

energy measures

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ADDITIONAL INFORMATION: Insulation

Understanding the types of insulation relevant to different parts of your property

Effective insulation of both your hotel building and of key pieces of equipment are the central tenet for any energy management programme. A wide variety of insulation materials are available. This table will help identify:

- where in your property and which equipment to insulate
- appropriate and efficient insulating materials
- likely cost savings assuming the referred area or equipment is currently not insulated.

AREA / EQUIPMENT	SUGGESTED INSULATION MATERIAL	LIKELY SAVING
Loft Space	<ul style="list-style-type: none"> ▪ Insulate between and over floor joists using 200 - 250 mm of glass fibre insulation material, mineral wool, or cellulose fibres. ▪ Select products with a U Value - for loft spaces this should be 0.17-0.18. 	Up to 20% of total heating fuel costs
Attic door(s)	<ul style="list-style-type: none"> ▪ Draught-strip the edges to prevent additional heat loss using draught stripping foam, rubber or plastic. 	Less than 1% of total heating fuel costs
Chimney area	<ul style="list-style-type: none"> ▪ Cap unused chimney areas to reduce heat loss 	Savings are highly dependent on the number of chimney's and current rate of heat loss. Draught reduction from this action may also significantly improve the guest experience.
Flat roofs	<ul style="list-style-type: none"> ▪ Flat roofs that are in good condition can be insulated using inverted warm deck construction. This is relatively expensive and should only really be considered as a part of a refurbishment programme. ▪ U values of 0.37 – 0.40 should be sought. 	Up to 20% of total heating fuel costs.
Cavity walls	<ul style="list-style-type: none"> ▪ Blown in or spray applied rock wool, fibre glass or polyurethane foam with U values of 0.45 to 0.60 	Up to 33% of total heating fuel costs.
Windows	<ul style="list-style-type: none"> ▪ Fit tight fitting thick curtains (which can be pulled back during daylight hours if required to ensure maximum use of natural light) ▪ Draught stripping foams; brushes; thin sections of rubber, plastic or metals; and sealants available from most hardware stores ▪ Secondary double-glazing, focusing on hinged or sliding double glazing systems which can be opened to allow ventilation and cleaning. 	<p>Up to 1% total heating fuel costs</p> <p>In an exposed area, double glazing or a tight fitting curtain reduce heat loss (in comparison to a single glazed window) by up to 70%</p>

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Doors	<ul style="list-style-type: none"> ▪ Deep brush draught stripping around all external doors ▪ Self-closing devices on all external doors and doors between areas of different temperature ▪ If renovating all or parts of the property, include draught lobbies on commonly used external doors and insulated doors where appropriate. 	<p>Up to 2% insulating doors alone can save total fuel costs.</p> <p>20% of total heat in a building can be lost through gaps around doors, floors, windows and pipes so a combination of measures delivers greater benefit.</p>
Hot water tanks	<ul style="list-style-type: none"> ▪ 80mm jacket or Styrofoam coating. ▪ If a thinner coating already exists, you can install a second jacket too greater than 50mm thickness to improve efficiency. 	<p>Up to 12% total heating fuel costs</p> <p>60% of heat can be lost from an un-insulated boiler</p>
Hot water pipes	<ul style="list-style-type: none"> ▪ 10mm jacket or Styrofoam moulded coating. ▪ Take care to label pipes to ease maintenance tasks. 	Up to 6% total fuel costs
Swimming pool	<ul style="list-style-type: none"> ▪ Swimming pool cover fitted at the end of operation each day/evening (which retains both heat and water). ▪ Check that the cover selected and access arrangements to the covered pool do not infringe health and safety requirements 	Up to 0.5% of total energy costs.
Radiators	<ul style="list-style-type: none"> ▪ Fit heat reflectors (silver coloured panels) to walls behind radiators 	Up to 1 % total fuel costs
Floorboards	<p>On draughty floorboards:</p> <ul style="list-style-type: none"> ▪ Fit thick carpet, ▪ Use cork, rockwool or other fibrous insulating material under floorboards ▪ Use a polymer sealant between floorboards to seal off draughts 	Up to 1% total heating fuel costs

Insulation terminology

Cellulose Fibres – A type of insulation material made from processed waste paper (usually treated with borax for fire and insect resistance). This type of insulation can be laid by hand or sprayed. It is suitable for use in lofts and some walls, but not suitable for areas where it may come into contact with moisture.

Conduction – A process by which heat transfer takes place in solid matter, such as walls in a house.

Convection – The flow of heat moving through air

Cork – Insulation corkboard is mainly used to insulate flat roofs (see information on inverted warm deck construction). Cork tiles can be used to insulate the underside of floorboards.

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Expanded and extruded polystyrene – Expanded or extruded polystyrene foam boards may be used for cavity wall insulation (but a cavity gap must be maintained). Polystyrene beads may also be blown in for cavity wall insulation, usually with a water based adhesive to prevent settlement.

Foamed glass – Mainly used for insulating and damp proofing flat roof constructions. Foamed glass is also available in slabs and boards suitable for wall and floor insulation (but only as a part of a major refurbishment).

U-Value – A measurement of how much heat will move through a given amount of material. For insulation materials, therefore, a low U-value is the aim and materials with higher U-values will need to be used in greater thickness

Phenolic foam – Mainly used for building services insulation because of its fire resistance.

Radiation – Transfer of heat through electromagnetic waves and absorption of that energy through a surface. In a hotel many surfaces will exchange heat through radiation, affecting overall ambient temperature.

Rock wool – one of the most commonly used insulation materials, which can be used as loft insulation, but is also available as boards/slabs suitable for roof use.

Thermal conductivity – A measure of how much heat will move through a given amount of material. Thermal conductivity is measured as a K-value.

Vermiculite – maybe used either as loose-fill (so it can be simply poured between the joists in a loft) or as an aggregate in plasters, composite boards or concrete. It is not commonly used unless as a part of a major refit.

Wood-wool slabs – Solid boards made of wood shavings bonded in cement, but leaving insulated voids.

Wool – An ecological alternative to some of the rockwool and glass fibre products. It can be laid in loft areas where it has the advantage of being able to absorb and release moisture.