

# Case Study



## > Epson

Epson Telford Ltd, part of the Seiko Epson Corporation, manufactures and distributes printer supplies and media products throughout Europe from its base in Shropshire. Airedale's air conditioning products are playing a major role in the precise control of temperature and air quality in critical areas and clean rooms at the Shropshire facility. Now Epson is working closely with Airedale to increase cooling capability whilst substantially reducing energy costs through free-cooling.

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## Epson Telford Requirements

The 42,000 m<sup>2</sup> plant in Shropshire is Epson's sole European manufacturing site and employs 1,100 staff involved in plastic injection moulding and ink cartridge assembly, in clean rooms where continuous system operation requires a 24/7 precise cooling capability that is both efficient and reliable.

Air conditioning plays a major role in the Epson manufacturing facility. Computers and machinery in the clean rooms need to be kept at 22°C to remain in optimum working condition. Keeping them at this precise temperature is difficult to maintain in a room filled with people and machinery. Air quality is also a major priority making it imperative that all the components and equipment are free from dust and debris from the air.



## Design Criteria

Two standard Airedale chillers have been supplying cooling to all indoor units at Epson, with close control units providing reliable and precisely-controlled air conditioning in Epson's two clean rooms. Ceiling cassettes have also been installed in other areas for staff comfort.

Now, with the cooling load on site increasing and new free-cooling technology available from Airedale, forward-thinking management at Epson has superseded the two existing Airedale chillers with three Ultima FreeCool chillers that will expand system capability at the same time as significantly cutting energy costs.



Ultima FreeCool Chiller

## Unit Specification

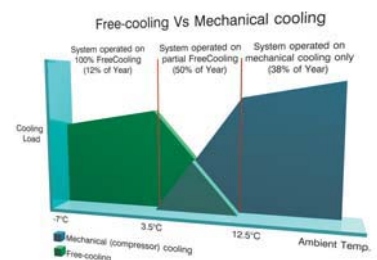
- > Three Ultima FreeCool dual system 750kW chillers equipped with sophisticated AireTronix Controls
- > Seventeen 125kW units and four 42kW units for close control in the two clean rooms
- > Eighteen ceiling cassettes for staff comfort
- > Eight air cooled condensing units for close control and comfort

## Recouping Energy Savings

The free-cooling cycle is designed to give priority to free-cooling whenever the external ambient is below the return water temperature, cutting back the need for mechanical cooling and reducing the energy consumption of the chiller. During the coldest parts of the year, free-cooling can totally satisfy the cooling load.

The Ultima FreeCool chiller can also operate on partial free-cooling for up to 50% of the year and only needs to operate completely on mechanical cooling for about 38% of the year, typically saving 35% of the energy consumed by a conventional air-cooled liquid chiller.\*

Epson is taking a holistic view of indoor and outdoor temperatures to maximise energy savings. Says Paul Lovegrove, General Affairs Assistant Manager at Epson: "Free-cooling makes sense. Gone are the days when we built a room and the air conditioning cost 'x' number of pounds. Now we're prepared to pay more for the unit in order to recoup energy savings over time. Our target is to reduce building energy costs by 7% annually which we have achieved over the past two years. Airedale's free-cooling chillers are already contributing to 3% of this annual saving."



\* Based on Met. Office figures for London

## Fine-Tuning with AireTronix Controls

Ultima FreeCool chillers are equipped with sophisticated AireTronix controls enabling Epson to develop and utilise a strategy that takes full advantage of the UK environment. AireTronix is a versatile control system, fully programmable to maximise product efficiency, energy savings and compatibility, with the ability to customise operational parameters on site and change set points remotely.

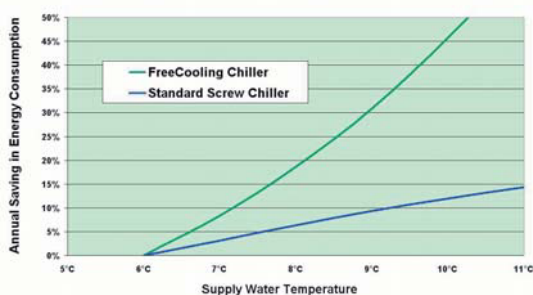
Monitoring valve positions of indoor units and adjusting water temperatures can enable Epson to achieve maximum free-cooling benefits, and by increasing supply and return water temperature, utilise free-cooling for a greater part of the year. The microprocessor controls also provide eight stages of cooling.

The ongoing partnership between Airedale and Epson has seen the development on site of a controls strategy which is fine-tuned to Epson's needs. A unique aspect of this strategy puts Epson ahead of the field in operating free-cooling on three separate chillers linked to the same circuit. Epson is able to make maximum use of the environment, with an option for mechanical cooling to top up any of the three chillers.

"AireTronix Controls also allow us to monitor the indoor fresh air system, compensating for high temperature. With the help of Airedale's intelligent AireWorks BMS and their maintenance team we can see which units are 'hot spots' and deal with them. Any upgrades Airedale do on the control side, such as improved strategies, we can download them."



**Energy Savings from Increasing Chilled Water Setpoint**



## Maximising Energy Efficiency Ratios (EER's)

Contributing to the energy saving benefits of Ultima FreeCool chillers, individual components are designed to maximise EER's and in turn minimise power consumption, lower running costs and reduce carbon emissions. Electronic expansion valves (EEV's) and modulating head pressure control offer even more enhanced EER's in part load and low ambient conditions. EEV's can operate at much lower condensing temperatures, reducing the need for unnecessarily high head pressures, and resulting in significant compressor energy savings whenever the ambient temperature and/or cooling requirement are below design conditions.

## Enhanced Capital Allowance

Epson can also benefit from the inclusion of Ultima FreeCool Chillers on the Energy Technology List due to their proven energy efficient performance. Under the Enhanced Capital Allowance scheme, businesses investing in energy saving products published in the approved list can claim 100% first-year capital allowances on their spending.

"We don't just install the units and let them run. We look at making the equipment work through a responsible partnership with Airedale. It's a complete and positive partnership, from design through to service and maintenance, sharing knowledge to continually monitor performance in order to recoup energy savings. In effect, we have the manufacturer on site."



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