



TP MA

Thermal Panel  
Manufacturers Association



## Who are we?

Founded in 2002, the Thermal Panel Manufacturers Association (TPMA), administered by AAAAMSA, represents the South African sandwich thermal panel industry on technical, regulatory, quality assurance and product acceptance issues.

## What is a sandwich panel?

An insulated sandwich panel is a product comprised of an insulating core sandwiched in between two metal or polymer composite skins. The cores can be made from different kinds of insulating materials such as Expanded Polystyrene (EPS), Mineral Wool (MW), rigid Polyurethane (PUR) and Polyisocyanurate (PIR). Insulated cores may also be created out of composite materials.

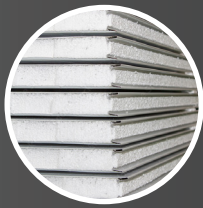


## Types

Each of the insulating core materials used in a sandwich panel varies in terms of thermal conductivity, sound insulation, and strength to weight ratio. Many construction projects today use PIR and PUR panels due to their low thermal conductivity, good insulation, and versatility.

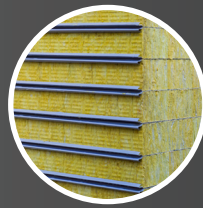
Mineral wool panels are favoured for buildings that need superior fire resistance. AN EPS-core panel is the budget-friendly choice for interior wall partitions.

The function and needs of every building are different. Sandwich panel choice thus varies according to thermal, acoustic; insulation and fire resistance needs of the building. Selecting the insulation core in accordance with the need of the building positively affects the performance one will obtain from the sandwich panel.



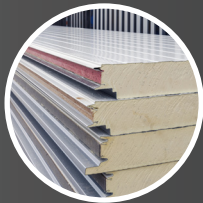
### EXPANDED POLYSTYRENE (EPS)

Expanded polystyrene is a thermoplastic material, a derivative of petroleum. The raw material of polystyrene, which has a micro-granular structure, is firstly heated and expanded with water vapor. Pentane gas, an organic component, is used to inflate the granules. After inflation process, the polystyrene granules stick firmly to one another and take the shape of the mould they are in. Finally, after having been shaped into blocks, expanded polystyrene is ready to use by cutting into sheets.



### MINERAL WOOL

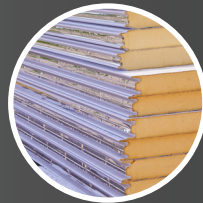
Mineral wool is the general name given to the fibres obtained by melting the inorganic rocks and other inorganic oxides at a high temperature. With its fibrous and open cell structure, mineral wool is the perfect choice for your building with regards to sound insulation and fire resistance. When it comes to thermal insulation, it has a lower insulation value compared to PUR and PIR.



### POLYURETHANE (PUR)

Polyurethane is the rigid foam formed by mixture of main components 'polyol and isocyanate' with catalyst materials under high pressure and special production conditions.

Ensuring superior thermal insulation by its closed cell structure, polyurethane has high dimensional stability, and does not absorb water. It does not create bacteria. Its mechanical performance is very high thanks to its high compressive strength.



### POLYISOCYANURATE (PIR)

A new macromolecular structure called polyisocyanurate is formed when the main components of the polyurethane foam chemically react at different mixture quantities. Polyisocyanurate rigid foam is the version of polyurethane with higher, enhanced fire resistance performance due to the difference in its structure. In case of a fire, the formation of smoke is lower when compared to polyurethane.

Select the insulation material suitable for the features and needs of the building from the Sandwich Panel Selection table below.

Core Type	Thermal insulation	Water insulation	Acoustic insulation	Fire resistance	Mechanical strength
PUR	4	4	2	2	4
PIR	4	4	2	3	4
MINERAL WOOL	3	3	4	4	3
EPS	3	3	2	1	2

\*\*\*\*Very good  
 \*\*\*Good  
 \*\* Medium  
 \*Poor

## Applications/Usage

Sandwich panels are generally used in industrial facilities, commercial buildings, cold storages, residential buildings, power plants as well as buildings for agricultural.

Sandwich panels are used to clad roofs and external walls of the buildings as well as achieving insulated internal walls and cold storages.

- **Laboratories** – Keeps Medical Equipment Cool and In Good Working Condition
- **Groceries, Supermarkets, And Hypermarkets** – Protects Wares from Fire And Moisture
- **Cold Storage Facilities** – Keeps Stored Food Cool and Fresh; Improves Refrigeration System Efficiency
- **Warehouses And Logistics Hubs** – Safeguards Goods from Possible Damage Caused by Water, Moisture, and Fire
- **Factories And Production Facilities** – Panels Thermoregulate Factories and Prevent Overheating Equipment

## Benefits



### FAST AND EASY INSTALLATION

Contrary to the traditional systems, continuous line manufactured sandwich panels are fully compatible and ready to assemble pieces that are prepared in the required dimensions, insulation types and colours based on the structure of the facility, with engineering and quality control processes conducted beforehand at the factory.

Installation of the sandwich panels is very easy with the few joints on wide surfaces. By means of advanced transport opportunities and mechanical lifting equipment, the duration of carrying and cladding is remarkably shortened allowing the project to be delivered in a short span of period, saving time.



### PERFECT THERMAL INSULATION

Thermal insulation means reducing the energy spent in winter for warming and in summer for cooling; and taking measures to prevent heat transmission with the objective to live in comfortable environments. The thickness of the insulation material in the sandwich panel varies according to the load bearing capacity, regional conditions, the usage purpose of the building, and the thermal insulation value.



### INVESTMENT ECONOMY

In many types of buildings, one can save on both building and installation time by selecting the appropriate sandwich panel. Thanks to its feature of easy mounting, one can conduct expansion and renovation works without interrupting everyday activities in the building. The lightness of sandwich panels allows one to gain advantage with regards to transport and main building costs. Maintenance costs are low thanks to their durable structure.



### HIGH FIRE RESISTANCE

When choosing sandwich panels for fire insulation, one should take into consideration the factors such as fire resistance and its duration, as well as the size and height of the building, and preferably sandwich panels with Mineral Wool.



### NOISE-FREE BUILDINGS

Sound insulation is a must to minimize the harmful effects of noise spreading around from noisy areas. Acoustic sandwich panels used on the roof and walls increase productivity by creating healthy and comfortable spaces free from noise and prevent workplace accidents.

# Technical & Fire Testing Compliance

Members are required to comply with *SANS 54509 Self-Supporting double skin metal faced insulating panels- Factory made products- Specifications* which is the equivalent of EN 14509. The reaction to fire classification is in accordance with SANS 53501-1 (EN 13501-1) *Fire classification of constructions products and building elements – Part 1 Classification using test data from fire reaction to fire tests*. The fire resistance testing for walls is in accordance with SANS 10177-2 *Fire testing of materials, components and elements used in buildings Part 2: Requirements for fire resistance test for building elements*.

In addition to the above, to satisfy insurance companies, members are also able to do additional testing in accordance with ISO 9705 *Fire tests-Full-scale room test for surface products* which is also acceptable in accordance with the requirements of FM Approvals Room Test, Test Procedure Class Number 4880: FM Approvals Room Test.

## Conclusion

Sandwich panels are a fast and aesthetic solution and budget-friendly for its longevity.



## Transport & Storage

Unloading should also be conducted with the use of forklifts or cranes. The panels must be stored on an even and dry foundation/ground. Due to considerable weight of the panels, stacking numerous panels one onto another should be avoided. In case of storing the panels outdoors, it should not be exposed to direct sunlight. Long-term outdoor storage of the panels at the construction site is not recommended, however, if it cannot be avoided, the panels should be covered with a tarpaulin or other UV – resistant and weather resistant fabric.



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