

What the ability of insulation material?

Yes, the ability of the material to insulate heat is measured with a measurement called thermal transmittance value (U value) which determines the rate of heat flow through a given efficiency of different thermal insulation system for walls and roofs.

The thermal transmittance value (U value) depends on the thickness of the material and its thermal conductivity (k). The U Value can be obtained by dividing the thermal conductivity (k) of the material with its thickness.

The following table shows some of the common insulation materials used and their thermal conductivity values.

How to get more information?

You may inquire from engineering offices / manufactures to give you more information about the thermal insulation materials suitable for your building.

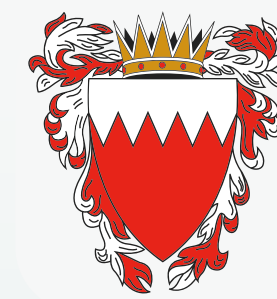
You may also call Electricity & Water Conservation Directorate on phone (17991463) or send your questions by Fax (No. 17006349) or may write to Electricity & Water Conservation Directorate. Electricity & Water Authority P.O. Box (2) Kingdom of Bahrain.

Always remember... Using thermal insulation reduces your monthly electricity bill.

Types of Thermal Insulation Materials and their thermal conductivity k.

No.	Materials	Thermal Conductivity k(W/m.°C)	
1	Perlite Expanded	0.058	Granules
2	Vermiculite	0.055	
3	Foam Glass	0.058	
4	Expanded Polystyrene (molded)	0.036	Ready Sheets
5	Expanded Polystyrene	0.032	
6	Polyurethane (Rigid)	0.029	
7	Rock Wool	0.034	
8	Fibre Glass	0.035	
9	Sprayed Polyurethane	0.024	Chemicals mixed & sprayed with pump

The additional cost of thermal insulation depends mainly on the building area and type of thermal insulation materials used.



Save Energy By Using Thermal Insulation in Buildings



You Can Save Up To 30% of Your Electricity Consumption By Using Thermal Insulation

What is thermal insulation in buildings?

It is the use of thermal insulation materials in the roof and walls of buildings. These materials have the capability of reducing heat transfer from the outside to the inside of the building during summer and from inside to outside during winter

What are the advantages of thermal insulation of Buildings?

The advantages of using thermal insulation in buildings are :

1. Savings about **30%** of electricity consumption.
2. Reducing the cooling capacity needed by air conditioners.
3. Protecting the building material and extending the building life.
4. Protects the furniture and internal decoration of the building.
5. Improving the comfort level inside the building.
6. Insulating the outside noise.



How do we thermally insulate buildings?

Thermal insulation in buildings can be achieved by using the following materials:

A) For walls,

1. Insulated Blocks: Similar to normal blocks but the insulating material is inserted in the block.
2. Aerated Autoclaved Blocks: made from lightweight insulating material.
3. External insulation: Insulating material is fixed on walls from outside.
4. Internal insulation: Insulating material is fixed on walls from inside.
5. Double wall: Insulating materials is inserted between the two walls. (Cavity wall)

B) For roofs,

1. Polystyrene boards: Semisolid materials made in the form of boards.
2. Polyurethane : Semisolid material easy to shape is an aerated material that gives it the insulation proper
3. Fiberglass and mineral wool.

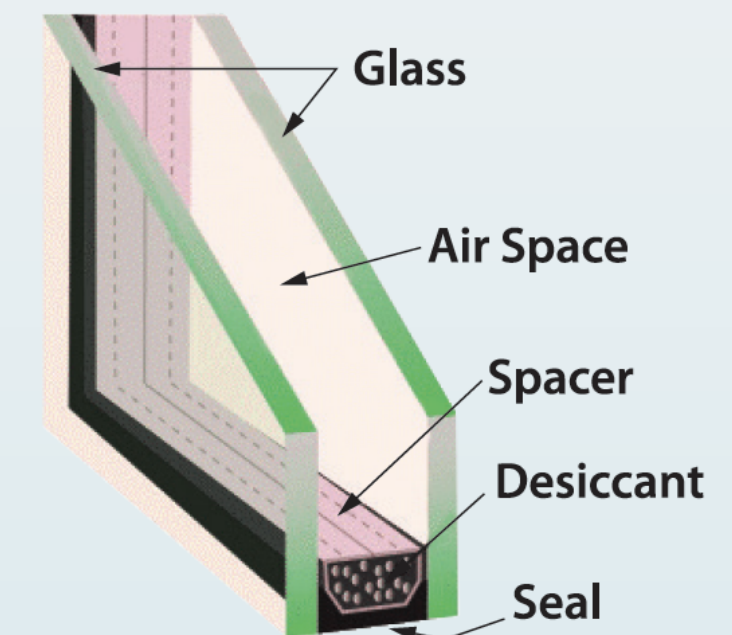
It is important that thermal insulation systems are installed properly under expert supervision in order to get the expected results.



What is the effect of different types of window glasses on heat transfer?

Heat is transferred to the inside of the building through window glass by thermal conduction and radiation. It is necessary to avoid using large size windows to reduce the cooling capacity needed by the air conditioners.

Double Insulated glass can be used to reduce the amount of heat transferred through glass. Several types of insulated glass are available in the market. You may consult your engineering office to choose the suitable type of your building.



Thermal insulation and the environment?

Using thermal insulation in building is good for the environment. It helps in reducing the environmental pollution. Thermal insulation reduces the demand of electricity for cooling thus reducing the amount of polluting gases produced by the power plants into the atmosphere.