BRITISH STANDARD

BS 7566-4:1992
Incorporating
Corrigendum No. 1

This Standard is confirmed.
See the BSI Catalogue for details.
June 1998

Installation of factory-made chimneys to BS 4543 for domestic appliances —

Part 4: Recommendations for installation design and installation

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee B/506, Chimneys, to Subcommittee B/506/5, Chimneys and their components having inner linings of metal, upon which the following bodies were represented:

Association of British Solid Fuel Appliances Manufacturers

British Coal Corporation

British Combustion Equipment Manufacturers' Association

British Flue and Chimney Manufacturers' Association

British Gas plc

British Precast Concrete Federation Ltd.

British Steel Industry

Building Services Research and Information Association

Clay Pipe Development Association Limited

Department of the Environment

Department of the Environment (Construction Directorate)

Health and Safety Executive

Institute of Domestic Heating and Environmental Engineers

National Association of Plumbing, Heating and Mechanical Services Contractors

National Federation of Master Steeplejacks and Lightning Conductor Engineers

National House-building Council

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

Department of the Environment (Building Research Establishment)

Institute of Vitreous Enamellers

Real Fire Association

Society of British Gas Industries

Vitreous Enamel Development Council

This British Standard, having been prepared under the direction of Technical Committee B/506, was published under the authority of the Standards Board and comes into effect on 15 July 1992

The following BSI references relate to the work on this standard:
Committee reference B/506/5
Draft for comment 89/13385 DC

ISBN 0 580 20583 5

Amendments issued since publication

Amd. No.	Date	Comments
14210 Corr. No. 1	18 March 2003	Change to **9.1**

Contents

Foreword

This British Standard has been prepared under the direction of Technical Committee B/506 Chimneys, and together with Parts 1 to 3 of BS 7566 supersede BS 6461-2:1984 which is withdrawn.

This Part of BS 7566 covers the installation of factory-made chimneys complying with the requirements of BS 4543. Masonry chimneys are covered by BS 6461-1:1984.

BS 7566 is published in separate Parts in an attempt to highlight the interfaces involved in the successful specification, design and installation of factory-made chimneys.

Part 1 of BS 7566 gives a method of specifying the information which should be supplied by the purchaser to the installation designer.

Part 2 of BS 7566 specifies design instructions to be followed by the installation designer to take account of the purchaser's requirements and relevant standards, when developing an acceptable chimney design for the particular application.

Part 3 of BS 7566 specifies installation practices which are to be followed in order to ensure that the designer's intentions are satisfactorily realized and which reflect good site supervision and working practices.

This Part of BS 7566 gives guidance to the purchaser, designer and installer on the options which have to be identified and the methods of achieving specified requirements in a manner that will ensure a safe and satisfactory installation. It also gives important guidance on matters such as maintenance and cleaning.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its 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 7 and a back cover.

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1 Scope

This Part of BS 7566 gives guidance on the installation design and installation of factory-made chimneys complying with BS 4543. It also gives information on cleaning and maintenance of the chimney following installation.

2 Definitions

For the purposes of this Part of BS 7566 the definitions given in BS 4543-1 apply.

3 Openings into chimney flue

3.1 General

Where it is not possible to clean or inspect the chimney through the appliance it will be necessary to provide an opening into the chimney. This may be achieved by the use of an inspection length or a tee piece, from the chimney manufacturer's standard range (either 90° or 135° angle) (see Figure 1).

It may also be necessary to provide openings for:

a) access for cleaning and maintenance;

b) control of draught and the installation of a draught stabilizer;

c) use of instrumentation in the assessment of the appliance performance.

3.2 Locations

3.2.1 *Open fire*

For open fire installations access for cleaning and inspection is readily available through the fireplace opening. It is desirable where a chimney serving an open fireplace installation includes an offset that a means of access for cleaning and inspection is provided above the offset.

3.2.2 *Debris trap*

An opening for removal of debris or drainage should be through the base of a tee-piece section. This may also be needed as access for cleaning and inspection of any vertical section of chimney. It is important that this specially manufactured opening from the manufacturer's standard range is fitted with a lockable, sealable closure which may be in the form of a plug or cap (see Figure 1, item K or A).

3.2.3 *Tee-piece*

Any tee-piece, with its associated opening, should be sited so as to allow for the introduction of a sweep's brush and to provide easy access for inspection (see Figure 1, item H).

3.2.4 *Inspection sections*

Where monitoring is needed an inspection section incorporating the necessary probe holes on the closure plate should be incorporated in the chimney design. Insulated chimney sections should not be drilled or modified to provide access for monitoring equipment necessary to check the performance of any appliance.

4 Distance from combustible matter

A chimney complying with BS 4543 will include some form of insulation in its design and manufacture. However, when used in a confined space the outside surface of the chimney may become hot. BS 4543 requires the chimney manufacturer to specify a separation distance from the outside surface of the chimney to any combustible matter. This distance is referred to in BS 4543-1 as the manufacturers specified distance *X* mm.

NOTE The specified distance *X* mm is usually 50 mm.

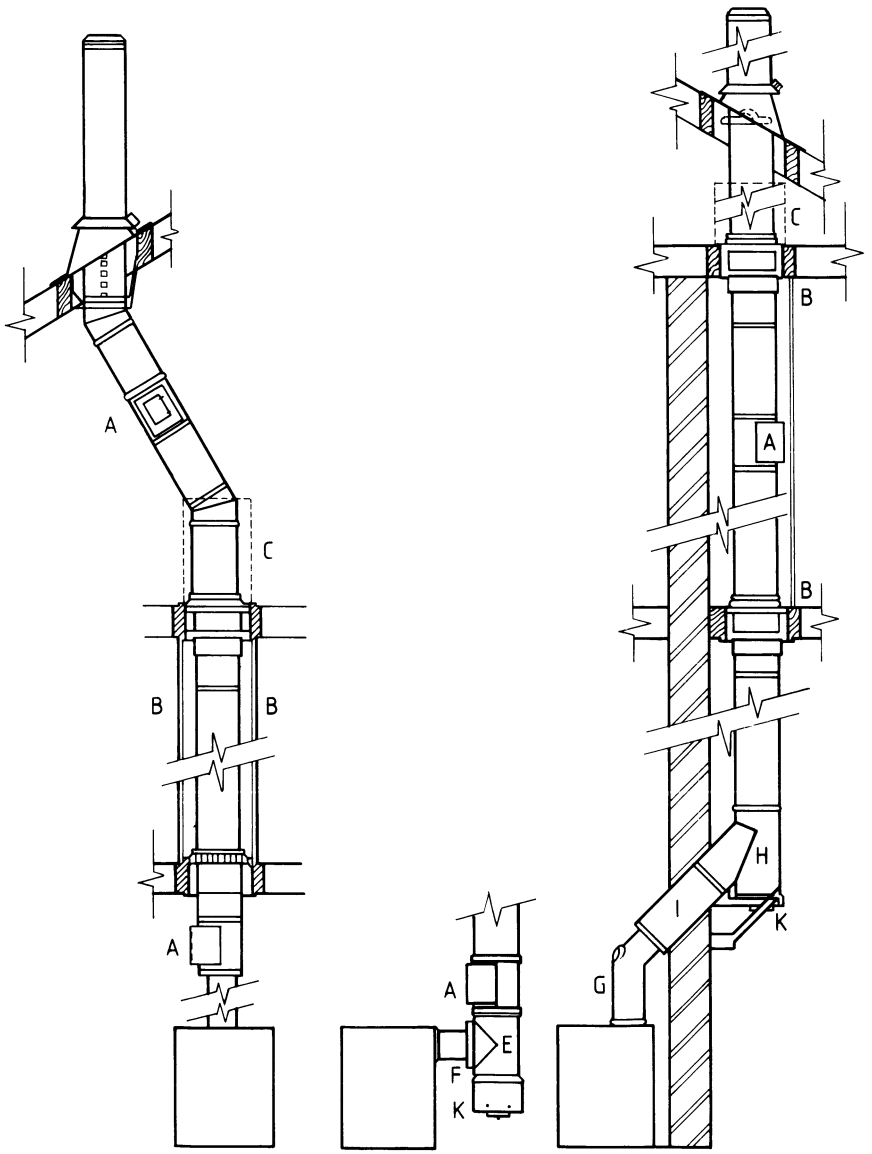
The chimney system manufacturers standard components include items such as fire-stops/spacers, which maintain this specified distance when the chimney passes through a floor or roof construction.

Where the chimney passes through a room or roof space, the chimney should be protected to prevent the accidental placing of combustible material within the specified distance *X* mm. This requirement is equally applicable where the chimney passes through an enclosure used as a storage cupboard.

A typical enclosure construction is wood studding with a 12 mm thick plasterboard and 3 mm plaster skim. It is important to maintain the specified distance *X* mm between the wood studding and the chimney. This enclosure should incorporate a removable panel to permit access for inspection.

In a loft space a wire mesh enclosure may be sufficient to prevent accidental contact from stored materials or the encroachment of loft insulation materials within the specified distance *X* mm. The mesh size should be small enough to prevent the passage of loft insulation.

It is essential that the specified distance *X* mm be maintained as an air gap and no attempt should be made to introduce insulating materials around the surface of the chimney.



a) Top outlet b) Back outlet c) Off-set through internal wall

Notes to Figure 1

The items shown in the figure are as follows.

Item A. Inspection length from manufacturer's standard range

This inspection opening may be used for cleaning and inspection when sited above an offset or above an appliance where there is no provision for flue cleaning through the appliance. Positioned above an appliance this section would permit the installation of a draft, stabilizer, if required.

Item B. Chimney enclosure (solid)

Plasterboard on studding set to maintain the manufacturer's specified distance *X* mm, as established in BS 4543-1.

Item C. Chimney enclosure (open)

Wire mesh on a rigid frame set to maintain the manufacturer's specified distance *X* mm and prevent accidental contact from stored materials or loft insulations, etc.

Item D. Chimney support/load bearing plate from manufacturer's standard range

Chimney support is used to prevent the chimney weight being supported by the appliance.

Item E. Tee-piece

90 °C insulated chimney tee-piece section from manufacturer's standard range used to connect flue pipe from back outlet appliance where access is available to debris trap.

Item F. Flue pipe connector

Flue pipe connector from back outlet appliance, not greater than 150 mm in length. Only suitable where there is adequate access for cleaning and maintenance.

Item G. Flue pipe connector

Flue pipe connector from top outlet appliance incorporating a cleaning eye. Where a draft stabilizer is required, it should be fitted on the flue pipe connector

Item H. Tee-piece

135° insulated chimney tee-piece section from manufacturer's standard range, used as change of direction piece.

Item I. Short section

Insulated chimney short section from manufacturer's standard range used to take chimney route through internal wall.

Item J. Sleeving

Sleeving supplied by the chimney manufacturer to give uninterrupted clearance around the chimney for expansion.

Item K. Debris trap

Insulated chimney section fitted with inspection cleaning plate or opening, for removal of debris and other cleaning purposes. This section may be fitted with a drainage point.

Figure 1 — Typical installations showing standard items

5 Stability of exposed sections

Where the chimney projects above the point of intersection with the roof, external lateral supports may be required. These supports should be fixed in accordance with the manufacturer's instructions. In the absence of manufacturer's recommendations where the chimney projects more than 1.8 m, external lateral supports should be provided.

Additional external lateral support may also be necessary for chimneys in areas prone to high winds (e.g. coastal areas and exposed high ground) as well as installations with a square shaped weathering/cladding which will have higher wind resistance than a round shape.

TV and radio aerials should not be attached to the chimney system.

6 Weatherproofing

Where the chimney manufacturer's preformed weatherproofing is provided the angle of the roof slope should be determined and only the correct manufacturer's component used for such purpose.

Where plumber's weatherproofing is manufactured on site, the roof slate and upstand should be designed and formed to suit the particular slope and application by agreement with the chimney manufacturer.

The weatherproofing, or roof slate and upstand, should be made of any non-combustible material and of a slate size to match the roof slates or tiles.

NOTE Proprietary flexible and adjustable roof slates commonly used on vent pipes are not considered suitable for use with solid fuel burning appliances.

7 Chimney flue outlets

7.1 General

Rain caps are not recommended for use on solid fuel installations. Their presence will. increase flow resistance and their upper surfaces, exposed to ambient conditions, provide chilled surfaces that encourage the formation of aggressive condensates. An unimpeded exhaust encourages good plume rise. In some instances, a terminal incorporating a spark guard may be demanded to reduce fire hazard. In such cases, regular cleaning is essential to prevent accumulation of material which could ignite and create a greater hazard than would be realized if no such device were used.

For oil burning installations, a rain cap may be included; again there is a considerable corrosion risk and regular inspection is recommended.

For gas burning installations, a flue terminal is required and this should comply with section 5 of BS 715:1989.

Flue terminal devices can be used to provide noise attenuation, generally where wind aspiration effects are causing annoyance. Where a flue terminal is used, consideration should be given to the need for ease of removal to allow for cleaning and inspection.

7.2 Anti-downdraught terminals

The use of so-called anti-downdraught terminals is not recommended.

8 Flue pipe materials

All materials and components used have to comply with the relevant British Standard given in Appendix A of BS 7566-2:1992. The types of flue pipe materials listed have either been shown to be satisfactory in use over a long period of time or have been subjected to a programme of tests for performance given in the relevant British Standards. Where materials, systems or components other than those listed are recommended as suitable, the designer should establish the ability to maintain the long-term integrity of the flue pipe, the resistance to acid attack and the ability to withstand temperatures up to 1 100 °C.

9 Cleaning and maintenance

9.1 General

The efficiency and the safety of a chimney is dependent on correct and regular cleaning in accordance with the manufacturer's instructions.

Inspection of the chimney is necessary to determine the frequency of sweeping required.

Even with regular inspection of the chimney, to check for a build-up of deposits and a regular programme of sweeping to deal with these, minor chimney fires are still a possibility.

Under no circumstances should the heating appliance be used to incinerate household waste. Incinerating waste materials can produce acids, which will, given the right circumstances of flue gas temperatures, attack the materials of construction of the appliance and the stainless steel inner liner of the chimney.

The correct and thorough cleaning of the chimney should be undertaken only by a competent chimney sweep.

9.2 Mechanical cleaning

Mechanical cleaning is the only recommended method of cleaning a factory-made chimney using the manufacturer's recommended bristle brushes sized to suit the chimney.

9.3 Maintenance

The chimney should be inspected at least once a year to see that the construction materials are in good condition. Particular attention should be paid to terminals, flashings and exposed sections. All inspection openings should be checked and debris traps cleaned. Any component showing signs of deterioration should be replaced under professional advice and any evidence of leakage identified by smoke staining should be investigated and rectified.

10 Lightning protection

10.1 Lightning conductors

10.1.1 *General*

All chimneys to BS 4543 serving buildings which have lightning conductors should be bonded in accordance with BS 6651.

The installation of a chimney to BS 4543 may result in a need to provide a purpose designed lightning conductor to serve the building and in such cases the recommendations of BS 6651 should be observed.

Where the chimney projects above the roof from the point of penetration, by more than 4.5 m it should be served by a lightning conductor or lightning conductor system in accordance with BS 6651.

10.1.2 *Specific considerations*

Consideration should be given to the following.

a) *Dwellings.* Lightning conductors are generally recommended or necessary for dwellings, without steel framework, when located in rural areas and especially when built upon high ground.

This recommendation applies to buildings which are of either:

1) a volume greater than 400 m^3; or

2) brick or timber frame construction (without steel framework) with a non-metallic roof construction.

b) *Special cases.* Consideration should also be given to the provision of lightning conductors where chimneys are to be installed in any building having a high occupancy or containing valuable or dangerous materials and equipment.

10.2 Earth bonding

Consideration should be given to the earth bonding of all chimneys to BS 4543 in accordance with BS 6651.

An external earth electrode having an earth connection to at least 1 m depth or ring earth should be provided in accordance with BS 6651.

It is essential that any earth bonding to serve a chimney or chimney flue is not connected to any existing water, drainage or similar services.

Appendix A Chimney design for fireplaces having non-standard openings

Fireplaces are essentially air movers. Small amounts of heated gas (combustion products) are diluted with large amounts of air. The flow of air into the fireplace opening is not only limited but actually diminishes past a certain maximum, despite further rise in mean overfire gas temperature, and is regulated by the chimney size and height. The mean flow velocity into a fireplace frontal opening can be considered as practically constant above 150 °C flue gas temperature rise. It follows that fireplace performance is relatively a matter of geometry. Laboratory tests indicate that smoking is controlled if the frontal inlet velocity is 0.25 m/s or more.

Publication(s) referred to

BS 715, *Specification for metal flue pipes, fittings, terminals and accessories for gas-fire appliances with a rated input not exceeding 60 kW.*

BS 4543, *Factory-made chimneys.*

BS 6461, *Installation of chimneys and flues for domestic appliances burning solid fuel (including wood and peat.*[1)]

BS 6461-1, *Code of practice for masonry chimneys and flue pipes.*

BS 6651, *Code of practice for protection of structures against lightning.*

BS 7566, *Installation of factory-made chimneys to BS 4543 for domestic appliances.*

BS 7566-1, *Method of specifying design installation information.*

BS 7566-2, *Specification for installation design.*

BS 7566-3, *Specification for site installation.*

[1)] Referred to in foreword only.

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