



Cost savings of evaporative humidification exceeds expectations for Benchmark

DR Series
MLP RO 800 and ML Solo

- Humidity Control
- Reduced Demand Charges
- Energy Savings
- Low Maintenance
- Eliminate Electrostatic Discharge



Evaporative Humidifiers Provide A Significant Energy Savings and Minimize System Maintenance for Benchmark Electronics

Project Overview

► Benchmark®

Customer: Benchmark Electronics

Location: Nashua, New Hampshire

Application: Electronics Manufacturing

Product: MLP RO 800 and ML Solo

The benefits of Condair's direct room humidification

- Precise humidification control
- Low operating costs, and reduced demand charges
- Minimal maintenance
- A completely hygienic solution

Challenge

Benchmark Electronics is the solutions provider for High Technology OEM customers, providing innovative design engineering services and manufacturing capabilities. The facility in New Hampshire is one of many world-class Benchmark Electronics manufacturing facilities. In this building, Benchmark requires that the environment is held at a consistent temperature and humidity in order to provide reliable finished components to their customers.

The facility consists of over 120,000 square feet of electronics manufacturing, storage and testing, with plans to expand an additional 10,000 square feet in the near future. In order to maintain a 40% relative humidity in the space, Benchmark had been using electrode-type humidifiers with blowerpacks to distribute steam directly into the space. In total, there was 875 pounds per hour of electrode-steam units in the space. With the expansion, an additional 300 pounds an hour was going to be needed to ensure that the space maintained the proper level of humidity year round. The Benchmark Facilities Supervisor suggested that an evaporative system be considered to replace all of the electric steam units, hoping for significant energy savings in the process.



Solution

To meet the needs of the Benchmark Electronics facility, Condair sized and planned a DR Series Direct Room evaporative humidification system. This solution would replace the electric steam units with a hygienic, in-space high-pressure system that includes a centralized pump station and water treatment system and humidification units with high-pressure atomizing nozzles. The space RH would be controlled through eleven humidification zones, each controlled independently. Condair and Norman Associates, the sales representative in the area, laid out and completed the installation of an MLPRO 800 system with 129 ML Solo heads in the summer of 2016. The water treatment system included Condair's proprietary conductance synthesis technology to ensure that absolutely no dissolved minerals are entrained into the rooms' air. After installation, the electric steam units were permanently turned off. Benchmark has also contracted Condair to do the annual maintenance on the system, making it a "set it and forget it" project!

Results

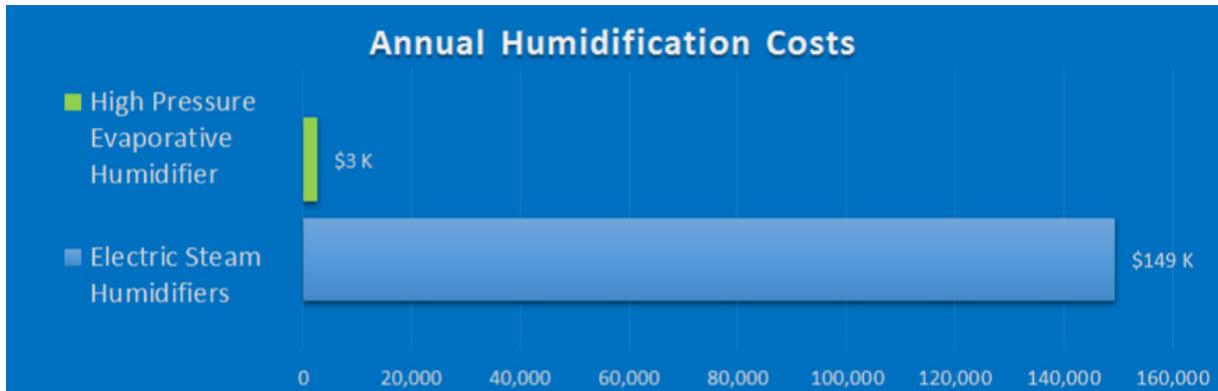
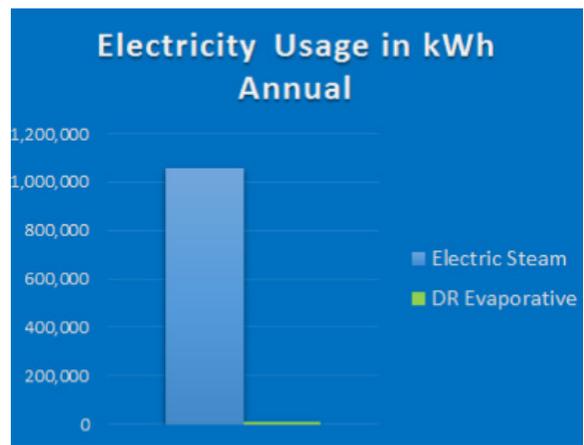
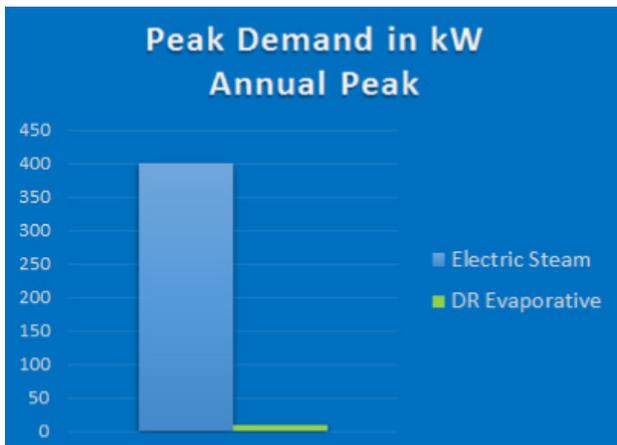
With the installation of Condair's evaporative system, Benchmark Electronics is controlling their humidity levels in space better than ever, with significantly less maintenance time and in a significantly more energy efficient manner. By replacing electric steam with an evaporative system, Benchmark has removed

"The new evaporative cooling and humidification system has exceeded our expectations," said Arthur Ryan, the facilities supervisor at Benchmark Electronics who suggested an evaporative system in the first place. "We are able to leave the system on 24/7/365, and it keeps our facilities properly humidified without our intervention! And with the electrical savings, it paid for itself in short order."

approximately 400,000 Watts of peak electric demand, as well as more than 1 million kWh of annual electrical usage. At average electrical demand and usage rates in New Hampshire, that equates to approximately \$140,000 dollars per year of electrical costs saved, resulting in a payback period well short of two years on the initial investment. Additionally, the evaporative effect potentially saves more than 10% of the electrical cooling costs for the facility. Including water, electrical, and maintenance costs and taking into account evaporative cooling savings, the total annual cost for an electric system versus the Condair evaporative system is estimated on the next page.



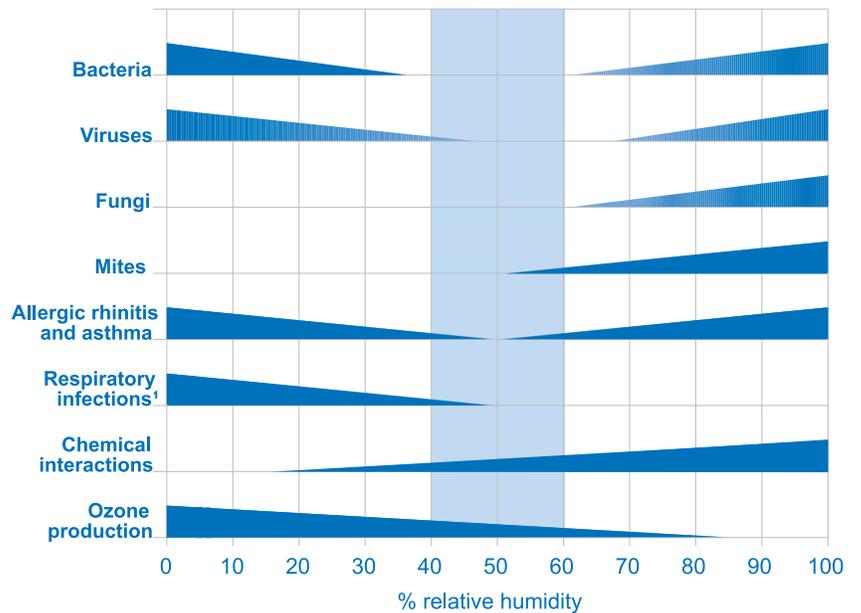
By replacing electric humidifiers with evaporative humidifiers, Benchmark is saving \$140,000 in electrical costs.



The Sterling Chart

The Sterling Chart illustrates how relative humidity affects health and well being and shows that the optimal air humidity level for humans is between 40 to 60% RH. This optimal humidity zone minimises risks to human health from biological contaminants and pathogens.

Colds, viruses, respiratory infections, dry eyes, itchy and cracked skin are all symptoms that are usually prevalent in the cold dry months of the winter when the indoor RH is at its lowest.



¹Insufficient data about 50% RH.

E.M. Sterling, Criteria for Human Exposure to Humidity in Occupied Buildings, 1985 ASHRAE.