SOLAR ENERGY TRANSMITTANCE (G)

SUMMARY

- ✓ g and g_{tot} are the key energy performance figures for assessing the amount of solar energy transmitted into a building.
- ✓ g-value indicates the amount of solar heat gain that is admitted by a window system with the glass alone.
- ✓ g_{tot} indicates the amount of solar heat gain that is admitted by the glazing and shading combined.
- ✓ g_{tot} is available from the European Solar Shading Database (ES-SDA) for a wide range of materials.

1.0 INTRODUCTION

Most modern buildings are designed with a higher proportion of glazing which allows them to bring in natural light and free solar energy. In order to benefit the most from these positive aspects, it is important to find the right balance and avoid the downsides such as unwanted overheating in the summer months.

This guidance note investigates g-value and g_{tot} as these provide key energy performance figures for assessing the amount of solar energy transmitted into a building.

2.0 g-value

- **What is g-value?**

G-value is the coefficient commonly used in Europe to measure the solar energy transmittance of glass.

- **What does g-value stand for?**

It is a ratio of the total solar energy transmitted into the building (through glazing alone) to the total incident solar energy transmitted. For example the clear single glass has a g-value of 0.85.

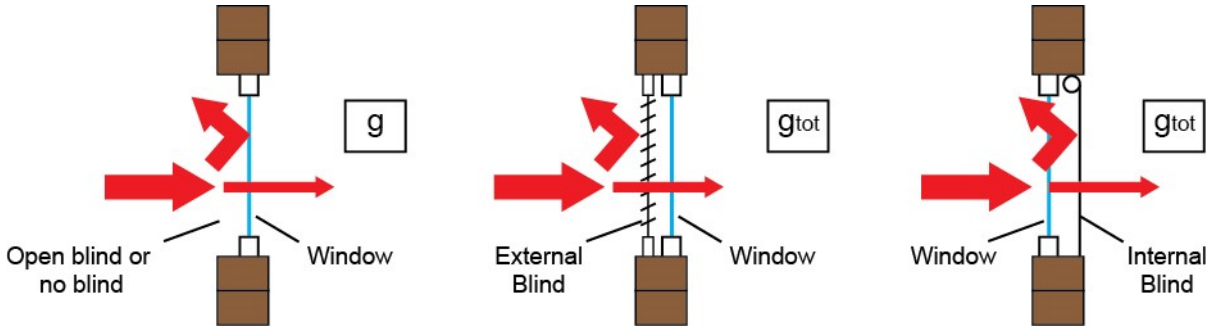
- **What does this mean?**

The value of 0.85 means that 85% of the energy gets transmitted into a building through glazing. Generally, the lower the g-value, the lower the amount of heat entering the building and the lower the heat gain.

- **Source of performance data**

It is important to use accurate data for the energy performance of glazing. Data is available from the International Glazing Database (IGDB).

For more information see: https://windows.lbl.gov/g/IGDB/



No or open blind | External blind | Internal blind

3.0 g_{tot}

- **What is g_{tot}?**

G_{tot} is the total solar energy transmittance through a window and a shading device combined.

- **What does g_{tot} stand for?**

It is a ratio of the total solar energy transmitted through the glazing and shading to the total incident solar energy.

- **What does this mean?**

The lower the g_{tot} value, the lower the heat gain. Typically external shading is extremely efficient as it stops the heat energy before it reaches the glass. Generally, all types of shading have the ability to lower the g_{tot}.

- **Why does it matter?**

Reducing g_{tot} and therefore excessive heat gain saves energy and money. In an office building one of the highest energy costs is air-conditioning. Effective shading can reduce the need for air-conditioning and also helps to reduce emissions. g_{tot} should be used in building information modelling as it is the most relevant measure for combined glazing and shading.

- **Source of performance data**

It is important to use accurate data to assess the energy performance of different types of shading in combination with different types of glazing.

Visit: http://es-so-database.com/essodata/index.html

BLIND FABRIC	DOUBLE GLAZING (g = 0.75)		SOLAR CONTROL GLAZING (g=0.32)	
	INTERNAL BLIND	EXTERNAL BLIND	INTERNAL BLIND	EXTERNAL BLIND
Opaque - White	0.43	0.05	0.24	0.02
Opaque - Black	0.63	0.14	0.30	0.07
Medium Translucent - White	0.40	0.20	0.26	0.10
Medium Translucent - Black	0.65	0.28	0.30	0.14

Improvements to g-value using internal and external shading indicative.

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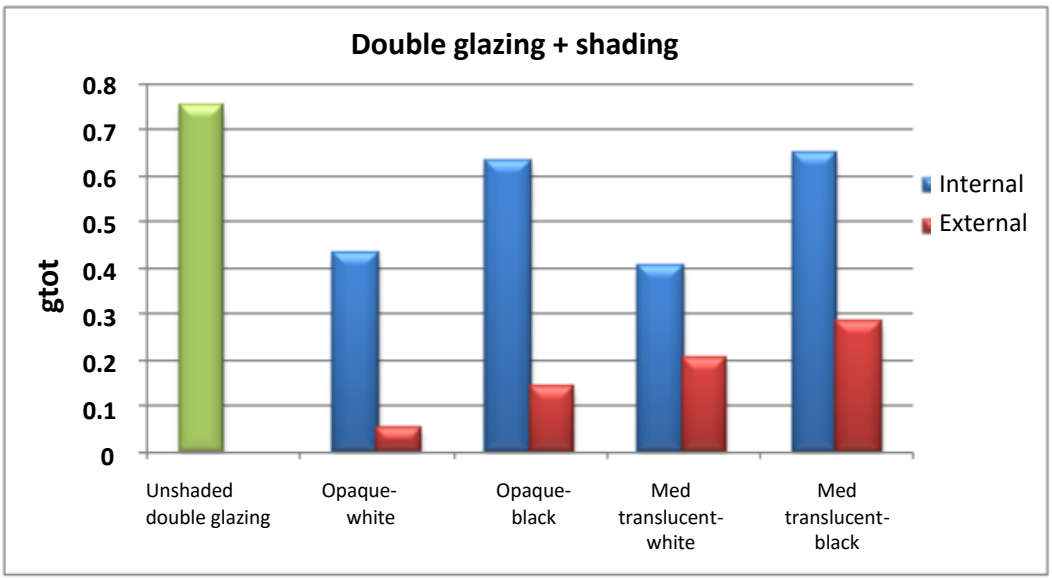

Source: BS EN 13363-2:2005 and BS EN 14501:2005

4.0 FURTHER INFORMATION

For more information including scientific reports, guidance notes and videos, visit the resources section of the BBSA's Shade IT website - www.shadeit.org.uk.