

## Whole building air leakage tests

This Technical note is one of two covering site testing to prove compliance with thermal standards. The other is:

TN45 Thermographic testing - identifying cold bridging and air leakage

This Technical Note considers the issues surrounding whole building air leakage testing and gives guidance on the practical aspects of procuring air leakage tests.

### Introduction

Uncontrolled air leakage (into or out of a building) is easily the biggest single factor causing heat losses and high energy consumption in buildings in the UK, TN47.

The Building Regulations recognise this and Part L2 places emphasis on reducing overall envelope air leakage and also proving this has been done on a project-by-project basis.

Independently of the Building Regulations Clients may set air leakage requirements for the whole building envelope to reduce the whole life operating cost of a building.

Whole building air leakage testing may also be undertaken to demonstrate the air leakage rate of a house type although this is not required by the Building Regulations Part L1.

### Regulation

The current Building Regulations Approved Documents Part L2 for England and Wales (April 2002) place a greater emphasis on energy conservation. Airtightness is one of a number of factors including solar gain, conduction heat losses through the facade, lighting and ventilation, that need to be taken into account.

The main objective of the airtightness requirement is to aid in the conservation of  
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fuel and power required to heat and cool the building. This leads to other benefits, particularly comfort and economy of operation. An airtight building requires less power to control the quality of the internal environment, thus reducing the annual running costs. Lower rated plant and air handling equipment can be installed; as less demand is put on the system so initial expenditure is reduced. This adds value to the building making it more attractive to the developer and tenant.

Part L1, relating to dwellings, requires the use of robust detailing to show compliance.

Part L2, relating to buildings other than dwellings also requires the use of robust details but further requires that all buildings with a gross floor area of more than 1000 m<sup>2</sup> be tested to show that the overall air permeability does not exceed 10 m<sup>3</sup>/hour/m<sup>2</sup>. If compliance with the Building Regulations is demonstrated by the 'Carbon emissions calculation method' then the required air leakage value may be lower.

Building Regulations Part L2: Construction part 2.2 refers to airtightness and states, "Air barriers should be installed to minimise air infiltration through the building fabric ... certificates or declarations should be provided .... stating ... that the results of air leakage tests carried out in accordance with CIBSE TM 23 are satisfactory".

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