Unilever say "Yes Peas" to Munters

Control frost formation with IceDry® equipment

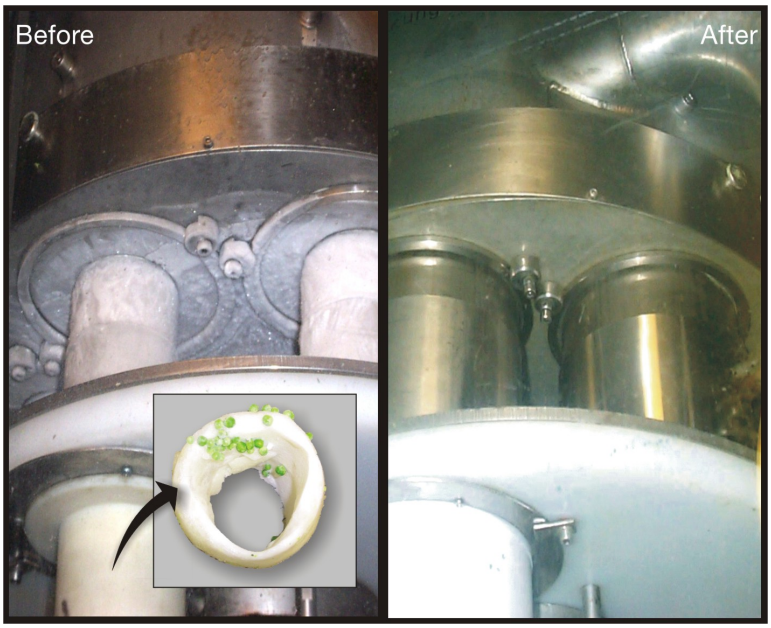
The Problem

Ice formation in the frozen and chilled food industry causes familiar but unwelcome problems. Munters IceDry® successfully tackled the root of the problem by removing the ice within the volumetric fill process at Unilever's Birds Eye frozen peas production plant.

Volumetric fill equipment dispenses product into a pack, by having a container that is filled with product and then passes over a hole to release the product through the chute into the packaging.

The frozen peas leave the cold store and pass via the chilled area, where they are sorted and graded, to the ambient temperature weighing and bagging area. As the peas pass rapidly between the different temperature conditions the peas experience the dewpoint effect of air around the peas creating condensation which rapidly freezes forming ice crystals. There is also ice creation due to moisture migration within the peas reaching the surface. This snow builds up on the surface and can get really bad on humid days.

A number of problems arise: the ice builds up, forming internally on the filling tube constricting the flow of peas into the bags. This is because the tube is colder than the air being pulled through and consequently, moisture was condensing out onto the internal surface of the tube and forming ice.



Prevent sticking during filling and weighing

- Faster Filling
- Accurate Weighing
- Reduced Giveaways
- Free up labour
- Less Stoppages

Munters

The Humidity Expert

This problem was exacerbated by the fact that ice particles from the peas themselves were adhering to the formed ice, in the same way that a snowball is made, and reducing the tube diameter even further.

On cup and collar mechanism, this ice formation prevents free movement of the cup to alter volume which leads to increased 'give aways'. The other benefit of the Munters IceDry® application is the reduction of "give aways" on the volume head of the weighing machine.

The ice build up made the balancing less controllable, and therefore to ensure that Unilever met the required volume levels, the filling machine was set prior to the IceDry® air application, to slightly overcompensate for this ice created control loss.

Both these issues caused productivity inefficiencies due to production downtime, which is measured by Unilever as "non planned stoppages" to production to remove ice build up on the tube, cup and collar and repair any mechanical damage caused by large ice pieces.

The Solution

Munters has installed many IceDry® solutions in freezer and coldstores in the Unilever Group and investigated a desiccant dry air solution to eradicate this ice build up.

The solution was to provide very dry air, at a dewpoint lower than that of the product. This dry air was introduced into the top of the head to flood the filling machine. This prevented the possibility of ice build up from the air and from the product. This ensured effective movement of the cup and collar mechanism. Now with dry air the control can be set more accurately reducing the give aways.

Prior to application of the Munters IceDry, the removal of ice could take typically 15 minutes or in some instances up to 1.5 hours.

This highly successful application, has shown a reduction of non-planned stoppages to near zero levels. The effect stated by Unilever is "You go in there now and you just don't see ice".

It has been so successful that the Unilever team won a Silver TPM (Total Productive Maintenance) European Award within the Group for innovation in process control, which included this dramatic reduction in non-planned production stoppages.

Munters IceDry® has also been successfully applied to multi-head weighing machines to prevent block freezing, deterioration and ensure accurate weighing. It has been used in freezers to dramatically increase throughput and in cold stores to improve safety and storage quality.

Freezing equipment is designed for a specific level of production, and frost on evaporators impedes and interrupts extended operation. It becomes difficult to maintain the temperature inside the freezer, then either it must be defrosted or the rate of throughput lowered to achieve correct freezing temperatures.

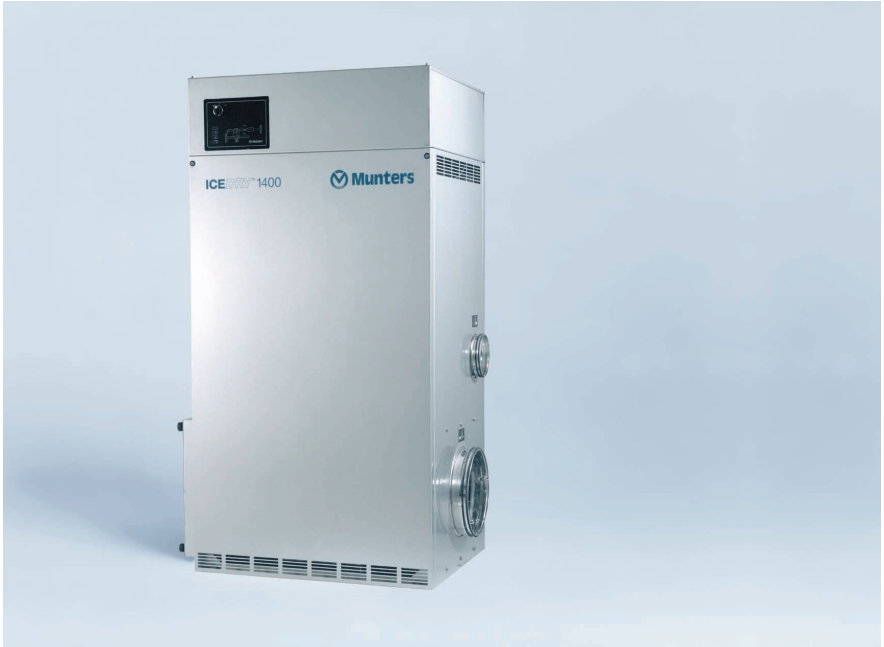
Munters Ice-Dry® runs as well during summer as in winter, providing higher production rates and reduced downtime.

Ice build-up on conveyor belts and cooling coils comes from surrounding air leaking into the freezer as well as from moisture evaporating from the product. Dehumidification practically eliminates frost build-up, resulting in uninterrupted production, reduced defrosting cycles, spoilage and higher profits with rapid drying of the freezer after cleaning

Munters Ice-Dry® removes the moisture in the air that forms ice and causes fog around coldstore doorways, blinding strip curtains and obstructing views in traffic ways. Apart from the safety issues, ice prevents the free operation of cold store and air lock doors, stopping them sealing properly, or lifting them out of their runners.

Ice also effects the efficiency of the refrigeration system, increasing defrost cycles and degrading temperature control. Munters remove the moisture from the air, so it can't condense out and form ice on cooling coils, floors, walls or air locks.

Fork trucks operate at normal speed, doors operate freely and IceDry® speeds up loading and unloading time and with no ice to slip on, no ice on strip curtains or fog around door entrances, visibility is improved



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