

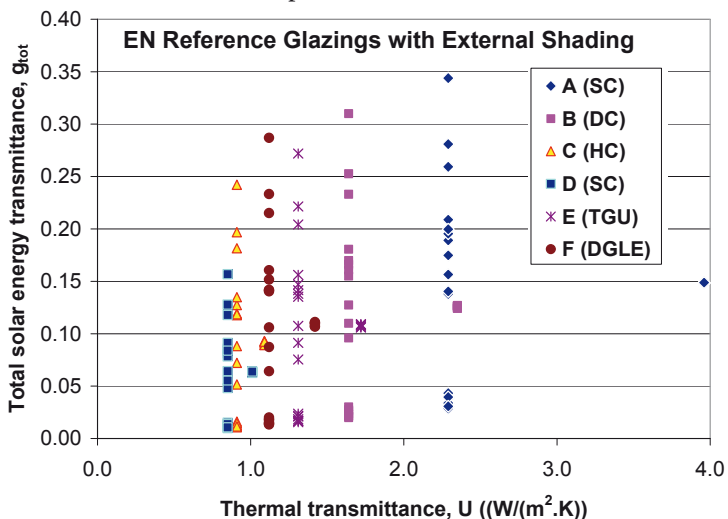
# Solar and daylight management for energy performance buildings



ANN VAN EYCKEN  
ES-SO vzw, Secretary general, Belgium  
www.es-so.com  
ann.vaneycken@es-so.com



The need for energy efficient solar shading solutions is shown in a recent scientific study commissioned by ES-SO, the European Solar-Shading Organization. Results of this study are summarised in “A New Vision on Solar Shading: Solar and daylight management as an essential concept in the energy performance of buildings”, the ES-SO position paper 2015; [www.es-so.com/publications](http://www.es-so.com/publications).



See the accompanying two illustrations of the ES-SO study 2014: Dynamic shading solutions for energy efficient buildings, impact of shading on cooling and heating.

Designing for solar and daylight management objectives needs an understanding of the shading performance properties and - most importantly- the use of accurate data.

In a preliminary enquiry among its members, ES-SO identified that in all European countries shading properties are used in the EPB calculation methodology and software.

Two thirds of the countries use the  $g_{tot}$  value, i.e. the solar energy transmittance of the glazing and the solar shading or in some countries the  $F_c$ -shading factor, which is the ratio of the solar factor of the combined glazing and solar shading ( $g_{tot}$ ) to that of the glazing (both values are defined in EN-14501 Blinds and shutters - Thermal and visual comfort - Performance characteristics and classification) in order to *combat overheating*. This is in accordance with the EPBD recast (recital 25) where solar shading has been determined as strategy to avoid or reduce overheating in energy performance buildings. In addition, one third of the European countries consider solar shading as an *additional thermal resistance* to the window and one third recognise the impact on the *visual comfort*. In one third of the EU countries default values for shading properties are only used; however in most of the countries detailed value properties are used as an alternative to default values.

## Objectives of ESSDA- the European Solar Shading Database

Compliant and Easily Accessible EPC (Energy Performance Certificate) input data is one of the objectives of the European QUALICHeCK Project. The database of shading properties at European level which is currently being developed by ES-SO will meet those requirements. The importance of considering shading in the early stages of design is highlighted as it enables a comparison of glazing with and without shading. Moreover, with the revision of the product standards EN 13659 (shutters) and EN 13561 (external blinds and awnings) to be published in the second half of 2015, the g-tot value (solar energy transmittance) on the shading products will become soon mandatory.

### The database intended use and audience

Solar shading within the Energy Performance of Buildings Directive (EPBD) has ensured that it is now a requirement in National Building Codes. The ESSDA database will provide energy performance data for shading combined with standard (reference) glazing types in EN14501 (Blinds and shutters - Thermal and visual comfort - Performance characteristics and classification) and EN13363/1, the Standards for initial design concepts and product comparison.

It also provides the data for shading that can be used for more advanced calculations in EN13363/2 (Solar protection devices combined with glazing - Calculation of solar and light transmittance - Part 2: Detailed method) which is used for more detailed building modelling.

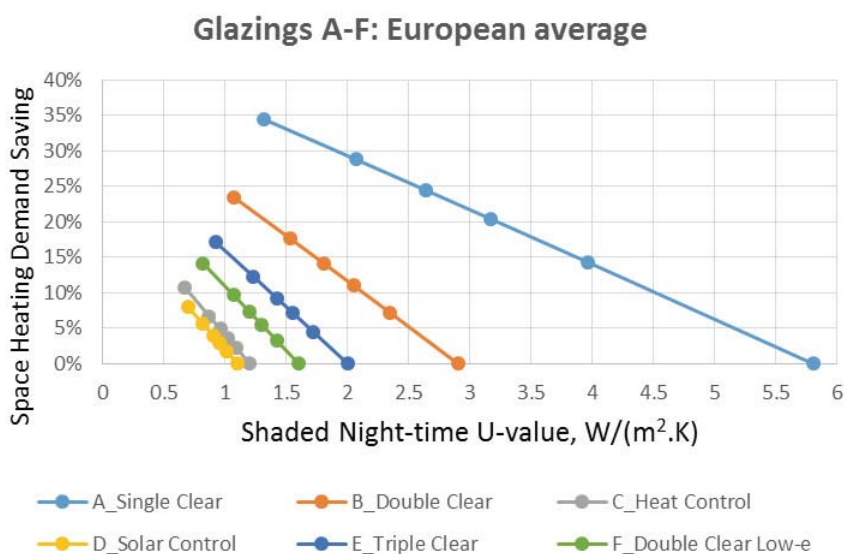
In general, this database will be useful for any simulation scientific based tool considering the impact of shading in the building design. In the longer term, the input data can also be used for a possible energy label based on the energy balance of the complex window, that is the glazing combined with the shading. The database will permit the different users of the solar shading industry, architects, specifiers and building services engineers to use reliable validated data.

### The Database procedure

All data submitted is generated by laboratory testing to EN standards. The data will be validated by a peer review team of shading manufacturers, to the same procedures as the requirements WIS-WINDAT (WIS 3.0: free European Software tool for the calculation of the thermal and solar properties of windows) which is similar to the requirements of WINDOW in America.

The database output will be able to demonstrate the control of solar energy transmittance (g-tot) and the heat retention (U-values) of solar shading products. Moreover, control of daylight figures of shading products will be available for glare control and openness factor of the product for outward vision. It has a knowledge base that explains the properties of shading and how to use the data.

The data file format for the data submitter is designed to be compatible with the existing European Window Information Systems (WIS) software database for shading and solar protection devices. Also the output values will be calculated following the WIS software.



The ESSDA, European Solar Shading database approach is based on the necessity and willingness of the industry to present and update shading manufacturers' declarations based on **reliable uniform data**. ESSDA will become the unique reference solar shading database from which comparable output will be possible for different uses and calculations for the benefit of specifiers' buildings owners and users.

### Procedures testing phase

At this stage, ES-SO is developing the procedure methodology to be followed by a testing phase. The QUALICHeCK project will be the ideal platform to present more information soon. ■