

2013 - EcoCooling Case Study - Cooling Pharmaceutical Warehouses

MERCK USE ECOCOOLING TO COOL THEIR PHARMACEUTICAL WAREHOUSE

Merck Sante, based in the French city of Orleans, manufactures and distributes pharmaceutical products. Their main warehouse is required to operate under the conditions of 'controlled room temperature' which for their range of products is less than 25°C.

Eighteen down discharge EcoCooling ECP16000 evaporative coolers were installed feeding high level plenum chambers. These positively pressurise the warehouse and air is extracted using automatic vents. The coolers are all linked to a common control panel.

Temperature is monitored at three levels in the warehouse and the coolers controlled accordingly. A humidistat ensures that the internal humidity does not exceed 85%.



All coolers are linked to the fire alarm system for automatic shutdown.



The principle of mean kinetic temperature (MKT) can be applied to pharmaceutical storage using the Arrhenius Equation.

The graph to the right shows that on a 40°C day the ambient MKT is 33°C. The output of an evaporative cooler in these conditions gives an MKT of 25°C which meets the storage criteria for this range of pharmaceutical products as defined by the MHRA guidelines.



24 MKT Hour Performance



CHEMILINES CHOOSE EVAPORATIVE COOLING TO ACHIEVE MHRA COMPLIANT CONDITIONS IN THEIR PHAMACEUTICAL WAREHOUSE

Founded 18 years ago, Chemilines is a parallel importer of pharmaceutical products with the NHS as its major customer. In March 2008 the company opened a new 90,000 sq ft repackaging and warehouse facility in Wembley.

A key objective was to ensure that the warehouse complied with temperature controlled storage conditions as regulated by The Medicines and Healthcare Products Regulatory Agency (MHRA). Please see the next page for a breakdown of the MHRA storage guideleines



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EcoCooling evaporative cooling was applied as part of a complete warehouse temperature control scheme. The existing heating system was incorporated into an integrated approach to heating, cooling and de-stratification. A central controller also provides data capture with remote access and automated alarm communication.

Full monitoring and data logging was provided together with SMS messaging of alarm conditions.



Chemilines Warehouse Temperature Graph



The current principles being applied to meet the MHRA controlled temperature guidelines are:

- The system shall be designed to maintain the warehouse under 25°C during normal UK weather conditions.
- In exceptional conditions the 7 day mean kinetic temperature shall not exceed 25°C.
- There shall be no 'excursions' over 30°C.

HOW MUCH COULD YOU SAVE USING AN ECOCOOLING ECP SYSTEM?

A building requiring 30kW peak load and 20kW minimum load. Cooling employed from April to October from 6am to 6pm, 5 days per week, in London, with electricity cost 8p/kWhr and water cost £1.20/m^{3.}

Running Costs - Annual	Evaporative Cooling	Air Conditioning	Calculated Saving
COP/EER	66.4	3.4	
Electricity (KWhr)	1515	14770	13255
Electricity Cost (£)	£121	£1,182	£1,060
Water Usage (m³)	45.5	0.0	- 45.5
Water Cost (m ³)	£54.65	£0.00	- £54.65
Total Cost	£176	£1,182	£1,006

TEST

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Paul Gilmour, Scotchem Ltd -

"We had 1 EcoCooler installed at end of 2006 to service 2 small units where prescription medicines are stored which deteriorate if the temperature goes above 25 degrees. We added 2 more units last year and we are very happy with the product as it is a very good product for the price, achieves good results, and is not as bulky as an air handling system"

For more information and case studies please visit the EcoCooling website www.ecocooling.org. Presentations and introduction videos are also avaliable on the EcoCooling YouTube channel.

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