

## NEWS ARTICLE

### CLAY BRICK WALLING BEYOND JUST THERMAL EFFICIENCY

Simple clay brick construction, goes beyond just providing thermal efficiency, it also sets the benchmark for optimal occupancy comfort and energy savings in homes across South Africa.

Science into the thermal performance of walling envelopes for housing has now defined the thermal efficiency limitations of alternative lightweight system technologies for achieving optimal thermal comfort in South Africa.

Scientific and thermal modelling research clearly shows that to achieve superior thermal efficiency, optimal thermal comfort conditions and lowest operational energy usage for heating and cooling of houses, across the varying climate zones of South Africa, the thermal mass inherent in conventional clay brick construction is fundamental.

The studies also established that insulated light weight walls common to Light Steel Frame Building and Timber Frame have little or no propensity to self regulate as do clay brick walls. This inability to self regulate translates into a real problem during South Africa's long hot summer months where internal temperature conditions become like a 'hotbox' necessitating greatest cooling energy to achieve thermal comfort conditions.

"Clay brick walled houses on the other hand demonstrate an exceptional ability to self regulate. The bricks function like thermal batteries to better moderate internal temperature conditions for longer, during both summer and winter," says At Coetzee, Executive Director of ClayBrick.org.

"In summer the double skin clay brick walls slowly absorb, store and release heat effectively slowing the transfer of the sun's heat to the inside by between 6 to 8 hours, such that the hottest part of the day is past before the heat reaches the inside. Secondly clay bricks function to absorb heat from the internal air as day time temperatures rise, thereby moderating internal temperatures and keeping the house comfortable for longer, reducing the need for additional cooling energy.

"In winter the internal thermal mass absorbs and stores radiant heat during the day, which is then slowly released in the evening as the cold night air impacts on internal conditions, thereby keeping the house warmer for longer. Should heaters be required, the clay bricks continue to function, absorbing and storing this heat and then releasing it to counter the inroads of the cold, thereby providing comfort conditions for longer," says Coetzee.

The superior thermal performance of double skin clay brick walled houses is well demonstrated in three South African studies where alternate lightweight building methodology consistently provided 'sub optimal' thermal outcomes.

The studies showed how clay brick construction not only provided very competitive or lower built cost but lowest life cycle energy costs as well, and as a face brick lowest total life cycle costs over a hypothetical 50 year life cycle. These findings correlate with the substantive thermal modelling done as part of a Full Life Cycle Assessment [LCA] by Energetics in Australia.

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Thermal modelling in this study considered a house built on a Verdant floor plan, placed in three different climatic zones, with four orientations. The house was constructed with cavity walling and comprised of five different walling material options, the lightweight walling option being of Timber Frame insulated weatherboard construction. The study found that on average the double skin cavity walled house used 15.9% less energy [kWh] to achieve target thermal comfort and the double brick with insulation 26.4% less energy.

When total energy [embodied as built plus operational energy] was considered over a 50 year life cycle the savings provided by the greater thermal efficiency of the clay brick options translated into an average saving in total Green House Gas (kg CO<sub>2</sub>-e) emitted of 17.9% for double skin cavity brick house and 26.4% in the case where insulation was applied in the cavity of the clay brick walls.

"The case for double skin clay brick walling for a more sustainable future is clear. Sustainability requires that we build houses that are able to endure with little maintenance, and definitely no materials replacement, way beyond a 100 year lifecycle. Clay brick is the one man made walling material that has proven itself to be more than up to this task," says Coetzee.

"To make thermal comfort optimisation and lowest greenhouse gas emissions a long term trend then it makes no sense to compromise on the holistic value clay brick brings. Clay Brick is for Good," concludes Coetzee.

ENDS.

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