

THERMOMAX® EPS CARBON

Graphite-Enhanced Expanded Polystyrene Board for Thermal Insulation

Product Description

THERMOMAX® EPS CARBON is a graphite-enhanced expanded polystyrene insulation board used for thermal insulation on vertical and horizontal surfaces of buildings. The graphite in its structure reflects thermal radiation and delivers a thermal conductivity roughly 20% lower than white EPS of the same density, so the same insulation performance is achieved with a thinner board.

It complies with EN 13163 and is produced in three compressive strength classes: EPS 50, EPS 90 and EPS 120.

Fields of Application

- External thermal insulation composite systems (ETICS)
- Façade applications where board thickness is restricted
- Internal wall insulation
- Loft spaces, roof compartments and non-trafficked roofs
- Thermal insulation of floors, under screed and ceilings

Application Area – Type Selection

The table below shows the suitable THERMOMAX® EPS CARBON type for each application area together with the property governing the selection. The final type and thickness must be determined according to the thermal calculation and load values of the specific project.

Application area	EPS 50	EPS 90	EPS 120	Governing property
External wall insulation (ETICS)	●	●	●	Tensile strength perpendicular to faces EN 1607 $\geq$ 100 kPa (TR100)
Façade applications with restricted thickness (recesses, balconies, boundary lines)	●	●	●	Thermal conductivity (λ D)
Internal wall insulation	●	●	○	Thermal conductivity (λ D) and water vapour diffusion
Non-trafficked roof, loft space, warm roof	●	●	○	Thermal conductivity (λ D)
Basement / garage ceiling insulation	●	●	○	Thermal conductivity (λ D)
Floor insulation under screed (residential, foot traffic)	○	●	●	Compressive stress CS(10)
Trafficked terrace roof (under screed)	–	○	●	Compressive stress and long-term deformation (EN 1606)
Industrial floor, under vehicle load	–	–	○	Compressive stress CS(10)
Cold storage room	–	–	○	Water absorption and compressive stress
Foundation / external wall below grade, soil contact	–	–	○	Water absorption

● Recommended ○ May be used depending on the project – Not recommended

- Graphite-enhanced boards absorb a high proportion of incident sunlight. Boards left in direct sun may show heat-related dimensional change, bowing and opening of joints. A shading net must be used on the façade and, on sun-exposed elevations, installation should be moved to the morning and evening hours.
- In external thermal insulation composite systems the governing property is not compressive stress but tensile strength perpendicular to the faces (EN 1607).
- Under permanent load, to keep deformation within 2% over a 50-year service life, the permanent load should not exceed approximately 30% of the CS(10) value (EN 1606).
- For industrial floors and cold storage rooms requiring higher compressive strength, THERMOMAX® EPS 200 should be preferred.

Advantages

- The graphite content reflects thermal radiation, giving a thermal conductivity roughly 20% lower than white EPS of the same density
- The same U-value is achieved with a thinner board, saving thickness on the façade
- Lightweight; adds no significant load to the structure
- High dimensional stability; retains its shape
- Easy to cut and install, saving labour
- Water vapour permeable; reduces the risk of condensation when used in adequate thickness
- Does not rot or grow mould; retains its physical properties over a long period

Technical Properties

Property	Unit	EPS 50	EPS 90	EPS 120
General Information				
Material composition	–	Graphite-enhanced expanded polystyrene (EPS)		
Appearance	–	Grey, cut board		
Average density (approx.)	kg/m³	15	18	21
Board size	cm	50 × 100		
Board thickness	cm	5 – 6 – 8 – 10		
Thermal Properties				
Thermal conductivity (λD – EN 12667)	W/mK	0.033	0.032	0.031
Service temperature	°C	–50°C / +75°C		
Mechanical Properties				
Compressive stress at 10% deformation (EN 826)	kPa	≥ 50 CS(10)50	≥ 90 CS(10)90	≥ 120 CS(10)120
Tensile strength perpendicular to faces (EN 1607)	kPa	≥ 100 TR100	≥ 100 TR100	≥ 150 TR150
Bending strength (EN 12089)	kPa	≥ 100 BS100	≥ 135 BS135	≥ 170 BS170
Dimensional Tolerances and Stability				
Length tolerance (EN 822)	mm	± 2 (L2)		
Width tolerance (EN 822)	mm	± 2 (W2)		
Thickness tolerance (EN 823)	mm	± 1 (T2)		
Squareness tolerance (EN 824)	mm/m	± 2 (S2)		
Flatness tolerance (EN 825)	mm	5 (P4)		

Property	Unit	EPS 50	EPS 90	EPS 120
Dimensional stability, 23°C / 50% RH (EN 1603)	%	± 0.2 — DS(N)2		
Dimensional stability, 48 hours / 70°C (EN 1604)	%	≤ 1 — DS(70,-)1		
Water and Water Vapour Properties				
Long-term water absorption by immersion (EN 12087)	vol. %	≤ 5.0 WL(T)5	≤ 3.0 WL(T)3	≤ 3.0 WL(T)3
Water vapour diffusion resistance factor (EN 12086)	μ	20 – 40	30 – 70	30 – 70
Safety Information				
Reaction to fire class (EN 13501-1)	–	Class E		
Hazardous substances	–	Refer to SDS		

The technical values stated were obtained at an ambient temperature of +23°C and 50% relative humidity.

Application Instructions

Surface Preparation

The substrate must be sound, load-bearing, dry, clean and free of dust. It must be cleaned of oil, paint, rust, mould-release agent and similar residues that could impair adhesion. Deviations in surface planeness exceeding 10 mm must be corrected before the boards are installed. Highly absorbent or dusting surfaces must be primed. The base profile on which the first row rests must be fixed level and true.

Installation of the Boards

The boards are installed from the bottom upwards in a staggered pattern, interlocked at the corners. The adhesive is applied as a bead along the board edges and as dabs in the centre, or over the whole surface with a notched trowel; the bonded area must be at least 40% of the board area. The boards are placed within the open time of the adhesive and aligned with a straightedge. Adhesive must not be allowed to squeeze into the joints; gaps wider than 2 mm must be closed with EPS strips and not filled with adhesive. Because graphite-enhanced boards heat up rapidly in sunlight, the scaffold must be covered with a shading net for the duration of the works, and on elevations in direct sun the boards should be installed during the cooler hours of the day.

Mechanical Fixing and Subsequent Layers

Mechanical fixing must not begin until at least 24 hours after bonding. The number and layout of the anchors are determined according to the building height and the wind load calculation. Level differences on the board surface must be corrected with a rasp before the base coat is applied. Bonded boards must not be left exposed before the base coat is applied; for graphite-enhanced boards this period is more critical than for white EPS and must not exceed 7 days where shading cannot be provided. During application and setting, the ambient and surface temperature must be between +5°C and +30°C.

Storage Conditions and Shelf Life

Store in the original, unopened packaging in a dry, cool place on a level base, protected from direct sunlight and sources of flame. If stored in the open on site, the boards must be shaded with a cover. When stored correctly, the shelf life is 24 months from the date of production.

Safety Precautions

The product has a reaction to fire performance of Class E according to EN 13501-1 and must be kept away from heat and naked flames. Welding, cutting and similar hot work must be avoided during storage and application. The product must not be brought into contact with materials containing organic solvents. Protective goggles and a mask

must be worn when cutting the boards. Store out of reach of children. For further information, refer to the Safety Data Sheet.

Liability

Our company is responsible only for the quality of the product. Any use of the product outside the scope of the written technical recommendations, including incorrect application or use under unsuitable conditions, is entirely the responsibility of the user. For further technical information, please refer to the product catalogue or contact our representatives.

Packaging

Shrink-wrapped packs of 50 × 100 cm boards, the number of boards per pack varying with thickness

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