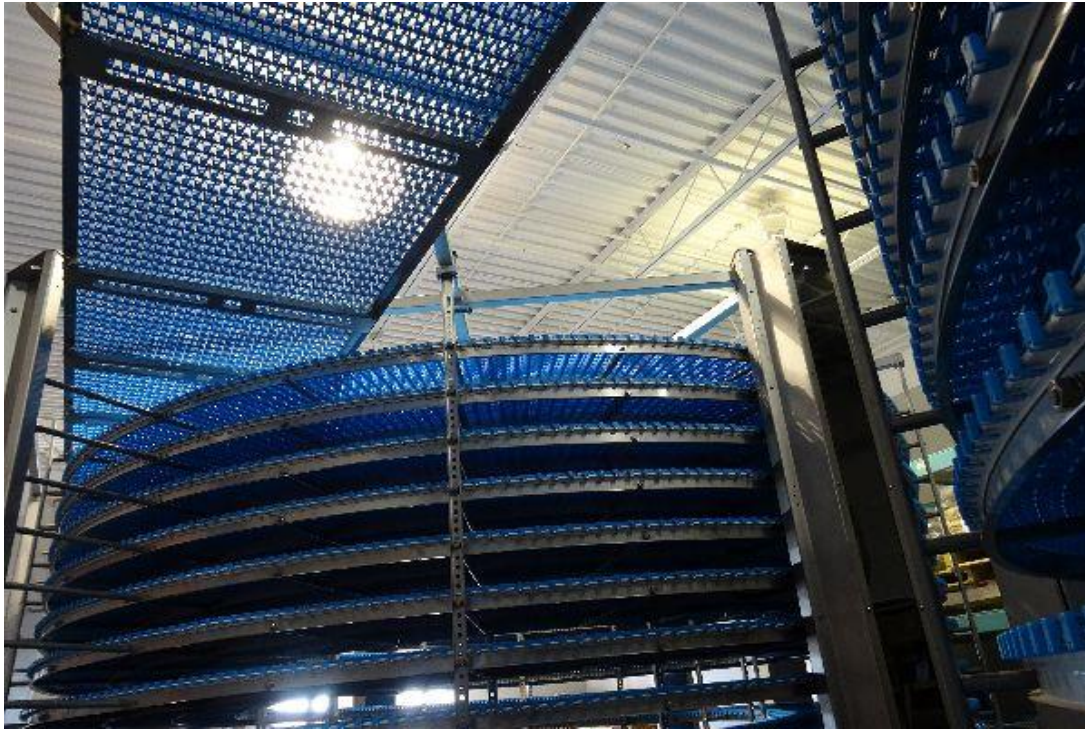




Increasing Efficiency in Spiral Freeze Systems for Food Production



The [spiral conveyor](#) has become a standard across many manufacturing and production environments because of its space saving and increased production throughput abilities. But few sectors rely on them more than food and beverage production as an integral part of the cooling process.

Quality, freshness, throughput maximization, and energy efficiency are all at odds in food production from baking and glazing processes where cooling is integral to the process. These processes must seamlessly integrate with spiral conveyors, the more specialized spiral freezers, and the entire conveyor system in complex ways to go from production to packaging.

Cooling is such an integral part of food production that it's difficult to identify any of its sectors that don't rely on a controlled rate of cooling. In fact, the spiral conveyor and the spiral freeze conveyor have a symbiotic relationship with cooling and freezing processes in food production. This tight relationship requires spiral conveyor manufacturers to understand how those processes intersect to meet the broadest set of food production and packaging needs criteria.

Cooling, Freezing, and Spiral Conveyors

Frozen foods require freezing before shipment, while many other food products require cooling after a baking or glazing process. Both processes have vastly different temperature thresholds to achieve desired results but they use somewhat similar processes. The mechanical or cryogenic refrigeration methods employed by most spiral freezers pump high-velocity air over the product horizontally or vertically with different airflow configurations to speed or slow freeze times.

Cryogenic freezers use gases like carbon dioxide or liquid nitrogen at low temperatures applied directly to the food to speed the freezing process. Circulating refrigerant and heat exchange processes reduce product temperatures in mechanical freezers. They both rely on the spiral conveyor working



within an insulated enclosure to move the product through the cooling process for a set period before the conveyor system transfers them to the next process.

Spiral freezer manufacturers in Canada and those also serving the USA design and build their systems to meet the complexity needs that come with food and beverage production processes. But there are those conveyor manufacturers that have developed specialization in this area as well.

Cooling and Freezing Within Holistic Conveyor Designs

Spiral freeze conveyor and conveyor system manufacturers must thoroughly understand the energy needs for cooling and freezing. But conveyor system manufacturers that are also spiral conveyor manufacturers have additional challenges. They must also develop holistic conveyor systems that span production lines to packaging and palletizing where cooling or freezing areas are only part of the production process.

Leading conveyor system manufacturers must understand the needs of the entire conveyor system and the different means of spiral freezer processes to create optimum conveyor system designs. These manufacturers are often aligned with spiral conveyor manufacturers since they build and design many standardized conveyor modules to create custom conveyor systems.

Their ability to deliver highly effective and innovative conveyor designs for food production hinges on their ability to ensure precise integration between the conveyor system leading to and following the spiral freezer. This is the only way to ensure their systems can meet each production environment's demand for maintaining the highest product quality and throughput while meeting energy efficiency parameters.

There are many ways to introduce efficiency improvements that can save energy while improving product quality and throughput. The spiral freezer system's airflow optimization can affect energy efficiency. But someone must carefully calculate it to match target temperature and process completion that factors in conveyor speed and product throughput parameters.

Increasing Spiral conveyor Cooling and Freezing Efficiency

The best approach to managing the freezing/cooling process is through monitoring and control systems that integrate with spiral conveyor and conveyor system motor control. The attenuation and monitoring of these systems can achieve significant annual energy savings while meeting production throughput parameters to meet supplier and retailer needs. That's why spiral conveyor manufacturers must understand spiral freeze design parameters and the energy saving solutions that can include:

- Variable Speed Drives (VSDs) for fans
- Freeze time increases matched to conveyor speeds and lower air velocities
- Adding additional monitoring and automation that integrates conveyor systems, spiral conveyor/spiral freeze conveyor systems
- Innovative spiral conveyor system designs

Spiral conveyor manufacturers also factor in travel length, product orientation and any product diverting need into their modular design parameters to meet customized system design needs for each facility. This modular approach makes for easy system installation and modification while considering manufacturing footprint.

The goal is to develop a conveyor system and integrated spiral conveyor system capable of operating across wide temperature bands with optimum chilling and freezing process performance. This must also encompass continuous product flow, optimum travel speed, and precise manufacturing process



product arrival. These all come together precisely to deliver precise temperature-controlled drying and cooling times to ensure maximum throughput and highest quality.

Conovey partners with the top spiral conveyor manufacturers like Hollitherm to deliver the ideal modular conveyor sections and parts for innovative food production conveyor systems. This ensures that customized designs can take varied products that are discharged from spiral freezers or coolers and deliver them for further processing and final packaging while maintaining the highest quality, maximum product throughput and greatest energy efficiency. To learn more about Hollitherm spiral conveyors, follow this link.

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