

BOHN®

IceCOLD®

CASE STUDY

IceCOLD® Performance Test Results



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Executive Summary:

A performance test was conducted on four (4) BOHN Refrigeration systems, two (2) BOHN models: MBZX0250M6CI, one (1) MBZX200M6CI and one (1) MBZ0100M6CI. The test was conducted by the **Frigus BOHN, S.A.** Laboratory, located in BOHN's Merida, Mexico product testing facility. The test was performed by the Director of Frigus BOHN's laboratory and the research team. The purpose of the test was to measure and validate the performance claims made by IceCOLD® technology. The BOHN coolers/ freezer units are the same type and models that are installed in 10,100 OXXO stores throughout Mexico.

The performance test resulted in a reduction of 28.3% KWH. This result is on the high end of IceCOLD's average KWH reduction range, which is reported normally 15-25%.

Several additional strategic considerations apply:

The components within IceCOLD that delivered these results are “dynamic” in nature.

The benefits gained initially by the introduction of IceCOLD into the system are realized for the duration of the system's performance life. As such, there is no need to re-treat refrigeration units with periodic booster applications. In addition, since the investment payback is typically 12 months or less, this results in an annual ROI of +/- 100% for each subsequent year of equipment life.

Carbon emissions / Green House Gases: The carbon foot print and the reduction of GHG is reduced an equal amount, through the use of IceCOLD. IceCOLD Mexico, working with a third party engineering company has developed a Measurement & Validation testing protocol which quantifies the GHG reductions and can produce CO² / GHG reductions that can be converted into Carbon Credits for trading on the World Exchanges.

IceCOLD's energy reducing technology enables systems to run an average of 20% less while delivering a superior pre-installation performance result. This result in MTBM [mean time between maintenance] and eventual system replacement costs are deferred by an average of 20%. The soft savings, derived from extended performance life, are not included in the financial considerations contained within this report.

Project Overview:

The study's objective was to substantiate the performance claims made by IceCOLD. The BOHN laboratory is less than one (1) year old and is equipped with data loggers, measuring equipment for energy, amp draw, temperature(s), system pressure monitors, door opening, timers and heat generators / coolers used to simulate customer usage of the coolers / freezers. The data was collected on 60 second intervals to establish pre-installation baselines and post-installation results for comparisons that show any energy savings due to the introduction of IceCOLD. The unit's energy consumption and performance characteristics were measured for one week prior to the installation of IceCOLD. At the end of week, IceCOLD was installed and allowed to react with the systems for seventy-two (72) hours. At the end of the seventy-two (72) hours of reaction time, the data was recorded for an additional seven days to collect the post-installation performance data. The overriding objective throughout the test was to identify and eliminate all potential variables that could impact the final results. Examples included locked thermostats, cycling heating systems, varying the heat loads to simulate operating conditions such as opening and closing of the doors and loading products in the systems within the environment of typical convenience stores, while insuring consistent operating hours etc.

Systems Tested

BOHN multiple door coolers were used in the testing. The BOHN units represent a typical installation of the refrigeration equipment used in 10,100 OXXO convenience stores. The BOHN laboratory is less than one (1) year old. The equipment tested normally operates less than 8 hours per day, 5 days a week. The laboratory protocols were developed specifically to perform M&V testing on new refrigeration related products and energy management systems, as well as new products designed and produced by BOHN's research and development facilities. The following photos show the equipment and monitoring equipment used.



