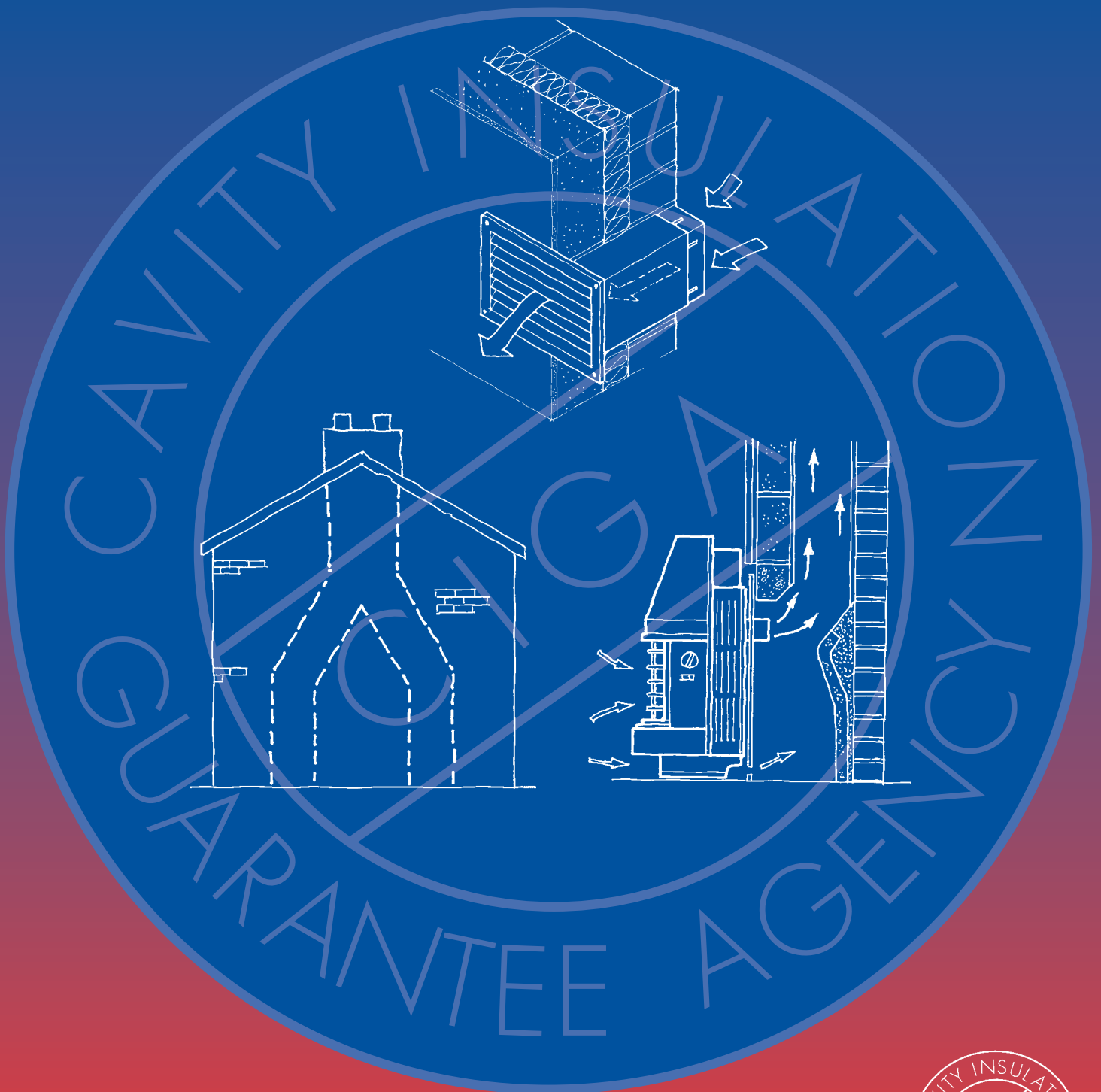


Flues, chimneys and combustion air ventilators



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. Version 3 (Issued in March 2006) supersedes all previous editions, and takes precedence over any other technician's guides in the series.

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:

BS 5440 Part 2: 2000 "*Specification for installation and maintenance of ventilation for gas appliances.*"

BS 5440 Part 1: 2000 "*Specification for the installation of flues.*"

OFTEC Publication: "*Oil firing industry technical advice on flues for modern open flued oil fired boilers T1/129.*"

OFTEC Publication: "*Air supply requirements T1/132.*"

Oil Firing Technical Association for the Petroleum Industry (OFTEC),
Century House, 100 High Street, Banstead, Surrey SM7 2NN.

© . . . All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means electronic, mechanical recording or otherwise without the prior written permission of the copyright holder.



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 programmes.

CIGA is an approved energy efficiency partner of the Energy Saving Trust. Cavity Wall Insulation is universally recognised, not only as a major contributor to energy saving, but also as an effective way of reducing carbon dioxide emissions

The *Technician’s guide* could not have been produced without the technical expertise and support of other energy efficiency partners and official bodies, listed below. We gratefully acknowledge their assistance in the preparation of this manual.”

Peter Dicks: technical director, Cavity Insulation Guarantee Agency (CIGA)

The British Board of Agrément (BBA) is linked to Government. The governing board includes representation on behalf of the Office of the Deputy Prime Minister. The BBA assesses and tests construction products, issuing Agrément Certificates to those that meet its high standards. An Agrément Certificate gives an independent and authoritative opinion of the fitness for purpose of a product or system. The BBA also assesses installers of cavity wall insulation. Approved installers are subject to regular surveillance by BBA inspectors.

The Energy Saving Trust (EST) was established as part of the Government’s response to the 1992 Earth Summit in Rio de Janeiro. This had addressed worldwide concerns on environmental issues such as climate change and global warming. Today, the Trust is the UK’s leading organisation working with a range of partners to deliver energy efficiency to domestic consumers. The EST is a non-profit distributing company set up by the Government and major energy companies. The Trust’s vision is “Working through partnerships towards the sustainable and efficient use of energy”.

Energy Saving Recommended is an Energy Saving Trust initiative backed by the Government. This endorsement scheme is a national branding and marketing programme that aims to transform consumers’ attitudes to energy saving and, ultimately, to reduce carbon dioxide emissions in the UK..

The *Energy Efficiency Best Practice Programme* is the UK Government’s principal energy efficiency information, advice and research programme for organisations in the public and private sectors. Since it was established in 1989, it has helped many organisations to save up to 20% of their energy bills, and stimulated UK energy savings of around £650m a year. The primary aim is to promote building standards above building regulations in a bid to reduce energy consumption in buildings. It also maintains the biggest library of independent information on energy efficiency in the UK. The programme is managed in the building sectors by the Energy Saving Trust.

INTRODUCTION

This guide has been written for the technician, to ensure that the performance of 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 are able to complete all of the necessary 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 the combustion air ventilators or flues of fuel-burning appliances, there is a risk of someone becoming ill or dying of carbon monoxide poisoning.

All fuel-burning appliances need an adequate air supply, and a clear flue to operate correctly. With an appliance in good working order, the main product of combustion is carbon dioxide. Carbon monoxide is produced when the flue is blocked or the air supply is impaired. When combustion products are not able to escape, this 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. The symptoms of carbon monoxide poisoning are vague and 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, diarrhoea or stomach pains
- Sudden dizziness when standing up

If carbon monoxide poisoning is suspected, all appliances should be switched off immediately and not used again until the fuel supplier or maintenance contractor has checked them.

Technician's competence

To attain a level of competence, technicians must have successfully completed a training course covering all checks and inspections referred to in this guide. Training centres must be equipped to carry out practical smoke and spillage testing.

Legal requirements

The main legal requirements for protection of the public and employees are the general provisions of the 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' and 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 pages 19-20.

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 or modifications to buildings in which gas appliances are installed and would include cavity wall insulation.

CONTENTS

YOUR RESPONSIBILITIES	1 - 2
Carbon monoxide (CO) analysers	
Carbon monoxide (CO) alarms	
Glass fronted fires	
Pre-installation checks	
Installation checks	
Post-installation checks	
IDENTIFYING APPLIANCES, VENTS AND FLUES	3 - 4 -5
Typical fuel-burning appliances	
Air bricks and ventilators	
Typical combustion air ventilators	
Other ventilators	
Common airbrick types	
Maintaining the combustion air supply	
COMBUSTION AIR & VENTILATION REQUIREMENTS	6
VENT REQUIREMENTS	7
VENTILATION REQUIREMENTS FOR OPEN-FLUED GAS APPLIANCES	8
FLUES	9
FLUELESS GAS FIRES	10
CHIMNEYS	11 - 12
CHECKING FLUES AND APPLIANCES	13
PRE-INSTALLATION CHECKS	13
POST INSTALLATION CHECKS	14 - 15 -16
Solid fuel appliances	
Glass-fronted fires/boilers and floor-mounted, free-standing boilers	
Gas-fired appliances	
Room-sealed appliances (balanced flues)	
Oil-fired appliances	
Testing for Carbon monoxide (CO)	
CO readings	
WARNING NOTICES	17 - 18
EXAMPLE OF RISK ASSESSMENT	19 - 20
TECHNICIAN'S SAFETY CHECK SHEET	21

YOUR RESPONSIBILITIES

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

When you identify a fault that could harm the occupants or yourself, remember that people's health and 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
- Smoke matches
- Warning notices

General

The normal procedure of installing CWI should not affect the operation of fuel-burning appliances, flues or chimneys.

The appropriate checks must be carried out at all stages: during pre-installation, installation, and post-installation.

When you leave the installation, make certain that you have not blocked a chimney, flue, or combustion air vent with insulant.

If for any reason a smoke/spillage test cannot be carried out by the CWI technician, the relevant fuel supplier or appliance maintenance contractor must carry out the appropriate tests. (i.e. CORGI-registered installer for gas)

Carbon monoxide (CO) analysers

Numerous types of CO analyser are available, but the equipment must be regularly calibrated and certificated, and technicians require some knowledge and training in its use. CO analysers must not be regarded as a substitute for the flue and combustion air checks referred to in this document.

They are particularly useful with fuel-burning appliances, but must only be used to indicate or confirm a hazardous situation, and not relied upon to prove safety.

Carbon monoxide (CO) alarms

The Health & Safety Executive, in its Discussion Document *Gas Safety Review: Options for change*, states:

“HSE currently recommend the use of CO alarms meeting BS 7860 (domestic CO detectors) as a ‘second line of defence’. However they are not required under the current Regulations, or referred to in the associated ACoP. It is emphasised by HSE that alarms must not be seen as a substitute for proper installation, maintenance and safety checks on gas appliances and flues.”

This view is endorsed by CIGA.

Glass-fronted gas fires

Some manufacturers state that decorative canopies or fronts should be removed from gas fires, in order to carry out smoke tests. If removing them would affect the safe operation of the appliance this work should only be done by a CORGI-registered installer. However if it was a part that could be removed by the householder for cleaning, this can be done by the CWI technician.

Run the appliance, observe the flame and test the appliance in accordance with the manufacturer's instructions, if available.

Pre-installation checks

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

Appliances must be run and the flame observed, especially with glass-fronted gas fires.

Confirm exit of combustion gasses.

Locate & note

- Each fuel-burning appliance:

Type

Fuel used:

Gas

Oil

Coal, coke, etc

Wood

- Combustion air ventilators for each appliance:

Location

Type

Size

- Combustion gases out:

Location of flue

Flue type

- Carry out smoke/spillage tests.

You must be satisfied that the combustion air ventilator supplying combustion air for the fuel-burning appliance meets current requirements (See pages 6/7).

Installation checks

Installation procedures are fully detailed in *The Technician's 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 insulation near a flue, check that no insulant is visible in the flue.

Post-installation checks

Ensure that:

a) all combustion air vents are clear

b) all flues and chimneys on external walls are clear.

Go inside the property and check whether any insulant is visible around fuel-burning appliances, or in fireplaces.

Ask the occupant to run each appliance. Check the appearance of the flame.

Whenever possible, you should observe flues and chimneys from outside the property, to ensure that spent gases are being exhausted.

Carry out smoke/spillage tests for all fuel-burning appliances on external walls, and compare them with your pre-installation check.

You could face personal prosecution if occupants subsequently become ill or die because of incorrect or careless work on your part.

Advice to customers

If you are not sure about the operation of an appliance or the effectiveness of the flues, chimneys and/or combustion air vents, you must issue a Warning Notice (See pages 17/18). Explain to the customer that the appliance must not be used until it has been thoroughly checked by the fuel supplier or maintenance contractor.

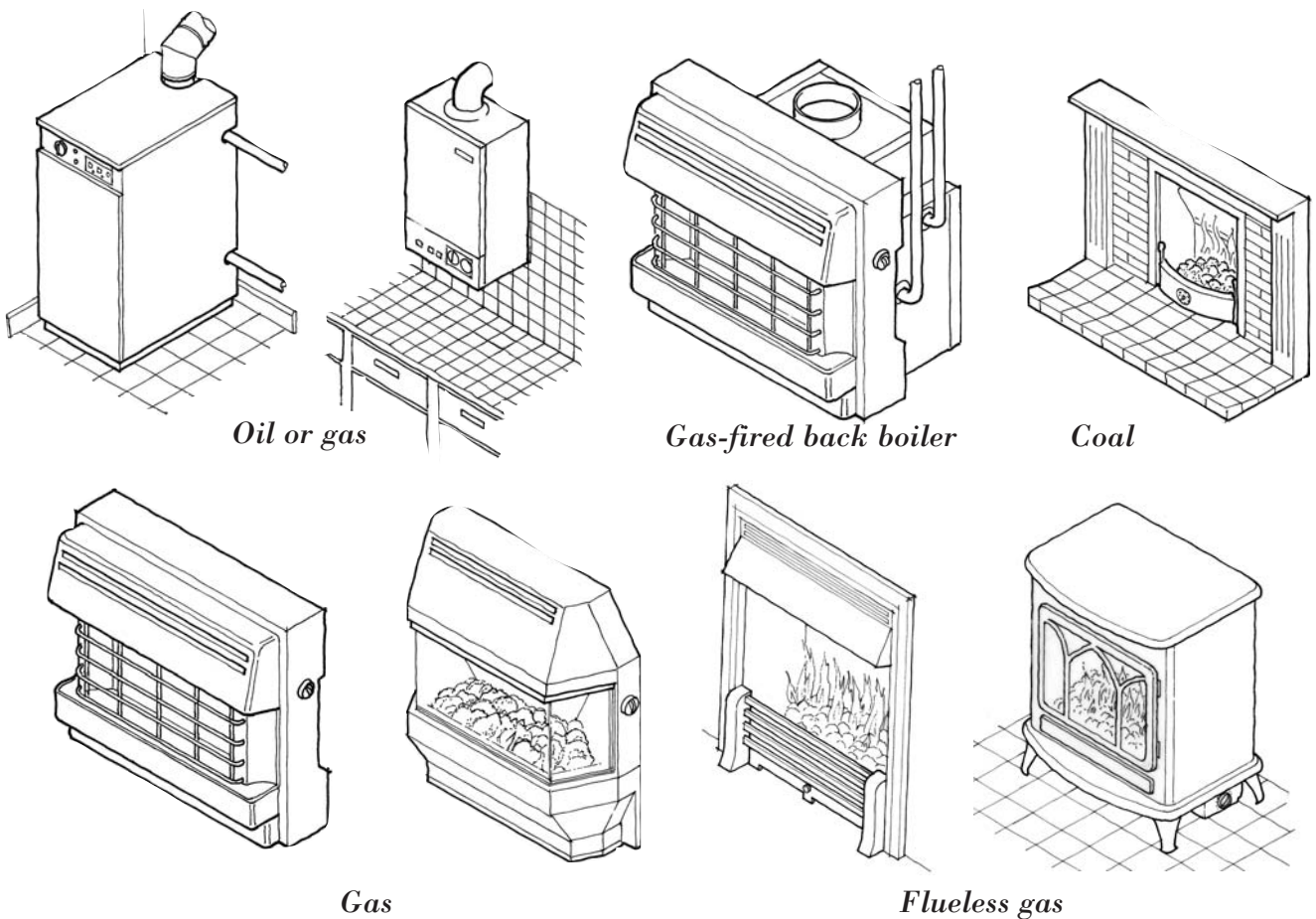
The information given here does not cover every eventuality. If you are in any doubt, seek further advice.

Identifying appliances, vents and flues

The following pages should help you to locate and identify appliances, and their flues chimneys and combustion air vents.

IDENTIFYING APPLIANCES, VENTS & FLUES

Typical fuel-burning appliances



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

Always see the appliance in use before CWI

installation. This will help you to compare its performance after the installation. The appearance of the flame should be noted in this respect (see Page 9: *Checking flues & appliances*). Scorch marks on the casing may indicate existing problems.

Safeguarding the combustion air supply

The combustion air supply must be isolated from the cavity, to guarantee an adequate supply of combustion air to the appliance(s). It is essential that the air ventilator is continuously sleeved across the cavity.

If there is not enough air, poisonous gases such as carbon monoxide may be produced. These could build up and cause serious illness to the occupants. In severe cases, it could kill them.

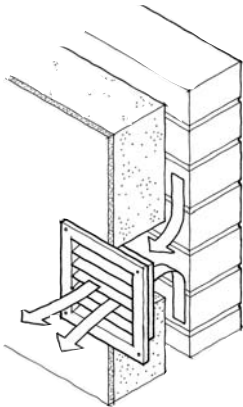
It is your responsibility to ensure that there is sufficient air available to the appliance after installation.

Air bricks & ventilators

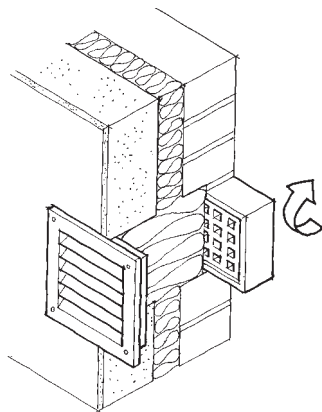
There are many air bricks and ventilators in external cavity walls. Where air bricks continue to have a purpose, they must be sleeved continuously with a proprietary duct from the cavity and not blocked by insulation material.

Initially you must locate, identify and note the position of combustion air ventilators for all fuel-burning appliances in the property. It is vital that these are thoroughly checked.

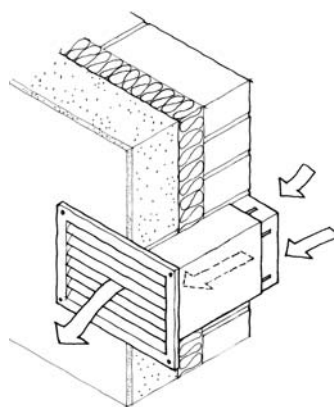
Typical combustion air ventilators



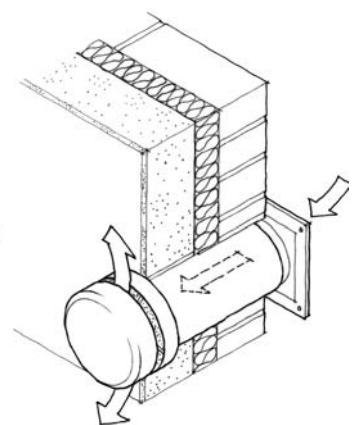
Incorrect - Primary air supply must not be drawn from the cavity



Incorrect



Correct



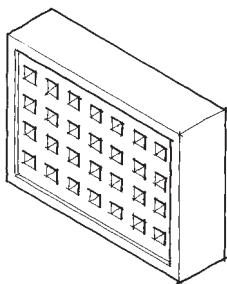
Combustion air ventilators must not draw air from the cavity, they need to be non-closable, kept clear of insulation, and free from

obstruction. Therefore all combustion air ventilators must be continuously sleeved across the cavity. (See above)

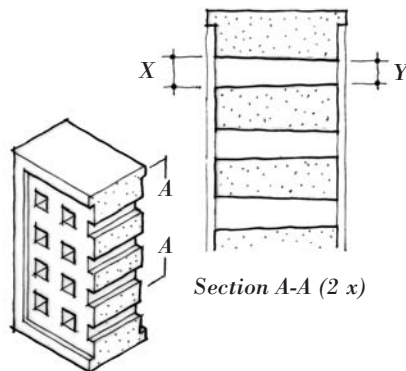
Common air brick types

'Due to the tapered design of their vent holes, 'terracotta' air bricks provide limited free air flow, and are not acceptable for combustion

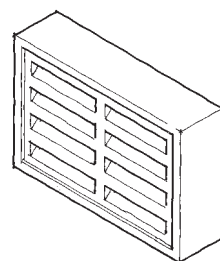
air ventilators. They should be replaced with a plastic air vent. Internal fly screens must be removed



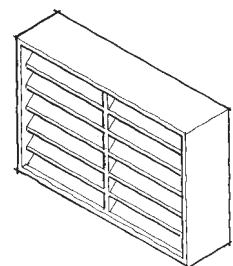
225mm x 150mm
Terracotta



Section A-A (2 x)

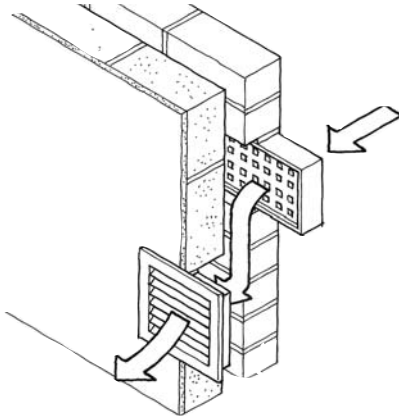


225mm x 150mm
Terracotta louvre

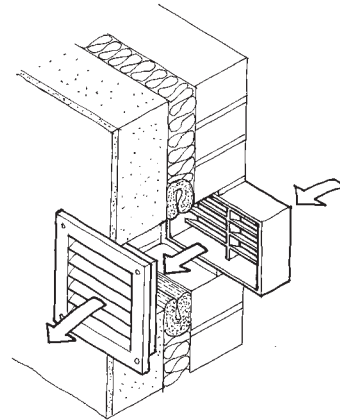


225mm x 150mm
Plastic

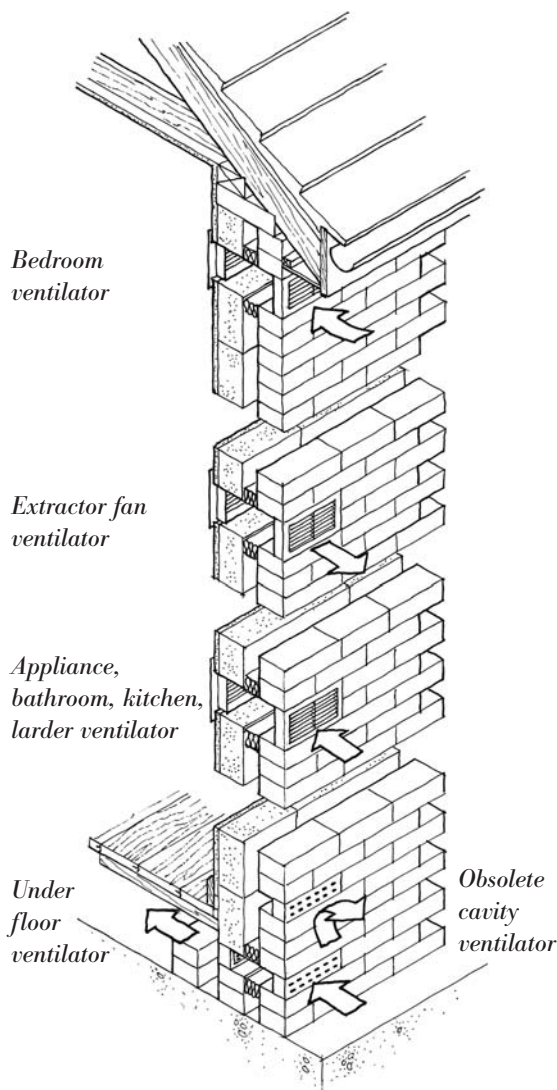
It is worth noting that airbricks are not always aligned. It may be necessary to remove doubtful airbricks to check the position of the inner one. Do not assume that these are simply cavity ventilators, without checking the inner wall.



Remember that it is not acceptable to use mineral wool quilt or cavity brush to seal the cavity. Combustion air ventilators must be continuously sleeved - as shown on page 4



Incorrect



Other ventilators

Other ventilators include those providing underfloor air (to suspended floors); cavity wall and roof ventilators, room ventilators, extractor fan ventilators, and air supply to larders or food storage cupboards.

Bathroom, kitchen and air supply ventilators to larders or food storage cupboards must be sleeved.

Gable end airbricks must be sleeved.

Baxi ducted air systems should be checked and sleeved.

Bedroom ventilators were originally intended to provide combustion air to an open fire and/or 'fresh air'. Due to changes in heating arrangements, many have been sealed off internally - and can be sealed off externally to prevent wind scour of the insulation, or infestation. The client should be consulted before sealing.

Obsolete cavity ventilators

These should be sealed with an appropriate material to prevent water ingress and infestation. Be careful not to confuse cavity vents with others, such as underfloor ventilators.

COMBUSTION AIR & VENTILATION REQUIREMENTS

If a combustion air ventilator is required, one must be fitted before you proceed with CWI.

The nominal size, and the free air area of combustion air ventilators varies 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 area that the vent provides.**

A number of different terms are used by 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 500mm² of free air per kW - above a 7kW 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 appliance, up to a 70kW rating, is shown on page 8. However, **most** fuel-burning appliances found in domestic CWI installations, are covered by two sizes of standard plastic air vents:

A typical 225mm x 150mm plastic air vent (the old 9" x 6," or 'two brick' size), provides up to 15,600 mm² of free air, which is sufficient for:

- Gas-fired appliances[‡] up to 37kW (126,000 Btu)

- Oil-fired and solid fuel appliances up to 30kW (102,000 Btu)

A typical 225mm x 225mm plastic air vent (the old 9" x 9," or 'three brick' size), provides up to 23,400mm² of free air, which is sufficient for:

- Gas-fired appliances up to 53kW (180,000 Btu)
- Oil-fired and solid fuel appliances up to 45kW (153,000 Btu)

Open-flued, solid fuel fires

A permanent air vent must be fitted in any room or space containing a working solid fuel appliance. The CWI installer is not required to fit an air vent when the installation is obsolete: e.g. when the appliance has been removed, or the flue and fireplace recess permanently blocked. With these appliances, the combustion air requirement is calculated as at least 10,000mm² unless otherwise specified in the manufacturer's instructions. The standard 225mm x 150mm plastic vent, or a 125mm dia. circular hole core ventilator, will usually provide 10,000mm². Always check the vent size before fitting.

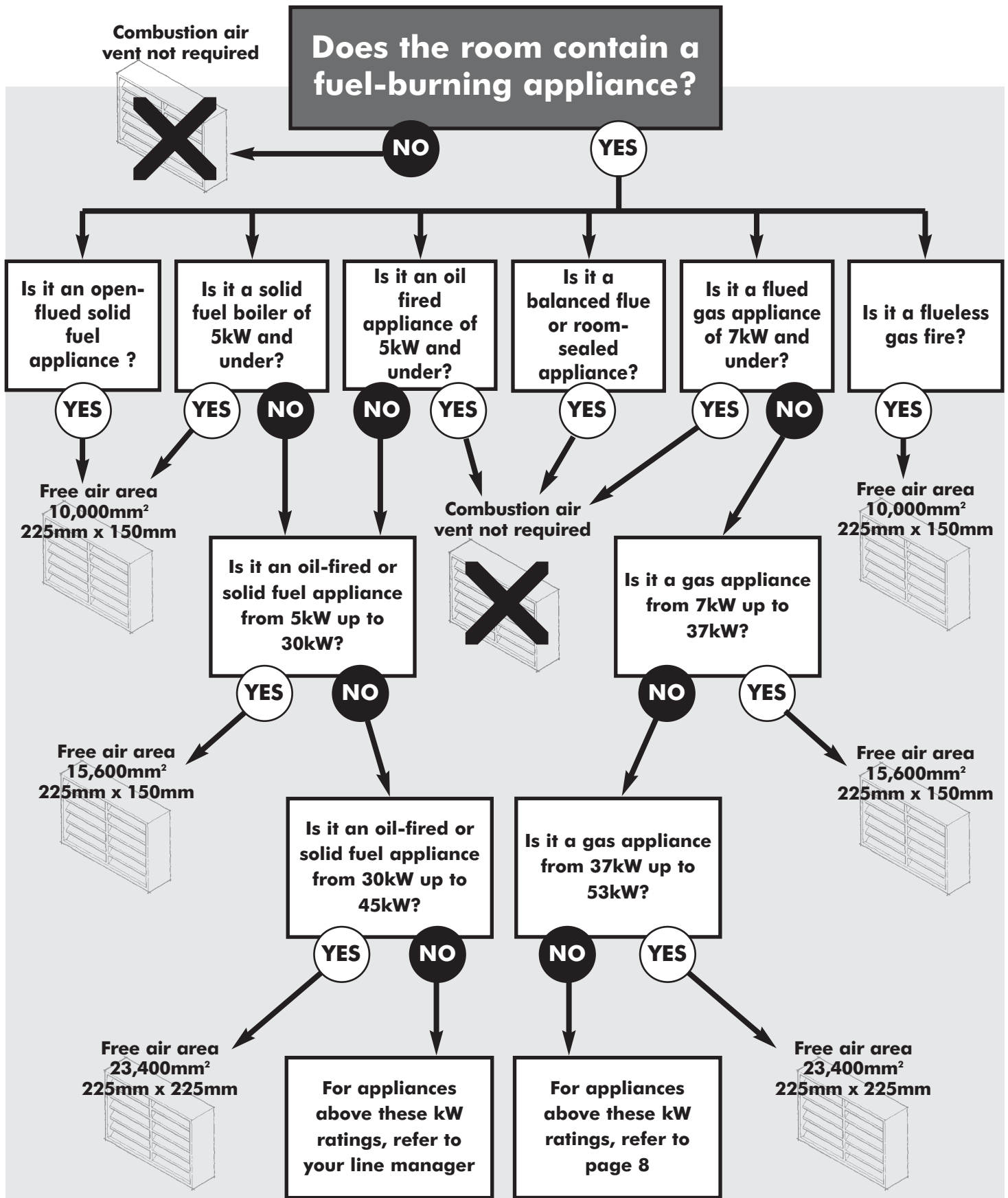
Flueless gas fires

Technicians should bear in mind that, unlike flued gas appliances of 7kW and under, **all** flueless gas fires require a permanent vent - typically of 10,000mm² . This vent must not be compromised by the CWI (see notes on page 10).

[†]Information regarding the input rating of a gas appliance can be found on the appliance data badge. This is normally fixed on the appliance casing.

[‡]Ventilation provided for gas appliances should not be over-sized, as this can have a detrimental effect on the energy-efficiency of the appliance. In turn, this may encourage customers to block the vent off.

VENT REQUIREMENTS



*All air vent dimensions are nominal sizes only, and will vary from manufacturer to manufacturer. Check that the vent provides the free air areas quoted above.

VENTILATION REQUIREMENTS FOR OPEN-FLUED GAS APPLIANCES

7kW and under heat input (net) requires no additional ventilation.

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

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

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

8 x 500mm² = 4,000mm² of ventilation required.

2. 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 x 500mm² = 9,000mm² of ventilation required.

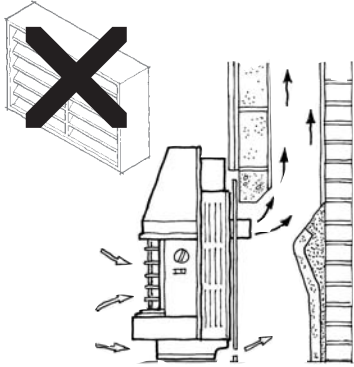
Note: There are different ventilation requirements for gas appliance with an input rating over 70kW (net). Advice regarding these appliances should be sought from your line manager

Open flue appliance ventilation requirements based on BS 5440-2:2000

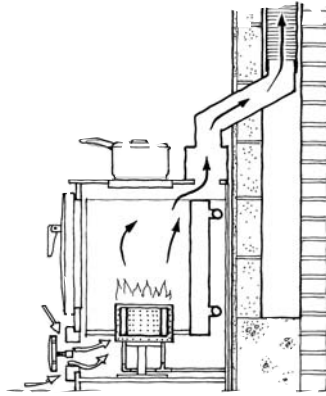
Heat input kW net	Room vent free area (mm ²)	Heat input kW net	Room vent free area (mm ²)
1	0	36	14,500
2	0	37	15,000
3	0	38	15,500
4	0	39	16,000
5	0	40	16,500
6	0	41	17,000
7	0	42	17,500
8	500	43	18,000
9	1,000	44	18,500
10	1,500	45	19,000
11	2,000	46	19,500
12	2,500	47	20,000
13	3,000	48	20,500
14	3,500	49	21,000
15	4,000	50	21,500
16	4,500	51	22,000
17	5,000	52	22,500
18	5,500	53	23,000
19	6,000	54	23,500
20	6,500	55	24,000
21	7,000	56	24,500
22	7,500	57	25,000
23	8,000	58	25,500
24	8,500	59	26,000
25	9,000	60	26,500
26	9,500	61	27,000
27	10,000	62	27,500
28	10,500	63	28,000
29	11,000	64	28,500
30	11,500	65	29,000
31	12,000	66	29,500
32	12,500	67	30,000
33	13,000	68	30,500
34	13,500	69	31,000
35	14,000	70	31,500

FLUES

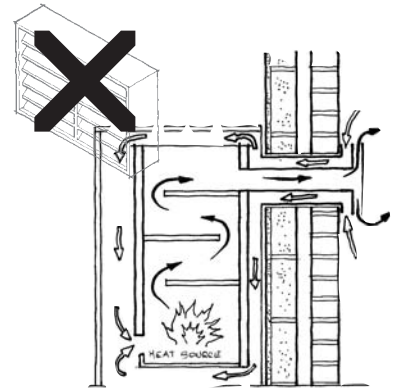
To work properly and safely, fuel-burning appliances need a continuous supply of air. Some draw air from within the room (*open flues*) and others from outside the room (*room sealed*).



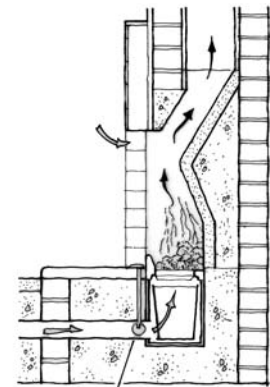
Gas fire 7 kW and under. Combustion air vent not normally required



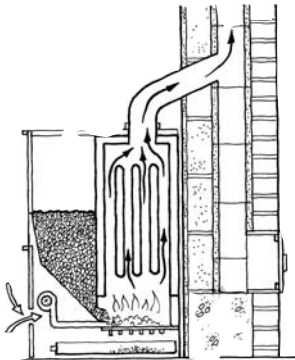
Oil cooker & boiler (lined flue.) Combustion air vent required.



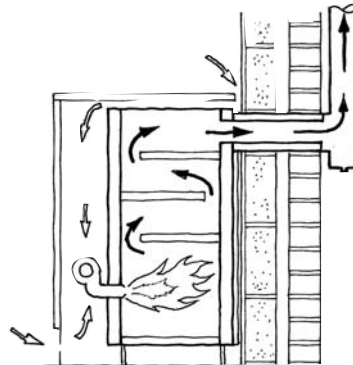
Room sealed (balanced flue, gas or oil-fired. No combustion air vent required)



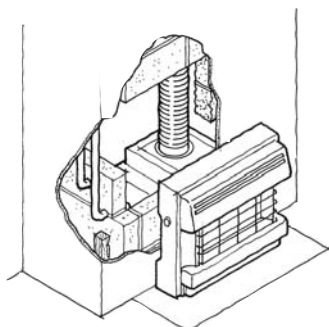
BAXI type under floor air supply. Combustion air vent required



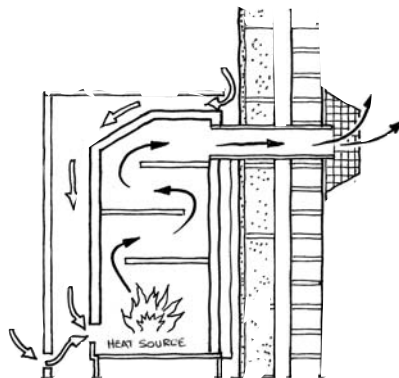
Solid fuel boiler (lined flue.) Combustion air vent required



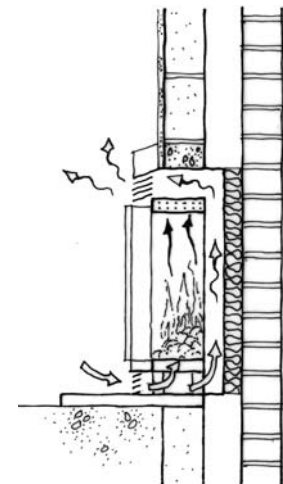
Free standing, oil-fired boiler. Combustion air vent required



Gas-fired back boiler. Combustion air vent required



Free standing oil-fired boiler. Combustion air vent required



Flueless gas fire. Combustion air vent required

FLUELESS GAS FIRES

Until recently, all fixed gas fires in the UK have been fitted with a flue to discharge the combustion gases to the outside air. 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.

However, gas fires that do not have a flue have now been introduced in the UK to be used only for background heating. These 'flueless' gas fires have been used for many years in other parts of the world such as North America and Australia.

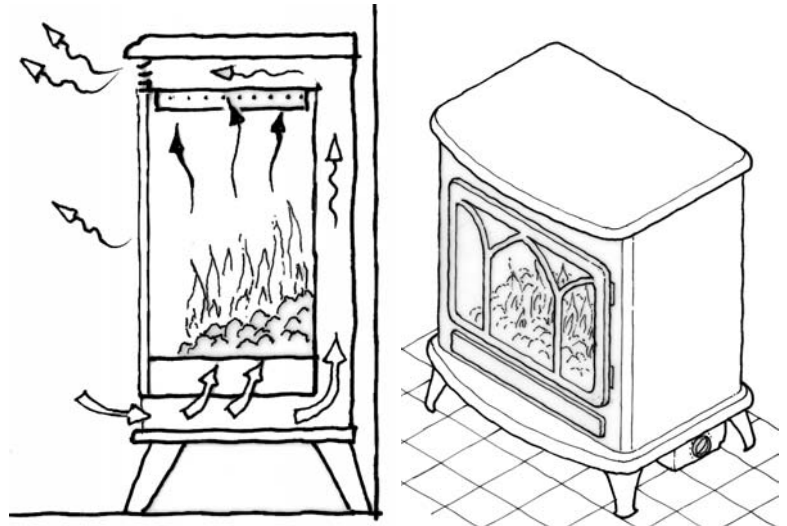
In place of a flue, these flueless fires have a catalytic element that converts carbon monoxide into carbon dioxide. In addition they have built-in oxygen detectors, that will shut down the fire if oxygen levels in the room change.

Considerations

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

All flueless fires require a permanent combustion air vent, typically of 10,000mm². This vent must not be compromised by the CWI.

Flueless fires can be positioned on internal walls, and an external survey of the building can not provide safe information on the fuel burning appliances that may be inside. This emphasises the importance of a careful internal survey and test, before and after the work.



There is an insert fire on the market that appears to be designed specifically to replace the internal leaf and the cavity itself.

Many of the fires must not be installed in a room of less than 40 m³ (approximately 14 ft³). Most main rooms in terraced houses, and many in semi-detached properties, do not meet this minimum volume.

Comment

As these flueless fires claim 100% fuel efficiency, they are attractive to low income households but any savings in fuel may be offset by damage caused through condensation if they are incorrectly used as the primary heat source. Most manufacturers of this type of appliance will advise in their instructions that they are only to be used as a secondary source of heating.

UK flueless fire manufacturers claim that these products are very safe, with 20-years of experience elsewhere in the world.

However, this should not lead to complacency, since the rest of the world does not have cavity walls and cavity wall insulation.

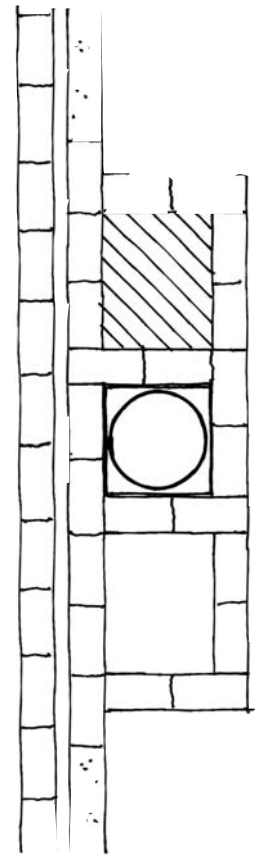
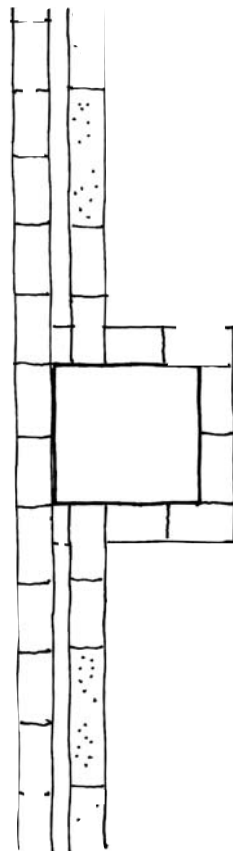
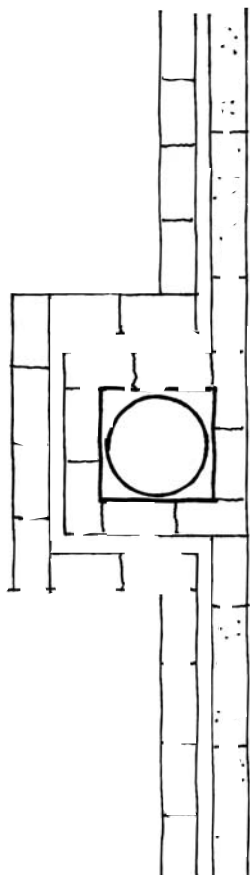
CHIMNEYS

If flues or chimneys become blocked, then gases cannot escape to the outside.

Therefore, it is extremely important to locate and identify flues and chimneys. Where the brick chimney is built externally and 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.

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 or built in to it.



Examples of chimney constructions

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 - whether or not the hole is injected with insulation.

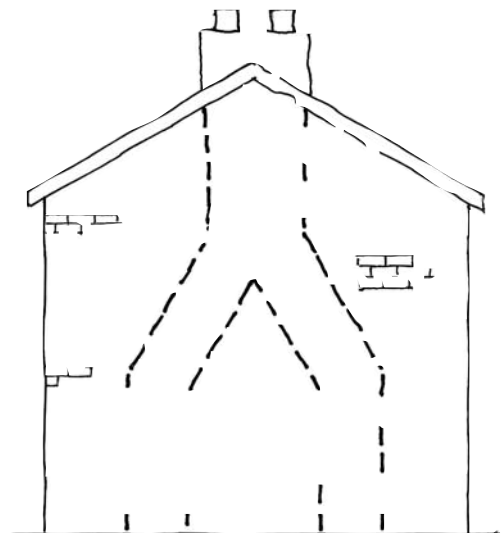
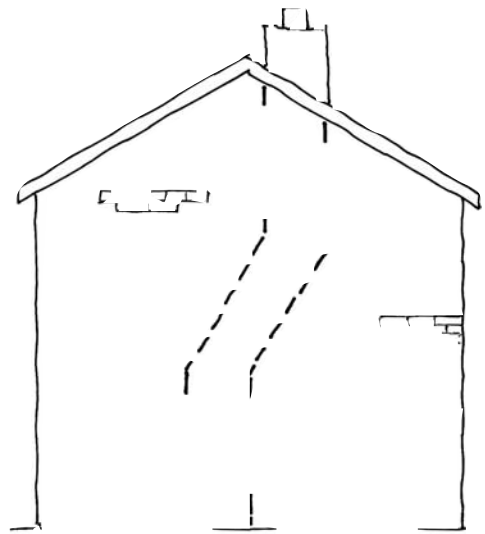
In some properties, flues may be formed from hollow blocks or interlocking liner pots built into the cavity.

Pre-cast flues serving gas appliances are particularly difficult to trace since both the internal and external walls show a flush face.

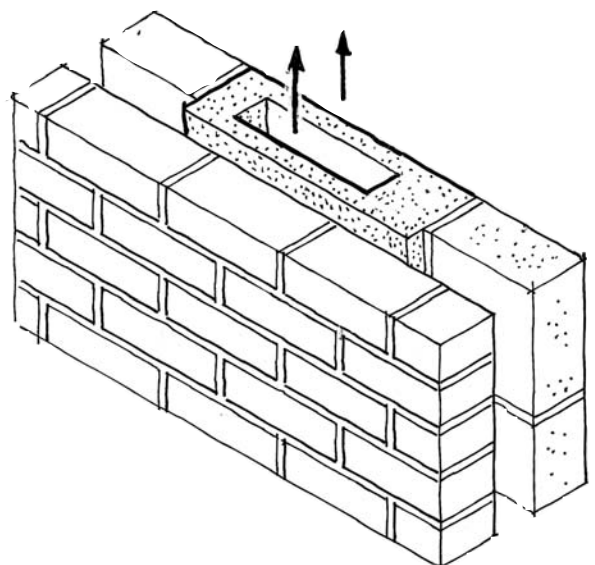
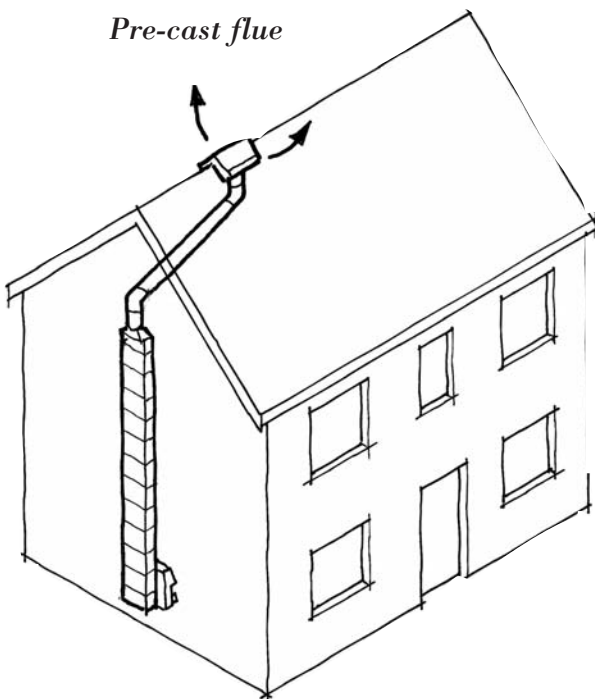
Since the pre-cast blocks can be in contact with the external leaf, it is very easy to drill into the flue, even if a depth stop is fitted to the drill.

Pre-cast flues can also incorporate offsets that traverse the wall. The pre-installation inspection of the loft space will show the line of the flue above first floor ceiling level.

Examples of chimney routes



Pre-cast flue



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.

Appliances must be operated at maximum output for 5 minutes to ensure stable operation. 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 after installation. It is essential to ensure 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.

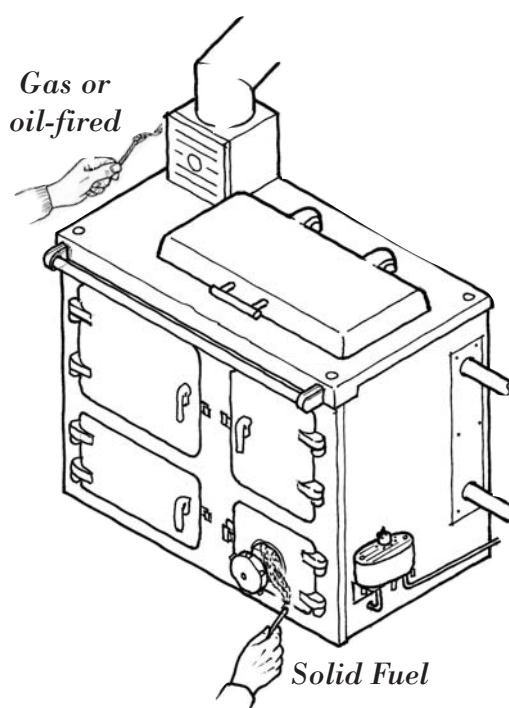
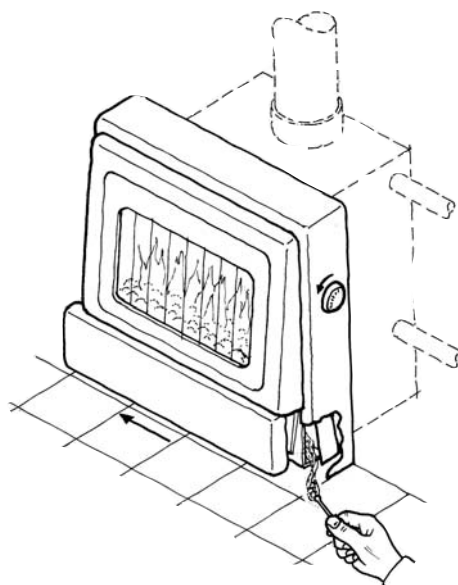
Because of the variety of fuel-burning appliance designs, it is sometimes difficult to establish whether the flue performance is satisfactory. If it is not possible to confirm this performance, the relevant fuel supplier or appliance maintenance contractor must carry out the appropriate tests.

PRE-INSTALLATION CHECKS

Each appliance should be operated prior to CWI installation to ensure that the flue is functioning correctly. This allows you to compare the performance of the appliance before and after installation.

Flame appearance is of particular importance with glass-fronted gas fires. With radiant and convector-type gas fires, check that there are no scorch 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

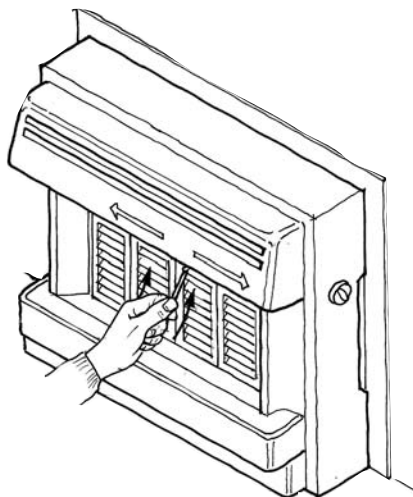
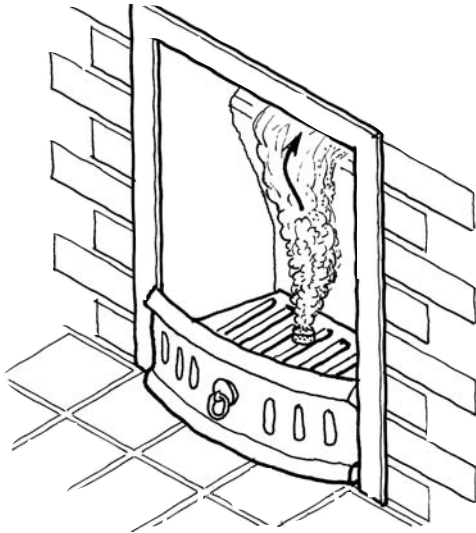
Where practicable, check with the aid of a mirror to see that no insulant has entered the flue. If a satisfactory visual inspection cannot be made, a check on the efficiency of the flue system must be carried out, using a smoke pellet test at each appliance.

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

Smoke can be generated from a smoke pellet, but this does not generate heat. If possible, burn newspaper in the appliance, or use the heat from a blowlamp, which can be passed into the flue openings for 1 minute just prior to repeating the smoke test.

Glass-fronted fires/boilers and floor-mounted free-standing boilers

Where an appliance is working, a smoke test to manufacturer's instructions should be carried out at the main refuelling door or at the air inlet port. All smoke should be drawn into the appliance. Spillage is indicated where smoke is not drawn into the appliance.



Gas-fired appliances

Under the *Gas Safety (Installation and Use) Regulations*, only approved CORGI

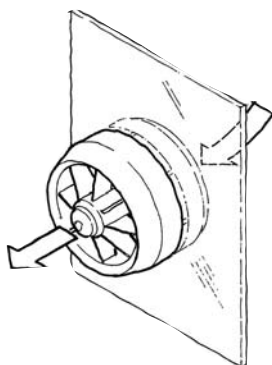
Engineers are permitted to carry out work, such as removing any integral part of a boiler or gas fire. "Work" is defined as:

- 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).

The following procedures must be adhered to:

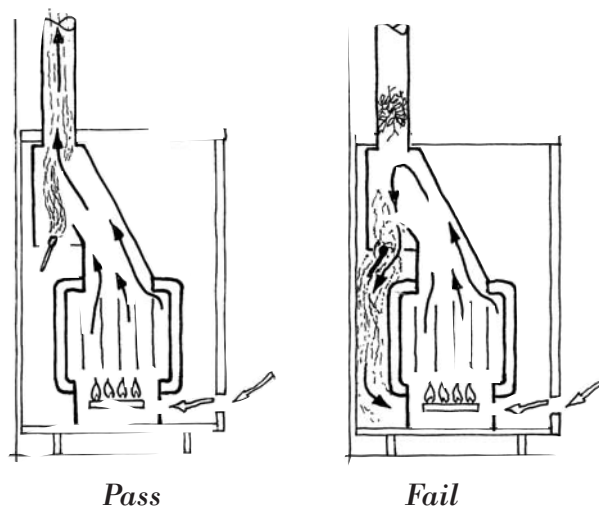
Carry out standard visual checks.

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, the spillage test must take place with the fan in operation and the inter-connecting doors open.



NOTE: The term 'fan', includes extractor fans, fans in open flue appliances, fans in cooker hoods, the circulating fans of warm air heating systems and circulatory ceiling fans.

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.



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 (See pages 17/18) and call in the relevant fuel supplier or CORGI registered appliance maintenance contractor.

Room-sealed appliances (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

Carry out standard visual checks.

Run the appliance for 5 minutes, during which time you should check the outlet to ensure that the flue has not been blocked.

In the event of a partial or total flue blockage the boiler will usually 'lock out'. If it does, you should call in the relevant fuel supplier or appliance maintenance contractor.

Installing firm's name, address and contact details
(or letterhead)

Warning – do not use

In our opinion, this appliance should not be used until a qualified person has checked the appliance to ensure that it is safe

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)

Warning Notice

Issued in accordance with current Gas Safety (Installation and Use) Regulations.

Important - this notice concerns your safety

Issued by: (print) Company:

Technician's signature: Date & time of issue:

Occupier's name:

Address:

.....

Postcode: Telephone number:

The appliance (make)..... (model) (appliance type)

(location of appliance)..... at the above property,

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 / installation left connected,
- The occupier was not present and this Notice has been left on the premises.

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:

Note: Two copies of this notice must be produced. The Technician must retain the second copy and return it to the office

EXAMPLE OF RISK ASSESSMENT

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, which can result in the impairment of combustion air flow and/or the escape of combustion gases produced by an existing fuel-burning appliance.

Risk The risk arising from this hazard is that carbon monoxide produced by fuel-burning appliances will be unable to escape. 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 of any affected building.

Elimination of Hazard (Control of Risk)

CWI installers must comply with the current ‘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, installation and post-installation of CWI to buildings containing fuel-burning appliances.

The risk assessment must include:

Survey, identify and record

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

Pre-installation checks

- Identify appliance, flue/chimney routes, internal & external
- Run appliance
- View and note flame colour
- Check combustion gases externally
- Appliance check (Smoke test/Spillage test)
- Identify combustion air supply

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
- Run appliances at maximum for at least 5 minutes
- Visually check that flame compares with pre-installation
- 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)**
- 2. Issue warning notice(s)**
- 3. Advise occupants and/or owner**
- 4. Call in the relevant fuel supplier or maintenance contractor (e.g. CORGI-registered installer for GAS)**

Training

All CWI installers will receive appropriate training to enable them to discharge their responsibilities relating to the prevention of insulation ingress into flues, chimneys and combustion air ventilators, and to ensure their competence to undertake the tests referred to in the CIGA guide.

Note:

All installing companies must ensure that their technicians are trained to enable them to discharge their responsibilities.

Installing firm's name, address and contact details
(or letterhead)

Technician's safety check sheet - Flues, chimneys and combustion air ventilators

This check 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 "Technicians guide to best practice - Flues, chimneys and combustion air ventilators."

Survey, identify and record

- 1 Fuel type(s)
- 1 Appliance type(s)
- 1 Flue/chimney location(s)
- 1 Location of combustion air ventilator(s)

Gas - Oil - Coal - Wood
Boiler - Gas Fire - Open Fire - Balance Flue
Internal wall - External wall, front, side, rear
Front elevation - Side elevation - Rear elevation

Pre-Installation

- 1 Appliance identified, flue/chimney routes, internal & external
- 1 *Appliance run
- 1 *View and note flame colour
- 1 *Combustion gases checked externally
- 1 *Appliance checked (smoke test/spillage test)
- 1 *Smoke/spillage test satisfactory
- 1 Combustion air supply adequate

Y	N
Y	N
Y	N
Y	N
Y	N
Y	N
Y	N

Comments

Installation - Visually check

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

Y	N
Y	N
Y	N

Post Installation

- 1 *Appliance run at maximum for a minimum of five minutes
- 1 *Visual check that flame compares with pre-installation
- 1 *Smoke test/spillage test satisfactory
- 1 *If results were unclear, re-test after a further 10 minutes
- 1 *Re-test satisfactory

Y	N
Y	N
Y	N
Y	N
Y	N

*Only on appliances fitted to flues & chimneys on external walls

If there is any doubt or any question answered 'N' then -

1. Switch OFF appliance and
2. Issue WARNING NOTICE and
3. ADVISE occupants and owner, and
4. CALL OUT a competent body or person such as fuel supplier or maintenance contractor (e.g. CORGI for gas)

Installation address

Name of Technician

.....

Signature

.....

Date / /200

Important:

- 1 It is the installing firm's responsibility to ensure that the Technician is trained to be able to discharge these responsibilities.
- 1 **Failure to carry out these safety checks could lead to the death of an occupant and prosecution of the Technician.**