Advisor Factsheet
November 2008

Wall Insulation

This document is intended for energy advice professionals only, and not the consumer

Key Points

- Insulation has a long lifetime - savings are seen year after year.
- Where cavity wall insulation is possible, this gives high CO_2 and financial savings.
- If the home has solid walls:
  - External wall insulation should ideally be considered when maintenance work going ahead. CO_2 and fuel bill savings are high.
  - Internal wall insulation can be applied to all exposed walls – if this is not possible, first consider rooms which are heated more than others.
- Heating requirement will drop, and so heating control settings should be revisited to maximise savings.
- **Myth!** "Cavity wall insulation is messy, expensive and takes days to install. I would need to move out of my home"

Savings Potential

- If every household in the UK insulated their cavity walls, we would save 4.6million tonnes of CO_2 and £860 million from our fuel bills a year.
- There are still over 7 million un-insulated cavity walls in the UK.
- Typical annual CO_2 and fuel bill savings for insulating walls are shown in the table below:

Table Notes
Internal wall insulation costs from around £42/m^2, and savings are typically less than external wall insulation.
^ The cost of cavity wall insulation includes a subsidy under the Carbon Emissions Reduction target, which should be available to customers. The full unsubsidised cost is likely to be around £500.
$^{++}$ Normally, individual flats cannot be insulated in this way, although internal solid wall insulation is possible
* Savings from internal wall insulation are likely to be lower. Installed cost for external solid wall insulation is for the full cost of installation for a 3-bed semi; however it can vary widely depending on factors such as ease of access, materials used and wall area. If other work is already being undertaken on the external walls (such as repair work) the cost for installing insulation will be lower.

		Cavity Wall Insulation. Installed costs: around £250 subsidised^				**Solid Wall Insulation – External. Installed costs: around £5,600***			
		Flat $^{++}$	Mid Terrace	Semi-detached	Detached	Flat $^{++}$	Mid Terrace	Semi-detached	Detached
Gas	**£ / yr**	**£60**	**£85**	**£160**	**£230**	**£175**	**£260**	**£500**	**£790**
	$kgCO_2/yr$	300	450	800	1,300	890	1,300	2,500	4,100
Electric	**£ / yr**	**£100**	**£150**	**£300**	**£480**	**£320**	**£480**	**£930**	**£1,500**
	$kgCO_2/yr$	690	1,000	2,000	3,300	2,100	3,200	6,300	10,100
Oil	**£ / yr**	**£85**	**£125**	**£230**	**£375**	**£250**	**£380**	**£730**	**£1,200**
	$kgCO_2/yr$	360	530	980	1,600	1,100	1,600	3,070	4,900
LPG	**£ / yr**	**£85**	**£130**	**£230**	**£380**	**£260**	**£390**	**£735**	**£1,200**
	$kgCO_2/yr$	330	490	880	1,400	1,600	2,400	4,600	7,400
Solid	**£ / yr**	**£65**	**£95**	**£180**	**£300**	**£195**	**£290**	**£570**	**£920**
	$kgCO_2/yr$	740	1,080	2,050	3,300	2200	3,300	6,400	10,300

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Behaviours

The heating requirement for a well-insulated home will be less, and heating up and cooling down times for the home will change.
Encourage to think about:

- How long the home needs to heat up – can the heating programmer be set to come on later in the morning?
- Turning the thermostat down by 1 degree can reduce fuel bills by 10%.
- Are thermostatic radiator valves (TRVs) being used correctly?

Further Information

- National Insulation Association (NIA) for professionally installed insulation products
  Tel: 01525 383313
  www.nationalinsulationassociation.org.uk
- Cavity Insulation Guarantee Agency (CIGA)
  Tel: 01525 853300 www.ciga.co.uk
- Energy Saving Recommended products database
  www.energysavingtrust.org.uk

Frequently Asked Questions

What is insulation?
For most of the year in the UK we heat our buildings to a higher temperature than the outside air. This means that heat flows from the inside of our houses out into the atmosphere. Insulation helps reduce the rate at which heat escapes from our houses.

Isn't cavity wall insulation messy, inconvenient and costly?
Cavity wall insulation typically costs around £250, and takes half a day to install - you won't have to leave the house. As the work takes place on external walls only, there should be no disruption or mess inside the house. A number of 18mm-25mm holes are drilled into the wall about 1.5 metres apart and the insulation is inserted into the cavity. The installer should ensure that all air vents and flues remain clear, and once the cavities are full the holes will be filled so that they match the original finish as closely as possible.

How will I know that the cavities are completely filled?
The installation machinery used has sensors to recognise when the cavity is full. The installers are well trained and their equipment must be checked every day.

We are interested in having cavity wall insulation but we have defective wall ties. Do we have to get wall ties repaired first?
Yes, before the cavities can be insulated the walls must be stabilised

Do I have to do anything before the installation of cavity wall insulation?
The drilling process can cause some vibration so it would be wise to remove ornaments for their safety and your peace of mind. Also, the insulation is only really effective if all walls are done - the installer will need access to all walls and need to get inside attached garages, lean-to sheds, conservatories etc. In some cases, the installer may need to access neighbouring property, so ask your neighbour in advance if this is ok.

Does the cavity wall insulation installer have to come into the house?
The installer must undertake certain checks before and after the cavity wall insulation installation process, so it is important that they have access to the inside of the property.

Does cavity wall insulation require servicing or maintenance?
Cavity wall insulation requires no maintenance, although normal building maintenance will of course be needed where required.

Does cavity wall insulation cause damp?
No, modern cavity wall insulation should actually reduce damp caused by condensation. Condensation is a result of the warm moist air found in the house coming into contact with cold surfaces, such as the external walls. The warm air cools against the cold surface and deposits water. Cavity wall insulation will ensure that these surfaces are warmer, and will therefore not encourage condensation to form. However, before insulation can be installed a detailed survey must be undertaken to identify areas with damp or at risk of damp developing.

Which should I do first: insulate my home or replace my boiler?
If you are going to replace your boiler, insulate your home first. Heat loss from a property is taken into consideration when deciding the size of your replacement boiler. If you insulate your home you will need a smaller boiler.

I live in a ground floor flat with cavity walls. Is it possible to have cavity wall insulation for just my flat, or would it need to be for the whole building?
Cavity wall insulation must be installed for the full height of the building. In some instances it may be possible to insulate one end of a building, but not specific floors. Cavity 'brushes' can be used in the case of terraced and semi-detached properties to prevent the insulation material going into the cavities of adjoining properties.

Does cavity wall insulation deteriorate over time?
Modern cavity wall insulation should last the life of the property and come with a 25 year independent (CIGA) guarantee.

Key Customer Questions

- If insulating solid walls externally: Is the external wall insulation system and installer approved by the Insulated Render and Cladding Association (INCA)?
- Is the cavity wall insulation being installed by an approved Cavity Insulation Guarantee Agency (CIGA) installer?
- For insulating solid walls internally: Where are heavy fixtures such as kitchen units, radiators and wash basins to be located? Timber fixing battens might be needed within the insulation layer.

Background

- **Cavity walls** are typical in homes built after the 1920s.
  - These are two leaves of masonry, with an average gap of around 65mm.
  - They were introduced to reduce damp and create an air barrier to heat loss. This heat loss can be further reduced by insulating the gap.
- **Solid walled homes** have no gap, and are typical in homes built before the 1920s. They can be insulated on their external or internal surface. So-called solid walled homes lose heat at a much faster rate than even an **un**insulated cavity.
- Spotting wall types:
  - Recommend that a surveyor carry out suitability survey.
  - If all the bricks are laid “side-on” and the walls are around 300mm (12in) thick they probably have cavities.
  - If they have a regular pattern of “side-on and end-on” brickwork, and the walls are around 225mm (9in) thick, they are probably solid walls.

Compliance

- External insulation will change the appearance of the building, and planning permission may be required.

  Customer should contact the Building Control Department of their local council.

Industry Developments

Solid Wall insulation still has cost barriers to uptake.

Due to recent Government policy changes, the volume of solid wall insulation to be supported by grant activity is expected to increase. Contact local energy suppliers to check availability of grants.

Different Technologies

Energy Saving Recommended products can be found for external wall insulation, cavity wall insulation and flexible thermal linings.

Cavity Wall Insulation

Most homes built after the 1920s have cavity walls, and a brick pattern type where all bricks are the same length is an indicator. Walls will typically already have been filled if

- Built after 1995.
- Looking closely, drill hole marks at regular intervals in the mortar indicate that walls have been filled.
- Always recommend that a surveyor carry out a suitability survey.

Notes on installation:

- Occupants can stay in the building during installation, which typically takes half a day.
- This should be carried out by a CIGA installer, who can first assess the home for suitability with no obligation.
- Any dampness problems should be rectified before installation.
- Ventilation and wiring requirements will be identified and outlined at the time of survey by the installing firm.
- Usually, individual flats cannot be insulated in this way – unless permission is sought from the landlord, residents and management company. Also need to consider height regulations.

Available products:

- Blown Mineral (glass or rock) Wool
- UF (Urea-formaldehyde) Foam
- Polystyrene beads or granules
- Other insulating materials such as cork, recycled cellulose, flax or sheep’s wool are available, although these are not commonly used for retrofit cavity insulation

Solid Wall Insulation

Generally, only the heat loss walls need to be insulated – those on the outside of the house. This should not be confused with external and internal wall insulation, which refers to the whether the internal or external *surface* of the heat loss wall is insulated.

EXTERNAL wall insulation

Not suitable for listed or historic buildings, or those with fine architectural detail. Not usually suitable for individual flats, although this can be an easier option in some cases - once permission is granted by landlord, management company and other residents.

Benefits:

- Increases life expectancy of building.
- Does not decrease living space (as opposed to internal wall insulation).
- Improves airtightness of building - reducing draughts - and can alleviate damp, water ingress and condensation problems.

Notes on installation:

- Usually installed with other remedial or refurbishment works to the exterior of building.
- Window recesses must also be insulated to prevent condensation in this area.
- Professional installation only.
- Not recommended if walls are structurally unsound or beyond repair.
- Any dampness problems should be rectified before installation.

Available products:

- Insulation typically consists of the insulating material plus a layer of
  - pebble dashing
  - render
    - thick sand/cement render over wire mesh
    - lighter polymer cement render over fibre mesh
  - dry cladding (may be more aesthetically pleasing)
    - timber
    - stone/clay tiles
    - brick slip
    - aluminium panels

INTERNAL wall insulation

Benefits:

- Allows wall insulation of an individual flat, or an individual room.
- Generally cheaper than external wall insulation.
- Allows external appearance to be maintained.
- Most cost effective when walls are being re-plastered, redecorated, or when major wall fixings are being replaced e.g. in kitchen/bathroom.

Notes on installation:

- Usually installed professionally.
- Insulate rooms which require most heat first e.g. living room.
- Ideal to undertake when existing plaster is being replaced Nb the condition of underlying plaster must be suitable and any remedial work undertaken before installation.
- Room size will be reduced, which may be noticeable in smaller rooms.
- Skirting boards, door frames and electrical fittings may need repositioning.

Available products:

- Plasterboard backed with rigid insulation onto the wall.
  - Up to 100mm deep, although recommended ‘best practice’ depth 60mm.
  - Common insulation materials are expanded and extruded polystyrene (EPS and XPS), and phenolic foam.
- Metal or wooden studwork frame with insulation between the batons using mineral wool fibre
  - Recommended ‘best practice’ depth 120mm.

Nb These two types of insulation can be combined.

FLEXIBLE THERMAL linings

- Rolls of thin insulation are applied internally to solid walls before wallpapering, tiling or painting.
- Does not reduce room size
- Can be applied to an individual room.
- Do not achieve the same high fuel bill savings of other solid wall insulation methods, but useful when full refurbishment is not an option.

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