MAIN CHANGES IN THE 1992 EDITION

This edition of the Approved Document F, Ventilation, replaces the 1989 edition. The main changes are:

Ventilation of kitchens: an amendment has been inserted regarding the provision of mechanical extract ventilation in kitchens with an open-flued appliance.
VENTILATION

APPROVED DOCUMENTS

The documents in this publication have been approved by the Secretary of State as practical guidance to meeting the requirements of Parts F1 and F2 of Schedule 1 to the Regulations.

The detailed provisions in the approved documents are intended to provide guidance for some of the more common building situations. Alternative ways of demonstrating compliance may be appropriate in other circumstances.

There is no obligation to adopt any particular solution in the document if you prefer to meet the relevant requirement in some other way.

If a contravention of a requirement is alleged then, if you have followed the guidance in the document, that will be evidence tending to show that you have complied with the Regulations. If you have not followed the guidance then that will be evidence tending to show that you have not complied. It will then be for you to demonstrate by other means that you have satisfied the requirement.

Other requirements

The guidance relates only to the requirement given at the start of each document. The building work will have to comply also with the requirements of any other relevant paragraphs in Schedule 1 to the Regulations. There are Approved Documents which give guidance on the other requirements in Schedule 1.

Materials and Workmanship

Any building work to which a requirement of the regulations applies must, in accordance with Regulation 7, be carried out with proper materials and in a workmanlike manner. You may show that you have complied with this requirement in a number of ways, for example by following an appropriate British Standard or British Board of Agrément Certificate or by the appropriate use of a product bearing a CE mark as defined in the Construction Products Directive (89/106/EEC). You will find further guidance in the Approved Document on Materials and Workmanship.

European technical specifications,
British Standards and British Board of Agrément Certificates

When a document makes reference to a named Standard, the relevant version of the Standard is the one listed at the end of the publication.

Building Regulations are made for specific purposes; health and safety, energy conservation and the welfare and convenience of disabled people. European Technical Specifications (as defined in the Construction Products Directive), British Standards and Agrément Certificates are relevant guidance to the extent that they relate to these considerations. The Specifications, Standards and Certificates themselves may address, also, other aspects of performance such as serviceability or aspects which although they relate to health and safety are not covered by the regulations.

The Secretary of State has agreed with the British Board of Agrément on the aspects of performance which they need to assess in preparing their Certificates in order that the Board may demonstrate the compliance of a product or system, which has an Agrément Certificate, with the requirements of the regulations. An Agrément Certificate issued by the Board under these arrangements will give assurance that a product or system to which the Certificate relates, if properly used in accordance with terms of the Certificate, will meet the relevant requirements. Similarly, the appropriate use of a product which complies with a European technical approval as defined in the Construction Products Directive will also meet the relevant requirements.

Approved documents

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
</tr>
<tr>
<td>F2</td>
</tr>
</tbody>
</table>
MEANS OF VENTILATION

Building Regulations – the Requirement

This Approved Document which takes effect on 1st April 1990 deals with the following Requirement from PART F of Schedule 1 to the Building Regulations 1991:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Limits on application</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Means of ventilation</strong></td>
<td></td>
</tr>
<tr>
<td>F1. There shall be adequate means of ventilation provided for people in the building.</td>
<td>This requirement applies only to: (a) dwellings; (b) the spaces within any building containing two or more dwellings which are used solely or principally with those dwellings; (c) rooms containing sanitary conveniences; (d) bathrooms.</td>
</tr>
</tbody>
</table>

Contents

<table>
<thead>
<tr>
<th>Contents</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>3</td>
</tr>
<tr>
<td>Introduction to provisions</td>
<td>3</td>
</tr>
<tr>
<td>Ventilation of habitable rooms</td>
<td>3</td>
</tr>
<tr>
<td>Ventilation of kitchens in dwellings</td>
<td>3</td>
</tr>
<tr>
<td>Ventilation of common spaces in</td>
<td>4</td>
</tr>
<tr>
<td>buildings containing two or more</td>
<td></td>
</tr>
<tr>
<td>dwellings</td>
<td></td>
</tr>
<tr>
<td>Ventilation of bathrooms</td>
<td>4</td>
</tr>
<tr>
<td>Ventilation of sanitary accommodation</td>
<td>4</td>
</tr>
<tr>
<td>Ventilation of habitable rooms through other rooms and spaces</td>
<td>4</td>
</tr>
<tr>
<td>Ventilating to a restricted external air space</td>
<td>5</td>
</tr>
<tr>
<td>Alternative approaches</td>
<td>5</td>
</tr>
</tbody>
</table>
**Guidance**

**PERFORMANCE**

In the Secretary of State’s view the requirement of F1 will be met if ventilation is provided which under normal conditions is capable, if used, of restricting the accumulation of such moisture (which could lead to mould growth) and pollutants (originating within a building) as would otherwise become a hazard to the health of people in the building.

In order to encourage its use the ventilation should not affect necessary security or comfort to a significant extent.

**Introduction to provisions**

0.1 This approved document shows two main ways of complying with the requirement:

(a) by following the provisions set out in paragraphs 1.1 to 6.3;

(b) by an alternative approach set out in paragraph 7.1.

**DEFINITIONS**

0.2 A ventilation opening can include any means of ventilation (whether it is permanent or closable) which opens directly to external air, such as the openable parts of a window, a louvre, airbrick, progressively openable ventilator, or window trickle ventilator. It also includes any door which opens directly to external air.

Ventilation openings should have a smallest dimension of at least 8mm other than in a screen, facia, baffle etc, so as to minimise resistance to the flow of air.

0.3 Common space means a space associated with two or more dwellings.

0.4 Habitable room means a room used for dwelling purposes but not a kitchen.

0.5 Bathroom includes shower-room.

0.6 Sanitary accommodation means a space containing one or more closets or urinals. Sanitary accommodation containing one or more cubicles counts as a single space if there is free circulation of air throughout the space.

**GENERAL**

0.7 The objective of the requirement is to provide a means of:

(a) extracting moisture from areas where it is produced in significant quantities (kitchen, bathroom and shower-room)

(b) achieving occasional rapid ventilation for the dilution of pollutants and of moisture likely to produce condensation in habitable rooms and sanitary accommodation

(c) achieving background ventilation which is adequately secure and does not significantly affect comfort in habitable rooms and kitchens, so as to encourage its use.

**VENTILATION OF HABITABLE ROOMS**

1.1 The requirement will be satisfied if there is:

(a) for rapid ventilation one or more ventilation openings with a total area of at least 1/20th of the floor area of the room, and with some part of the ventilation opening at least 1.75m above the floor level, e.g. an opening window; and

(b) for background ventilation a ventilation opening (or openings), having a total area not less than 4000 square millimetres, e.g. a trickle ventilator. The opening(s) should be controllable and secure and located so as to avoid undue draughts.

1.2 If ventilation is through another room or space or into a restricted air space see paragraphs 6.1 to 6.3.

**VENTILATION OF KITCHENS IN DWELLINGS**

2.1 The requirement will be satisfied if there is both:

(i) mechanical extract ventilation for rapid ventilation, rated as capable of extracting at a rate not less than 60 litres per second (or incorporated within a cooker hood and capable of extracting at a rate of 30 litres per second), which may be operated intermittently for instance during cooking; and

(ii) background ventilation, either

(a) by a controllable and secure ventilation opening (or openings), having a total area not less than 4000 square millimetres, located so as to avoid draughts, e.g. a trickle ventilator, or

(b) by the mechanical ventilation being in addition capable of operating continuously at nominally one air-change per hour.

2.2 Mechanical extraction as set out in Paragraph 2.1(i) with an open-flued appliance in the kitchen can cause the spillage of flue gases and could create dangerous conditions.

In such situations it may be appropriate to reduce the provision set out in Paragraph 2.1(i).

2.3 A kitchen which is wholly internal and is ventilated as set out in Paragraph 2.1 above should not contain an open-flued appliance.

2.4 In other kitchens where there is an open-flued appliance and mechanical extraction is provided as set out in Paragraph 2.1(i) then the appliance and flue
should be able to operate effectively whether or not the fan is running. For example with:

(i) Gas appliances a spillage test as described in BS 5440: Part 1, 1990, Clause 4.3.2.3. should be carried out.

(ii) Oil-fired appliances, advice can be obtained from: Oil Firing Technical Association for the Petroleum Industry (OFTEC), Century House, 100 High Street, Banstead, Surrey, SM7 2NN.

(iii) Solid fuel appliances – mechanical extraction should not be provided in the same room.

**VENTILATION OF COMMON SPACES IN BUILDINGS CONTAINING TWO OR MORE DWELLINGS**

3.1 The requirement will be satisfied if there is provision for ventilation by ventilation opening(s) with a total area of at least 1/50th of the floor area of the common space or communicating common spaces.

3.2 Where the space is wholly internal, and is used for access only, the requirement can also be satisfied by the provision of mechanical extract ventilation capable of one air-change per hour.

**VENTILATION OF BATHROOMS**

4.1 The requirement will be satisfied by the provision of mechanical extract ventilation capable of extracting at a rate not less than 15 litres per second which may be operated intermittently.

**VENTILATION OF SANITARY ACCOMMODATION**

5.1 The requirement will be satisfied by either:

(a) provision for rapid ventilation by one or more ventilation openings with a total area of at least 1/20th of the floor area of the room, and with some part of the ventilation opening at least 1.75m above the floor level; or

(b) mechanical extract ventilation, capable of extracting air at a rate not less than 3 air changes per hour, which may be operated intermittently with 15 minutes overrun.

**VENTILATION OF HABITABLE ROOMS THROUGH OTHER ROOMS AND SPACES**

6.1 Two habitable rooms may be treated as a single room for ventilation purposes if there is an area of permanent opening between them equal to at least 1/20th of the combined floor areas.

6.2 A habitable room may be ventilated through an adjoining space if:

(a) the adjoining space is a conservatory or similar space; and

(b) there is an opening (which may be closable) between the room and the space with an area not less than 1/20th of the combined floor areas of the room and space; and

(c) there are one or more ventilation openings with a total area of at least 1/20th of the combined floor area of the room and space and with some part of the ventilation opening at least 1.75m above the floor level; and

(d) for background ventilation there are ventilation openings to the space and openings between room and space, each having a total area not less than 4000 square millimetres. The openings should be located so as to avoid undue draughts.
VENTILATING TO A RESTRICTED EXTERNAL AIR SPACE

6.3 If a ventilation opening serving a habitable room faces a wall nearer than 15m, the following minimum distances should be maintained:

(a) if there is a wall on each side of the opening (forming a closed court) (see Diagram 1(a)), then the vertical distance from top of the opening to the top of the wall containing the opening, Dt, should be less than twice the horizontal distance from the opening to the facing wall, Df, or

(b) if there is a wall on only one side of the opening (forming an open court) (see Diagram 1(b)) and if the length of the facing wall, Di, is more than twice the horizontal distance from the opening to the facing wall, Df, then either:

(i) the vertical distance from the top of the opening to the top of the wall containing the opening, Dt, or

(ii) the horizontal distance from the side of the opening to the open side of the court, Ds, should be less than twice the horizontal distance from the opening to the facing wall, Df.

Alternative approaches

7.1 As an alternative to paragraphs 1.1 to 6.3 the requirement will be satisfied

(a) if mechanical ventilation designed to be capable of continuous operation is provided throughout the dwelling; or

(b) by following the relevant recommendations of BS 5720: 1979 Code of Practice for mechanical ventilation and air conditioning in buildings. The relevant clauses are:
   - 2.3.2.1
   - 2.5.2.10 and 2.5.2.11
   - 3.1.1.1

(c) by following the relevant recommendations of BS 5250: 1989 Code of Practice: the control of condensation in buildings. The relevant clauses are 9.9 and 9.10.

---

Diagram 1 Ventilating a habitable room

(a) Closed court

(b) Open court

If Di is more than 2Df,

Dt should be less than twice Df

or

Ds should be less than twice Df
This Approved Document which takes effect on 1st April 1990 deals with the following Requirement from PART F of Schedule 1 to the Building Regulations 1991:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Limits on application</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Condensation in Roofs</strong></td>
<td></td>
</tr>
<tr>
<td>F2. Adequate provision shall be made to prevent excessive condensation –</td>
<td></td>
</tr>
<tr>
<td>(a) in a roof; or</td>
<td></td>
</tr>
<tr>
<td>(b) in a roof void above an insulated ceiling</td>
<td></td>
</tr>
</tbody>
</table>
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>8</td>
</tr>
<tr>
<td>Introduction to provisions</td>
<td>8</td>
</tr>
<tr>
<td><strong>Section 1</strong></td>
<td></td>
</tr>
<tr>
<td>Roofs with a pitch of 15° or more</td>
<td>8</td>
</tr>
<tr>
<td>(pitched roofs)</td>
<td></td>
</tr>
<tr>
<td>Alternative approach</td>
<td>8</td>
</tr>
<tr>
<td><strong>Section 2</strong></td>
<td></td>
</tr>
<tr>
<td>Roofs with a pitch of less than 15°</td>
<td>8</td>
</tr>
<tr>
<td>and those where the ceiling follows</td>
<td></td>
</tr>
<tr>
<td>the pitch of the roof</td>
<td></td>
</tr>
<tr>
<td>Alternative approach</td>
<td>9</td>
</tr>
</tbody>
</table>
PERFORMANCE

In the Secretary of State’s view, the requirement of F2 will be met if condensation in a roof and in the spaces above insulated ceilings is limited so that, under normal conditions:

(a) the thermal performance of the insulating materials and

(b) the structural performance of the roof construction

will not be substantially and permanently reduced.

Introduction to provisions

0.1 The requirement will be met by the ventilation of cold deck roofs, ie those roofs where the moisture from the building can permeate the insulation, as in sections 1 and 2 below.

0.2 It is not necessary to ventilate warm deck roofs or inverted roofs, ie those roofs where the moisture from the building cannot permeate the insulation.

0.3 For the purposes of health and safety it may not always be necessary to provide ventilation to small roofs such as those over porches and bay windows.

0.4 Guidance is given on meeting the requirements for pitched roofs in section 1 below. However if the ceiling of a room follows the pitch of the roof ventilation should be provided as if it were a flat roof.

0.5 Guidance is given on meeting the requirements for flat roofs in section 2 below.

0.6 Although a part of a roof which has a pitch of 70° or more is to be insulated as though it were a wall, the provisions in this document apply to roofs of any pitch.

0.7 Ventilation openings may be continuous or distributed along the full length and may be fitted with a screen, fascia, baffle, etc.

0.8 Further detailed guidance is given in the BRE publication 'Thermal Insulation – Avoiding Risks'.

Section 1

ROOFS WITH A PITCH OF 15° OR MORE (PITCHED ROOFS)

1.1 If the ceiling follows the pitch of the roof see section 2.

1.2 Pitched roof spaces should have ventilation openings at eaves level to promote cross-ventilation. These openings should have an area on opposite sides at least equal to continuous ventilation running the full length of the eaves and 10mm wide (see Diagram 1(a)).

1.3 Purpose-made components are available to ensure that quilt and loose fill insulation will not obstruct the flow of air where the insulation and the roof meet.

1.4 A pitched roof which has a single slope and abuts a wall should have ventilation openings at eaves level and at high level. The ventilation at high level may be arranged at the junction of the roof and the wall or through the roof covering. If it is through the roof covering it should be placed as high as practicable. The area at high level should be at least equal to continuous ventilation running the full length of the junction and 5mm wide (see Diagram 1(b)).

Alternative Approach

1.5 The requirement can also be met by following the relevant recommendations of BS 5250: 1989 Code of practice: the control of condensation in buildings. The relevant Clauses are 9.1, 9.2 and 9.4.

Section 2

ROOFS WITH A PITCH OF LESS THAN 15° AND THOSE WHERE THE CEILING FOLLOWS THE PITCH OF THE ROOF

2.1 These provisions also apply to roofs with a pitch of 15° or more if the ceiling follows the pitch of the roof.

2.2 Roof spaces should have ventilation openings in two opposite sides to promote cross ventilation. These openings should have an area at least equal to continuous ventilation running the full length of the eaves and 25mm wide (see Diagram 1(c)).

2.3 Roofs with a span exceeding 10m or other than a simple rectangle in plan may require more ventilation, totalling 0.6% of the roof area.

2.4 The void should have a free air space of at least 50mm between the roof deck and the insulation. Where joists run at right angles to the flow of air a suitable air space may be formed by using counter-battens.
2.5 Pitched roofs where the insulation follows the pitch of the roof also need ventilation at the ridge at least equal to continuous ventilation running the length of the ridge and 5mm wide (see Diagram 1(d)).

2.6 Where the edges of the roof abut a wall or other obstruction in such a way that free air paths cannot be formed to promote cross ventilation or the movement of air outside any ventilation openings would be restricted, an alternative form of roof construction should be adopted (see paragraph 0.2).

2.7 Vapour checks can reduce the amount of moisture reaching a void but they cannot be relied on as an alternative to ventilation. A complete barrier to moisture is needed for this.

Alternative Approach

2.8 The requirement can also be met by following the relevant recommendations of BS 5250: 1989. The relevant Clauses are 9.1, 9.2 and 9.4.
Standards referred to

F1 and F2


Building Regulations 1985

HMSO Bookshops
49 High Holborn, London, WC1V 6HB
(counter service only)
071-873 0011 Fax 071-873 8200
258 Broad Street, Birmingham, B1 2HE
021-643 3740 Fax 021-643 6510
Southey House, 33 Wines Street, Bristol, BS1 2BQ
0272 264306 Fax 0272 294515
9-21 Princess Street, Manchester, M60 8AS
061-834 7201 Fax 061-833 0634
16 Arthur Street, Belfast, BT1 4GD
0232 238451 Fax 0232 235401
71 Lothian Road, Edinburgh, EH3 9AZ
031-228 4181 Fax 031-229 2734

HMSO's Accredited Agents
(see Yellow Pages)

and through good booksellers

© Crown copyright 1985
Applications for reproduction should be made to HMSO
First published 1985
Second edition 1989
Sixth impression (with amendments) 1992

£3.35 net