RISE | Retrofit information, support & expertise

# Loft insulation: An overview

## Supply chain advice pack

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Funded by:

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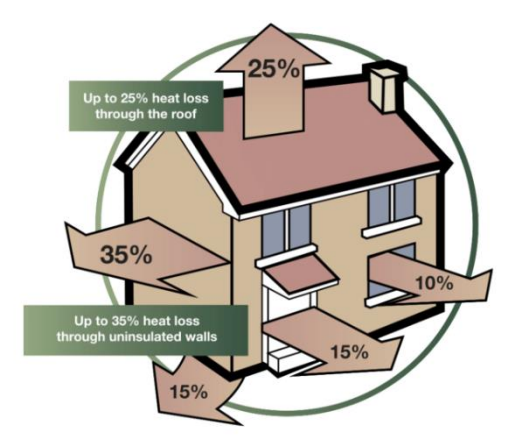
www.riseretrofit.org.uk

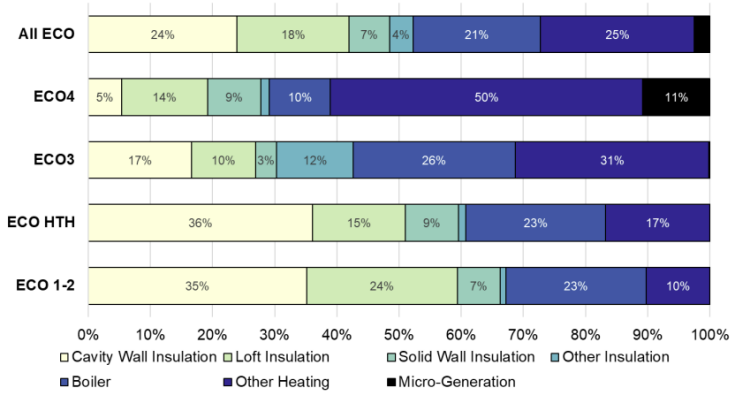
# Introduction

With innovation in energy savings technology, basic measures like loft insulation can be overlooked, however up to **25%** of heat loss in a home occurs through the roof[1]. Therefore, it's a critical part of the UK's decarbonisation journey. Loft insulation was only introduced into the building regulations for new UK houses in 1974 and then only to a thickness of 25 mm[2]. Standards have improved a lot since then. A 2025 estimate is that of the **26.1** million homes in the UK with lofts, **67%** have loft insulation (at least 125mm)[3]. Many housing stock owners and installers may have already retrofitted most of their homes with loft insulation as it is usually seen as 'low hanging fruit' before moving onto more complex measures. It is traditionally a well-funded measure due to its heat loss saving potential. Through the Energy Company Obligation (ECO) scheme, which ran from 2013, to the end of December 2025 around **4.4 million** measures have been installed in **2.6 million** households, **18%** of which were loft insulation[4].

This pack is designed at an introductory level and will follow a pre-install, install and post-install structure.




Source: Research Gate




Source: GOV.UK

This advice pack covers:

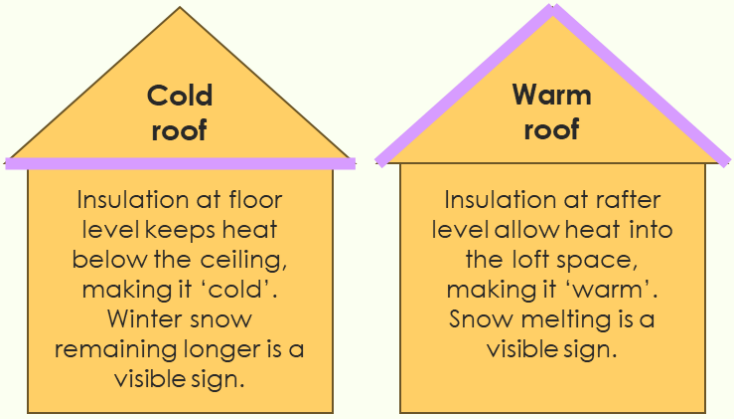
**Basics** → **Pre-install** → **Install** → **Post-install**

[1] Research Gate
[2] Open University
[3] Household Energy Efficiency Statistics (GOV.UK)
[4] Household Energy Efficiency Statistics (GOV.UK)

# Basics

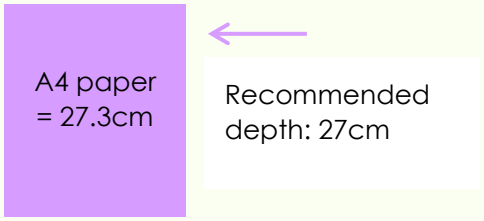
## Warm and cold roofs

The placement of insulation determines whether it is called a 'warm or cold' roof. See the diagram for more. This pack focuses on 'cold roof' insulation.




**Depth**

It depends on the material – a board could be denser whereas typical roll wool insulation is recommended to be 27cm[1].




## Type, material and depths:

**Types:** There are 3 main 'types' of loft insulation and many different materials:

**Types of loft insulation**

**Quilt Insulation**

Source: Changeworks

**Blown Insulation**

Source: Rockwool

**Board insulation**

Source: Kingspan

# Materials:

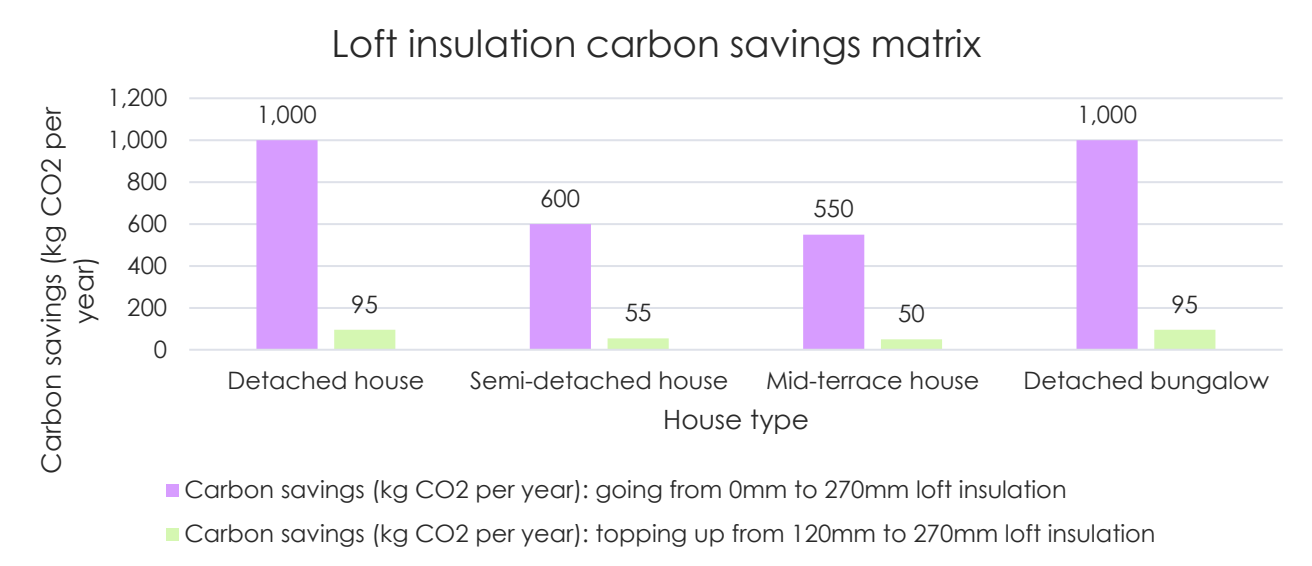
We recommend researching u-value and thermal conductivity too.

| Example material | Pros | Cons |
|---|---|---|
| **Mineral wool roll** | • Strong thermal performance<br>• Very good fire resistance<br>• Good acoustic insulation<br>• Affordable and widely available | • Can irritate skin and lungs during installation<br>• Requires protective gear<br>• May sag more than a board<br>• Items can't be placed on top of it |
| **Boards** Examples: PUR (polyurethane), PIR (polyisocyanurate), polystyrene | • High insulation values<br>• More condensed i.e. narrower depth which is useful where depth space is limited<br>• Very suited to warm roof applications, between roofing rafters<br>• Can be lightweight and easy to cut | • Typically, more expensive than mineral wool roll<br>• Some are made of petrochemicals<br>• Toxic fumes if burned<br>• Poorer sound insulation<br>• Risk of thermal bypass through gaps between wooden rafters and insulation board<br>• Some types may have poor vapour permeability<br>• Some may require fire protection |
| **Sheep's wool** | • Natural material<br>• Considered a safe material<br>• Low carbon<br>• Natural moisture absorption and release properties | • More expensive than synthetic options<br>• Ethical considerations<br>• Likely to require treatment before between field to install |
| **Blown fibreglass** | • Quick to install<br>• Cost-effective | • Costlier to remove<br>• Profession installers only<br>• Could blow around with draughts if it's not enclosed, causing uneven insulation and potential thermal bridging |
| **Spray foam** | • Quick to install<br>• Reduces risk of gaps in insulation | • This method could invalidate warranties and mortgages<br>• Can cause moisture problems and impact structural integrity of roof.<br>• Difficult to remove.<br>• Can cause ventilation issues. |

# Insulation depths

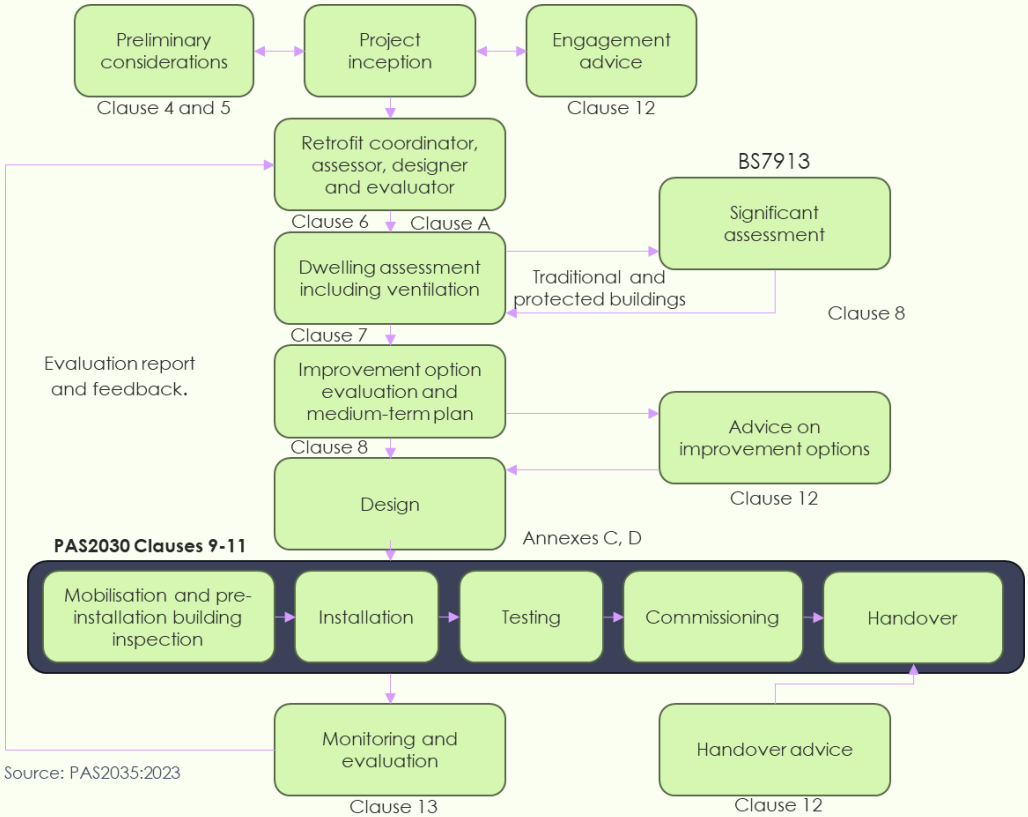
**Carbon savings:** differences in depths.

Improving loft insulation from 0 to 270mm can saving up to 1,000kg CO2 per year in a detached house or bungalow and 95 kg CO2 where topping up from 120mm to 270mm.




Data source: Energy Savings Trust

# Pre-install



# PAS 2035:2023

Installs via government grant funded schemes, such as Warm Homes, are required to follow PAS 2030 and PAS 2035 and MCS requirements and all measures must be lodged on Trustmark. For loft insulation, this means following the usual PAS process with retrofit assessment, coordination and design determining the measures.

### B.9.1 Additional installation requirements

"When installing loft insulation, in addition to meeting the core requirements set out in Clause 4 to Clause 10, the Installer shall also comply with any standards, specifications, instructions or guidance identified in B9-I1 of Table B.9" (PAS 2030). Elements of table B.9 are discussed below.

### Pre-installation buildings inspection (PIBI) – loft specifics

An extract of the requirements are shown in the table below and include items like:

| | | | |
|---|---|---|---|
| **Asbestos checks** | **Rodent, pest or protected species checks** | **Water penetration checks** | **Access to loft space, free from belongings** |

It can be hard to tell the condition of a loft remotely and without regular checks, there could be hidden deterioration which can cause delays. Therefore, it is essential that a PIBI is carried out and evidence of this is required for the retrofit designer and coordinator to see, and for Trustmark lodgement. This must include a completed PIBI form, and date stamped and geotagged photos.

| **Extracts from PAS 2030 of loft insulation PIBI requirements** |
|---|
| The Retrofit Installer shall investigate and determine:<br>• Pre-existing damage to the areas that are accessed by the installation operatives.<br>• The extent of the area and elements to be insulated.<br>• If relevant checks have been undertaken to determine if materials containing asbestos are present.<br>• If the condition of the roof space is suitable for the works to commence in relation to:<br>• Existence of appropriate roof space ventilation arrangements.<br>• The roof space being free from rodents/pests and protected species, e.g. bats.<br>• Timbers free from rot and/or infestation.<br>• The condition of the ceiling.<br>• Metal structural roof members being free from visible signs of corrosion.<br>• Electrical wiring is free from visible defects, e.g. damaged cables, trailing cables, exposed conductors. |

- No visible signs of water penetration; and
- No visible signs of leakage from water system components, e.g. pipework, cisterns, tanks, etc.

### Example issues

| Example issue | Considerations |
|---|---|
| **Inadequate access** | Loft hatches, appropriate ladders, safe landing spaces, safe boarding for working are all required for safe installs and you may need to set this up before being able to install. |
| **Personal belonging obstacles or hoarding** | Personal belongings can be a sensitive issue and for residents they can hold memories which may take time to resolve. However, both for safety purposes and to enable a complete install, lofts need to be cleared. Managing this clearance with the residents may take time and you will need to plan accordingly. |
| **Resident concerns** | Residents may be concerned about being able to store belongings in the loft after the insulation is installed. Belongings cannot go on top of insulation, as squashing it reduces its effectiveness. It is common for boards to be put over the insulation after install, on top of extension legs to enable belongings to be stored. With grant funding you should eligible expenditure to check what is covered. |
| **Bird, mice or other animal droppings** | Will require risk management and additional health and safety considerations. You may need to commission a separate contractor to remove materials, which could involve extra costs related to disposal and personal protective equipment. |
| **Protected species** | Ecological surveys may be required and then if any protected species are found the appropriate guidance should be followed. |
| **Asbestos** | Asbestos could be present within the loft itself, or on any other part of the roof structure such as tiles, soffits and fascia boards. Will require following the relevant safety standards, may require testing, samples, work around or work to stop altogether. You may think adding loft insulation should not involve disturbing materials, however ventilation, hatches, boarding etc all pose risks. This may add time and cost to the project. |

### Wider considerations:

- Skills: Competence and level of skill required for installing loft insulation is outlined in PAS 2030 .

**Ventilation:**

- There are two aspects to ventilation when installing loft insulation: ventilation of the loft, and ventilation of the rest of the building.
  As mentioned above, the PIBI must assess the existing loft ventilation, in accordance with the guidance set out in BS5250: Management of Moisture in Buildings and Approved Document F: Means of Ventilation. If the ventilation is assessed as inadequate for the new insulation then the retrofit designer must include ventilation upgrades to the loft in their design.
- Annex C in PAS 2035 sets out the requirements for adequate ventilation in the rest of the building, which is required when installing any fabric measures. Existing ventilation must be assessed and if an upgrade is required, a ventilation strategy must produced as part of the proposed design. Evidence of the installation must be provided along with evidence of the loft insulation.

**Importance of ventilation:**

In the pursuit of energy savings sometimes we can make homes more airtight. Although this can help prevent heat loss it presents risks:

- Air quality: Insulating a home makes it more airtight and reduces the air changeover rate, lowering the amount of oxygen in the air. This changes relative humidity and co2 levels. The PAS process addresses this risk by requiring assessment of air tightness and the provision of adequate ventilation.
- Condensation build up: less opportunity for moisture to escape could cause condensation build up over time.

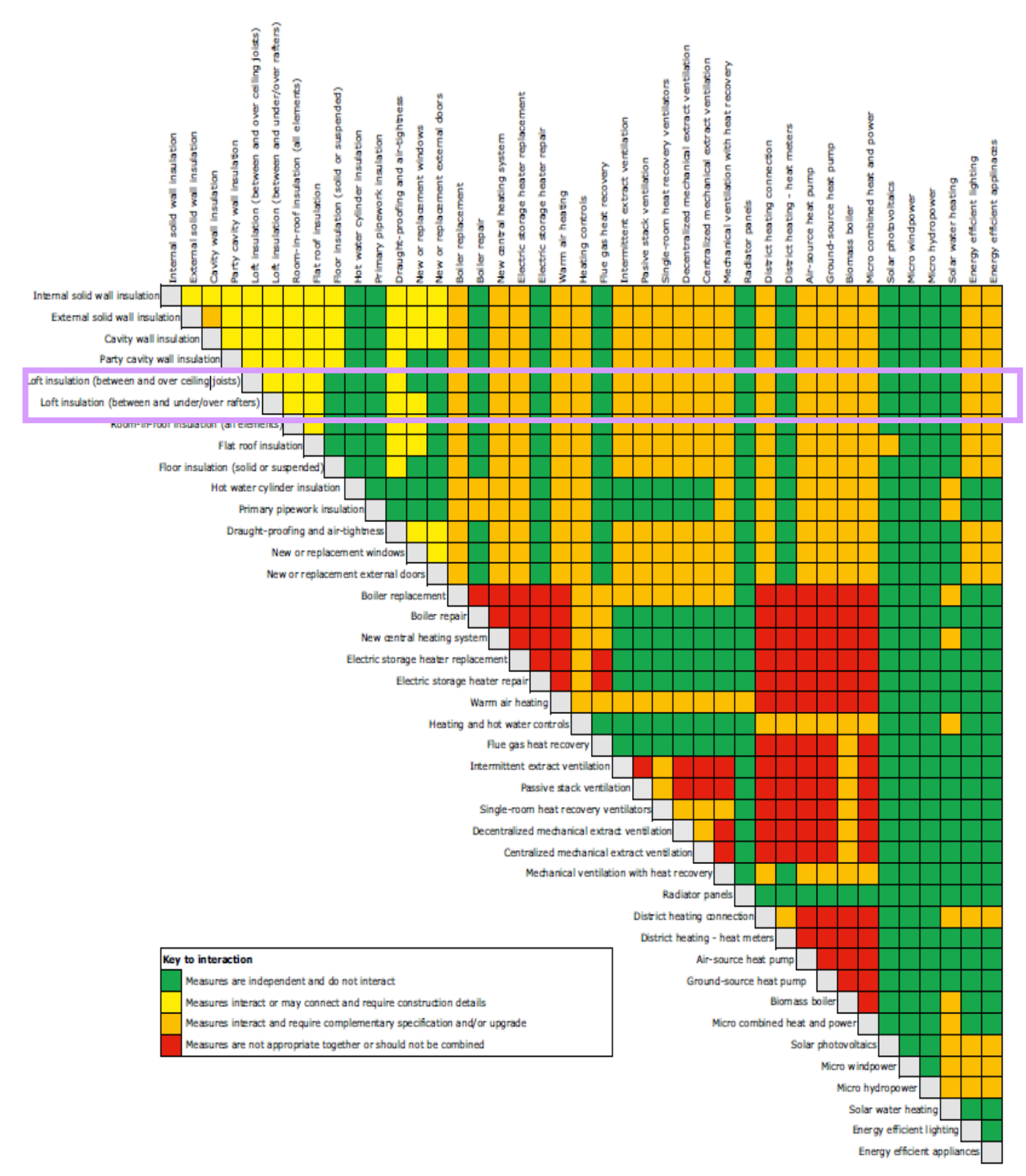
When we add more insulation to a loft, not only does this reduce the temperature in the loft, increasing the risk of condensation on the roof structure but it also risks blocking openings in the eaves which allow cross ventilation. This is why it's vital to provide adequate ventilation in the loft as well as in the rest of the dwelling.

**Design:**

When insulating a loft, a retrofit designer should consider interaction with other measures in line with PAS. This many include consideration of:

- Interaction with the loft hatch
- Interaction with other parts of the building such as CWI, EWI or sloping ceiling
- Overall, the design should be specific to the property
- Designers should also reference the PAS measure interaction matrix, described below.

**Measure interaction:**
In the PAS 2030 measure interaction matrix, red means the measure should not be combined. Loft insulation, highlighted in the purple, box has now reds.




Source: PAS 2030

# Install

Overall installers should refer to section 6 of PAS 2030 and check any loft insulation specifics.  Section 6 covers method statements, equipment and tools, storage of materials.



Source: PAS 2030

Note: in this advice pack we cover handover in the post-install section

Source: Change works

Protective equipment: it is likely that safety googles, protective clothes, a face mask and protective clothing may be required. Any evidence of animal droppings or asbestos may then require more specialist protection.

The installer is required to take date stamped and geo tagged photos of the loft insulation, including ventilation upgrades, and the insulated and draughtproofed loft hatch.

# Post-install

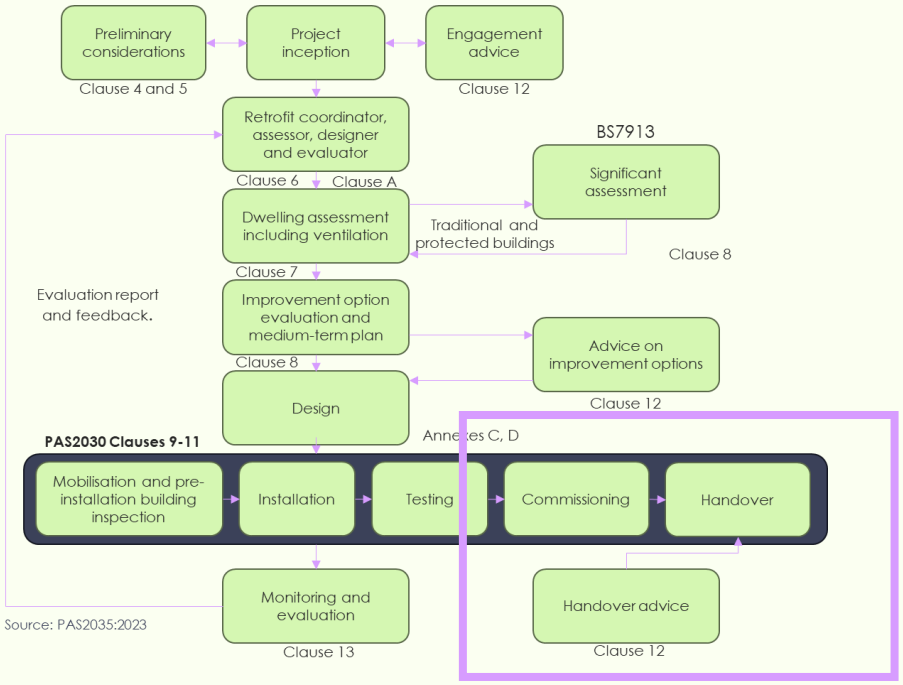
The PAS 2035 requires a tenant handover section for all installations (clause 9). And for loft insulation specifically, it is stipulated in table B-9 in PAS 2030 for loft insulation that:

***The Retrofit Installer shall handover to the client:***

- A Building Regulations compliance certificate where appropriate (or information explaining that a Building Regulations compliance certificate is required and will be provided within 30 days); and
- Any relevant product warranty information and guarantees.
- Note that any electrical ventilation such as extract fans installed with the loft insulation will also need to have an Electrical Installation Certificate supplied to the client.

**Handovers:**
*For loft insulation most handover aspect will cover:*

- How long it lasts (typically 40 years) [5]
- That placing belongings on the insulation will damage its effectiveness
- To be mindful of birds or rodents burrowing into or stealing material
- No settings or annual checks required

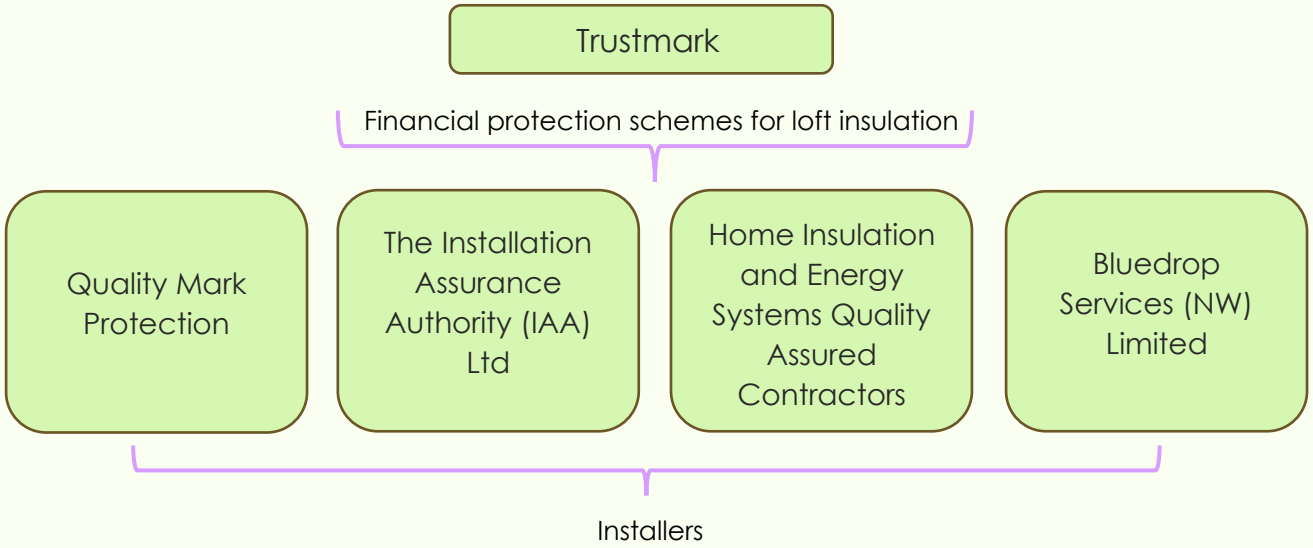



**Source: PAS 2030**

## Warranties or guarantees:

PAS 2030 specifies 'any relevant product warranty information and guarantees' so what does this mean?

Through Trustmark there are several different financial protection bodies. Most of them offer a 2-year cover. As part of their Trustmark accreditation, installers must comply with the approved financial protections mechanisms set out by Trustmark.




[5] Energy Savings Trust

# Summary

Installer should follow the PAS 2035 process and PAS 2030 installation standard which will involve pre-installation building inspections specific to loft and roof elements. It will involve a retrofit assessor, coordination, designer and installers being involved. Common issues can be personal belongings, hatch access, birds, mice or bats, technical angles and ventilation requirements. Post-install processes will involve PAS compliant handovers, lodgement and any certifications. Overall, loft insulation is an effective way to save carbon in our homes.

# Resources

**Podcast**: All RISE podcasts are available here.

**Podcast**: "PAS for Warm Homes projects" available here.

**Masterclass:** All RISE masterclasses are available here.

**Masterclass** "Introduction to insulation and ventilation" available here.

**Advice pack:** All RISE advice packs available here.

**Advice pack:** "Introduction to PAS 2035" available here).

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