

## Brick Technical Bulletin - Thermal Insulation

BTB 15

Marshalls bricks will generally be used in a number of locations during the construction process with the following effect on the thermal performance of the building.

### Facing Bricks/Dense Concrete Common Bricks/Utility Bricks/Dense Coursing Bricks

The products can be considered similar to dense aggregate blocks in terms of density and thermal conductivity. They would normally be used in external walls or below ground level, although solid common bricks will offer particularly good values of sound insulation in separating walls.

Thermal Conductivity (Dry)

1.11 W/mK

Thermal Conductivity @ 3% m/c

1.24 W/mK

Thermal Conductivity @ 5% m/c

1.33 W/mK

### Lightweight Coursing Bricks

Lightweight coursing bricks have similar properties to medium weight aggregate blocks with a density range of 1350-1450kg/m<sup>3</sup>. Coursing bricks are available in both 100mm and 140mm widths.

Thermal Conductivity (Dry)

0.42 W/mK

Thermal Conductivity @ 3% m/c

0.47 W/mK

Thermal Conductivity @ 5% m/c

0.50 W/mK

### Engineering Quality Bricks (EQs)

EQs have a slightly higher density than normal dense bricks with thermal conductivity values as follows:

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### Thermal Conductivity @ 3% m/c

1.39 W/mK

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1.47 W/mK

### Air Permeability

Although no declared values are quoted, similar products achieve air permeability values of 0.15 m<sup>3</sup>/hr/m<sup>2</sup>.

### Specific Heat Capacity

Assume values of 840-880J/Kg °C

### U-Value

The current value to achieve the maximum U-values allowed in UK Building Regulations in simple terms set a limiting value for external walls at 0.30W/m<sup>2</sup>K, although lower values may be specified. Other aspects such as air permeability, edge sealing etc. have to be taken into account. Due to the amount of additional insulation incorporated either into the cavity or on the inner leaf, the thermal properties of an external facing brick have no real significance on the overall performance of the wall. Consequently, an Marshalls facing brick can be deemed to produce similar results to that of a rendered dense aggregate block or reconstructed stone unit. Due to the infinite numbers of permutations in achieving the required U-value using internal and cavity insulation systems and inner leaves it is impractical to demonstrate methods of achieving the required thermal requirements in this particular Bulletin.

*Note: When calculating U-values the effect of mortar joints when using Marshalls bricks can be ignored. For precise calculations the conductivity data given above should be used in individual cases.*

### Coursing Bricks

Marshalls coursing bricks are produced in two widths, 100mm and 140mm, to suit the most popular block sizes. Both types are 65mm high and are available either as dense coursing units to be compatible with dense aggregate blocks, or as lightweight/medium aggregate bricks to complement medium/lightweight aggregate blocks. They are not suitable for use with autoclaved aerated blocks.