

Installation of domestic heating and cooking appliances burning solid mineral fuels —

Part 1: Specification for the design of installations

Committees responsible for this British Standard

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- Association of British Solid Fuel Appliance Manufacturers
- British Ceramic Tile Council
- British Coal Corporation
- Consumer Policy Committee of BSI
- Department of Energy (Energy Efficiency Office)
- Department of the Environment
- HETAS Ltd.
- Incorporated Association of Architects and Surveyors
- Low Temperature Coal Distillers of Great Britain Ltd.
- METCOM
- National Fireplace Manufacturers' Association
- National Society for Clean Air
- Real Fire Association
- Solid Smokeless Fuels Federation
- Waterheater Manufacturer's Association
- Coopted members

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Foreword

This Part of BS 8303 has been prepared under the direction of the Engineering Sector Board, and together with BS 8303 Parts 2 and 3 supersedes BS 8303:1986 which is withdrawn.

BS 8303 covers the design and installation of domestic heating and cooking appliances burning solid mineral fuel.

This Part of BS 8303 details the design specification to be followed by the designer, when developing an acceptable appliance installation design for a particular application.

Part 2 of BS 8303 specifies the practices to be followed when installing the appliance in accordance with the design specification. It reflects good site supervision and working practices.

Part 3 of BS 8303 gives guidance and recommendations to the designer and installer on options to be identified and the methods of achieving a safe and satisfactory installation. It also gives important guidance on other matters including maintenance and cleaning.

BS 8303 does not deal with design or installation of hot water heating systems or hot water supply systems. However, where the appliance involves hot water services then attention is drawn to BS 5449:1990.

Attention is drawn to the need to ensure compliance with all local and general regulations as they affect the installation, including the following;

- planning permission;
- Building Regulations [1];
- Clean Air Act [2];
- Gas Safety (Installation and Use) Regulations [3].

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 30, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Part of BS 8303 specifies both general and specific requirements relating to the design and installation of all domestic heating and cooking appliances burning solid fuels in both new and existing buildings. The appliances covered by this standard are categorized as follows (see clause 6):

- a) open fires;
- b) roomheaters;
- c) freestanding cookers and independent boilers.

Specific installation requirements related to each category of appliance are detailed under separate headings (see clauses 17 to 20).

In addition to the definitive requirements, this standard also requires the items detailed in clause 4 to be documented. For compliance with this standard, both definitive requirements and the documented items have to be satisfied.

2 Definitions

For the purposes of this Part of BS 8303, the definitions given in BS 1846-1:1994 apply.

3 References

3.1 Normative references

This Part of BS 8303 incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on page 30. For dated references, only the edition cited applies; any subsequent amendments to or revisions of the cited publication apply to this Part of BS 8303 only when incorporated in it by amendment or revision. For undated references, the latest edition applies, together with any amendments.

3.2 Informative references

This Part of BS 8303 refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

4 Information and requirements to be agreed and documented

NOTE Annex A includes an example of a checklist that may be used to document this information.

4.1 Information to be supplied by purchaser

The information to be supplied by the purchaser shall be fully documented. Both definitive requirements specified throughout the standard and the following documented items shall be satisfied before a claim of compliance with the standard can be made and verified:

- type (open fire, roomheater, independent boiler, cooker) and make/model (where appropriate) of appliance selected and overall heat services required.

NOTE Further information on the selection of appliances is given in Annex B.

- details of building structure including materials of construction;
- location and materials of construction of fireplace recess;
- hearth, including size and material of construction and decorative finish;
- environmental conditions particular to the area, e.g. topography;
- hot water boiler with hot water heating or supply system, if required;
- gas ignition supply point, if required.
- electrical supply, if required;
- type, size and location of fuel storage, if required;
- other accessories, if required, e.g. fireguard.

4.2 Items for agreement

The following items to be agreed between the contracting parties shall be fully documented. Both the definitive requirements specified throughout the standard and the following documented items shall be satisfied before a claim of compliance can be made and verified:

- exact siting of the appliance, including:
 - a) special dimensional or constructional requirements for the appliance location, the fireplace recess or surround;
 - b) access for the installation and maintenance of pipework and/or warm air ductwork;
- position, size and type of chimney flue, and access for sweeping;
- position and type of ventilators necessary to ensure adequate provision of air for combustion and ventilation.

4.3 Exchange of information with appliance installer

The design specification shall be made available to the installer prior to commencing work.

5 General requirements

5.1 Mechanical resistance and stability

The designer shall use materials whose mechanical resistance and stability is not adversely affected when subjected to the heat expected during normal use.

Where it is necessary to construct a new fireplace recess, the designer shall ensure adequate foundationing for it and the chimney serving it.

The design of the fireplace recess (see clause 7) shall be such that the chimney is adequately supported by the fireplace recess where appropriate by the use of load bearing lintels or corbelling of coursed masonry.

Where it is necessary to construct a new chimney, it shall conform to the requirements of BS 6461-1:1984 or BS 7566:1992.

In the case of a chimney not serving a fireplace recess the chimney shall be constructed with adequate foundationing where appropriate, so that no part of the chimney is supported by the appliance.

NOTE Further information is given in clause 4 of BS 8303-3:1994.

The designer shall ensure that the appliance manufacturer's instructions regarding securing the appliance are followed in order to prevent movement during normal use which could cause joint separation and a leakage to occur between the appliance and the flue, such that the ability of the chimney to evacuate products of combustion safely to the outside atmosphere is impaired.

NOTE Further information is given in clause 5 of BS 8303-3:1994.

5.2 Safety in case of fire

The materials used in the installation of an appliance shall be non-combustible in accordance with the requirements of BS 476-4:1970 in order to limit the spread of fire to other rooms.

5.3 Hygiene, health and the environment

The size of air inlets into the room shall be such that sufficient air for combustion and ventilation is provided to avoid the escape of products of combustion from the appliance.

In the case of an open fire an air opening or openings with a total free area of at least 50 % of the throat opening area (see clause 14 and Figure 1, Figure 2 and Figure 3) shall be provided. For other appliances an opening or openings with a total free area of at least 550 mm² per kW of rated output above 5 kW shall be provided. Where a flue draught stabilizer is used the total free area shall be increased by 300 mm² for each kW of rated output.

Extractor fans shall not be located in the same room or space in which an appliance is installed.

All joints between an appliance and its chimney shall be sealed using non-combustible material in a manner that enables the joint to withstand the expansion and contraction to which it is subject during normal use.

NOTE Further information is given in clause 7 of BS 8303-3:1994.

The designer shall ensure that the chimney outlet conforms to BS 7566:1992.

5.4 Safety in use

The designer shall ensure that the chimney flue size for the appliance to be installed is not less than those shown in Table 1.

NOTE Further information is given in clause 8 of BS 8303-3:1994.

Any fireplace recess shall be constructed of non-combustible material in accordance with clause 7. The outer surface temperature of the walls of the fireplace recess shall be such that during normal use of the appliance adjacent combustible material is not ignited from the heat transmitted.

An appliance shall be installed on or above a hearth (see clause 8) so that adjacent combustible materials shall not be ignited from the following causes:

- a) direct radiation or conduction of heat from the appliance (see clauses 17 to 20 depending upon the specific appliance to be installed);
- b) embers falling from the appliance (see clause 8);
- c) heat transfer from the fluepipe and fittings (see clauses 9, 10 and 11).

NOTE Further information is given in clause 9 of BS 8303-3:1994.

Where accidental human contact is possible surfaces shall be either lower in temperature than can cause harm as described in BS 4086:1966 and PD 6504:1988 or where appropriate be protected by the use of a fireguard conforming to BS 6539:1984. Where fireguards are used, provision shall be made for fixings conforming to BS 6539:1984.

NOTE Lowering the surface temperature of some surfaces may be achieved by the use of insulating materials.

It shall be possible to inspect, clean and maintain the chimney without removing the installed appliance. Where the chimney cannot be swept through the appliance a soot door and/or flue pipe access port shall be provided for inspection, cleaning and maintenance (see clause 10).

Each appliance shall be connected to its own individual flue. A number of individual flues may form part of a single chimney stack.

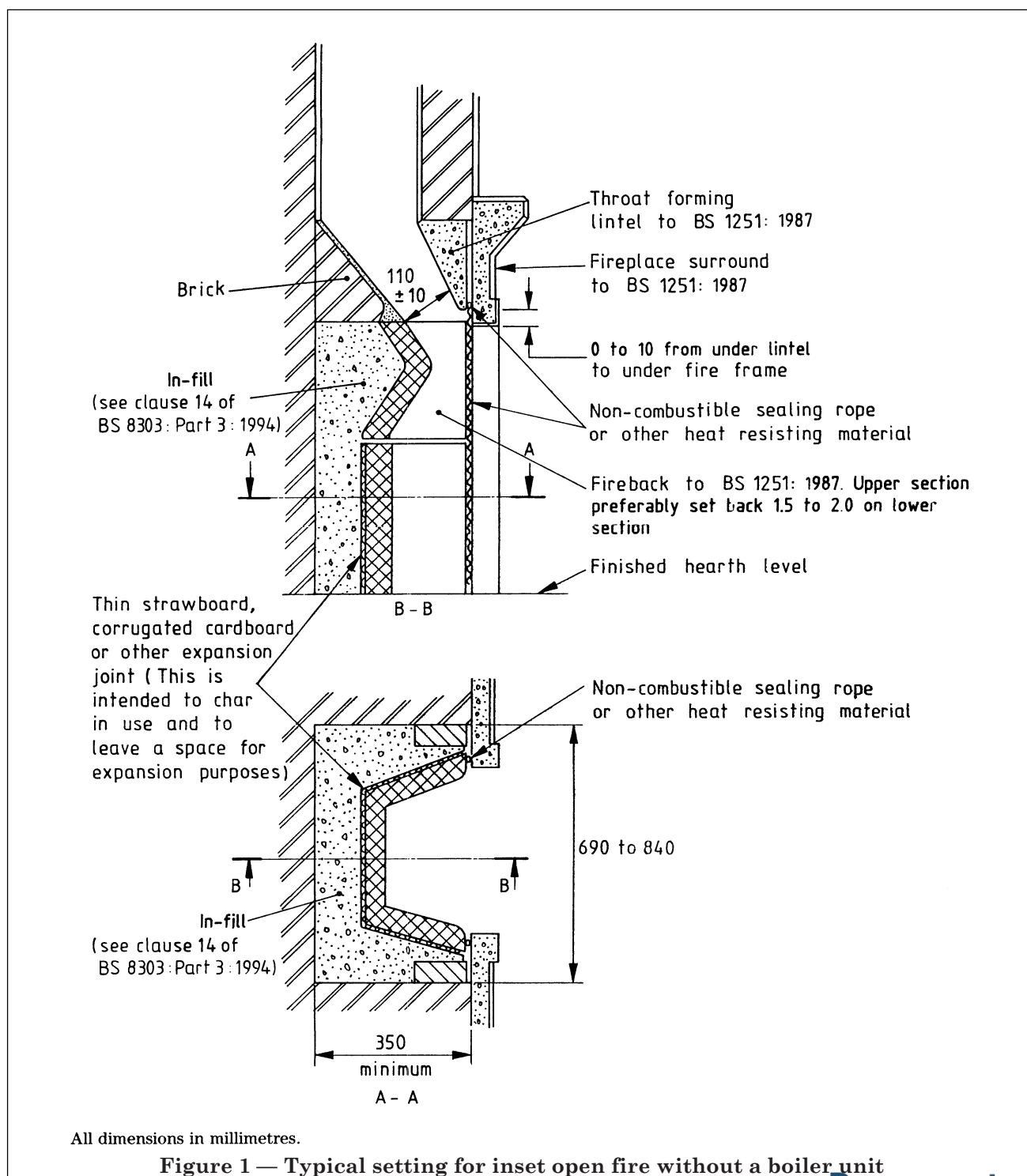
Electrical components shall have an electrical supply fitted with an appropriate fuse. Means of isolating electric components shall be provided in accordance with BS 7671:1992.

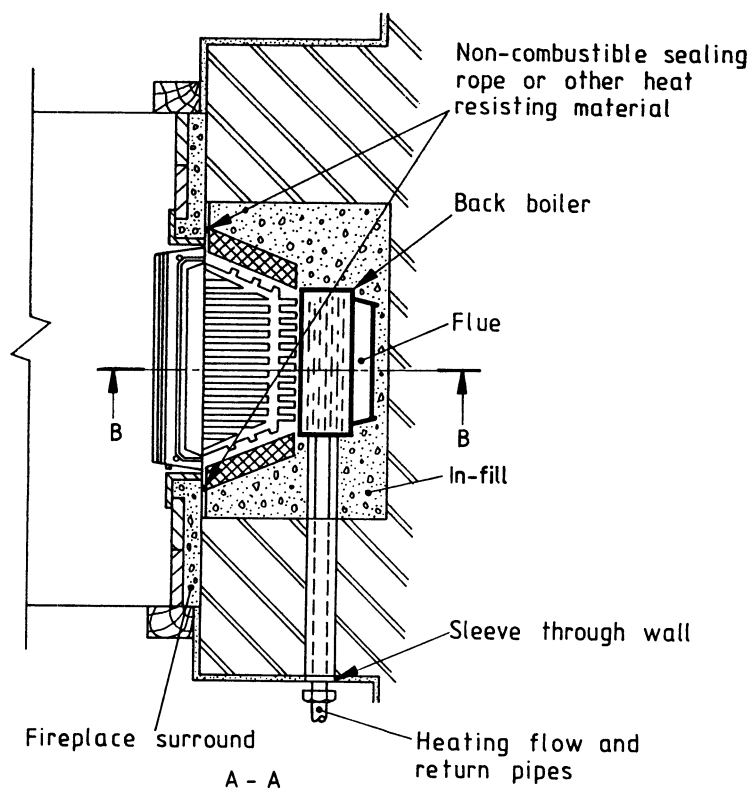
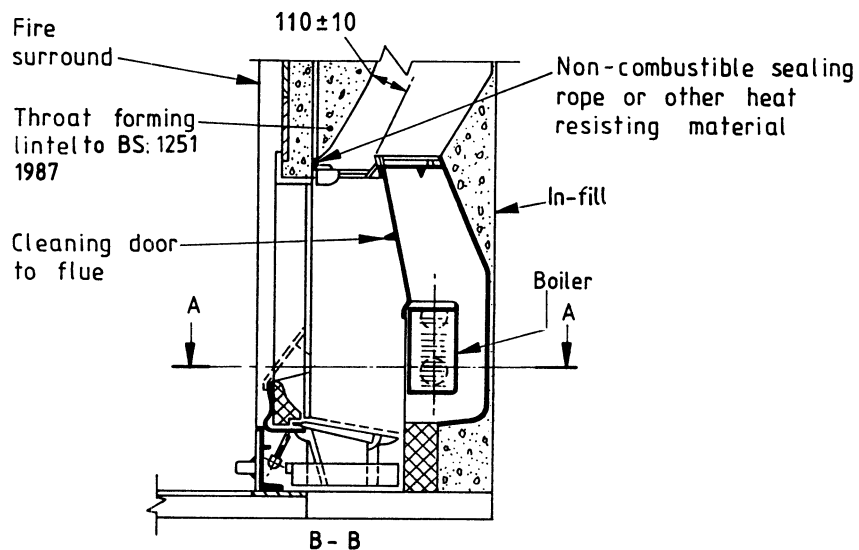
NOTE Where gas is to be used for ignition purposes, attention is drawn to the Gas Safety (Installation and Use) Regulations [3].

5.5 Protection against noise

Where noise generated from the operation of an appliance is sufficient to prevent sleep or rest the installation of the appliance shall be such that the noise is not transmitted to adjacent occupancy areas.

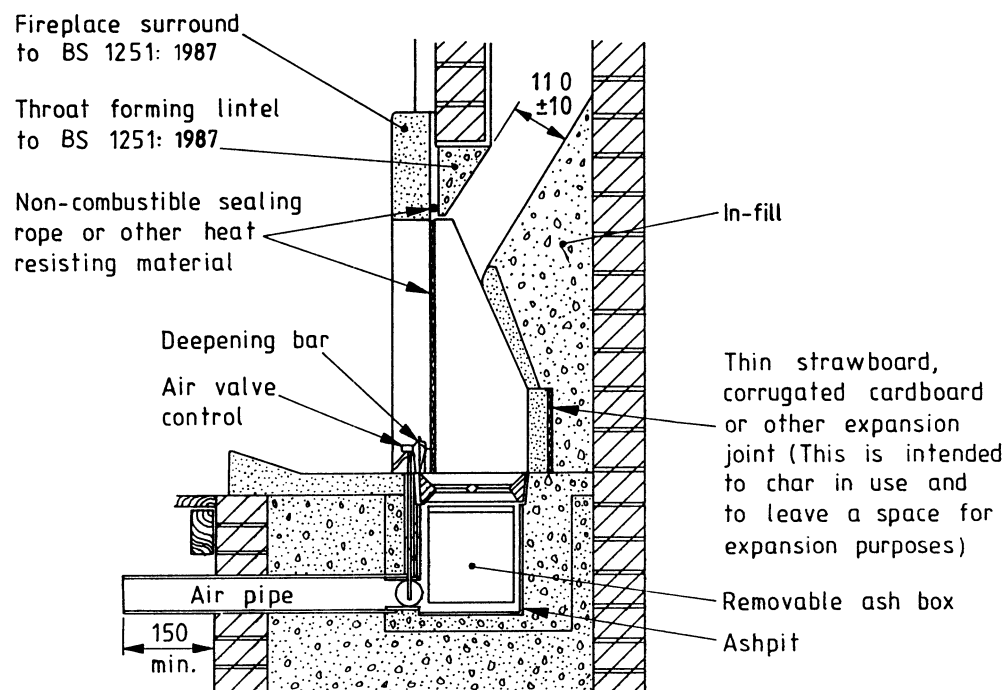
NOTE Further information is given in clause 10 of BS 8303-3:1994.





All dimensions in millimetres.

Figure 2 — Typical installation of inset open fire with a boiler unit



All dimensions in millimetres.

Figure 3 — Typical installation of a sunken ashpit inset open fire with underfloor air supply

Table 1 — Size of flues

Installation	Minimum flue size
Appliance in a fireplace recess with an opening up to 500 mm × 550 mm.	200 mm diameter or square section of equivalent area.
Closed appliance up to 20 kW rated output.	125 mm diameter or square section of equivalent area.
Closed appliance up to 20 kW rated output burning bituminous coal.	150 mm diameter or square section of equivalent area.
Closed appliance above 20 kW and up to 30 kW rated output.	150 mm diameter or square section of equivalent area.
Closed appliance above 30 kW and up to 45 kW rated output.	175 mm diameter or square section of equivalent area.
NOTE Should an offset be necessary in a flue run then the flue size should be increased by 25 mm on each dimension, diameter or each side of square flue.	

5.6 Energy economy and heat retention

The installation of the appliance shall be such that the amount of energy required in use, is kept to a minimum.

NOTE Further information is given in clause 11 of BS 8303-3:1994.

5.7 Materials and working life

The designer shall use durable materials, supported by relevant British Standards, British Board of Agreement Certificate or products bearing a CE mark as defined in the EC Construction Products Regulations [4].

NOTE This includes the requirement for an economically reasonable working life subject to normal maintenance and foreseeable operating criteria.

6 Appliance classification

The appliances covered by this standard are categorized¹⁾ as follows:

- a) open fires;
- b) roomheaters;
- c) freestanding cookers and independent boilers.

Appliances within these three main categories shall be further categorized for installation purposes as follows:

- 1) freestanding appliance: an appliance designed to operate anywhere within a building where a chimney can be provided;
- 2) inset appliance: an appliance, usually an open fire or a roomheater, that is designed to be built into and operate within a fireplace recess (see clause 7).

7 Fireplace recess

7.1 General

An appliance shall be installed in such a manner that its operation in proximity to combustible material does not result in a fire (see 5.4).

NOTE A fireplace recess is a means of satisfying this requirement.

Account shall be taken of the manufacturer's installation instructions for the appliance as well as the information obtained from the purchaser as detailed in clause 4.

7.2 Construction

Fireplace recesses shall either be of brick or block work construction or built from non-combustible prefabricated components.

NOTE 1 When the nominal size of the appliance is known the fireplace recess may be constructed to a width to accommodate the appliance and any infill that may be required.

When the size of the appliance is not known the recess shall be constructed to a maximum width of 840 mm (see Figure 4). The depth of a fireplace recess shall be 350 mm minimum excluding any surface finish except for any non-combustible treatment applied directly onto the front of the recess jambs.

Where the construction of the fireplace recess is of traditional brickwork the essential characteristics of Figure 4a shall be applied.

NOTE 2 This applies particularly in the forming of the gather from the top of the fireplace opening to the flue.

Where the top of the fireplace recess terminates in a raft lintel the essential characteristics of Figure 4(b) shall be applied.

The flue opening of the fireplace recess shall be reduced smoothly from the flue outlet of the appliance, or its flue pipe, to the chimney flue and the fireplace recess shall be of adequate height to allow for this. Where the type of appliance to be installed is not known the recess height shall be approximately 1 100 mm.

8 Hearth

8.1 General

A hearth shall be constructed such that the temperature under or adjacent to the hearth does not cause damage to or ignition of combustible material during the normal operation of the appliance.

NOTE Further information is given in clause 9.2 of BS 8308-3:1994.

8.2 Size of hearth

The size of the hearth shall be such that the proximity of the appliance to its edges will prevent damage to or ignition of other parts of the house e.g. carpet, walls or to any combustible material placed upon it.

NOTE Further information is given in clause 9.2 of BS 8303-3:1994.

9 Flue pipes

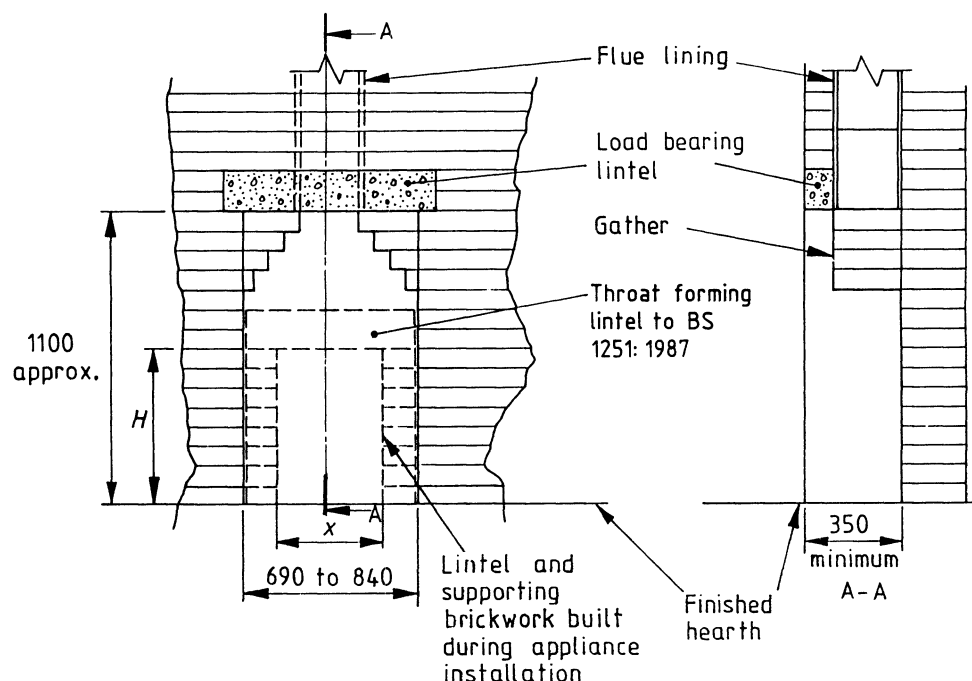
9.1 General

A flue pipe shall be used only to connect the appliance to the chimney. It shall serve only one appliance and not pass through any combustible wall or ceiling.

9.2 Size

The flue pipe internal diameter shall be not less than that of the appliance flue outlet.

¹⁾ Appliances are categorized under the Heating Equipment Testing and Approval Scheme. Full details are available from HETAS Ltd., P.O. Box 37, Bishop's Cleeve, Gloucestershire, GL52 4TB, Telephone No. 0242 673257.



NOTE. x is the opening to accommodate BS 1251 fireback. H is 0 mm to 10 mm greater than height of surround opening from finished hearth level.

a) Traditional brick construction.

Figure 4 — Construction of a fireplace recess

9.3 Material

A flue pipe shall be manufactured using material conforming to one of the following specifications:

- cast iron conforming to BS 41:1973; or
- low carbon steel conforming to a part of BS 6323:1982, with a wall thickness of at least 3 mm;
- stainless steel conforming to BS 1449-2:1983 for Grade 316 S11, 316 S13, 316 S16, 316 S31, 316 S33 or the equivalent Euronorm 88-71 [5] designation with a wall thickness of at least 1 mm, or equivalent UK gauge; or
- vitreous enamelled steel of low carbon content, coated internally and externally with acid-resistant enamel conforming to BS 6999:1989; or
- other materials shown to be no less suitable.

NOTE Further information is given in clause 12 of BS 8303-3:1994.

9.4 Bends

A flue pipe shall have no more than two bends each providing a maximum change of direction of 45°, except for a back outlet application using a 90° “T” piece in accordance with the manufacturer’s instructions. In this case the horizontal flue run from the back outlet of the appliance shall only be used to connect the appliance to a chimney or flue pipe and shall be not more than 150 mm in length. There shall not be a change of direction in the flue for at least 600 mm from the outlet of a top-outlet appliance unless the appliance is fan blown.

9.5 Cleaning

Any flue pipe shall be erected in such a way that it can be cleaned through its length without difficulty or causing damage to any part. A sealable cleaning door having a durable fixing shall be fitted if access cannot be achieved through the appliance or via a suitable soot door in the chimney that allows easy access to the flue pipe (see clause 10).