

Active chilled beams helps Government reduce energy consumption

By John Staunton,
Room Comfort
Brand Manager,
SAS International.

“If you’re still occupying – or planning to build – a property with high-energy consumption, you’re in trouble” writes Hugh Pearman in the *Sunday Times* (May 11th).

The introduction of EPCs in April is making tenants’ comparisons of the energy performance of buildings easier. It is not surprising with the price of crude oil on another of its “sharp upward excursions” companies are looking to cut their energy bills (the \$120 a barrel mark was surpassed in May for the first time in history).

Chilled beams and radiant chilled ceilings are emerging as an energy efficient alternative to traditional cooling methods. Using water as the heat transfer method the relative high operating temperatures (14° to 17°C) reduce the need for active cooling and enable technologies such as free cooling and ground sourcing to be utilised.

JOBCENTRE PLUS, BOURNEMOUTH

The Government’s Jobcentre Plus programme by the Department of Works & Pensions (DWP) is a programme started in 2002 to merge existing office buildings into modern customer-friendly facilities that also meet strict sustainability standards.

Scott Brownrigg architects were commissioned by Land Securities Trillium to design a new 28,450 sq ft office building in Bournemouth. As part of the brief, many sustainable initiatives were required to be incorporated into the building in order to achieve the highest possible “BREEAM” rating. Included was an active chilled beam solution by SAS International which provided comfort cooling and fresh air to the occupied spaces.

Active chilled beams were mounted flush with the suspended ceiling system giving a monolithic appearance from below. “The chilled beams supplied through SAS provide an ideal cooling solution,” commented Mark Longland, the Jobcentre Plus Mechanical Engineer for M&E Consultants WSP. “The system is energy efficient and quiet, making it ideal for a modern office type environment. SAS were able to manufacture a bespoke ceiling system which met the strict design and branding requirements the DWP has for all its Jobcentre Plus buildings.”

Active chilled beams



FLEXIBILITY

Mounting chilled beams flush with a suspended ceiling system is not their only application. Chilled beams are often specified as a design feature and enclosed in a metal casing. When chilled beams integrate luminaires and other building services such as cabling, PA, and fire detection and control systems – they are then referred to as Integrated Service Modules (ISMs) or Multi Service Chilled Beams (MSCBs).

ISMs offer all the fixed production, delivery and installation times you would expect from a prefabricated unit, greatly reducing the risk of project



overrun and on-site wastage.

Because water is the heat transfer method, the need for the bulky ducting associated with traditional air conditioning systems is removed and the floor to ceiling height can be increased. Chilled beams are proving popular both in new build and refurbishment projects.

PERFORMANCE

There are two types of chilled beam: ‘passive’ chilled beams work using natural convection, while ‘active’ chilled beams incorporate additional fresh air distribution.

The rate at which fresh air is supplied to the active chilled beams is variable. Active beams therefore offer an increased amount of control, as the level of induction of ‘hot room air’ through the beam is managed by the flow of the fresh air supply. The induction ratio of a beam measures the amount of room air drawn through it in relation to the volume of fresh air introduced. As the air induced through the beam is cooled this process determines its cooling capacity. While a high induction ratio is often desirable it is not always required and the level should be determined by the requirements of the space.

Passive beams can achieve cooling outputs of up to 400W/linear metre, while active chilled beams can achieve a higher cooling output of up to 500W/linear metre due to the additional fresh air supply function.

ISMs also offer the added benefit of opening the concrete soffit up for thermal storage - a natural process that has a cooling potential of up to 25W/m², according to the Concrete Centre.

SOLUTION

In addition to the sustainable demands of the project, the facility was built on an unusually shaped site and is designed to respond to the curved nature of this restricted area. The DWP requires that all of its Jobcentre Plus have a similar interior design which required SAS to create a bespoke radial ceiling reflective of the building’s shape. SAS undertook the design, manufacture and co-ordination of the suspended metal ceiling system to meet the DWP’s strict fit-out requirements and the building shape.