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Armstrong PCM Ceilings help a new health unit keep its Cool

Ceiling systems from Armstrong were specified for a new Pre-Operative Assessment Department and Surgical Admissions Suite at Bristol Royal Infirmary for their sustainability credentials.

Armstrong's [CoolZone](#) passive energy-saving tiles were used alongside the manufacturer's Ultima⁺ range, which is the world's first complete ceiling range to win Cradle to Cradle certification, with a Tegular edge detail on a 24mm suspension grid throughout the £2million replacement Surgical Admissions Suite (SAS) and Pre-Operative Assessment Department (POD).

Some 300m² of the metal CoolZone tiles incorporating Phase Change Material (PCM) which absorbs heat during the day and releases it at night to reduce a building's reliance on air conditioning, feature alongside 300m² of Ultima⁺ mineral tiles.

The new building, located on the roof of the hospital's King Edward Building replaces a derelict structure that was carefully demolished with full scaffold protection to the roof perimeter. In addition, small areas of refurbishment were carried out within adjacent areas to provide links to two retained towers.

Of modular build, the new structure was craned into place, with a road closure and 24-hour security but no hitches or incidents, over a single weekend before being fitted out to provide 15 consulting rooms, nine changing cubicles, reception, waiting areas and associated clinical support services.

The brief from University Hospitals Bristol NHS Foundation Trust to CMS Architects was to provide an enlarged accommodation schedule to facilitate the client's "Model of care" which streamlined two services into one department as part of a £143million investment in the redevelopment of Bristol Royal Infirmary.

Armstrong World Industries Limited

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The concept layout of the building was developed to consider passive design methods focusing on thermal mass, orientation, and natural lighting and cooling strategies in collaboration with end users (staff and patients) and representatives from infection control, hotel services and facilities management.

CMS senior architect Paul Rogers said: “The design embraced sustainable thinking from the outset, with the use of prefabrication construction methods, natural ventilation, maximising daylight with external louvres, and innovative PCM ceiling tiles.

“These are used throughout the building to absorb daytime solar gains and level any peaks, releasing their stored energy by night-time purge ventilation working with the natural ventilation system. This works particularly well as the building is only occupied during the day.”

He added: “The project and building design champion sustainable principles. All materials specified were Green Guide A rated as a minimum standard. The PCM tiles enabled the project to achieve Part L requirements without the need for cooling and thus additional renewables/photovoltaics to offset this increased energy usage.

“It is early days but client feedback has been very positive, that the environment even during hot days has remained pleasant.”

Careful consideration was given to the elevation treatment and form of the building to marry in with the historic King Edward Building which was built in 1902. Engagement with the local planning authority and conservation officer was promoted from the outset to progress a solution which was affordable and sustainable while in keeping and subservient to the host building.

CMS Architects are regular Armstrong specifiers but this was the first time they had used the CoolZone system which was installed alongside the Ultima⁺ tiles by specialist sub-contractor Pegasus Interiors for main contractor Halsall Construction, supplied by the Bristol branch of distributor SIG Interiors.

Paul Rogers said: “We were initially looking for a PCM product for walls and came across the Armstrong ceiling tiles. The client had requested their standard specification be followed but due to the fact the project was using the PCM product we promoted the use of a common supplier for all ceiling systems/treatment.”

CoolZone incorporates BASF Micronal PCM into Armstrong’s plain metal ceiling tiles. This material – microscopic polymer capsules containing a wax storage medium - is embedded in gypsum and then encased in the metal tile.

On heating during the day and cooling at night, the wax melts and solidifies. In this way the internal temperature is regulated, reducing and even eliminating the need for air conditioning. During initial tests, the CoolZone tiles delayed the onset of air conditioning by approximately four to five hours in an average office. Not only can this save around 40% of the HVAC energy costs and reduce peaks in demand for air conditioning but it can also help to improve the thermal comfort for the occupants.

The next-generation Ultima⁺ range features a bright white surface, with 87% light reflectance to help achieve 16% cost savings compared with indirect lighting.

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Manufactured with up to 64% recycled content and 100% recyclable, it is available in three core densities that allow specifiers to engineer sound absorption and attenuation for optimum acoustic performance – standard Ultima⁺ giving medium density, Ultima⁺ OP giving low density and Ultima⁺ dB giving high density, up to 41 dB.

Pegasus director Rich Shore said: “The CoolZone tiles were easy to use and install and they give a great effect due to their metal finish. They complemented the Ultima⁺ tiles very nicely.

“The whole project went smoothly, with all parties in the supply chain cooperating well and the technical support from Armstrong was exceptional.”

To see more on the project go to <http://bit.ly/1EzvGhR>.

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