the combination of a deep-freeze system with a newly developed normal cooling (transcritical) combination system in CO₂ mode, started at the end of November 2004 in the COOP store in the Tägipark Centre (Switzerland). High-quality goods are sold here on a sales floor of 5,000 m².

The total refrigeration capacity required for normal cooling of 320 kW is divided between separate combination refrigeration units, each with an identical refrigeration capacity. The waste heat for the deep-freeze area (50 kW) is extracted in cascade with the normal cooling area. The refrigerated cabinets in both areas are supplied by the directly expanding carbon dioxide in the evaporator. A CO₂ gas cooler removes the heat from the deheater into the surrounding air. Heat recovery is also incorporated into the overall system concept. In this way, hot water for the heating is provided during the cold period, and hot water for general use is provided throughout the year.

This solution uses up to 10 % less energy in comparison with previous systems (e.g. refrigerant systems). Further advantages are lower system installation and running costs, lower quantities of refrigerant with simultaneously improved performance, and a more attractive purchasing price for the natural coolant.



This revolutionary concept is further expanding the role of Linde Kältetechnik as an innovative leader in the refrigeration sector.

Cologne/Mainz-Kostheim, February 2005

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