THE BENEFITS OF MEEFOG™ TECHNOLOGY

- Lower maintenance costs
- Lower energy usage
- Flexible design
- Dust-free environment

CHALLENGE

Grand Valley State University was constructing a new four-story building to house its Business College. It needed a centralized humidification system that would service six air handlers distributed throughout the building.

SOLUTION

A single MeeFog humidification system was installed in the mechanical room, with pipes distributing the pressurized water to fogging nozzle arrays inside each air handler.

As the Associate Vice President for Facilities Planning, James Moyer is responsible for balancing the needs of the university with its available funds, whether coming from tuition, the state or private donors. One of the challenges is to control energy costs. He points out that a university operates under a relatively fixed income scenario since the tuitions and state funding are set well in advance. Designing more efficiency into a building shifts part of the energy cost to an initial capital expenditure, reducing the risk of later energy price fluctuations. This decision to reduce energy costs led the university to construct its first LEED building in 2004 which was a very difficult process considering it was also the first for its design firm. But that didn’t mean the university would abandon its energy efficiency efforts. In fact, it set LEED Silver as the standard for all its new buildings. But it wasn’t going to prioritize energy efficiency over all else.
The Physical Site

L. William Seidman Center, Grand Valley State University’s (GVSU) eleventh LEED certified building, is a four-story, 127,643 square foot building opened in 2013 to house the university’s Business College. The chiller, boiler, pumps and MeeFog skid are located in a fourth floor mechanical room. The six air handlers are distributed throughout the building.

Aesthetic Efficiency

By using a high efficiency variable air volume (VAV) HVAC system with occupancy and CO₂ sensors, a centralized MeeFog humidification system, perimeter heating and other methods, the Seidman Center achieves 38% lower energy usage than the baseline ASHRAE standards, according to a study by the Department of Energy’s Pacific Northwest National Laboratory. And it got a good return on investment while meeting GVSU’s operations and maintenance requirements.

The university doesn’t try to achieve energy savings at the cost of additional maintenance. Nor does it sacrifice appearance or comfort.

“There is no place in the building where you can see any mechanical traces from the outside, which made the design challenging,” says Rod Boerman, Senior Mechanical Engineer at Diekema Hamann Engineering, who did the initial mechanical design work for the building when he was with Integrated Architecture.

“MeeFog is a wonderful system. First time we used it was in 2002 for a laboratory, and with the purified water you don’t get the buildup of crystals and other things that can come from steam.”

— James R. Moyer, Associate Vice President for Facilities Planning
The MeeFog system requires a lot less maintenance than a steam based system,” says Moyer, “and it can respond quickly to the requirements of the building.” The MeeFog system also uses waste heat in the return air to evaporate the fog so the energy consumption is much less than steam humidifiers.

Providing Clean Humidification

At GVSU, MeeFog humidification is primarily used during the winter, when the relative humidity can drop to 10%, but it can also be used to maintain tight humidity control year round in laboratories as well in galleries and theaters where dry air can damage artwork or musical instruments. In the Seidman Center, the MeeFog system was first put to use during construction. The walls are lined with beautiful maple laminates, which could be damaged by low humidity. According to Ken Myers of Quality Air, in order to maintain indoor air quality during the extensive millwork phase, the air handlers were run using 100% outside air and MERV13 filtration to keep particles from building up in the ducts, or on the walls and ceilings. Humidity was needed both for occupant health and to preserve the construction materials.

“They are able to maintain tight control over the humidity,” says McWatters, “and with the purified water going to the nozzles it keeps the wood dust free.”
A typical fog system uses one horsepower for every 600 lbs. of water, which is 3% of the energy usage of compressed air-type systems and about 1% of the energy usage of electric steam systems.

### ENERGY COST COMPARISON CHART (ANNUAL)

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>MeeFog™ System</td>
<td>$706</td>
<td>1%</td>
</tr>
<tr>
<td>Ultrasonic</td>
<td>$8,467</td>
<td>6%</td>
</tr>
<tr>
<td>Compressed Air</td>
<td>$13,054</td>
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<tr>
<td>Steam to Steam</td>
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<tr>
<td>Gas to Steam</td>
<td>$74,966</td>
<td>49%</td>
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<tr>
<td>Electric Steam</td>
<td>$153,931</td>
<td>100%</td>
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</tbody>
</table>

**Assumptions:** $.10 per kWh, $1.20 per therm, 3500 hours operation, 1000 lbs. per hour moisture output.

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**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.