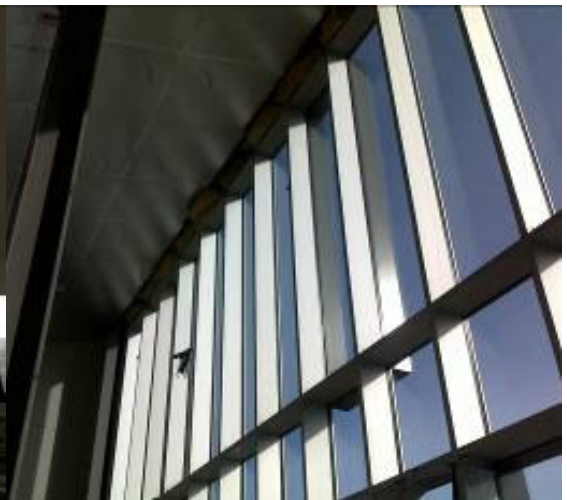


DuPont™ **Energain®**

DuPont™ Energain® allows RMJM and Balfour Beatty to add high-tech thermal mass to the new Edinburgh Napier University campus



Images courtesy of RMJM and ENU



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DuPont™ **Energain®**

Modern construction methods, particularly for lightweight buildings, can result in the problem of low-inertia due to a lack of thermal mass. This inability to efficiently control rapid temperature variations without expensive cooling and heating systems creates problems for both energy consumption and interior comfort, especially during hot weather. This in turn can have an adverse effect not only on the environmental footprint and running costs of a building, but also on the wellbeing and productivity of its occupants. The project by RMJM and Balfour Beatty to create a state-of-the-art new campus for Edinburgh Napier University faced just such challenges.

However, DuPont Building Innovations offers an ingenious solution to adding lightweight thermal mass without compromising design or construction methods. DuPont™ Energain® is an advanced phase change system which exploits a high-tech compound – and a helpful calculation model – to address these crucial issues. The system is supplied in easy-to-install panels of 1.0m x 1.2m x 5.26mm thickness which are sealed behind the plasterboard in walls or above ceiling panels, using standard tools and working practices. Build time, energy use (both on-site and in transport) and weight loadings are considerably reduced using this straightforward solution.

DuPont™ Energain® works by absorbing ambient heat as room temperature rises (at around 22°), storing it until the temperature drops again (at around 18°), and then releasing it back into the room. In ventilated structures this can make a significant difference to comfort and also to the choice of construction methods and materials. In buildings with air-conditioning DuPont™ Energain® can reduce costs by an average of 35% and help to reduce heating bills in the winter by up to 15%.

At Edinburgh Napier University, 650 m² of DuPont™ Energain® has been installed in the soffit of the top floor of a multi-storey Learning Resource Centre of the £50m new campus project in the West of Edinburgh, a combination of new and refurbished buildings occupying 24,000m². The project is designed to reflect the progressive reputation of this prestigious educational and research establishment. Appropriately for a university that offers an award-winning Building Performance Centre, the construction methods and materials are consistent with key sustainability goals of the BREEAM 'excellent' certified project.

Project architect Liane Edwards explains why DuPont™ Energain® was specified : “the structural steel and pre-cast concrete structure was unfeasible on the roof of the LRC due to the technical and constructional constraints of achieving a vast double monopitch form. DuPont™ Energain was selected not only because it offered a much more lightweight and buildable solution but also provided the thermal properties essential to the heating and cooling strategy for the building.”

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Comparing DuPont™ Energain® with traditional thermal mass solutions such as concrete, material analysis of equal volume has shown that concrete offers only approximately 17%

of the energy capacity offered by DuPont™ Energain® in the temperature window of 18-24°C for a 5 mm panel. While traditional mass contributes only to stabilising room climate, DuPont™ Energain® can help to also improve the energy efficiency of the building thanks to its heat storage and release capacity.

Edinburgh Napier University is the latest exciting project to take advantage of this significant step forward in sustainability for the built environment. Other installations internationally include schools, commercial buildings and private 'eco-houses.' The new campus is due to open its doors to students in 2010 and will undergo testing to measure the performance DuPont™ Energain® as installed in the new building.

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