



AIR TIGHTNESS TESTING

Approved Document L1A (Dwellings) and L2A (Non-Dwellings) of the Building Regulations calls for air tightness standards to be met and compared to either the upper limit of Building Regulations, or the Standard Assessment Procedure (SAP) requirements.

This Client Information Bulletin explains these requirements in summary form, as well as offering guidance as to the number of tests required in a development.

What is the Purpose of an Air-tightness Test?

Testing is the only satisfactory way to establish whether a building is reasonably airtight. There are a number of potential leakage paths in a new building. These unplanned ventilation routes all equate to a loss of energy.

How do we Test for Air Leakage?

We use UKAS calibrated equipment to perform air leakage tests. A temporary door cover and frame is used to seal the main entrance door; this also houses our fan which is used to depressurise the building. A series of pressures are reached, with data collected at each point (typically 25 to 55 Pascals). These are then analysed and an overall air permeability rate is calculated. The testing is non-destructive and personnel can remain inside the building during testing.

When should we undertake an Airtightness Test?

For residential schemes, about half of the scheduled test sample for each dwelling type should be carried out during construction of the first 25% that will be ready. This is to enable lessons to be learned and adjustments made to the design and/or site procedures before the majority of the dwellings are built.

We would recommend air tightness testing is carried out when the ex-



ternal fabric of the building is in its final state and all windows & penetrations etc. are completely sealed, i.e. end of 2nd fix. N.B. This is also the ideal time (i.e. prior to carpets being laid) for sound testing to be undertaken.

For commercial schemes, as soon as the external building fabric is sealed is a good time to test.

This allows for any remedial measures to be implemented prior to installing false ceilings/floating floors etc.

The Units of Airtightness

Air tightness of a building is measured in the following units:

$$\text{m}^3/(\text{h.m}^2) @ 50\text{Pa}$$

The unit is the volume of air leakage (m^3) per hour in or out of the building per square meter of building envelope. This is at a reference pressure of 50 Pascals.



How Many Tests are Required?

Testing should be carried out on 3 units of each dwelling type or 50% of all instances of that dwelling type; whichever is the less. On a large development, each block of flats should be treated as a separate development, irrespective of the number of blocks on the site. The dwellings to be tested should be taken from the first completed batch of units of each dwelling type.

The specific dwellings that make up the sample to be tested should be selected by Building Control.

On a site with multiple dwellings, terraced houses, or a block of flats, the final Dwelling CO₂ Emission Rate (DER) calculation must incorporate the assessed air permeability; this shall be determined as follows:

- 1) Where the dwelling has been pressure tested, the assessed air permeability is the measured air permeability.
- 2) Where the dwelling has not been tested, the assessed permeability is the average test result obtained from other dwellings of the same dwelling type on the development **plus** a penalty of $2\text{m}^3/(\text{h}\cdot\text{m}^2)$ @ 50Pa.
- 3) On small developments where the builder has opted to avoid testing, the assessed air permeability is the value of $15\text{m}^3/(\text{h}\cdot\text{m}^2)$ @ 50Pa.

Note: Point 2 above means that in a block of flats, the highest measured air permeability for any dwelling should be a maximum of $8.0\text{m}^3/(\text{h}\cdot\text{m}^2)$ @ 50Pa. We have found many developers are requesting a greater sample of testing rather than taking any 'penalties'. SAP Assessors commonly assume an air permeability rate of $5.0\text{m}^3/(\text{h}\cdot\text{m}^2)$ @ 50Pa. This means that on site, the tested units need to achieve a maximum of $3.0\text{m}^3/(\text{h}\cdot\text{m}^2)$ @ 50Pa to account for the untested plots.

Testing Commercial Units

Approved Document L2A applies to all building types other than dwellings; this includes "rooms for residential purposes" such as a room in a hostel, hotel, boarding house, halls of residence or a residential home.

Buildings less than 500m^2 total useful floor area may choose to avoid air pressure testing, in which case an air permeability rate of $15\text{m}^3/(\text{h}\cdot\text{m}^2)$ @ 50Pa is assumed. This will affect the outcome of the SAP calculations and as such it may well be beneficial to complete an air pressure test, as this should be less than $10\text{m}^3/(\text{h}\cdot\text{m}^2)$ @ 50Pa which will allow greater headroom for the Building CO₂ Emission Rate (BER) to achieve the TER.



What Evidence is Required?

To comply with Building Regulations, air testing must be carried out where appropriate.

On successful completion of an air tightness test, we will issue a full report detailing our methodology, details of instrumentation and all details concerned with obtaining suitable measurements and of course the results.

As a UKAS accredited testing laboratory (No. 4083), you can be sure it will be accepted by the Building Control body.

Hann Tucker Associates are one of the few consultancies that are a UKAS Accredited Testing Laboratory (No. 4083) for undertaking air tightness testing and sound insulation testing. Air tightness testing is undertaken by staff trained under UKAS approved procedures, testing in accordance with ATTMA Technical Standards.

As a cost effective solution, air tightness and sound insulation testing can be undertaken during a single visit using one point of contact; this reduces costs and simplifies the process of obtaining engineers on site at relatively short notice.



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Hann Tucker Associates

Consultants in Acoustics Noise & Vibration

Head Office:

Duke House, 1-2 Duke Street
Woking, Surrey GU21 5BA

(t): +44 (0)1483 770595

(e): enquiries@hanntucker.co.uk

Manchester Office:

First Floor, 346 Deansgate
Manchester M3 4LY

(t): +44 (0)161 832 7041

(w): www.hanntucker.co.uk