

LOEWS CORONADO BAY RESORT & SPA

September 8, 2011

Mr. Brian A. Manning
 Director of Engineering
 Loews Coronado Bay Resort & Spa
 4000 Loews Coronado Bay Road
 Coronado, CA 92118



Walk-In Freezer

Dear Brian,

Thank you for the opportunity to conduct a Proof of Performance with the installation of IceCOLD® into the bakery walk-in freezer located at The Loews Coronado Bay Resort & Spa in San Diego, California.

Using a defined protocol methodology, we conducted the Proof of Performance on this installation to demonstrate the savings the Loews Coronado Bay Resort & Spa will garner as a result of treating their refrigeration units with IceCOLD®.

The following report outlines the methodology, results of the Proof of Performance, efficiency improvement and ultimate savings obtained:

METHODOLOGY

Purpose:

Establish a baseline for electricity cost, return and supply air temperatures, under normal operating conditions of a walk-in unit at Loews Coronado Bay Resort & Spa in San Diego. Measure the difference between cost of operating unit before IceCOLD® and after IceCOLD® to determine efficiency improvement and expected energy savings.

Brands: Heatcraft (Model: ELC122FS2)
 Copeland (Model: NRD1-032E-TFC-800)

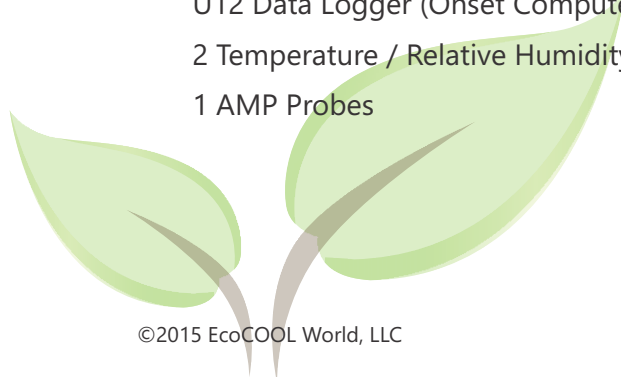
Use: Freezer

Refrigerant: R22

IceCOLD® Installed: 7 ounces

Tools Utilized:

- U12 Data Logger (Onset Computer)
- 2 Temperature / Relative Humidity Sensors
- 1 AMP Probes



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Probe Placement:

Channel 1: AMP Probe (lower amp reading) placed on the line side voltage on the compressor

Channel 2: Temp/RH probe (lower temp reading) placed on the supply air from the evaporator

Channel 3: Temp/RH probe (higher temp reading) placed on the return air on the evaporator

Units Measured:

Amperage: Current draw on the L1 (overall amp draw) compressor unit

Temperature/Relative Humidity: On the return and supply air on the evaporator unit

Volume of IceCOLD® Installed:

Using a standard formula ratio of 1 ounce of IceCOLD® to 1 ton, 7 ounces were installed on Monday, August 8, 2011.

Units Measured:

AMP: Amount of electricity needed to operate system

Temperature/Relative Humidity: affecting performance of system

The data logger collected the following data:

As this is a refrigeration unit (walk-in freezer), no cooling degree days were used in the calculations. Improvement is based on reduced electricity consumption and improved cold air into the unit. To ensure a comparative analysis, four days were chosen in the baseline period for comparison to the exact same days in the post period. Three of those days were Saturday and Monday and Tuesday which represent a sample of days in terms of weekend and week days.

Baseline:

August 12, 14 and 15, 2011 were chosen to represent baseline

Total amps for the period = 25,847.21

Average Amps: 9.478

Return Air average = 10.75°F

Supply Air Average = -5.715°F

CDD: 1

Post Installation:

September 3, 5 and 6, 2011

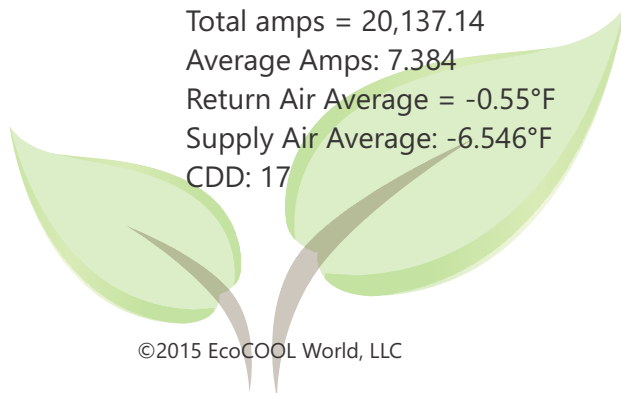
Total amps = 20,137.14

Average Amps: 7.384

Return Air Average = -0.55°F

Supply Air Average: -6.546°F

CDD: 17



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There was total decrease in amps used by 5,710.07

There was a decrease in amps from an average of 9.478 to 7.384 amps

There was a total decrease in supply air of -0.831°F and a decrease in return temperature of 10.20°F .

While the unit is located in the basement and not an influenced by external temperatures to a greater degree, it is worth noting that the CDD in the baseline period was 1 meaning the overall daily temperatures were not very high nor spiked at any given time slot. However, the post period saw an increase in CDD's to 17 meaning the outside temperature was hotter.

Reduction of 22.09% Electricity Use

The lowest supply temperature in baseline was -9.38°F .

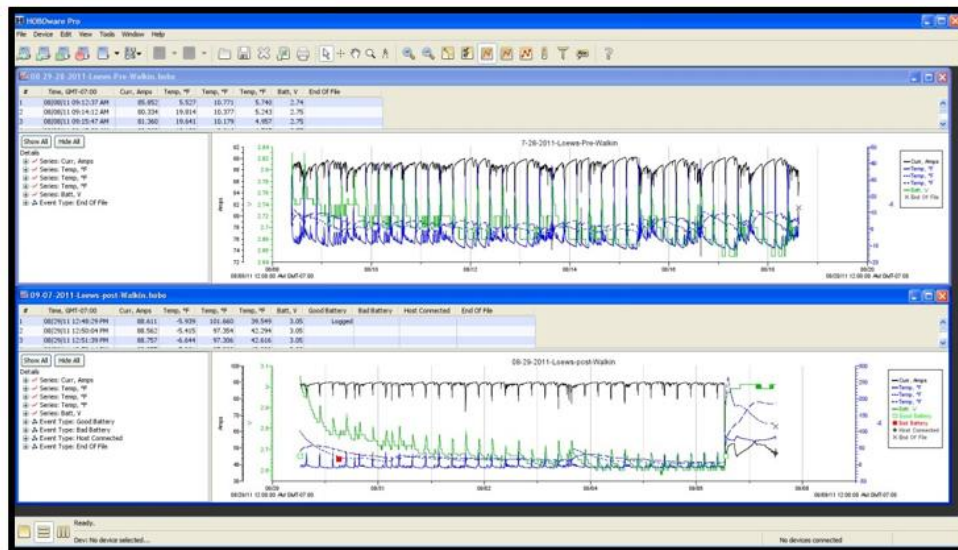
The lowest supply temperature after inclusion of IceCOLD® was -11.29°F

Supply temperature improved by: -1.972°F

The unit is now able to supply cooler air to the unit and as such not only cools the space faster; turns off the compressor more quickly but also is able to keep the space cooler longer with less fluctuation in temperature inside the unit.

22.09% Improvement

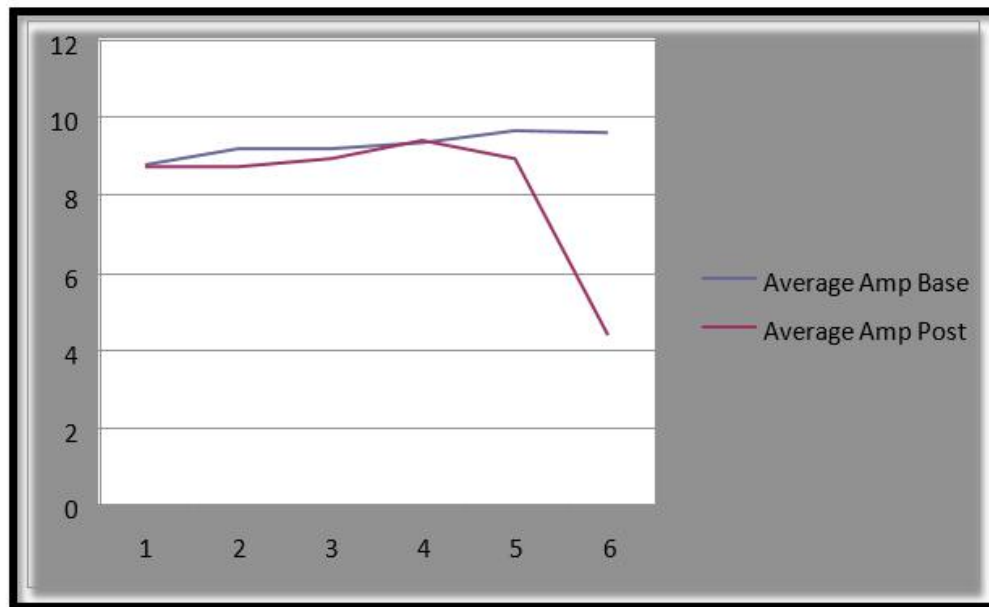
As the graphs below illustrate there is now a very consistent performance improvement in the function of the equipment since the installation of IceCOLD®.



The upper portion of the image above shows the erratic nature of the equipment. Its use of power and production of cold air is inconsistent and has highs and lows plus spots of dark black where power demand is higher. It is clear from this simple view that the baseline function of the equipment was erratic with power consumption fluctuating and temperatures jumping to accommodate the internal heat load. The bottom portion of the image shows how consistent and balanced the performance has become since the inclusion of the IceCOLD®.

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The amperage use in baseline varies within a fairly consistent path and range of consumption. As IceCOLD® begins to react we see a shift in the post use of amps that is slightly below the baseline consumption initially and then suddenly drops off where the full catalytic reaction is beginning to take place. It is clear that IceCOLD® is having a tremendous impact on electricity consumption.



PERFORMANCE IMPROVEMENT

Unit used 22% LESS power to keep the walk-in freezer cooler by reducing the return and supply air by 11.7 degrees. By reducing the delta between return and supply air the content inside the walk-in freezer is less exposed to extreme temperature changes. The compressor does not need to run as often or as long in order to meet and hold thermostat set point.

22.09% less electricity was required for cooling of the space post installation of IceCOLD®

