Building Regulations for windows and doors in new homes

A quick guide for self-builders

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Building Regulations
for windows and doors in new homes

Are you planning on self-building your new home? Then start by finding out more about Building Regulations.

Once you have finally received planning permission, you will probably find yourself wondering "where do I start now?" Truth is, you are just at the beginning of your journey, and still have to ensure your dream home is built to the correct standards, as laid out in Building Regulations.

Building Regulations are statutory, unlike planning permission, and a house will pass or fail according to this set of rules.

Windows and doors are an important investment for any self-build, renovation or improvement project, so it's vital to make sure the products you buy - and they way they are installed - comply with relevant Building Regulations.

This guide provides a quick overview of Building Regulations in England* for windows and doors installed in 'single dwellings' - defined as self-contained accommodation in which up to six people can live together, such as a family home.

You can find comprehensive information on Building Regulations in England and Wales on the UK Government website.

Your architect, builder, and window and door supplier should also be able to give you advice on how to comply with the Building Regulations which are relevant to your project.

*PLEASE NOTE: This document is only our interpretation of the regulation highlights, and in no way represents the full extent of each regulation.

It is the responsibility of our customers to fully assess and interpret regulatory requirements and ensure compliance. We recommend to seek expert guidance where required.

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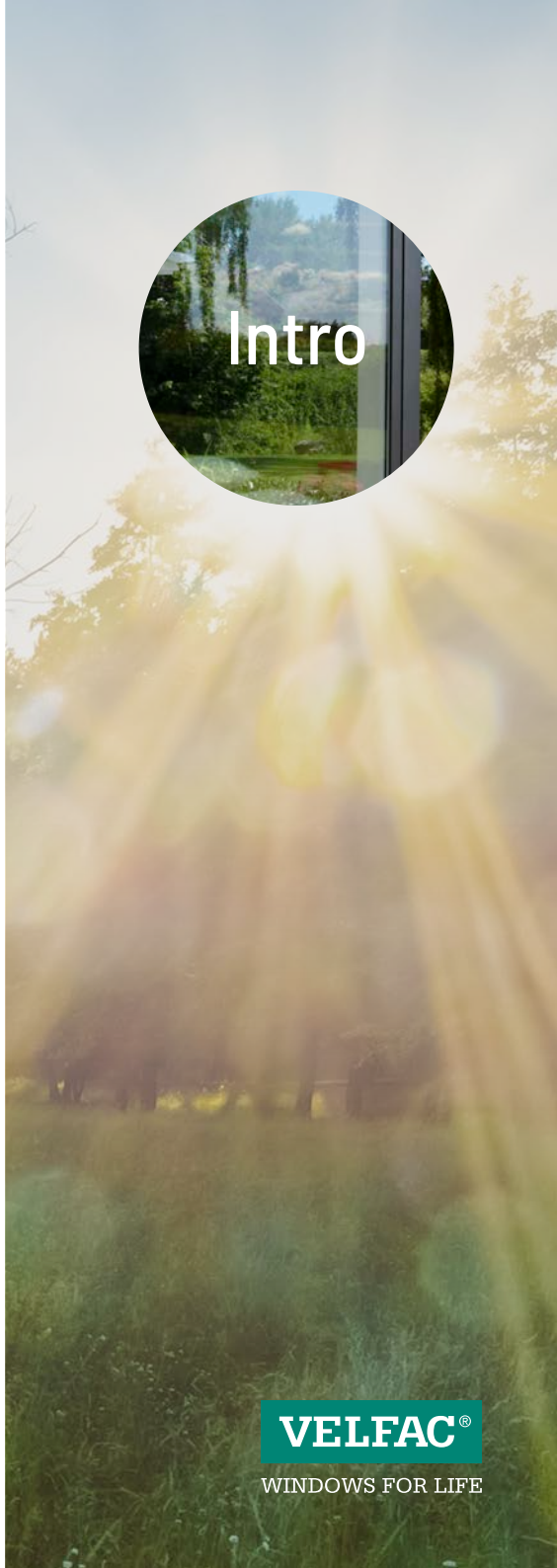

What are Building Regulations?

Overview

What are Building Regulations?

Building Regulations play a vital role in the success of every building project, and non-compliance can result in costly remedial work, fines from the local authority and even (at worst) prosecution. So it's important to plan ahead and make sure that the design of your project, and the building products you want to use, meet all the Building Regulations.

What are Building Regulations?
In England and Wales, Building Regulations are a series of legal requirements that focus on promoting, protecting and enforcing adequate quality standards for the construction of buildings, including domestic properties.

The UK Ministry of Housing, Communities and Local Government (MHCLG) publishes guidance on how to meet Building Regulations in the form of 'Approved Documents' – these cover a range of topics including:

- design and construction
- quality standards
- good design
- good practice

Approved Documents provide general guidance on the expected performance of materials and building work in order to comply with Building Regulations, and practical examples of how compliance can be achieved in order to gain final sign off from Building Control.

What is Building Control?
Building Control is the official body that checks compliance with Building Regulations, and which penalises non-compliance. You, your builder or your architect could be fined or even prosecuted by Building Control if you don't comply with Building Regulations, and your local authority could make you pay for faulty work to be fixed. For this reason, it's very important to plan in advance to meet relevant Building Regulations, and to seek expert advice as soon as possible.

Continued on next page »

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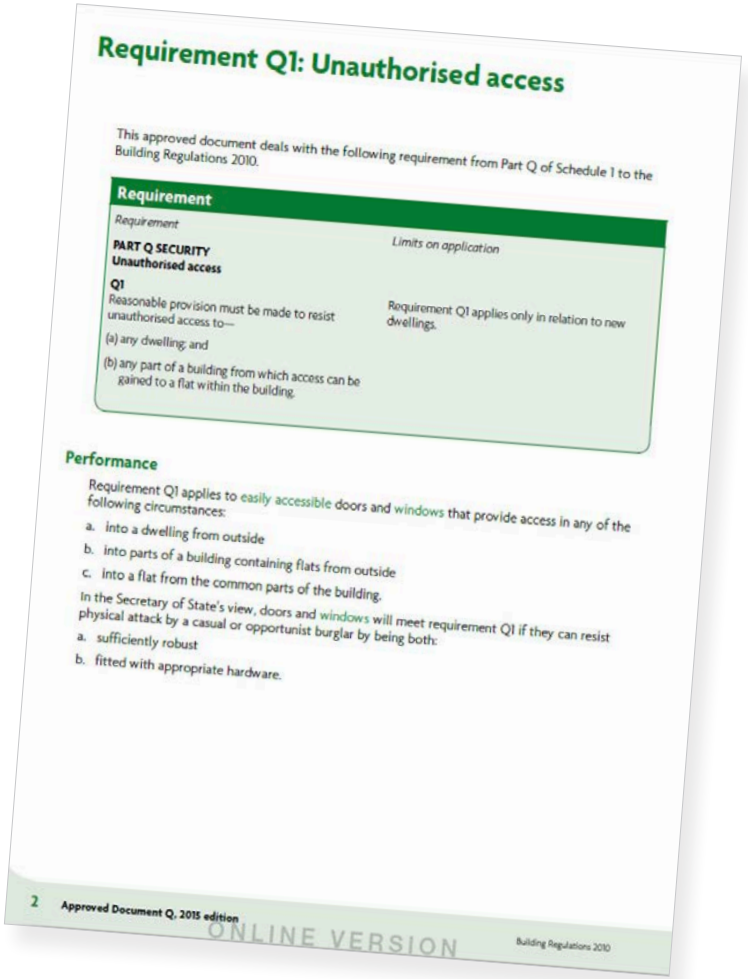
Key Building Regulations and Approved Documents
for windows and doors for single dwellings

- Part B Vol 1 - Fire safety
- Part F Vol 1 - Ventilation
- Part K – Protection from falling, collision and impact
- Part L Vol 1 - Conservation of fuel and power
- Part M - Access to and use of buildings
- Part Q - Security in dwellings
- Part O - overheating

How to read an Approved Document

The Requirement of the specific Approved Document is set out in a green box.

Practical advice and guidance on how to meet the requirement is contained within the rest of the document



Requirement Q1: Unauthorised access

This approved document deals with the following requirement from Part Q of Schedule 1 to the Building Regulations 2010.

Requirement

Requirement	*Limits on application*
PART Q SECURITY **Unauthorised access** **Q1** Reasonable provision must be made to resist unauthorised access to— (a) any dwelling; and (b) any part of a building from which access can be gained to a flat within the building.	Requirement Q1 applies only in relation to new dwellings.

Performance

Requirement Q1 applies to easily accessible doors and windows that provide access in any of the following circumstances:

a. into a dwelling from outside
b. into parts of a building containing flats from outside
c. into a flat from the common parts of the building.

In the Secretary of State's view, doors and windows will meet requirement Q1 if they can resist physical attack by a casual or opportunist burglar by being both:

a. sufficiently robust
b. fitted with appropriate hardware.

2 Approved Document Q, 2015 edition ONLINE VERSION Building Regulations 2010

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Keeping your family safe

At a glance:

- Only relevant to new build homes
- Covers escape and fire resistance
- Each floor of the home requires a different combination of escape windows, doors and protected stairs
- Important - don't confuse fire and exit doors when specifying

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PART B Vol 1: Dwellings - Fire Safety

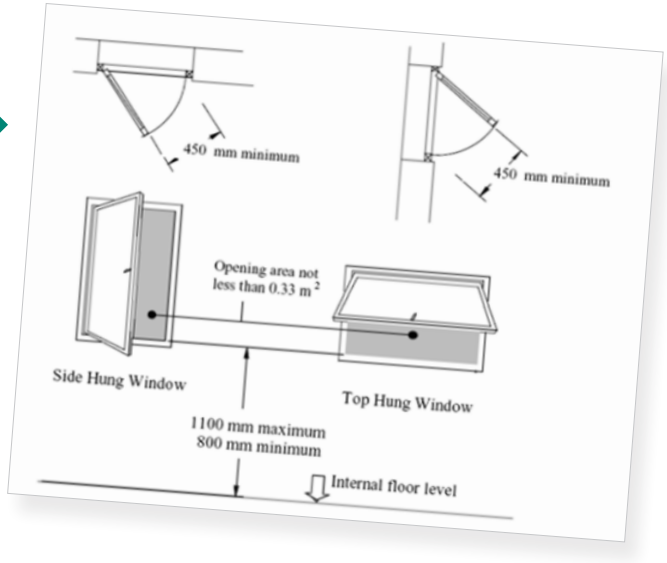
When it comes to fire safety, self-builders and renovators are encouraged to 'build-in' the relevant safety measures right from the start, to avoid any need to alter or adapt a building design later in the building process. Building Regulation Part B Vol 1: covers escape windows and escape doors, and provides detailed information to self-builders to achieve compliance. Please note - Part B Vol 1 covers fire safety in new build homes, not renovations to existing properties.

Key requirements of Part B Vol 1:

- Everyone in a home must be able to escape to a place of safety without external assistance
- If a ground floor habitable room does not open on to a hall leading to a final exit then it must have an emergency escape window or door
- Habitable rooms up to 4.5m above ground level (excluding kitchens) must have an emergency escape window or door if:
  – they are served by only one stairway, and
  – there is no access to a protected stairway
- Escape from habitable rooms more than 4.5m above ground level must only be via a protected stairway

Escape windows - to comply with Part B Vol 1:

- **Escape windows must provide an unobstructed openable area** of at least 0.33m2, and be at least 450mm high and 450mm wide. The bottom of the openable area should be no more than 1100mm above the floor.
- **They must lead to a safe place** and if this place is an area without an exit, such as a courtyard or garden, then it must be at least as deep as the building is high.
- **Compliance is also required with Building Regulation Part K: Protection from falling, collision and impact** - any escape window on upper floors less than 800mm above internal floor level will need to have guarding unless it is in a roof, where the minimum height above floor level is 600mm.
- **Escape windows must remain open without support** – so that anyone escaping does not have to hold the window open.
- **Locks can be fitted to escape windows**, including locks with or without removable keys
- **Stays can also be fitted** but must feature a release catch, which can be child resistant.



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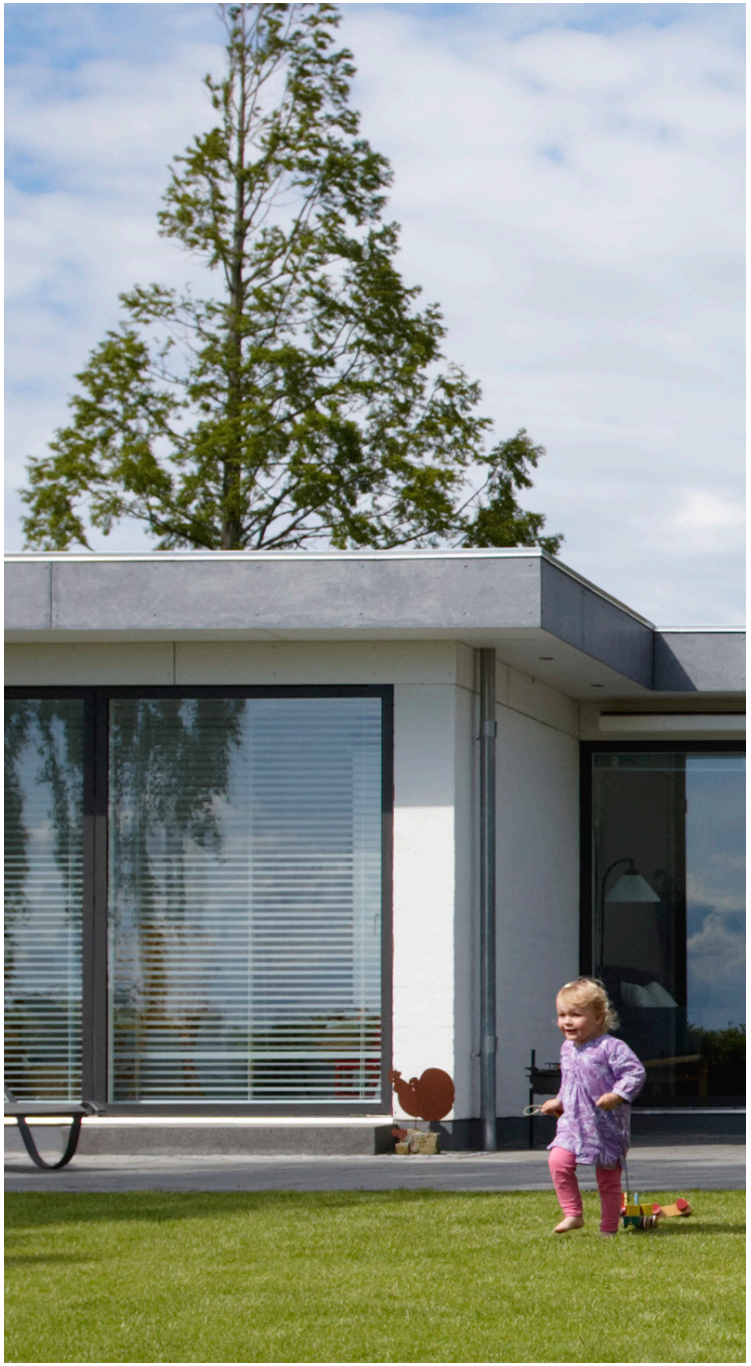
PART B Vol 1: Definitions

- **Fire doors** are internal doors designed to resist fire when closed – different door designs resist fire for different lengths of time, so seek advice on the most appropriate door specification and performance level for your home.
- **Exit doors** provide a route of escape out of a home onto a street, passageway, walkway or open space – they do not necessarily have to be fire resistant. Exit doors are always external doors, and their location should allow residents to make a rapid exit. The width of the exit door depends on the maximum number of people who may need to use it. (more info in the section dedicated to Part M)
- A 'dwelling' (or 'dwellinghouse' in Wales) is a house where up to six people can live together as a family
- 'Habitable rooms' are those rooms used to live in, which includes kitchens but not bathrooms




Good ventilation
is the key to wellbeing

At a glance:

- Good ventilation helps reduce levels of moisture, pollutants and allergens
- Ventilation can be mechanical (extractor fan) or natural (open windows and doors)
- Effective ventilation combines continuous background (or trickle) ventilation with rapid purge (intermittent) ventilation
- Building Control wants to see evidence of both ventilation types

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PART F: Ventilation

Good ventilation is key to a healthy, comfortable indoor climate. It helps remove atmospheric pollutants from the home, including irritants such as pollen and dust, and also the moisture caused by heating, bathing, washing and cooking. This is particularly important as excess moisture causes condensation which, if unchecked, can lead to mould growth on walls, windows and furniture. Condensation is also evidence of a humid atmosphere which can exacerbate respiratory problems, allergies and other conditions.

Building Regulation Part F looks at three key types of ventilation:

- Intermittent – mechanical ventilation
- Background or trickle – slow and continuous ventilation
- Purge – rapid ventilation

Windows and doors are essential for both background and purge ventilation, as follows:

Background ventilation

This is usually provided by trickle vents installed within a window frame or door, and which:

- provide a continuous exchange of air at a relatively low rate
- are typically positioned at least 1.7m above floor level to avoid draughts
- are designed to remain permanently open, but can also be partially or fully closed.

When assessing background ventilation, Building Control will want to see the 'Equivalent Area' measure for each trickle vent – this is normally given as mm2 and should be clearly marked on the vent itself.

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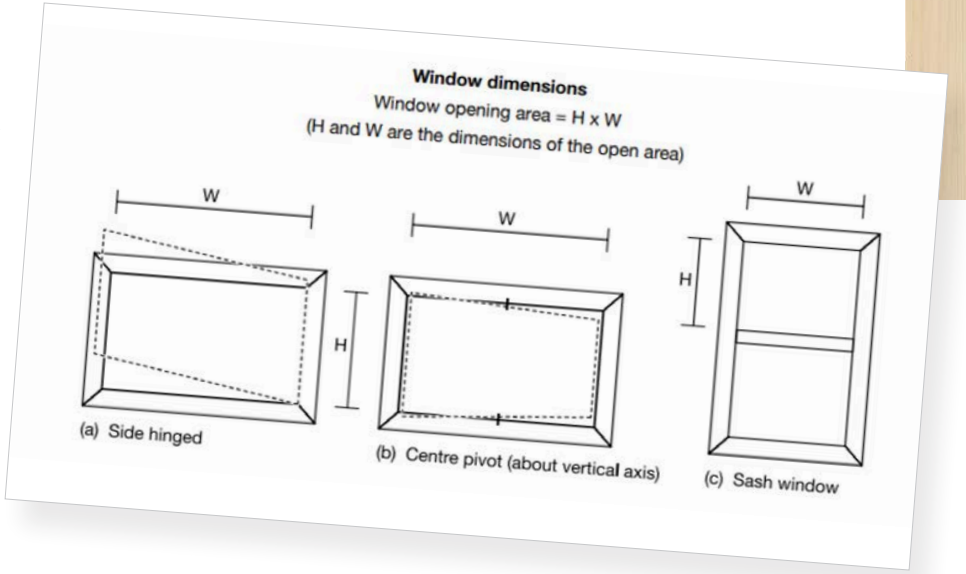
Ventilation

Purge Ventilation

Purge ventilation is provided by extractor fans or open windows and doors, and is used to swiftly remove excess moisture or high concentrations of pollutants from a room - the result of activities such as painting and decorating, for example, or the accidental burning of food.

Building Control will want to make sure that purge ventilation can take place in every habitable room either naturally or mechanically. For effective natural purge ventilation, the openings provided by any windows or doors that open beyond 30 degrees must be equal to at least 1/20th of the floor area of the room.



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Safe as houses

At a glance:

- The main safety risks associated with windows and glazed doors are accidental falling and injury from broken glass
- Guarding may be required to prevent falling from upper floor windows and doors
- Safety glass – glass which breaks safely or provides protection from falling,
  - must be installed where the risk of impact is greatest

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PART K – Protection from falling, collision and impact

Safety is a primary consideration when planning the installation of windows and doors around your home, especially the safety of young children. This is the focus of Building Regulation Part K, which gives detailed guidance on how to ensure risk-free glazing design and installation, as follows:

- Window and door guarding may be necessary to prevent occupants – accidently falling from a window. In a home, guarding 'must be considered' (but may not be essential) for:
  – upper floor fixed windows with a cill height below 800mm
  – upper floor opening windows with a cill height below 800mm - this can be a guard up to 800mm high, or a permanent restriction device
  – upper floor inward opening Juliette balcony doors, up to a height of 1100mm

- If children under five will be living in your home, then make sure:
  – a 100mm sphere cannot pass through any guard openings, to prevent small children getting stuck in the guard
  – there are no horizontal rails, to prevent climbing

Requirement K4: Protection against impact with glazing: Installing different types of safety glass

When it comes to accidental injury resulting from impact with glazing, the risk increases in certain locations around the house – in particular:

- doors and door side panels, particularly between floor and shoulder level and near to door handles and push plates
- low level glazing in walls and partitions (where children are especially vulnerable).

If you plan to install glazing in these locations, or are likely to come into contact with windows or glazed doors while moving about your home, then glazing must offer either:

– Safe breakage – unlikely to cause injury if broken
– Containment – resists impact without breaking
– Guarding

'Safe breakage' glass is mainly found in locations where internal and external floor levels are the same - where guarding is not essential but where glass must break in a way that prevents major injury. The two main types of 'safe breakage' glass are:

- **Toughened** - designed to disintegrate into small blunt pieces when broken, rather than shattering into spikes and shards (as annealed (float) glass would)
- **Laminated** - typically constructed from two sheets of annealed (float) glass with a polyvinyl butyral (PVB) central interlayer. If broken, the interlayer holds the glass in place and prevents it from separating into large sharp pieces.

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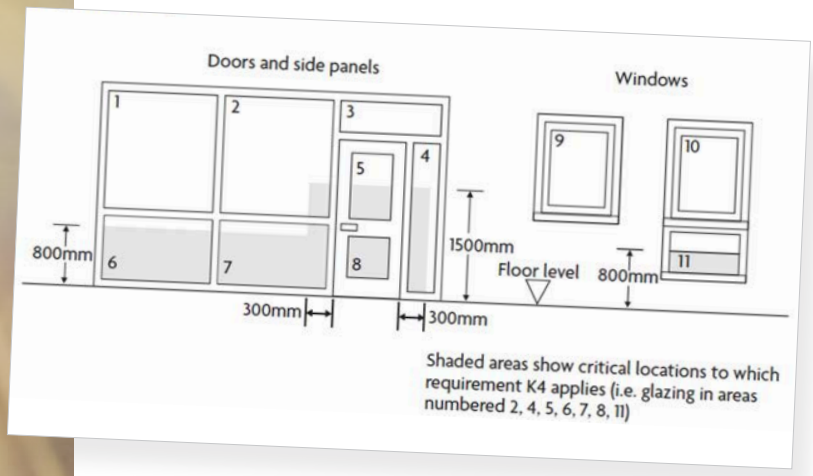
Protection

Glazing in critical locations should:

- **Break safely** – use toughened or laminated glass
- **Be in robust or small panes** – for thickness, refer to Approved Document-K
- **Be permanently protected** - guarding (either a separate element or the glazing itself)

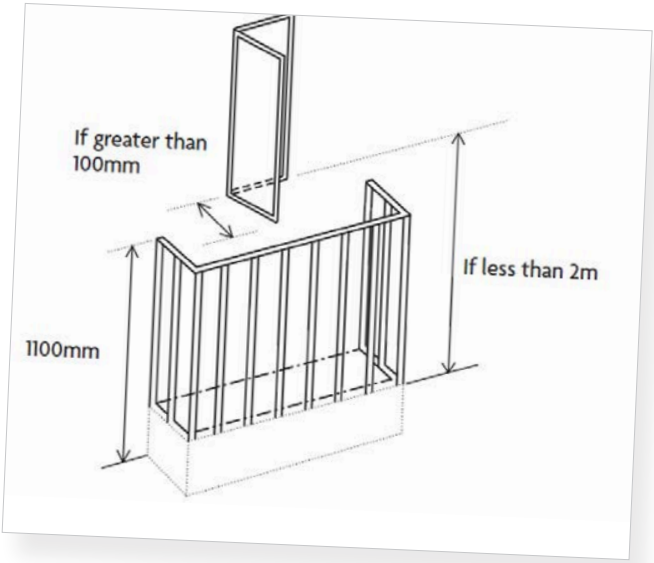


Guarding must be provided when:

- There is a change of internal and external level of more than 600mm
- The window is below 800mm from finished floor level (FFL)

A 100mm sphere should not pass through the rails (clause K2)

Rails should be vertical not horizontal, to prevent climbing



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Let energy in and
save on bills

At a glance:

- New doors and windows must meet minimum energy performance targets
- The UK has set in law a target to bring all its greenhouse gas emissions to net zero by 2050.
- As part of the journey to 2050 , starting from the 15th of June 2022, windows and doors installed in new houses need to comply to a new set of rules.

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PART L – Conservation of fuel and power

A 'low energy' approach to new build homes, extensions and renovations is actively encouraged by the Government as a way to reduce bills and also solve many common household problems such as damp, mould and draughts.

Improved energy performance is regulated by Part L, and to comply you have to prove that your new windows and doors (described as 'controlled fittings') meet minimum performance requirements, measured by the:

U-value – this indicates the amount of heat escaping through a window or door, and the lower the U-value the better the insulation. U-values are therefore lower for triple glazed window units, and for windows with slim frames as glass is a better insulator than typical framing materials such as wood or metal. Composite frames (combining timber and aluminium) offer better U-values than single material frames.

Frame factor (Ff) – this is the ratio of glass to frame in the window as a whole. A slim-framed window will have a higher frame factor than a window with a wider frame, and a better thermal efficiency. This is because the slim frame increases the percentage of glass in the window and allows more daylight and solar heat to enter the interior. If a window with the same overall dimensions has a wider frame then the percentage of glass will be lower and as a result the passage of light and heat will be restricted.

Notes:

- Projects submitted to Building Control before 15 June 2022 are allowed to comply with the previous version of Part L provided that building work is started before the 15th of June 2023

- New windows and doors installed in existing homes (to replace older windows, or as part of refurbishment projects) are allowed to comply with the previous version of Part L until 14 June 2023

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Energy efficiency

R24-27C ONLINE VERSION

Table 1.1 Summary of notional dwelling specification for new dwelling[1]

Element or system	Reference value for target setting
Opening areas (windows, roof windows, rooflights and doors)	Same as for actual dwelling not exceeding a total area of openings of 25% of total floor area[2]
External walls including semi-exposed walls	U = 0.18 W/(m²·K)
Party walls	U = 0
Floors	U = 0.13 W/(m²·K)
Roofs	U = 0.11 W/(m²·K)
Opaque door (less than 30% glazed area)	U = 1.0 W/(m²·K)
Semi-glazed door (30–60% glazed area)	U = 1.0 W/(m²·K)
Windows and glazed doors with greater than 60% glazed area	U = 1.2 W/(m²·K) Frame factor = 0.7
Roof windows	U = 1.2 W/(m²·K), when in vertical position (for correction due to angle, see specification in SAP 10 Appendix R)
Rooflights	U = 1.7 W/(m²·K), when in horizontal position (for correction due to angle, see specification in SAP 10 Appendix R)
Ventilation system	Natural ventilation with intermittent extract fans
Air permeability	5 m³/(h·m²) at 50 Pa
Main heating fuel (space and water)	Mains gas
Heating system	Boiler and radiators Central heating pump 2013 or later, in heated space Design flow temperature = 55 °C
Boiler	Efficiency, SEDBUK 2009 = 89.5%
Heating system controls	Boiler interlock, ErP Class V Either: – single storey dwelling in which the living area is greater than 70% of the total floor area: programmer and room thermostat – any other dwelling: time and temperature zone control, thermostatic radiator valves
Hot water system	Heated by boiler (regular or combi as above) Separate time control for space and water heating
Wastewater heat recovery (WWHR)	All showers connected to WWHR, including showers over baths Instantaneous WWHR with 36% recovery efficiency utilisation of 0.98
Hot water cylinder	If cylinder, declared loss factor = 0.85 × (0.2 + 0.051 $V^{2/3}$) kWh/day where V is the volume of the cylinder in litres
Lighting	Fixed lighting capacity (lm) = 185 × total floor area Efficacy of all fixed lighting = 80 lm/W
Air conditioning	None
Photovoltaic (PV) system	For houses: kWp = 40% of ground floor area, including unheated spaces / 6.5 For flats: kWp = 40% of dwelling floor area / (6.5 × number of storeys in block) System facing south-east or south-west

NOTE:
1. For a dwelling connected to an existing district heat network, an alternative notional building is used. See paragraph 1.8 and SAP 10.
2. See SAP 10 for details.

12 **Approved Document L Volume 1, 2021 edition** Building Regulations 2010

ONLINE VERSION

Part L requirements:

Windows and glazed doors with greater than 60% glazed area
Maximum U-value - 1.2W/(m^2·K)
Frame factor - 0.7

Opaque door (less than 30% glazed area)
Maximum U-value = 1.0 W/(m^2·K)

Semi-glazed door (30–60% glazed area)
Maximum U-value = 1.0 W/(m^2·K)
DSER Band B or better

Note:
These measures are applied to a 'standard' window - the effect of Georgian bars and / or leaded lights is ignored

Future Homes standard
The UK has set in law a target to bring all its greenhouse gas emissions to net zero by 2050. As part of the journey to 2050, The 2019 Spring Statement includes a commitment that, by 2025, the UK government will introduce a Future Homes Standard for new build homes to be future-proofed with low carbon heating and world leading levels of energy efficiency.

This consultation also sets out government's plans for achieving the Future Homes Standard, which include a mandatory 30 per cent cut in carbon for all new homes. Windows and doors contribute massively to the energy efficiency of a building, therefore installing energy efficient units will become necessary to achieve the Future Homes standard

Read the Approved Document Part L

› https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1057372/ADL1.pdf

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Open the door to
new possibilities

At a glance:

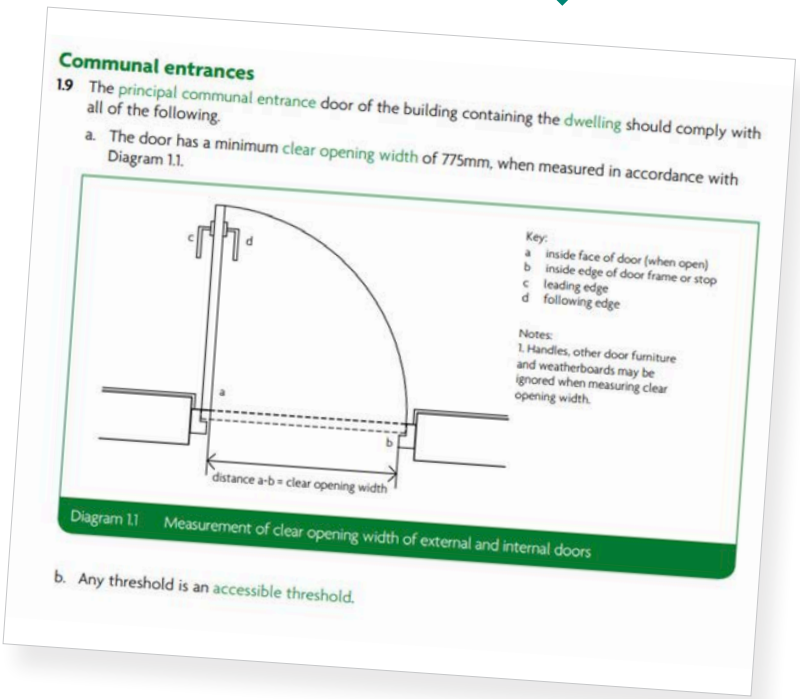
- Only applies to doors in new build homes
- Improves accessibility for everyone, and throughout their lives
- Entrance doors must be wheelchair friendly
- Entrance door thresholds should be level, or meet strict height and design guidelines
- Entrance doors must also meet minimum clear width parameters

PART M - Access to and use of buildings

Part M details the design features required to make sure a new build home is accessible and usable by everyone, regardless of disability, age or gender. These features also reduce the need for homeowners to move or adapt their property as their needs change.

Part M only applies to doors, as follows:

- An area of flat ground (also called a 'level standing'), of at least 1500mm x 1500mm, must be immediately in front of the main entrance door – this area must be clear of any door swings and made of a material that does not impair wheelchairs, such as loose gravel
- The threshold of an entrance door should provide weather protection but should not be a barrier for wheelchair users, or a trip hazard
- A level threshold is ideal, especially for doors used frequently, but not if it allows water penetration and draughts
- If a raised threshold is unavoidable then it should have a maximum height of 15mm, with a minimum number of upstands and slopes (these create the raised profile of the threshold)
- Upstands higher than 5mm must be chamfered (the corner cut away at a right angle, also known as bevelled)
- The minimum effective clear width for a single leaf entrance door (or one leaf of a double door) varies depending on the angle of approach as follows:



Communal entrances

1.9 The principal communal entrance door of the building containing the dwelling should comply with all of the following.

a. The door has a minimum clear opening width of 775mm, when measured in accordance with Diagram 1.1.

Diagram 1.1 Measurement of clear opening width of external and internal doors

b. Any threshold is an accessible threshold.

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Protecting your home
from intruders

At a glance:

- Applies to ground floor windows and doors
- Also applies to upper storey windows and doors which could be accessed by a burglar
- Test evidence is needed for Part Q compliance of windows an doors
- Look for Part Q compliant units to avoid additional testing

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PART Q - Security in dwellings

Security is a home-owner priority, especially when it comes to windows and doors which are a common target for burglars. Police statistics show, however, that most intruders are opportunistic and will give up in under three minutes if they can't force their way into a property.

Part Q is designed to improve the security of any door or window which can be easily accessed by a burglar, helping minimise the risk of forced entry.

Part Q applies to all homes and covers:

- ground floor windows and doors, including patio doors
- windows, doors and patio doors installed above flat or gently sloping roofs and within 3.5m of ground level
- windows, doors and patio doors installed 2m above a flat or sloping roof (such as a balcony, garage or porch), or other surface

Part Q compliant windows and doors have a number of enhanced security features, including:

- (for glazed units) at least one pane of strengthened, laminated 6.8mm glass – this provides enhanced resistance to forced entry and will break safely if shattered
- internal glazing beads – glass panes are fitted and sealed from the inside, making it impossible to remove a glass pane externally
- multi-point locking systems – these secure a window or door at more than just the handle, providing additional resistance to forced entry using tools such as crowbars or screwdrivers
- durable external frame materials, such as aluminium, which can resist forced entry more easily.

To demonstrate Part Q compliance you need to provide test evidence

- If your windows and doors are supplied by a Part Q-compliant manufacturer then test evidence will be supplied when the units are delivered.
- If your windows and doors are bespoke, ask your manufacturer to provide evidence for every unit.
- If you buy 'off the shelf', ask your supplier for evidence of Part Q compliance.
- If test evidence is not available, you will have to commission it from a testing specialist.

Windows and doors built with compliance in mind

Conclusions

- You, as the building owner, are responsible for complying with Building Regulations
- Compliance is checked by Building Control
- Non-compliance can mean expensive remedial work, or even prosecution
- Building Regulations can be challenging, so start your research early
- Seek expert advice and consult relevant Government websites
- To reduce risk, buy products which already comply with Building Regulations

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Choose VELFAC – windows and doors and comply with key Building Regulations

The iconic VELFAC composite frame combines aluminium on the outside, for durability and style, with internal wood for a beautiful, natural finish. Our motto is 'life, light and air':

- All our windows and glazed doors feature ultra-thin frames to boost daylight and solar gain
- Low U-values, especially for triple glazing, deliver excellent insulation and noise control
- The external aluminium frame needs no repainting for the lifetime of the window
- Every VELFAC unit includes a range of security features, from internal glazing beads to multi-point locking
- Our commitment to sustainability guides our choice of raw materials and manufacturing processes.

Part L - Conservation of fuel and power:
Minimum U-value required for new windows: 1.2W/m2k

- U-value for VELFAC triple glazed units: 0.8W/m2k
- VELFAC windows frame factor comply with the required 0.7

Part Q - Security in Dwellings

- VELFAC has a range of windows accredited by Secured by Design, the UK Police initiative to 'design out crime' - which also means they are Part Q compliant.

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VELFAC units built with compliance in mind

Fixed window

- Fixed window in wood /aluminium
- Used as source of light, can be combined with opening windows to create beautiful glazed curtain walls.
- All VELFAC windows feature the same slim profile whether they open or not

Sideguided window

- Sideguided window in wood / aluminium
- Available as single or double opening
- When fully opened, a 150mm (minimum) gap allows cleaning from the inside
- Can be combined with different windows types (fixed, tophung, sidehung) as they all appear identical

Topguided window

- Topguided window in wood / aluminium
- When opened the sash provides a ventilation gap at the head
- Can be combined with different windows types (fixed, sideguided, sidehung) as they all appear identical

Reversible window

- Reversible window in wood / aluminium
- The sash can be rotated by up to 170° to allow cleaning from the inside
- The window can be reversed to the cleaning position where an automatic catch keeps the window in place

For further info about VELFAC products and features, and for advice on how to configure them to comply with specific building regulations, please contact VELFAC for domestic projects.

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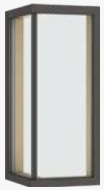
VELFAC units built with compliance in mind

Glass to glass corner window		· VELFAC glass to glass corner window in wood / aluminium · Can be used where an external view is required without disruption caused by corner posts · The window allows maximum light to enter · Glass corner is 90°
Casement door		· Casement door in wood / aluminium · Available as single or double leaf opening · The sash stops at 90°, but is also available with 180° hinge which allows the sash to fold back flat against the wall · The frame profile of the door matches all VELFAC windows
Sliding door		· Sliding door in wood / aluminium · Available as single or double leaf opening · Max. width for total screen is 6m · The frame profile of the door matches all VELFAC windows · Available with standard or low treshold for easy access
Entrance door		· Flush or glazed entrance doors in wood / aluminium · Available in a number of external designs and can incorporate a range of glass apertures. · High security features including internal beading – to prevent external removal of glazing and multi-point locking · VELFAC Ribo doors can be coupled with fixed windows to create glazed entrance screens

For further info about VELFAC products and features, and for advice on how to configure them to comply with specific building regulations, please contact VELFAC for domestic projects.

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Your notes:

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