



A different way of thinking

As our planet warms, we need more than ever to keep our people cool. However, concern continues to escalate over the potential dangers and inefficiencies of air conditioning, with Richard Branson recently joining the debate to try and force more legislation to ensure manufacturers reduce the use of dangerous refrigerants and raise their energy efficiency. But why not also consider other energy efficient, cost effective and hygienic ways of cooling? John Barker of Humidity Solutions explains.

Adiabatic cooling is created when water changes state from a liquid, water, to a gas, humid air, whilst evaporating. Heat energy is taken from the surrounding air to provide the energy required for this change of state to take place.

This is not a new process – every square in Mediterranean towns has a fountain which provides welcome cooling to local residents as they gather to discuss the issues of the day. Turkish houses have two chimneys, with water sprayed in one. This causes the cooler, heavier humid air to drop into the premises while the hot air rises up the other chimney creating a positive airflow of cool air through the property.

These are crude but effective ways of creating cooling in a very cost effective, low energy way.

The new Nepronic SKV employs this technology but in the most up to date and hygienic way possible. In an evaporative humidifier, water is supplied to the top of the evaporative module and flows down the wet media. Warm dry air passes through the wet media, evaporates water and thus raises the humidity level and reduces the temperature. The SKV offers up to 12°C of cooling as a result of the transfer of energy when the water evaporates.

Cost effective and hygienic, this is the solution for many low energy buildings and particularly when humidity and cooling is required in space such as data centres and lots of industrial applications such as paint shops and car part manufacturers where perhaps the

injection moulding machines generate excess heat, but the gluing process required humidity to ensure rapid and full strength curing.

The manufacture of the equipment is made to measure, ensuring that the whole width of the air handling unit is covered by the matrix to achieve the maximum efficiency of the system, reducing pressure drops which would be caused by a blanking plate.

The inclusion of the blanking plate would also increase installation costs, so it is another important factor to reduce the total costs of the system. Air velocity through the matrix is an important consideration and if it raises above 3.5m/s a droplet separator would be required to prevent water droplets from coming off the matrix face. This again increases cost and pressure drops, so reducing the velocity but ensuring that the humidifier is sized correctly to the particular air handling system reduces these figures. The knock on effect is that the fan size can be reduced due to the lower pressure drops which again reduces the energy required for the system as a whole and possibly the cost of the capital equipment.

The media is inorganic fibreglass media which is hygienic as it does not provide nutrients to bacteria and is fire resistant and incombustible.

Hygiene is further enhanced over and above the water management system built in to the control panel which ensures that no water is left in the pan should the humidifier not be in operation. This is the inclusion of a silver ion filter which eliminates any bacteria in the

incoming water supply.

Evaporative humidifiers can be retro fitted to air movement systems, assuming that the psychometrics of the system are suitable, or installed into new plant quickly and simply, with the humidifiers able to be supplied flat packed or pre-assembled with user friendly quick installation or removal of the media and a reversible and easy to remove pump skid so that the humidifier can have the services supplied from either side of the air handling plant.

This is a great solution for providing humidity control with cooling when installed in the inlet air supply but can also provide very low cost cooling by being installed in the extract air prior to the heat exchanger which then cools the incoming fresh air without adding humidity, which may not be required in the summer months.

In conclusion, the adiabatic process – which is as old as can be – has been updated and designed with innovative manufacture and modern materials to make the evaporative family of humidifiers the most energy efficient way of introducing moisture into the air.

For applications that would benefit from cooling as well as humidification, the cost savings on energy are extremely attractive with short pay back times, and for those projects that just require low energy cooling – 2kw of cooling for 20watts of power – then with clever system design, this is the way to stay cool with low energy consumption whether in the home or the office – an option worth considering.