

Technical Bulletin 005(A)

Developed with Communities and Local Government

Title: Gas cookers in internal kitchens - Ventilation requirements as applied to England, Wales, the Isle of Man and Guernsey

Date issued: 1 July 2015

Note: This version of Technical Bulletin (TB) 005 replaces the version originally published 15 October 2010 which is now withdrawn. This version has been reviewed and updated in line with BS 5440-2: 2009 and Approved Document 'F' 2010 of the Building Regulations and applies particularly to installations in England, Wales, the Isle of Man and Guernsey.

This Technical Bulletin provides guidance to Gas Safe registered businesses/engineers on the ventilation requirements for gas cooking appliances located in 'internal' kitchens and those kitchens which are now regarded as 'internal' following modifications to the building and applies particularly to England, Wales, the Isle of Man and Guernsey

Background

This Technical Bulletin (TB) is intended to provide guidance on the ventilation requirements of gas cooking appliances located in internal kitchens and those kitchens which have now become internal due to modifications to the building e.g. due to the addition of a conservatory, or building extension and applies particularly to the requirements for England, Wales, the Isle of Man (IOM) and Guernsey.

Note 1: For details on the ventilation requirements Gas cookers in internal kitchens in Scotland see [TB 005\(B\)](#) and for Northern Ireland, see [TB 005\(C\)](#).

Note 2: For a list of definitions used in relation to this TB see page 4.

Ventilation requirements

The ventilation requirements for gas cookers/hobs can be found in the current British Standard (BS) 5440-2⁽¹⁾ and in particular, Table 6 – *Minimum permanent opening free-area for flueless appliances* – gives the ventilation recommendations for gas cooking appliances. Part of the Table relevant to gas cooking appliances is reproduced below.

Type of appliance	Maximum appliance rated input limit (net)	Room volume (m ³)	Permanent vent size cm ²	Openable window or equivalent also required ^{(A) (B)}
Domestic oven, hotplate, grill or any combination thereof ^(C)	None	<5	100	Yes
		5 to 10	50 ^(D)	
		>10	Nil	
(A) Alternative acceptable forms of opening include any adjustable grille or louvre, hinged panel or other means of ventilation that opens directly to the outside air. This is additional to the permanent vent requirement. (B) Where no openable window direct to outside is available, other products shall be sought (see 7.4) Building Regulations advice should be followed, see 7.4 (Note: clause 7.4 is reproduced below). (C) The appliance, unless a single burner hotplate/boiling ring, shall not be installed in a bedsitting room of less than 20m³ volume. (D) If the room or internal space containing these appliances has a door which opens directly to the outside, no permanent opening is required.				

Note 3: Where appropriate, the requirements of BS 5440-2⁽¹⁾ Clause 6.6 – **Multi-appliance installations** – should also be taken into consideration.

Clause 7.4 of BS 5440-2: 2009⁽¹⁾ states:

“7.4 Internal kitchens

Open-flued appliances in internal kitchens shall be provided with ventilation in accordance with 6.3. Flueless appliances in internal kitchens shall be ventilated in accordance with Table 6.”

For further information, ‘Commentary’ on clause 7.4 to BS 5440-2⁽¹⁾ directs the reader to Approved Document ‘F’⁽²⁾ (ADF⁽²⁾) to the Building Regulations for England and Wales and Gas Safe Register Technical Bulletin (TB) 005.

Note 4: The current ventilation provision for dwellings in England and Wales can be found in ADF 2010 of the Building Regulations England and Wales. In the case of the Isle of Man and Guernsey, the respective Government websites direct the reader to the ‘Approved Documents’ (ADs) for Building Regulations in England and Wales for specific guidance. However, it should be noted that the Isle of Man and Guernsey may not always apply the requirements of the latest published ADs. It may be appropriate to contact Local Building Control for further guidance.

Note 5: For details of current gas safety legislation, building legislation and industry standards for the geographical areas covered by Gas Safe Register, see the [Legislative, Normative & Informative Document List \(LNIDL\)](#)⁽³⁾ at: <https://www.gassaferegister.co.uk/sign-in/> - login and visit the Technical Information area.

In addition to the ventilation requirements for combustion air, there is a need for the provision of ventilation, including purge ventilation (previously termed rapid ventilation) in dwellings. Purge ventilation is provided to aid removal of high concentrations of pollutants and water vapour released from activities such as painting, cooking, etc.

Building legislation – Approved Document F (ADF⁽²⁾) Ventilation (2010 edition)

Building Regulations for England and Wales – ADF⁽²⁾ – Clause 5.5 states:

“Extract ventilation to outside is required in each kitchen, utility room and bathroom and for sanitary accommodation. The extract can be either intermittent or continuously operating. The minimum extract air flow rates at the highest and lowest settings should be no less than in Table 5.1a.

Clause 5.6 of ADF⁽²⁾ states:

The whole dwelling ventilation rate for the supply of air to the habitable rooms in a dwelling should not be less than specified in Table 5.1b.”

The relevant parts of Tables 5.1a and 5.1b in ADF⁽²⁾ are reproduced in [Table 1](#) and [Table 2](#) below.

Table 1

Room	Minimum intermittent extract rate	Continuous extract	
		Minimum high rate	Minimum low rate
Kitchen	30 l/s (adjacent to hob) or 60 l/s elsewhere	13 l/s	Total extract rate must be at least the whole building ventilation rate in Table 2.

Table 2

Whole building ventilation rates					
Whole building ventilation rate l/s ^(a) ^(b)	Number of bedrooms in dwelling				
	1	2	3	4	5
	13	17	21	25	29

Notes to Table 2:

- (a) *In addition, the minimum ventilation rate should not be less than 0.3 l/s per m² of the internal floor area (this includes each floor e.g. for a two storey building, add the ground and first floor areas).*
- (b) *This is based on two occupants in the main bedroom and a single occupant in all other bedrooms. This should be used as the default value. If a greater level of occupancy is expected, then add 4 l/s per occupant.*

Clause 5.7 of ADF⁽²⁾ advises that purge ventilation provision is required in each habitable room and should be capable of extracting a minimum of 4 air changes per hour per room directly to outside. Generally, openable windows or doors can provide this function, otherwise a mechanical extract system should be provided. In other rooms (e.g. kitchens and bathrooms) the mechanical or passive stack extract provisions should be sufficient, although passive stack ventilation will take longer to purge the room.

Use of extract fans to achieve purge air requirements for gas cookers

If the kitchen has no external walls, the ventilation provision (background and purge) should be via an intermittent mechanical extraction fan. The extract fan rate should be a minimum of 30 l/s where the fan is located above the hob and 60 l/s if the fan is located elsewhere in the kitchen. Intermittent extract can be operated manually and/or automatically by a sensor (e.g. humidity sensor, usage sensor, etc.). In kitchens, any automatic control should provide sufficient flow during cooking with fossil fuels to avoid the build up of combustion products.

Any automatic control should provide a manual over-ride to allow the occupant to turn the extract system on. The fan should have a 15 minute over-run facility. In rooms with no natural light the fan may be controlled by the operation of the main light switch.

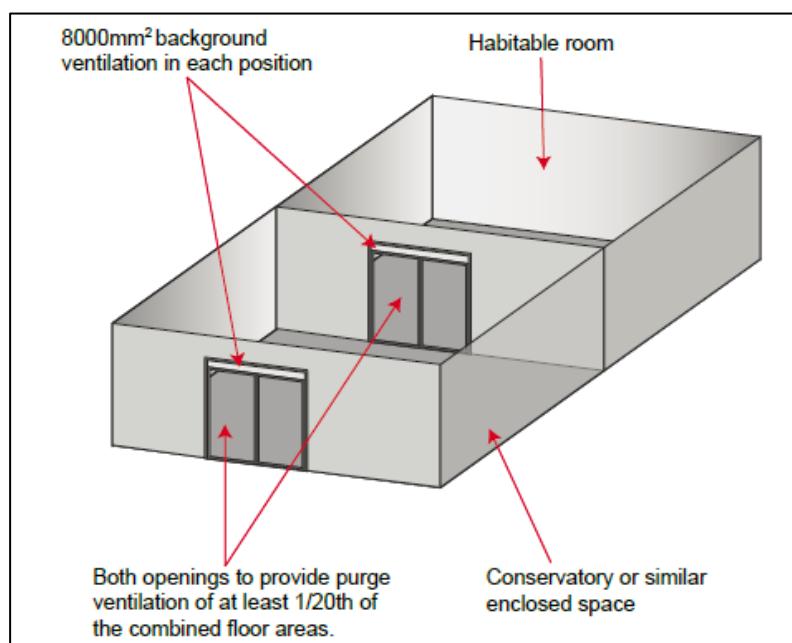
If the extraction is via a cooker hood, it should be installed paying due regard to both the hood and cooker manufacturer's installation instructions. Mechanical extract terminals and extract fans should be placed as high as practicable but preferably within 400mm of the ceiling.

Note 6: For further guidance on the effects of extract fans on open flued appliances, see [TB 095^{\(4\)}](#), which can be viewed at: <https://www.gassaferegister.co.uk/sign-in/> - login and visit the Technical Information area.

To ensure good air transfer throughout the dwelling, there should be an undercut equivalent to a minimum area of 7600mm² in all internal doors above the floor finish, between the internal kitchen, adjoining room and outside air **above the floor finish**, e.g. an undercut of 10mm from a standard width 760mm door above the floor finish, or by 20mm undercut above floorboards, or other surface if the finish (e.g. carpet/tiles etc.) has not been fitted.

Building extensions/conservatory installations

In the event that a building extension or conservatory is added to a dwelling and in the absence of intermittent extraction as described above, the general ventilation rate for the building extension or conservatory and where necessary the kitchen behind, can also be achieved by the use of background ventilators in the following manner:



- a) Purge ventilation via openable doors windows or similar to outside air with a total opening area equivalent to 1/20th the total combined floor area of the kitchen and building extension/conservatory;

and

- b) Background ventilation (trickle vents) of at least 8000mm² which are closable and located at least 1.7m above the floor.

Note 7: See diagram opposite for the method of providing ventilation to an internal kitchen through a conservatory.

Passive stack ventilation

Alternatively, guidance given in ADF⁽²⁾ (Table 5.2b) explains that an open-flued appliance may provide sufficient extract ventilation for the room in which it is located when in operation via its chimney/flue system acting as a form of 'Passive Stack Ventilation' (PSV) and can be arranged to provide sufficient ventilation when not firing. It is essential that the recommendations of BS 5440-2⁽¹⁾ are complied with. ADF⁽²⁾ explains that the provisions **may** be adequate in the case of:

- a) A solid-fuel open-flued appliance installed in the internal kitchen is the primary source of heating, cooking or hot water; or
- b) Where there is an open-flued appliance (e.g. gas-fired, oil-fired), which has a chimney/flue system with a free area equivalent to 125mm diameter and the appliance's combustion air inlet (e.g. air vent) and dilution inlet (e.g. draught diverter) are permanently open, i.e. there is a path with no control dampers which could block the flow or ventilation path and can be left open when the appliance is not in use.

Note 8: For further guidance on PSV systems, see TB 057⁽⁵⁾, which can be viewed at: <https://www.gassaferegister.co.uk/sign-in/> - login and visit the Technical Information area.

Additional guidance

A flowchart has been developed (see Appendix 1) to provide guidance to Gas Safe registered businesses/engineers when assessing the safety of gas cooking appliances located within internal kitchens in relation to the requirements of the primary legislation concerning the safe installation, maintenance and use of gas systems and appliances, (e.g. in Great Britain (GB) – the Gas Safety (Installation and Use) Regulations (GSIUR)) – in particular regulation 26(9) of GSIUR and also the current Gas Industry Unsafe Situations Procedure (GIUSP).

Note 9: Similar legislative requirements apply in other geographical areas covered by Gas Safe Register (see also Note 5).

Note 10: The GIUSP (IGEM/G/11⁽⁶⁾) can be viewed at: <https://www.gassaferegister.co.uk/sign-in/> - login and visit the Technical Information area.

ADF⁽²⁾ 2010 also calls up the 'Domestic Ventilation Compliance Guide⁽⁷⁾' which is designed to help persons comply with the requirements of ADF⁽²⁾. Where appropriate, further help and advice on the suitability of the ventilation provision should be sought from the local building control body.

Definitions of terms used in this Technical Bulletin

Background ventilator: is defined in ADF⁽²⁾ as "a small ventilation opening designed to provide controllable whole building ventilation".

Habitable room: is defined in ADF⁽²⁾ as "a room used for dwelling purposes but which is not solely a kitchen, utility room, bathroom cellar or sanitary accommodation".

Internal kitchens: In relation to this TB, examples include but are not limited to:

- where there is no door, openable window, or equivalent to direct to outside air;
- where there is no opening communicating directly with the outside air because all walls are internal, e.g. no walls are in direct contact with outside air, such as in residential flats;
- where a conservatory, or building extension has been 'built over' the only wall of a kitchen communicating with outside air, such as in a terraced property.

Outside air: can be hard to define at times and the person carrying out the inspection should treat each case on its own merits. As an example, a ventilation route is taken through an exterior wall; however, a car port has since been constructed over the ventilation termination. There are gates at either end of the car port which fills 75% of the end space. The roof to the car port is corrugated but the gaps under the corrugations have not been filled. The air in this case may be considered as outside air, as the space cannot be realistically described as overtly enclosed.

Passive stack ventilation (PSV): is a ventilation device using ducts from terminals in the ceiling of rooms, to terminals on the roof that extract air to outside by a combination of natural stack effect and

the pressure effects of wind passing over the roof of the building. Open-flued systems such as those utilised by gas appliances operate in a similar manner.

Purge ventilation: is defined in ADF⁽²⁾ as “manually controlled ventilation of rooms or spaces at a relatively high rate to rapidly dilute pollutants and/or water vapour. Purge ventilation may be provided by natural means (e.g. an openable window) or by mechanical means (e.g. a fan).”

Note 11: For general information about the process behind the development of Gas Safe Register Technical Bulletins and the expectations for all Stakeholders, see [TB 1000^{\(8\)}](#) at: <https://www.gassaferegister.co.uk/sign-in/> - login and visit the Technical Information area.

Bibliography

- (1) BS 5440-2: 2009 – Flueing and ventilation for gas appliances of rated input not exceeding 70kW net (1st, 2nd and 3rd family gases) – Specification for installation and maintenance of ventilation provision for gas appliances
- (2) Approved Document 'F' (ADF) – Means of ventilation: http://www.planningportal.gov.uk/uploads/br/BR_PDF_ADF_2010.pdf
- (3) LNIDL - Gas Safe Register Legislative, Normative & Informative Document List
- (4) TB 095 - Effect of mechanical fans on open-flued appliances
- (5) TB 057 - Passive stack ventilation
- (6) IGEM/G/11- The Gas Industry Unsafe Situations Procedure
- (7) Domestic Ventilation Compliance Guide: http://www.planningportal.gov.uk/uploads/br/domestic_ventilation_compliance_guide_2010.pdf
- (8) TB 1000 – An introduction to Gas Safe Register Technical Bulletins

Note: Gas Safe Register Technical Bulletins and the Legislative, Normative & Informative Document List can be viewed at: <https://www.gassaferegister.co.uk/sign-in/> - login and visit the Technical Information area

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Appendix 1 - Ventilation requirements for flueless gas cooking appliances in internal kitchens as applied to England, Wales, Isle of Man and Guernsey

