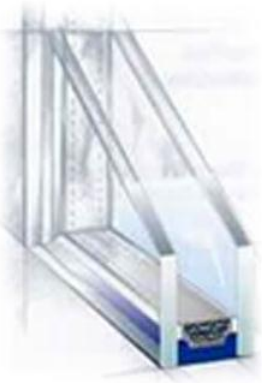
Energy Efficiency Solutions

Windows insulation

Whether they are relatively small punched openings in the façade or a completely glazed surface, windows are usually a dominant feature of the hotel's exterior appearance. But windows in a hotel also have a true impact on visual comfort, on thermal comfort and on space heating and cooling needs.

The window industry has been quick to develop alternative window technologies to address most of the performance shortcomings of conventional glazing systems. Its efforts over the past decade have been nothing short of revolutionary, and the end-result is high-performance windows.

What are the advantages of energy efficient windows?



- **Energy saving:** Because insulated windows help keep the building warm in winter and cool in summer, they reduce space heating and space cooling needs. Potential energy saving on space heating: 7 to 15%.
- **Improved winter comfort:** A low emissivity glazing eradicates the "cold window" sensation in winter, and thus improves guests' comfort.
- In addition, a well insulated window and a waterproof joinery is the best way to eradicate cold air infiltration in winter.
- **Improved summer comfort:** A closed, well-insulated window will help to keep the building cool when the outside air temperature is higher than the inside temperature (together with sun shading devices).
- **Improved acoustic comfort:** Changing windows is also a great opportunity to increase acoustic comfort in your hotel.

What are the criteria to consider when choosing a glazing?

Windows may cause important heat loss in winter whereas in summer, the glass surfaces may be a source of overheating.

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The installation of thermal insulated windows is key to reducing heating and cooling needs (1). The type of glazing is an important aspect to consider, together with the type of frame. Note that even old-fashioned sash windows can be double-glazed! (1) To prevent overheating in summer, it is also recommended to install appropriate sun shading devices (solution n°VIII).

The right choice of glazing will depend on the climatic conditions of the hotel's location, on the orientation of the façade and on its exposure to noise.

The key is to select windows that are as energy-efficient as possible, given your hotel needs and budget.

In most cases, the more efficient unit will probably offer other advantages, such as better comfort and resistance to condensation in very cold climates

The criteria to consider when choosing the type of glazing are: its thermal insulation (to prevent heat loss), its thermal transmission (to benefit from free solar heating in winter), its ability to transmit natural light (to improve comfort and reduce lighting needs) and the protection it offers against noise. It is recommended you choose glazing that offers the best compromise between these criteria, while taking into account the specific needs of your hotel. Don't forget to consider the advantages and disadvantages of framing materials, as well as the maintenance required and the durability of hardware. Windows are a long-term investment.

Glazing properties	Definition
Light transmission coefficient	A high light transmission coefficient means a good capacity to transmit natural light
Solar heat gain coefficient *(2)*	The solar heat gain coefficient is an indicator of the proportion of incoming energy that will be emitted behind the glazing
Heat transfer coefficient *(3)*	A low heat transfer coefficient indicates good thermal insulating capacity
Emissivity *(4)*	A low emissivity indicates low energy loss through radiation (and thus improved comfort in winter)

(2) A high solar heat gain coefficient is important in winter for the hotel to benefit from solar heating but, ideally, a low solar heat gain coefficient would be needed in summer to avoid overheating.

To solve this problem, it is best to install glazing with a high solar heat gain coefficient and to combine this with sun shading devices to avoid overheating in summer.

(3) The heat transfer coefficient depends on the thickness of the glazing, on the gas used to fill in the space formed by the unit (in the case of a multiple glazed unit) and on the emissivity of the glazing.

(4) A low emissivity glass has a thin coating, often of metal, on the glass that reflects thermal radiation or inhibits its emission, reducing heat loss through the glass.

What are the criteria to consider when choosing joinery for window frames?

Joinery for window frames needs to be chosen with particular care because of its impact on the thermal insulation power of the window, on its waterproofing, and on the ventilation of the room. To ensure good thermal insulation of a window, it is important to choose a window frame with a low heat transfer coefficient.

What are the precautions to take when carrying out window insulation works?

Whenever thermal insulation works are carried out on an existing building, caution must be taken about ventilation within the building. Indeed, a building that is better insulated will have less capacity for natural ventilation: its ventilation system may need to be upgraded.

My hotel is a listed building - can we install energy efficient glazing?

Yes, in most cases. However, subject to your hotel listing status, we would recommend liaising with your local conservation officer, who will be able to give you further advice.

What type of glass is best?

The most energy efficient glass for energy efficient windows is low emissivity (Low-E) glass. This often has an unnoticeable coating of metal oxide, normally on one of the internal panes - next to the gap.

It lets sunlight and heat in but cuts the amount of heat that can get out again.

What about condensation?

Condensation can sometimes occur on the outside of new low-e glazing. This is because low-e glass reflects heat back into the hotel and as a result the outside pane remains cool and condensation can build up in cold weather.

Link with other solutions in the database

Solution n°IX (installation of sun shading devices) should be considered together with solution n°VI (window insulation) for solar control issues.

If the hotel is undertaking a façade renovation, it might be appropriate to consider solution n°VII (building insulation) together with solution n°VI (window insulation).

When replacing poorly insulated windows by well insulated ones, it is important to check that the ventilation of the building is still sufficient. If it is not, solution n°XX (renovation of the ventilation system) should be considered.

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