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Commercial Air Permeability Checklist

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This checklist is split into four sections to help.

Section 1 is for building preparation – How to prepare the building in time for the air leakage test.

Section 2 is important air pressure testing information.

Section 3 is comprehensive information and worth a read. Let us help you!

Section 4 is a list of simple steps to ensure that you are planning an air tightness strategy, with details of how we can help.

'Air Tightness Barrier'
A continuous airtightness barrier system is the combination of interconnected materials, flexible sealed joints and components of the building envelope that provides the airtightness of the building enclosure and the separateness of heated and unheated spaces.

Section 1

Building Preparation

✔	
☐	Internal doors to riser cupboards may be closed but should not be artificially sealed.
☐	Lift doors should be closed (but not artificially sealed). Any external lift shaft vent should remain open.
☐	All drainage traps should be filled with water.
☐	All incoming service penetrations (e.g. power, telecoms) should be permanently sealed.
☐	All external doors and windows should be closed (but not artificially sealed). This includes door thresholds. The exception to this will be apertures to which test equipment is connected.
☐	Smoke vents should be closed but not artificially sealed.
☐	Background trickle ventilators, passive ventilation systems and permanently open uncontrolled natural ventilation openings should be permanently open. Uncontrolled natural ventilation openings should be temporarily sealed.
☐	Mechanical ventilation and air conditioning systems should be turned off. These systems should be temporarily sealed to prevent air leakage through the systems during the test.
☐	External doors, windows & manual vents need to remain closed for the test. All internal doors need to be propped open.
☐	We do require a door frame of standard size to fit our square adjustable frame. You may need to modify the opening to suit our template. Minimum size opening 700 x 1300mm/ Maximum 1100 x 2400mm

Section 2

Testing information

1. Personnel can work normally within the building on the day and during test setup. However, access in/out of the building needs to be controlled, particularly during the test (usually around 30 mins). They also need to be made aware of the test and the need to leave the building in the required state of preparation.

2. Please ensure that other works on the test day will not prevent the test from being undertaken. Examples would include commissioning the HVAC systems, screeding floors, power outages, painting & decorating in the vicinity of the fans, fitting doors etc. (If the test cannot reasonably proceed to planned timescales due to such works, then it may have to be aborted at full cost).

3. An appropriate member of the project team should be present to liaise with the Engineer. This will facilitate the smooth running of the test and for witnessing any required leakage diagnosis and to take notes.

4. A safe means of access above 2.0m will be required to facilitate air leakage identification in high level areas.

5. We expect to be using electric fans for this test, for which a 240v or 110v power supply will be required for each fan. Please ensure that either mains power is live within the building, or that generators of sufficient capacity (please discuss) are on site. Fan positioning is an important consideration. External doors leading into large open areas and stairwells are preferred to ensure the widest distribution of pressure.

6. We require a parking space for a van (transit size) within 10–20meters of the test location on site. If you are unable to provide a parking space, parking charges including fines incurred will be chargeable.

7. Tests will be carried out in strict accordance with the requirements of the correct methodology (ATTMA TS1).

8. Our testing staff need to be allowed to carry out their tests without being subjected to any form of harassment. Any deviations from normal testing practice will need to be confirmed in writing from Building Control.

9. Air Permeability Target – If the target from your SBEM is known, please let us know prior to the test or have it ready for the engineer on the day.

Section 3

Comprehensive information – worth a read!

Blockwork	All blockwork leaks, from 0.1 to 60 m3/h/m2. Plastered blockwork does not leak, however, any area that is not plastered is a potential problem i.e. above false ceilings and below raised floors. Painting good quality blockwork reduces leakage but painting poor quality blockwork has little effect.
Pipework and electrical services	Pipework and electrical penetrations through the envelope into plant rooms and electrical switch rooms should all be sealed, as collectively they can add up to a large area of leakage.
Beams and steelwork	Steelwork encased in fire cladding and hallow concrete beams. If they are not sealed properly, then sealing after construction could prove either futile or at the very least expensive.
Ceilings	All types of ceilings are a potential area of leakage due to light fittings.
Curtain walling systems	All joints are weak points, especially where it abuts the floors, walls and roof sections.
Dry Lining systems	Dry lining systems should be sealed with a continuous bead of plaster along the length of the bottom of the board. All penetrations should be sealed. Where these systems join the external walls extra care must be taken to ensure that there are no leakage paths.
Lift shafts	Lift doors should have adequate seals. Special attention must be made to any raised floors adjacent to the lift. The vent at the top of the shaft should not be sealed for the test.
Profiled metal decking	The underside of profiled metal decking and all joints will require effective sealing during the laying of the sheets. Perforated liner sheets and relying on the vapour barrier should be avoided as they under perform.
Windows and door frames	Windows and doorframes need to be sealed to the inside surface of the envelope. Any cavities must be sealed before final finishes are made.
Wall to ceiling and roof joints	All walls to ceiling and roof joints need to be sealed properly at the time of construction, as these areas are the hardest to reach and not easily inspected after construction. All expansion joints between concrete beams and blockwork should be deep filled with an airtight compound.

Section 3

Riser shafts	Riser shafts need to be very tightly air sealed to prevent leakage into plant rooms and the building cavity.
Steelwork penetrations	Steelwork penetrations that pass through the internal surface must be sealed with a compound that will allow for expansion and contraction.
Loading bay doors	Loading bay doors should preferably be of the panel tight with adequate seals.
Roller Shutter Doors	BS EN 12426 classifies the air permeability of doors. The seven Classes run from 0 – 6.The higher the class, the lower permeability. A Class 1 door has a permeability of 24m^3/m^2h at 50 Pa. Each class has a permeability rate half that of the previous Class.
Water and condensate traps	Water and condensate traps should be filled at the time of the test.
Materials that must be avoided when sealing any joints	Mineral wool and rockwool.
Tape and expanding foam	The life span of tape and expanding foam is too short for use in a building that would be standing for many years. Only foam designed for air sealing should be used.

How to plan

1. Define an airtightness performance target. This is found on your SAP (Standard Assessment Procedure) calculation. This will enable you to plan a strategy to achieve this level and better.
2. Establish ventilation with your SBEM assessor. Different ventilation systems work most effectively with different levels of air tightness. We have the expertise to advice on your ventilation requirements.
3. Details should be thoroughly worked out at design stage and not 'left-to-chance' later on site.
4. The airtightness barrier needs to be designed into the building envelope during the initial concept design stage. It can be useful to take plans and sections and draw a continuous red line that passes through all the elements that separate heated and unheated spaces.
5. Tightly manage the design implementation by appointing an 'Airtightness Champion' to coordinate.
6. Use a performance specification.
7. Ensure all trade specifications include their requirements and interfaces with other trades.
8. Specify airtight components, membranes, seals and jointing methods.
9. If the design team is inexperienced, it might also be prudent to appoint an independent adviser. We are here to help.

On site

1. Site manager needs to understand how critical it is to understand the designed air tightness and the methods involved around it. Communication with the design team is key.
2. It is useful at an early stage to identify critical details that will have a bearing on the airtightness barrier.
3. Appoint an Air tightness Champion for the responsibility and to coordinate between consultants and contractors.
4. Think in 3D and explore around every corner.
5. Check trades and the interfaces between each specific aspect that the air tightness hasn't been compromised.

Section 4

How we can help

Below are all the various services we can assist with. Help is at hand.

Temporary Air Sealing	Temporary sealing programme will ensure the building is fully prepared in advance of the air permeability test itself. It will involve sealing of all ventilation systems and extracts.
Contract Structural Air Sealing	Designing an effective air sealing strategy should begin at design stage and continue through to the formal Air Test, with the latest practicable 'start point' being 1st. Fix Stage. Our sealing teams, managed by experienced air test engineers, will use robust sealing products and bring tried and tested expertise of working alongside other trades contractors to ensure that the building will ultimately achieve a successful 'PASS' come the formal air test day.
Air Permeability Drawing Review	A drawing review in our mind is the most effective way to identify potential design flaws and/or anomalies that may have an impact upon meeting the standards required to achieve compliance with Part L of the Building Regulations. Our qualified Engineers/Assessors will review all aspects of the drawings and prepare an easy-to-read detailed report. In addition with advice and guidance on how to best prepare the building/s in readiness for successfully achieving a 'PASS' at the time of formal air permeability testing.
Air Permeability Drawing Review Site visit	A great way to get on site with the architect(s)/developer(s) to identify potential design flaws and/or anomalies that may have an impact upon the building/s meeting the standards required to achieve compliance with Part L of the Building Regulations. Our qualified engineers/assessors will review all aspects of the drawings and provide advice and guidance on how to best prepare the building/s in readiness for successfully achieving a 'PASS' at the time of formal air permeability testing.
Pre - Air Permeability Test Visit	Hands on approach to get on site with one of our experienced engineers/assessors will, together with client / site agent, carry out a detailed examination of the build (where accessible) and identify potential areas of 'air leakage'. In addition providing straightforward practical advice and solutions to help you prepare the environment and develop the required 'air test mind-set' which will ensure peace of mind come test day. A FREE easy-to-understand 'tick-box' report will be provided on site identifying specific areas of leakage and recommending specific measures that will assist the client in achieving improved levels of energy efficiency.

Section 4

Air Permeability Testing - Pre Improvement	Why not get your existing house tested to establish heat loss throughout the building. Why spend thousands on the insulation when a simple air leakage test can be just as effective. We leave an easy-to-understand 'tick-box' report can be provided on site. This identifies specific areas of leakage and recommends specific measures that will assist the client in achieving improved levels of energy efficiency.
Air Permeability Testing - Post Improvement	After all remedial works have been carried out at pre-improvement stage we can carry out an air leakage test to demonstrate the levels of improved energy efficiency that have been achieved as a result of the recommended improvements or remedial works.
Air Permeability Smoke Testing	Want to see where it leaks? By using a combination of odourless, non-toxic smoke and building pressurisation to identify air leakage exit points and air flow paths. This is the most effective way of identifying air leakage defects within a building structure. A FREE easy-to-understand 'tick-box' report will be provided on site identifying specific areas of leakage and recommending specific measures that will assist the client in achieving improved levels of energy efficiency.
Air Permeability Site Visit(s)	A friendly yet informative site visit to provide advice and guidance regarding the air test process and to walk the client through our easy-to-understand air test preparation checklist.
Air Permeability Test	To conduct formal air permeability testing in accordance with the ATTMA TS1 issue 2 (BS, EN Standard 13829:2001) and to produce the required iATS Certificate/s to demonstrate that the building/s comply with Part L of the Building Regulations. All our testing is carried out by our in-house team of iATS certified Air Test Engineers and we provide ALL of our clients with a FREE easy-to-read checklist to help you successfully prepare the building/s prior to testing.
Air Permeability - Multi-Unit Testing	Large sites... we can help. Air Permeability Testing to ATTMA TS1 Issue 2 (BS,EN Standard 13829:2001) Standard - to comply with Approved Document L of the Building Regulations and including all associated Test Reports(s) and Certificate(s). Multi-unit air permeability testing designed for the larger sites. Simple matrix to be used for every site visit. Dependant on the site conditions we are able to test between 15-20 plots per visit per engineer.