Case Study: GEA AY-Series IQF Tunnel freezer helps Enfield Farms reduce costs while maintaining superior product quality

Eliminates the need for liquid nitrogen or other cryogenic crusting processes

“This freezer has reduced our operational costs tremendously, while improving product quality.”

The GEA AY-series freezer

Capable of processing 1.5 to 15+ tons per hour (based on green peas)
Perfect IQF quality with long wave fluidization™
Able to freeze soft raspberries without pre-crusting with liquid nitrogen
Low product dehydration with short freezing time
Optimum energy consumption
The most hygienic freezer design on the market today
Challenges preserving raspberries
Product quality is critical to raspberry processors, who long have faced challenges in maintaining the delicate attributes of the berry during the preservation process. The raspberry’s hollow shape and sensitive texture makes it susceptible to crushing, which can turn the berry into a jam-like substance. To maintain the berry’s shape, liquid nitrogen crusting freezers have been used in front of the traditional IQF raspberry freezer as one of the few viable methods of conditioning the berries before deep freezing. However, the high costs associated with the use of liquid nitrogen has long left fruit processors seeking out a less expensive solution while still maintaining the quality of their frozen berry products. Such was the case for Enfield Farms in relation to their frozen raspberry products.

“We take pride in using the most progressive farming techniques and latest technology in processing to produce exceptional fruit for our customers,” said Andy Enfield of Enfield Farms. “We did not have a way to preserve our raspberries that would ensure the quality of the product without liquid nitrogen. However, using liquid nitrogen can get very expensive, as we were using about 2–3 tanker loads per day with our old tunnel. We wanted to eliminate the use of liquid nitrogen and find a way to maintain the high quality of our product, without the huge expense.”

Another challenge in maintaining adequate product quality is broken pieces of fruit clumping of raspberries during the freezing process. These can occur through uneven temperature distribution during the freezing process. These can occur through uneven temperature distribution during the freezing process.

A cost-effective alternative to liquid nitrogen and cryogenic crusting processes
After hearing from customers about their challenges in freezing raspberries in a cost-effective manner, that would still maintain quality product standards, GEA Refrigeration Canada, formerly GEA Aerofreeze Systems, responded to the market’s need for an improved, yet lower operating cost, method of freezing raspberries without the use of liquid nitrogen. The company’s new GEA IQF Tunnel Freezer, referred to as the GEA AY series (Aerofreeze), eliminates the need for liquid nitrogen or other cryogenic crusting processes. The tunnel’s fully-welded, enclosed design helps provide a powerful and yet gentle airflow together with specially designed belt conveying system to evenly freeze the berries to the highest Individual Frozen Quality. The freezer ensures product quality through a combination of an even air distribution, higher air pressure than conventional belt freezers, and mechanical belt agitators. The result is ideal freezing conditions while maintaining product quality with reduced clumping and breakage. In addition, the freezer operates at an economical operation at a suction temperature of -35°C/-31°F, which offers more than 20% energy savings for the processor compared to -40°C/-40°F, which is often required by other freezer suppliers.

To be sure, Enfield performs a variety of tests including picking berries off the discharge and squeezing them. If the berries separate into individually frozen raspberry seeds, it is around the right temperature. The core of the actual fruit is inspected for freeze consistency as well as from the freeze consistency from product across the belt. It is important that the IQF is producing consistent fruit temperature across entire width of the belt as once the fruit is packed, any temperature differential can affect the final product. Quality inspectors will collect small buckets of berries randomly and inspect them for damage, freeze quality and give it a letter grade rating, of which Enfield earns the United States Department of Agriculture’s A-grade rating. By definition, to qualify for the USDA’s A-grade rating, the quality of frozen raspberries possess similar varietal characteristics, possess a bright, practically uniform typical color; are practically free from defects, possess good character, normal flavor and odor, and score not less than 85 points when scored in accordance with the scoring system. Enfield’s products exceed these standards.

“There is no other freezer currently available that can handle this type of product and deliver the required product quality,” said Robert Laflamme, president, GEA Refrigeration Canada, Inc. “We’ve been working over the past several years to develop a freezer that meets the unique needs of this market, and are pleased that Enfield Farms is realizing benefits.”