

## **THERMAL INSULATION MATERIAL**

Thermal insulation material refers to the material that can limit heat loss for air supply ducting systems, hot and cold machines and equipment, provide thermal insulation for factories and save energy costs for cooling equipment.

With those functions, insulation materials have been widely used in various industries such as construction, machinery, chemicals, food processing in industrial zones, etc.

Insulation is the general name for many different types of this material. Therefore, insulation materials should be selected to suit different purposes and each project's specific needs.

## 1. Types of Insulations

### a) Glass wool insulation

Glass wool is made from synthetic glass fibers from stone, slag, clay... The main composition of glass wool consists of aluminum, calcium silicon, metal oxide, etc. It is free from asbestos, non-flammable and soft, and has good elasticity. Glass wool rolls are heat and sound insulating, fire resistant, durable, non-corrosive against chemicals, and light-weight. With various densities, glass wool can withstand temperatures up to 350°C.

Glass wool is divided into two categories: Glass wool without aluminum foil and Glass wool with aluminum foil.



*Glass wool with and without aluminum foil*

### b) Insulation air bag

The insulating airbag consists of a pure aluminum layer coated on the plastic sheet containing fully blown air bags. The aluminum layer with light silver color helps reflecting the heat, whilst the plastic layer containing air bags prevents the heat transmission and dissipates it quickly. The airbag layer also prevents sound from passing through it, and at the same time eliminates the reflection of sound waves to avoid echoes, thanks to its irregular surface and shape. The heat insulating capacity of insulation airbag goes up to 95 - 97% of external radiation. The temperature difference between the two sides of the product is about 50-70%.



*Insulation air bag*

### c) Moisture-resistant PE OPP foam

The PE-OPP foam sheet is made up of air-blown PE foam on the surface of the OPP film (aluminum foil) that has been treated to prevent oxidation; it is used for heat and sound insulation, moisture resistance. It is also used against moisture for wooden floor in hotels/buildings, heat and moisture for factories, warehouses, offices in industrial zones, export processing zones, etc. Insulation for air-conditioning systems and cold rooms, soundproofing for ceiling and partition systems of railway stations, airports, schools, supermarkets, hospitals, meeting rooms, conference halls, theaters, studios, dancing floors, bars, karaoke rooms, etc. It can insulate up to 95 - 97% of external radiation. The temperature difference between the two sides of the product is about 80 - 99%.

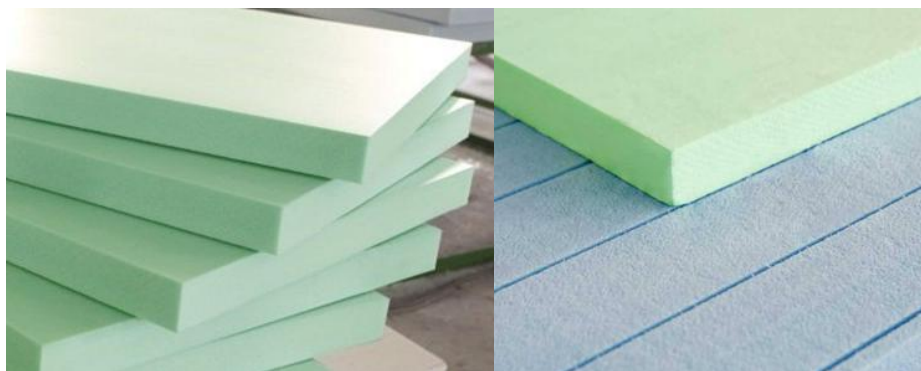


*Moisture-resistant PE OPP foam*

#### d) Moisture-resistant XPS foam

XPS foam is a heat / sound proof, anti-vibration material that has been used for a long time in construction works. Recent studies of newly constructed buildings show that with XPS panels of 15-18 cm thick can save between 343 and 344 kWh/m<sup>2</sup> of annual energy consumption.

Thanks to its superior mechanical hardness compared to conventional thermal insulation materials, XPS insulation panels offer more advantages when insulating floors, roofs and walls of buildings. XPS foam sheet meets the health and safety regulations during the production, installation and use.



*Moisture-resistant XPS foam*

#### 2. Actual energy saving potential when used for insulation in factories:

Plants using electric boilers. Steam distribution piping systems requiring good insulated. However, most steam valves are not insulated. The surface temperature of a steam valve is 132°C.



*Uninsulated steam valves*

The plant has started insulating the steam valves. Energy saving is about 90,785 kWh/year.



*Insulated steam valves*

Analysis table of savings after insulating steam valves in the factory:

Total investment cost	VND 29 Million.
Energy saving	90,785 kWh/year.
Cost savings	VND 50 Million.

	Payback time	0.6 Years.	
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