

Press Release
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Pupils Help Passively Achieve 'Very Good' Eco Standards

A BREEAM rating of 'very good' is set to be achieved at a new primary school built through eco strategies supplied by Passivent to requirements in part determined by the pupils.

Kent County Council commissioned the new Warden Bay Primary School on the Isle of Sheppey to provide additional learning resources for 210 children, required as a result of its change from a three-tier education system to two-tier. The area already had the first eco-school in the county, prompting designers Hartwell Architects to not only consult with the teachers and pupils on what sustainable strategies they would like included in the new school, but to implement those as far as possible in the new building.

As a result, the aircraft wing-inspired structure is ventilated entirely naturally, using a combination of cross ventilation solutions supplied by the UK's leader in the field, Passivent. Natural daylight also plays a major role, using six of Passivent's Sunscoop SR98 tubular rooflights, each 530mm dia, along corridors and teaching areas within.



A total of 23 Passivent Window Aircool ventilators draw in fresh air at high level on the single storey facade, avoiding draughts, whilst a further 34 'dummy' Aircools provide aesthetic harmony. Two acoustically attenuated Passivent Airscoop roof terminals draw the air through the building, minimising noise transfer and extracting the 'used' air. The two-storey section of the school is ventilated by three Airscoops, connected to strategically positioned ceiling louvres, ensuring appropriate inflow of fresh air and extraction of used air in the Year 6 classroom, library and staff room.

The entire ventilation is managed by Passivent's iC6000 environmental controller, monitoring and adjusting airflow in 15 zones depending on internal and external temperatures, and 11 of those zones for CO₂ levels. A night cooling option ensures that when necessary the ventilation continues to function removing excess CO₂ and heat build-up when the school is unoccupied to restore a fresh, comfortable internal environment the next morning.

"We wanted to make the whole site including the building part of the learning environment," explained project architect Rob Page. "The overall design reflects the area's history of aviation. The main classrooms face north with 1500mm wide rooflights, whilst Sunscoops in the smaller south-facing teaching areas deliver a brighter natural light. The building rises in height from single storey to



two-storey, all naturally ventilated by cross ventilation. Elements such as these help the children understand geography and physics.

"We should achieve a BREEAM rating of 'very good'!"

Natural ventilation is proven to reduce capital costs by 15%, operating costs by 40%, and almost eliminate maintenance costs, over conventional mechanical ventilation. It is also proven to reduce incidence of "sick building syndrome" and improve the performance and productivity of the building occupiers.

Passivent Aircool ventilators are installed in the building façade to provide controlled fresh air intake or extract as part of a natural ventilation system, or in conjunction with mechanical cooling systems where they can reduce the need for daytime cooling and air conditioning. Using just 1watt of electricity to attenuate the ventilation louvres, the Aircool units can be minutely adjusted to control airflow requirements taking into account the weather outside- the speed and direction of wind, rain, temperature, and the location of the units within the building façade, to ensure a gentle flow of fresh air into the building without draughts. The units can be controlled individually, or linked to an overall ventilation control or building management system.

Thermally broken and insulated, the units are as thermally efficient when closed as a standard double glazed window, thanks to a controllable damper that combines a unique profile with highly reflective strip inserts. At Warden Bay, the Aircools deliver an air leakage when closed of $9.7\text{m}^3/\text{hour}/\text{m}^2$ at 50Pa pressure, and a U value of $1.10\text{W}/\text{m}^2\text{K}$.

Wind-driven Passivent Airscoop units catch wind from any direction and channel it down through the windward chambers into the building, which exhausts warm, "used" air out through the leeward chambers. Airscoops are designed to function regardless of wind direction to provide a controllable natural ventilation solution that can be used in most commercial large or deep-plan buildings up to two storeys high, for providing secure and weatherproof night cooling, even at wind speeds up to 51m/s.

Passivent Sunscoop tubular rooflights comprise a glazed roof dome, which catches up to three times the amount of natural light as a comparable-sized vertical window, and transmits that light down a highly reflective tube to a ceiling mounted diffuser in the room below. A standard 530mm dia Sunscoop delivers eight times more light than a 60W electric bulb/13w low energy lamp.

Passivent natural ventilation and daylighting strategies are just part of its range of 'green' solutions to minimize carbon consumption within buildings. The company also offers a range of solar shading products, and 'mixed mode' ventilation combining the benefits of natural ventilation and air conditioning in one.

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