

Case Stories

CO₂ Cold Store Operates with Energy Efficiency and Sustainability in Eastern China

Yonghai Yi, Senior Sales Engineer at Vahterus China

Panasonic Appliance Refrigeration System (Dalian) Co., Ltd is one of the leading refrigeration system and industrial refrigeration turnkey project providers in China. The company has successfully completed several green cold-chain projects for Chinese e-commerce market leaders, many of them based on the natural refrigerant CO₂.

Huachen Longdefeng Group has a diversified business portfolio, including real estate, financial investment, asset management, food importing and logistics. The e-commerce boom in China created strong demand for the group's logistics business. In 2017, Huachen group invested in a new energy-efficient logistic centre. Panasonic won the refrigeration contract.



Panasonic supplied an energy-efficient refrigeration system with Vahterus PSHE to Huachen Group's green cold store.

The centre has cold stores in two three-storey buildings. Each storey has a floor area of 7,500m². In Complex No.4, the high temperature zone has three cold rooms with a design temperature of 0 to 5°C. It can store up to 1,770 tons of goods. The low temperature zone has one cold room with a design temperature of -23 to -25°C. It can store up to 16,450 tons of goods. The deep freezing zone has one cold room with a design temperature of -55 to -60°C. It can store up to 800 tons of goods. The buffer zone has one cold room with a design temperature of -25°C. In Complex No.5, the low temperature zone consists of 17 rooms with a design temperature of -18 to -20°C and it can store up to 19,090 tons of goods. Both buildings have a passage and processing area designed at 5–10°C.

Panasonic designed R507/CO₂ refrigeration systems for cold rooms -23 to -25°C in Complex No. 4 and cold rooms -18 to -20°C in Complex No. 5. In these systems, CO₂ operates as brine. Each complex has two independent CO₂ systems to ensure that the goods stored in them are safely preserved.

The cascade heat exchanger is a critical piece of equipment between the two refrigeration systems. The Panasonic team made a thorough technical evaluation of different heat exchanger technologies and brands. Vahterus was chosen to supply the PSHEs for this project due to its strong market reputation and the technical advantage of its PSHEs. The compact size lowers the system refrigerant charge. High heat transfer efficiency enables closer temperature approach between R507 and CO₂. High suction pressure helps in reducing system energy consumption. The fully welded construction of PSHE also minimises leakage risks and is maintenance free.

The PSHEs were installed in October 2018. Huachen's project further proves that Vahterus is the right choice for demanding CO₂ refrigeration systems. This adds another successful green cold-chain project to Panasonic's portfolio. The journey continues!