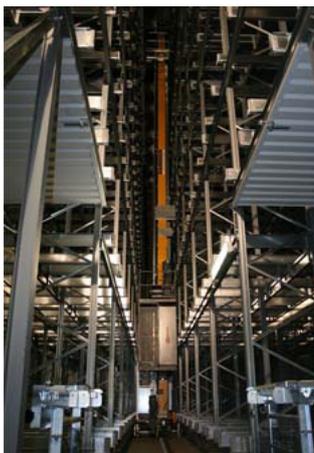


High-rise refrigerated fruit storage and distribution, using a NH₃/CO₂ fluid system, gives optimum results for stored products and company financials.

Mr. Klaas de Jong, owner of this very sophisticated high-rise fruit distribution centre in the Netherlands, can call on several decades of experience in this business. His first choice of refrigerant would always be ammonia, but if not permitted by the authorities, then the NH₃/CO₂ fluid solution has proven to be the next best. The plant was commissioned in 2007 and is located near the port in Rotterdam. The building is 20 meters high and can store 12,500 pallets, spread over 15 individually-controlled temperature compartments.

Internal transport is done using fully automated cranes and conveyor systems. This ingenious system dispenses with the need for people and forklift trucks. Forklift trucks are now only used on the dispatching floor, for loading and unloading trucks and containers.



High rise storage



Separators and heat exchangers

The main advantage of this automated storage system is that the logistics process operates more efficiently and reliably. Pallets are no longer damaged, each pallet location is accessible and because the refrigerated cells are always kept closed, the refrigeration of the cells is extremely efficient, which enhances the shelf life and quality of the products being stored.

The challenge at that time was that CO₂ experience was available for freezing but not for cooling. The Dutch industrial refrigeration contractor Cofely took on that challenge and created a unique design for this NH₃/CO₂ pump system.

As the temperature of the different zones can be adjusted to below zero °C, air defrosting was not an option. A small CO₂ compressor generates hot gas for defrosting, which is done in the same way as traditional NH₃ hot gas defrosting, but at higher pressures. It implied a maximum working pressure of 52 bar. Danfoss technology and support resulted in the application of ICF assemblies for all hundred evaporators, altogether providing 3,000 kW refrigeration capacity. (NH₃ at -13°C and CO₂ at -8°C)

The technical responsibility lay from the start in the hands of Mr. Theo Baaijens, who revealed that the past two years had shown 2 drawbacks to the system, but that the overall performance and especially the energy efficiency were better than expected. In order to ensure maximum benefit and trouble-free operation, attention should be paid to the maximum water content of the CO₂, and to the defrost system.

For more information regarding this case-study please visit:

www.hmdejong.com

www.cofely-gdfsuez.nl