

# Aspects of heat insulation efficiencies for modern windows Intelligent solutions

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## **Abstract**

Requirements on performance characteristics of windows as building elements are continually increasing as demands on energy-efficiency of buildings are growing. It becomes more and more evident that thermal performance of windows of “traditional” design, i.e. using frame constructions of improved thermal insulation and low-e coated glass panes with inert gas filling between them can not be further improved. Investigating the potentials that intelligent products may offer are coming to the fore. In this paper the author identifies which physical processes related to the functioning of a window has to be controlled in order that the thermal performance could be further improved. In the light of these findings the technical possibilities of imparting intelligent features to windows are surveyed. These include the use of smart materials, sensor and actuator techniques as well as energy gains. The author gives his suggestions for development of intelligent windows in three directions: improvement of energy utilisation, influencing the internal climate and enhancement of database on boundary conditions.