CASE STUDY – UV SOLUTIONS

Major UK retailer trials Gibbons ultraviolet air disinfection

When facilities management at the head office of one of the UK's leading retailers wanted to improve HVAC energy-efficiency and increase cooling performance, Gibbons Ultraviolet Solutions was commissioned to perform a trial installation.

The air-handling unit (AHU) selected for the trial is normally in operation between 7am and 6pm during the week. The AHU's cooling coil was originally designed to provide a dehumidification function, but this feature has since been disabled – rendering the coil oversized and inefficient.

The cooling coil of an AHU is a breeding ground for mould, viruses and bacteria, which form a slimy substance on the coil fins known as biofilm.

As well as reducing cooling coil efficiency by restricting thermal conductivity and therefore increasing energy consumption, biofilm contaminates the airstream which may jeopardise the health, wellbeing and productivity of building occupants.

It was decided to fit Gibbons' CoilCare® ultraviolet germicidal irradiation (UVGI) air and surface disinfection system within one of the building's AHUs, with a view to proving the effectiveness of the technology. Once this was demonstrated, the client would have the option of a full system installation to eradicate contaminants and return the equipment to its original operating condition.

CoilCare® uses powerful high-output ultraviolet-C (UVC) lamps to disinfect all the way through the cooling coil by disrupting the biofilm's DNA and eradicating it. The system is chemical free and requires minimal maintenance, with lamps having an 18,000-hour service life. Continued use of our CoilCare® system prevents the re-growth of biofilm, maximises AHU performance and helps protect all building users.

The cooling coil's performance was measured and mould samples collected, before four 64" high-output UVC Photoniser® lamp were mounted vertically within the client's AHU.

U values measure a cooling coil's thermal performance. Prior to the installation of CoilCare®, a U value of 5,473 w/m2K was recorded from the client's cooling coil. The U value after fitting CoilCare® was 12,462 – an increase of 127.7%.

Calculated pro rate, the client's annual chilled water flow was reduced from 32,010 to 16,399 tonnes (49%).

After taking into account supply, installation and running costs of the CoilCare® system, our client would enjoy net annual savings of £3,356, with return on investment achieved in two years and two months.

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