



INTELLIGENT MEMBRANES

**Speller
Metcalfe**

SPELLER METCALFE



**DUDLEY COLLEGE ANIMAL
STUDIES CENTRE**

PASSIVE PURPLE & PASSIVE PURPLE BRUSH

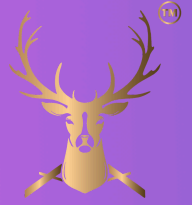


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Giving an Existing Building a New Future



Not every high-performance building begins with a new foundation. At Dudley College of Technology, a redundant 1950s building on the Broadway Campus was selected for a remarkable transformation as part of a £7.5 million investment into modern educational facilities. Rather than opting for demolition and rebuild, the project team chose a more sustainable route: a comprehensive deep retrofit designed to extend the life of the existing structure while dramatically improving its performance.



The vision was ambitious. The building would become a state-of-the-art Animal Studies Centre, providing modern teaching spaces for animal care and animal science students while significantly reducing energy demand and improving occupant comfort.

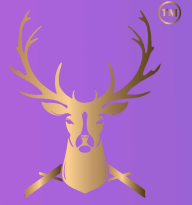


By upgrading rather than replacing the building, the project also helped reduce embodied carbon while demonstrating how existing structures can be successfully adapted to meet modern performance expectations.

To achieve these objectives, the building envelope required a robust airtightness strategy capable of supporting the wider retrofit programme and future external wall insulation system.



The Challenge



Retrofitting older buildings presents unique challenges. Decades of use, repairs and alterations often leave hidden defects within the building fabric, creating numerous opportunities for uncontrolled air leakage.

Existing masonry walls, repaired openings, service penetrations and structural junctions all needed to be addressed before the building could achieve the desired performance standards.

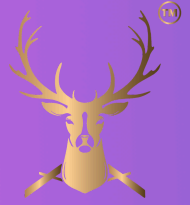


The project team required a solution that would create a continuous airtight and smoke-tight layer across the external structure before the installation of the External Wall Insulation (EWI) system.

This airtight layer would play a critical role in reducing heat loss, improving energy efficiency and helping the building achieve the high-performance standards expected from a modern educational facility.



Creating an Airtight Foundation



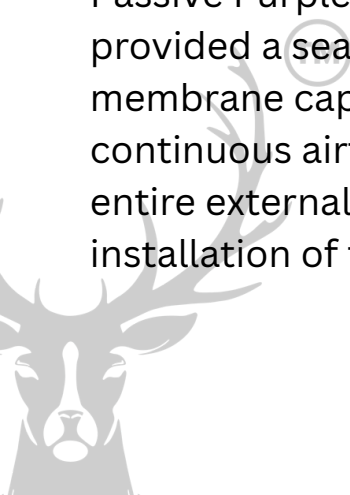
Before the thermal upgrade could begin, the existing masonry structure needed to be transformed into a reliable airtight envelope. Following repairs to damaged brickwork and the closure of redundant openings, Passive Purple Brush was applied to critical junctions, penetrations and areas requiring additional reinforcement. These details are often responsible for significant air leakage if not properly sealed.



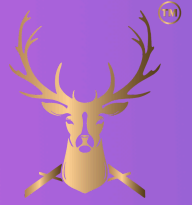
Once the preparation work was complete, Passive Purple Internal Airtight Vapour Control Membrane was spray applied directly onto the external masonry walls.

Although traditionally used internally, Passive Purple was selected because it provided a seamless liquid-applied membrane capable of creating a continuous airtight layer across the entire external structure prior to the installation of the EWI system.

Unlike traditional sheet membranes, the liquid-applied coating conforms to uneven masonry surfaces and difficult junctions, ensuring complete coverage without overlaps, joints or taped connections.

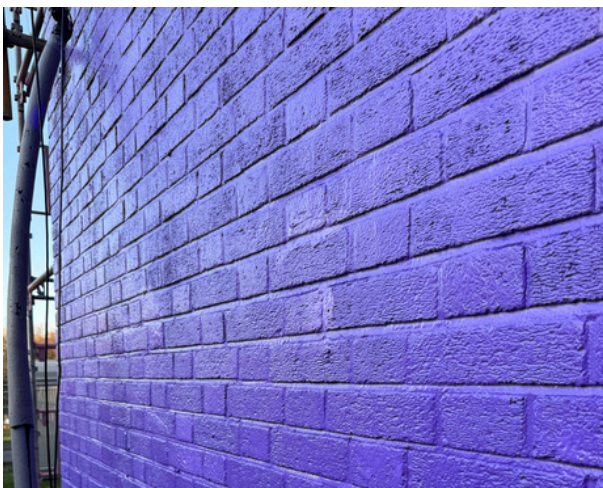


The Purple Building Everyone Talked About



During construction, the Dudley College Animal Studies Centre became instantly recognisable thanks to the striking purple coating covering the external masonry walls.

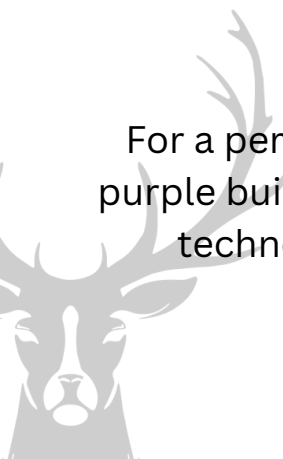
While many people saw the colour, few realised they were looking at one of the most important elements of the entire retrofit strategy. The vibrant purple finish wasn't decoration - it was the airtightness layer that would help transform a redundant 1950s building into a modern, high-performance educational facility.



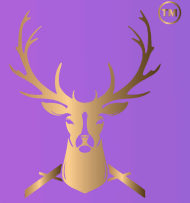
Applied directly to the external masonry before the installation of the External Wall Insulation (EWI) system, Passive Purple created a continuous airtight and smoke-tight barrier around the structure. Although it would eventually disappear behind the finished façade, its contribution to the building's performance would remain.

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For a period during construction, however, it became known simply as "the purple building" - a visible reminder that some of the most important building technologies are often the ones that eventually disappear from view.



Airtightness Results



Hidden beneath the completed envelope, the Passive Purple airtightness layer helped the project achieve an impressive airtightness result of 0.91 ACH, supporting the wider sustainability objectives of the £7.5 million redevelopment and demonstrating the critical role airtightness plays in successful retrofit projects.



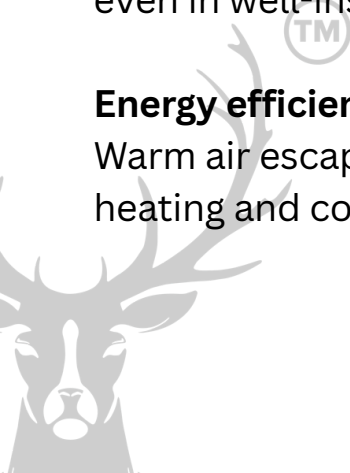
Why airtightness matters

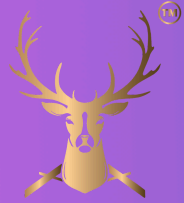
Comfort

Air leakage can create draughts, cold spots and uneven temperatures, even in well-insulated buildings.

Energy efficiency

Warm air escaping in winter and hot air entering in summer increases heating and cooling demand, undermining insulation performance.





Why Passive Purple Was Selected

The project demanded more than a conventional airtightness solution.

Passive Purple was chosen because it combines airtightness, vapour control and smoke-tight performance within a single liquid-applied membrane. Its ability to adhere directly to masonry substrates made it particularly suitable for the challenges associated with deep retrofit projects.

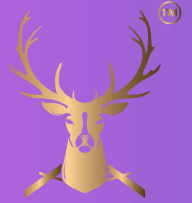
The seamless nature of the coating allowed the installation team to maintain continuity throughout the building envelope, reducing the risk of uncontrolled air leakage while improving long-term durability. By creating a continuous barrier around the existing structure, Passive Purple helped prepare the building for its thermal upgrade and contributed towards the overall performance objectives of the project.



- allows Moisture Control Design compliant with
- ✓ EN 15026
 - ✓ ASHRAE 160
 - ✓ DIN 4108



Supporting Sustainable Education

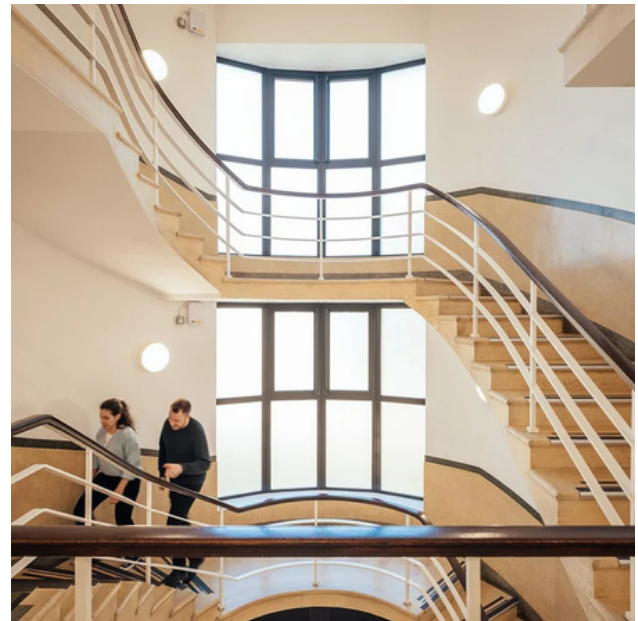


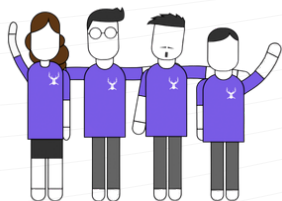
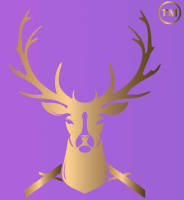
Today, the completed Animal Studies Centre provides Dudley College students with a modern, comfortable and energy-efficient learning environment.

Behind the finished façade sits an airtight building envelope that continues to reduce heat loss, improve thermal performance and support the college's wider sustainability objectives.

By choosing retrofit over demolition, the project team not only preserved the existing structure but also significantly reduced embodied carbon while delivering a facility capable of meeting the demands of modern education.

The Dudley College Animal Studies Centre stands as a powerful example of how existing buildings can be successfully repurposed, upgraded and future-proofed through intelligent retrofit strategies and high-performance airtightness technology.





Rated Excellent



NBS

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