



NEWS ARTICLE

CLAY BRICK – THE MOST THERMALLY EFFICIENT DEAL

Clay Brick 1 of 2

Recent research in the subject of energy usage and comfort continues to confirm that Clay Brick construction, so widely applied in South Africa for house construction, deserves its pre-eminent status. Equally interesting is the finding that Clay Brick internal partition walls add so much more to the thermal comfort equation of houses than previously thought.

Specifically, it was found that after introducing more thermal mass in the form of internal walls to the 6m² x 6m² modules comprising slab-on-ground, significant North wall glazing, the following additional reductions in energy consumption were realised:

- *Insulated cavity brick 6%*
- *Insulated reverse brick veneer 8%*
- *Insulated lightweight 20%*

While internal partition walls in brick afforded improvements in all instances, the effect of the additional thermal mass was found to be less prominent than for the lightweight walled building, because the masonry walled modules were already benefiting from lower energy demand from the thermal mass that brick walls provide.

The research findings of 8 years of Empirical study at the University of Newcastle's Priority Research Centre for Energy – where building modules comprising different wall construction types were continually measured under real life conditions, both free floating and controlled internal conditions - have comprehensively shown that:

- *Insulated lightweight building (high thermal resistance [R-value] with no thermal mass in the walls) as the worst performing in all seasons.*
- *Insulated cavity brick performed the best.*

The reason for the superior performance of the insulated brick masonry solution lies in the additional thermal mass inside of the thermal insulation within the cavity wall. This brickwork acts as a thermal 'battery', storing heat for release in colder periods, and absorbing heat at warmer times.

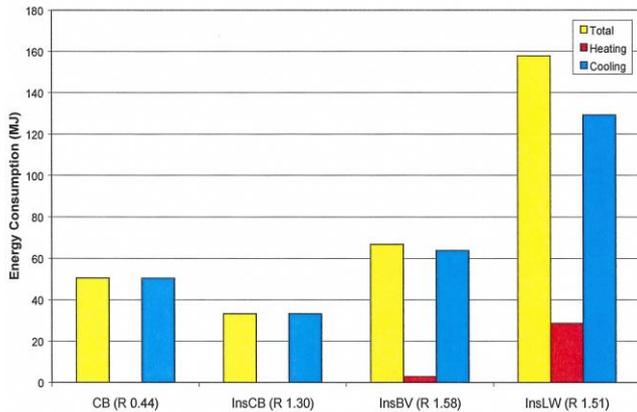
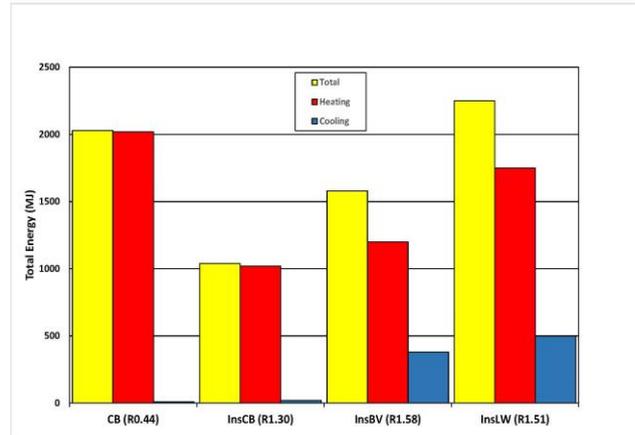


Figure 5.20 Total energy consumption, October 2007



Total Energy Consumption July/August 2008

As shown in the above two graphs representative of results derived at separate times in 2007 and 2008 [refer www.thinkbrick.com.au – ‘A Study of the Thermal Performance of Australian Housing’, Priority Research Centre for Energy, The University of Newcastle] the lightweight module InsLW(R1.51) that responded immediately to the external solar radiation incident on the external surface performed worse than double skin clay brick both un-insulated CB(R0.44) and insulated CB(R1.30). *Inhibiting the performance of the lightweight module was its lack of requisite thermal mass to assist in maintaining adequate thermal comfort.*

The insulated lightweight module exhibited greater variations in internal temperature and little thermal lag. The lightweight module, notwithstanding its high R-value, had the highest temperatures during the day and the daily swing in temperature was also consistently the highest. This necessitated the energy consumption of the lightweight module to be higher to counter the large daily temperature swing.

Clay Brick Walls Outperform Lightweight

To better understand why double skin Clay Brick construction with the appropriate use of resistance between the brick skins for the climatic zone is the real deal for achieving optimal energy efficiency in climates akin to South Africa and the ‘extra’ value Clay Brick partition walls provide, go www.thinkbrick.com.au and download “Energy Efficiency and the Environment; The case for Clay Brick, Edition 4”. The findings of this empirical research correlate with all thermal modeling studies that have used ASHRAE and Agreement SA compliant software.

The bottom line for Clay Brick construction in the South African context is that it does the job properly, efficiently, cost-effectively as built – providing all round performance and optimal energy efficiency for all building types, occupancies and climate zones, in compliance with SANS 10400XA: Energy Usage in buildings.

For more information visit: www.claybrick.org.za.

Ends.