Solar control solutions for reducing overheating risks in retrofitted Danish apartment buildings from the period 1850-1900 – A simulation-based study

Advancing energy efficient renovation solutions in residential buildings necessitate adopting high-insulation and airtightness to avoid heat loss through transmission and infiltration, which can result in overheating. Elevated indoor temperatures have been proved to have a highly negative effect on occupants’ health and well-being. Energy efficient solutions to the problem with overheating include limiting the solar heat gains through the glazed parts of the facade and effective ventilation. A typical Danish residential apartment building from 1850-1900 recently refurbished, was modelled with five different solar shading devices and three typical ventilation solutions. External solar shading could efficiently reduce overheating below the limits specified by the national building regulations in all tested cases. The marquisolette reduced the number of occupied hours with temperature above 27 °C by min. 85%, the external venetian blinds by min. 81%, and the drop arm awning by min. 74% compared to the situation without solar shading. The internal solar shading as venetian blinds and roller blind could reduce the overheating hours by 20-40%, which was efficient only in combination with mechanical ventilation in case of south and east building orientations.

General information
Publication status: Published
Organisations: Department of Civil Engineering, Energy and Services, Indoor Environment
Contributors: Zukowska-Tejsen, D., Ananida, M., Kolarik, J., Sarey Khanie, M., Nielsen, T. R.
Number of pages: 8
Publication date: 2019
Peer-reviewed: Yes
Source: PublicationPreSubmission
Source ID: 180899573
Research output: Contribution to conference › Paper – Annual report year: 2019 › Research › peer-review