EPS Geofoam Blocks

Lightweight, Durable and Versatile for Geotechnical Applications



FMI-EPS is your source for EPS (Expanded Polystyrene) Geofoam Blocks. Our staff has been working with Engineers, Designers and Contractors on EPS Geofoam projects for over 25 years.

EPS Geofoam is a lightweight cellular plastic foam block used in geotechnical applications such as lightweight fill for construction on soft ground. Road embankment stability can be enhanced with a properly designed EPS Geofoam Blocks. Utilizing an interlocking stack of EPS Geofoam Blocks on a slide slope can greatly reduce horizontal movement and vertical loads. By placing EPS Geofoam Blocks directly behind retaining walls, bridge abutments or foundation walls results in a considerable reduction of lateral stress on the structure. This means less conventional materials to construct a new wall.

In terms of Civil Engineering applications the use of “The EPS Geofoam Construction Method” typically translates to benefits that include Cost Effective Design, Reduced Traffic Congestion, Timely Construction Schedules and Real Dollar Savings in the overall cost of construction. The use of EPS Geofoam in engineered construction applications, is growing rapidly.

EPS Geofoam Block Uses:

EPS Geofoam has been successfully used in the following engineered applications:

- Breams and Embankments
- Bridge Approaches
- Buried Utilities Protection
- Compressible Inclusions
- Dikes and Levees
- Foundations of Buildings
- Landscape Designs
- Loading Docks and Ramps
- Parking Structures
- Plaza and Residential Decks
- Railways and Runways
- Retaining Walls

EPS Geofoam Block Advantages Include:

+ **Cost Effective Solution:** The lightweight nature of EPS Geofoam Blocks can eliminate costly preloading, surcharging or staged construction. Given the light weight of EPS Geofoam Blocks, the need for heavy earth moving and compact equipment can be reduced or even eliminated, compared to conventional fills. On projects where poor access or rough terrains are a cost issue, EPS Geofoam Blocks can be transported, moved and placed faster than conventional fills, saving the project time and money.

+ **Dependable:** EPS Geofoam Blocks are manufactured in our modern manufacturing facility, with state-of-the-art equipment. This assures consistent physical properties in each individual Block that make up a typical EPS Geofoam fill system. Other lightweight fill materials such as tires, wood chips and foamed concrete can be varied and inconsistent in the make-up of their fill. This can result in a non-uniform load transfer, differential settlement, leachates and possible fire hazard.

+ **Durable:** High compressive strength makes EPS Geofoam Blocks durable and resistant to damage and shifting over time.

+ **Environmentally Safe:** EPS Geofoam contains no CFC’s, HFC’s, HCFC’s, Dyes or formaldehyde. EPS is an inert and highly stable product that will not decay, decompose, or produce undesirable gases or leachates to the surrounding environment. EPS Geofoam Blocks are recyclable and safe for waste-to-energy (WTE) systems and landfills.

+ **Insect and Mold Resistant:** EPS Geofoam Blocks can be manufactured with an inert non-polluting additive that repels termites and carpenter ants. EPS Geofoam is inert, it does not sustain mold and or mildew growth.

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- **Low Density / High Strength:** The Density of EPS Geofoam ranges from 1 to 2.85 lb/ft³, which equates to 1/100th the weight of soil and rock, making it a superior, ultra lightweight fill system that significantly reduces the stress on underlying sub grades. The lighter load reduces the settlement and increases the stability against bearing and slope failures.
- **Low Interface Friction:** In direct shear tests the interface friction between sand and EPS Geofoam is comparable to the internal friction of sand alone.
- **Predictable and a Proven Performer:** For over 35 years engineers, designers and contractors have been using EPS Geofoam Blocks worldwide. EPS Geofoam meets ASTM D6817, "Standard Specification for Rigid Cellular Polystyrene Geofoam." It is currently approved for use by numerous state Departments of Transportation (DOT), and the Federal Highway Administration (FHWA). We can assist you in determining what grade of EPS Geofoam Blocks will meet your project requirements. EPS Geofoam Blocks can stand up to all industry tests...and it has.
- **Maximize Onsite Installation Efficiency:** EPS Geofoam Blocks arrive on the jobsite on your schedule, ready to be installed, NO weather delays. Other fill material such as wood chips, saw dust, foamed concrete and soil can be weather sensitive during installation, putting your project behind schedule.
- **No Maintenance:** Under normal conditions, a project that uses EPS Geofoam Blocks requires no maintenance for the life of the project fill system.
- **Thermal Insulation:** EPS Geofoam Blocks are 98-99% air by volume, making it a highly efficient thermal insulator.

EPS Geofoam Block Product Features:

- **Adaptable:** EPS Geofoam Blocks come precut from our plant, but they can be easily cut and or fabricated on the jobsite with a hot-wire cutter or a saw.
- **Custom Project Specific Sizes:** EPS Geofoam Blocks, are manufactured to meet project specific requirements. We have the capability to manufacture various block sizes, depending on your project's requirements. Please don't hesitate to contact us to determine the most cost effective size for your next project.
- **Production Identification:** Each EPS Geofoam Block is clearly labeled, showing the date the Block was manufactured, ASTM designation, density and our UL 3rd party label.



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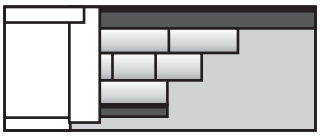
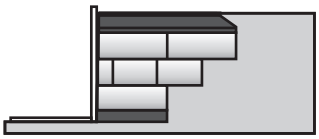
EPS Geofoam Blocks & Construction Method

is the Solution to these Common Problems

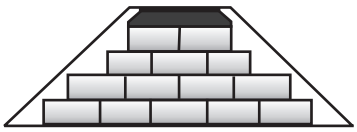
Bridge Abutments
Lightweight Fill



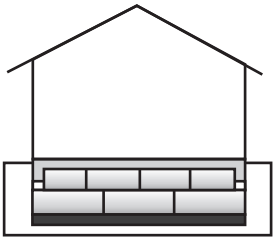
Retaining Walls
Lightweight Fill



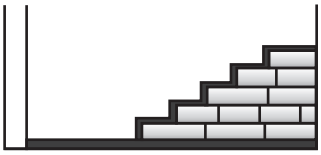
Freeways & Roads
Lightweight Fill



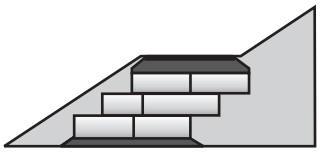
Foundations



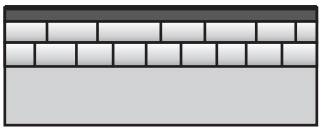
Elevation Changes / Stadium Seating
Widening & Raising



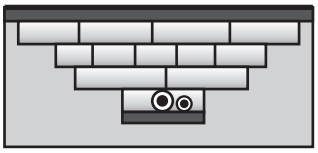
Side Hills
Widening Embankments



Weight Reduction for Structures



Weight Reduction for Utilities Protection



EPS Geofoam Fill System Makes Sense:

Extremely lightweight to reduce lateral and or bearing loads.

Predictable engineered product performance, for over 40 years.

Wide range of strength available to meet specific project requirements.

Not weather sensitive, can be installed in various weather conditions.

Cost effective solution, saves money and time.

EPS Geofoam Fill System Design Recommendations:

- For EPS Geofoam applications. The design load stresses should not exceed 1% strain for the combined live and dead loads.
- In applications where the EPS Geofoam fill will be subject to vehicular traffic, a Load Distribution Slab, (min. 6 inches) is recommended under the road subbase.
- In regions where differential icing may occur (e.g., bridges and overpasses) a well graded subbase should be provided. A well graded subbase will contain a high degree of fines and will retain moisture. A subbase thickness of 20” to 32” over the EPS Geofoam Blocks is adequate for most designs.
- In applications where the EPS Geofoam fill is periodically subject to submergence from flooding or fluctuating ground water, uplift buoyancy force must be counteracted with proper overburden or other restraint devices with geogrids or geomembranes.
- FMI-EPS recommends that the complete EPS Geofoam Fill System be completely designed and reviewed by a Licensed Civil Engineer.

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Table 1

Physical Properties of FMI-EPS Geofoam Blocks*

TYPE - ASTM D 6817		EPS12	EPS15	EPS19	EPS22	EPS29	EPS39	EPS46
Density, min.	lb/ft³ (kg/m³)	0.70 (11.2)	0.90 (14.4)	1.15 (18.4)	1.35 (21.6)	1.80 (28.8)	2.40 (38.4)	2.85 (45.7)
Compressive Resistance** @ 1% deformation, min.	psi psf (kPa)	2.2 320 (15)	3.6 520 (25)	5.8 840 (40)	7.3 1050 (50)	10.9 1570 (75)	15.0 2160 (103)	18.6 2680 (128)
Elastic Modulus	psi (kPa)	220 (1500)	360 (2500)	580 (4000)	730 (5000)	1090 (7500)	1500 (10300)	1860 (12800)
Flexural Strength min.	psi (kPa)	10.0 (69)	25.0 (172)	30.0 (207)	40.0 (276)	50.0 (345)	60.0 (414)	75.0 (517)
Water Absorption	volume %	< 4.0	< 4.0	< 3.0	< 3.0	< 2.0	< 2.0	< 2.0
Oxygen Index, min.	volume %	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Buoyancy Force	lb/ft³ (kg/m³)	61.7 (990)	61.5 (980)	61.3 (980)	61.1 (980)	60.6 (970)	60.0 (960)	59.5 (950)
Poisson's Ratio	—	.05	.05	.05	.05	.05	.05	.05
Coefficient of Friction	—	.6	.6	.6	.6	.6	.6	.6
Dimensional Stability	(max. %)	< 2%	< 2%	< 2%	< 2%	< 2%	< 2%	< 2%
Additional Properties for Compressible Applications								
Compressive Resistance** min. @ 5% deformation	psi (kPa)	5.1 (35)	8.0 (55)	13.1 (90)	16.7 (115)	24.7 (170)	35.0 (241)	43.5 (300)
Compressive Resistance** min. @ 10% deformation	psi (kPa)	5.8 (40)	10.2 (70)	16 (110)	19.6 (135)	29 (200)	40.0 (276)	50.0 (345)

*See ASTM D6817 Standard for test methods and complete information.
**Properties are based on data provided by Resin Manufactures, Independent Test Agencies and FMI-EPS.

Imperial / Metric Conversion

Length	1 foot	0.308 meter
Force	1 pound force	4.448 Newton
Stress	1 pound force per square foot (psf) 1 pound force per square inch (psi)	47.88 Pascal 6.898 kilopascal (kPa)

FMI EPS LLC

EPS Molders Association

The information in this bulletin is presented in good faith, and is believed to be accurate. All statements are made without warranty expressed or implied.

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