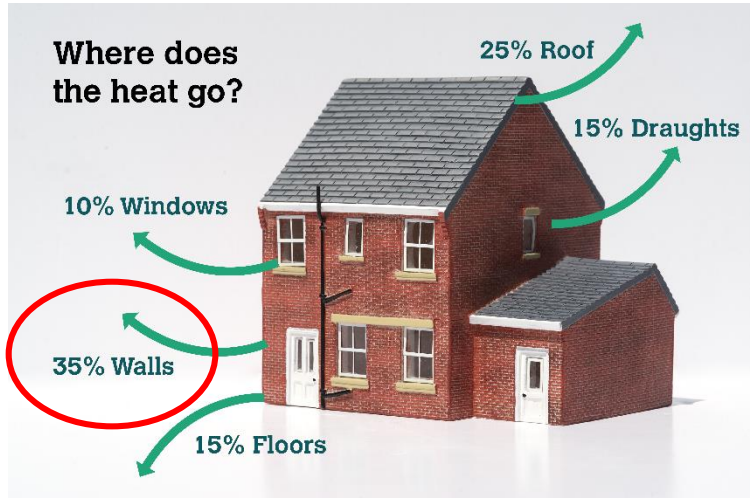
Energy efficiency measures – Solid wall insulation

Scope

- This training module is aimed at **HomeWorks** registered tradespeople who are acting as Low Carbon Ambassadors (LCAs) to provide basic energy efficiency advice to homeowners
- It is one in a series of training modules aimed at LCAs:
  - Introduction to domestic retrofit
  - What is **HomeWorks**?
  - Understanding an EPC (Energy Performance Certificate)
  - Energy efficiency measures (EEMs):
    - Low/no cost measures
    - Loft insulation
    - Draughtstripping
    - Cavity wall insulation
    - **Solid wall insulation**
    - Replacement windows
    - Boilers

EEMs – Solid wall insulation - Learning outcomes

- The learning outcomes of this training module are to summarise:
  - The approach for identifying solid walls
  - The pros and cons of the two types of solid wall insulation
  - The typical installation costs and energy savings as well as other benefits
  - The barriers to installing solid wall insulation and how to solve them
  - The associated risks and how these can be managed



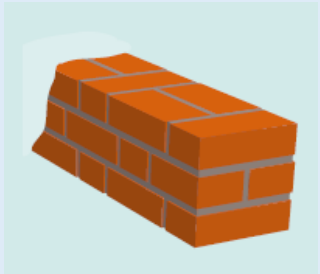
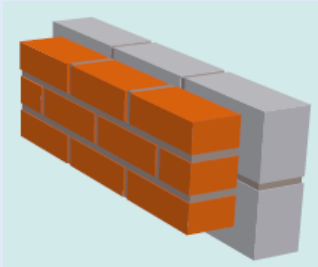
Solid wall insulation - Description

- Houses built before 1920s usually have solid walls; after this time cavity wall construction dominated – see module ***Cavity Wall Insulation***
- Solid walls constructed from brick, block or stone
- As there is no cavity, insulation is applied either externally or internally
- Solid wall insulation needs to be undertaken by a professional installer to ensure risks are managed and offering an appropriate 25-year guarantee
- Installer may be member of Solid Wall Insulation Guarantee Association (SWIGA), or may offer an independent insurance-backed guarantee

Typical Edwardian house (c1910) with solid walls

Solid wall insulation – Identifying suitable walls

- House age only provides indication, but there are other tests:

Brick pattern	Solid brick walls have alternating pattern with some bricks laid across wall Different pattern depending on bond (e.g. English or Flemish) Cavity walls have even pattern where bricks are laid length-ways	 
Wall width	Solid brick walls generally only 220mm wide, although stone walls generally thicker Cavity is typically 50-60mm wide (but can be wider) so overall width of cavity wall is typically 250mm	
EPC	EPC indicates what wall types present and also if they have been insulated already	See module ***Understanding an EPC***

See https://www.simpleenergyadvice.org.uk/pages/checking-for-cavity-walls for further information

Solid wall insulation – Identifying suitable walls (continued)

- There is also range of non-traditional construction forms including:
  - Timber frame
  - Steel frame
  - Concrete panels

- In these cases specialist contractor needs to advise on insulation options

- Registered Solid Wall Insulation installer will need to undertake survey

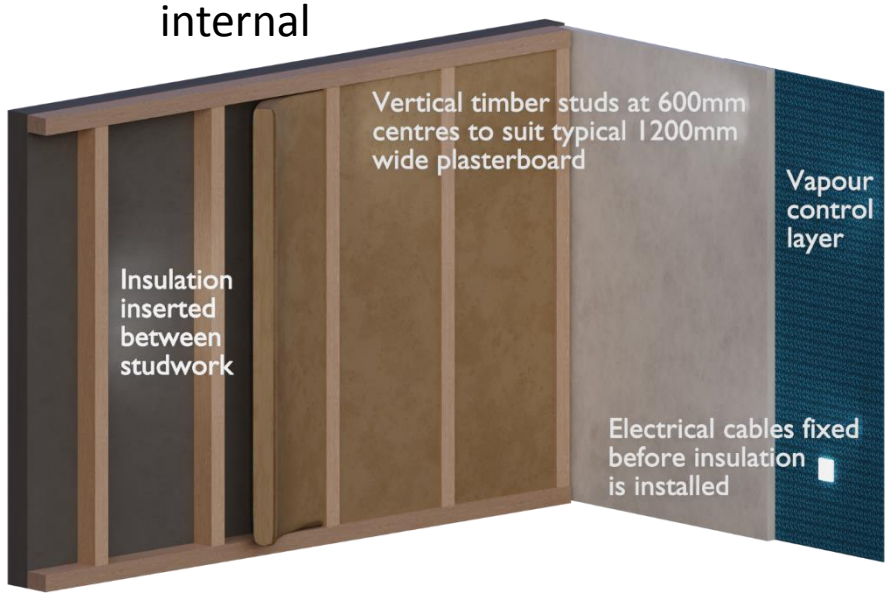
Internal and External Wall Insulation

- Solid wall insulation applied internally or externally depending on:
  - House construction form
  - Cost
  - Available space
  - Planning requirements
  - Householder preference etc.

- **Internal wall insulation** consists of:
  - fitting rigid insulation boards to the wall, or
  - building stud wall and filling in with mineral wool

- **External wall insulation** involves fixing layer of insulation material to wall and covering with render or cladding

internal



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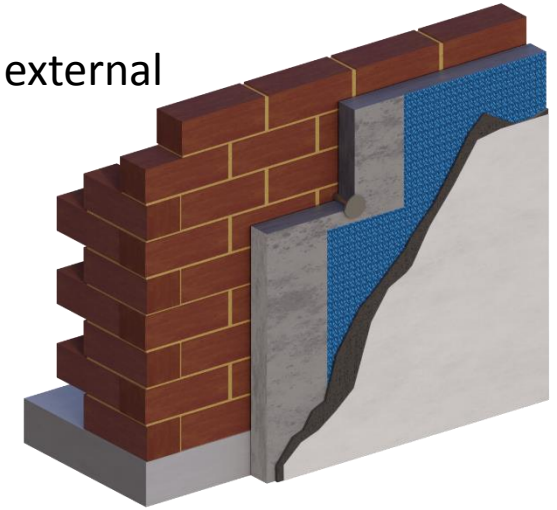

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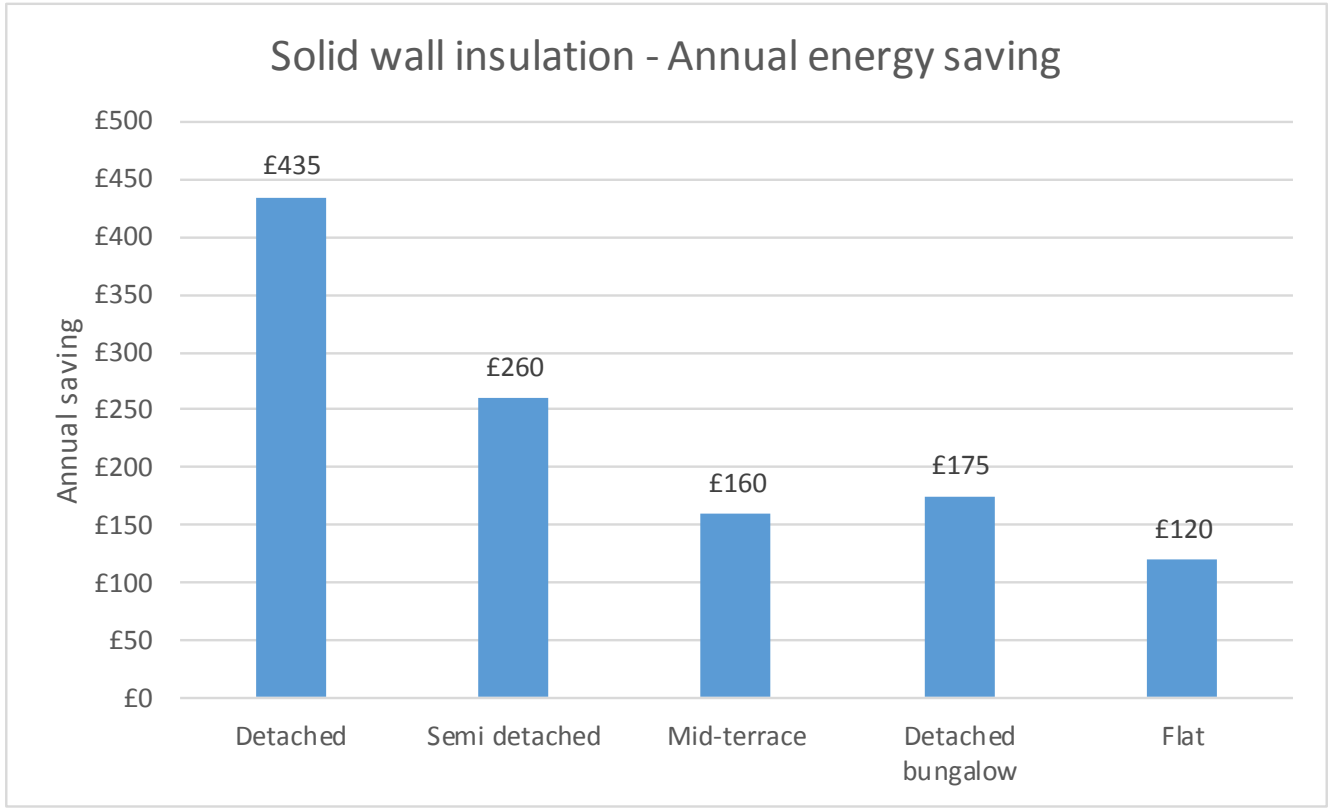
Internal vs External Wall Insulation

External wall Insulation		Internal Wall Insulation	
Pros	**Cons**	**Pros**	**Cons**
Effective insulation approach	More expensive than internal insulation	Cheaper than external insulation	• Re-decoration required • Harder to hang heavy items on walls but fixings available
Improves external appearance and room size maintained	Planning may not allow changes to external walls	• External appearance retained • Planning permission only required if listed building	Reduces room size
Avoids disruption in house	Requires good access to external walls and needs scaffolding	Can be fitted one room at a time	Disruptive to residents
Reduces condensation on internal walls and helps prevent damp	Need to move/modify external pipework, guttering, sills etc.		• Care needed to avoid condensation • Need to move/modify skirting boards, radiators, sockets etc.

Solid wall insulation – Costs and annual energy saving

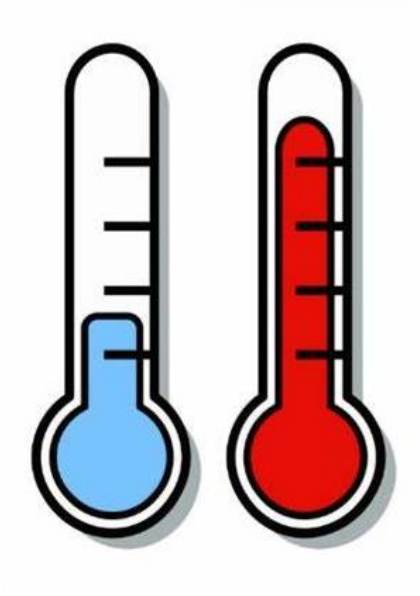
- Average cost to install solid wall insulation in semi detached property:
  - External Wall Insulation: £13,000
  - Internal Wall Insulation: £7,400

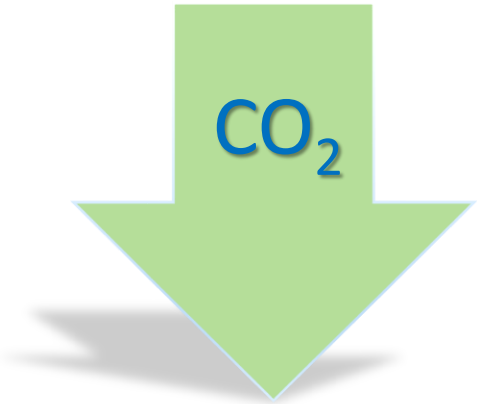


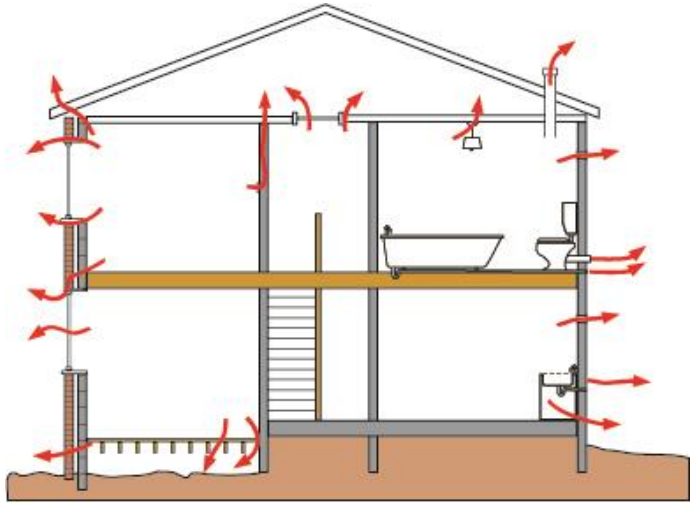
Figures taken from Energy Saving Trust (EST)

Solid wall insulation – Other benefits

- Reduced carbon dioxide emissions
- Improved thermal comfort
- Reduced draughts and noise from outside







Solid wall insulation – Associated risks

Fire

- Use materials and fixings that resist the effects of fire

Poor indoor air quality

- Ensure adequate ventilation is provided

Moisture and damp

- Diagnose and rectify existing damp problems
- Undertake comprehensive survey to determine suitability for solid wall insulation
- Ensure water vapour control strategy is implemented
- Robust design and installation to eliminate thermal/cold bridges

- These risks and others will be identified and managed by the Retrofit Coordinator as part of PAS 2035

Solid wall insulation – Further information

- Additional information on solid wall insulation can be found on the Energy Saving Trust (EST) website at: https://energysavingtrust.org.uk/home-insulation/solid-wall

- The EST has produced leaflets on the two types of solid wall insulation:
  - **Internal Wall Insulation:** https://energysavingtrust.org.uk/sites/default/files/reports/Solid%20wall%20-%20internal%20wall%20insulation_0.pdf
  - **External Wall Insulation:** https://energysavingtrust.org.uk/sites/default/files/reports/Solid%20wall%20-%20external%20wall%20insulation.pdf

- Further information can also be found on the Simple Energy Advice (SEA) website: https://www.simpleenergyadvice.org.uk/measures/meta_cavity_fill_and_solid_wall_insulation