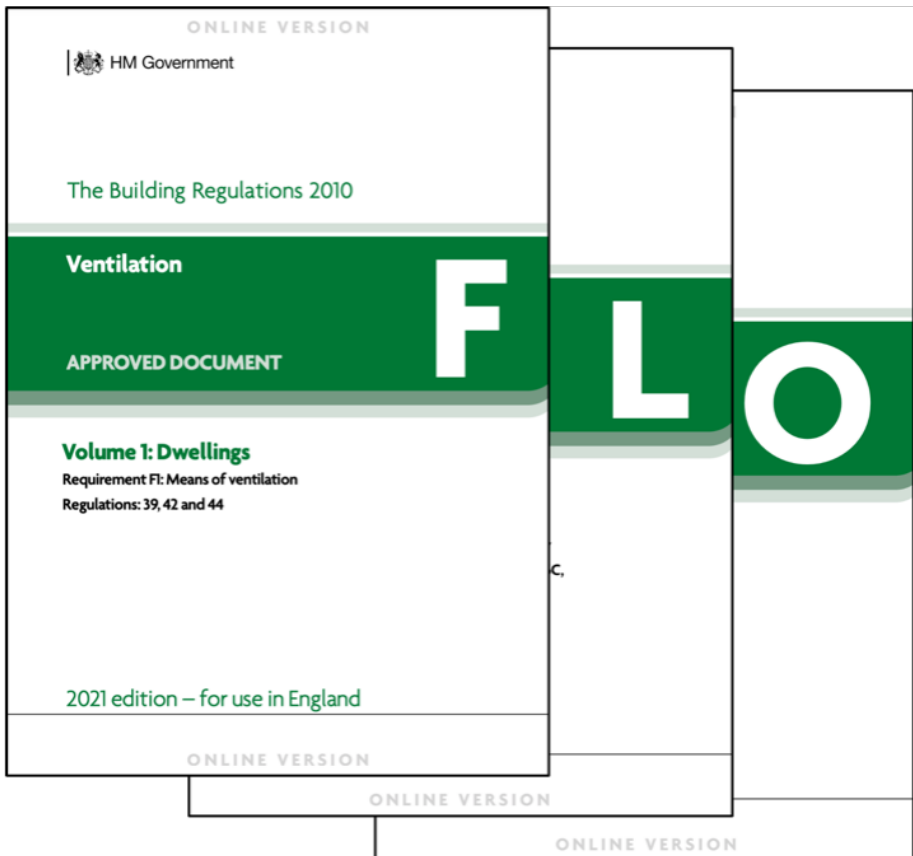


Guide to English Approved Documents F, L & O for new and existing dwellings



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AD F: Ventilation - New Dwellings

The AD allows for three types or systems of ventilation for new build.

System 1 is referred to as Natural Ventilation and allows for background ventilation to be used (Trickle Vents). This can only be used in dwellings regarded as less airtight.

Less airtight is defined by: -

- a) Calculation at design stage with air permeability higher than 5 cubic metres of air per hour per square metre of floor area at 50 pascal of pressure. ($5\text{m}^3/\text{hm}^2$ at 50Pa)
- b) Established by air tightness test after build as higher than 3 cubic metres of air per hour per square metre of floor area at 50 pascal of pressure. ($3\text{m}^3/\text{hm}^2$ at 50 Pa)

In the situation where System 1 applies, the following table must be used (**Table 1.7 in AD F**)

Room Type	Minimum Equivalent Area of background ventilators for dwellings with multiple floors.	Minimum Equivalent Area of background ventilators for single storey dwellings
Habitable Room (<i>see Note 2 & 3</i>)	8,000mm ²	10,000mm ²
Kitchen (<i>see Note 2 & 3</i>)	8,000mm ²	10,000mm ²
Utility Room	NO MINIMUM	NO MINIMUM
Bathroom (<i>see Note 4</i>)	4,000mm ²	4,000mm ²
Sanitary Accommodation	NO MINIMUM	NO MINIMUM

Notes for the use of System 1

The use of this table is not appropriate in the following situations or conditions and expert advice must be sought.

- 1a) If the dwelling has only one exposed facade (e.g. within a multi-storey building)
- 1b) If the dwelling has at 70% of its openings on the same facade.
- 1c) If a kitchen has no windows or external facade where a ventilator could be installed.
- 2) Where a kitchen and living room accommodation are not separate rooms (i.e. open plan), no fewer than three ventilators of the same equivalent area as for other habitable rooms should be provided within the open plan space (8,000mm²)
- 3) The total number of ventilators installed in the dwelling's habitable rooms and kitchen/s should be no fewer than five, except in one bedroom properties where there should be no fewer than 4.
- 4) If a bathroom has no window or external facade through which a ventilator can be installed, the minimum equivalent area specified should be added to the ventilator sizes specified in nearest adjoining rooms. (i.e. 8,000mm² increased to 12,000mm² and 10,000mm² increased to 14,000mm²)

System 2 is continuous mechanical extraction allows for a minimum of 4,000m² of equivalent area of background ventilators for each habitable room and at least the same number of ventilators as bedrooms plus another two (i.e. a one bedroom dwelling should have 3 ventilators, a 2 bedroom dwelling should have 4 ventilators and so on)

System 3 is a mechanical ventilation system with heat recovery with no provision for background ventilators.

END OF GUIDANCE ON VENTILATION - NEW DWELLINGS

AD L: Energy Efficiency - New Dwellings

The Notional dwelling 'U' Values for Windows and Doors are laid out in Table 1.1 of the Approved Document L

Table 1.1

Description	'U' Value
Windows	1.2W/m ² K
Doors with glazed area greater than 60%	1.2W/m ² K
Other doors	1.0W/m ² K

Important Note: The calculation method in Section 4 now includes reference to the Industry standard window size and design i.e. fixed next to opener with a single dividing mullion 1230mm wide x 1480mm high. The reference to BS EN 14351 has been removed.

The lowest specification 'U' Value allowable referred to as the Limiting 'U' Values are shown in Table 4.1.

Table 4.1

Description	'U' Value
Windows	1.6W/m ² K
Doors	1.6W/m ² K

New addition to Regulations

Windows and doors installed into new build are required to be sealed with air sealing tape around the structural openings. Compressible seals or gun sealant may be used to supplement taping.

END OF GUIDANCE ON ENERGY EFFICIENCY - NEW DWELLINGS

AD O: Overheating - New Dwellings

The Approved Document O is a new regulation introduced to mitigate the risk of overheating and is only applicable to new dwellings. The aim is to limit Solar Gain and remove excess heat.

The document separates England into two categories i.e. High Risk and Moderate Risk. Appendix C of the document contains a list of postcodes that should be considered High Risk. All other areas are considered Moderate Risk. As a means of reducing solar gain, the document contains a series of tables which sets limits on the allowable glazed area by orientation and also by introducing a provision for shading. (This may also be achieved with the introduction of Window Film. Please consult a GGF Window Film specialist)

Appendix A includes Key Terms for better understanding of the full document. Below are some which are relevant to understanding this section.

Key Terms

Cross-ventilation The ability to ventilate using openings on opposite façades of a dwelling. Having openings on façades that are not opposite is not allowing cross-ventilation, e.g. in a corner flat.

Floor area The area of the residential unit, measured to the internal face of the perimeter walls at each floor level.

Floor area of the room The area of the room, measured to the internal face of the perimeter walls. Where a room serves more than one activity, e.g. open-plan kitchen and living room, the area with the largest glazing area should be assessed and the room area calculated based on a room depth no greater than 4.5m from the glazed façade.

Table 1.1: Buildings or parts of buildings with cross-ventilation should not exceed these maximum glazing areas

Largest glazed facade orientation	High risk location		Moderate risk location	
	Max. area of glazing (% floor area)	Max. area of glazing in the most glazed room (% floor area of room)	Max. area of glazing (% floor area)	Max. area of glazing in the most glazed room (% floor area of room)
North	15	37	18	37
East	18	37	18	37
South	15	22	15	30
West	18	37	11	22

Table 1.2: Buildings or parts of buildings with no cross-ventilation should not exceed these maximum glazing areas

Largest glazed facade orientation	High risk location		Moderate risk location	
	Max. area of glazing (% floor area)	Max. area of glazing in the most glazed room (% floor area of room)	Max. area of glazing (% floor area)	Max. area of glazing in the most glazed room (% floor area of room)
North	15	26	15	26
East	11	18	18	26
South	11	11	15	15
West	11	18	18	11

Residential buildings in the high risk location should, in addition to the maximum glazing areas in Table 1.1 and Table 1.2, provide shading for glazed areas between compass points North-East and North West via the South. Shading should be provided by one of the following means.

- a) External shutters with means of ventilation
- b) Glazing with a maximum g value of 0.4 and a minimum light transmittance of 0.7
- c) Overhangs with 50 degrees altitude cut-off on due south-facing facades only.

Removing excess heat

The document offers guidance on the removal of excess heat by means of ventilation. An openable window or door is considered adequate to remove excess heat as long as it complies with the minimum requirements for opening in Table 1.3 below.

Table 1.3: Buildings or parts of buildings with cross-ventilation should equal or exceed these minimum free areas

Total minimum free area	High risk location	Moderate risk location
		The greater of the following: a) 6% of the floor area b) 70% of the glazing area
Bedroom minimum free area	13% of the floor area of the room	4% of the floor area of the room

Note: The total minimum free area is the free area for the whole dwelling house, residential unit, shared communal room or common space including any bedrooms.

AD O: Overheating - New Dwellings continued

Table 1.4: Buildings or parts of buildings with no cross-ventilation should equal or exceed these minimum free areas

	High risk location	Moderate risk location
Total minimum free area	The greater of the following: a) 10% of the floor area b) 95% of the glazing area	The greater of the following: a) 12% of the floor area b) 80% of the glazing area
Bedroom minimum free area	13% of the floor area of the room	4% of the floor area of the room

Note: The total minimum free area is the free area for the whole dwelling house, residential unit, shared communal room or common space including any bedrooms.

END OF GUIDANCE ON OVERHEATING - NEW DWELLINGS

AD F: Ventilation - Existing Dwellings

Assessing background ventilation (Trickle Vent) requirements when installing replacement windows & doors.

Members should refer to Table 3.1 and Diagram 3.1 which detail where windows are replaced in conjunction with other efficiency measures and states that in some cases the dwellings will or may require extra ventilation. The extra ventilation may be provided via background ventilation (Trickle Vents) as well as other measures. If no other energy efficient improvement works are being carried out, the requirements are as follows: -

Section 3.14: Existing windows with background ventilators (Trickle Vents)

If the existing windows have background ventilators, the replacement windows should include background ventilators. The new background ventilators should comply with both of the following conditions: -

- a) **Not be smaller than** the background ventilators in **the original window**.
- b) Be controllable either automatically or by the occupant.

If the size of the original background ventilator is not known then use the guidelines in Section 3.15.

Section 3.15: Existing windows without background ventilators (Trickle Vents)

3.15 Replacing the windows is likely to increase the airtightness of the dwelling. If ventilation is not provided via a mechanical ventilation with heat recovery system, then increasing the airtightness of the building may reduce beneficial ventilation in the building. In these circumstances, it is necessary to ensure that the ventilation provision in the dwelling is no worse than it was before the work was carried out. This may be demonstrated in any of the following ways.

- a) Incorporating background ventilators in the replacement windows equivalent to the following: -
 - i) Habitable rooms - minimum 8,000mm² equivalent area (EA)
 - ii) Kitchen - minimum 8,000mm² equivalent area (EA)
 - iii) Bathroom (with or without a toilet) - minimum 4,000mm² equivalent area (EA)
- b) If the dwelling will have continuous mechanical extract ventilation, installing background ventilators in any replacement windows which are not in a wet room, with a minimum equivalent area of 4,000mm² in each habitable room.
- c) Other ventilation provisions, if it can be demonstrated to a Building Control body that they comply with the requirements within paragraph 3.2
- d) If it **not technically feasible** to adopt the minimum equivalent areas set out in paragraph 3.15, the background ventilators should have equivalent areas **as close to the minimum value as is feasible**.

In summary, any window installation into an existing dwelling that is carried out where the outgoing windows do not have background ventilation installed must meet EA's in Section 3.15. The equivalent area is measured by room not by window i.e. divide EA by number of windows in the room. Any windows removed with background ventilation must be replaced with like for like ventilation. Night latches on windows are not acceptable as ventilation.

AD F: Ventilation - Existing Dwellings continued

It is worth noting the following details within the Approved Document: -

If the Energy Efficiency works involve only replacing windows, then the guidance in 3.14 to 3.16 may be followed as means of demonstrating compliance.

Within Table 3.1 under replacement of windows and doors, if the replacements are less than 30% of the total existing windows or door units, this would be regarded as a Minor Energy Efficiency measure. More than 30% is a major Energy Efficiency measure.

If the method in Diagram 3.1 below results in the work being categorised as Category A, it is likely that the energy efficiency measures have not reduced the ventilation provision of the dwelling below the requirements of F1(1) so no further ventilation provision is necessary. Companies however must ensure that no other Energy Efficiency measure included in Table 3.1 has been or is being carried out at the same time which would exceed the 2 minor measures allowable in Category A.

		Number of minor measures						
		0	1	2	3	4	5	6
Number of major measures	0	Category A						
	1	Category B						
	2							
	3			Category C				

Diagram 3.1 Chart for categorising impact on ventilation when carrying out works in existing dwellings

Additional points to note

1.34 Background ventilators should be at least 1700mm above floor level, to reduce cold draughts, but still be easy for the occupant to reach. **NOTE:** Background ventilators are intended to normally be left open.

1.52 All rooms with external walls should have background ventilators. If a habitable room has no external walls, paragraphs 1.42 to 1.44 should be followed.

1.53 If the dwelling has more than one exposed façade, the area of background ventilators on each façade should be similar, to allow cross-ventilation.

1.54 If an exposed façade is close to an area of sustained and loud noise (e.g. a main road), then a noise attenuating background ventilator should be fitted.

1.55 If fans and background ventilators are fitted in the same room, they should be at least 500mm apart.

1.56 The minimum total area of background ventilators in each room should follow the guidance in Table 1.7

**END OF GUIDANCE ON
VENTILATION - EXISTING DWELLINGS**

AD L: Energy Efficiency - Existing Dwellings

3.2 'U' Values, Window Energy Ratings (WER) and doorset energy ratings (DSER) of replacement windows and doors must be both: -

- No worse than that of the element being replaced
- Meet the limiting standards in Table 4.2 (Lowest specification of 'U' Value or WER/DSER allowable)

Table 4.2

Description	'U' Value	WER/DSER
Windows	1.4W/m ² K	B
Doors with glazed area greater than 60%	1.4W/m ² K	C
Other doors	1.4W/m ² K	B

'U' Values, Any windows and doors replaced will need to be at least the level of performance detailed in Table 4.2 above.

Note: For timber windows, a maximum 'U' value of 1.6W/m² is permissible and for external fire doorsets, a maximum of 1.8W/m² is permissible.

The U value calculation method for doors within Approved Document L 2021 has changed. The reference to BS EN 14351-1 has been removed. It now gives sizes that doors must be calculated to as well as stating the actual configuration of the door must be used.

For standard doors:

Calculated for a standard door 1230w x 2180h using the actual configuration of the door

For non-standard (multi leaf doors):

Calculated for a non-standard door 2000w x 2180h using the actual configuration of the door
The sizes for both standard and non-standard door calculations are able to be +/- 25% of the sizes given above.

You may still calculate the U value on the actual size and configuration of the installed door should you wish to do so.

You may also measure the U value using the hot box method as set out in BS EN ISO 12567-1.

Alternatively, for doors and windows, the default value from the Standard Assessment Procedure (SAP) Table 6e can be used.

Please note that the information provided in this Guide is a summary of the content relevant to windows and doors within the Approved Documents L, F & O. We strongly advise members to obtain the full versions from the Government website and specifically at: -

<https://www.gov.uk/government/collections/approved-documents>



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