RESULTS OF THE ENVELOPE AIRTIGHTNESS TEST CARRIED OUT ON:

18 Ros na Hinse, Carrick-on-Shannon, Co. Leitrim

Report reference: TMN 240109

Date: 24th January 2009

Carried out for: Susan Butler,
18 Ros na Hinse,
Carrick-on-Shannon
Co. Leitrim

Carried out by: Tony Mc Nerney
National Energy Assessors
Block C
N4 Axis Centre
Longford
Co. Longford

Maximum permitted Air Permeability: 10.0 m³/(hr . m²) @ 50Pa
Test Result: 5.46 m³/(hr . m²) @ 50Pa

THIS DWELLING **PASSES** THE AIR-TIGHTNESS TEST
INTRODUCTION

This report is presented to provide the results of the air permeability depressurisation test carried out at 18 Ros na Hinse, Carrick-on-Shannon, Co. Leitrim to determine compliance with Approved Building Regulations and to identify any sources of air leakage.

The measured air permeability of the dwelling was 5.46 m³/(h.m²) at a test pressure of 50 Pascals with no non-conformities in the dwelling set up.

TEST CONDITION & EQUIPMENT

<table>
<thead>
<tr>
<th>Environmental Parameter</th>
<th>Before Test</th>
<th>After Test</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan off pressures</td>
<td>auto</td>
<td>auto</td>
<td>pre -3.5 post -2.8</td>
</tr>
<tr>
<td>Internal Temperature</td>
<td>16.4°C</td>
<td>16.5°C</td>
<td>16.5°C</td>
</tr>
<tr>
<td>External Temperature</td>
<td>4.6°C</td>
<td>4.5°C</td>
<td>4.6°C</td>
</tr>
<tr>
<td>Barometric Pressure</td>
<td>990.55</td>
<td>990.39</td>
<td>990.47</td>
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<tr>
<td>Wind Speed</td>
<td>0.5 m/s</td>
<td>1.0 m/s</td>
<td>0.75 m/s</td>
</tr>
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</table>

Equipment Used (Calibration Certificates available on request)

<table>
<thead>
<tr>
<th>Equipment Used</th>
<th>Serial Number</th>
<th>Expiry date of Calibration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minneapolis Blower Door Fan</td>
<td>5KCP39PG</td>
<td>9th June 2010</td>
</tr>
<tr>
<td>Micromanometer DG700</td>
<td>10674.6.700</td>
<td>9th June 2010</td>
</tr>
<tr>
<td>Testo 511 Barometer</td>
<td>39102443/709</td>
<td>4th June 2010</td>
</tr>
<tr>
<td>Testo 110 &amp; wired probe Thermometer</td>
<td>33919697/801</td>
<td>4th June 2010</td>
</tr>
<tr>
<td>Testo external wireless Temperature Probe</td>
<td>34400775/509</td>
<td>4th June 2010</td>
</tr>
<tr>
<td>Wind Speed anemometer, ANEMO</td>
<td>51179</td>
<td>9th June 2011</td>
</tr>
<tr>
<td>Energy Conservancy Software</td>
<td>Tectite Express version 3.6.7.0</td>
<td>N/A</td>
</tr>
</tbody>
</table>

This Test procedure has been carried out in accordance with ATTMA TS1 and IS EN 13829
The Air-Tightness Test

How an Air Tightness Test is carried out

A test is carried out by connecting a fan, or a number of fans, in the doorway of a building and depressurising the building over a range of pressure differences. The fan speed is increased in steps up to a maximum and then decreased in steps. Air volume flow rate through the fan (equal to the air leaking through the building envelope) and the pressure difference across the building envelope are recorded at each fan speed. In calculating air permeability, corrections are made for temperature and barometric pressure. Local wind speed should preferably be below 6 m s\(^{-1}\).

Before the test is carried out, all mechanical ventilation systems must be switched off. All mechanical ventilation grilles and openings to the outside must be temporarily sealed. Temporary sealing can be achieved with plywood sheeting or plastic sheeting and strong adhesive tape. Smoke vents should be closed but not sealed. Drainage traps should be filled. Any closeable openings should be securely closed. Any permanent openings which are for heating or ventilation should be temporarily sealed. While the depressurisation test is being carried out all external doors and windows must be closed and secured to avoid them being blown open. Internal doors must to be wedged open during the test to avoid them slamming shut.

The fan unit will create draughts in the building. Lightweight objects and paper near the fan unit should be removed or covered to avoid them being blown about. Fixtures and furniture will not be affected.

Access in and out of the building during the test will not be possible (unless there is an emergency and a need to evacuate the building). The test will take approximately 60 minutes. Site workers can remain in the building during the test, or will have to remain outside until the test is complete. There are no health risks to site workers who remain in the building during the pressure test; however there may be some discomfort due to cold draughts and some noise from the fan.

Air permeability is expressed as volume flow per hour (m\(^3\) h\(^{-1}\)) of air supplied to the space per square metre (m\(^2\)) of envelope area for an internal to external pressure difference of 50 Pascals. Example: 5.0 m\(^3\) h\(^{-1}\) m\(^{-2}\) at 50Pa
1. Overview

The term itself - air tightness - is a somewhat confusing one – perhaps air control is more accurate. When we talk of air tightness, what we’re essentially speaking about is the elimination of draughts. In other words when we want fresh air, we open a window or slide the cover of a vent across, and we have the fresh air that we want. Draughty buildings provide fresh air whether we want it or not. In winter when ambient external temperatures may be only three or four degrees and we like to relax indoors in temperatures around twenty degrees, we end up footing the bill for warming-up any incoming air. The less cold air that we have to heat, the better, so air tightness or air control saves money. Airtight buildings offer another economic benefit – they don’t let much warm air escape either.

Air Leakage is the uncontrolled flow of air through gaps and cracks in the fabric of a building (sometimes referred to as infiltration or draughts). This is not to be confused with ventilation, which is the controlled flow of air into and out of the building through purpose built ventilators that is required for the comfort and safety of the occupants. Too much air leakage leads to unnecessary heat loss and thus discomfort to the occupants from cold draughts. This heat loss also has a negative impact on fuel bills. A building which is properly designed and constructed to achieve low air permeability will reduce unwanted air infiltration, lower fuel and energy bills, and save the homeowner money.

The aim should be to ‘Build tight – ventilate right’. Taking this approach means that buildings cannot be too airtight, however it is essential to ensure appropriate ventilation rates are achieved through purpose built ventilation systems or openings.

Gaps and cracks in the building fabric are often difficult to detect simply by visual inspection. The only satisfactory way to show that the building fabric is reasonably airtight is to measure the leakiness of the building fabric as a whole. Air leakage is quantified as air permeability. This is the rate of leakage \( \text{m}^3/(\text{h.m}^2)@50\text{pa} \) between the inside and outside of the dwelling.
2. Legislation

Mr John Gormley TD, Minister for the Environment, Heritage & Local Government, published building Regulations under Part L of the building code dealing with energy efficiency for homes in on late 2007. The Regulations provide for a dramatic improvement in energy efficiency standards in Irish homes. They are aimed at ensuring that new housing stock in Ireland is built to the highest international standards, where they will be cheaper to run and will have a much lower impact on the environment. The new building regulations are split in to two parts L1 & L2 and they are:

- **L1** A dwelling shall be designed and constructed so as to ensure that the energy performance of the building is such as to limit the amount of energy required for the operation of the building and the amount of CO2 emissions associated with this energy use insofar as is reasonably practicable.
- **L2** Sets out how the requirement of L1 shall be met.

For new dwellings, the key issues to be addressed in order to ensure compliance are:

- **Use of Renewable Energy Sources** providing that the contribution of low or zero carbon energy sources to the calculated primary energy requirement meets the required target.
- **Fabric insulation**: providing for fabric insulation, including the limitation of cold bridging, this satisfies the guidance in this regard.
- **Air Tightness**: designing air infiltration to be under certain maximum limits.
- **Boiler efficiency**: providing an efficient boiler or other heat source, minimum 86% efficiency.
- **Insulation of pipes, ducts and vessels**: limiting the heat loss from pipes, ducts and vessels used for the transport or storage of heated water or air.
- **Building Services Controls**: controlling, as appropriate the demand for and output of space heating and hot water services provided.
- **Mechanical Ventilation Systems**: providing that, where a mechanical ventilation system is installed, the system meets reasonable performance levels.
- **Artificial Lighting**: providing that the installed lighting system meets reasonable performance levels.
- **Performance of Completed Dwelling**: Ensure design and construction process are such that completed building satisfies compliance targets and design intent.
- **User information**: Ensure that adequate operating and maintenance instructions are available to facilitate operation in an energy efficient manner.

These new regulations came into operation on the **1st July 2008** and apply to all new buildings where planning permission is sought on or after that date.
3. Airtightness role in the Building Regulations

Air pressure testing should be carried out on a proportion of dwellings on all development sites. The approved procedure for pressure testing is given in the ATTMA publication 'Measuring Air Permeability of Building Envelopes' or other ref 1. The manner approved for recording the results and the data on which they are based is given in section 4 of that document.

On each development, an air pressure test should be carried out on at least one unit of each dwelling type. The number of tests required is related to the number of units in the development and on the results achieved in the earlier tests carried out and is presented in Table 4 of the 2008 Building Regulations Part L, as extracted below. Where a number of apartment blocks are constructed on the same site, each block should be treated as a separate development irrespective of the number of blocks on the site. One dwelling from the first four units of each dwelling type planned for completion should be tested.

<table>
<thead>
<tr>
<th>Number of units</th>
<th>Number of tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 or less</td>
<td>One test</td>
</tr>
<tr>
<td>Greater than 4, but equal or less than 40</td>
<td>Two tests</td>
</tr>
<tr>
<td>Greater than 40, but equal or less than 100</td>
<td>At least 5% of the dwelling type</td>
</tr>
<tr>
<td>More than 100 (a) where the first five tests achieve the design air permeability</td>
<td>At least 2% (for dwellings in excess of first 100 units)</td>
</tr>
<tr>
<td>(b) where one or more of first five tests do not achieve the design air permeability</td>
<td>At least 5% of units, until 5 successful consecutive tests are achieved, 2% thereafter</td>
</tr>
</tbody>
</table>

The Following is the link to the ATTMA publication 'Measuring Air Permeability of Building Envelopes'
http://www.attma.org/ATTMA_TS1_Issue2_July07.pdf
4. **How to make your building air-tight and eliminate unwanted draughts.**

The main way of making your house air tight is to seal off all areas where possible air infiltration may occur. These areas include:

- Top Floor Ceiling
- Around Windows & Doors
- Electrical Sockets & Switches
- Service Penetrations

**4.1. Top Floor Ceiling**

It is recommended that a membrane be put in place around the top floor ceiling. This is to prevent air leakage from the attic space and other areas. This membrane should be lapped at all ends where the wall meets the roof and should be lapped in joints in the ceiling. All overlaps should be secured with purpose-made tapes.

The following pictures demonstrate two houses which have this done:

![Picture 1](image1.png) ![Picture 2](image2.png)

**4.2 Around Windows & Doors**

You may have paid for the most expensive, energy efficient windows on the market, but if they are not installed and sealed properly, air infiltration will occur around the frames. So when windows are installed the best way to prevent this is to put a seal / membrane around them where they meet the wall and carefully tape all junctions. See pictures below.

![Diagram](diagram1.png) ![Picture 3](image3.png)
4.3 Electrical Sockets & Switches

There can a degree of air infiltration through the wiring coming down from the attic or service space. The conduit which carries the wires can act to duct the cold air down from the attic or service space. The best way to prevent this is to seal the opening where the conduit meets the wall box that holds the socket, the left picture below shows how this is done.

![Image of electrical socket and conduit sealing](image1.png)

4.4 Service penetrations

Another area where unwanted air infiltration will occur is where the service pipes, wires, etc. penetrate the thermal envelope. All these pipes should have permanent sealant around them to prevent this air infiltration occurring. The picture across shows wires and pipes leading to the attic and they are sealed off simply by filling voids with silicone which allows some movement in the pipe but stops the air infiltration. This should be done for all service pipes such as toilet and sink waste pipe, oil and gas service pipes and so on.

![Image of service penetrations with sealant](image2.png)
5. Common Air Leakage Paths

To avoid air leakage in new dwellings it is necessary to know where leaks might occur. The illustration below shows the most common air leakage paths. Many of the paths shown here were found in the dwellings investigated during the Energy Efficiency Partnership for Homes study.

Most common air leakage paths:
1. Underfloor ventilator grilles.
2. Gaps in and around suspended timber floors.
3. Leaky windows or doors.
4. Pathways through floor/ceiling voids into cavity walls and then to the outside.
5. Gaps around windows.
6. Gaps at the ceiling-to-wall joint at the eaves.
7. Open chimneys.
8. Gaps around loft hatches.
9. Service penetrations through ceilings.
10. Vents penetrating the ceiling/roof.
11. Bathroom wall vent or extractor fan.
13. Kitchen wall vent or extractor fan.
15. Gaps around floor-to-wall joints (particularly with timber frame).
Air Leakage Paths

- Around the ends of floor joists or joist hangers
- Beneath inner window sills and around window frames
- Through windows and/or hollow window frames
- Through and around doors – particularly double doors
- Beneath doors and doorframes
- Along the top and bottom edges of skirting boards
- Between and around sections of suspended floors, usually timber floorboards
- Around loft hatches
- Through the eaves
- Around roof lights
- Through gaps behind plasterboard on dabs or hollow studwork walls
- Cracks or holes through a masonry inner leaf
- Around supplies from external meter boxes
- Around wall mounted fan or radiant heaters; around and through fused spurs and pull switches
- Gaps around boiler flues
- Around water and heating pipes that penetrate into hollow floor voids and partition walls
- Around waste pipes passing into floor voids or boxed in soil stacks
- Around waste pipes passing through walls
- Gaps around heating pipes
- Around and through recessed spotlights
- Around waste pipes, gas and water supplies, cables, which penetrate the lower floor
- Around vent pipes passing through to loft void
- Through MVHR or warm air heating systems; around terminals
- Gaps around pipes to cold water and/or heating header tanks
- Around and through wall-mounted extract fans, cooker hood vents, tumble dryer vents
- Around and through ceiling roses
- Through room thermostats and heating controllers
- Behind polystyrene coving along wall to roof joints
- Through key holes and where locks and bolts prevent effective draught proofing
- Around internal timber joists that penetrate plaster walls
- Through subfloor air supplies to solid fuel heaters
- Through gaps in the casings of MVHR units
- Through airbricks and partially closable hit-and-miss vents
- Through window spinner vents
- Around and through closed trickle vents
6. Achieving Airtightness

Airtightness should be considered at every stage of the design process. The line of the airtightness barrier should be established very early on. Airtightness is all about avoiding gaps – gaps in contractual arrangements and the design process as well as those between components and those left during installation. Airtightness needs to be a priority throughout the construction process – before, during and after.

The adoption of an ‘airtightness strategy’ should be seriously considered as listed below;

- Consider the appointment of an independent airtightness adviser.
- Appoint an air barrier manager.
- Identify the line of the air barrier at an early stage of design.
- Inform the project teams of the importance of the air barrier.
- Refer to airtightness in all contracts which impact on the air barrier.
- Specify and/or select airtight components.
- Check interfaces between components and work packages to ensure the continuity of the air barrier.
- Inform the site management team of the location and importance of the air barrier.
- Explain to site operatives the critical importance of airtightness.
- Check air barrier completeness before it becomes impossible to access.
- Schedule an airtightness test by a competent body well in advance.
- A pre-test visit to site by the testing body is recommended for larger sites.
- Ensure all airtightness works are complete.
- Contractor to have responsibility for sealing vents and open flues, closing trickle vents, external doors and windows, in preparation for airtightness test.
- Airtightness test carried out and results issued.
- Results submitted to Building Control/client by contractor.
Suppliers of Air Tight Membranes & Tapes

Mr. Stephan Hannemann
SIGA tapes and membranes
Tel: 087 6100557.
Email: shannemann@siga.ch
Website: www.siga.ie

Intello Plus membranes and tapes
Tel: 046 9432104.
Website: www.ecologicalbuildingsystems.ie

Moy Isover Limited, Ardfinnan, Clonmel, Co. Tipperary.
Vario membranes and tapes
Tel: 052 66100
Website: www.moyisover.ie

BSRIA Certified Air Tightness Tester & Energy Consultant

Mr. Tony McNerney
National Energy Assessors,
Block C,
N4 Axis Centre,
Longford,
Co. Longford.
Tel: 043 47491
Mobile: 086 8356935
Email: tony.mcnerney@nea.ie
Website: www.nea.ie
Photos of the test set-up

Front of house under test

Rear of house under test
Testing apparatus set up in front doorway

Environmental assessment instruments
Extractor fans sealed

Fireplace sealed up

Kitchen extractor fan sealed

Attic hatch closed

Wall vents closed

Drainage traps filled
IR survey findings:

To improve the air-tightness of the dwelling, the following areas could be improved at the areas indicated below. In the infra-red photos, the infiltrating cold and cold air show up as dark sections in the image. In addition to scanning for air-leakages I also scanned the walls and ceilings for insulation performance. Therefore some of these photos will illustrate where there are missing or inadequate insulation levels at these cold areas.
The temperature range of the displayed objects is at the bottom of the picture.
First Priorities:

1. **Attic Insulation**

While the attic insulation is reasonably well laid with uniform coverage, it is nonetheless distorted and clumped in places. In addition the layer is only 150mm deep. Current building regulations call for a minimum 250mm depth, though 300mm is more sufficient. I therefore recommend that a second layer of 150mm depth is laid crossways over the existing layer. As the main body of heat rises, it is very important to have adequate roof insulation in order to retain as much heat as possible and to slow the passage of heat through the ceilings.
2. **Wall Vents and Extractor Fans**

In this property there seems to have been an over-specification of wall vents, for example there are two in one of the back bedrooms. These vents have no insulation value and they allow an excessive amount of cold air infiltration above normal ventilation requirements. The four extractor fans in the bathrooms and utility also permit excessive amount of cold air infiltration and together these components are responsible for the high air-change rate you are currently experiencing.

The primary objective of any ventilation system is to allow a controlled change of air in the internal environment. Internal air needs to be changed for many reasons;

- To ensure that dangerous gases such as Carbon Monoxide and Radon do not build up inside the home.
- To ensure a fresh supply of clean air high in Oxygen.
- To expel air that is high in humidity. This will prevent condensation and mould build-up, which is detrimental to both the building and its occupants.

If adequate ventilation is not present in your home the possibility of mould growth could also occur. Mould will develop at cold spots if moisture is not properly vented. It appears on walls as black/grey spots and there will usually be a musty smell due to the airborne spores released from the fungus. If allowed to grow inside your house, mould can be a problem because,

- It can damage your possessions
- It can cause health problems, for example
  - Allergic reactions such as asthma or allergic rhinitis or non allergic reactions such as headaches, and other symptoms including lung and airways infections.

It is required to have one vent per habitable room in order to comply with Part F of the current building regulations. It is also required that you have electrical extractor fans or equivalent fitted in your bathrooms, kitchens and utility rooms. Having electrical extractor fans or equivalent is important as they will help prevent condensation in these ‘wet rooms’.

The type of ventilation currently in use in your entire home is natural ventilation, which is by means of the windows, window and wall vents, chimney and cooker hood extractor fan; this is deemed to be rapid ventilation. It is advised to have electrical extractor fans present at the cooker hood, en-suites and bathrooms.

While wall or window vents will allow a certain amount of cold in and lose heat, they are nonetheless an important component of the house structure. There are modern vents available now which open automatically when the humidity rises and can be controlled also, for instance closed during very cold or stormy weather.

It is advised to have an unobstructed permanent vent in any room which has an open fireplace, or an open flame such as a gas-fired room heater.
Wall Vents
Heat loss is a common problem with standards vents and can be reduced with the installation of modern vents. There are various types of modern wall vents available:

- **Option 1** – Controllable wall vent
- **Option 2** – Responsive wall vent

**Controllable wall vent**
This is a non-mechanical, manually controllable, through-wall vent with optional pre-settable trickle ventilation facility. This type is ideal for habitable rooms.

Features and Benefits:
- Easily controlled by pull cord
- Designed to prevents draughts and provide efficient air distribution
- Condensation protection by insulation within internal controller unit
- Dust and insect filter

**Responsive wall vent**
This is a demand-controlled, non mechanical, through-wall vent which automatically responds to changes in room humidity. This type is ideal for bathrooms, en-suites etc.

Features and Benefits:
- Energy saving: provides ventilation only when needed, minimising loss of warm air
- Not dependent on occupier operation, and can be made tamper-proof
- Needs no electrical connection or power supply, and has no running costs
- Designed to prevents draughts and provide efficient air distribution
- Condensation protection by insulation within internal controller unit
- Optional manual on/off override cord control if required
Replacement of Extractor Fans with Passive Stack Ventilation

Another efficient way of removing moisture from the room is to install a passive stack ventilation system. This system works independently of human control and does not require electricity to operate. This system works when the humidity in the room reaches over 40%. This would be an excellent and energy-efficient alternative method of venting a wet room. Passive stack ventilation is driven primarily by the natural stack or convection effect by which warm air rises. Moisture laden air is extracted directly from wet rooms (kitchen, bathrooms etc.) through ducting up to a roof terminal where it is vented to the outside. Due to there being no mechanical parts in this system, there is a saving on electricity and there is no maintenance, CO₂ emissions are lowered, it has silent operation and you can enjoy lower fuel bills.

Condensation can occur when the ventilation is inadequate, but more likely it is due to cold bridging and poor insulation of the window/glass. Mould can then easily grow in these cold damp areas.

Another important component of natural ventilation is the chimney flue. It is important not to fully block or obstruct the flue, and to ensure that there is adequate ventilation of fresh air from the wall or window vents when a fire is burning.

Recommendations

- It is important not to block up the fireplace flue. Windows must be opened for a short period during the day to allow a change of air.
- Consider replacing the wall vents with controllable vents.

Modern Vent Suppliers:

- Passivent Ltd.,
  Unit 520,
  Greenogue Business Park,
  Rathkill,
  Co. Dublin
  01 412 1600
  www.passivent.com

- Richmond Builders Providers
  148 Richmond rd,
  Fairview,
  Co. Dublin
  01-837 5470
**Recommendations:**

To improve the air-tightness of the dwelling, the following areas could be improved as indicated below.

**Windows**

In this property some of the window opes do not seal correctly to the frame when closed. These are not tight enough and the sealing is weak and out of position in places. I recommend that you call the installer or supplier back to adjust the windows to ensure a tighter close, and to replace the seals. In addition, the junctions between the window boards and the frame and the wall are not properly sealed in many places. I recommend to seal these joints with paintable silicon or other caulking material which will have flexibility for expansion.

**Skirting Boards**

Another major area of air infiltration is the skirting boards. Cold air is emanating from the skirting junctions between wall and floor. The source of this cold air path could be from the internal wall cavity or behind the plasterboard cavity. I recommend to remove all the skirting boards and fill the gap between the bottom of the plasterboard to the floor with expanding foam. When the skirting boards are being refitted, ensure that they are sealed to the wall and floor with silicon or other proprietary sealant.

**Draught-stripping at base of doors**

It is important to ensure that the doors are fully draught-stripped, and that the frames and jambs are sealed properly to the wall. A heavy drape from floor to ceiling will reduce the amount of cold coming through the front doorway.

**Draught-stripping at attic hatches**

It is important to ensure that the attic hatch doors is fully draught-stripped, and that the frames and jambs are sealed properly to the wall.

**Service penetrations**

Another key air leakage path is through the various service penetrations through the internal environment envelope. It is important that these are properly sealed. Examples of these are pipes going through the hotpress and utility room ceilings, and the radiator pipes and electrical wiring going though the tiled walls.

**Chimneys**

On average, 40m$^3$ of the heated internal air is lost up the chimney every hour. As your home has an open fireplace, that is a sizable loss of heat, particularly as you are on a partially exposed hill site which accentuates the ‘stack effect’ and increases the draw for the chimney. I recommend for the open fires that you either install an insert stove, which has a damper or choke plate in the flue, into the fireplaces. Alternatively you can have chimney closure units fitted to close off this heat loss when the fire is not in use.

The options are as follows;
There are products on the market that can help reduce both the heat loss and the draughts. There are both high cost and low cost options.

**Low Cost Option 1 - Chimney Closure Unit**

70% of heat is lost through the chimney. A temporary chimney closure will help reduce heat loss by 66% in each room when the chimney is not in use. The chimney closure unit reduces heat loss and eliminates down draughts when the fire is not in use. The chimney closure seals out sleet, rain and snow. It keeps out birds, animals and reduces noise; it also allows the ‘draw’ to be controlled when the fire is in use.

A spring loaded cap, fitted to a customised sleeve, is simply placed in the chimney and locked into position. It is shut by means of a chain that extends through the flue, to the fireplace, where it is secured to a bracket fastened into the forward part of the side fireplace wall.

Typical cost €285 each, with €65 for installation.

**Principal of operation –**

- Pulling on the chain will close chimney top, thus eliminating draughts.
- Releasing chain will open chimney top for use.

**Benefits –**

- Reduce heat loss by up to 66%
- Prevent birds nesting in your chimney
- Reduce Carbon Dioxide emissions by over 500kg per annum
- Reduce outside noise
- Prevent rain getting into your chimney
- Control the draught level in your fire and save fuel

**Chimney Closure Unit Supplier and Installer:**

- Brian Neenan,
  Chimney Closure Ltd.
  Meadowlands,
  Tralee,
  Co. Kerry
  1850 253 253
  066 712 2867
  [www.chimneyclosure.com](http://www.chimneyclosure.com)
Low Cost Option 2 – Chimney Balloon

This is the simplest, cost-effective way to stop chimney draughts, reduce noise and heat loss. The chimney balloon saves energy by preventing heat from going straight up the chimney.

Other benefits including the following:-
- Stops Chimney Draughts
- Reduces Heat Loss
- Reduces Noise
- Saves you Money

The chimney balloon not only stops cold draughts coming down your chimney, but also stops the warm air in your room disappearing up your chimney when not in use.

Supplier Details:
Energy Liberators Ltd
15 The Orchards
Courtbrack Avenue
Limerick
061-309517
www.energyliberators.com

High Cost Option - Multi Fuel Stove

The conversion to a multi fuel stove is another option to consider for the open fireplace. It is over twice efficient; an open fire is at best 30% efficient, and a multi fuel stove is 65% efficient or greater. The multi fuel stove will also eliminate the problem of warm air being lost up your chimney when not in use. Money spent on a high efficiency stove can be saved on fuel bills over time.
**Insulation of the External Walls**

Another method to make your home warmer and more energy-efficient would be to fit thermally insulated plasterboard panels of at least 63mm thickness, which includes 50mm of high performance polyisocyanurate insulation to the inside of all the external walls.

Normal skim finish would then be applied.

While this would be very effective and produce last-lasting energy saving benefits, it would also entail redecoration to the interior of all the external walls.

Existing window boards would also have to be replaced with deeper ones, and the skirting boards would also have to be either replaced or refitted after being shortened slightly.

The thermal plasterboards can be applied either with an adhesive bonding or fixed to battens. It would be recommended to apply the thermal boards to battens if the internal walls are uneven.

This will help to improve the overall U-value of your walls. One point to consider when choosing the thickness for your thermal board is the amount of space that the boards will occupy throughout your home.

The thermal boards are available from thickness of 37.5mm (including 25mm insulation plus 12.5mm plasterboard) right up to a thickness of 92.5mm (including 80mm insulation plus 12.5mm plasterboard). The greater the thickness of the insulation the more heat loss you will prevent escaping. But of course the greater the thickness, the small your room becomes.

Usually the thermal board application can prove to be quite inconvenient and messy as the boards are installed to all the exposed walls internally, but once installation is complete the advantages are long-lasting.
Conclusion

Having your home air tight is a very important issue when it comes to energy conservation.

You may find the following documents from BRE useful references during remedial works.

This concludes your Air-tightness Test report.
I would like to thank you for choosing National Energy Assessors and would be happy to answer any questions on it or any general or specific queries you may have.

Congratulations on passing the test.

Kind Regards,

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Tony McNerney