

Dehumidified automated warehouse at Novo Nordisk A/S awarded

Novo Nordisk is world leader in diabetes care with insulin products as well as systems for dosing of insulin. With 26,000 employees, whereof almost 50% are working in Novo's homecountry, Denmark, Novos products are represented in appr. 180 countries with affiliates and offices in 80 countries.

Expansion required new ways of thinking

In Bagsværd, Denmark, Novo Nordisk A/S is storing raw materials, and bulkinsulin, for further distribution to factories abroad. Lately the storage facilities needed to be extended, storing 4 times more insulin at a -20°C cold store. At the existing store employees had to enter the coldstore to manually pick the small 2 kilos container with bulkinsuline – a cold and uncomfortable job.

Tonny Tesdorph Sørensen, Project Leader, was responsible for the expansion and as the physical conditions were very limited he had to work creatively on a solution.

Novo Nordisk A/S was looking for a automated warehouse system, but realized that such a system was never invented for use in chilled or cold stores.

Together with the partners Søborg Køl Aps (Cooling company), Handler A/S (Scandinavia's largest supplier of automated warehouse equipment) and Munters A/S a completely new warehouse system was invented. The three companies build a system based on a vertical lift system (automated warehouse sealed into a huge box). To make the system fit into the limited space the floor was excavated and the lift continues 1.2 m below floor level.

The temperature in this system and the storage room behind is kept constant at

-20°C. When the raw material is shipped to factories around the world, the containers are packed on pallets with dry ice, securing the high product quality is kept during transportation.

The lift itself can contain more than 9,000 plastic containers each filled with about 2 kg bulkinsulin. Behind the lift system, 120 pallets form a buffer store.



Dehumidification: Automated warehouse



Dehumidification ensures:

- Optimal conditions for storage of high-value bulkinsuline
- No condensation on products during picking from chilled store
- Comfortable and safe working environment for employees
- DH creates optimal conditions for cooling system, performing its utmost
- No need of deicing of evaporators



Munters

The Humidity Expert



Jan Barbré, Munters A/S with Project Leader Tonny Tesdorpf Sørensen, Novo Nordisk

When employees need to pick items from the warehouse, they enter a code for the product needed on a digital panel at the front of the door. The sliding door on the front of the lift opens and the products are delivered – moved from the cold stores -20°C to the packing rooms +20°C without any employee entering the storage.

Because of the big difference in temperatures in the opening of the lift system where the insulin containers are delivered, condensation would create severe ice buildings. Ice buildings would occur not only on the products itself, but also on the lift system, which gearwheels would become ice covered and malfunctioning within a very short while.

No lift system possible without dehumidification

It was obvious from the beginning that dehumidification would be decisive for the functioning of the system.

Two dehumidifiers – type ML690 – are installed above the storage. One dehumidifier is supplying dry air to the inner of the vertical lift system where 2 fans distribute the dry air evenly. A slight overpressure prevents ambient air to penetrate into the lift system. All ductwork within the lift system was specially designed and all made in stainless steel with built-in LED light. The other dehumidifier supplies dry air

to the entrance of the store. Dry air is blown into the lock – preventing condensation when the door is opened during transport of goods into the warehouse. Without dehumidification ice build up would create problems like slippery floors, fog, ics on products, walls, and ceilings and regular deicing would be necessary.

The two dehumidifiers are functioning with modulating effect, controlled by sensors to keep a dewpoint at -20°C or below – securing that the water content in the air of the system is so low, that condensation never occurs.

Novo Nordisk A/S has been positively surprised, not only because of the very short time used for development and installation of the whole system, but also by the big advantages they face.

Employees appreciate very much that they don't have to enter the cold store any longer. Safety problems with wet and slippery floors are avoided and the picking procedure itself is very time saving.

Award for innovative thinking

Tonny Tesdorpf Sørensen has been awarded the “Novo Nordisk Occupational Health & Safety Award 2007” for this projects innovation and consideration for employees comfort and safety. “This project is a major success and we expect it to be copied to other storage facilities around the world, just like our factories can take advantage of the experiences. How effective the dehumidification works was illustrated clearly during the assembling of the lift system. Some mistakes were made and the floor got all covered by water which we needed to get rid off immediately. Munters recommended us to switch on both dehumidifiers and next morning when the cleaning company arrived for removing the water it was already gone ! Convincing ! “.



Doors of -20°C automated warehouse with bulkinsuline

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