

InsulFoam® GF

Geofoam

Description

InsulFoam® GF (Geofoam) is a high-performance, lightweight, geosynthetic fill material consisting of closed cell expanded polystyrene (EPS). Geofoam is the common industry term for InsulFoam GF and similar products. InsulFoam GF is manufactured from the same high-quality blocks as our InsulFoam brand insulations and meets or exceeds the requirements of ASTM D6817, Standard Specification for Rigid Cellular Polystyrene Geofoam. InsulFoam GF is manufactured in a common density range between .70 to 2.85 lb/ft³ (11.2 - 45.7 kg/m³) and is an ideal, lightweight fill alternative for many construction applications.

Uses

InsulFoam GF is commonly used in areas where unstable soil conditions exist and as an alternative to various fill materials. The unique load disbursement and lightweight characteristics of InsulFoam GF help to minimize any post-construction settling. InsulFoam GF is also used as backfill to reduce lateral earth pressure behind adjacent structures such as retaining walls. InsulFoam GF is successfully used in the following engineered applications:

- Roads & Highways
- Bridge Approaches
- Retaining Walls
- Berms & Embankments
- Loading Docks & Ramps
- Landscaping
- Railways & Runways
- Dikes & Levees
- Foundations
- Parking Structures
- Buried Utilities Protection
- Compressible Inclusions

Advantages

- **Lightweight.** With typical densities from .70 to 2.85 lb/ft³ (11.2 - 45.7 kg/m³), InsulFoam GF is significantly lighter than soil (approximately 120 lb/ft³).
- **Cost Effective.** The lightweight nature of InsulFoam GF can reduce or eliminate the need for heavy earth moving and compaction equipment. The InsulFoam GF blocks can be easily picked up and placed manually. At sites with rough terrains or poor access, InsulFoam GF blocks can be transported, handled and placed faster than soil and other fills.
- **Environmentally Safe.** InsulFoam GF contains no CFC's, HFC's or formaldehyde. It is an inert and highly stable product that will not decompose, decay, or produce undesirable gases or leachates. InsulFoam GF is recyclable and safe for waste-to-energy (WTE) systems and landfills.



- **Insect and Mold Resistant.** InsulFoam GF can be manufactured with an inert additive that repels termites and carpenter ants. InsulFoam GF does not sustain mold and mildew growth.
- **Proven Performer.** For over 40 years engineers have been successfully using Geofoam worldwide. It's currently approved for use by numerous state Departments of Transportation (DOT), the Federal Highway Administration (FHWA) and other government and private entities.
- **Weather Resistant.** InsulFoam GF can be transported, handled and installed in most weather conditions and is unaffected by freeze-thaw cycling, moisture, and road salts. Other fill materials such as wood chips, saw dust, lightweight concrete and soil can be weather sensitive during installation.
- **Maintenance Free.** Under normal conditions, InsulFoam GF requires no maintenance for the life of the fill system.
- **Homogenous Make-up.** InsulFoam GF is manufactured with consistent properties throughout individual blocks. Other lightweight fill materials such as used tires, wood chips and fibers can be varied and inconsistent in their make-up which can result in non-uniform load transfer and differential settlement.
- **No Preloading.** Unlike other fill materials, InsulFoam GF does not require surcharging, preloading or staged construction.

Product Features

- **Job Specific Sizes.** InsulFoam GF is manufactured to meet job specific requirements. With varying maximum block-sizes available from the InsulFoam facilities, it is important the designer contact the local InsulFoam representative to determine maximum block sizes available for their project.

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- **Adaptable.** If jobsite block size adjustments are needed, InsulFoam GF can be easily cut on-site with hot wire tooling or saws.
- **Clear Product Markings.** Each Insulfoam GF block is marked with the manufacture date, location, ASTM designation and density.

Design Considerations

- For InsulFoam GF applications, design load stresses should not exceed 1% strain for combined live and dead loads.
- In conditions where InsulFoam GF is periodically subjected to submergence from fluctuating ground water, add 1.87 lb/ft³ (30 kg/m³) to the InsulFoam GF design density.
- In conditions where InsulFoam GF is continually below ground water, add 5.00 lb/ft³ (80 kg/m³) to the InsulFoam GF design density.
- In earth work applications such as levees, dikes, and berms, uplift buoyancy forces must be considered. The buoyancy force must be counteracted with overburden or restraint devices with geogrids or geomembranes.

Design Considerations

- InsulFoam GF contains a flame retardant additive; however, it shall be considered combustible and should not be exposed to open flame or any source of ignition.
- Protect InsulFoam GF from exposure to hydrocarbons, highly solvent extended mastics and coal tar.
- If long-term (6 months or greater) outside storage is necessary, InsulFoam GF should be covered with an opaque material. Exposure to UV may cause surface discoloration but does not effect physical properties.
- Blocks of InsulFoam GF should be placed tightly on a prepared leveling course.
- If multiple layers of InsulFoam GF are required, orient the successive layers with the long axis at 90° to the previous layer.
- Use InsulGrip Plates during inclement weather to provide horizontal restraint between layers of InsulFoam GF and to help keep the product from shifting.
- In windy conditions, InsulFoam GF should be ballasted during storage and upon installation.
- Heavy equipment should not operate directly on the surface of the InsulFoam GF.

Typical Tested Physical Properties*

Type- ASTM D6817	Units	EPS12	EPS15	EPS19	EPS22	EPS29	EPS39	EPS46
Density (nom. pcf)	lb/ft ³ (kg/m ³)	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** min. @ 1% deformation	psi (kPa)	2.2 (15)	3.6 (25)	5.8 (40)	7.3 (50)	10.9 (75)	15.0 (103)	18.6 (128)
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 Strength (psi, 10% deformation)	psi (kPa)	5.8 (40)	10.2 (70)	16.0 (110)	19.6 (135)	29.0 (200)	40.0 (276)	50.0 (345)
Flexural Strength (min. psi)	psi (kPa)	10.0 (69)	25.0 (172)	30.0 (207)	40.0 (276)	50.0 (345)	60.0 (414)	75.0 (517)
Oxygen Index, min.	Volume %	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Dimensional Stability	(max. %)	< 2%	< 2%	< 2%	< 2%	< 2%	< 2%	< 2%
Buoyancy Force	lb/ft ³ (kg/m ³)	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
Absorption	Volume %	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Elastic Modulus, min.	psi (kPa)	220 (1500)	360 (2500)	580 (4000)	730 (5000)	1090 (7500)	1500 (10300)	1860 (12800)

*Properties are based on data provided by resin manufacturers, independent test agencies and Insulfoam.

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