



## Acoustic solution to natural ventilation for urban school

A positive learning environment is being achieved at a Southampton school next to a busy road with help from Passivent Ltd.

Southampton City Council commissioned Ash Construction to build a two-storey extension at the 750 pupil Woolston Secondary School, of general teaching areas, subject specific teaching areas for IT, music and drama, a fitness suite and appropriate changing facilities. Conscious of research that proves students benefit from a well ventilated and well, naturally lit environment, and of Government policy to utilise sustainable building practice, the Council specified natural ventilation to be used wherever possible.

### Ventilation Strategy

Target ventilation rates of 8 litres per second per occupant were required to meet DfES guidelines in Building Bulletin 87. The diversity of Passivent's product range meant it could provide a sensible solution,

which met all objectives, including target ventilation rates, a 30dBa noise reduction level set by the local planning authority and maximisation of combined natural light and ventilation.

### Passivent Solution

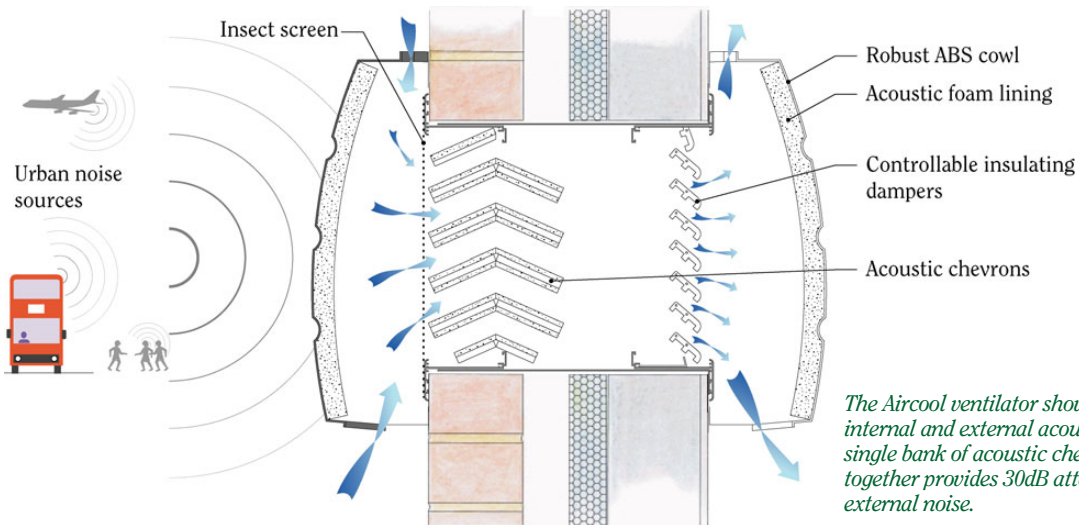
Passivent designed the system using calculations based on CIBSE recommendations and a software package designed during the NatVent™ European research project in which Passivent was a partner.

On the two facades facing the road, 26 Aircool acoustic ventilators were fitted, to draw fresh air in and attenuate external noise from the main road and nearby rail line. A further 14 "dummy" ventilator cowls were included to balance the architectural aesthetics of the external façade.

To further enhance the aesthetics, black cowls were chosen, to set against the red brick wall giving a striking contrast to the school's elevation.



Used air is exhausted through 8 Passivent Litevents. These combined controllable ventilators and roof lights were sited on flat areas of the roof, hidden from external view behind a parapet wall, and provided the added benefit of allowing natural light into the central teaching rooms where there were no external walls or windows.



*The Aircool ventilator shown features internal and external acoustic cowls and a single bank of acoustic chevrons that together provides 30dB attenuation of external noise.*

## Attenuated Passive Stack Ventilation

In the subject specific first floor IT and music rooms, Passivent designed a ventilation system that would also prevent heat build-up in the IT room, and noise ingress in the music room.



Passivent's solution involved the use of Passive Stack Ventilation where fresh air would be supplied via low-level acoustically attenuated Aircool louvres. The air would be drawn across the classrooms by the stack effect and would be exhausted via

Passivent roof mounted High Capacity Terminals.



An integral boost fan was incorporated in the IT room, to enable teaching staff to increase ventilation rates when the room experienced high heat gains in hot weather.

Passive stack is the most effective natural ventilation strategy with its combination of cross ventilation, convection (warm air rising) and the venturi (wind passing over the terminals causing suction) effect. Use of Passivent High Capacity Terminals can ventilate twice the depth inside the building compared to conventional single sided strategies, and provides effective night cooling as internal and external

temperatures have a higher variance at night increasing convection.

Passivent offer a range of acoustically treated products. Each range has been independently tested by Salford University in accordance with BS EN 20140: Part 10: 1992 Laboratory measurements of airborne sound insulation of small building elements.

Acoustic data sheets are available that provide detailed information on the acoustic performance of Passivent products across a range of frequencies.

