

GGF Datasheet: Windows & Doorsets - Weather Resistance - Dwellings

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1. Introduction

This datasheet provides background, guidance and direction related to the Statutory Regulations and Standards which must be complied with when placing windows and doorsets on the UK and ROI markets.

It is also important to recognise that customers may need, or expect performance and/or functionality in addition to these requirements. The relationship between statutory obligations and customer desires has to be understood when aiming to provide products and installations that result in satisfied customers.

The background and supplementary information in this datasheet should assist in understanding these issues and provide the necessary information to support negotiations and agreements.

It should be noted that the requirements for windows and doorsets can be quite different when being supplied for replacement within an existing building aperture than those for windows and doorsets in an extension to an existing dwelling or for a complete new-build.

This datasheet is not a comprehensive set of instructions of how to meet all obligations, statutory or regulatory, and should not be relied upon as such. The responsibility lies with the building owner to ensure that the work carried out is safe and complies with the relevant regulations. A risk assessment should be carried out prior to works starting. GGF member

companies will be able to assist with additional guidance on safe working practices and regulation compliance.

There is no intent to reproduce here all the data contained in standards, statutes or regulations as these are subject to regular review and amendment and are easily accessible. The user is advised to ensure that they are always referring to the most up-to-date version of any document being relied upon.

2. Scope

This document describes aspects of performance of windows and doors relating to weather resistance, specifically air permeability and watertightness and wind loading.

It applies to windows and doors made from any material and intended for installation within the building envelope of dwellings.

3. Definitions

Building envelope - All elements of the outer shell of a building that maintain a dry, heated or cooled indoor environment.

Weathertightness - Performance in respect of air permeability, watertightness and wind resistance.

4. Guidance

Windows and doors, as part of the external envelope of a building, must contribute to protecting it from the effects of the prevailing weather.

They must be resistant to the ingress of wind driven rain protecting the building from water damage and resistant to the passage of air, in or out, causing discomfort by draughts and wasted energy through loss of heated or cooled air.

They must also be robust enough to withstand the loads created by wind pressure.

4.1 Determination of performance level required

It is important to understand if a product design is appropriate for the installed location.



The method of determining what level of performance is appropriate is defined in standards.

The standard uses information about the installation location as follows:

Geographical position in the UK on a wind speed map.

Height above sea level

Exposure conditions such as on an exposed hillside or in a sheltered urban location

Height of building

The use of this data enables the determination of the design wind pressure

From the design wind pressure, the required level of water-tightness, air permeability and wind resistance are defined.

4.2 Determination of weather performance of products

This performance is determined by physically testing representative products. The system designer will have test evidence available. When representative products are made to the system manufacturer's manual they will achieve the declared performance.

Products are exposed to positive and negative pressures and the amount of movement measured.

The volume of air required to maintain different pressures is measured to assess how weather tight the products are.

A rain simulation at different pressures is conducted and the product examined to see at what pressure and at what location any water appears on the test specimen.

It can be seen that the stated performance of product designs can then be matched to the proposed location to ensure suitability.

4.3 Tested performance versus real life.

The determination of design wind pressure and the performance under test are an indication of suitability of products for the intended location.

They do not guarantee complete airtightness or that leakage will not occur in unusual extreme weather conditions that may be experienced. For example, it is possible that windows may leak during a prolonged spell of driving rain caused by a storm. This does not indicate that the products are not fit for the location.

It is not unusual to see water within the channels of a window or door frame. The provision for drainage of water

is designed in such a way that sometimes water will be visible as it passes through the drainage system to the exterior face.

The use of trickle vents may cause a slight draft, and in some extreme weather events water ingress is possible.

4.4 Conflicting requirements

Care should be taken to ensure products are fabricated in accordance with the system designer's instructions. Elements of product structure provided to give stiffness to meet design wind pressure requirements may lower thermal performance. Such components must not be substituted in order to improve another characteristic without due consideration and knowledge that the products will remain suitable for the location intended.

For example replacing steel reinforcement with plastic thermal inserts may improve insulation but may reduce stiffness and could therefore compromise structural and security performance.

Annex A – Additional information

Determination of performance level required. (Exposure Category)

The method of determining the correct level of performance for weather-tightness is contained within BS 6375-1: Performance of windows and doors. Classification for weather-tightness and guidance on selection and specification.

The exposure category of a window or doorset shall be classified as detailed in Table 1 of BS 6375-1.

Air permeability

The air permeability shall be as specified for the appropriate exposure category in Table 1 of BS 6375-1. The air permeability requirement has been determined by the following:

- a) The exposure category
- b) The heat loss that can be accepted
- c) The health and comfort of the occupants.

The air permeability is tested in accordance with BS EN 1026 and classified in accordance with BS EN 12207.

Watertightness

The watertightness shall be as specified for the appropriate exposure category in Table 1 of BS 6375-1. There shall be no leakage during the test up to and at the test pressure class given in Table 1 of BS 6375-1.

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The watertightness is tested in accordance with BS EN 1027 and classified in accordance with BS EN 12208.

Resistance to wind load

The resistance to wind load shall be as specified for the appropriate exposure category in Table 1 of BS 6375-1.

For the purpose of the test three sets of pressure have been identified.

P1 - to measure deflection of parts of the sample.

P2 - 50 cycles of pulsating pressure to assess the sample for repeated exposure to wind.

P3 - applied to assess the safety of the sample under extreme conditions.

The UK exposure category is determined by the P1 deflection measurement and not the P3 safety gust.

The deflection of any framing member shall be no more than 1/150 of its length, (Class A of BS EN 12210) when tested to P1.

The relationship between P1, P2 and P3 is as follows.

$P2=0.5 P1$, and $P3=1.5 P1$. The pressure is measured in Pascals. (Pa)

Resistance to wind load testing is carried out in accordance with BS EN 12211 and classified in accordance with BS EN 12210.

BIBLIOGRAPHY

The latest edition of the referenced document applies.

BS 6375-1 Performance of windows and doors. Classification for weathertightness and guidance on selection and specification.

BS EN 1026 - Windows and doors. Air permeability. Test method.

BS EN 12207 - Windows and doors. Air permeability. Classification.

BS EN 1027 - Windows and doors. Watertightness. Test method.

BS EN 12208 - Windows and doors. Watertightness. Classification.

BS EN 12211 - Windows and doors. Resistance to wind load. Test method.

BS EN 12210 - Windows and doors. Resistance to wind load. Classification.

