

## Presentation of Performance Data for Insulating Glass Units

### According to European Standards

This data sheet describes the method of presenting values of thermal transmittance (U-values) and total solar energy transmittance (g or solar factor) for insulating glass units, in particular those incorporating coated glass. Throughout this data sheet reference is made to European Standards produced under the auspices of CEN TC129.

### Determination of Thermal Transmittance (U-value)

The U-value shall be calculated in accordance with EN 673 and quoted to one decimal place.

The following characteristics/parameters apply to the calculation:

1. Near normal emissivity ( $\epsilon_n$ ) shall be used (see note 1 below)
2. Airspace width shall be quoted
3. Gas type(s), e.g. air, argon, etc., and concentration(s), i.e.  $c_{i,o}$ , shall be quoted
4.  $\Delta T$  is 15K

Where:

$\epsilon_n$	The near normal emissivity shall be determined in accordance with EN 12898. The value shall be quoted to two decimal places
$\epsilon_m$	The measured value of near normal emissivity shall be $\leq \epsilon_d + 0,02$ , see prEN 1096-4
$\epsilon_d$	The declared value of near normal emissivity, used for calculation
$c_{i,o}$	Nominal gas concentration, for calculation of U-value, as defined in prEN 1279-3
$c_i$	The measured gas concentration shall be $c_{i,o} - 5\% \leq c_i \leq c_{i,o} + 10\%$ (see note 2 below)
$\Delta T$	The temperature difference between bounding glass surfaces

**Note 1.** For the U value calculation, the corrected emissivity ( $\epsilon$ ) is determined from the near normal emissivity in accordance with A.2 of EN 673

**Note 2.** A  $c_{i,o}$  of 90% means that the  $c_i$  shall be between 85% and 100%

Unless specified by national regulations a nominal gas concentration,  $c_{i,o}$ , of 90% shall be used.



## Determination of Total Solar Energy Transmittance (g)

g shall be calculated in accordance with EN 410 and quoted to two decimal places.

The configuration of the insulating glass unit shall be specified as follows:

1. Glass types and thickness; in the case of a low emissivity glass the value of  $\epsilon_d$  may be stated, where required
2. Airspace width
3. Gas type(s), e.g. air, argon, etc., and concentration(s), i.e.  $C_{i,o}$ , shall be quoted

### Normative References

EN 410: 1998 – Glass in building – Determination of luminous and solar characteristics of glazing  
EN 673: 1997/A2 – Glass in building – Determination of thermal transmittance (U-value) – calculation method  
prEN 1096-4: 2001 – Glass in building – Coated glass – Part 4: Evaluation of conformity  
EN 1279-3: 2002 – Glass in building – Insulating glass units – Part 3: Long term test method and requirements for gas leakage rate and gas concentration tolerances  
EN 12898: 2001 – Glass in building – Determination of emissivity

*Glass for Europe is the trade association for Europe's flat glass sector. Flat glass is the material that goes into a variety of end products, primarily in windows and facades for buildings, windscreens and windows for automotive and transport as well as solar energy equipment, furniture and appliances. Glass for Europe brings together multinational firms and thousands of SMEs across Europe, to represent the entire building glass value-chain. It is composed of flat glass manufacturers, AGC Glass Europe, Guardian, NSG-Group, Saint-Gobain Glass Industry and Siseçam-Trakya Cam, and works in association with national partners gathering thousands of building glass processors and transformers all over Europe.*

