

## GGF Datasheet: Windows & Doorsets - Light & Solar Transmittance - 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 the transmission of light and energy into a building.

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

### 3. Definitions

Light Transmission – A measure of light allowed to pass through a surface.

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

### 4. Guidance

Glazing in buildings contributes to the wellbeing of occupants by admitting natural daylight and allowing a view of the external environment.

#### 4.1 Solar Gain

Radiation from the sun is spread over many wavelengths some of which are felt as heat.

When the radiation from the sun meets the glass in a window or door; some of it is reflected, some of it is absorbed and the glass gets warmed and some of it is transmitted through into the building providing light and warmth inside.

This proportion that is transmitted is termed the solar factor *g*.

The more that is transmitted, the higher the *g*.



This factor can be modified by the addition of tints to the glass or by the use of special coatings.

When considered as part of the whole building, the factor can be modified by changing the proportion of glass in the building envelope. It should be noted that depending on the orientation of the façade differing measures may be required, eg South facing facades may require measures to reduce solar gain more so than other facades of a building.

Transmitted heat can be a benefit, providing free energy and helping to reduce the heating and lighting requirement. However, in some circumstances it can become a problem leading to overheating and the necessity to use energy to cool the interior of the building or at the other end of the scale darkening the interior so that there is more dependence upon artificial light.

Balancing this feature is an important aspect of building design. For more information on ventilation please refer to Glass and Glazing Federation datasheet 6.3 Windows and Doorsets – Ventilation – Dwellings.

### 4.2 Solar Radiation and damage

Damage to furnishings and artwork can occur from exposure to solar radiation over a prolonged period of time. The damage will usually present itself in the form of fading or sometimes cracking to finishes of materials. It is recommended that advice be sought prior to installation if damage to furnishings is a concern particularly where there is large areas of glass, eg conservatory roofs or attic rooms. Different glass coating technologies can help to reduce the effect of solar radiation and the damage caused by it. Other factors such as levels of illumination, temperature and exposure time can all have an effect on furnishings. In some cases a laminated glass can be more effective at preventing the negative effects of UV damage.

### 4.3 Daylight Factor

Daylight is a combination of direct sunlight, diffused skylight and reflected light. A measure for the amount of light available in a room is

the daylight factor, this compares the amount of light available in a room to that available outside and is calculated as a percentage. The higher the daylight factor the better the illuminance within the room and the easier it is to undertake tasks such as reading or writing, an acceptable level of daylight factor in a domestic property would be 2% rising as high as 5% for a well lit home office. The level of daylight available in a room can be affected by many factors including the weather, the time of year and sun position, the design and orientation of the

building, any obstructions such as trees, the internal decoration of the room and even the glass combination being used, therefore it is essential to design with all these factors in mind. In deep rooms the level of daylight diminishes the further into the room, but the ratio of glazed area to floor area does not necessarily correspond with higher daylight factor. For example a deep room with 20% glazed area in a wide facade will offer high intensity of daylight immediately next to the source of light, diminishing to 2% daylight factor a couple of metres into the room. Increasing the level of glazing to 50% of the facade will allow more light in however it is still likely to diminish to less than 2% daylight factor within 4 metres. If the facade was smaller in width and the internal decoration is a light colour then the daylight will likely reflect further into the room.

### BIBLIOGRAPHY

Glass and Glazing Federation datasheet 6.3 Windows and Doorsets – Ventilation – Dwellings.