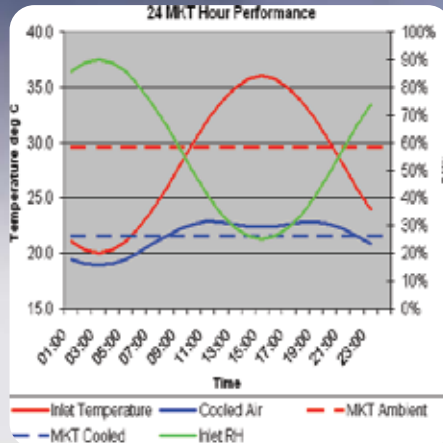


Pharmaceutical Storage Case Study



The Problem

A major pharmaceutical manufacturer needed to achieve controlled room temperatures in his distribution warehouse, with a mean kinetic temperature below 25°C, to maintain stability and to preserve shelf life.

The Solution

Eighteen down discharge evaporative coolers were installed, feeding high level plenum chambers to positively pressurise the warehouse, with air extracted using automatic vents.

The coolers are all linked to a common control panel, and temperature is monitored at three levels in the warehouse.

A humidistat ensures that the internal humidity does not exceed 85%, and all coolers are interfaced with the fire alarm system for automatic shutdown.

Despite the large volume of the warehouse, even temperatures are achieved thanks to the balanced ventilation design.

The Results

The graph above shows that on a 36°C day, the mean kinetic temperature without cooling would be 29°C, which is unacceptable. With the coolers installed, the mean kinetic temperature falls to 22°C, well within the storage criteria for this range of pharmaceutical products, and the peak temperature falls to 23°C instead of 36°C.

The installed cost of the system was less than 30% of the equivalent air conditioning system, and running costs are approximately 80% lower.

Interesting Facts

The system is inherently fail safe, because unlike conventional refrigeration, evaporative coolers do not reduce in efficiency or fail if temperatures exceed the design conditions.