FRESH PRODUCE INDUSTRY

IceCOLD®

CASE STUDY

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Demonstrating the extent and range of value, that the IceCOLD® Catalyst delivers across all industries is an ongoing, dynamic process, which continues to produce positive and beneficial results.

Background

The Fresh Produce Industry is a particularly interesting study, due to its reliance on cooling and/or refrigeration throughout the supply chain. Typically, the most compelling incentive for installing the IceCOLD® Catalyst, is reducing operating costs. Cooling and refrigeration can account for over 50% of an organization's electricity bill – the ability to reduce this component of energy cost by 10% to 20%+ is significant. However, our discussions with the Fresh Produce Industry, revealed a different category of incentive. When processing fresh fruit, which is harvested as it ripens, 'time' becomes the critical factor. In this case, saving electricity/energy takes second place to optimizing the 'speed' at which a set-point temperature can be reached, during pre-cooling.

Test Scenario I

A leading producer of fruit and other fresh produce, based in the South East of the United States, decided to conduct a series of tests at the company's Florida pre-cooling facility. The objective was to prove that, in any given timeframe, pre-cooler units treated with the IceCOLD® Catalyst, would process more product than untreated units.

In our test case, the temperature of harvested fruit (Strawberries) averaged over 80 degrees Fahrenheit (26.7 degrees Centigrade). Before freshly harvested Strawberries can be safely shipped, the temperature of the fruit pulp must be reduced to approximately 34 degrees Fahrenheit (1.11 degrees Centigrade).

The first pre-cooler unit (Unit 1); was treated toward the end of the winter strawberry season. Because the tests were planned with pre-coolers operating at full capacity, the natural reduction in end of season volumes resulted in the first test being switched from strawberries to green peppers, which have a target shipping temperature of 40 degrees Fahrenheit (4.44 degrees Centigrade).

For seven days, Unit 1 and its operating environment, were carefully measured, to establish a normalized performance baseline, prior to installing the IceCOLD® Catalyst. Data loggers were used to measure ambient temperature, amp draw, supply air, vent air and most importantly in this test, time to achieve set-point temperature.

When the performance baseline had been established, the IceCOLD® Catalyst was installed in Unit 1, and the measurement protocols continued for a further twenty one days.

Results

Despite the test being conducted in the challenging conditions of a working agricultural site, data analysis showed an immediate 15% improvement in the performance and efficiency of Unit 1.

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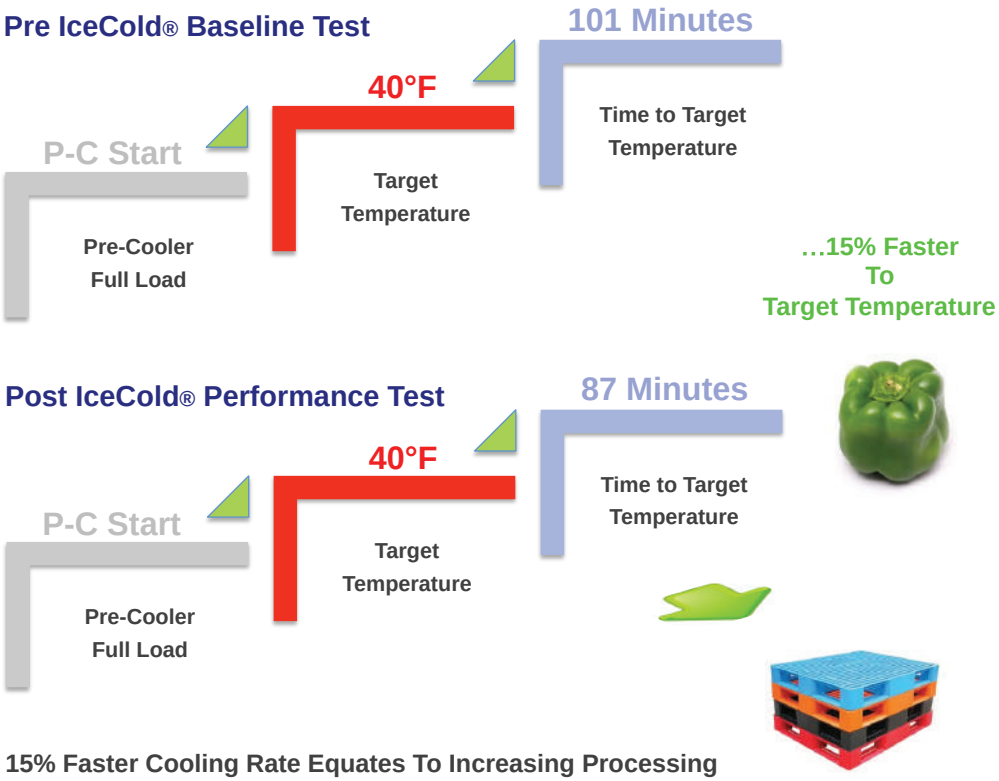

15% Faster Cooling Rate Equates To Increasing Processing Capacity Of Existing Pre-Cooler Units By 84 Additional Palettes Per Day

Although the test, conducted on Unit 1 was an outstanding success, 80% of the producer's business is strawberries. So while peppers are hot; in this case, the hotter question was whether we could consistently reduce the time it was taking to cool strawberry pulp, to 34 degrees Fahrenheit (1.11 degrees Centigrade)? Unlike peppers, which are largely hollow, the greater density of strawberries demands cooling of both the outer surface of the fruit and also the pulp, where most of the post-harvest heat is retained.

Test Scenario II
With one important distinction, pre and post testing of Unit 2 followed the same methodology as Unit 1.

When the pre-cooler had received a full load of palettes and clamshells, sites were selected to measure temperature-drop at locations where there was a measureable variation in airflow. At each location, data logger probes were inserted directly into the strawberry pulp.

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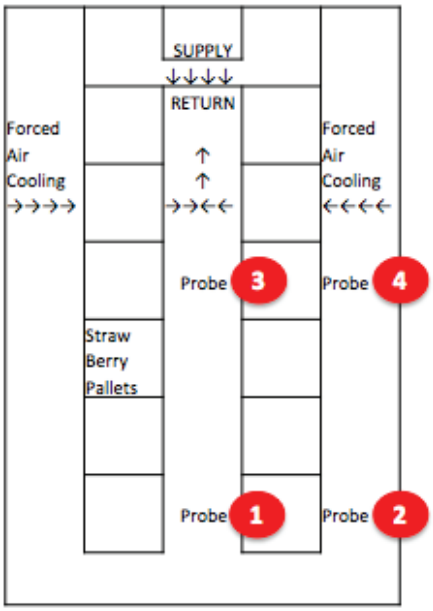


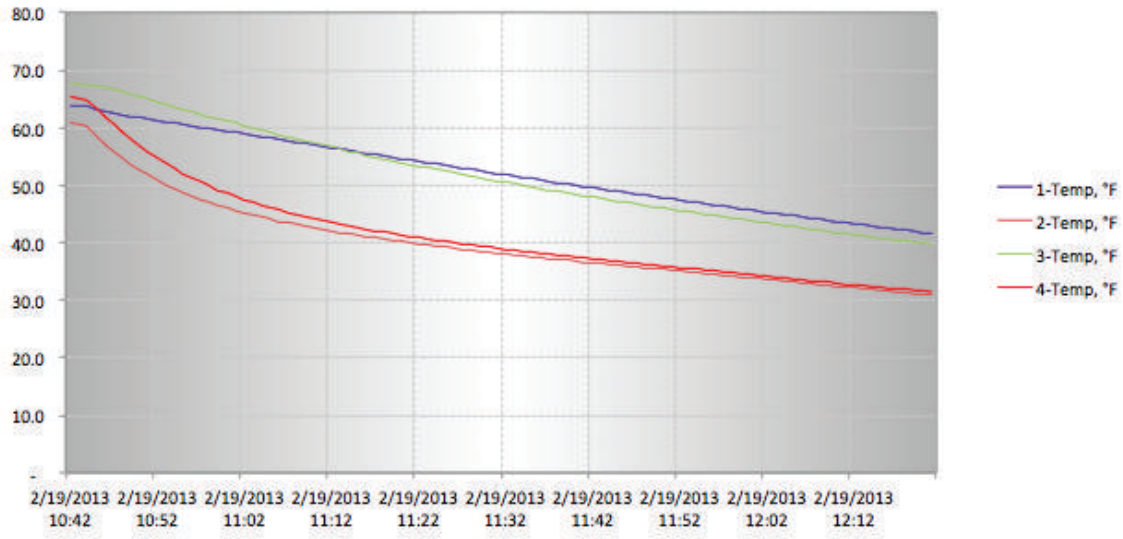
Results

Test data were treated using methodologies developed in the physics of radioactivity and known as “half-life of radioactive isotopes” (the time required for an isotope to decay half of its initial mass).

In our case, we compared times required for dropping half of the initial temperature differential; half of the difference between the strawberries’ initial temperature and the required final set-point temperature of 34 degrees Fahrenheit (1.11 degrees Centigrade).

This approach is in complete compliance with ASHRAE’s recommendations for data analysis in commercial fruit refrigeration.

Graph shows rate of temperature drop at all 4 probe locations following installation of IceCOLD



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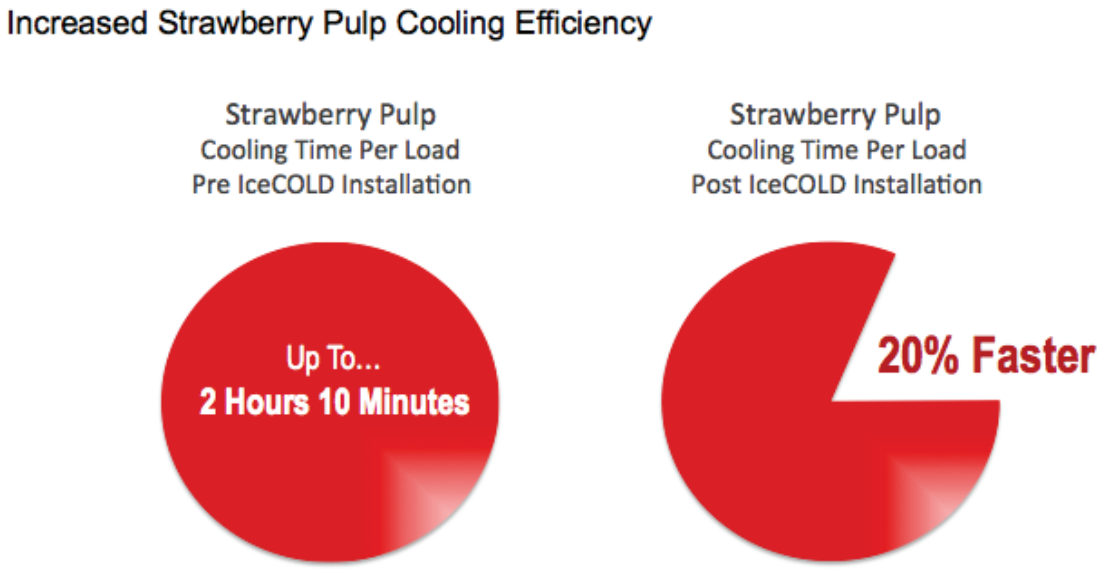
After applying the IceCOLD catalyst to Unit 2, a stable increase in the rate of cooling was observed, (in Degrees F/min), rates ranged from 10% to 30%, related to the respective locations of the four loggers. This increased rate, (speed of cooling), indicates higher efficiency and can be attributed only to improved colder airflow. It confirms the expected improvement to the producer's pre-cooler refrigeration system. Averaged across all four data-loggers, strawberry pulp reached its required set-point temperature, 20% faster.



There is an interesting postscript to the tests conducted for this fresh produce supplier.

The company CEO asked whether the teams, responsible for loading the pre-coolers and monitoring the cooling process, had noticed any differences between the treated and untreated units.

The operations teams were not aware of the exact details of the project, or which units had been treated with IceCOLD.

When the teams were confronted with the CEO's question; unhesitatingly, they responded that two units were like "rocket ships" compared with the rest of the pre-cooler line-up and they always prioritized these units when they faced pressure situations, related to high volumes or tight timelines.

They identified the "rocket ships" as Unit 1 and Unit 2!