

Abridged version

Effects of the revision of EN ISO 10077-2 on the thermal performance of roller shutter boxes - Development of a proposal for the adaptation of the roller shutter box directive RokR

In autumn 2017, EN ISO 10077-2:2012 was withdrawn at European level and replaced by a revised version. As part of the revision of EN ISO 10077-2, the regulations for the treatment of air cavities were essentially changed from a technical point of view. This has an effect on the determination of the thermal resistance of the roller shutter box. At present, there are no comparative values or experiences available regarding the effects to be expected from the modification of the algorithms. It is therefore not known to what extent the thermal properties of roller shutter boxes would change if the calculation procedure were to be converted to the new EN ISO 10077-2 standard

The aim of the research project was therefore to carry out comparative calculations of the thermal properties of roller shutter boxes. These calculations allow the effects of the "new" EN ISO 10077-2 on the thermal characteristics of roller shutter boxes to be determined.

Therefore, within the framework of the project, the thermal properties of the heat transfer coefficient U_{sb} and the temperature factor $f_{R,si}$ were calculated for different types of roller shutter boxes (lintel box, top box, front box) with and without external thermal insulation according to the regulations of both the 2012 and 2017 versions of EN ISO 10077-2.

For non-ventilated cavities of the roller shutter box, the calculation according to EN ISO 10077-2:2018 gives thermal transmittance coefficients equal to or less than the values according to EN ISO 10077-2:2012. The average reductions are approx. $-0.05 \text{ W/m}^2\text{K}$ and thus approx. 6% in relation to the minimum requirement of $U_{sb} \leq 0.85 \text{ W/m}^2\text{K}$. The new calculation method would also have no significant effect on the current safety level with regard to the minimum requirement of the internal surface temperatures.

In the case of slightly ventilated roll space, the U_{sb} value calculated in accordance with both standards is similar for boxes with the insulation facing the inside of the roll space. The difference here is approx. $0.05 \text{ W/m}^2\text{K}$. The new standard leads to both reductions and increases in the U_{sb} value. The $f_{R,si}$ value for these roller shutter box variants is also comparable with the old 2012 version if it is calculated according to the 2018 version.

In the case of roller shutter boxes insulated from the outside with a slightly ventilated cavity, the new calculation method EN ISO 10077-2:2018 increases the U_{sb} value in some cases significantly compared with the 2012 version. This is due to the fact that the thermal insulation in front of the rolling cavity is virtually no longer effective. The calculation of the $f_{R,si}$ values also results in slightly reduced values.

It is recommended to replace DIN EN ISO 10077-2:2012 by DIN EN ISO 10077-2:2018 in the next revision of the RokR.