

Technical datasheet 1

Thermal performance



Why is thermal performance important?

- House builders are under pressure to design and build homes that not only conserve energy and reduce CO² emissions.
- Many factors need to be taken into consideration when designing a building and the impact of those factors on the thermal efficiency. The risk of solar over-heating, the importance of ventilation and air infiltration and the possible need for air-conditioning all need to be factored in when choosing the construction material and method in order to comply with stringent Building Regulations.
- Another important aspect to consider is thermal mass, which is a measure of how much heat a building component can absorb, store and then release back into interior spaces. By storing the warm daytime heat from warm air and direct sunlight this delays the rise in daytime internal temperature which is then released back into the dwelling as the external temperature drops.



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How does aircrete stack up?

Aircrete has excellent thermal insulation characteristics, offering good thermal insulation and robust construction details, good thermal mass and air tightness properties.

It reduces the extremes of internal temperature within a building, keeping it at a more consistent and comfortable level by reducing the high and low characteristics of lighter, low thermal mass structures regardless of how high their levels of thermal insulation.

The cellular structure of aircrete products minimises heat loss, saving vital energy and reducing the need for costly insulation.

Because aircrete falls between lightweight construction and heavyweight, it is in the unique position of being able to combine low thermal conductivity with a useful specific heat capacity. Low thermal conductivity refers to the ability of a building, which has been built using aircrete, to warm up quickly owing to its good thermal insulation from cold during the winter. Its relatively high thermal mass then ensures that it cools down slowly once the heating is switched off.

Aircrete constructions can easily comply with the requirements of Part L of the Building Regulations.

Aircrete can be used in, full or partial fill cavity wall solutions with the minimum of additional wall thickness - a primary concern when seeking to minimise liveable space within the building footprint. There are many solutions that the manufacturers are able to offer, but as a general rule compliance with the current Part L 2013 can be easily achieved with 100 to 150mm wide cavities.

One of the most significant contributors to unwanted heat loss is air tightness. Air pressure testing is now an established requirement for new dwellings and aircrete blockwork achieves excellent air permeability ratings using general purpose mortar. These ratings are even better when using aircrete's thin layer mortar as it is applied in such a way that the mortar joint is fully filled, reducing the air infiltration rate.

Aircrete constructions and details achieve significant improvements in linear thermal bridging values (psi values), which have become more and more dominant as fabric insulation increases. These details effectively reduce heat loss at the junctions of constructions, further reducing CO₂ emissions. The use of aircrete enhanced construction details, such as the LABC Registered Construction Details or the Constructive Details can result in significantly lower psi and y-values, generally half of the default values that are used in SAP assessments.

The issue of thermal loss via the clear cavity of a separating party wall has been well documented. As a result, it is now accepted that cavity party walls need to be insulated. Aircrete constructions with full fill insulation of rolls, batts and blown mineral wool can be used which have been assessed and published by Robust Details Ltd. The Robust Details are simple additions to the existing details, which have been tested to ensure that there is no detrimental effect on the acoustic performance of the building.

Typical Part L Solutions



Partial fill cavity



Full fill cavity

For more information

This factsheet is only intended to be an outline guide to aircrete products and you are advised to contact APA members for comprehensive technical support and guidance, backed by extensive technical literature covering every aspect of designing and working with aircrete and solid wall construction.



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