THE BENEFITS OF MEEFOG TECHNOLOGY

- Able to provide humidity to a large number of air handlers with a single MeeFog system
- Lower energy costs than a steam humidifier
- Lower maintenance costs

CHALLENGE

The Smithsonian Institution recently acquired a new storage facility to house and restore many of its artifacts. These artifacts require a constant humidity to prevent damage from continual shrinking and swelling as the humidity levels change.

SOLUTION

A single MeeFog humidification system was able to supply up to 540 lbs. per hour of moisture to fifteen separate duct mounted stainless steel humidification chambers, allowing precise control of humidity throughout the facility.

Smithsonian Institutions, Pennsy Collections and Support Center
Landover, Maryland

Lining the National Mall in Washington, DC are some of the Smithsonian Institutions major museums — the Air and Space Museum, the American Indian Museum, the Natural History Museum, the American History Museum, all of which contain a fraction of what’s warehoused at the Pennsy Collections and Support Center.

Within the Pennsy center, one can find rows of 20’ high shelving containing every imaginable type of artifact. The building also holds an extensive textile collection with floor to ceiling racks filled with 18th century pianos, as well as historic films, photos and documents. Since these artifacts are rare in nature, the building needed to follow strict environmental controls to preserve these treasures.
A single MeeFog humidification system was able to supply optimal humidity levels for a limited range of climate zones.

The Physical Site

The Smithsonian Institution recently moved into a leased 360,000 square foot facility, a former furniture warehouse. The new building houses collections for several of its museums, as well as offices, workshops and training facilities. Each of these areas needs to be maintained at the proper temperature and humidity for the material it contains.

Installation Challenges/Specifications

There are 29 separate roof mounted air handlers servicing the building. A single MeeFog™ system was designed to provide humidification to fifteen humidification chambers, each of which can be separately controlled to provide the right level of humidity for the area it serves.

The Installation

One of the major challenges was creating a workable environmental control system for the building. Don Posson was the managing principal engineer from Vanderweil for the project. Most buildings are designed for a limited range of climate zones. In this case there were offices, a café, meeting rooms and workshops that needed to be kept comfortable for humans. Within the archival portions, it was a whole different story. Most of the areas didn’t require

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— Don Posson, Managing Principal Engineer, Vanderweil
The highly reliable, robustly engineered MeeFog rack incorporates a system of high-pressure pumps, which pressurize demineralized water. This ultraclean water flows through a network of stainless steel tubes and then through the revolutionary MeeFog nozzles. Each self-contained MeeFog rack includes a programmable logic controller (PLC) control system that allows the system to operate safely in automatic mode.

The MeeFog system built for the Pennsy warehouse uses a single pump skid to pressurize the water and send it through 2400 feet of high-pressure stainless tubing to fifteen separate duct mounted stainless steel humidification chambers. The pump can provide up to 540 lbs. of water per hour to arrays of impaction pin nozzles within those humidification chambers. The water passes through a .006” orifice in the nozzle and then strikes the impaction pin, which splits the water stream into billions of minute droplets which rapidly evaporate in the airstream. Solenoid valves controlled by the building management system open or close as needed to control the water flow to the nozzles, providing the exact amount of humidification needed at that moment in time.

any extreme temperatures or humidity levels, though one section did have to be kept at 52° and another at 26°. However, the rest of the warehouse the temperature and humidity must be tightly controlled.

“The majority of the warehouse is one climate zone, with a standard humidity and temperature we dictate for the collections,” says Oehler. “We have to avoid wide swings in the humidity. If it swings up and down the materials will expand and contract damaging the artifacts.”

The air in different areas did often need to be kept separate, for example some of the shops had dust collection systems that vented to outside collectors. Others had paint booths or soldering areas with Nederman snorkel exhaust units to remove the fumes. Some specialized labs required once-through air systems. In the end, Posson says there were at least 29 air handlers on the roof to maintain the air quality in different parts of the building.

“There were a lot of specialized areas, each with its own climate control,” he says. “We really wanted to keep the climate zones separated so there wouldn’t be any cross contamination.”

While there were a large number of air handlers, the building was able to get away with a single humidification system. Initially the warehouse was going to use a boiler, but this would have been too costly. Instead, they went with a MeeFog high pressure system which is much cheaper to operate and easier to maintain.

“The MeeFog system is more energy efficient, especially for a building that is getting humidification throughout the greater percentage of the year,” says Posson. “We were originally moving in the direction of a steam boiler system and steam injection, but the Smithsonian brought up that they were going to be spending a lot of money on utilities, so we looked at the MeeFog system as an option to keep the operational cost down.”
About Mee Industries Inc.

For over 45 years Mee Industries has led the world with innovative water fog technology. MeeFog systems are used to humidify and cool many industrial, commercial and agricultural processes and to create interesting and dynamic special effects. Today there are over ten thousand MeeFog systems in use around the world. The MeeFog team looks forward to helping you with your fogging project.

The Mee Advantage: Experience, Innovation, Performance

In 1969, Thomas Mee Jr. a former Cornell University research scientist, founded Mee Industries. The company originally manufactured high-tech electro-optical, meteorological instrumentation, but by the early 1980’s, high-pressure water fogging had become the main focus of the company. Today, Mee Industries provides innovative, highly effective, economical fog solutions for many industrial applications including gas turbine inlet-air fogging, commercial and industrial building humidification and cooling, data center humidification, outdoor air conditioning, greenhouse climate control, wine barrel storage humidification, as well as dynamic special effects for the entertainment industry and theme parks.

Industry Leaders — Focused on Fog Technology

Mee specializes in providing custom-engineered, turn-key high-pressure fog solutions. We are committed to researching, developing, marketing and supporting the most innovative and reliable fog systems available anywhere in the world.