



BSI Standards Publication

Chimneys, flue pipes and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases)

Part 2: Installation and maintenance of ventilation provision
for gas appliances – Specification

Publishing and copyright information

The BSI copyright notice displayed in this document indicates when the document was last issued.

© The British Standards Institution 2023

Published by BSI Standards Limited 2023

ISBN 978 0 539 25168 5

ICS 91.060.40

The following BSI references relate to the work on this document:

Committee reference GSE/30

Draft for comment 23/30466572 DC

Amendments/corrigenda issued since publication

Date

Text affected

Contents

	Page
Foreword	III
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
<i>Figure 1 — Typical air vent arrangements</i>	2
4 Competence	5
5 Design and materials for air vents and ducts	5
5.1 Design	5
<i>Table 1 — Minimum separation distances between air vents and appliance terminals</i>	7
5.2 Materials	8
5.3 Intumescent air vents	8
5.4 Fire-rated compartments	8
6 Equivalent free area	9
6.1 General	9
6.2 Room-sealed appliances installed in an appliance compartment	9
<i>Table 2 — Minimum air vent equivalent free area for appliance compartments: room-sealed appliances</i>	9
6.3 Open-flued appliances	10
<i>Table 3 — Minimum air vent equivalent free area for appliance compartments: open-flued appliances</i>	11
6.4 Flueless appliances	12
<i>Table 4 — Minimum permanent opening equivalent free area for flueless appliances</i>	12
6.5 Multi-appliance installations	13
7 Positioning of air vents	14
7.1 Air vents direct to outside	14
7.2 Air vents not communicating directly with outside air	14
<i>Figure 2 — Roof space terminal</i>	15
7.3 Air vents in series	15
<i>Figure 3 — Air vents in series</i>	15
7.4 Room-sealed appliances	17
<i>Figure 4 — Air vent positions for a room-sealed appliance in an appliance compartment, room and internal space</i>	17
7.5 Open-flued appliances	18
<i>Figure 5 — Air vent positions for an open-flued appliance in a room or internal space</i>	19
<i>Figure 6 — Air vent positions for an open-flued appliance in an appliance compartment</i>	21
<i>Figure 7 — Examples of incorrect air vent positions for an open-flued appliance in an appliance compartment</i>	23
8 Other aspects of ventilation	23
8.1 Effect of fans	23
8.2 Passive stack ventilation	24
8.3 Radon gas	24
8.4 Internal kitchens	24
9 Maintenance	24
Annex A (normative) Existing proprietary air vents and non-proprietary air vents	25
<i>Figure A.1 — Equivalent free areas</i>	26
Bibliography	27

Summary of pages

This document comprises a front cover, an inside front cover, pages I to IV, pages 1 to 28, an inside back cover and a back cover.

Foreword

Publishing information

This part of [BS 5440](#) is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 December 2023. It was prepared by Technical Committee GSE/30, *Gas installations (1st, 2nd and 3rd family gases)*. A list of organizations represented on this committee can be obtained on request to the committee manager.

Supersession

This part of [BS 5440](#) supersedes [BS 5440-2:2009](#), which is withdrawn.

Relationship with other publications

[BS 5440](#), *Chimneys, flue pipes and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases)*, is published in two parts:

- Part 1: *Design, installation, commissioning and maintenance of chimneys – Specification*;
- Part 2: *Installation and maintenance of ventilation provision for gas appliances – Specification*.

Information about this document

This is a full revision of the document, and introduces the following principal changes:

- updated in line with recent changes in building legislation, in particular, Approved Document F [1] and Approved Document J [2];
- updated flueing and ventilation installation practices to reduce occurrences of carbon monoxide (CO) related incidents attributable to flueing and ventilation for gas appliances; and
- incorporated, where necessary, additional requirements and guidance previously covered within Technical Bulletins.

BS 5440-2 allows manufacturers' instructions to specify a method of installation, testing, commissioning or maintenance which differ from this standard. This reference to manufacturers' instructions is allowed only where it results in at least an equivalent level of safety. In such circumstances, it is important that the manufacturer's instructions are followed.

This publication can be withdrawn, revised, partially superseded or superseded. Information regarding the status of this publication can be found in the Standards Catalogue on the BSI website at bsigroup.com/standards, or by contacting the Customer Services team.

Where websites and webpages have been cited, they are provided for ease of reference and are correct at the time of publication. The location of a webpage or website, or its contents, cannot be guaranteed.

Use of this document

It has been assumed in the preparation of this part of BS 5440 that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

This document is to be used in conjunction with relevant geographical industry standards and building regulations, e.g. Approved Documents.

Presentational conventions

The provisions of this document are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Requirements in this document are drafted in accordance with the *Rules for the structure and drafting of UK standards:2022*, subclause **G.1.1**, which states, “Requirements should be expressed using wording such as: ‘When tested as described in Annex A, the product shall ...’”. This means that only those products that are capable of passing the specified test will be deemed to conform to this document.

Where words have alternative spellings, the preferred spelling of the *Shorter Oxford English Dictionary* is used (e.g. “organization” rather than “organisation”).

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient’s own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

In particular, attention is drawn to the following specific regulations:

- The Gas Appliances (Safety) Regulations 1995 [3]
- The Gas Safety (Installation and Use) Regulations 1998 [4]
- The Gas Safety (Installation and Use) Regulations 1994, as amended and applied by the Isle of Man Gas Safety (Application) Order 1996 [5]
- The Gas Safety (Installation and Use) (Northern Ireland) Regulations 2004 [6]
- The Health and Safety (Gas) (Guernsey) Ordinance 2006 [7]
- The Control of Asbestos Regulations 2012 [8]
- The Building Regulations 2010 [9]
- The Building Regulations (Scotland) 2004 [10]
- The Building Regulations (Northern Ireland) 2012 [11]

1 Scope

This part of [BS 5440](#) specifies the requirements for the installation and maintenance of ventilation provision relating to gas appliances utilizing 1st, 2nd or 3rd family gases, with a rated heat input not exceeding 70 kW based on net CV (calorific value), used for domestic or non-domestic purposes.

NOTE 1 The Institution of Gas Engineers and Managers Standard IGEM/UP/10 covers instances where an appliance installation (not exceeding 70 kW net heat input) is associated with other appliances where the total net heat input exceeds 70 kW.

This standard does not cover:

- a) gas installations in touring caravans, leisure accommodation vehicles or residential park homes;
- b) decorative fuel effect gas appliances covered by [BS 5871-3](#);
- c) cooking appliance installations in catering or educational establishments; or
- d) hydrogen-only appliances.

NOTE 2 This part of [BS 5440](#) can also be used for installations of gas appliances which are not required to carry the CE or UKCA/UKNI mark, such as previously used or second-hand appliances.

NOTE 3 Maintenance requirements relating to existing vents are specified in [Clause 9](#).

NOTE 4 Prior to 2000, manufacturer's heat input was typically quoted in gross.

NOTE 5 The ratio of gross:net heat input is approximately 1.11:1 for natural gas, 1.09:1 for propane and 1.08:1 for butane. For example, 9 kW input based on gross CV for natural gas is converted to the equivalent net CV input as follows:

$$\text{Net input} = 9.0/1.11 = 8.1 \text{ kW.}$$

While the conversion of rated input between gross and net values strictly depends on the CV of gas used, in practical terms, a common factor 1.1 has been used.

NOTE 6 [BS 6173](#) covers requirements for the installation and maintenance of gas-fired catering appliances for use in all types of catering establishments (2nd and 3rd family gases). Further information for the catering environment can be found in DW 172, Specification for kitchen ventilation systems [[12](#)], and CAIS 23, Gas safety in catering and hospitality [[13](#)].

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions, or limits the application, of this document¹⁾. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

[BS 5871-1](#), Specification for the installation and maintenance of gas fires, convector heaters, fire/back boilers and decorative fuel effect gas appliances – Part 1: Gas fires, convector heaters, fire/back boilers and heating stoves (1st, 2nd and 3rd family gases)

[BS 5871-2](#), Specification for the installation and maintenance of gas fires, convector heaters, fire/back boilers and decorative fuel effect gas appliances – Part 2: Inset live fuel effect gas fires of heat input not exceeding 15 kW, and fire/back boilers (2nd and 3rd family gases)

[BS 5871-3](#), Specification for the installation and maintenance of gas fires, convector heaters, fire/back boilers and decorative fuel effect gas appliances – Part 3: Decorative fuel effect gas appliances of heat input not exceeding 20 kW (2nd and 3rd family gases)

¹⁾ Documents that are referred to solely in an informative manner are listed in the Bibliography.