

APT



AIR PRESSURE TESTING LTD

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IT'S OUR AIM TO GET YOU A PASS FIRST TIME!

Dear Sirs,

I would like to take this opportunity to introduce our company to you and explain the services we are able to offer. APT is an independent company, formed by two directors, who have a vast amount of experience in the Construction Industry. We have extensive knowledge regarding the way different materials and construction methods can influence the results of an Air Pressure Test. Ultimately, we understand the importance of constructing an air tight building envelope that has a high thermal performance and complies with Acoustic Regulations (part E). The services we offer are:

- ***Air Leakage Testing***
- ***Infra-Red Thermographic Surveys***
- ***Acoustic Airborne and Impact Sound Testing***
- ***Construction Phase Consultancy***

1. Air Leakage Testing

Air Testing is the simplest and most popular method used in the construction industry to confirm compliance with Part L of the Building Regulations. The air leakage test is simply a test of the building fabric integrity. Draughts and heat loss will occur wherever there is a hole or gap in the building envelope.

As many people are aware, since April 2006 **all** new commercial buildings have been required to be tested for Air Permeability, in order to comply with Part L2 of the Building Regulations, however commercial buildings with a total useable floor area of less than 500m² GROSS can avoid testing if a figure of 15 M³/hour/M² is used as the leakage rate in the SBEM calculation, although this is rarely practical. Testing to dwellings under part L1 (April 2006) has also been made part of the regulations. A representative sample (1 of or a minimum of 10%) of each different house or flat type needs to be tested on each site. (Flats on different floors are classed as being different types)

We provide a personal, helpful, efficient and cost effective service to our clients. Using the latest high power, portable door fans systems, we offer air leakage testing to all building types, ranging from small rooms, flats & houses to office blocks & large distribution warehouses in accordance with the ATTMA Technical Standard 1.

Our fan systems are compact, discreet and fit simply into a personnel door. The system can easily be transported through areas of limited access or up to high level areas. It is for this reason that many companies working in busy city centres utilise our expertise and equipment. We are able to eliminate the site disruption caused by the larger trailer type testing equipment. Work can also continue inside the building whilst the air leakage test is being carried out.

In the event of a building failing an air test we then offer smoke testing, which highlights the areas of leakage in the building fabric. We can then undertake a full written and photographic survey as reference for your site management and relevant subcontractors. We will also offer FREE advice on the best method to seal any leaking areas. The main benefits of this are:

- ***Air leakage is quickly identified in the event of a test failure***
- ***Remedial works can start straight away***
- ***Practical completion can be achieved more quickly***

2. Thermographic Surveys

Infra-Red Thermographic surveys can be undertaken to provide a qualitative assessment of the thermal performance of components through the whole building envelopes, and identifies missing or misplaced insulation, wet insulation, severe cold bridging, air leakage paths, etc. Thermographic surveys on whole buildings can be used to prove compliance with the continuity of thermal insulation requirements of part L of the building regulations. The main benefits of these surveys when used in association with leakage testing are:

- ***Quick inspection***
- ***Results shown clearly in pictures***
- ***Shows thermal insulation defects***
- ***Can be used to show the efficiency of heating and cooling installations***

3. Acoustic Testing

Recent changes to the Building Regulations 2000 mean that many new dwellings and conversions require sound insulation tests to demonstrate compliance with the airborne and impact sound insulation criteria given in Approved Document E (ADE). APT can perform these at relatively short notice for any sized development, from two-flat conversions up to hundreds of flats.

4. Construction Phase Consultancy

APT has a practical 'hands on' approach during building construction and prefers to be involved as practically possible during this stage. We undertake periodic site visits to inspect the building envelope assembly as it is constructed and provide both written and photographic reports to enable any further works / remedial works deemed necessary to be accurately targeted. Site visits are generally to allow us to identify:

- ***Insulation placement, continuity and effectiveness at thermal bridge junctions***
- ***Air barrier continuity within elements and at interfaces (particularly at sub-contract package interfaces)***

Our Promise to you

We guarantee to be professional, reliable, helpful and very competitive; we offer a last minute service at no extra cost, and we also undertake weekend working both on Saturday and Sunday in order to meet your out of hours testing requirements. We offer a nationwide service offering a single supplier for all of your projects.

Most of our clients, who use us for the first time, continue to use our services because of our proactive and helpful testing service. It is our continual aim to help you pass at the first attempt. **This proactive approach has led to nationwide agreements with some of the top UK Contractors, which allows them to benefit from even more competitive rates.**

To help your company prepare for future Testing we have included the following appendices.

APPENDIX 1 - Air Leakage Design checklist

APPENDIX 2 - Our Testing Equipment

APPENDIX 3 - Air Leakage Test, Contractors checklist of items that need to be completed prior to a test

APPENDIX 4 - Acoustic Test, Checklist of items that need to be completed prior to a test

I hope that by way of this introduction letter and the attached information, you are now more informed about the testing requirements of Part L & Part E and the services we offer. If you need any further information or a quotation please feel free to contact me, Darren Helliwell 07775 623464, or Malcolm Fish on 07967233836. Please also feel free to visit our website for an online quote at www.airpressuretesting.net

Yours Faithfully

Darren Helliwell
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Appendix 1:

Design Checklist

Successful building leakage air tests and air tight building construction stems from an attention to detail at both the design and construction stages of the project.

An airtight barrier layer needs to be identified within the building, and this layer extended to all facets of the building elevations. The following information identifies the most common types of materials used to construct building envelopes, and highlights the areas where particular attention needs to be paid.

Wall Constructions:

The inner skin of the external walls should ideally form the airtight barrier in wall constructions. External walls should be extended from floor level to the underside of intermediate floors and roofs. All gaps between blockwork and intermediate floors, roof members, windows/doors, steel columns, etc should be sealed.

Blockwork:

Standard blockwork is not impermeable to air unless it is plastered. The block density and standard of mortar joints have a significant impact on the overall permeability of the construction. Full mortar joints are preferable. Painting blockwork reduces the permeability and two coats of emulsion can make a significant improvement.

Drylining:

Ensure that the external walls are completed and fully sealed prior to springing internal stud partitions from them. Avoid/minimise service outlets such as sockets, data outlets etc in the dry lining of external walls as they are rarely well sealed. Make sure that blockwork behind dry lining has full mortar bed joints and perps. The gaps at the top & bottom of the plasterboard should be sealed.

Sheet Metal Cladding:

Insulation to the correct density needs to be used and compressed to the correct thickness within the construction and mastic joints used to seal the sheets. Profiled closer pieces of the correct size and profile must be used and sealed where panels meet other constructions.

Composite panel systems are generally better than in-situ built up systems, since the joints between panels have gaskets and the steel cladding layers are completely filled with foam.

Special attention needs to be paid at the interface between wall cladding and other methods of construction. **The head of the wall/ underside of roof junction is particularly susceptible to leaking.**

Curtain Walling Systems

Curtain walling systems are normally well designed and constructed with gasket joints between panels and frame construction. Generally it is the joints with other types of construction such as Concrete edge beams, roof parapets, brickwork etc. In addition care needs to be taken with multi storey construction to avoid air leakage between floors.

Floor constructions:

Cast In situ Concrete Slab:

This type of floor provides the best type of airtight seal since the concrete fills any voids, both horizontally and vertically.

Pre-cast Hollow Concrete Floor Planks:

The hollow core of this type of floor can allow air to track horizontally and end up outside the airtight layer of a cavity wall. The problems are made worse with drainage and service penetrations, which if poorly sealed allows air to enter the hollow core and escape. Care should be taken to ensure all penetrations are sealed properly. We would recommend that the ends of the concrete planks are also sealed.

Beam and Block Floors:

This type of floor construction can lead to similar problems to those described for the pre cast planks above.

Ceiling Constructions:

Where roof/ceiling voids exist, lay in type false/suspended ceilings do not form an airtight barrier layer. Plasterboard type ceilings if plastered and edges sealed are significantly better than other types of lay in ceilings.

Roof Constructions:

Profiled Metal Decking:

The inside surface of the decking if possible should form the airtight barrier and needs to be sealed to all the adjoining structure and the sheets sealed to each other during the construction of the roof. Use of the vapour barrier as the airtight layer should be avoided since this is rarely an effective seal. Steelwork supporting the roof can sometimes prevent access to the roof decking above and prevent a satisfactory seal being formed. Careful detail is needed to address this. Any Profiled decking can cause difficulties in sealing walls where they run on the underside. A profiled closer piece should be used to fill the void, and this in turn should be sealed with mastic.

Flat Roofs:

These types of roof generally provide a good airtight barrier over the main horizontal area of the roof, since they are designed to prevent water ingress. Particular care needs to be taken around parapet walls, flashings and roof penetrations.

Doors and Windows:

Door and window frames need to be sealed to the internal air tight barrier and not just sealed to the external façade. Window sills are often an area, which performs particularly poorly and should be fitted after the cavity has been sealed using an appropriate cavity closer.

Lift Shaft Doors:

Lift shafts have a permanent vent to outside at the head of the shaft and should be fitted with effective doors seals at each landing. Any floor or ceiling voids adjacent to the shaft should also be adequately sealed to prevent leakage.

Loading Bay Doors:

Concertina type sliding doors are very difficult to seal. Where possible, Roller Shutter or Sectional type doors, with good quality rubber seals should be specified. The seal between the head of the door and the cladding soffit should be checked to make sure it fully closes the gap.

Mechanical and Electrical Systems:

The airtight barrier should generally step inside the building separate the plant rooms from the rest of the building. The plant room partition walls, floors and ceiling as well as service risers require careful sealing around all mechanical and electrical service penetrations. Particular care is needed to fill voids INSIDE electrical service trunking.

All incoming service ducts should be sealed after the services have been installed.

Sanitary Services:

All drainage traps including floor gullies and air handling plant condensate traps should be filled with water prior to the test.

Detailing and materials selection needs to be high on the list of priorities for all members of the team, right from the start of the project to ensure that:

- 1) The airtight barrier layer is identified
- 2) The correct products are used where required
- 3) The relevant areas are monitored throughout the construction phase

The use of certain types of products such as adhesive tapes or expanding foam should be avoided since these do not perform over the life of the building.

Appendix 2:

Our Equipment

Fan Systems

The photograph below shows the very latest, world leading, high power fans that we use to test all sizes of buildings from dwellings up to large distribution warehouses. These fans are demountable & portable, making them suitable for use where access is limited. They eliminate the need for the large trailer mounted fans, which can cause disruption and access problems on site.



Appendix 3

Checklist of Items to be completed prior to our arrival on Site to undertake the Air Leakage Test

1. Prior to attending site we require accurately calculated values for the Floor Area, External Wall Area, Roof Area & Volume of the building. We will also require a set of floor plans and elevations to mark up areas of leakage in the event of a test failure.
2. We will require the Design Air Leakage Rate or Air Permeability for the building. For commercial buildings this is generally **10 m³/hour/m²**, but can be lower, if requested in SBEM calculations. For houses the value is generally lower than 10 m³/hour/m² and should be documented in the SAP rating report.
3. We require TWO 240v Electric sockets within 25 metres of EACH of our testing equipment set up.
4. Ensure that the completed building envelope is finished. All doors, windows, and cladding must be installed, or if items, such as glazing are missing, they should be sealed up to prevent air leakage.
5. Seal with tape or cardboard any duct work and mechanical vents to the outside. Pay particular attention to the air conditioning system.
6. Seal all ducts and penetrations where the main services enter the building.
7. Seal all SVP and waste pipe penetrations passing through external walls and ceilings. Make sure that the tops, sides & ends of all pipe boxing's are sealed to prevent air leaking into the boxing and escaping through SVP/waste pipe penetrations.
8. Ensure that all toilets and U bends in sinks have water in them.
9. Turn off all pilot lights and combustion equipment. Seal all flues.
10. Decide which personnel door/s are to be used for the test. Make sure that there are no obstructions within 3 meters of the inside and outside of the door/s chosen for the test. In some cases the door/s may need to be removed, if so you will need to supply an attendance to remove the door/s.
11. Ensure all external doors and windows are closed fully and trickle vents closed. Internal doors should be wedged open.
12. Smoke vents are to be closed but NOT SEALED.
13. Lift shaft vents are to be left open, with lift doors closed.
14. Remove 1% of ceiling or floor tiles that are adjacent to the external envelope.
15. In houses all penetrations through the top floor ceilings should be sealed.

16. Have a competent member of your staff available on the test day to modify and/or seal any further areas that we identify as requiring extra work.
17. If the door/s chosen for the test has a larger opening larger than 1.200m x 2.100m high, you will need to modify the opening to suit our standard template.
(Please call us for advice should this be required.)
18. Whilst we would prefer to have the building empty during the test duration, people can stay in the building whilst the test is in progress. They may not however enter or leave during the test period. (Approx 1- 2 hours)
19. The customer must confirm the test date in writing at least 72hrs before the programmed test date, if this doesn't happen APT reserve the right to cancel the Air Leakage Test until written confirmation is received.
20. We require a parking space for a transit van type vehicle within 10 metres of the test location on site.
21. Testing cannot take place in high winds or if significant temperature differences persist, particularly for high buildings. You should inform us immediately if on the day of the test high winds in excess of 6 m/s are experienced, and a personnel door in a sheltered area cannot be utilised. If we arrive on site to carryout the test and have to abort the test due to wind speeds in excess of 6 m/s the full test fee will be payable.
22. If we arrive on site and are delayed due to the site not being prepared adequately, or the items in this checklist not being completed prior to our arrival, we reserve the right to cancel the test. The full test fee will be payable.

If you have any questions about the preparation or actual test, then please ring our offices to discuss them. We are here to help you achieve a pass at the first attempt.

Appendix 4:

Checklist of Items to be completed prior to our arrival on Site to undertake the Acoustic Test

The best time to carry out sound testing is towards the completion of the project. In addition the optimum conditions are when the site is quiet. If there is noise on the site from equipment and 'on going works' here is an increased chance of a sound test failure. Housing developers and/or site managers will have to nominate a day for testing and restrict any noisy activity during the tests. The following list provides an indicative checklist for site managers for the requirements of the plots and sites where testing may be carried out.

A site is ready for testing when:

1. Windows are fully fitted with locks in place.
2. Window trickle vents are in place or temporarily blocked up for testing.
3. Room and front doors are in place and closable.
4. All wall surfaces in rooms to be tested are complete (including sockets and switches if applicable).
5. Floor and ceiling surface are complete.
6. Carpets or timber laminates have NOT been laid in rooms where floors are to be tested (with the exception of bonded carpet).
7. Staff made aware that a quiet site environment is required during testing