

DuPont™ Energain®

ENERGY-SAVING THERMAL MASS SYSTEMS

A major breakthrough in sustainable building materials.

DuPont™ Energain® is a revolutionary new product, which provides additional thermal mass to low inertia buildings at the mercy of solar gains and temperature fluctuations. The aluminium-laminated panels help increase comfort levels, save on energy costs and reduce CO₂ emissions.



The miracles of science™

A responsible building system that benefits the environment.



DuPont™ Energain® comes in aluminium-laminated sheets that can be cut to any size. Once cut, aluminium tape is used to seal the edges of the sheets and to cover any holes or abrasions that may occur during installation.

The demand for innovative construction solutions and products has never been greater. As the world moves towards the inescapable reality of the effects of climate change, the need to reduce energy and utilize sustainable materials is now of paramount importance, for governments, corporations and individuals alike.

That's why DuPont™ Energain® represents a breakthrough of major importance as a radical new concept in thermal mass materials that could revolutionize the way the world constructs. Easy to install in commercial, public and residential buildings, DuPont™ Energain® benefits buildings in three ways:

- It controls comfort levels through reducing temperature peaks by as much as 7°C;
- It reduces energy usage and costs, lessening the need for air conditioning; and
- It helps to reduce CO₂ emissions.

A NEW SOLUTION TO AN AGE OLD PROBLEM

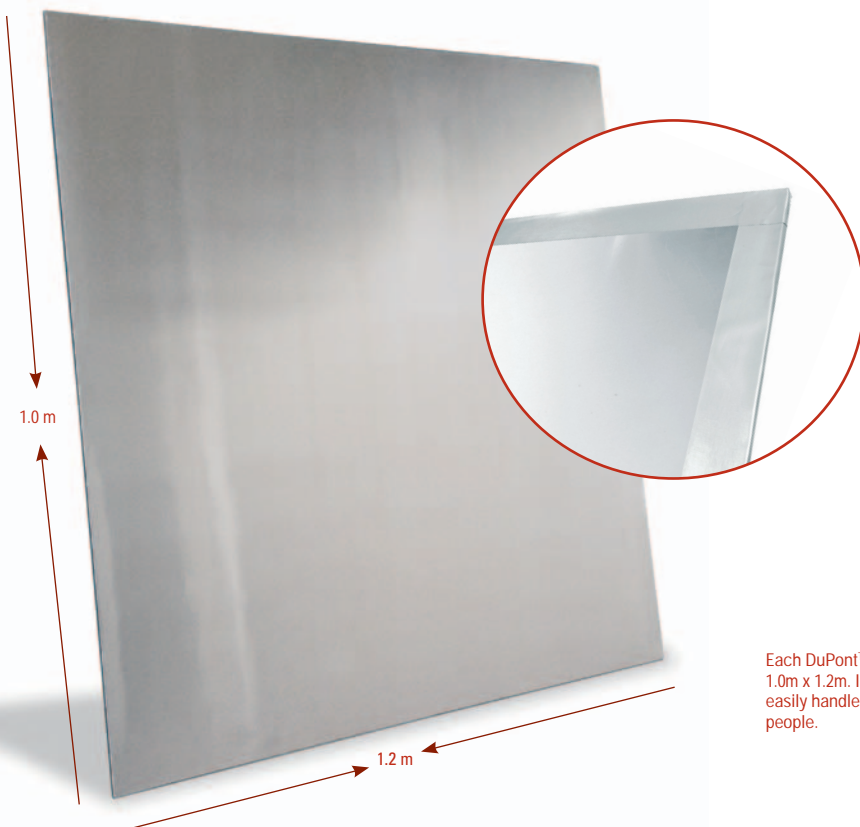
Buildings of all sizes and dimensions are at the mercy of solar gains, temperature fluctuations and the effects of internal heat sources, such as humans and electrical equipment.

In structures with a low thermal mass, for example frame-constructed buildings, the effects of fluctuating temperatures are traditionally offset by the use of air conditioning and heating systems. This comes at a price; quite literally, in terms of running costs, but also in the environmental footprint they leave on society: high energy use means high levels of CO₂ emissions: in today's geo-political climate, an unacceptable state of affairs.

HOW DUPONT™ ENERGAIN® MAKES A CRITICAL DIFFERENCE

DuPont™ Energain® comes in aluminium-laminated panels, bordered at the edge with aluminium tape, which contain a copolymer and paraffin wax compound. The panels are installed on the interior walls and ceilings of a building, behind the plasterboard lining, together with a mechanical ventilation system. The wax in DuPont™ Energain® thermal mass panels melts and solidifies at around 22°C and 18°C respectively. As the compound melts heat is absorbed from a room and as it re-solidifies it releases heat back into the room.

- By absorbing heat, DuPont™ Energain® significantly slows down the temperature increases within a room, reducing temperature peaks by as much as 7°C;
- As temperatures drop, the absorbed heat in the panels is released, warming rooms and reducing the usage of heating systems.



Each DuPont™ Energain® panel measures 1.0m x 1.2m. It weighs 5.4kg and can be easily handled and installed by just two people.

THE BENEFITS OF DUPONT™ ENERGAIN®: COMFORT, COST AND SUSTAINABILITY

DuPont™ Energain® is beneficial in three key areas, of importance to all parties in a construction venture, from architects to engineers and project owners to the inhabitants of a building.

Maintaining acceptable levels of sustainable comfort

Heat from solar gains and temperature fluctuations can cause degrees of discomfort to the inhabitants of low inertia buildings, where thermal mass is limited. Put simply, buildings get too hot when solar gains and external temperatures are high and too cold when temperatures are low. DuPont™ Energain® regulates temperature fluctuations at both ends of the scale, ensuring that comfort levels are readily maintained, without having to resort to excessive use of cooling and heating systems.



DuPont™ Energain® controls temperature fluctuations, keeping the inhabitants of a room comfortable without having to frequently flip between air conditioning and heating systems.

Reducing the need for cooling and heating systems saves money

With DuPont™ Energain® buildings can be fitted with smaller, more economical air conditioning units. Furthermore, standard-sized air conditioning units need not be used to the same degree as they are in a building without DuPont™ Energain®. Tests carried out by DuPont and independent third parties indicate that a saving of up to 35% on air conditioning costs can be realized with DuPont™ Energain®. Furthermore, the release of heat back into a room, as temperatures drop, lessens the need for heating systems, which also represents an energy-related cost saving.

Reduced energy use means reduced CO₂ emissions

In decreasing the amount of energy used in a building by controlling temperature levels, DuPont™ Energain® requires less electricity to be used. The knock-on effect of this is, ultimately, to help reduce the need for fossil fuels – oil, coal and gas, which emit CO₂ into the atmosphere when burnt. This shrinks

the environmental footprint of the building, in line with creating responsible building strategies that are being pursued politically at local, national and global levels.

As easy to install as standard plasterboards

The panels are very similar in dimension to ordinary plasterboard panels, yet weigh half as much, and are just as easy to install. The panels can be easily cut to any size, then simply nailed, stapled or screwed in place. The only specialist material needed for use with DuPont™ Energain® panels is DuPont™ Energain® aluminium tape. This tape must be used to:

- Tape any 'open' edges on a panel, where the internal compound would otherwise be exposed; and
- Repair any damage to the panel's aluminium surface.



Using less energy means a reduction in CO₂ emissions. DuPont™ Energain® is a smart solution aligned with the need to construct sustainable buildings for an environmentally friendly future.

DuPont™ Energain® - A thermal mass solution that's ready to make its mark.



CoDyBa* – The Dynamic Simulation Software for major projects

CoDyBa is a unique simulation software program, especially adapted for proprietary use with DuPont™ Energain®. CoDyBa enables architects and engineers to model with DuPont™ Energain®, enabling them to determine energy-savings and illustrate responses to temperature fluctuations and the reductions in CO2 emissions. CoDyBa simulations are offered on specific projects. Details are available upon request or can be found directly on the website.

* CDB_dDDN_V2

DuPont™ Energain® – The future of construction is here now

DuPont™ Energain® is available to order from DuPont today. The product is available in panels measuring 1.0m x 1.2m and weighs 5.4kg. All panels are supplied with taped edges, and come with additional aluminium tape. DuPont provides technical assistance with simulation, specifications and project design.

For technical and commercial enquiries, please refer to the contact details below.

Recommendations as to methods, use of materials and construction details are based on the experience and current knowledge of DuPont and are given in good faith as a general guide to designers, contractors and manufacturers. This information is not intended to substitute for any testings you may need to conduct to determine for yourself the suitability of our products for your particular purposes. This information may be subject to revision as new knowledge and experience becomes available since we cannot anticipate all variations in actual end-use conditions. DuPont makes no warranties and assumes no liability in connection with any use of this information. Nothing in this publication is to be considered as a licence to operate under a recommendation to infringe any patent right.

| DuPont™ Energain® | Technical Properties | |
|------------------------------------|----------------------|--------------|
| THERMAL MASS PANELS | Unit | Value |
| Descriptive Properties | | |
| Thickness | mm | 5.26 |
| Width | mm | 1000 |
| Length | mm | 1198 |
| Area weight | kg/m ² | 4.5 |
| Aluminium thickness (sheet) | µm | 130 |
| Aluminium thickness (edges) | µm | 75 |
| Thermal properties | | |
| Paraffin loading | % | 60 |
| Melt point (paraffin) | °C | 21.7 |
| Latent heat storage capacity | kJ/kg | > 70 |
| Total heat storage capacity | | |
| (Temperature range 14°C to 30°C) | kJ/kg | > 170 |
| Physical properties | | |
| Aluminium sheet delamination force | N/cm | > 20 |
| Conductivity solid | W/(m.K) | 0.18 |
| Conductivity liquid | W/(m.K) | 0.14 |
| Flash Point (paraffin) | °C | 148 |
| ALUMINIUM TAPE | Unit | Value |
| Descriptive Properties | | |
| Thickness | µm | 75 |
| Width | mm | 50 |

The data above is extracted from the full technical sheet, which is available at www.energain.dupont.com

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