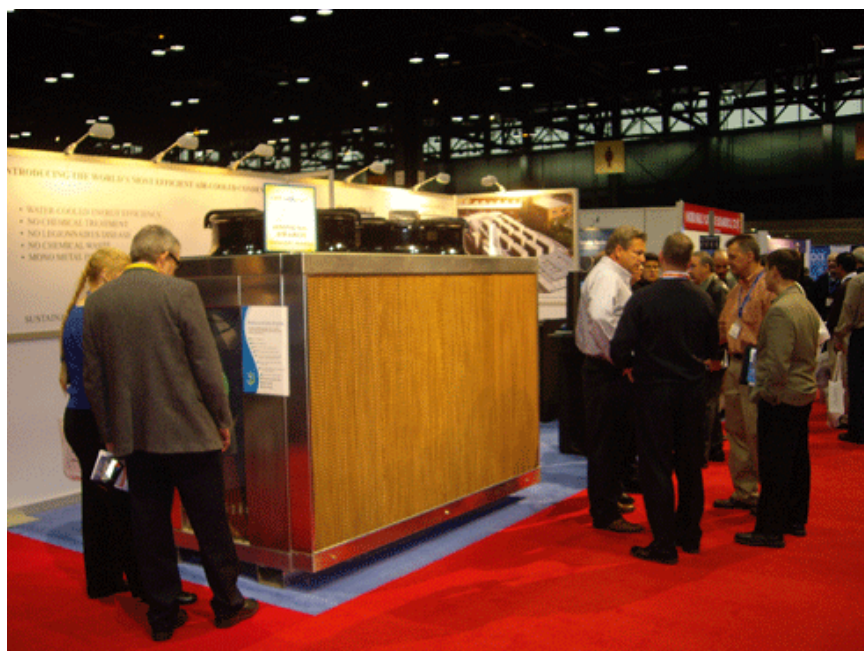


A Factor 5 water saving with a cooling systems innovation

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Melbourne-based manufacturer Muller Industries Australia's new cooling system saves 80 per cent of the average water usage in commercial office buildings that use water-based cooling towers.



Credit: Muller Industries Australia

Why is this important? One million water towers are used in such buildings globally as part of their cooling systems – this innovation eliminates the need for any water cooling towers at all, saving water and reducing health risks.

Many commercial and public buildings, and in particular larger buildings, have water cooling systems which use cooling towers. They can account for up to 30 to 40 per cent of a building's water use.

Water cooling systems process and remove heat from the building, essentially by evaporating water. The evaporation of 1 litre of water absorbs more heat than any other liquid in the same conditions, which is why water-based cooling towers are installed on so many buildings. In an office with 10 000 m² of floor space, roughly 2 megalitres of water will be evaporated each year using water cooled systems.

The main alternatives to water cooling systems are dry cooling systems, which do not use any water at all but tend to use a lot more energy. Given that it is important in a carbon constrained world to reduce energy usage, dry cooling systems are no longer going to be a viable alternative in commercial or office buildings.

A new hybrid dry air/water cooling system, developed by Muller Industries Australia, enables reductions in water usage of around 80 per cent while still being almost as energy efficient as water cooled systems. The Muller 3C Cooler

uses air to cool in ambient temperatures, only uses water under extreme conditions, and is designed so that it can be retrofitted, easily replacing water cooled systems and their water cooling towers.



Credit: Muller Industries Australia

The cooler consumes 30 per cent less energy than other air-conditioning systems, and uses only slightly (5–10 per cent) more energy compared to water cooled systems. It also delivers a sizeable 7 decibel (dBA) noise reduction.

What's more, cooling towers are open systems which make ideal conditions for the propagation of the *Legionella* bacteria, the cause of Legionnaires' disease, which can be fatal. The 3C Cooler, on the other hand, is a closed system, thus eliminating this risk. It therefore provides hospitals and other more 'high risk' public buildings with the security of knowing that their air-conditioning system dramatically reduces the chance of *Legionella* infection.

Currently there are over 600 installations of the Muller 3C Coolers across Australia and others in the United Kingdom, France and Asia. The cooler has been used in a range of applications, including hospitals, commercial office buildings and government buildings.

Another innovation, the Muller Dricon, is designed to be used instead of evaporative condensers to supply cool air for refrigeration. Coles Supermarkets in Australia are using this technology to reduce water usage in their refrigeration air cooling systems.

The Muller 3C and the Dricon can use rainwater and greywater, enabling them to further reduce commercial buildings' water usage from mains water.

Melbourne University's new Faculty of Economics and Commerce building is an example of this approach. They claim that the 12-storey building delivers carbon reductions of 73 per cent and water use reductions of up to 90 per cent. The building achieves this through reducing cooling demand by utilising natural ventilation and chilled beam cooling technology, and by the installation of Muller 3C Coolers combined with rainwater harvesting and greywater reuse.

More information:

Muller Industries Australia, www.mullerindustries.com.au

Muller Industries will be featured as one of the leading case studies in the forthcoming international publication *Factor 5: Transforming the Global Economy through 80% Improvements in Resource Productivity*, by Weiszacker E, Hargroves K, Smith M, Desha C and Stasinopoulos P (2009), Earthscan. See www.naturaledgeproject.net/factor5.aspx