



Protecting print with humidity control

Optimising the performance of presses and finishing equipment is central to a successful and profitable print company. John Barker of Humidity Solutions explains the importance of humidity control.

Print companies invest thousands of pounds in their printing and finishing equipment as well as paper stock – so it makes sense to invest a little more to ensure optimum performance and long life for that equipment. To that end, there are very clear and well documented benefits to maintaining effective humidity control within a print environment – whether it be digital, litho or web.

Without some sort of humidity control, machines and paper stock are exposed to uncontrolled environments where climatic conditions may be changing on an hourly basis. Low humidity, for example, can draw moisture from the paper, potentially causing curling, tight edges due to shrinkage and build up of electrostatic charge.

Inevitably, this has a deleterious impact on the print process, reducing machine speeds and increasing the risk of paper jams. It may also affect the quality of the final product, harming your reputation with customers. Similarly, high humidity will affect the performance of both paper and machines.

Stable humidity reduces static and improves the dimensional stability of the paper, thereby avoiding these issues.

This requirement is reinforced by press manufacturers, which require effective humidity control to maintain effective performance of their equipment. For instance, all digital print machine manufacturers have an environmental quality zone detailed in their operating manuals – generally 18 to 25°C and 40 to 60% relative humidity. Within these conditions the machines will give their best performance, but such conditions will not occur naturally for much of the year.

For instance, humidity levels are naturally low at certain parts of the year but because of the heat output of digital printers many companies install an air conditioner for cooling, which dries the air even more so increasing the issues of low humidity unless it is properly managed. This issue is clearly reflected in the many urgent calls we receive from printers every winter to help resolve problems with low humidity.

To add a humidifier greatly improves the humidity control but temperature and humidity are so closely linked that a solution where the components are controlled together provides the best and most efficient solution.

Air quality

Just as importantly, humidity is an important contributor to indoor air quality, which impinges negatively on the health and productivity of staff and can also influence absenteeism and staff turnover. For example, low humidity – which is the most common problem in the UK – can make the eyes become dry and itchy, especially for contact lens wearers, and respiratory surfaces start to dry out, leading to dehydration. Drying out of mucus membranes may also reduce the ability to resist airborne infections such as colds and influenza.

In addition, a relative humidity below 40% makes people feel colder than the actual temperature would suggest so they turn up the heating and, again, increase energy consumption. Raising the set point temperature also lowers the relative humidity even further so the problem gets worse.

Tailored approach

The important thing is that each project requires a solution that is tailored to the particular conditions of the building and the types of print machinery being used – which requires specialist knowledge of both humidity control and the challenges faced by printers.

Our philosophy is that there is no 'one size fits all' solution. Each project is evaluated against a number of key criteria so that the best solution is identified. The fact that we are independent and not tied to any particular manufacturer means we are able to tailor each project using the best and most appropriate solutions on the market.

For example, we have designed a unit specifically for use in smaller digital print rooms. It provides temperature and humidity control plus air filtration, air movement and fresh air from a single unit to ensure



conditions remain in the quality zone for optimum machine speeds and print quality.

Specifically designed by Humidity Solutions, the Eiger unit provides temperature and humidity control plus air filtration, air movement and fresh air from a single unit for digital print rooms. As such, it enables temperature and humidity to be maintained at the optimum conditions for digital printers to ensure that the room is kept in the quality zone for optimum machine speeds and ensuring print quality.

In terms of convenience it also avoids the need to source separate systems from different suppliers. Temperature and humidity levels can be altered easily on the Eiger's controller to suit the machine and operator but then self regulates keeping the room within tolerance.

The Eiger unit is designed to provide humidity control, cooling and heating in typical digital print rooms of around 100 m³. It is installed in the room against an external wall, with a connection through the wall to an outdoor condenser. Mounted on castors for easy siting, its compact size allows access through standard doorways, whilst the use of flexible connections supports fast and simple installation.

Ideal options

For litho, large digital and web based printers a high pressure system is the ideal option. A high pressure system injects water into the air under pressure through multi-directional, fan assisted nozzles. The pressure ensures the water is atomised and absorbed rapidly into the air – within 1.5 metre of the nozzle – and these systems can be used with ceiling heights as low as 2.4 metres.

The nozzle fan heads are about the same size as a CCTV camera, making the system very unobtrusive and easily retrofitted in existing buildings. The nozzles can be evenly distributed throughout the press hall and controlled individually or in small groups within a zone. This ensures that the rate of humidification is precisely aligned to the requirements of each space – for example, providing localised humidity control over individual presses or reel stands and multiple zones can be controlled from one central controller.

A key benefit of this approach is that it uses cold water, so that no additional heat energy is required. The absorption into the air (adiabatic humidification) also has a free cooling effect which reduces the load on comfort cooling systems. For each 500 litres of water that is evaporated such a system provides around 345 kW of cooling for a power input of just 4 kW.

High pressure systems have been successfully installed in many renowned web press publishing houses including the New York Times, News International, and the Daily Mail.

It is essential!

Humidity control is an essential part of the printing process and all

press manufacturers require this to ensure the effective performance of their equipment. Print halls on the continent, and specifically in Germany, are rarely seen without humidity control. The UK industry is now catching up in its understanding of the benefits of humidity control and its implementation.

It is also worth noting that humidity control generally costs less, in terms of both capital and running costs, than most printers expect. So it is worth finding out more rather than just thinking 'expensive' based on a gut feeling. A no obligation quote costs nothing and could lead to a real boost in productivity and profitability. **PS.**

Turnkey humidity control supports digital print quality

A full turnkey humidification system from Humidity Solutions is ensuring stable 50% RH humidity in the digital print room of KnowledgePoint in Reading, Berkshire. This ensures stock is maintained in best condition and provides the dimensional stability required for high quality finishing.

KnowledgePoint required a humidification solution that would provide precise control whilst avoiding airflows from ceiling mounted air cooling units.

Humidity Solutions proposed using an Airtec high pressure nozzle system, using three Hydrojet humidifier heads suspended over critical areas. The three nozzles operate from a single pump and are controlled within one zone.

To prevent minerals from the water precipitating onto printheads a reverse osmosis water treatment system has also been supplied, as well as a water softener to extend the life of the reverse osmosis membrane, and an ultra-violet steriliser to eliminate any bacteria in the water.

Humidity Solutions delivered a comprehensive service that included calculating loads, designing and installing the system and providing a planned maintenance programme.

KnowledgePoint stated that: 'Humidity Solutions provided excellent support throughout the process of installation and commissioning and, since then, has serviced and maintained the system. The result is a trouble free system that supports our production quality and productivity.'

John Barker has published a guide to designing climate control systems for print: 'Humidity and Temperature Control for Print'. To receive a free electronic copy of this book, please visit www.humiditysolutions.co.uk or use the following direct link: tinyurl.com/HumidityforPrint