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ENERGY SAVING MATERIALS

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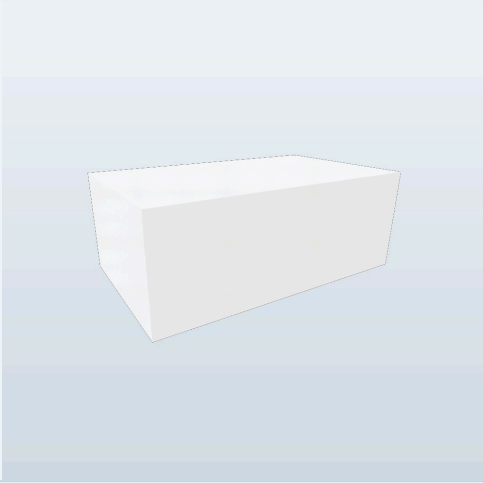
Geofoam

Engineered ultra-lightweight EPS structural fill — about 1% the weight of soil



Overview

Geofoam is engineered, ultra-lightweight expanded-polystyrene (EPS) fill weighing roughly 1% as much as soil (typically 10–30 kg/m^3). Supplied as large, closed-cell blocks that one or two people can lift, place dry and field-cut with a hot-wire cutter or saw, it sharply reduces the vertical and lateral loads a substructure must carry — cutting settlement, bearing demand and earth pressure while speeding construction over soft ground. Placed without compaction or consolidation delays and largely unaffected by normal placement weather, geofoam is specified internationally to ASTM D6817 (physical properties) and D7180 (geotechnical design), and offers incidental thermal insulation.

Applications

- Road and rail embankments over soft or compressible soils (peat, soft clay)
- Bridge approaches — eliminates the differential-settlement "bump at the bridge"
- Abutment and retaining-wall backfill — reduces lateral earth pressure on the wall
- Slope stabilisation — replaces heavy slope soil to cut driving loads
- Culvert, pipeline and tunnel protection — reduces surcharge on buried structures
- Void and irregular-space fill — easily shaped and trimmed on site
- Compensating / lightweight foundations, rooftop gardens, stadium and theatre seating
- Frost-heave mitigation via the closed-cell, hydrophobic structure

Benefits

- About 1% the weight of soil — dramatically less load, settlement and lateral thrust on substructures
- Fast, dry placement: no compaction, no consolidation wait and minimal plant on site
- Enables lighter foundations and far fewer, lighter truck movements — lower cost and emissions
- Closed-cell and hydrophobic — low water absorption with good frost and moisture resistance
- Grades can be mixed on one project (stronger blocks in high-stress zones) to optimise cost
- Recyclable and regrindable EPS

Specifications

Density grades	EPS 12 – EPS 30 (≈10–30 kg/m^3), selected to design load
Unit weight	~1% of soil (one block lifted by 1–2 people)
Compressive resistance @1% strain (design limit)	15–100 kPa, grade-dependent
Thermal conductivity (λ)	0.030–0.038 W/m·K (incidental insulation)
Water absorption	< 4% (closed-cell, hydrophobic)
Typical block size	2.5 × 1.25 × 0.95 m (field-cut and stacked)
Coefficient of friction (μ)	≈ 0.5 on moulded and cut faces
Governing standards	ASTM D6817 (properties) / D7180 (geotechnical design)
Reaction-to-fire (FR grade)	SANS 53501-1 Class B-s1,d0

Load / performance

EPS grade	Min density (kg/m^3)	Design load @1% strain (kPa)	Resistance @10% (kPa)
EPS 12	11.2	15	40
EPS 15	14.4	25	70

EPS 29	28.8	75	200
EPS 39	38.4	103	276
EPS 46	45.7	128	345

Fire & compliance: EPS geofoam is combustible; flame-retardant (FR) grades reduce fire spread from a small ignition source but do not make the material non-combustible. FR EPS achieves SANS 53501-1 reaction-to-fire Class B-s1,d0 — a reaction-to-fire classification, not a fire-resistance rating. In service the blocks are normally covered by soil, pavement, slab or geomembrane and must not be exposed to open flame or nearby hot works.

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