



Installing Cavity Wall Insulation to standard construction buildings up to 12m in height Best Practice Guide

Best Practice Guide: May 2020

Version:1.0

This guide has been produced by the Insulation Assurance Authority (The IAA) as best practice guidance for injected cavity wall insulation.

1. Preface

The aim of this document is to provide a clear reference document for installers of injected cavity wall insulation to a standard masonry/cavity/masonry construction up to 12 in height, and with the required minimum width.

The guide is not produced to include injected cavity wall insulation to non-standard construction.

Any drawings or images are provided as a general guide and are not prescriptive guidance but simply produced to assist in the installation processes and procedures.

When undertaking installation of any insulation upgrade measures, a suitability assessment must be completed and must also be thorough and robust, specific to that property.

The guide should be followed by all cavity wall insulation installers and used in conjunction with system design specification, product testing specification and recommended training programmes.

The basic approach to installation of injected cavity wall insulation can be summarised as follows:

- Construction detail
- Suitability assessment
- Health & Safety Risk Assessment
- Material selection and compliance
- Installation specification
- Method statement
- Completion
- Post installation checks

Contents:

1. Preface
2. Introduction and Benefits
3. Health & Safety
4. Customer Care
5. Partial fill cavity Insulation
6. Competence Requirements
7. Building Suitability Assessment
8. Identifying a cavity wall
9. Non-traditional construction
10. Installation
11. Ventilation
12. General items of consideration
13. Injected cavity wall insulation products
14. Post installation checks

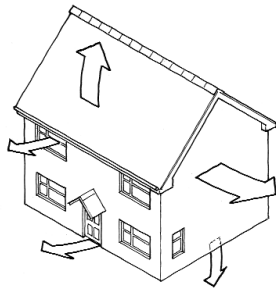
2. Introduction & Benefits

Cavity Wall Insulation is one of the most effective and efficient ways of reducing heat-loss from a building resulting in improved thermal efficiency and assisting in providing a warm, comfortable and affordable living environment.

Inefficient and difficult to heat home environments are known to increase the likelihood of respiratory illnesses such as influenza, pneumonia, and bronchitis. In addition, cold conditions in homes can promote and encourage mould growth and dust mites, which have been linked to respiratory conditions such as asthma.

35% of heat loss is through the masonry external wall construction but with injected cavity wall insulation, heat loss and energy efficiency is massively improved.

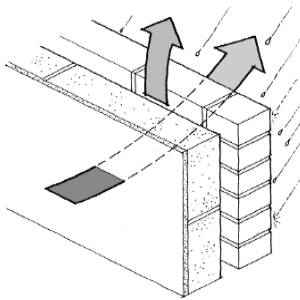
Heat loss areas



- 35% External Walls.
- 25% Roof
- 15% Draughts
- 10% Windows.

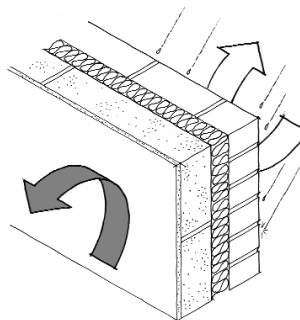
The energy wasted in poorly insulated homes accounts for one quarter of the polluting greenhouse gases produced by all buildings.

uninsulated cavity wall



Filling the residual cavity space with an insulation material provides continuity from roof space insulation and also replacement UPVC windows, fully encapsulating the home and massively improving thermal performance and comfort.

Insulated cavity wall



3. Health & Safety

The Assessor & Installer should be mindful of the Health and Safety at Work Act and follow all guidance and specific requirements of this regulation.

Safe systems of work

Your safe system of work, should as a minimum include the following precautions-

- Appointment of a senior Technician.
- Supervisors (Safety person) should be given responsibility to make sure that the necessary precautions are taken, to check safety and wellbeing of the technicians.
- Fully trained and competent Technicians with sufficient experience of this type of work and having received the relevant training for the task are to carry out the work.
- A risk assessment and method statement detailing the work to be carried out. Where the CDM Regulations apply a CDM plan.
- Where risk assessment highlights exceptional constraints as a result of the physical layout of the installation, Technicians must be fully and appropriately trained in all aspects of H & S requirements including: Ladder and access training, Gas awareness etc.

Isolation of services and mains supply

- Prior to work starting, the location of the mains electricity consumer unit, water stop clock and gas isolation valve should be checked to ensure they are readily accessible.
- Isolation of electrical cables which could be inadvertently operated or dislodged.
- If there is gas pipework evidence, leaking fumes could be evident, therefore you may need to isolate the pipework checking that the isolation is effective.

Tools and Equipment

- Tools and equipment must be maintained and serviced appropriately whenever necessary and must be kept, used and stored safely and appropriately.

Personal protective equipment.

- Provision of and use of the equipment including PPE (Bump cap, safety glasses, gloves) and RPE (to the relevant FFP rating) and lighting including back up lights may be required.

Emergency arrangements

- Emergency arrangements will need to be in place to cover the necessary postponement or termination of an installation if circumstances require.

Communications

- An adequate communications system via either a mobile phone or regular daily contact with senior staff will be adopted.

4. Customer Care

Installing injected cavity wall insulation can be slightly disruptive to the residents with regards to noise, dust etc on the properties involved. It is therefore essential that thorough discussions with the resident takes place before any works proceed. This as a minimum should include –

- The extent of any disruption that is caused by the chosen installation method (removal of fittings and or fixtures, potentially dislodged by the drilling process and vibration).
- Any additional works that may be required to facilitate the installation of insulation (repair of defects, additional ventilation etc).
- Time anticipated to undertake the works, and any deviation from this during the works caused by unforeseen issues.
- The extent of any making good that is included in the works.
- General Customer Care guidelines also apply:
 - Check you are at the right address, and identify yourself, showing your credentials.
 - talk to the customer personally, without being over-familiar, customers like their names being used
 - Do not park vehicles on the customers drive without permission.
 - Explain to the customer what you intend to do before you start work.
 - Use shoe protectors / covers when entering the property.
 - Advise the customer of any precautions needed e.g. removal of materials or possessions that restrict access.
 - Put down dust sheets where required.
 - Following completion of the works, all packaging / waste materials must be removed from site and disposed of in the appropriate manner.
 - Clear up any mess as soon as possible and dispose of waste in the appropriate manner.
 - Ask permission if you need to use the customer's toilet facilities.
 - Try not to get involved in any disputes with the customer or respond negatively to any complaints or criticism.
 - Point out any problems or defects to the customer before starting work and report on the pre installation check sheet.
 - If any damage is caused, however small, inform the customer and report the matter to your organisation, and advise the customer that the matter will be dealt with appropriately.
 - Ensure the work is fully explained to the customer including areas where they are not to enter or be in the vicinity of works underway.
 - Any specific safety considerations as recommended by the manufacturer of the product or system utilised should also be followed.

5. Partial fill cavity wall

Since the 1930s the vast majority of houses were built with a cavity wall and if not already treated, are entirely likely to be suitable for injected cavity wall insulation following a thorough pre-installation suitability assessment.

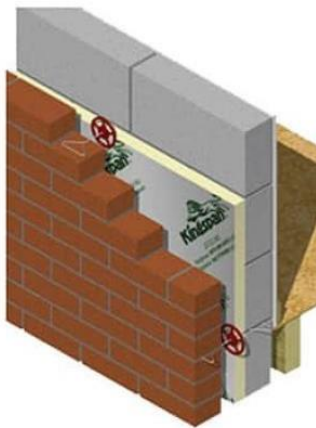
A robust and thorough assessment must be completed in order to minimise all risk and ensure the property is totally suitable for injected cavity wall insulation.

Since the early 1980's insulation has been an integral part of housing construction including cavity wall insulation, injected or fitted during construction to fully or partially fill the cavity space.

Built in cavity wall insulation products include the following:

- Mineral wool slab
- Expanded Polystyrene Board (EPS)
- Foil Faced Polyurethane or Phenolic Board
- Flexible multi-layer Insulation

And many more:



Unless the product proposed to be installed has specific approval for injection to a partial fill cavity wall and all other criteria with regards to suitability assessment are met, injected cavity wall insulation must not proceed.

6. Competence requirements

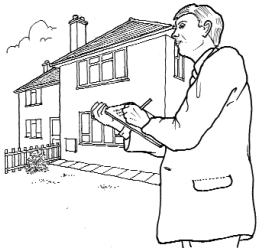
Installation competence requirements for injected cavity wall insulation

All System Certified Technicians must be:

- Trained and approved by a System Designer
- Hold an NVQ level 2 for injected cavity wall insulation
- Registered with certification body
- Hold an industry approved qualification in technical competence.
- Access and ladder training and competence

- Gas awareness along with a general understanding of construction detail

7. Building Suitability Assessment



The property being surveyed for injected cavity wall insulation must be thoroughly and robustly assessed for suitability by a trained, competent and qualified Retro-fit assessor. The assessor must hold an industry approved qualification and registered with The IAA ISA (Independent Surveillance Assessment)

The assessor must record all salient facts within the assessment records supported by digital images. The Installation must not proceed until such time that the assessment / Desk top assessor has approved the assessment and issued a Unique Reference Number (URN)

Before starting the planned works the installation technician's, must carry out a pre-installation inspection to verify the details within the assessment. Where details are found to be incorrect or where alterations are required as to the methodology of the installation, these must be conveyed to the installer company, the assessor and retrofit Coordinator as required.

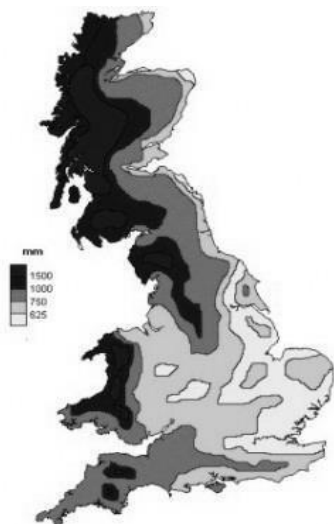
The assessment is of particular importance in the case of, flues, chimneys and combustion air ventilation where it is the responsibility of the installation technician to carry out pre and post installation safety checks on flues and appliances. (The IAA Best Practice Guide: Flues, chimneys and combustion ventilators)

Arrival to the customers property

Upon arrival:

- introduce yourselves to the customer and show your ID.
- confirm that you are at the correct address.
- Go through the customer journey advising the customer of the process of the works.
- Explain that access must be available to the property to include the loft space to carry out the required pre and post installation safety checks.
- Check to make sure that the building does not exceed 12m in height.
- Where access is required to the adjoining property or neighbouring properties access permission will be necessary.
- Ensure all relevant information is obtained, acceptance and permissions also obtained, and all documentation is comprehensive and complete.

Exposure zones



Whilst there are areas and regions of the UK subjected to increased levels of wind driven rain, all injected cavity wall insulation products registered with the IAA are tested and approved as suitable for treatment to all regions without exception.

Higher exposure is of course an element of the general suitability assessment which must be considered, but this simply forms part of the wider assessment process and does not necessarily mean that a particular property is unsuitable.

A suitability assessment requires the Assessor to confirm the property proposed for treatment meets all the criteria compliance necessary, with exposure being a single element to consider.

8. Identifying and confirming suitability for cavity wall Insulation

There are no hard and fast rules for identifying if the building is of solid wall construction or cavity wall construction, however the appearance of the outer wall brickwork will provide an indication.

Stretcher bond brickwork on the outer wall normally indicates cavity wall construction, although a stretcher bond is also used on single leaf walls such as garages, porches and occasionally bay windows.

The first indication that the wall may be of a solid wall construction would be visible header bricks, but this does not provide confirmation, and if localised, may be a construction detail for a chimney, therefore, additional checks are required.

If the overall measurement across the entire external wall to the internal plaster finish is approximately 230mm the wall construction is likely to be solid. However, if the overall width of the wall is 265mm or more this would indicate a cavity construction which may be suitable to receive cavity wall insulation, and an intrusive inspection can proceed.

A cavity width of less than 50mm must not be approved or treated unless the cavity wall insulation system to be installed has been tested and approved by the system certification body for the measured width and confirmation of a continuous, unobstructed cavity wall.

Some pre-1939 properties have cavity wall construction on the ground floor but with a rendered brickwork upper floor with little or no cavity. However, if the general assessment confirms the a well-maintained property and all other criteria for suitability are met regarding weather protection and minimal risk assessed e.g. cavity trays, weep vents etc, the property may be suitable for treatment.

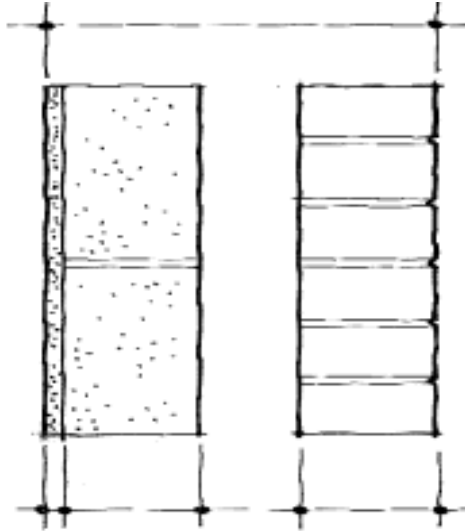
The cavity space should be clear, unobstructed and a consistent and adequate width.

If in doubt, seek advice.

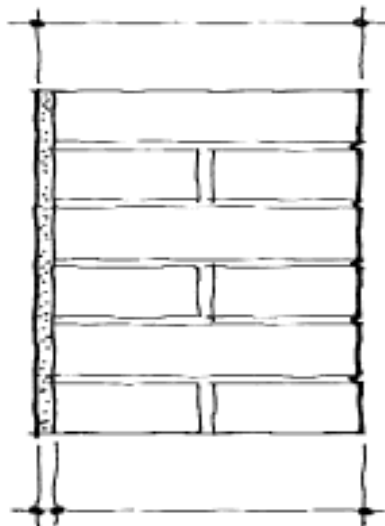
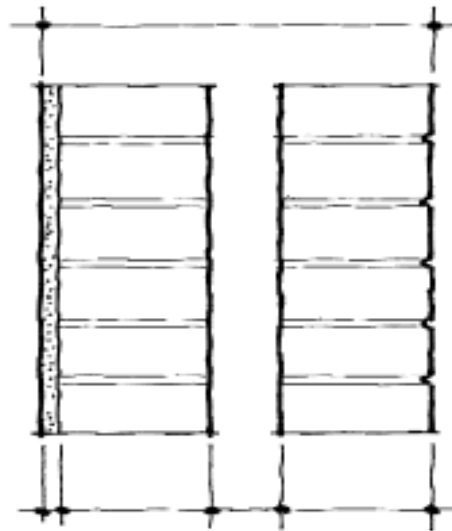
From the 1970's

From the 1930's

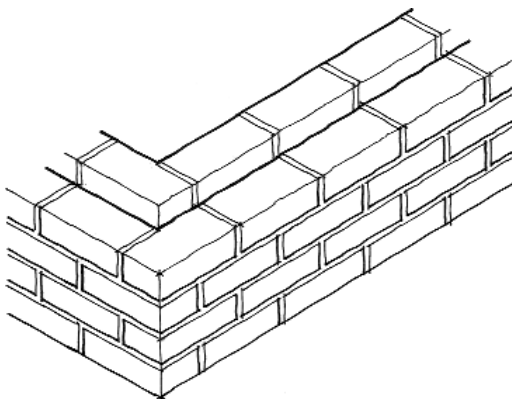
Metric measurements 290mm



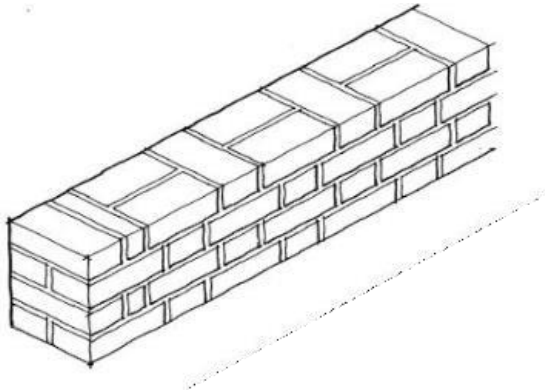
Imperial measurement 287mm



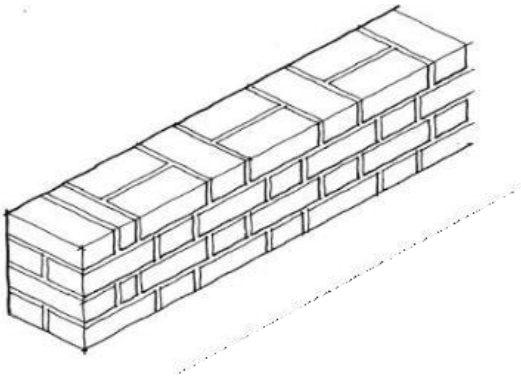
Solid construction 238mm



Stretcher bond example (cavity construction)



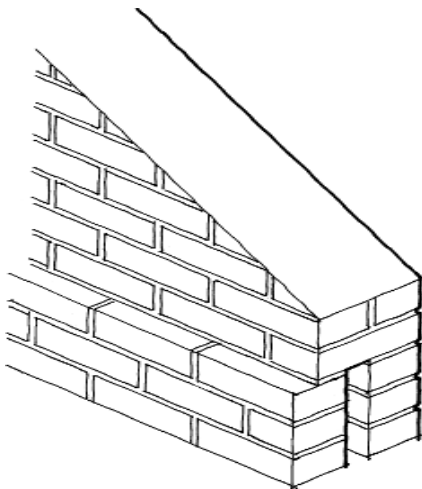
Flemish Bond (non-cavity)



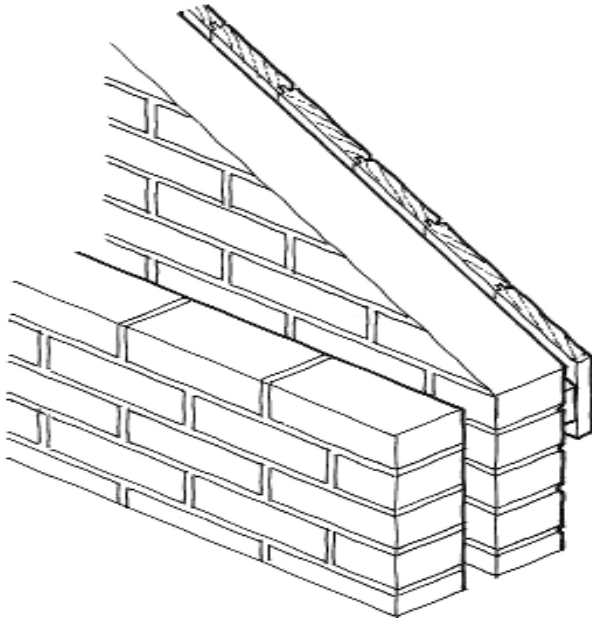
English bond (non-cavity)

However it is also worth noting that unique and bespoke single constructions have occasionally been constructed with an English or Flemish bond and a single measurement across the entire wall from a doorway or window will indicate if there is a cavity wall likely.

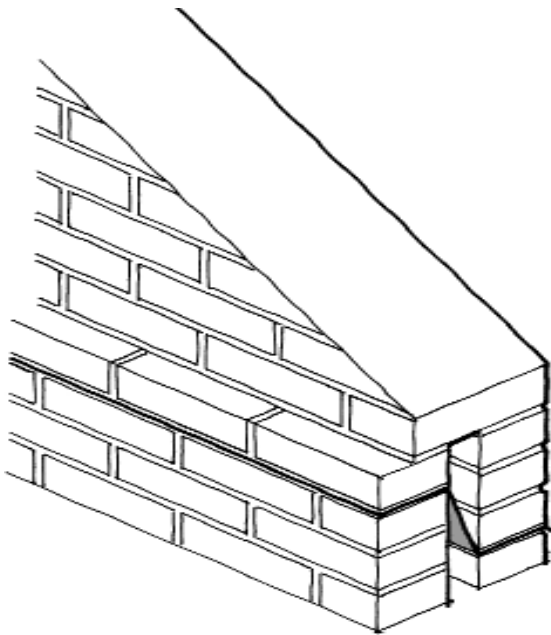
Gable Apex detail considerations



The Assessment should consider condition, orientation, exposure etc before this detail is approved as suitable for injected cavity wall insulation depending on the product proposed.



With an externally cladded and weather protected gable ridge, this detail is suitable for all injected cavity wall insulation systems.



If there is an existing cavity tray this should be visible from outside and should also include weep holes, however, weep holes are not always fitted, and the general suitability assessment should consider all other factors and risk assessment before the property is proposed as suitable and the correct product specification is vital in this situation..

9. Non-Traditional construction

Timber Frame

Timber frame construction became popular in the early 1980's and can be difficult to identify and will have a 50mm clear cavity wall between the outer brickwork and inner breather paper and ply sheeting. However, this construction detail is **not suitable** for injected cavity wall insulation under any circumstances.

It is therefore vital that the initial assessment identifies this construction detail and the property is rejected at that stage.

How to check

- Timber frame construction rarely use galvanised wall ties but simply polypropylene or plastic ties which can be identified and viewed with a standard check scope.
- A check scope inspection will show a dark coloured and untextured inner wall surface i.e. breather paper.
- The electricity meter box is often a place where the cavity can be viewed and will show the breather membrane and ply sheeting.
- All internal wall surfaces will be dry lined, however, 'dot and dab' dry lining is also used across masonry; therefore, this is not confirmation but will assist in a full investigation.
- A check inside the roof space will show a timber framework across gable ridges and diving wall between properties (party wall)

Steel and concrete frame

Testing and approval for steel and concrete frame construction types has not been completed and whilst we are aware of many of these non-standard properties have been treated with injected cavity wall insulation and have guarantees, new installation will not be appropriate and Guarantees will not be available.

How to check

- Customers will know the construction detail.
- An intrusive check scope inspection will show the steel framework.
- Look for evidence of corrosion, particularly at plate/ground level
- Look for evidence of general rusting.
- The cavity width will be 100mm to 150mm.
- There will be no wall ties.
- The steel frame will be visible from inside the roof space.
- The loft space itself is likely to be steel joists set at 1m spans
- Occasionally steel framework properties are set on a bed of steel and the perimeter steel work may be visible at external ground level.
- The overall measurement across the outer wall surface gained from a doorway or window will far exceed a standard masonry construction.

10. Installation

Pre-installation checks

When you are satisfied that the property is of suitable cavity wall construction, the installation technicians should carry out other necessary checks to make sure that the property has been correctly assessed, prior to treatment, to include SD/The IAA and relevant installation standards and requirements.

Garage Roofs

Carefully inspect the condition of the roof and supporting structure. Where damage is identified the customer must be informed and details recorded with safe access identified and implemented before works commence.

Where alternative, installation techniques are required due to access difficulties, the method of installation system must be approved and certificated to ensure that the installation, has been carried out in strict accordance with the agreement certificate and system designer specification.

Glass and Plastic or Composite roofs.

These types of roofing types are fragile structures and can be damaged during the installation process. Generally, these roofing types are not weight bearing structures therefore approved and tested access equipment must be used where a safe working access is required.

Condition of these roof types.

Advise the customer of any damage to roof sheeting, structure etc and record the details on the work records and ensure that a safe-working access is provided or in-place practice before starting the planned works.

Flues, Chimneys and Combustion Air Ventilators.

It is vital, that all fuelled appliances and chimney flues within the property are checked for safe operation both at pre installation and post installation stages.

(The IAA guide to best practice: Technicians Guide -Flues, chimneys and combustion air ventilators)

At the assessment stage and installation stages you must- locate, identify and record details on the assessment and work record, the location and position of flues, chimneys & combustion air ventilators for all fuel-burning appliances within the property.

Additional checks must be carried out and recorded:

- Appliance Type & Kw rating
- Open flues – solid fuel Fires
- DLF – ILF fires & flueless appliances
- Boilers flues, routes and locations

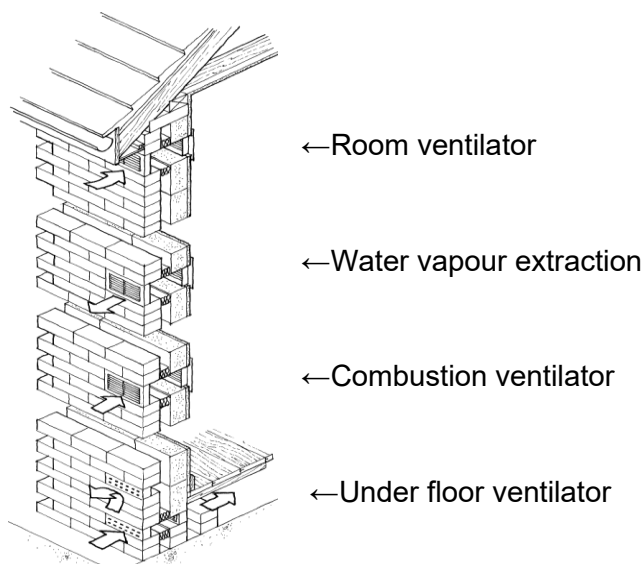
Please note:

Where combustion air ventilation is required, in-depth checks must be carried out to ensure that existing ventilators are of correct standard applicable to the flue/appliance and if this information is unavailable seek manufacturers advice and guidance.

Where the room of the flue or flued appliance has no combustion air ventilation fitted, the installation must not go ahead until a regulatory ventilator has been fitted. A signed declaration from the customer advising that they will get one fitted as soon as possible is not acceptable and the planned works must not proceed until the correct ventilation requirements are agreed and met.

11. Ventilation

Where confirmation of the Kw rating of a heating appliance or the requirement for combustion air ventilation cannot be confirmed i: e the lack of an appliance information plate further advice and guidance must be sought before works proceed.



The function and location of all air ventilators must be noted and dealt with in accordance with requirements.

Under floor air ventilation points can occasionally be off-set or staggered or sometimes both, and it is unlikely the initial suitability assessment would have identified this building detail, but it is essential that existing ventilation is thoroughly safeguard.

Cavity ventilators without a corresponding inner leaf vent are rendered redundant following the installation of cavity wall insulation and must be sealed external in order to avoid water ingress or material spillage.

Cavity barriers (required if the neighbouring property is not to be treated)



When installing retrofit blown insulation to semi-detached or terraced housing, a cavity barrier/brush must be installed if a neighbouring property is not to be treated.

The cavity barrier must be installed on the party line of each adjoining property and left in position on completion of the works.

Where cavity wall insulation has been installed previously to an adjoining property, ensure that the barriers remain correctly in place and there is no significant spillage. However, if there is evidence of over spill or under spill, the excess material will need to be extracted or an identical product used for the new installation.

12. General items of consideration

Deteriorated mortar joints

Deteriorated mortar joints will inevitably increase the risk of water penetration and whilst the initial suitability assessment should highlight any defects and propose remediation, with access equipment available for the installation process a clearer and up close inspection may identify further issues.

Defects and potential points of water ingress must be made good at the time of installation and adequately weather protected. ([refer to: The IAA Technical note 29 Recessed Mortar Joints](#))

Rainwater guttering and downpipes

Check for damage to the guttering or down pipes and their fittings to ensure that they are securely fixed, and in good condition.

Where the condition of the rainwater system is damaged or leaking, they must be rectified prior to installing cavity wall insulation. (Refer to [Technical note 47 Downpipes, guttering and wastewater drainage](#))

Finlock Gutters

The Finlock guttering system is no longer used in construction but was popular method of rainwater drainage in the 1950's and 1960's incorporate sections of concrete guttering laid directly across the cavity heads.

Cavity Wall Insulation **must not** take place unless the guttering system has been confirmed to be fully lined with an appropriate secondary waterproof lining. ([Refer to: Technical note 27 Finlock Guttering](#))

Damp Proof Course (DPC)

All cavity walls should be protected by a continuous DPC above the ground level; however, this is not always visible and can be embedded into the masonry or covered by render.

The initial suitability assessment should have thoroughly inspected for evidence of rising dampness, and as the property has proceeded to install stage the likelihood is there was no evidence reported and surface moisture content was at an acceptable level. (refer to: [The IAA Technical note 14 DPC](#))

Note: Cavity Wall Insulation must not proceed until the technician has completed all the necessary pre-installation safety checks and confirmed compliance.

(seek technical advice / support from BBA – KIWA agreement certificates and system designer technical specifications for suitability and methods of installation).

Density, appearance and stability and calibration tests must be completed to ensure compliance with the agreement certificate and system certification.

The quality control checks must be carried out before each installation and results recorded within the work records.

The specific details of the required checks are available within the System designer Technical manual and are relevant to the machinery being used.

13. Injected cavity wall insulation products

Mineral wool

All mineral fibre systems must be injected into each injection point in turn, starting at a natural barrier i: e cavity barrier etc and at the lowest injection point and working upwards completing each row in turn before progressing p to the next row of holes.

- The straight injection nozzle must be the depth of the outer leaf
- The length of a directional nozzle must be extended to ensure that the right-angled injection hole within the nozzle is within the cavity.
- When the cavity wall insulation injection starts, the insulation is blown in at a pre - determined flow rate to ensure that the cavities are filled to the required density.
- When the section of wall area is filled to the correct density the pressure switch on the blowing machine disengages the blowing valve to prevent a continued flow of material that will result in blockages within the delivery hose, and can be time consuming in clearing the hose in preparation for moving onto the next injection point.
- Check that the insulation has travelled to the next injection point.
- In the event, that the filling time is less than normal, this may be indicated as a blockage or tightly packed within the nozzle and as a result activating the pressure switch on the machine. Following clearance of any blockage within the nozzle repeat the blowing / injection to the point where the blockage occurred.
- Where the injection or blowing time exceeds the normal expected blowing time, you should stop and investigate to assess where the excess material is going,

and the process restarted only when the issues are identified and rectified.

Poly Bead

The insulation should be injected into each hole in turn.

Start at the bottom corner and continue around the building filling the lowest line of holes – located just below windowsills.

All injection holes in the lowest row of an elevation must be filled in turn prior to moving up to the next row - and so on.

It is not necessary to fill gable peaks, unless they form part of a heated living space (room in roof)

Where a room in roof exists the drilling pattern must be extended to the uppermost part of the gable wall.

- The injection nozzle must be inserted to the depth of the outer wall.
- Activate the compressed air. When you can see the beads running through the clear section of hose and turn on the adhesive valve.
- The mixture of beads and adhesive flow into the cavity building up to form a cohesive mass.
- When each injection point is full, back pressure will stop the flow of beads and at this point the adhesive valve must be closed.

Detailed information is available within the System Designer Operations manual Making good upon completion

Following the installation, the making good of mortar joints, render, Tyrolean, spa chippings etc must be completed to match as closely as possible to the original texture finish and colour. (customers will often have sufficient surplus external paint to make good injection points)

The kerbside appearance of the property post installation is paramount and will inevitably affect neighbouring potential customers if the finish is poor.

Ventilation safeguarding for timber floors and combustion ventilation is absolutely vital at completion stage, and the importance cannot be overemphasised.

A mortar mix should be made up before the filling operation begins, to allow the installing technician to repoint the preceding injection point whilst the next one is being filled.

Check the correct colour and texture of the sand relative to local areas

Plasticiser or Surfactant **Must Not** be used under any circumstances.

14 POST INSTALLATION INTERNAL CHECKS.

Remove or cover dirty clothing and footwear before entering the house.

It is vital that post – installation checks on all flues and fuel-burning appliances are carried out on external walls, and that the required combustion air ventilation is in place, allows unobstructed air flow and not compromised,

Technicians must be aware that appliances on internal walls may be unsafe. It may therefore be prudent to carry out the respective flue and spillage checks at the same time.

In the event, that these flues and appliances show a concern, the technician should advise the customer to have them checked by a registered gas safe or solid fuel engineer.

[Refer to The IAA Guide to Best Practice Guide: Flues, Chimneys & Combustion air ventilators]

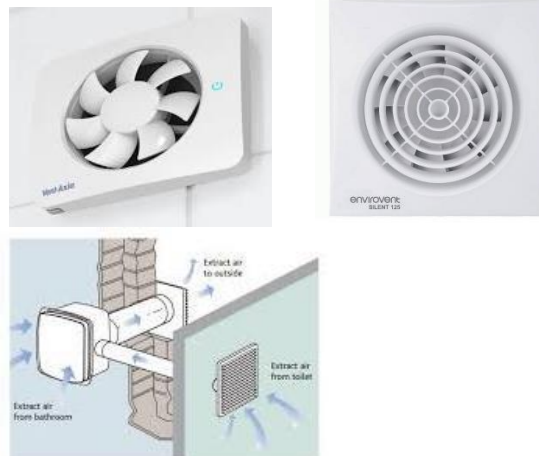
Ensure that the cavity wall insulation has not entered inside the property

Check:

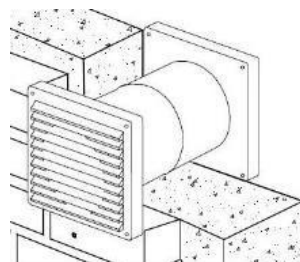
- Each room
- Underneath Sink units / baths etc
- Loft area
- Boilers / water heaters on external walls

All spilled material must be cleared away and removed from site.

- Ensure that all room ventilators are open and not compromised and allow unobstructed air flow.
- Check operation of extractor fans, Vent axias



- Confirm combustion air vents are not compromised



- Ensure all electrical circuits and appliances are re-instated
- Replace ornaments, mirrors etc which have been removed at pre installation