

How do changes to Part F of The Building Regulations affect Ventilation Testing



On 15th June 2022 UK Building Regulations changed. The changes primarily affect the building of new homes although some of the changes also affect renovations of existing dwellings too.

The changes are many and complex and in some cases, open to interpretation too.

This document will provide you with the key points that you need to know, to ensure your projects adhere to the most up-to-date Building Regulations and can ultimately achieve sign-off from Building Control.

Why are Building Regulations changing?

The UK is committed to achieving net zero CO2 by 2050 in a collective effort to combat climate change. Together with the 2025 Future Homes and Buildings Standard, these changes are designed to keep us on track when it comes to a low-carbon future, through the building of more energy-efficient homes.

Changes relating to ventilation standards have arisen from Public Health England data on indoor air pollution.

Which part of the Building Regulations is changing?

The changes to Building Regulations launched in June 2022 focused on 4 specific areas of overall Building Regulation...

- Changes to Approved Document L Conservation of fuel and power
- Changes to Approved Document F Ventilation
- Creation of Approved Document O Overheating
- Creation of Approved Document S Infrastructure for charging electric vehicles.



What is Ventilation Testing and Commisioning?

When Part F of the Building Regulations were introduced in 2010, the requirement to test the practical performance of ventilation systems in new dwellings was born.

Ventilation testing and ventilation commissioning are actually two different things. Testing refers to extractor fans, like you would find in a toilet, bathroom or kitchen. These are tested to ensure they are extracting a sufficient amount of air.

Commissioning refers to more complicated ventilation systems, such as Mechanical Ventilation Heat Recovery (MVHR). These need to be balanced, to make sure the correct amount of air is either being extracted from or supplied to every room in the house.

There are 4 different types of recognised ventilation methods in building regulations part F:

Type 1: Intermittent extract fans with background ventilators – This is what is found in most houses – Extractor fans in kitchens, toilets and bathrooms and trickle ventilators on the windows.

Type 2: Passive Stack Ventilation – This is very rarely seen. It is a system which uses a combination of cross ventilation, buoyancy (warm air rising) and the venturi effect to ventilate. It is rarely used because it's very much weather dependant.

Type 3: Mechanical Extract Ventilation (MEV) – This can either be a whole house system or a localised system for specific rooms. With the former, multiple ducts will run from a constantly running unit to wet rooms (kitchen, WC, bathroom) continuously extracting stale air. When these rooms are in use, the system will boost up to extract a larger volume of air.

Type 4: Mechanical Ventilation Heat Recovery (MVHR) – This is similar to Type 3, except that it also supplies fresh air to all non-wet rooms (bedrooms, dining room, living room). The heat from the stale extracted air is kept in the central unit and used to heat the fresh air from outside before it is supplied to the house.

Why is it important?

As the requirement to achieve ever-increasing air-tightness grows, so too does the need for appropriate control of ventilation. Controlling the flow of air into, out of and throughout the dwelling is vital in ensuring air quality levels are maintained. Unless correctly ventilated, exceptionally air-tight homes could see an increase in;



- Moisture (condensation / mould growth)
- Carbon monoxide
- Allergens (dust mites)
- Odours
- Carbon dioxide

Although the maximum allowable air tightness is now $<8m3/(h\cdot m2)@50Pa$ (see our guide to Change to Airtightness Testing for more information) any homes that deliver a score of $<3m3/(h\cdot m2)@50Pa$ or below, will be required to install continuous mechanical ventilation.

It's worth noting that fan flow rates have not actually changed under the new regulations.

Intermittent Extract Flow Rates (System 1)

Room	Intermittent extract rate (1/s)
Kitchen (cooker hood extracting to the outside) ⁽¹⁾	30
Kitchen (no cooker hood or cooker hood does not extract to the outside) ^[2]	60
Utility room	30
Bathroom	15
Sanitary accommodation ⁽¹⁾	6
NOTES:	
1. See Diagram 1.1.	
2. See Diagram 1.2.	
3. As an alternative for sanitary accommodation, the purge ventilation guidance	e may be used.

Continuous Extract Flow Rates (System 3/4)

Room	High rate (1/s)	Continuous rate	
Kitchen	13	The sum of all extract ventilation in the dwelling on its continuous rate should be at least the who dwelling ventilation rate given in Table 1.3	
Utility room	8		
Bathroom	8		
Sanitary accommodation	6		
NOTE:			



What's Changed?

Whole Dwelling Ventilation Rate

Prior to June 2022, the whole dwelling ventilation rates required under the 2013 Part F Approved Document were as follows...

	Number of bedrooms in dwelling				
-	1	2	3	4	5
Whole dwelling ventilation rate ^{a, b} (I/s)	13	17	21	25	29
Notes:					

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 add 4 l/s per occupant.

Changes made in June, now mean that the whole dwelling ventilation rates required Part F Approved Document are;

- **1.24** The minimum whole dwelling ventilation rate for the supply of air to the habitable rooms in a dwelling should meet both of the following conditions.
 - a. A minimum rate of 0.3 litres per second per m² of internal floor area (this includes all floors, e.g. for a two-storey building, add the ground-floor and first-floor areas).
 - b. A minimum rate determined by the number of bedrooms, as specified in Table 1.3.

Number of bedrooms ⁽¹⁾⁽²⁾	Minimum ventilation rate by number of bedrooms (1/s
	19
2	25
	31
	37
	43
NOTES:	

The changes now require a much higher minimum whole dwelling ventilation rate, which will, in turn, improve air quality in new homes going forward.

Background Ventilators

The updated Building Regulations now only recommend the use of intermittent extract fans and background ventilators for less airtight dwellings - those that have air permeability of greater than 5 m3/(h.m2).



However, as we have already indicated, changes to air tightness testing announced in Part L of Building regulations, mean that in order for new homes to become more energy efficient, it's almost certain that they will need to become more air tight - with an air permeability of less than 5 m3/(h.m2). Even so, if a dwelling does have air permeability of greater than 5 m3/(h.m2) and therefore is permitted to use background ventilation, there are changes to be aware of...

Previously, Part F stipulated a minimum ventilator area required for the whole dwelling depending on its total floor area and number of bedrooms, as per the below table...

Total floor area (m ²	9	Number of bedrooms ^b			
	1	2	3	4	5
≤50	35000	40000	50000	60000	65000
51-60	35000	40000	50000	60000	65000
61-70	45000	45000	50000	60000	65000
71-80	50000	50000	50000	60000	65000
81-90	55000	60000	60000	60000	65000
91-100	65000	65000	65000	65000	65000
> 100		Add 7000 mm ² for every additional 10 m ² floor area			

However, under new legislation, the minimum required area for background ventilators is now assessed over a room by room basis...

Room	Minimum equivalent area of background ventilators for dwellings with multiple floors	Minimum equivalent area of background ventilators for single- storey dwellings
Habitable rooms ⁽²⁾⁽⁹⁾	8000mm ²	10,000mm²
Kitchen ⁽²⁾⁽³⁾	8000mm ²	10,000mm²
Utility room	No minimum	No minimum
Bathroom ⁽⁴⁾	4000mm ²	4000mm ²
Sanitary accommodation	No minimum	No minimum

NOTES:

1. The use of this table is not appropriate in any of the following situations and expert advice should be sought.

- If the dwelling has only one exposed façade.
- If the dwelling has at least 70% of its openings on the same façade.
- · If a kitchen has no windows or external façade through which a ventilator can be installed.
- 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.
- 3. The total number of ventilators installed in a dwelling's habitable rooms and kitchens should be no fewer than five, except in one-bedroom properties, where there should be no fewer than four.
- If a bathroom has no window or external façade through which a ventilator can be installed, the minimum equivalent area specified should be added to the ventilator sizes specified in other rooms.



When considering continuous mechanical ventilation systems, previous legislation required a minimum equivalent area of 2500mm2 (except wet rooms) whereas new legislation has increased this to 4000mm2.

Purge Ventilation

Little has changed in requirements for purge ventilation - A purge ventilation rate of at least 4 air changes per hour directly to outside is still required. This can be achieved by opening hinged or pivot windows with an opening angle of 15 to 30 degrees having a minimum total open area of at least one tenth of the room floor area.

If the opening angle is greater than 30 degrees then the minimum total open area can be one twentieth of the room floor area.

If needed, the Purge ventilation rates can also be met through mechanical means. However, although 4 air changes per hour is the minimum required rate, higher ventilation rates may be required to meet the new overheating requirements of Part O of the Building Regulations.

Buildings Other Than Dwellings

The ventilation requirements for offices under the new 2021 Part F Approved Document also remain largely unchanged.

Toilets still require 6 I/s extract per WC/urinal, showers and baths still require 15 I/s extraction, and kitchen areas still require 15 I/s where there is only a microwave present. This increase to 30 where a cooker is present or 60 I/s depending on whether the fan is located adjacent to oven or not.

When considering supply ventilation, there is still a required fresh air supply rate of 10 l/s per person. However, added under the new regulations is also a requirement to provide at least 1 l/s per m2 of floor area, whichever is the higher rate should be provided.

Common areas such as corridors or lift lobbies etc. also require either natural ventilation openings equal to at least one fiftieth of the floor area, or if provided by mechanical ventilation provide at least 0.5 l/s per m2 of floor area.



Need help or advice with Ventilation Testing?

Ventilation tests must be undertaken using UKAS calibrated equipment and should be conducted by an engineer registered with a competent scheme. JosTec engineers have successfully completed the BPEC Domestic Ventilation course and all of our equipment is fully UKAS calibrated. As part of our service, we offer our expertise from the very start of any project to give your property the best chance of passing.

Please contact us for further information, by calling 01923 518923 or emailing us at info@jostec.co.uk

