



Energy Efficiency Solutions

Building insulation

Improving the thermal insulation of the hotel building is the most cost-effective way of saving energy and reducing heating and cooling bills.

Which benefits can my hotel gain from insulating?

- Improves comfort
- Provides a healthier environment
- Provides added sound control
- Helps lower energy bills
- Provides a lifetime of energy saving

Where to insulate in a hotel?

There are many areas of a hotel that should be insulated to improve the energy efficiency and overall comfort. In addition to the walls and attic, fiber glass, rock wool, and slag wool insulation is installed above ceilings with unheated spaces, basement walls, floors above vented crawl spaces, cathedral ceilings, floors over unheated garages or porches, knee walls, and in between interior walls (especially bathrooms), ceilings or floors.

What are the materials when choosing a proper insulation?

There are a variety of insulations to choose from including fiber glass, mineral wool, expanded or extruded polystyrene, cellulose, urethane or phenolic foam boards and cotton. The two most common types of insulation for hotel applications are expanded polystyrene (EPS) for external insulation and fibre glass and urethane or phenolic foam boards for internal insulation. There are several things to consider before making an insulation decision like thermal performance, lifetime performance, fire safety, moisture and condensation, air infiltration and environmental benefits.

Which are the different techniques used for building insulation?

Exterior walls can be insulated either internally or externally.



Insulation is best placed on the exterior of the wall (when it is feasible) as it enables the building to benefit from the thermal mass of the walls and eliminates the thermal bridges resulting from construction or improper workmanship (these are responsible for heat losses).

- Internal insulation typically consists of either dry lining in the form of flexible thermal linings, laminated insulating plasterboard, or a built-up system using fibrous insulation such as mineral wool held in place using studwork.
- External insulation systems are comprised of an insulation layer fixed to the existing wall, plus a protective render or decorative cladding. Dry cladding offers a wide range of finish materials that can be used – timber panels, stone or clay tiles, brick slips or aluminium panels.

How do I insulate my hotel if it has cavity walls?

In some countries, the exterior walls may be cavity walls (i.e. two 'skins' separated by a hollow space). The skins are usually masonry such as brick or concrete block. Cavity wall insulation is a cost effective way to reduce the amount of heat (as much as 35%) lost from convection through walls. It consists of a continuous layer of insulation filling the wall cavity. This solution is a first step and has a low payback time. Treatment of thermal bridging in cavity wall openings may also be considered.

When is the best time to insulate my hotel building?

The best moment to insulate the building is when the façade or the roof is being renovated. If your external walls and your roof need work anyway, it is an ideal time to have insulation added.

Much of the labour costs are being paid already and you will only need to pay the extra cost for the insulation materials and the extra hours of work.

Which specifications should I take into account when investing in building insulation materials?

- Thermal bridges need to be treated with care (typically in floor-wall connections, in window and door installations, around balconies...).
- When exterior walls are insulated internally, caution must be taken to avoid condensation in the insulation.
- 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 a lower degree of natural ventilation: its ventilation system may need to be upgraded.
- Thermal insulation of the building needs to be considered before the replacement of space heating equipment. Indeed, there's not much point putting in an energy efficient boiler if all the heat goes straight out of the hotel again.
- In winter, major heat loss occur through the building's roof and exterior walls. That is why the insulation of the roof and of the exterior walls is particularly recommended.
- Thermal insulation can also help reduce the cooling needs of the hotel in summer
- Improving the thermal insulation of the building is also a way to save on cooling because it is a barrier to solar radiation. But to be really efficient, cooling strategies need to be associated (e.g. sun protection, cooling ventilation and air-cooling) and the building needs to have an appropriate thermal mass (1).





(1): the thermal mass comes from the materials used for the walls and the other construction elements. It provides 'inertia' against temperature fluctuations. It keeps heat (in winter) and coolness (in summer) inside the hotel for longer.

Which precautions need to be taken when insulating a building?

It is important to understand how thermal heat transfers and humidity transfers occur through the building before deciding to insulate it, and you will need professional advice on this. Most walls need to "breathe" and it is essential to allow for this.

How much does it cost to insulate my hotel building?

- Internal insulation of exterior walls: approx. 20 to 50 € per m² Indicative cost (French prices 2009)
- External insulation of exterior walls: approx. 50 to 80 € per m² Indicative cost (French prices 2009)

Which is the return on investment time?

- Cavity wall insulation: <2-6 years
- External wall insulation: <5-10 years
- Loft insulation: <5-7 years
- Floor insulation: <5-7 years

Note that costs and return on investment may vary greatly depending on the local context and on the hotel's initial situation.

What is lifetime performance?

In order to ensure the expected energy savings, it is important that the insulation does not deteriorate, or settle, over time. Fiber glass batts and rolls do not settle. Fiber glass and rock and slag wool loose-fill insulations may settle approximately 1-3% resulting in virtually no impact on the thermal performance of the insulation.

In contrast, cellulose insulation not only settles to a much greater degree (approx. 20%), but also at a higher rate. If cellulose insulation is being considered, make sure the installer understands that most cellulose insulations settle in attic loose-fill applications - that's a significant loss of insulating effectiveness. In fact, it is recommended that an additional 25% of thickness be added for cellulose insulation to compensate for this extreme loss of R-value.

Link with other technologies?

- If the hotel is undertaking a façade renovation, it might be appropriate to consider solution n°VI (window insulation) together with solution n°VII (building insulation).
- When upgrading the thermal insulation of the building, it is important to check that the ventilation within the building is still sufficient. If it is not, solution n°XX (efficient ventilation systems) should be considered.

Disclaimer: The sole responsibility for the content of this factsheet lies with the authors. It does not necessarily reflect the opinion of the European Union. Neither the EACI nor the European Commission are responsible for any use that may be made of the information contained therein.

