

Home Insulation Guide

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Reducing heat loss in your home is one of the most effective ways to reduce your energy consumption.

This will save you money on your gas or electricity bills and help the environment by reducing carbon emissions.

If your home is poorly insulated then excessive heat loss could mean you pay more than you need to in heating your home even if you have invested in a new boiler.

There are several areas to consider when thinking about insulating your home:

- Roof and loft
- Cavity wall and solid wall
- Floor
- Draught-proofing
- Pipes, tanks and radiators
- Managing condensation



Roof and Loft



Without insulation, about 25% of the heat in your home is lost through the roof (costing around £140 a year for a typical semi-detached home). It is recommended that you have 27cm (about 11 inches) of insulation in your loft. Even increasing insulation from 12 to 27cm could save you up to £25 a year on your bills and keep you warmer.

Loft or roof insulation should be effective for at least 25 years. A wide variety of materials can be used, including recycled glass, wool, recycled paper, foam or cork and these may come as blankets, boards, loose or blown fibres. The process consists of adding a layer of insulating material such as mineral wool, insulated plasterboards or insulating foam. The type of material to be used will depend on the specific type of requirements of the roof space you wish to insulate, such as accessibility and the insulating performance you wish to achieve.

In most cases, the process of insulating a roof or a loft is straightforward and many DIY shops will provide a guide on their website or in store. Improved insulation will mean

your loft space is cooler so you will also need to insulate any pipes or cold water tanks to ensure they don't freeze and split. Ensure there are no cold spots by insulating your loft hatch too.

Insulation should not be fitted tight into the eaves as it is important to maintain a free flow of ventilation in a roof space. In addition, insulation should not be fitted under water tanks.

If the loft is difficult to access, there are existing problems with condensation, damp or a more complex insulation system is needed, you may wish to use an approved installer. The National Insulation Association provides contacts¹.

¹ National Insulation Association <http://www.nia-uk.org/>

Cavity and Solid Wall



Most homes in the UK have either cavity or solid walls. An unfilled cavity wall accounts for the loss of around a third of the heat from a home, whereas an uninsulated solid wall may lose twice that.

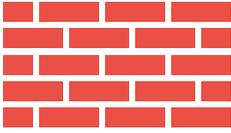
Cavity walls consist of two 'skins' separated by a hollow space (cavity). They were introduced in the late 19th century and have gained widespread use since the 1930s.

In most cases it is easy to tell the type of wall you have following these simple criteria:

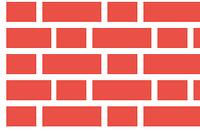
- If your home was built after the 1920s it is very likely that it has cavity walls although those built in the interwar period often have "narrow cavities" which can be difficult to insulate.

- If your home was built after 1990 it is very likely to already have insulated cavity walls.
- Measuring the thickness of the wall at any entrance or window will help to determine the construction type. If your home has brick walls with a depth of less than 260 mm, it is very likely that they are solid walls. Stone walls could potentially be thicker but normally they are also solid walls.
- If the bricks follow a regular pattern, it is likely to be a cavity wall; if they follow an alternate pattern, it is very likely that is a solid wall.





Cavity wall



Solid wall

Cavity walls are usually simple, cheap and easy to insulate, however the work has to be done by a registered installer and to relevant building standards.

Wall vents and air bricks should be maintained with appropriate ducting fitted where necessary.

The process consists of drilling a pattern of small holes (22mm) about 1 metre apart into the wall to be insulated. Insulation material is blown into the cavity through each of these holes. Finally the drilled holes are filled again with matching material, so they become hardly noticeable.

The work for a normal house should take no more than a couple of hours and is a non-disruptive process. No additional maintenance is required during its lifetime.

Solid walls and other forms of non standard construction such as “Wimpey No-fines” are more complicated to insulate and are likely to cost more.

There are two options:

- External wall insulation
- Internal wall insulation

External wall insulation means that a layer of insulating material is attached to the facade of your home and to any other wall that is exposed. The insulating material is covered with a render and a finish can then be applied. This process will allow your home to have a new look - the finish could be smooth, textured, painted, tiled, panelled, pebble-dashed or finished with brick slips.



A home without exterior wall insulation



A home with exterior wall insulation



Photo: NIA

Internal wall insulation consists of fitting insulating material (rigid boards or building a stud wall filled with mineral wool) on the inside of your home. This process is generally cheaper however there are some considerations before deciding which type of insulating is best for your home:

| Type of insulation | Potential advantages | Considerations |
|---------------------------------|--|--|
| External Wall Insulation | <ul style="list-style-type: none"> • Does not cause too much disruption during the installation. • Allows for a new finish for the outer walls of your home. • Does not reduce the floor area of your home. • Improves weatherproofing and sound resistance, as well as reducing draughts through the filling of any cracks which may be present in the brickwork. • Could help reduce damp as the walls are no longer the coldest surface for moisture to condense on. | <ul style="list-style-type: none"> • May require planning permission - check with your local council. • Outer walls should be easily accessible, structurally sound and free from damp. • External pipework, boiler flues and sometimes window sills will need to be extended or adjusted. • There is an increased risk of condensation forming in areas that are not insulated. |

Using vapour permeable (breathable) materials for internal wall insulation can reduce the build up of moisture by allowing air to flow continuously. If opting for non-breathable materials, consult with your installer as it is very important to see if any extra considerations need to be made to ensure air movement.

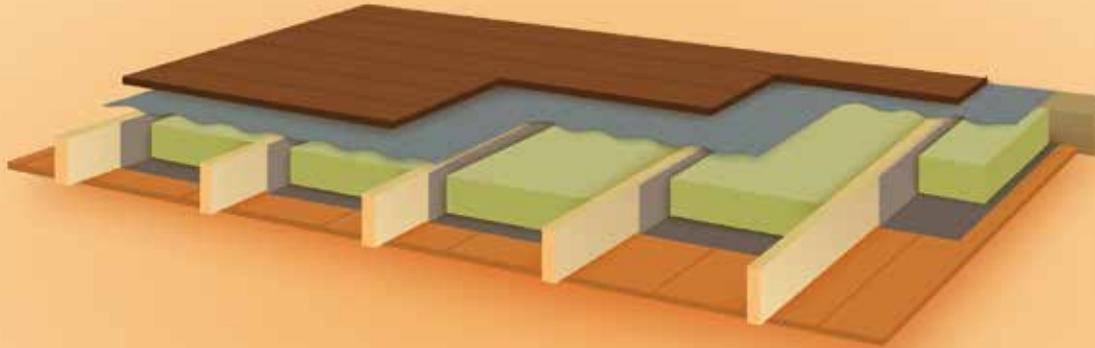
To reduce the costs of wall installation, it is advisable to try and have it done at the same time as improvements are made to your home. For example external wall insulation could be done in conjunction with roof repairs or window painting.

Under no circumstances should air vents and airbricks be covered up. These are essential to the proper ventilation of your home and also to the safety of gas appliances.

Fitting vapour insulation foil under thermally insulated attic surface



| Type of insulation | Potential advantages | Considerations |
|--|--|--|
| <p>Internal Wall Insulation</p> | <ul style="list-style-type: none"> • Often cheaper than external wall insulation. • May be more suitable for properties in a conservation area or which have ornate brickwork or other attractive external features. | <ul style="list-style-type: none"> • The installation can cause disruption if not done during general renovations (such as installing a new bathroom or kitchen) as any architraves, picture rails, radiators and power sockets will need refitting. • The work can be carried out room by room. • Requires existing problems such as rising or penetrating damp to be dealt with first. • Causes a slight reduction in the room size. • Can increase the risk of condensation occurring within the fabric of the wall. |



Up to 15% of a room's heat can be lost through an uninsulated ground floor. You can reduce this by taking steps to insulate underneath the floorboards on the ground floor of your home.

If you are in an older house, the likelihood is that you will have suspended timber floors, which can be insulated by laying mineral wool supported by netting underneath the floorboards in between the joists. Houses with access to the floorboards via a cellar allow for floors to be insulated with minimal disruption, however if this is not possible it would be necessary to remove floorboards before the insulation can be installed. It is essential not to block under-floor airbricks in your external walls, as this can lead to timber rot.

When insulating the floor it is also important to take the opportunity to lag any hot or cold water pipes located below the floorboards.

If your house was built more recently, the ground floor is likely to be made of solid concrete, which can only be insulated by laying rigid insulation on top of it. The rigid insulation usually has a layer of chipboard placed over it and then your floor covering – this will raise the height of your floors so doors may need to be altered and power socket fixtures repositioned.

If you have easy access to the floorboards it may be possible to insulate a suspended floor by yourself. However, insulating a solid floor is a more complicated job and a professional should be consulted. Make sure the installer you choose is a member of the National Insulation Association².

² National Insulation Association <http://www.nia-uk.org/>

Draught-proofing

You can find draughts in your home anywhere gaps expose the inside of your home to the outside. There are several areas where you may find draughts and various options to deal with them:

- **Windows** – if they open, draught proofing strips made of foam, metal or plastic can be fitted around the frame to fill any air gaps. Thick or thermal curtains can also help keep the heat in.
- **Doors** – make sure you have a metal flap which drops over your keyhole and use a flap/brush for your letterbox. You could cover any gaps at the bottom of the door using a brush or a draught excluder, whilst any gaps around the door can be covered by fitting strips of foam or brush. Inside doors which are rarely used can be kept closed with draught excluders blocking any gaps at the bottom of the door. A curtain over a draughty door can also help.
- **Chimneys and fireplaces** – if your fireplace is not in use you could fit a cap over the chimney pot. Inflatable draught excluders are also available to place within the chimney. Please note ventilation should still be maintained within the chimney area to avoid potential condensation.
- **Floorboards and skirting boards** – any cracks or gaps can be filled in with filler, usually silicone-based such as flexible filler, mastic-type fillers or decorator's caulk.
- **Loft hatches** – strip insulation can be used to seal off any gaps between the hatch and the frame.



- **Pipework** – for small gaps around the pipes silicone-based fillers can be used, whilst larger gaps would benefit from the use of expanding polyurethane foam.
- **Cracks in walls** – if the gap is fairly small, these can be filled in using cement. However for larger gaps it is best to seek professional help as there may be an underlying structural problem which needs to be fixed.

Take care to leave your home well ventilated, ensuring good air flow around your property to minimise condensation and damp. Do not draught proof rooms with a condensation problem or where there is a cooker/fire that burns gas or solid fuel.

Under no circumstances should air vents and airbricks be covered up. These are essential to the proper ventilation of your home and also to the safety of gas appliances.

Pipes, tanks and radiators



Insulating pipes and tanks in your home will reduce the time and energy it takes to heat water and reduce heat loss.

Make sure that your hot water cylinder is fitted with a jacket or has factory fitted foam at least 75 mm thick. This is fairly easy to fit yourself. Foam tube insulation can be fitted around pipes; this is particularly effective for those that come from the boiler to the hot water cylinder.

If the pipes in your home are easily accessible then you can do this yourself, otherwise it may be necessary to consult a professional.

Reflector panels can be easily fitted behind radiators to reflect any heat generated by the radiator back into the room, instead of letting it escape through external walls.

Typical costs and savings:

| | Fuel bill savings (£/year) | DIY cost (approx.) |
|---|----------------------------|--------------------|
| Hot water tank jacket on an uninsulated tank | £115 - £140 | £15 |
| Hot water tank top up insulation (25 to 80mm) | £115 - £140 | £15 |
| Primary pipe insulation | £10 - £15 | £20 |

Source: NEA

Managing condensation

Condensation can occur as a result of moisture generated from breathing, clothes drying, cooking, using gas appliances, baths/showers or structural defects within the fabric of the home. Take these steps to help minimise condensation:

- Keep kitchen and bathroom doors shut, otherwise any water vapour escaping could condense on colder walls in your home.
- Open windows if they mist up, and make sure you allow adequate ventilation if you draught proof your home. Use any extractor fans you have fitted in your bathroom or kitchen when necessary, and keep any slot ventilators clear so vapour can escape. However be careful not to 'over ventilate' your home when it is cold outside as it will cause the temperature to drop and make condensation more likely.
- Heating one room to a high level and leaving other rooms cold makes condensation worse in the unheated rooms. If your house is prone to condensation it is better to have a medium-to-low level of heat throughout the house.
- Allow adequate air circulation behind any cupboards, wardrobes or other storage units by not placing them directly against a wall. Instead, leave a small gap for good ventilation.



- Whilst insulating your chimney can help to save energy, you should leave some ventilation or fit an air vent.

As general guidance, you could expect the following paybacks for insulating works you install:

| Insulation measure | Payback Period |
|---------------------------|--------------------|
| Hot water cylinder jacket | Less than one year |
| DIY draught proofing | 2 - 3 years |
| Cavity wall insulation | 3 - 5 years* |
| Loft insulation | 5 - 6 years* |
| Floor insulation | 7 - 8 years |

Source: NEA

*There may be grants available which can mean the cost is subsidised or in some cases free for these measures so you start to see the savings immediately. Check with your energy supplier or local authority to see if any grants are available.

External and internal wall insulation tend to have longer payback periods and could vary significantly depending on the size and type of home. For further advice contact your local authority or visit <http://www.energysavingtrust.org.uk/>



For further information on saving energy and reducing your impact on the environment visit www.greenourherts.org.uk

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For further advice on possible grants towards insulation measures contact your local authority or energy supplier.



Herts Healthy Homes

Herts Healthy Homes provides information and free practical measures to help vulnerable residents across the county stay warm and healthy in their homes. To see if you are eligible for a Herts Healthy Homes visit and to find out more, call Herts Help on 0300 123 4044



The information in this leaflet is general and the circumstances for individual homes may vary and, where appropriate, the advice of registered professionals should be sought. Whilst every effort has been made to provide accurate information Green Our Herts and its member authorities do not accept any liability for any problems arising from reliance on guidance provided in this leaflet.