Advisors Toolkit
Factsheet No 3.a

Draughtproofing

Draughtproofing is one of the cheapest and easiest ways to save energy in any type of building. It should be fitted to:

- windows
- doors (Including letterboxes and keyholes)
- chimneys and fireplaces
- floorboards and skirting boards
- loft hatches
- pipework (leading outside)
- damaged walls

The Energy Saving Trust estimates that draughtproofing can generate fuel bill savings of around £85 every year. Blocking an unused chimney can save an additional £50-£60 per year.

Windows: For windows, there are 2 main types of material:

- self-adhesive foam strips – the cheapest option, and easy to install, however may not last as long as other methods
- metal or plastic strips with brushes or wipers attached – these are long- lasting, but cost more

Make sure the strip is the right size to fill the gap in the window. If the strip is too big it will get compressed and damaged and it may be difficult to close the window. If it's too small there will still be a gap.

For sliding sash windows, it's best to fit brush strips or consult a professional. Foam strips do not work well.

For metal-framed windows or windows that don't open, a silicone or sealant can be used.

Doors: Gaps under and around external doors, letterboxes and keyholes can all cause draughts:

- fit brushes or hinged flat draught excluders at the bottom of the door
- fit draughtproofing strips (foam or brush) around the door frame
- fit a purpose-made cover for the keyhole
- use a letterbox flap or fit a letterbox brush

Internal doors need draughtproofing if they lead to a room not normally heated, like the spare room or kitchen. Keep doors to unheated rooms closed as much as possible to stop the cold air from moving into the rest of the house.

Internal doors between two heated rooms don't need draughtproofing – it can be useful to let warm air circulate between different rooms.

Chimneys and fireplaces: If the fireplace is unused, the chimney is probably a big source of unnecessary draughts.

There are 2 main ways to draughtproof a chimney:

1. have a cap fitted over the chimney pot
2. use a chimney balloon – an inflatable cushion which blocks up the chimney and can remain in place until the fire is next lit

Floorboards and skirting boards: block cracks using filler.

Floorboards and skirting boards often contract, expand or move slightly with everyday use, so a filler that can tolerate movement should be used – these are usually silicone-based.

Fillers block gaps permanently so be careful when applying them and wipe off any excess or mess with a damp cloth before it dries. Fillers may break down over time, but can easily be re-applied.

Loft hatches: Draughtproofing the loft hatch is essential, since hot air rises and is lost into the cold space in the loft.

Cold air can also blow in through the gaps around the loft hatch. Loft hatches can be draughtproofed by using strip insulation, similar to that used on doors.

Which rooms don't need draughtproofing?

Be careful about draughtproofing rooms that need good ventilation, including:

- areas where there are open fires or open flues – It is essential that areas like this have adequate ventilation.
- rooms where a lot of moisture is produced, such as the kitchen, bathroom or utility room. Good ventilation helps reduce condensation and damp. See also Factsheet 7.c Condensation and Dampness.

Other areas that might cause heat loss include:-

- pipework (leading outside) – use expanding polyurethane foam, filler or silicone mastic
- damaged walls – use a hard-setting wall filler or cement (but if cracks reappear it may be best to consult a surveyor)
- unused vents and fans – these can be blocked up

Never block boiler flues, air bricks or trickle vents – adequate ventilation is absolutely essential.

Draughtproofing products and installers

For a list of registered installers, products and manufacturers, see the National Insulation Installers website https://www.nia-uk.org/

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Tank & Pipe Insulation

Both tank and pipe insulation keep water hotter for longer by reducing the amount of heat that escapes.

The most common type of water heater blanket (jacket) is fibreglass insulation with a vinyl film on the outside. The insulation is wrapped around the tank and the ends are taped together. It is important that the blanket be the right size for the tank and not block air flow or cover safety and drainage valves, the controls, or block airflow through the exhaust vent, if any.

Insulating a hot water cylinder is one of the simplest and easiest ways to save energy and money.

Fitting a jacket around a cylinder will cut heat loss by over 75%. The Energy Saving Trust estimates that a well-fitted hot water cylinder jacket on a previously uninsulated cylinder can lead to savings of between £40 per year. A jacket costs around £18. Fitting a jacket to a hot water cylinder is a straightforward DIY job.

Pipe insulation is used to prevent heat loss and gain from pipes, to save energy and improve effectiveness of thermal systems. In addition to reducing costs and environmental impacts of energy consumption, the benefits include:

- reducing or eliminating condensation on cold pipes
- protection from dangerous pipe temperatures
- In domestic hot-water systems, the water temperature at the point of use can be closer to the temperature at the water heater, and wait time for hot water can be reduced
- control of noise
- reduction of unwanted heat gain to air-conditioned spaces

Insulation for hot water pipes will cost around £20 and can save around £10 a year.

Fitting insulation to pipes is easy if the pipes are accessible, but professional help may be required to fit insulation to harder-to-reach pipework, which would incur extra cost.

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Loft Insulation

As much as a third of the heat produced in a home could be escaping through the roof. Most loft insulation materials work by preventing the movement of heated air through the material. Loft insulation is located between the joists on the loft floor of a property (roof insulation is located between the tiles and the rafters). The materials most commonly used are quilted mineral wool, blown mineral wool and blown cellulose (usually recycled newspaper). Sheep's wool is also available as a natural fibre.

Quilts: Sold in flexible blankets of different thicknesses. Man-made from glass or rock fibre, some of which will have been recycled. Mineral wool is the most common form of loft insulation quilt in the UK.

Blown insulation: Blown loose into specific, sectioned-off area to the required depth. Blown cellulose fibre or mineral wool should only be installed by professionals.

Loft insulation quilts should be laid horizontally between the joists and reach the top of the joist. Typically, this will make the insulation around 100mm to 150mm deep. More layers should then be added at right angles, to close up any gaps between the joist and the quilt, and to bring the depth to the recommended 270mm. Quilts are suitable for DIY installation, but blown insulation should only be installed by professionals with specialist equipment.

Air vents (and soffit, tile or ridge vents) must be kept clear to help prevent condensation. All electric wires, cables and light fittings must be kept visible to avoid overheating. If in doubt, it may be best to contact a professional installer.

The recommended depth for loft insulation is 270 mm for glass wool, 250 mm for rock wool or 220 mm for cellulose.

Remember to insulate the pipes and water tank. Insulating between the joists of a loft will keep a house warmer but make the roof space above colder. So, without their own insulation, pipes are more likely to freeze. Also, the cooler air of an insulated loft could mean cold draughts through the hatch, so this should also be insulated.

For a list of professional installers, see the National Insulation Association website https://www.nia-uk.org/

Loft insulation can help lower heating bills, reduce wear and tear on boilers and reduce global warming and climate change. Potential savings range from £120 to £230. Loft insulation top-up offers potential savings of £11 to £21.

There are a number of grants and schemes available to home owners which can substantially reduce the cost of installing these products - see Chapter 4 Sources of Help and Funding

Flat roofs can also be insulated. This is usually done using rigid insulation boards, and is best undertaken when weatherproofing/roof coverings are being replaced. Potential fuel bill savings are similar to those for loft insulation. If a flat roof is being replaced, it must be insulated in order to comply with current Building Regulations.

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Cavity Wall Insulation (CWI)

The external wall of a house is often constructed of two masonry (brick or block) walls, with a cavity (gap) of at least 50mm between. Metal ties join the two walls together.

The cavity wall is injected with insulating material by drilling holes in the external wall, through the mortar joint. Holes are generally of 22-25mm diameter and are 'made good' after injection. Each hole is injected in turn, starting at the bottom.

Before the installation, the installing firm will undertake an assessment of a property to confirm that it is suitable for insulation.

There are several different types of insulation:

- bonded bead (polystyrene beads)
- glass or rock wool (yellow/white or grey/brown in colour)
- urea formaldehyde foam (white foam)

Note: both glass wool and rock wool are known as 'mineral wool'.

All systems of CWI have been tested, assessed and approved by the British Board of Agreement (BBA) or the British Standards Institution. All are suitable for their purpose. Except for Urea Formaldehyde foam, the systems can be used in all parts of the UK. All systems have a similar insulation value.

A technician must undertake checks before and after installation, including a check of any heating appliances, so it is essential that they have access inside the property.

Ventilators supplying combustion air to fuel burning appliances must be safeguarded. Similarly, ventilators at ground level that ventilate below timber floors must be safeguarded. A technician will investigate them to check they are already sleeved. If they are not, the technician will remove them and seal around them to stop them being blocked by the insulation. Other vents, which may be redundant, such as cavity vents or vents that are used to supply air to open fires in bedrooms may be closed off. Redundant airbricks may be filled.

CIGA (Cavity Insulation Guarantee Agency) issue an independent 25 year guarantee covering materials and workmanship. All professional approved installing firms are members of CIGA and can apply for a CIGA Guarantee, for properties built with traditional cavity walls.

The Cavity Assessment Surveillance Scheme (CASS) checks the suitability of properties for upgrades, ensures assessments are structured and independent and confirms they are sent to the BBA. The BBA then checks the assessments to verify the correct procedures have been followed.

With CWI, a house should hold its temperature for longer, therefore the time between heating cycles may be longer. The result should be a more even possible.

Filling cavity walls is not a DIY job. Installation must always be carried out by a professional installation company, registered with one of the following organisations:

1. National Insulation Association (NIA)
2. Cavity Insulation Guarantee Agency (CIGA)
3. British Board of Agreement (BBA)

There are a number of grants and schemes available which may support the installation of cavity wall insulation.

See Chapter 4 on Sources of Help and Funding

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Solid Wall Insulation (SWI)

Internal and External Insulation

Solid wall properties tend to be more difficult and expensive to improve in terms of adequate insulation and heating. Solid walls lose heat more quickly than cavity walls, but because they are solid there is no easy way to insulate them. Solutions include external and internal wall insulation.

External wall insulation (EWI)

This involves adding a decorative weather-proof insulating treatment to the outside of the house. The thickness of the insulation needs to be between 50mm and 100mm and is usually installed where there are severe heating problems or the exterior of the building requires some form of other repair work, providing the opportunity of adding insulation.

External insulation systems are made up of an insulation layer fixed to the existing wall, using a combination of mechanical fixings and adhesive - depending on the insulation material used. This is then covered completely with a protective render or cladding finish. Most external renders consist of either thick sand/cement render applied over a wire mesh, or a thinner, lighter polymer cement render applied over a 'GRP scrim'.

External wall insulation must be fitted by a specialist installer trained by approved system designers. To find such an installer visit the Insulated Render & Cladding Association (INCA) website or the National Insulation Association (NIA) website. The installer will need full access to all the walls from the outside. It is not recommended for homes with structurally unsound outer walls that cannot be repaired.

To prevent condensation, recessed areas around windows must be insulated as well as the walls – with the depth of insulation depending on the width of the window frame.

The Energy Saving Trust estimates that an average semi-detached house (gas heating) could save around £260 per year on fuel bills by installing external wall insulation.

External insulation is likely to change the appearance of a home and will cover up existing brickwork. Planning permission may therefore be required.

For information on planning permission in Scotland, visit the Scottish Government Building Standards webpage https://beta.gov.scot/policies/building-standards/

Internal wall insulation (IWI)

Solid walls can also be insulated by applying internal wall insulation, usually ready-made insulation/plaster board laminates or wooden battens in-filled with insulation or flexible linings.

Thermal boarding is a composite board made of plasterboard with a backing of insulation. The insulation backing can be specified in a variety of thicknesses. Insulation in excess of 60mm will typically be required to achieve best practice performance. Up to 100mm of insulation can be included. Thermal boards are fixed to the wall surface using continuous ribbons of plaster or adhesive, plus additional mechanical fixings.

Insulation/plaster board laminates consist of plasterboard backed with insulating material typically to a total thickness of up to 90mm. Installing them involves the boards being fitted directly to the inside of the wall and the thicker the board the better the insulation.

Alternatively, wooden battens in-filled with insulation and covered with a plasterboard finish can be fitted to a wall. Flexible insulating linings (a form of dry lining) can also be used. These are cheaper and less disruptive to install, though savings on energy bills are lower. Flexible thermal linings are insulation on a roll specifically for use in solid wall homes, mansard roofs and dormer ceilings.

The Energy Saving Trust estimates that installing internal wall insulation will save an average semi-detached house (gas heating) £260 per year.

There are a number of grants and schemes available which may support Installation of solid wall insulation.

See Chapter 4 on Sources of Help and Funding