



WINDOW & DOOR BUILDING REGULATIONS

Complying with the 2022 Updates



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The Future Homes & Buildings Standard

Why is it being introduced?

The UK has set targets for reducing greenhouse gas emissions by 100% (Net-Zero) by 2050. In 2020 the built environment, both business and residential, accounted for 34% of the UK's Greenhouse Gas emissions; 16% of these emissions came from the nearly 28 million residential homes in the UK. Upon its full implementation, the government hopes that the new standard will go some way to tackling climate change, with the standard becoming the framework and roadmap for the built environment to reach Net-Zero.

Designed to work alongside the building regulations, the standard is set to be published in 2025, and its introduction has been broken down into four key stages.

The Four Key Stages

Phase 1 Changes to Key Building Regulations Impacting Energy Efficiency	June 2022
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Revision of both Part F & L.
Introduction of Part O.

Phase 2 Review & Assessment	Autumn 2021 - Summer 2024
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Research and analysis phase to develop FHS technical specification.
Develop specific guidance and embed understanding of technical specification of FHS.

Phase 3 Consultation on the Standard	Spring 2024
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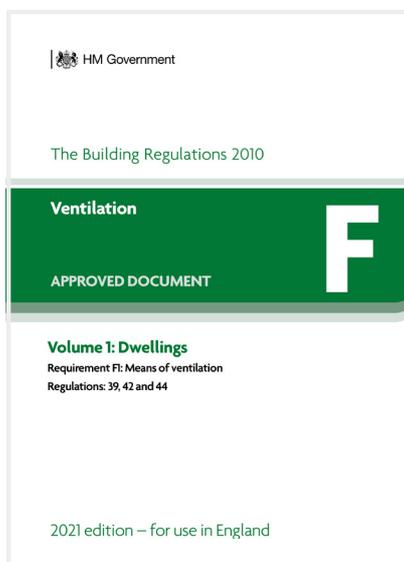
Technical consultation and final proposal of FHS.

Phase 4 Full Implementation of the Standard	Autumn 2024
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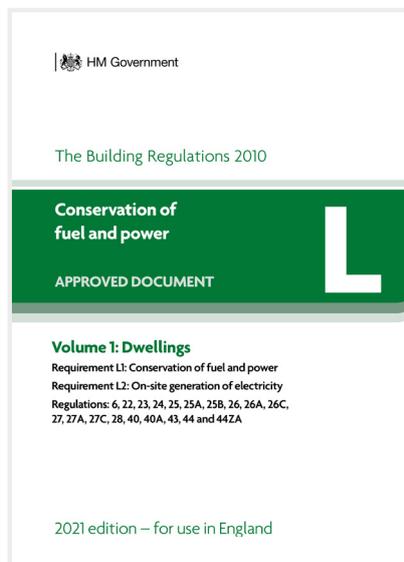
The Future Homes & Buildings Standard

Phase 1

Key Documents



Revision of Approved Document **F Ventilation**.



Revision of Approved Document **L Conservation of Fuel & Power**.



Introduction of Approved Document **O – Overheating**.

When Will New Build & Existing Homes Need to Comply?

The changes to Approved Document F & L and the introduction of Approved Document O will be phased in. The regulations will apply from 15th June 2022 unless a full planning application or building notice is submitted before 15th June 2022. This means that developers and homeowners submitting plans from 15th June 2022 must ensure they comply with the relevant new Approved Documents.

If a developer or homeowner submitted plans or a building notice on 14th June 2022, the dwelling would not need to comply with the new regulations. However, the actual work needs to start on or before 14th June 2023. The following table summarises the various scenarios, showing when a developer and homeowner would and would not need to comply.

	Works started between 15th June 2022 and 15th June 2023	Works started after 15th June 2023
Either full plans or building notice submitted before 15th June 2022	Exempt	Must comply
Full plans of building notice submitted after 15th June 2022	Must comply	Must comply
Existing homes without planning application or building notice submitted	Must comply	Must comply

Build Type Compliance

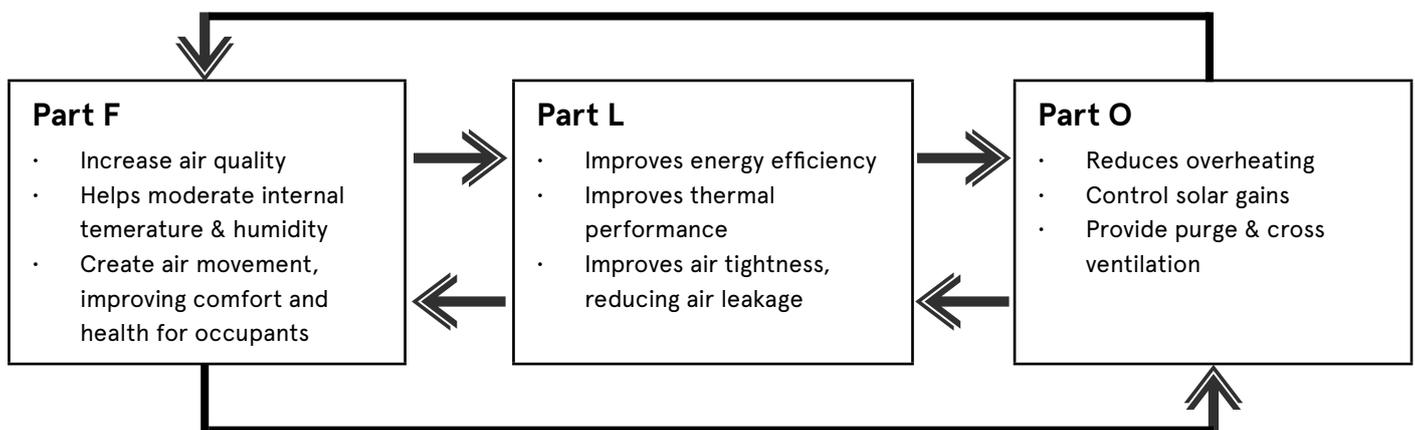
The Future Homes and Buildings Standard targets both new and existing homes, with the aim of making new build homes future-proof whilst improving the energy efficiency of existing homes. The following table highlights which regulation applies to new and existing homes when carrying out any work.

	New Build Homes	Existing Homes
Approved Document F	Must Comply	Must Comply
Approved Document L	Must Comply	Must Comply
Approved Document O	Must Comply	Exempt

Finding the Right Balance with Approved Document F, L & O

The changes to Approved Documents F & L and the introduction to Approved Document O are designed to complement each other, striking a balance across comfortability, energy efficiency and ventilation.

Improvements in thermal performance and air tightness can potentially increase the number of internal air pollutants within a home due to the reduction in a building’s natural air leakage. However, Approved Document F & O aids a building’s air exchange, resulting in a healthier internal environment with a more comfortable temperature.



When to Notify Planning & Building Control

Whether a project is a new build development, refurbishment of an existing building or project involving a building’s change of use, one of the most important considerations is whether it is possible to gain planning permission.

But when is planning permission needed?

Under most UK authorities, planning permission is generally required when:

- Building something new, including a multi-storey extension to an existing home;
- Making a major change to a building, such as installing new windows of a different design;
- Changing the use of a building;
- Making changes to a listed property.

Who Is Responsible for Compliance?

With all building work, the **owner of the property (or land) in question is ultimately responsible** for complying with the relevant planning rules and building regulations. In addition, Approved Document F, L & O explains those responsible for building work include agents, designers, builders, and installers. These individuals must also ensure the building work complies with all applicable requirements of the building regulations.

Failure to comply with the relevant rules will result in the owner being liable for any remedial action, which could go as far as demolition or corrective works. The general advice is always to discuss your proposals with the relevant local planning authority and building control service before starting work.

Approved Document F Ventilation

The primary aim of Approved Document F (ADF) is to improve air quality and occupants' health through the means of both background and purge ventilation. Improving a building's ventilation will help reduce:

- Moisture increasing the risk of condensation and mould growth.
- Carbon monoxide.
- Allergens (dust mites).
- Odours.
- Carbon dioxide.

Key Changes to Approved Document F in 2022

One way of improving energy efficiency is to reduce heat loss through air permeability, resulting in homes that are more airtight. However, an increase in air tightness leads to reduced ventilation; therefore ADF is updated to ensure that sufficient levels of ventilation are still provided.

Room	2010 regulations	New 2022 regulations: Homes with multiple floors	New 2022 regulations: Homes with a single floor
Habitable rooms	5,000mm ²	8,000mm ²	10,000mm ²
Kitchen	2,500mm ²	8,000mm ²	10,000mm ²
Utility room	2,500mm ²	No minimum	No minimum
Bathroom	2,500mm ²	4,000mm ²	4,000mm ²
Sanitary accommodation (i.e. WC)	No minimum	No minimum	No minimum

Other Key Changes to Consider

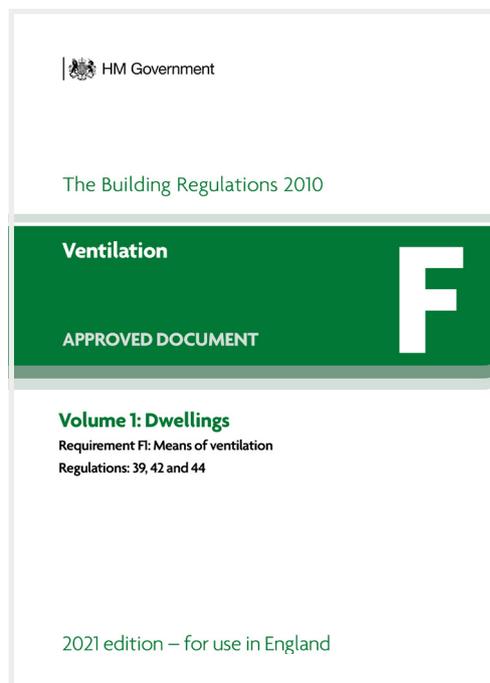
The new ADF will simplify the ventilation approach with a combination of:

- Extraction ventilation from wet rooms, by either intermittent or continuous running systems;
- Complete dwelling ventilation to provide fresh air to dilute pollutants, either mechanically, or via background ventilators;
- Pure ventilation to remove high concentrations of pollutants and water vapour.

In addition to the increased airflow rate, an opportunity has been taken to simplify the regulations, making them easier to design and implement. The previous equivalent area (EA) floor area model was deemed complicated and difficult to calculate, so the updated ADF has replaced this model with an easier to understand room-by-room model.

What Are the Types of Ventilation?

There are two main types of ventilation: Natural ventilation (i.e. trickle vents, air bricks) and mechanical ventilation. A trickle vent is more commonly used but to select the right system, a homeowner or developer needs to consider all of the advantages and disadvantages of both systems.



Trickle Ventilation

Pros

- ✓ Cost-effective.
- ✓ Can be used in new & existing homes.
- ✓ More security than night vents or opening windows.
- ✓ More energy efficient as they do not need power.
- ✓ Simple design and more universally used.
- ✓ Minimal in design and discrete in appearance.

Cons

- X Reliant on external factors to maximise airflow.
- X Little variation in trickle vent products.
- X Air flow rate control is limited.
- X Difficulty in directing airflow.

Mechanical Ventilation & MVS or MVHR System

Pros

- ✓ More reliable, consistent air flow rate.
- ✓ Not reliant on external weather.
- ✓ Designs are flexible and can be tailored to any property.
- ✓ Can be incorporated into other systems (i.e. air-con).

Cons

- X Expensive to buy and install.
- X Major works to install in an existing home.
- X If not installed correctly, performance can be compromised.
- X Maintenance costs can be high.
- X Additional space needed for ventilation units & ducts.



Did you know for the average 3-bedroom home, an MVS or MVHR will cost around **£6,500**. Adding trickle vents into windows and doors costs around **£500**.

Means of Ventilation

Trickle vents are deemed as the preferred choice of ventilation for most developers, architects, and homeowners as they are flexible in design, easy to use and low in cost. Within the newly revised Approved Document F, there are some considerations to be taken into account when designing any residential project which incorporates trickle vents:

- Open plan living areas (living room/kitchen) need a minimum of 3 trickle vents;
- A minimum of 5 trickle vents must be fitted in any property;
- Night vent facilities will NOT meet the new Approved Document F regulations.

Despite trickle vents being the preferred choice, alternative ventilation options are available, such as MVS/MVHR systems and air bricks. There are some scenarios within ADF when a ventilation system is not required:

- If a home has a minimum of 70% of its windows or doors on the same external wall;
- If equal to or less than 30% of the total existing windows and doors are being replaced, and no other major works are done (see Approved Document F, Section 3);
- If a property is listed or in a conservation area (always consult your conservation and building control officer).

The Cost & Consequence of Non-Compliance

If a home's ventilation system is insufficient, the effects can become serious, ranging from prosecution and enforcement notices from your local authority. The local authority may serve an enforcement notice to the owner requiring alterations or corrective works to ensure compliance. If the owner does not comply, the local authority has the power to undertake the work themselves and recover the costs from the owner.



The estimated costs of the corrective works for an average 3-bedroom house:

- Installation of a mechanical ventilation system - **£8,000-£10,000 (+ labour)**
- Replacement window frames with trickle vents - **£3,500-£5,000 (+ labour)**

Approved Document L

Conservation of Fuel & Power

The purpose of Approved Document L1A & L1B (ADL) is to increase standards for energy performance, whilst reducing carbon emissions for new and existing dwellings.

- **Approved Document L1A – New Dwellings.**
- **Approved Document L1B – Existing Dwellings.**

The main focus is on new build dwellings and making them 'zero-carbon ready' from 2025.

The standards in ADL1B have been significantly improved for existing homes, with the aim to make them more energy-efficient. The goal is to drive existing homes towards an energy rating of B or above from 2025. This is going to be achieved primarily by raising the performance standards of home improvement products, such as new windows and doors, from 2022.



Key Changes to Part L in 2022

The main focus of ADL is increasing the energy efficiency of all elements in the building fabric; its core focus U-values.

New Build Homes	Existing Homes
<p>Required window & door U-values for new builds:</p> <p>Notional target – windows & doors 1.2 W/m²K. Limiting standard – windows & doors 1.6 W/m²K.</p>	<p>Required window & door U-values for existing dwellings:</p> <p>Notional target – windows & doors 1.4 W/m²K. Limiting standard – windows & doors 1.4 W/m²K.</p>

Notional Targets vs Limiting Standards

Approved Document L suggests elements such as wall materials, including windows, should aim to achieve 'notional' targets to maximise a building's energy efficiency. However, Approved Document L also allows a minimum or 'limiting standard' to aid design flexibility and build costs.

Notional Targets	Limiting Standards
<ul style="list-style-type: none"> • Desired target rating (U-value) for the building product. • Used only for new build projects. • Help achieve whole building Target Fabric Energy Efficiency (TFEE) with ease. 	<ul style="list-style-type: none"> • A minimum rating (U-value) for the building product. • Used across all build types. • When all U-values are input into a SAP10 model the building must achieve the Target Fabric Energy Efficiency (TFEE).

SAP10 Models

When elements of a building's fabric are selected, their U-values are used to calculate the energy performance in a SAP model. The UK government has introduced the new SAP10 model, replacing the previous SAP2012 model. SAP calculations are a requirement of the building regulations and are required for all new build homes in the UK. SAP calculations determine three things:

- To confirm a building's SAP rating (the energy-related to running costs of the dwelling);
- To demonstrate compliance with Approved Document L;
- To produce a building's Energy Performance Certificate (EPC).

In addition to new build homes, a SAP model may be required for a conversion or extension, so it is always highly recommended to contact building control regarding any project performance requirements.

What data do you need for SAP models?

- Building's window & door average U-value.
- Building's window & door average G-value.

How to Pass SAP10

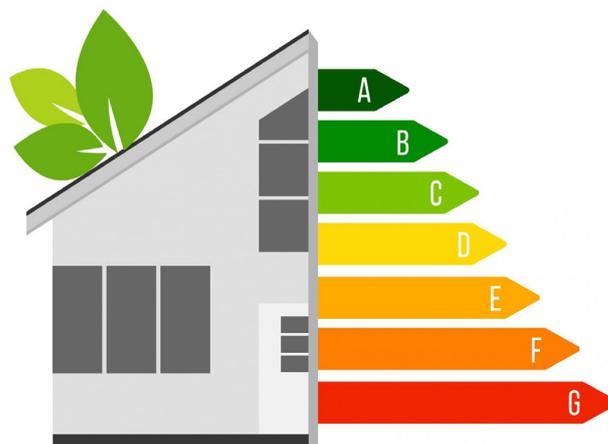
With the introduction of the SAP10, achieving a building's Target Fabric Energy Efficiency is more challenging than the previous SAP2012 model. Here are a few hints & tips on how to pass a new build SAP10 model.

Minimum U-values are there to be beaten, not followed – limiting standards are included in Approved Document L to offer designers flexibility and developers the opportunity to reduce build costs; however, when considering SAP models, it is recommended to meet notional targets for elements of the building fabric (i.e. 1.2U_w on windows).

Window and door performance – within the building's fabric, windows and doors lose more heat when compared to a fully insulated cavity wall, so it is vital that windows and doors have the highest possible U-values to help achieve the building TFEE level.

Make it airtight – new builds require air permeability testing on completion, and the resulting figures go into the SAP calculations. Junctions, where elements meet, such as roofs and windows are more susceptible to air leakage. Correctly installing high-performance windows and doors will increase SAP10 results along with sealing the building envelope efficiently, so always look to select windows and doors that are fully tested and certified for their performance.

Pay attention to thermal bridging – the new SAP10 model now requires building junctions to be modelled so the PSI values are more accurate. Building junctions, like where windows meet the building fabric, are suspect of heat loss, so it is important that window and door materials are considered. Frame factors do vary across timber, aluminium and uPVC, but timber is a natural, solid material, meaning timber windows retain more heat, losing less heat through the outer frames.



All Bereco technical data is available from our Resource Centre
www.berecoresourcecentre.co.uk

Approved Document O Overheating

The aim of requirement Approved Document O (ADO) is to protect the health and welfare of occupants of domestic dwellings and residential like commercial properties such as care homes and student accommodation by reducing the occurrence of high indoor temperatures.

Part O Focuses on:

- Limiting unwanted solar gains in summer;
- Providing an adequate means to remove heat from the indoor environment.



Approved Document O provides a list of ways to limit solar gain and remove excess heat from a building.

Limiting Solar Gain	Removal of Excess Heat
Shutters External blinds Overhangs Glazing type and size (window sizes and G-values)	Opening windows Ventilation louvres Mechanical ventilation systems Mechanical cooling systems

How to Comply with Approved Document O

To comply with ADO, two methods can be utilised: the simplified method & the dynamic thermal modelling method.

The Simplified Method

The simplified method (section 1 of Approved Document O) is based on:

- Restricting maximum allowable window area, which limits a building’s solar gains;
- A minimum area of those windows that can be opened.

Both areas are percentages of the total floor area.

First, a development’s location must be determined as either:

1. High risk.
2. Moderate risk.

Then the development (or building) must be categorised as:

1. Cross-ventilation compliant – natural method of cooling via opening windows on opposite positions in the same area.
2. Not cross-ventilation compliant – only having opening windows on one elevation in the same area.

Next is the maximum glazing area if a building does not meet cross ventilation requirements (see table 1).

Residential buildings in ‘high risk’ locations should also provide shading on East, South & West facing glazed areas via:

- External shutters (with means of ventilation);
- Glazing with max G-value 0.4 & min light transmittance (Lt) of 0.7;
- Overhangs with 50 degrees altitude cut.

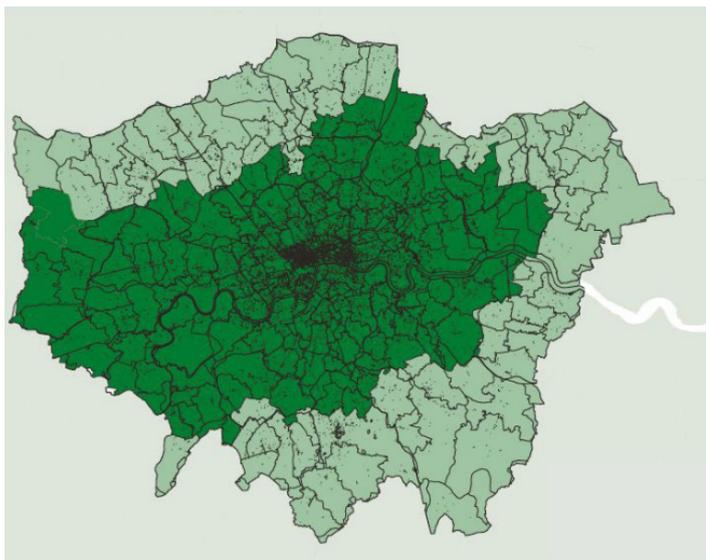
Finally is the minimum openable areas. To meet removing excess heat, table 2 shows the minimum openings required.

Table 1 Limiting solar gains for buildings or parts of buildings without cross-ventilation.

Largest glazed façade orientation	High risk location		Moderate risk location	
	Maximum area of glazing (% floor area)	Maximum area of glazing in the most glazed room (% floor area of room)	Maximum area of glazing (% floor area)	Maximum 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

Table 2 Minimum free areas for buildings or parts of buildings with cross-ventilation.

	High risk location	Moderate risk location
Total minimum free area	The greater of the following: a. 6% of the floor area b. 70% of the glazing area	The greater of the following: a. 9% of the floor area b. 55% of the glazing area
Bedroom minimum free area	13% of the floor area of the room	4% of the floor area of the room



Tables and map are taken from Approved Document O of the building regulations - Overheating

In addition to London, Central Manchester with the below postcodes should also follow guidance for higher risk locations:

Post Codes: M1, M2, M3, M5, M15, M16, M50

- High Risk
- Moderate Risk

The Dynamic Thermal Modelling Method

A dynamic thermal modelling method for overheating compliance is used when:

- The simplified method is too prescriptive;
- The designer/architect would like to design a building outside the simplified limits, offering flexibility.

For compliance, a building's Dynamic Thermal Model must undergo and satisfy a CIBSE TM59 overheating assessment.

In new homes that are naturally ventilated, overheating is defined as:

- Bedrooms warmer than 26°C for 1% of the year's sleeping hours;
- No room may exceed 26°C by more than 1°C for more than 3% of annual occupied hours.

In new homes with mechanical ventilation, overheating is defined as:

- Rooms that are 26°C for more than 3% of annual occupied hours.

Compliance With the New 2022 Standards

Part F

We have introduced a new standard vent with a **4,600mm² EA rating**, resulting in less vents needed to comply per habitable room.

Part O

Anti sun glazing available with **G-Value ranging between 0.2–0.4** is available across our product range.

Part L

Our double-glazed timber windows and doors offer U-values up to **25% better** than the new 2022 standards.

- Sliding sash windows from 1.2W/m²K
- Casements from 1.2W/m²K
- Bi-fold doors from 1.2W/m²K
- Patio doors from 1.2W/m²K
- French doors from 1.2W/m²K

Even if you have a project in a conservation area, we have you covered. Our Heritage products are **12% better** than the new 2022 standards, meaning you can meet planning requirements while also being fully compliant with the new regulations.

- Heritage flush casements from 1.4W/m²K
- Heritage sash windows from 1.4W/m²K

How Bereco Can Support You?

We support our customers with range of free literature and advice:



Speak to the Experts

Our team at Bereco are fully trained on the current and new building regulations. We can guide you through your project, from tender to delivery, and our experts will help select the perfect product for your project.



Bereco Resource Centre

The Bereco Resource Centre gives you full access to view and download a range of technical and marketing material, ensuring you remain well informed and up to date with our latest, fully compliant product range. You will have full access to:

- Performance data, including NBS specifications, ready to enter into SAP model calculations;
- Downloadable product sections and elevations in PDF & CAD format;
- Downloadable general and high performance, PAS-24:2016, FSC 100% and acoustic performance certification.

Get in touch

We would love to discuss your project.

The Bereco Resource Centre
berecoresourcecentre.co.uk

NBS Source
source.thenbs.com

Speak to us
info@bereco.co.uk
01709 838188

