



Eaton-Williams humidifiers reduce museum's energy costs and provide greater operational control



Case Study

Eaton-Williams® is helping the National Museum of Wales to benefit from substantial savings by replacing its aged humidification system with VAPAC® resistance heater humidifiers.

The units have been installed throughout the building to enable the museum to meet its requirements for controlled temperature and humidification whilst delivering energy saving and reduced maintenance costs. Introducing moisture into air is a simple enough process but water quality is a major consideration when it comes to humidification. Being located in a soft water region presented a number of obstacles for the museum which was facing increased energy bills and maintenance costs. The solution lay in the installation of over 50 VAPAC resistance heaters in three phases, to provide reliable closer operational control 24/7 throughout the museum where humidification is a critical element of the buildings services function.

Wales' national museum is filled with hundreds of objects containing a variety of hygroscopic materials including wood, bone, canvas, fabric, paint and ceramics that without humidification control could be subject to cracking, chipping, peeling and distortion. Humidification is critical and the museum aims to maintain 40% to

60% relative humidity (RH).

In addition to its own collections the museum regularly hosts exhibitions which include numerous items on loan from other museums, but what visitors don't see is that the preservation of exhibits relies on providing carefully controlled temperature and humidification.

Previously the museum was reliant on multi-vendor systems and during critical periods struggled to maintain optimum environmental conditions. The properties of the water in the area are such that the resistance heater series were the most suitable solution.

Three resistance humidifiers were installed on a trial basis in the East Wing with the temperature being maintained at 21°C +/- 1°C with humidity holding at 55%RH +/-5%.

LR units combine the high level technology of electrode boiler units with resistance heater elements, mounted in a long life stainless steel cylinder for durability. A polypropylene lining enables the LR to be used for thousands of hours of operation. When used with Base Exchange softened water, most scale precipitation is 'soft' and can be removed by flushing and wiping down the unit as part of a low maintenance programme.

"Water type can have a great impact

on humidifier performance, maintenance requirements, vapour quality, and efficiency of operation. The LR units proved their worth so we looked at replacing the other systems in two phases," says Paul Brooks, the museum's Building Services Engineer.

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The museum's curators were driven by the need for accurate and reliable control to protect exhibits as well as the ability to generate graphs and data, but Paul Brooks was keen to also keen to control costs.

"Greater control and integration with our building management system were essential but the running costs of the existing systems, maintenance and spares were also factored into the decision-making process and whether savings could be achieved in these areas," adds Paul.

A further 25 units were ordered for the second phase with a further 25 units installed as part of phase three. Now all the main galleries, storage areas and laboratories are conditioned.

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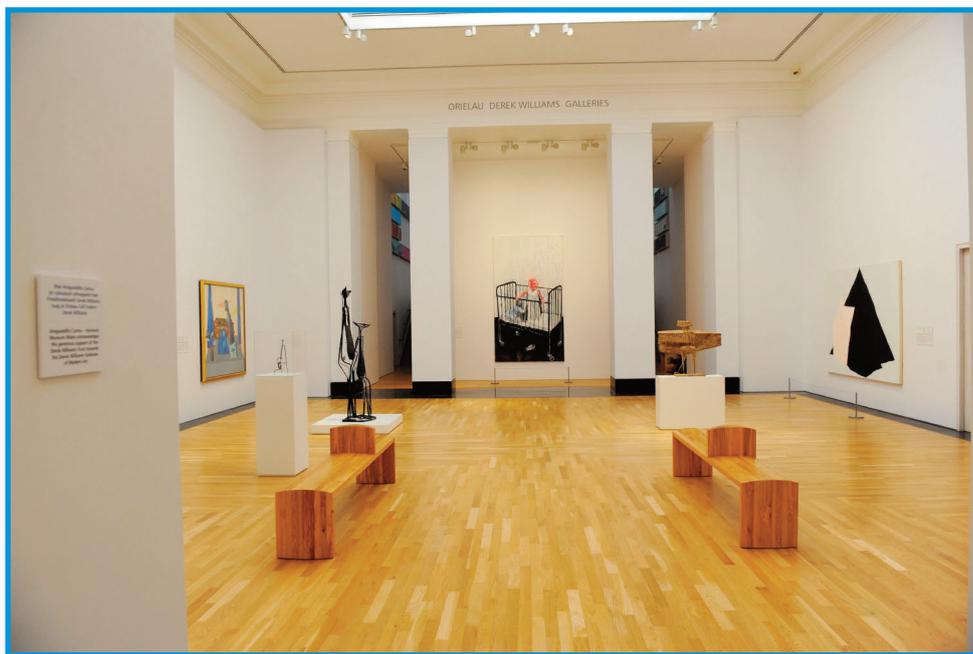
Introducing a new humidification system was not without its challenges. The museum's exhibits are diverse and exhibits on loan often have their own criteria to meet insurance requirements. Temperatures can fluctuate in the galleries as environmental conditions can drift when doors are opened and shut frequently. An influx of visitors, particularly when coach parties arrive, can also affect the environment quite dramatically, more so in the main hall where there is no buffer zone. Galleries 11-13 have buffer zones and temperature and humidity swings are less of a problem.

The solution was to ensure the humidifiers' output is infinitely variable with a set point 55% RH ensuring that the correct amount of moisture is introduced into the galleries at all times. For every 1% below 55%RH the units' variable output will rise by a nominal 10%.

To prevent humidity levels increasing above the required level, chillers are programmed to de-humidify when required. The museum has now reduced the service intervals on the humidifiers. This is now set at 2,500hr intervals. The museum is also benefitting from a planned preventative maintenance programme, remote diagnostics and hand held controllers.

"By having greater operational control, we have managed to significantly reduce our energy costs, maintenance programme and improved our carbon footprint," says Paul.

With all publicly run museums under pressure to reduce costs, the National Museum of Wales is an example of the savings and benefits that can be achieved.



LR Humidifier Benefits

- Seven units available ranging from 5-60Kg/hr
- VAPANET® control system provides easy access to performance information
- Variable water types
- Stainless steel cylinder with removable liner