

Thermally improved spacers

Part 1

Determination of representative Ψ -values for profile sections of windows

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Foreword

As set out by the window product standard EN 14351-1 clause 4.12, one of the methods to determine the thermal transmittance U_w of windows is by calculation as per EN ISO 10077-1. The quantities required for this calculation are the thermal transmittances of the frame and the glazing, U_f and U_g , respectively as well as the linear thermal transmittance Ψ . The Ψ -value describes the heat loss caused by fitting the glass in the frame. The amount of this Ψ -value depends largely on the type of spacer inserted in the insulating glass unit. In this context we distinguish between 'conventional' and thermally improved spacers. The definition of a thermally improved spacer is included in EN ISO 10077-1 and has again been summarised in the scope of this Guideline.

For calculation of the U_w -value of windows, EN ISO 10077-1 states global Ψ -values for both 'conventional' and thermally improved spacers which can be used without further verification. But it is also possible to calculate the Ψ -value for thermally improved spacers as per EN ISO 10077-2. In this conjunction it should be taken into account that the Ψ -value depends on the profile section, the configuration of the glass unit as well as the respective built condition and mounting situation.

As set out by EN 14351-1, evidence of performance of windows is based on representative test specimens. For example, it is sufficient to calculate the thermal transmittance U_w of a representative size of 1.23 m x 1.48 m. Likewise, also other characteristics, such as air permeability can be determined using representative test specimens.

In the same way, Ψ -values of thermally improved spacers can be established on the basis of representative profile sections and glass units. This approach offers two main advantages:

1. The Ψ -values determined in this way can be used acc. to EN 14351-1 as part of the U_w -value declaration to be provided by the manufacturer.
2. Based on the uniform boundary conditions when determining the Ψ -value it is possible to compare the performance of thermally improved spacers fairly and objectively.

Therefore the Ψ -values determined in accordance with this Guideline are designated as representative Ψ -values.