Shaping Refrigeration Systems for Tomorrow

Customer's Point of View

38% Power consumption reduced by installing NewTon

In the newly built Yumeshima Logistics Center, (2) NewTonR-6000 for the cold storage, (1) NewTon C for the dock area and (1) Brine application NewTon B for the platform on the main floor are installed.

Deciding Factor

Energy Savings and Safety, in comparison to the DIRECT Ammonia system

Advantages

Power consumption reduction ; 38% reduced compared with similar size facilities
CO₂ Emission Reduction

• Easy to install, Self-contained reduces the installation time and cost

• **Improved Safety** ; Semi-hermetic screw compressor and Low ammonia charge reduces the risk of an ammonia leak. Also, the ammonia refrigerant charged is contained to the machine room reducing exposure to employee and product. Complete automation, as well as 24 hour remote monitoring, offers a very safe operation.



Energy consumption comparison between Yumeshima and the similar sized facilities (June 2014 to March 2015)





NewTon

Yokohama Reito Co.,ltd.

Since its foundation in Yokohama in 1948, Yokorei has been dedicating their business to cold storage facility logistics and food product sales. Their contribution to food safety and its consumers has earned a excellent reputation in the industry.

Yumeshima logistic center was newly built in Osaka's Special Economic Zone, at the crossroads of logistics flow in Osaka's economy. This facility has the function of both international port and distribution center logistics. Based on its corporate philosophy of Social contribution through Business, Yokorei's 3 main business philosophies are: High Quality Management, Environmentally Conscious Cold Storage Facilities, Ideal Storage Environment. With these 3 concepts in mind, Yokorei has chosen and will choose new technologies with environmental consideration for their facilities

Company Profile

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Proven Energy Efficiency



Upon seeking new refrigeration system for Yumeshima Logistics Center, the foremost consideration of all was to have a system with a natural refrigerant. After considering initial capital cost, operating cost (maintenance and utility), and 20-year life cycle cost, Yokorei's clear decision was to use a Mayekawa NewTon system.

"At first I was skeptic, thinking an NH3/CO2 refrigeration system that has to employ a secondary refrigerant might not as efficient as the conventional direct Ammonia refrigeration system," Mr. Sasaki from Yokorei's technology department. However, after visited Mayekawa's Moriya factory to inspect NewTon in service and reviewing performance data, Mr. Sasaki's skepticism was gradually melting away. "To be able to operate and maintain with a very little superheat, due to the flooded-type evaporator on the condenser that is strong against the load variation. Very little gap between the NH3's evaporating temperature and CO2's condensing temperature. CO2's high performance as a refrigerant. These 3 points convinced me of the superiority of NewTon in efficiency and energy-saving. The pairup between the IPM motor and the inverter on NewTon is arguably the best match in a refrigeration system this size.

With the BEMS (Building Energy Management System) installed, the power consumption of the entire facility, as well as that of NewTon, is closely monitored and it has been showing a very good result."

Advantages of Factory Packaged System

A NewTon package comes as a skid mounted unit that requires no

on site assembly. This is an advantage in workmanship and quality over a conventional built-up system. Also, the CO₂ pipe size and material can be change to reduced size and schedule, resulting in lower cost for material and construction. Furthermore, Mr. Sasaki states that he has seen other secondary benefits of a packaged system. "Factory packaged systems



reduce areas for regular maintenance. The usually required oil flushing is one of those that are not required anymore. Also, the longer product life gives us a very long interval between overhauls. On top of these, the ammonia detector is only required in the machine room. All these benefits have given us a dramatic cost in the maintenance cost.





Newton was also praised for its design consideration to safety.

"The chance of Ammonia leak is minimized due to the low Ammonia charge and the semi-hermetic screw compressor, compared with the direct Ammonia cooling system of the same size. Also, by containing the ammonia equipment within the machine room, you are reassured as a facility manager that damage would be minimal in case of Ammonia-related accident. The little risk of liquid back due to the flooded type condenser is also important."

In terms of CO₂ refrigerant management, the over pressurization protection during extended shutdown periods is guaranteed by automatically reducing the CO₂ pressure to a set point, when it rises while the compressor is stopped. "NewTon is strong in protective measure to maintain the CO₂ circulation system. Operation to avoid super-cooling and therefore to avoid the refrigerant from turning to dry ice is just one example. These cannot be done in the conventional system."

Power consumption reduction by 38%, compared with similar size facilities

Approximately 38% in power usage reduction has been proven is at Yumeshima logistics center over a year period, compared with the similar size facilities.

"The direct expansion R-22 system our company have been using does not require fan power for the evaporator and is a very efficient system. It is such a surprise to see NewTon exceed it in efficiency.



"Upon seeing these results from our first facility with NewTon, we have planned to install NewTon in other facilities as well. To start, Five NewTonR-3000 will be installed at a facility of our child company Thai Yokorei Co.,Ltd Bangpakong Distribution Centre Phase II in Thailand."



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