IS YOUR HOME WARM AND COMFORTABLE ALL YEAR ROUND?

If not, then hear are the top ten reasons why not:

The Top Ten

Retrofitting airtightness to a building is best done as part of a comprehensive refurbishment of the property, where the refit includes Airtightness, ventilation and Insulation. However, there are still a number of ways to improve the quality and comfort of the building. Ways which may not lead to a passive house standard, but will certainly improve your comfort and reduce your utility bills and therefore your carbon footprint.

We can focus, for the moment, on the more obvious places around the building that cause air leakage and therefore heat loss.

Windows:

The first thing to check is the window seals. The window should be able to close tightly against the seal and remove any possibility of an air leak. If this is not the case then the seals need to be replaced, hinges adjusted or handles tightened. In many cases the entire window may need to be replaced if the frames are in poor condition.

The window frames, which are hidden behind the plasterboard in the reveals, are in many cases, the main cause of air leakage. When windows are installed, sometimes the expandable foam is not the best quality and may not be installed with Airtightness in mind. The foam, generally, does not close the areas around the packing pieces or the window straps used in the installation. We have often found leaks in these areas in past projects. Lower quality expandable foams also deteriorate over time and simply break down and become of no benefit whatsoever.

To overcome this problem, we place airtightness tape around the frames after the expandable foam in used to fill the gap. This makes the window frame permanently airtight. A wind tight tape (*diffusion-open wind tight tape, fully windproof and resistant to driving rain*) can be used on the frame externally. This tape also has good plaster adhesion properties. Internally, there is a choice of tapes with vapour control properties and good plaster adhesion properties that can be used. This will depend on the design of the house. This is best done when new windows are installed, but retrofitting the airtight tape is also possible. The plasterboard, plaster, warm board or fibreboard in the reveals needs to be removed and redone after the taping is complete. Depending on the style and design of the building, this can be relatively easy or can show other problems that may require additional work, when the plasterboard is removed.

For example, if the house has a cavity wall, where cavity closers were not used, this could mean retrofitting extra insulation in the reveals before the work can be finished.

Skylights, when installed correctly, can be easily made airtight in a similar manner. However, if the skylight was incorrectly installed, this could require additional measures.

Doors:

Doors and door frames are much the same as windows. Seals in general need to be in good condition as with the frames, before any attempt to make the door airtight. The floor area may require lifting tiles or floorboards to get access to the frame. There will be a difference between concrete floors and suspended timber floors.
Making the ground floor of the building airtight will be dealt with later.

External Walls:

The work carried out here will depend on the design of the building, i.e. Block build with cavity wall, Timber frame etc. Most of the houses that will require retrofitting will be block built. All of the external walls will need be treated equally. Each wall will be made airtight whether it is the dividing wall in a semi-detached house or the walls in a terraced house. Each wall can be made airtight by plastering or by placing battens on the walls and stapling an airtight membrane to the battens. This will reduce the size of the room more significantly, but will allow you to put insulation between the battens. It can also be used as a service cavity for pipes and cables. In the case of a house with an external insulated wrap, or a cavity wall with insulation, the depth of this insulation will need to be calculated accurately to avoid condensation and increase the risk of mould etc. It may not be necessary to use more insulation at all and plastering may be sufficient.

Ground floor:

Suspended timber floors should be lifted to reveal the timber joists. There is ventilation required below these joists so filling between the joists with insulation is not an option. It is recommended to place a breathable membrane between each joist to enable the insulation to leave a gap below the joist for the movement of air. Insulation can then be placed between the joists. An airtight layer can then be placed below the finished floor of your choice. This layer will be connected to and sealed to the airtight layer on the external walls.

First Floor

An important area to complete the airtightness on external walls is between the ceiling and the floorboards above the ceiling. This gap is rarely sealed or plastered and can cause serious air leakage. The area between each rafter needs to be sealed using plaster or airtight paint or a combination of both. The gap between the plaster and the timber joists needs to be taped or painted, as the ends of the timbers are tight against the outer wall causing a strong possibility of air leakage.

Chimney Breast

Chimney breasts should always be treated as an external wall. The chimney flu should be blocked if not in use or the appropriate seals used on the flu to make it airtight.

Bedroom ceilings:

Depending on whether you have a warm or a cold roof in the design of your building will determine whether or not you need to place an airtight layer on the bedroom ceilings. If your insulation is installed on your attic floor and not between the rafters on the roof, then you have a cold attic. This will require an airtight membrane on the bedroom ceilings. This membrane is sealed to the external walls airtight layer and all areas, such as light fittings and internal studs are made airtight. If you require a warm attic, there are many other elements to consider, such as: having a breathable membrane under the roof tiles, which will allow you to

leave a gap of 50mm between the felt and the insulation to allow for air flow and remove the risk of moisture build up. This will reduce the depth of insulation and may prove inadequate. Head height in the attic is also a consideration and may eliminate the possibility of making much use of this area.

The loft hatch is an area that will cause serious heat loss and air leakage. It is recommended that this is replaced with an airtight insulated hatch which is available off the shelf.

External meter boxes:

The external meter box allows cold air to access the property through poor fitting and flow past the cables where they enter the property. This can be a difficult area to seal and sometimes the only answer is to use a combination of materials such as high quality expandable foams with airtight paint and tapes, where possible.

Gas boilers:

Depending on the type of gas boiler you are using, this can cause air leakage around flus and vent pipes. Caution is required here, as accidentally blocking the required ventilation could cause a serious health hazard.

Sockets, switches, wall mounted fans, thermostats etc:

These areas allow air to flow from a multitude of areas around the building, such as cables running from a cold attic. The air will flow from the attic through the cable conduit and out through the switch or the socket. There is some remedial work that can be done to reduce this problem. A preliminary airtightness test would show the extent of this problem and help to decide the extent of the remedial work required.

As you can see from the information so far, there are many considerations to making an older building airtight, insulated and comfortable. The only way to get a better understanding of your requirements is to carry out a survey of your building and discuss the main areas of concern. It just depends on your budget and how far you want to go to both reduce your carbon footprint, reduce your utility bills and increase your general comfort.

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