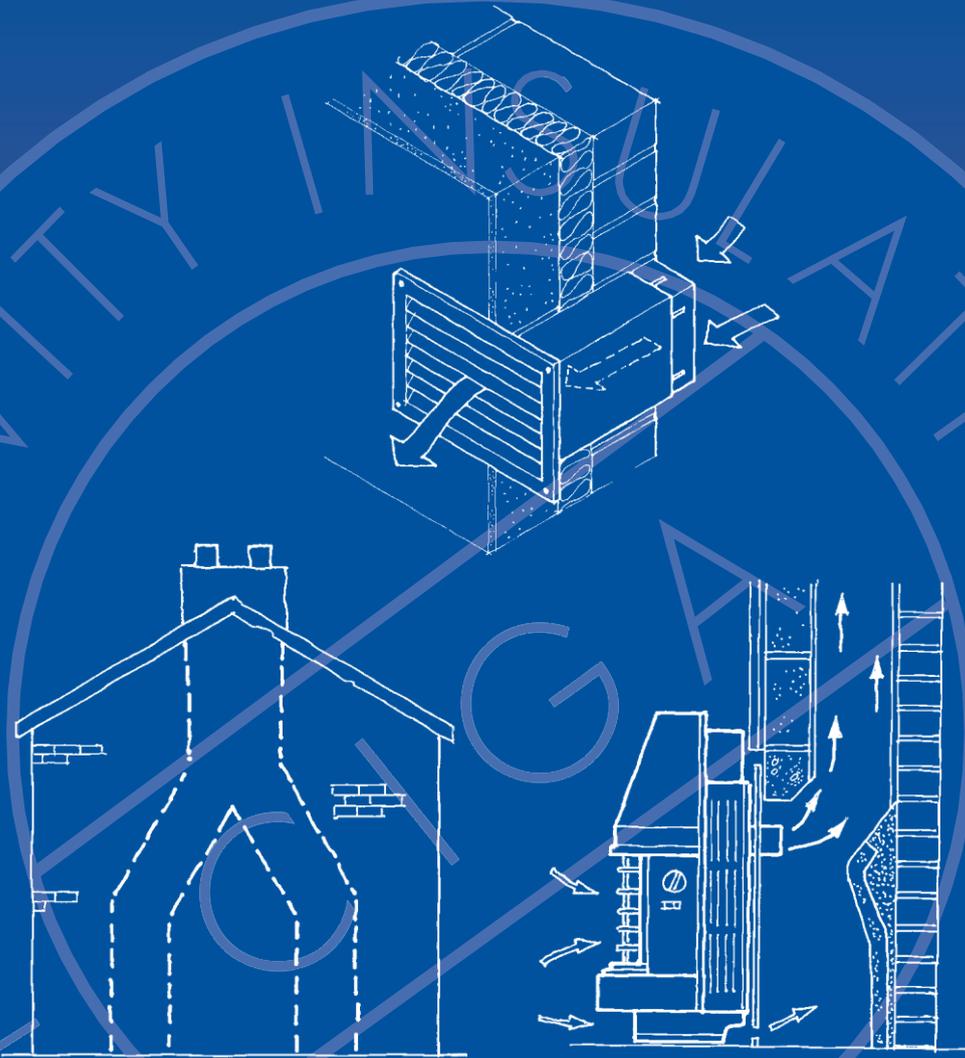


Flues, chimneys and combustion air ventilators.



Flues chimneys & combustion air ventilators is published by the Cavity Insulation Guarantee Agency (CIGA). It is one of a series of technician's guides, intended to contribute to best practice in cavity wall insulation.

Whilst every care has been taken in its preparation, CIGA and its authors specifically exclude any liability for errors and omissions or otherwise arising from the contents of this guide. Readers must understand the principles and practices described in relation to any particular application and where necessary, take professional advice.

The information contained in this guide is not exhaustive. Further details on flues, chimneys, and combustion air supply can be obtained from the following publications.

Gas Appliances

BS5440 – Flueing and Ventilation for Gas Appliances not exceeding 70kW

Part 1 2008: Specification for the Installation and maintenance provision for gas appliances

Part 2 2009: Specification for the Installation of gas appliances to chimneys and maintenance of chimneys

BS 5871 Specification for the installation and maintenance of gas fires, convector heaters, fire/back boilers and decorative fuel effect appliances –

Part 4 2007: Independent gas-fired flueless fires, convector heaters and heating stoves of nominal heat input not exceeding 6 kW (2nd and 3rd family gases).

Further Technical information should be sought / obtained from the relevant fuel supplier;

Natural Gas

- Gas Safe

Oil Appliances

- (Oil Firing Technical Association for the Petroleum Industry: OFTEC) Solid

Solid Fuel

- Solid Fuel Appliances The Building Regulations 2010 Part J Appendix F_ www.planningportal.gov.uk

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LEGAL REQUIREMENTS

The main legal requirements for protection of the public and employees are the general provisions of Health and Safety at Work act 1974, and related legislation, including the Management of Health and Safety at Work Regulations 1999.

These require the drawing up of a 'risk assessment' plan of protective measures, as well as the appointment of competent persons to ensure that safety requirements are met effectively. An example of a risk assessment for Flues, Chimneys and Combustion Air Ventilators is given on page 32.

In addition, for gas installations, there is a requirement to comply with the current edition of the Gas Safety (Installation and Use) Regulations, and in particular: Regulation 8.

This covers alterations and modifications to buildings in which gas appliances are installed and this would include cavity wall insulation.

PREFACE

“The Technician’s guide to best practice provides technicians with a simple, but detailed manual. It covers best practice for dealing with flues, chimneys and combustion air ventilators during the installation of Cavity Wall Insulation (CWI). It clearly sets out the responsibilities of the CWI installer companies, with practical examples and illustrations of procedures to be carried out by the competent technician.

The guide should be followed by all CWI installer companies and used in conjunction with recommended training programs.

INTRODUCTION

This guide has been written for the CWI Company and technician, to ensure that the performance of fossil fuel-burning appliances is not adversely affected by the installation of Cavity Wall Insulation (CWI).

CWI should not be installed unless you can gain entry to the property, and you are able to complete all of the necessary pre and post installation checks.

Installation is a relatively simple operation, but you must carry out your pre- and post-installation checks correctly, or you put the occupants in real danger. If you block any combustion air ventilators or flues of fuel-burning appliances, there is a high risk of someone becoming seriously ill or dying of carbon monoxide poisoning.

All fuel-burning appliances need an adequate air supply and need a clear chimney /flue to operate correctly and safely.

With an appliance in good working order the main products of complete combustion are Carbon Dioxide and Water Vapor. Both of these gases are non-toxic, however if the air supply becomes impaired or violated highly toxic carbon monoxide is produced. This is known as incomplete combustion.

Where the products of combustion are unable to pass through a flue to outside atmosphere, or they re-enter the premises through either a blocked or defective flue or chimney it is referred to as 'spillage'.

Carbon monoxide poisoning

You cannot see, smell or taste carbon monoxide, but it is an extremely toxic gas. It is absorbed by the red blood cells via the lungs, resulting in illness or death. Exposure to high levels of carbon monoxide can lead to death in as little as 1-3 minutes.

The symptoms of carbon monoxide poisoning can be confused with those of other illnesses, such as colds and flu.

Someone exposed to the gas may complain of:

Unexplained headaches. Chest pains or muscular weakness, General lethargy or fatigue
Sickness, diarrhea or stomach pains, Sudden dizziness when standing up, convulsions
If carbon monoxide poisoning is suspected, all appliances must be switched off immediately and not used again until the cause has been fully established and rectified.

Where carbon monoxide poisoning is confirmed the installation must not be disturbed (other than making safe) and the incident reported to the HSE under RIDDOR.

Technician's competence

To attain a level of competence, technicians must have successfully completed an approved / registered Combustible Fuels Awareness training course covering all checks and inspections referred to in this guide.

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YOU'RE RESPONSIBILITIES

You must leave flues, chimneys and combustion air ventilators in the same or in better condition than before cavity wall insulation took place.

When you identify that a fault could harm the occupants or yourself, remember that people's health & well-being must be safeguarded. You should take appropriate action and or issue a Warning Notice.

You must ensure that the installation vehicle is equipped with:

- Smoke pellets and holder
- Smoke matches and holder
- Warning notices.

General.

The normal procedure of installing cavity wall insulation should not affect the operation of fuel – burning appliances, flues or chimneys.

The appropriate checks must be carried out at all stages of the works:

- Pre installation
- Installation
- Post installation.

When you leave the installation, make certain that you have not blocked or compromised any chimney, flue or combustion air ventilators with insulation materials.

If for any reason a smoke / spillage test cannot be carried out by the cavity wall insulation installing technician, an approved appliance maintenance contractor must carry out the appropriate checks. (I.e. Gas Safe – registered installer for gas appliances HETAS or Solid Fuel approved engineer installer for all solid fuel appliances – OFTEC registered engineer for Oil appliances)

CARBON MONOXIDE (CO) ALARMS

The Health & Safety Executive in its discussion documents Gas Safety Review: options for changes states: HSE recommends the use of CO alarms meeting all current British Standards as a second line of defence. It is emphasised by the HSE that alarms must not be seen, as a substitute for proper regulatory installation maintenance and safety checks on Gas appliances and flues. This view is endorsed by CIGA.

GLASS FRONTED FIRES

Some manufacturers state that decorative canopies or fronts of fires should be removed from gas fires in order to carry out spillage tests. Where these parts are to be removed by the householder and are not designed for the safe use of the appliance, then this can be carried out by the installation technician.

Where removing the part would affect the safe operation of the appliance then this work must only be carried out by a Gas Safe registered installer.



PRE- INSTALLATION CHECKS

Fuel burning appliances, combustion air ventilators, and the routes of all flues on chimneys on external walls must be located and identified.

Ventilators should be checked to ensure that they are compliant with the regulatory standards and that chimneys are not capped.

Appliances must be run, and the flame observed, especially with glass – fronted gas fires. Confirm exit of combustion gases by carrying out a flue, or spillage test.

Should any of the checks prove unsatisfactory report them to your supervisor and do not proceed with the installation until the problem(s) have been fully resolved.

LOCATE and NOTE

- **Each Appliance Type:**
 - Boiler
 - Space Heater (fire)
 - Other
- **Fuel Type Used**
 - Gas
 - Oil
 - Smokeless Ovoids
 - Briquettes, Wood,
 - Bio Fuel,
 - bituminous coal
- **Combustion air ventilators for each appliance**
 - Location
 - Type
 - Compliant / None Compliant

CARRY OUT A SPILLAGE TEST'S WHERE APPLICABLE

You must be satisfied that the ventilator's supplying combustion air for the fuel – burning appliances meets the current standards and requirements.

INSTALLATION CHECKS.

Installation procedures are fully detailed in the Technicians Guide: *Installing Cavity Wall Insulation*

PARTICULAR CARE IS NEEDED DURING:

DRILLING.

When drilling holes, do not drill directly in line with a chimney or flue.

INJECTION.

When installing cavity wall insulation near a chimney or flue, check that no insulation material is visible within the flue. Care and attention should always be applied.

POST – INSTALLATION CHECKS.

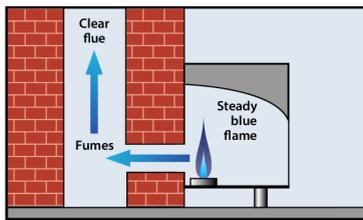
Ensure that:

- a) All combustion air ventilators are clear and functioning correctly
- b) All flues on external walls are clear and not compromised.

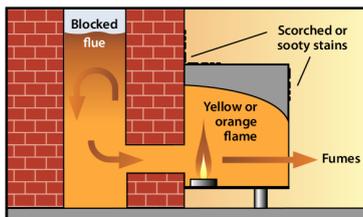
Go inside the property and check for any visible evidence of insulation material in or around fuel-burning appliances.

Ask the customer / occupant to run each appliance then check the appearance of the flame.

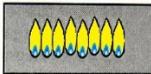
A safe gas appliance



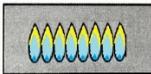
A dangerous gas appliance



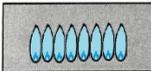
Yellow flames:
Further adjustment required.



Yellow tips on outer cones:
Normal for LP Gas.



Soft blue flames:
Normal for Natural Gas.



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For wood burners and Solid Fuel Fires

you should observe flues and chimneys from outside of the property, to ensure that combustion gases are being exhausted.

Carry out Smoke / Spillage tests for all fuel burning appliances on external walls and compare them with your pre-installation safety checks.

You could be held personally responsible and face prosecution if occupants subsequently become ill or die from carbon monoxide poisoning due to careless work on your part.

ADVICE TO CUSTOMER'S.

If you are unsure about the operation of an appliance or the effectiveness of the flues, chimneys and combustion air vents you must issue a warning notice (see pages 18/19) Explain to the customer that the appliance must not be used / operated until the appliance and or its flueing system has been thoroughly check by a registered and approved maintenance contractor.

Should you believe that a Gas appliance is dangerous it must be turned off and the Gas Emergency Service or Gas Safe registered contacted and immediately notified.

For liquid petroleum gas –

Contact the Supplier.
The information provide here does not cover every eventuality.

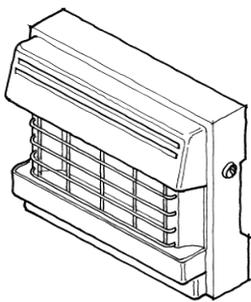
IF YOU HAVE ANY DOUBT SEEK TECHNICAL ADVICE.

IDENTIFYING APPLIANCE, VENTS, & FLUES

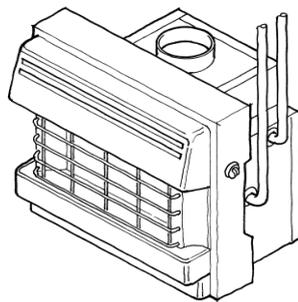
It is important to establish what fuel type is used by each appliance. Different fuels and appliances will have different flues, chimneys and combustion air ventilation requirements.



Solid Fuel Fire



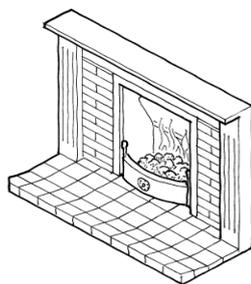
Gas Appliance



Gas Fire Back Boiler



Flueless Gas Appliance



Coal Fire



Gas Appliance

Always see these appliances in use before
Before installing cavity wall insulation to
compare its performance following the
installation

The flame pattern / colour should be noted at
pre and post installation checks

During the checks – look for staining, scorch
marks, in or around the appliance surround /
casings or other signs of distress as these may
indicate existing problems that must be
checked by a registered engineer.

SAFEGUARDING THE COMBUSTION AIR SUPPLY.

It is your responsibility to ensure that there is the required level of combustion air available to the appliances and for open flues:

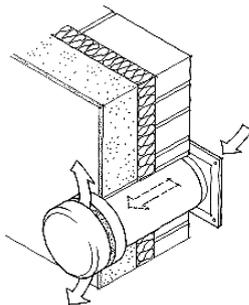
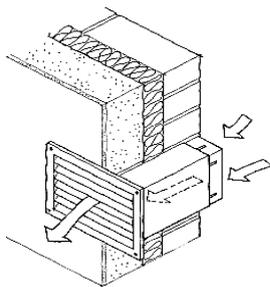
Initially you must locate, identify and note the position of combustion air ventilators for all fuel burning appliances within the property and they are thoroughly checked

The combustion air supply to each appliance or open flue must be isolated from the cavity to guarantee an un-obstructed supply of air to the appliance(s).

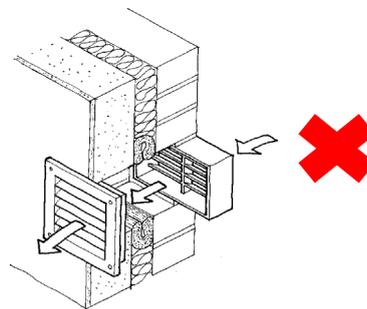
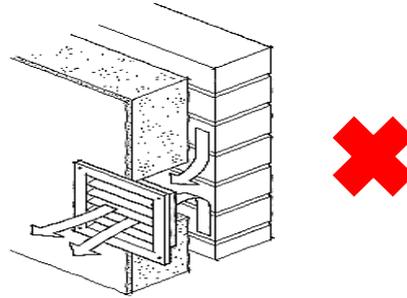
It is essential that each combustion air ventilator is continuously sleeved across the cavity (connected to both internal and external ventilators).

In the event, that the combustion air supply required for the appliance or flue has been compromised, or has not been fitted, carbon monoxide may be produced which could build and cause serious illness to the occupants, in severe cases there may be a fatality.

TYPICAL COMBUSTION AIR VENTILATORS.



Combustion Air Supply Must Not Draw Air from the Cavity Walls.



Combustion Air Ventilators

- Must Not be Closable
- Free from obstruction
- Must not incorporate a mesh or fly screen.

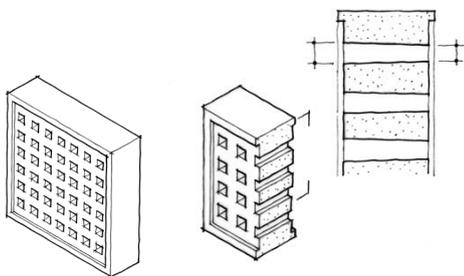
The fitting of or Existing Combustion ventilators must comply with current standards and stamped with -:

Free Area cm² (i:e 100cm²)

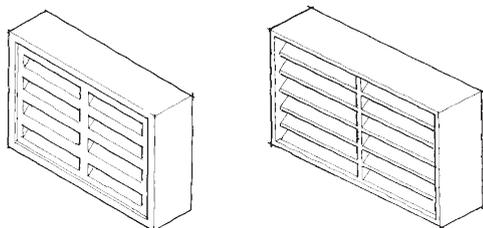
COMMON AIR BRICK TYPES

Due to the tapered design of their vent holes, "Terracotta" air bricks only provide limited free air flow and will not normally provide sufficient combustion air.

They must be replaced with a regulatory combustion air vent. Combustion air ventilators with fly screens must be removed / replaced



Terracotta air ventilators are tapered and as a result reduce air input



Terracotta
Louvered Vent

Plastic Covered
Vent

OTHER VENTILATORS

Other ventilators include those

- providing under floor (to suspended floors)
- Cavity wall & roof ventilators
- Room vents (kitchen / bathroom)
- Extractor fans
- Air vents to larder / food storage.

All operational ventilators must be sleeved and protected and maintained (Kitchen / bathroom vents must be maintained)

Bedroom ventilators must be maintained; however, should the client request that these are sealed over, record ventilator location and its use on the work records.

Be careful not to confuse cavity vents with others – such as under floor vents.

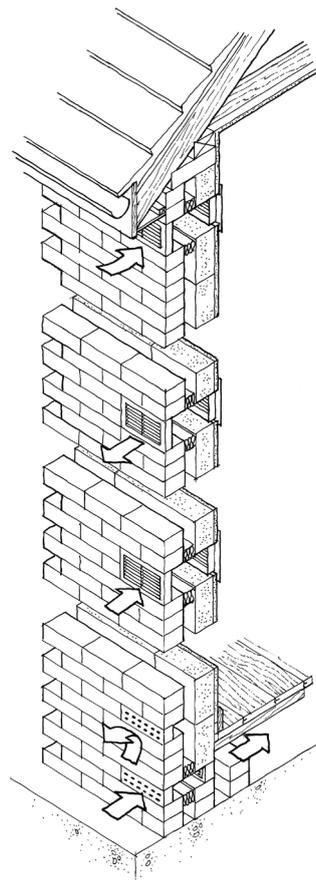
OBSOLETE CAVITY VENTILATOR'S.

These must be sealed with an appropriate material to prevent

- Material loss
- water ingress
- infestation

Maintaining air supply

- Bedroom Ventilator
- Bathroom / Kitchen Ventilator's
- Under floor Ventilators
- Radon Gas Ventilators
Concreted
Beamed
Floors



Ventilation to suspended timber floor joists

External ventilators providing essential air circulation to suspended timber joists and floorboards must be identified and safeguarded as necessary, as System Designer and BBA specification.

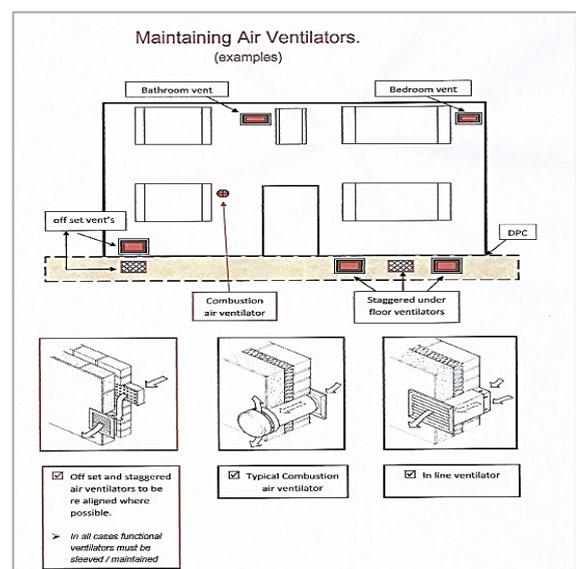
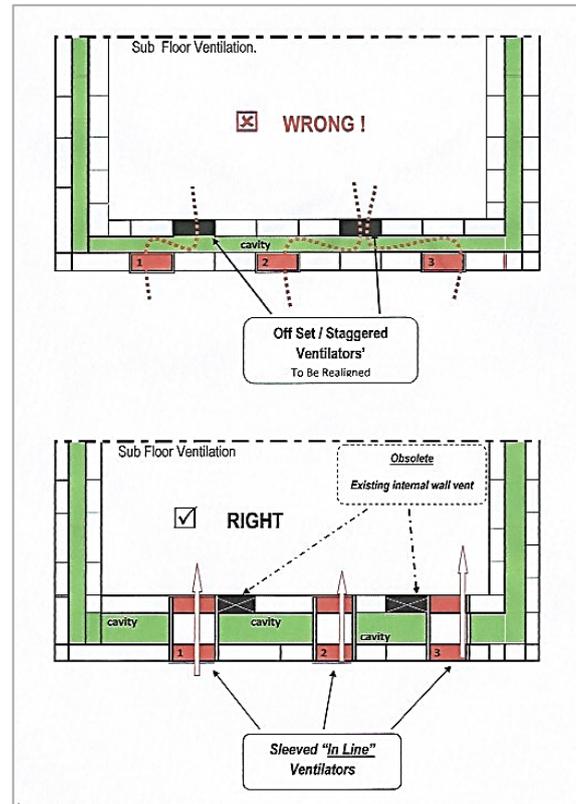
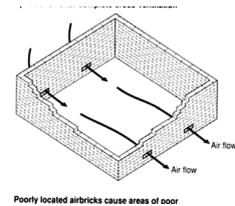
Any reduction in air circulation to the floor void following the installation of cavity wall insulation due to unsafeguarded vents, would rapidly raise humidity under the timber floor and also within the property, increasing condensation and ultimately providing an environment entirely conducive for timber destroying mould spores to develop.

Where vents are found to be compromised at assessment stage due to debris, insects etc. a thorough inspection of timber floors should be undertaken to ensure there is no sign of deterioration and if there is any doubt seek further guidance.

Off-set external ventilation points for suspended timber joists and floorboards may not necessarily be directly above inner leaf openings, and the assessment must therefore confirm that under floor ventilation is not compromised following the installation. This may require the removal of an external vent to visually confirm the inner leaf opening, alternatively access below the timber floor for confirmation will be necessary.

Where timber decking or raised garden feature areas reduce the air circulation pathway to the external vents a thorough inspection must be undertaken to ensure all vents are safeguarded.

If this cannot be confirmed due to inaccessible areas the property may not be suitable for the installation of cavity wall insulation.



Sub Floor Ventilation – Conservatories and Extensions

Conservatories and extensions have become extremely popular in recent years and the constructions will generally include a concrete and screed base.

Original pre-existing under floor ventilation points will therefore be compromised, reducing air circulation and cross flow ventilation within the sub floor void. Extensions built to extend across the entire rear elevation of a property also compromises this essential cross flow ventilation, raising humidity below the timber floor and increasing the potential risk of timber destroying mould growth to develop.

CIGA has seen a marked increase in recent years of timber floor-board, and joist deterioration caused by reduced cross flow ventilation, with total collapse in some instances within two or three years of the installation of cavity wall insulation.

Positive and negative air pressure is essential, and it is likely that conservatories and extensions will reduce this essential air circulation below the floor void, and this may in time cause similar timber deterioration.

However, following the installation of cavity wall insulation any subsequent deterioration will inevitably be concluded, that if not totally caused by the installation of cavity wall insulation, it would certainly be considered to be a contributory factor.

It is therefore essential that the assessment for suitability for injected cavity wall insulation considers the path for cross flow ventilation, thus avoiding unnecessary risk of timber deterioration. This may require the installation of additional sized air vents on two sides of a property if ventilation points on the rear elevation cannot be replaced or introduced.

Burnall Fires.



Background

These types of appliance are predominantly found in Northern Ireland but may have been installed within other parts of the of the UK

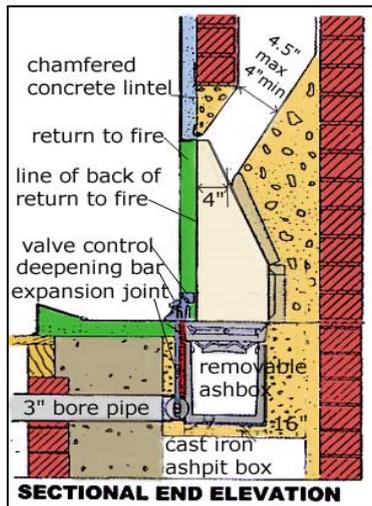
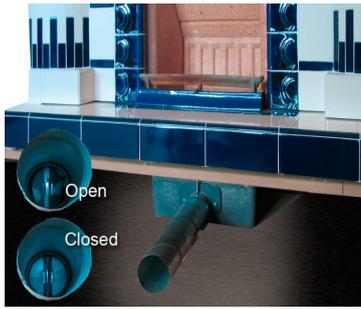
When assessing buildings for suitability and the type of heating is used, a robust inspection must be carried out to confirm this this type of appliance is applicable and noted within the work records accompanied by photographic evidence.

This type of appliance requires combustion air taken from either the ventilated sub floors of buildings or via a piped ventilation to the outside through the solid floors. substrate.

On this appliance type there is no requirement to fit additional combustion air ventilation through the external walls as this would impede the operation of the appliance. This appliance is also available with a back-boiler system.

Instead of drawing air from the room, the Burnall Fire relies on air supplied from under the floor to burn its fuel. Air is to be supplied via underfloor pipework fitted to the appliance. The method of receiving the air flow depends upon the floor type being Suspended or Solid Floors.

Burnall Fires -: Cont'd



How does the appliance work?

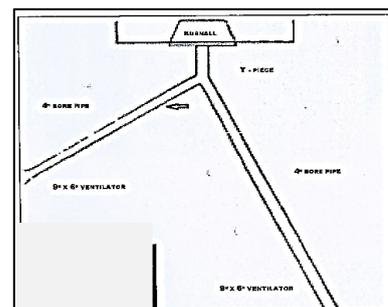
✚ *Obtaining a Draught for the fire.*

- When the floor is suspended There must be a good flow of air under the floor to prevent dry or wet rot. If there is a good flow of air, the manufacturers of the appliance recommend that a 2 foot (60cm) length of air pipe is fitted to project through the brick fender under the hearth, making sure there is no obstruction at the end of the pipe.
- Inspect all the sub floor ventilators around the house, to confirm that they all are open and that a clear unobstructed air flow is present.
- Also check holes in all dividing walls and walls that support the joists under the floor.

- if there is not a good circulation of air, it is important to fit additional sleeved ventilators directly to under floor air space.

WHEN THE FLOOR IS SOLID:

- These types of appliance are predominantly found in Northern Ireland but may have been installed within other parts of the of the UK
- When assessing buildings for suitability and the type of heating is used, a robust inspection must be carried out to confirm this this type of appliance is applicable and noted within the work records accompanied by photographic evidence.
- This type of appliance requires combustion air taken from either the ventilated sub floors of buildings or via a piped ventilation to the outside through the solid floors. substrate.
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COMBUSTION AIR VENTILATION REQUIREMENTS

Where a combustion air ventilator is required. The ventilator must be fitted before you proceed with cavity wall insulation.

The nominal size and the free air area of combustion air ventilators vary from manufacturer to manufacturer. Dimensions referred to in this guide are the nominal sizes used by the trade, but the key consideration is the free air cm² area that the vent provides.

A number of different terms are used by air vent manufacturers to describe the free air area, including: 'air flow rating,' 'free air opening,' 'available air opening,' and 'vent free area.'

✚ Gas appliances must be provided with a least 500mm² of free air per kW - above a 7kW net input rating.

✚ Oil and solid fuel appliances require 550mm² of free air per kW - above a 5kW rating.

A table showing the vent free areas required for any open flued gas appliance, up to a 70kW Nett rating is shown on page 21

OPEN FLUED – SOLID FUEL FIRES.

- A permanent air ventilator must be fitted in any room or space containing a working solid fuel open fire. The only time that a combustion air ventilator is not required is when the fire has been deemed out of service or redundant i:e
- The fire basket has been permanently removed. It is common practice for some customers to wish to maintain the fire as a decorative item with floral decorations within them as a feature. It must be stressed that unless the fire basket etc has been permanently removed then the fire requires a combustion air ventilator fitted.

- You must Advise the customer that they must not re- instate the fire unless a registered and approved solid fuel engineer has been contacted and commissioned / appointed to test the integrity of the flue and re-instate the fire appliance
- The Fireplace / flue opening is permanently blocked / bricked up – however caution must be taken to ensure that the closed flue has a ventilator fitted to the facing of the flue to reduce or prevent condensation within the flue. (see CIGA Technical Note : Redundant Flues)

Always take digital evidence as evidence and record details on the work card

- In the event, that the customer refuses to have the required ventilator fitted, the installation must not go ahead. It is not acceptable for the customer to provide the technician or installer company with a letter saying that they would take full responsibility for not having the air vent fitted.

SOLID FUEL STOVES, CLOSED APPLIANCES (Boilers / Cookers)

- Approved document J requires ventilation for any appliance with a rated output above 5kW or every kW where the fire is fitted within a property that has been constructed since 2008

- ✚ Information regarding the input rating of a Gas Appliance can be found on the appliance data badge.
- ✚ Ventilation provided for Gas Appliances should not be oversized as this can have a detrimental effect on the energy – efficiency of the appliance. In turn this may encourage customers to block off the air ventilator.

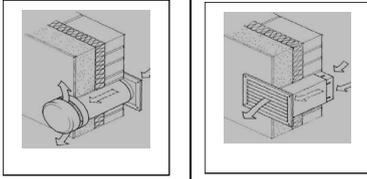
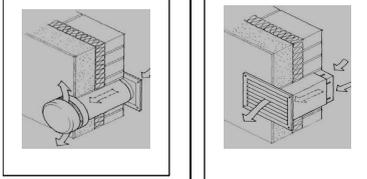
Note: For all Gas Appliances ventilation requirements are calculated from the Net Values

Where the manufacturer specifies Gross values divide the Gross Value by 1.11

Where concern remains seek qualified advice.

Where the kW rating of the Gas Appliance cannot be determined, the Assessor and technician must advise the customer that a combustion air ventilator must be fitted.

Combustion Air Ventilation Requirements for Solid Mineral Fuel & Wood Burning Appliances.

Does the room contain a Solid Mineral Fuel or Wood Burning Appliance?	
Does the room contain a Closed appliance? Approved document J requires: <ul style="list-style-type: none"> Ventilation for any appliance with or without a draught stabilizer fitted? Ventilation required for any appliance for every kW into a property built from 2008 	

Extract from -: Approved Document J Combustion Air Ventilation

Open Fire	The size of an air vent is subject to the throat area or cross - sectional area of the flue-: [50%]
Closed Appliance	<ul style="list-style-type: none"> Free air of 550mm² x kW rating applies to appliances above 5kW Free air of 555mm² x kW for homes built from 2008.

Table: ADJ Air Supply to Solid Fuel Appliances

Type of Appliance	Type and Amount of Ventilation
Open appliance	Permanently open vent with a total equivalent area of at least 50% of the cross-sectional area of the flue
Open appliance, such as an open fire with a throat.	Permanently open vent with a total equivalent area of at least 50% of the throat opening area.
Open Appliance, such as a stove, cooker or boiler with a draught stabiliser	Properties built before 2008: <ul style="list-style-type: none"> 300mm²/kW for the first 5kW of the appliance rated output 850mm²/kW for the balance of the rated output.

Equivalent area is measured -:
divide the area given in mm by 100 to find the corresponding area in cm²

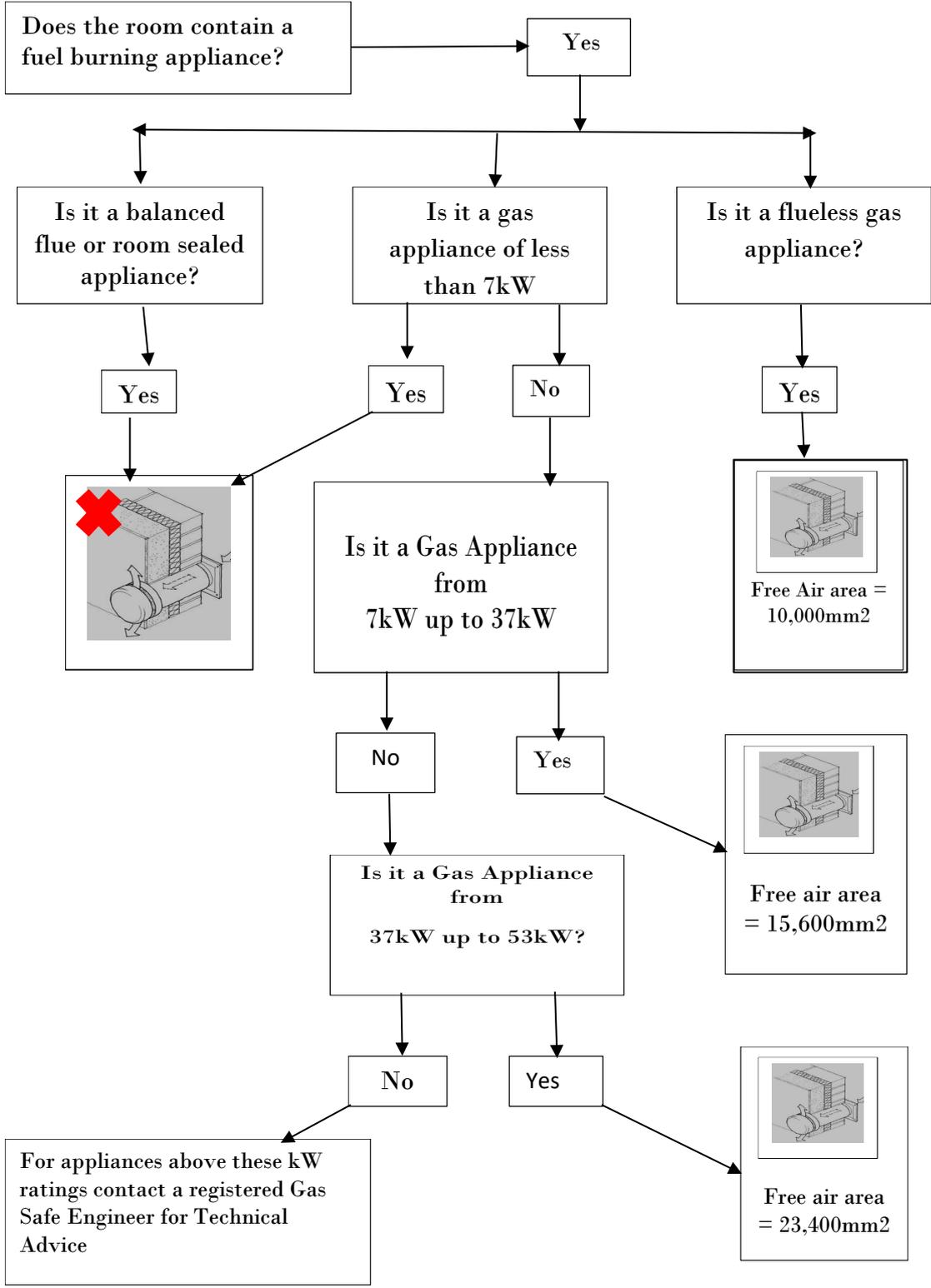
Nominal fire size (fireplace opening size)	350mm	400mm	450mm	500mm
Total equivalent area of permanently open vent's	14,500mm ²	16,500mm ²	18,500mm ²	20,500mm ²

Example: an appliance with a flue draught stabiliser and a rated output of 7kW would require an equivalent area of [5 x 300] + [2 x 850] = 3200mm²

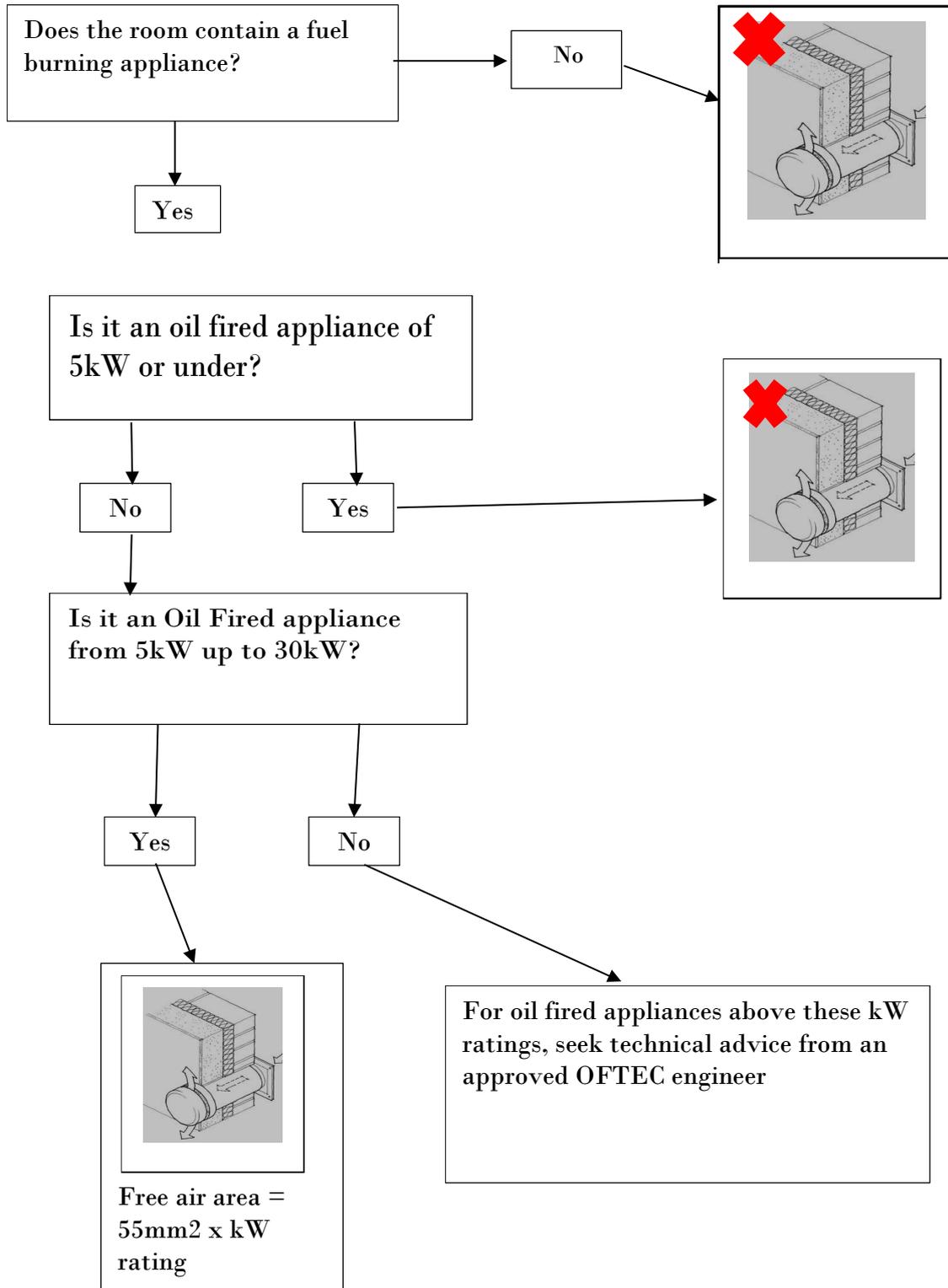
It is unlikely that a dwelling constructed prior to 2008 will have an air permeability of less than 5.0m² unless the dwelling has received extensive measures to improve the air permeability.

Combustion Air Ventilation Requirements for Gas Appliances

Does the room contain a DFE fire in an open flue?	Yes	Where a design plate or Appliance Manual is Not available: seek Technical Advice
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Combustion Air Ventilation for Oil Fired Appliances



VENTILATION REQUIREMENTS FOR OPEN FLUED- GAS APPLIANCES.

7kW and under heat input (net) does not require additional ventilation.

The combustion air requirements for an open flued gas appliance can be determined using the following:

A gas range rated appliance with a heat input from 20kW to 25 kW (net) the maximum heat input must be used to determine the ventilation required.

$$25\text{kW} - 7\text{kW} = 18 \text{ kW}$$

$$18 \times 500\text{mm}^2 = 9,000\text{mm}^2 \text{ of ventilation required.}$$

Note: There are different ventilation requirements for a single gas appliance or groups of appliances with a total input rating over 70kW (net). Advice regarding these appliances should be sought from a registered gas safe or solid fuel engineer

Gas Appliances in compartments

Open flued gas appliances located in compartments which are ventilated directly to outside require ventilators fitted at high and low level.

The ventilators should be sized as follows:

High Level Ventilator - 500mm²/ kW heat input

Low level ventilator – 1000mm²/ total kW heat

Input Example: 20kW boiler + High Level 500 x 20 = 10,000mm²

Low Level 1000x20 = 20,000mm²

Heat input greater than 7kW (net) requires an additional 500 mm² of ventilation per kW e.g. an appliance with 15kW input requires:

$$15\text{kW} - 7\text{kW} = 8\text{kW}$$

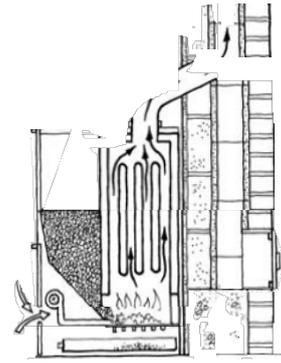
$$8 \times 500\text{mm}^2 = 4,000\text{mm}^2 \text{ of ventilation required.}$$

Heat input kW net	Room vent free area (mm ²)	Heat input kW net	Room vent free area (mm ²)
1	0	3	14,500
2	0	3	15,000
3	0	3	15,500
4	0	3	16,000
5	0	4	16,500
6	0	4	17,000
7	0	4	17,500
8	500	4	18,000
9	1,000	4	18,500
1	1,500	4	19,000
11	2,000	4	19,500
1	2,500	4	20,000
1	3,000	4	20,500
1	3,500	4	21,000
1	4,000	5	21,500
1	4,500	5	22,000
1	5,000	5	22,500
1	5,500	5	23,000
1	6,000	5	23,500
2	6,500	5	24,000
2	7,000	5	24,500
2	7,500	5	25,000
2	8,000	5	25,500
2	8,500	5	26,000
2	9,000	6	26,500
2	9,500	6	27,000
2	10,000	6	27,500
2	10,500	6	28,000
2	11,000	6	28,500
3	11,500	6	29,000
3	12,000	6	29,500
3	12,500	6	30,000
3	13,000	6	30,500
3	13,500	6	31,000
3	14,000	7	31,500

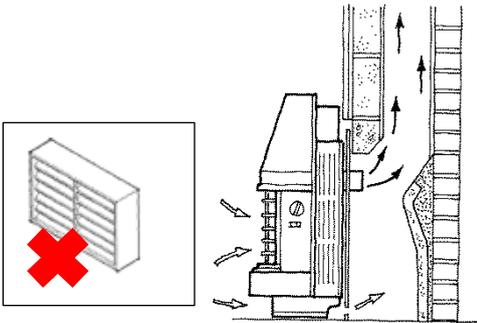
FLUES

To work properly and safely, fuel burning appliances need a continuous supply of air.

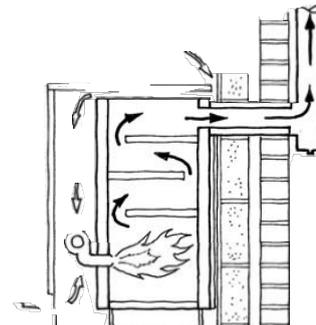
(See Technical Data Plate or Appliance Specification for Combustion air ventilation requirements)



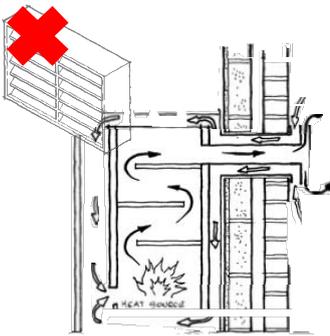
Solid fuel boiler (lined flue) combustion air vent required



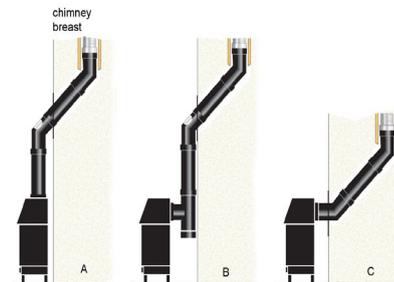
Gas Fire of 7kW and under – combustion air ventilation not normally required.



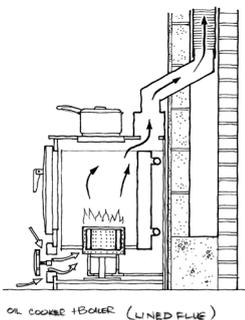
Free standing boiler combustion air vent required



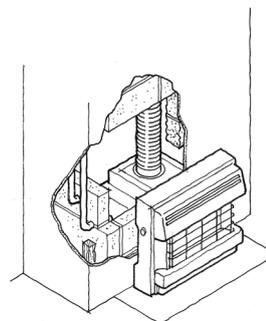
Room Sealed Balanced Flue or Oil Fired – No Combustion Air Ventilator Required.



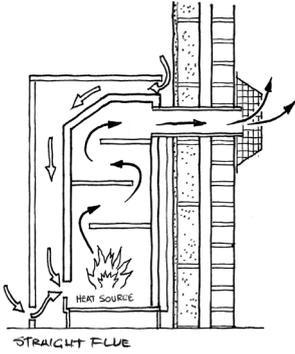
Example of a free standing stove flue arrangement



Oil Cooker & Boiler (lined flue) combustion air ventilation required.



Gas fired back boiler combustion air vent required



Free standing oil – fired boiler combustion air ventilation required.



Inset Flueless gas fire (SEEK TECHNICAL ADVICE)

FLUELESS GAS FIRES

Where these appliances are only for room heating, and with the exception of the fuel effect type, they have generally been exempt from the requirement to have a permanent vent to provide combustion air

‘In all cases you must seek technical advice to confirm ventilation requirements on these appliance types.

In place of a flue, these fires use burner technology or have a catalytic element that ensures that only minimal non harmful levels of carbon are produced. In addition, they have built-in oxygen depletion sensor that will shut down the fire if oxygen levels become depleted

Considerations

Several important facts must be borne in mind by all CWI personnel involved in the installation process, and [particularly by the CWI technicians

All flueless fires require a minimum permanent combustion air vent of 10,000mm². Further additional ventilation will be required for appliances with a rated input above 2.7kw net within a room, or 5.4kw net within another internal space (i.e. hallway). The vent must lead directly outside and must not be compromised by the CWI see manufacturers data for specific ventilation requirements

Flueless fires can be positioned on internal walls, and an external survey of the building cannot provide safe information on the fuel burning appliances that may be inside. This emphasizes the importance of a careful internal survey to note the appliance type and location. Where flueless appliances are located on external walls, then safety checks must be carried on each appliance before and following the planned installation.

Where flueless appliances are located on external walls, then safety checks must be carried on each appliance before and following the installation of cavity wall insulation.

When installed in an occupied room the minimum room volume is 1 m³ for every 0.045 kW net or when in other internal spaces such as hallways 0.09 kW net. For example, a 1.8 kW appliance installed in a lounge area must have a MINIMUM room volume of 40 m³ where the room volume is smaller it must not be installed. It should be noted that most main rooms in terraced houses, and many in semi-detached properties, do not meet this minimum volume.

GENERAL:

Flueless fire or stove (Secondary Heating Only)

- Highly efficient energy using appliance.
- No flue or chimney or outside wall required.
- Supplementary ventilation is required. (e.g. a small air vent, as per manufacturer's specification - instructions) through outside wall directly into the room
- Supplementary to primary heating.
- Room size restrictions apply.

CHIMNEYS.

If flues become blocked, then gasses cannot escape to the outside.

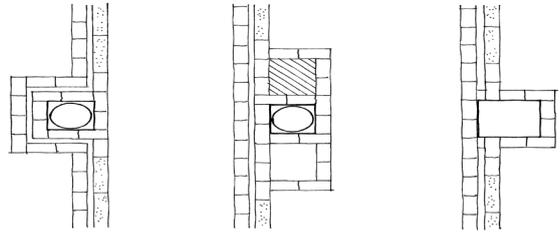
Therefore, it is extremely important to locate and identify flues and chimneys.

Where the brick chimney is built externally, it is therefore easily identified, drill holes may be positioned close to the side of the chimney, but not in the projecting part of the chimney. (See System Designer CWI System Specifications for maximum / minimum distance from edge of the flue to the injection points)

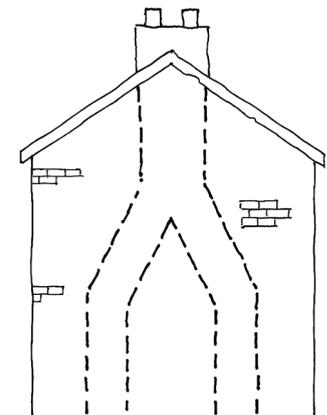
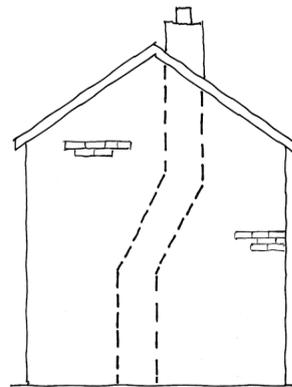
It is worth noting that brick- built chimneys serving open fires and boilers in houses built before 1964 are unlikely to contain a clay flue liner.

Flues and chimneys built into a cavity wall may be isolated from the cavity and therefore must be protected from possible Ingress of debris / material into the flue.

EXAMPLES OF CHIMNEY CONSTRUCTIONS



EXAMPLES OF CHIMNEY ROUTES

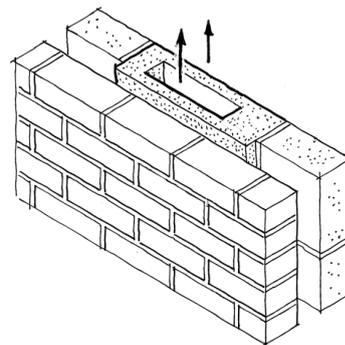
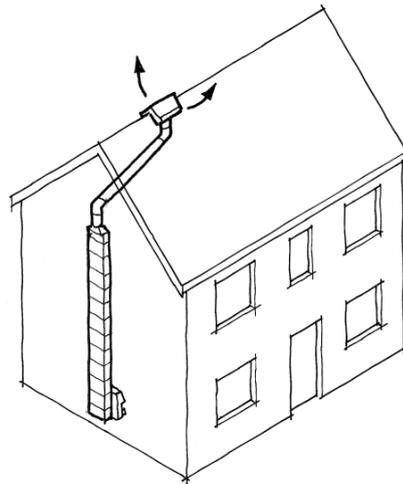


During the pre-installation check, the line of the flue must be identified by noting the position of the appliance and its terminal as shown below, the route often includes offsets that are not obvious, either internally or externally.

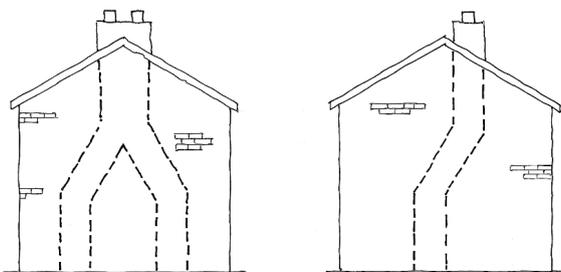
You must know which type you are dealing with to ensure:

- that no drilling takes place on the line of the flue.
- Drilling a hole into a flue could dislodge a piece of masonry or flue liner that may impede the flue gases
- In some properties, flues may be formed from hollow blocks or interlocking liner pots built into the cavity.
- Pre-cast flues serving gas appliances are particularly difficult to trace since both the internal and external walls show a flush face. the pre-cast blocks can be in contact with or very close to the external leaf, it is very easy to drill into the flue, even if a depth stop is fitted to the drill.
- Pre-cast flues can also incorporate offsets that traverse the wall. The pre-installation inspection of the loft space will help to show the line of the flue above first floor ceiling level.

Pre Cast (True Flue)



Internal – External Chimney Routes,



CHECKING FLUES AND APPLIANCES

Testing appliances

With the exception of decorative fuel effect gas fires, flames in gas appliances must be clear and well defined, not yellow or orange in appearance. The appearance of the flame will vary depending on the fuel used.

You should check the operation of all appliances before CWI installation.

With other types of fuel types, the appearance of the flame may vary depending on the fuel used.

Appliances must be operated at maximum output for at least 5 minutes with all doors and windows shut to ensure stable operation under worst case conditions. A smoke/spillage test must be carried out in accordance with the appliance manufacturer's instructions.

General

Every flue system on an external wall must be checked before and after installation. It is essential that these flues remain clear and that the combustion products are completely discharged to the outside air. Appropriate methods of inspection and testing for various types of flue system are described below.

Because of the variety of fuel-burning appliance designs, it is sometimes difficult to establish whether the flue performance is satisfactory. If it is not possible to confirm this performance, the fuel appliance, maintenance contractor must carry out the appropriate tests.

PRE-INSTALLATION CHECKS

Each appliance should be ignited and operated prior to CWI installation to observe that the flue is functioning correctly. This allows you to compare the performance of the appliance during, and on completion of the works.

Flame appearance is of particular importance with glass-fronted gas fires. With radiant and convector-type gas fires, check that there are no scorch or soot marks on the outer casing just above the flame enclosure, which would indicate flue problems.

Where a flue is found faulty, CWI installation should be delayed until the appropriate remedial action has been taken.

POST - INSTALLATION CHECKS.

Solid Fuel Appliances

Where practicable, check with the aid of a mirror to see that no insulation material has entered the flue. If a satisfactory visual inspection cannot be made, a check on the efficiency of the flue system must be carried out using a smoke pellet to test each appliance.

All of the smoke should be drawn into the flue. Where there is a shared flue system, no smoke should escape from any other opening within the building.

In certain conditions, there may be a spillage of smoke due to the flue being colder than the outside air. In such cases heat the flue and repeat the test 10 minutes later.

 Where doubt remains, a fully qualified engineer should be contacted to confirm the integrity of the flue.

Smoke can be generated from a smoke pellet, but this does not generate heat. If possible and with great care, generate heat within the appliance (e.g. heat from a blow lamp) which can be passed into the flue openings for one minute just prior to repeating the smoke test.



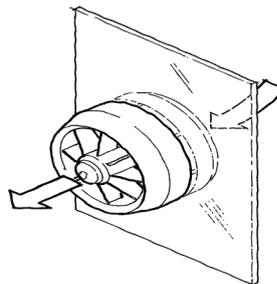
GLASS FRONTED FIRES/BOILERS AND FLOOR MOUNTED FREE – STANDING BOILERS.

Where an appliance is operational / working, a spillage test should be carried out in accordance with the manufacturer's instructions and visually assess that the appliance / flue is no different in its appearance and operation to the checks carried out during the pre-installation process

Gas- Fired Appliances

Under the Gas Safety (Installation and Use) Regulations, only registered and approved Gas Safe registered engineers are permitted to carry out work, such as removing any integral part of a boiler or gas fire. "Work" is defined as:

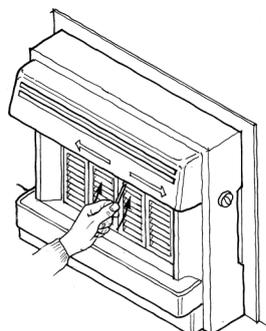
- a) Installing or reconnecting the fitting.
- b) Maintaining, servicing, permanently adjusting, disconnecting, repairing altering or renewing the fitting, or purging it of air or gas.
- c) Where the fitting is not readily moveable, changing its position and
- d) Removing the fitting (but the expression does not include the connection or disconnection of a bayonet fitting or self-sealing connection.
- e) The following procedures must be adhered to



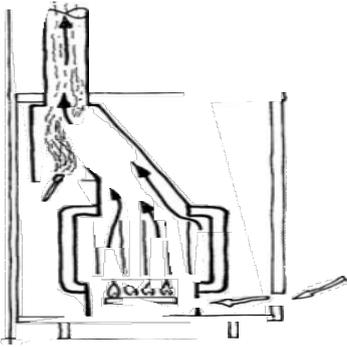
Carry out standard visual checks.

When carrying out a flue spillage test,

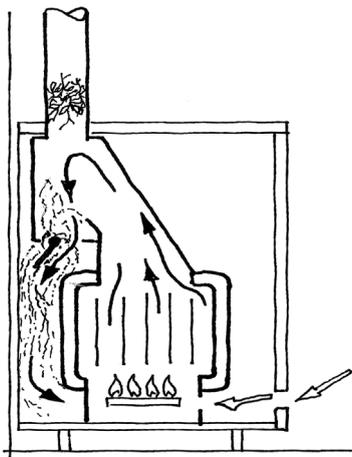
- All doors and windows in the room should be closed. However, if there is an extractor fan in any room within the premises, includes extractor fans, fans in open flue appliances, fans in cooker hoods, the circulating fans of warm air heating systems and circulatory ceiling fans.
- The test must take place with the fan in operation and the inter-connecting doors open.
- Run the appliance for 5 minutes. Carry out a spillage test at the base of the canopy, draught diverter - or to the manufacturer's instructions. No spillage should occur.



A suitable, smoke match holder **must** be used during the spillage test process



✓ PASS



✗ FAIL

ROOM - SEALED APPLIANCE (balanced flues)

- Wherever possible, look inside flues and air inlets from an external position to check for obstructions.
- Assess the appearance of the combustion chamber flame, compared with how it looked in your pre-installation check.
- A well-defined flame generally means that the flue and airway are unobstructed

OIL – FIRED APPLIANCES

- Wherever possible, look inside flues and air inlets from an external position to check for obstructions. Assess the appearance of the combustion chamber flame, compared with how it looked in your pre-installation check. A well-defined flame generally means that the flue and airway are unobstructed

- Using a suitable sized tube or tooling, hold a smoke match with its tip approximately 3 mm inside the lower edge of the canopy of the fire. Smoke escaping outwards from the draught diverter or canopy indicates spillage.

If spillage does occur,

- Continue to run the appliance for 10 minutes and repeat the test.
- If spillage still occurs, switch the appliance off. Issue warning notices and call in the relevant fuel supplier or in the case of a gas appliance the gas emergency service.

Installing Firm's Name, Address and Contact Details
(or Letterhead)



In our opinion, this appliance should not be used until such time that a fully qualified / registered person or company has checked the appliance, open fire, flue, boiler, and that the appropriate certification has been provided following investigation and resulting remedial / corrective works to ensure that it is safe to use.

Please refer to the 'Warning Notice' issued to you

Contact points:

Gas:

Oil

Solid Fuel

Installing Firm's Name, Address and Contact Details
(Or Letterhead)



In accordance with current Gas Safety (Installation and Use) Regulations
IMPORTANT – This notice concerns your safety

Issued by; (print)

Company:

Technician's signature:

Date and time of issue:

Occupiers name:

Address:

Post code:

Telephone number

The make of the appliance:

Model

Appliance type

Location of the appliance:

It is unsafe to use, because:

In the interest of safety and to comply with current Gas Safety (installation and use) Regulations, the following action has been taken:

- The appliance has been turned off and labelled
- The occupier has been informed, and the appliance left connected:
- The appliance has been turned off and the emergency service notified: ref no:

The occupier to sign:

I have received a copy of this Warning Notice and confirm that I understand that the use of the installation could present a hazard and could place me in breach of the current Gas Safety (installation and use) Regulations,

Signed:

Print Name

Date

GENERAL:

RISK ASSESSMENT RELATING TO FLUES, CHIMNEYS AND COMBUSTION AIR VENTILATORS:

Activity The installation of Cavity Wall Insulation (CWI) within the external walls of existing buildings.

Potential Hazard

- The ingress of insulation material into existing combustion air ventilators, flues or chimneys during the CWI installation, can result in the impairment of Combustion air flow and / or the escape of combustion air gases produced by an existing fuel – burning appliance into the dwelling.

RISK:

- The risk arising from the hazard is that carbon monoxide produced by fuel – burning appliances will be unable escape to outside atmosphere.
- ✚ Carbon monoxide is an extremely toxic gas and its presence is difficult to detect. Anyone exposed to carbon monoxide is likely to suffer fatal or very serious illness.

THOSE AT RISK:

- ✚ The occupants within a building.

ELIMINATION OF HAZARD (Control of Risk)

Cavity wall insulation installers must carry out their duties in accordance with:

- Current regulations governing the identified fuel types.
- Technicians guide to best practice: 'Flues, chimneys and combustion air ventilators' published by the Cavity Insulation Guarantee Agency (CIGA)

This guide sets out the appropriate checks, procedures and actions that must be carried out during survey, pre – installation and post installation of cavity wall insulation to buildings containing fuel – burning appliances.

THE RISK ASSESSMENT MUST INCLUDE:

ASSESS / SURVEY, IDENTIFY and RECORD

- Primary Air Type.
- Appliance Type.
- Chimney / Flue Location.
- Combustion Air Supply.
- Secondary Fuel Type.
- Appliance Type.
- Combustion Air Supply Location.

TECNICIANS SAFTY CHECKS

PRE-INSTALLATION CHECKS

- Identify appliance, flue/chimney routes, internal & externally.
- Carry out a spillage test to unlit open flues

GAS.

- Run appliance
- View and note flame colour.
- Check for staining to fires appliances and surrounding decoration.
- Check combustion gases externally
- Appliance check (Smoke test / Spillage test)
- Identify combustion air supply
 - Fitted
 - Correct size
 - Location

INSTALLATION - VISUALLY CHECK.

- Chimney/flue routes to avoid drilling into them
- Chimney/flue routes for ingress of material
- Combustion air ventilator is unobstructed.

POST INSTALLATION CHECKS

- Visually check appliances for insulation ingress into the appliance and or chimney flues
- Carry out a spillage test.

GAS.

- Run appliances at maximum for at least 5 minutes
- Visually check that flame compares with pre-installation checks

- Appliance check (Smoke test/Spillage test)
- If results are unclear, retest after a further 10 minutes.

IF THERE IS ANY DOUBT:

1. Switch off the appliance's (Gas) or Ensure where practical that the solid fuel appliance must not be used
2. Issue Warning Notice
3. Advise occupants and / or owner.
4. Call in the relevant fuel supplier or registered maintenance contractor / engineer

TRAINING.

All CWI installers must receive appropriate combustible fuels awareness training to enable them to discharge their responsibilities relating to the prevention of insulation ingress into appliances, flues, chimneys and combustion air ventilators, and to undertake the simple safety checks referred to within the CIGA guide.

NOTE:

All installing companies must ensure that their technicians have successfully attended a (STGW -: Standard Training in Gas Work, HETAS / OFTEC Awareness course) to enable them to discharge their responsibilities. This course should include solid fuel flues and chimney awareness

The STGW course must be re-taken by each approved technician every 5 years *being the maximum term of Certificate.*

Technician’s safety check sheet – flues, chimneys and combustion air ventilators.

This sheet specifies the minimum checks, and actions that must be carried out during the installation of CWI to buildings containing fuel – burning appliances.

It must be read in association with “ Technician’s guide to best practice – Flues, chimneys and combustion air ventilators”

Survey – identify and record

- Fuel type(s)
- Appliance type(s)
- Flue, chimney location(s)
- Location of combustion air Ventilator(s)

Pre – Installation

- Appliance identified, flue / chimney routes internally, externally.
- Appliance run
- View and note - appearance and flame colour.
- Combustion gases checked externally.
- Appliance checked for staining and general visual condition (smoke / spillage test)
- Smoke / spillage tests satisfactory.
- Combustion air supply compliant.
- Signs of spillage / distress to open flues, chimneys.

Installation – Visually check

- Flue / chimney routes to avoid drilling into them.
- Flue / chimney routes to avoid ingress of material
- Combustion air ventilator(s) unobstructed.

Post - Installation

- Visible signs of spillage of the cavity wall insulation within the fire, appliance, flue.
- Appliance run at maximum for a minimum of five minutes
- Visual check that the flame compares with pre – installation inspections.
- Smoke / spillage test satisfactory.
- If results were unclear, re- test after a further ten minutes.
- Re – test satisfactory.

If there is any doubt or questions answered “N” then :-

1. SWITCH OFF THE APPLIANCE – OR ENSURE THAT THE SOLID FUEL APLIANCE CANNOT BE USED
2. ISSUE A WARNING NOTICE.
3. ADVISE OCCUPANTS AND OWNER.
4. CALL OUT a competent body or person such as a registered qualified supplier or maintenance contractor (e.g. Gas Safe, Hetas, Solid Fuel, Oftec)

Installation address:	Name of Technician:
	Signature:
	Date: / / 202

Important -: It is the installer company’s responsibility, to ensure that the Technician is competent to discharge these responsibilities.

❖ Failure to carry out visual inspections or safety checks could lead to the death of an occupant and prosecution.