



# Low Carbon Housing Learning Zone



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## AIRTIGHTNESS

### INTRODUCTION

Airtightness is crucial to improving the energy performance of buildings. In the UK, the temperature of the outside air is nearly always lower than the temperature of the air inside the building, thus, any air leakage from the inside to the outside of the building is likely to result in:

- A significant reduction in the thermal resistance of the thermal insulation, due to thermal bypassing, leading to increases in fabric U-values.
- An increase in the building's ventilation and fabric heat losses, resulting in an increase in space heating requirement.
- Increased energy costs.

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#### Thermal Bridging

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#### Sequencing



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It is also important to realise that as the fabric performance of new dwellings improves, the proportion of total heat losses attributable to ventilation is likely to increase, unless air leakage is addressed. For instance, in reasonably well insulated but relatively leaky dwellings (those built to Part L 2006 with an air permeability of  $10\text{m}^3/(\text{h}\cdot\text{m}^2)$ ), ventilation heat losses can account for up to one third of the dwellings' total heat loss.

Comparison of ventilation and fabric heat losses for a 'notional' ( $80\text{m}^2$ ) semi-detached house

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