

Unilever Says “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 packaging materials. Normally, a container (hopper) is filled with frozen product. At preset intervals holes open in the bottom of the container or hopper to release the product through a chute into the packaging below. The volume of the chute acts as the primary measuring device for the process. A chute that is filled with product correlates to a properly weighed package when the chute opens and fills the package.

The frozen peas leave the cold store and pass through a chilled area where they are sorted and graded before moving to the ambient temperature weighing and bagging area. As the product passes rapidly between the different temperature conditions the peas experience a dew point effect when condensation quickly freezes and forms ice crystals on the surface. This snow build up is more significant on humid days when ambient moisture infiltration increases the total moisture load.

The end result is a series of operational problems: as ice builds up on the internal surfaces of the filling chutes it constricts the flow of product into the bags. This situation was exacerbated by the fact that



Case Study:
Unilever



IceDry® Facts:

- Reduces the formation of ice and frost
- Cuts down on time-consuming and costly defrost cycles
- Saves on energy bills and reduces maintenance
- Reduces the risk of damaged products
- Eliminates the risk of worker injuries

ice particles from the peas themselves were adhering to the inner walls of the filling chutes, further reducing the tube diameter.

On the cup and collar mechanism the ice formation prevents free movement of the cup, preventing it from adjusting the fill volume. Operators are forced to compensate manually since the ice build up made the balancing less controllable. Therefore, to ensure that Unilever met the required volume levels the filling machine was set to slightly overcompensate for the ice on the inside surface of the fill chutes. Inevitably this practice leads to overfilled bags (increased “giveaways”).

Both these issues caused productivity inefficiencies due to production downtime. In Unilever’s facilities these events are considered “non planned stoppages” to allow the production team to remove ice build up on the tube, cup and collar mechanisms. They also utilized this downtime to repair any mechanical damage caused by large ice pieces.

The Solution

Munters has installed many IceDry® solutions in freezer and coldstore applications within the Unilever Group so it drew upon this experience before proposing a desiccant-based solution to tackle the ice build-up problem.

The solution was to deliver very dry air, at a dew point lower than the temperature of the product itself. The dry air was introduced into the top of the filling head to flood the filling machine with dry air. By supplying air at a dew point lower than the surface temperature this approach effectively prevented ice from building up inside the filling chutes. This also ensured effective movement of the cup and collar mechanism. Since the dry air solution has been operating the control can be set more accurately, reducing costly “giveaways.”

Prior to installing the Munters IceDry® system, the removal of ice from the filling machines would require shutting down production for roughly 15 minutes. In some instances, however, this de-icing procedure would take 1.5 hours! With the IceDry® system operational, Unilever has seen a reduction of non-planned stoppages to near zero levels. As stated by Unilever, “You go in there now and you just don’t see ice.”

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

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

Freezers are designed for a specific level of production, and frost on evaporators impedes and interrupts extended operations. It becomes difficult to maintain the temperature inside the freezer as ice layers effectively insulate the evaporator surfaces. Eventually the evaporator must be defrosted or the rate of throughput must be lowered to achieve the correct freezing temperatures.

Munters IceDry® systems run 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 infiltrating into the freezer as well as from moisture evaporation from unwrapped products. Dehumidification practically eliminates frost build up due to infiltration, resulting in uninterrupted production, reduced defrosting cycles, decreased spoilage and greater productivity due to rapid drying of the freezer after cleaning.

Munters IceDry® removes the moisture in the air that forms ice and causes fog around cold store doorways, blinding strip curtains and obstructing views in traffic areas. Apart from safety issues, ice prevents the free operation of cold store and air lock doors, stops them from sealing properly, or lifts them out of their runners.

Ice also effects the efficiency of the refrigeration system, increasing defrost cycles and degrading temperature control. Munters desiccant dehumidifiers remove the moisture from the air so it can’t condense and form ice on cooling coils, floors, walls or air locks. Fork trucks operate at normal speed and doors operate freely. IceDry® speeds up loading and unloading time with no ice to slip on, no ice on strip curtains and no fog around door entrances to reduce operator visibility.

