



Foam glass aggregate for earthworks



60
0–60 mm

Foamit 60 is an environmentally friendly foam glass aggregate made of recycled glass and used in earthworks.

The grey-coloured aggregate is light, porous and has an angular shape. In earthworks, particle sizes from 0–60 mm are usually used (Foamit 60). The product is also available in smaller particle sizes (Foamit 20, 4–20 mm and Foamit 30, 20–30 mm).

Production method

The cleaned, crushed glass cullet is milled into a powder of less than 0.1 mm, and a foaming agent is added. The glass powder mixture swells fivefold in a 900-degree furnace. The hardened foam glass consists of about 92% air pores. After cooling, the foam glass sheet breaks into fragments of ready-to-use pieces.

Environment

Foamit is made from 100% recycled materials. Of the product, about 99% is made up recycled glass and about 1% of a foaming agent from an industrial byproduct. Foamit does not require a separate environmental permit even in groundwater areas. When dismantling structures, Foamit can be reused. Foamit has a low, verified carbon footprint. Foamit Group's operations are based on ISO 9001, ISO 14001 and ISO 45001 certified quality, environmental and occupational health and safety systems. Foamit Group is committed to sustainable business and reports on the sustainability of operations annually.

Storage

Foamit 60 is coarse and polygonal. Its easy accumulation allows for storage at earthworks' sites. The product does not need separate protection from rain. Before installing Foamit, it must be ensured that any layers of snow are not moved with the product to the newly constructed fill.

Advantages in earthworks

Foamit reduces the overall weight of the fill, enabling construction on many soft soil types. The high friction angle allows you to work easily and quickly. In many structures, the Foamit layer does not require embankments for support. In road structures, it is often possible to omit edge embankments. Foamit aggregates do not need a geotextile membrane to achieve the desired compaction or load-bearing capacity. There is therefore no need to encase or 'bag' the Foamit layer. A geotextile is only needed to separate the foam glass aggregate from loose stones and gravel.

- Lightweight and interlocking
- Good thermal insulator
- High freeze-melt resistance
- Good drainability in situ
- Does not leach harmful substances
- No specialist equipment required for installation
- Installation without support embankments possible
- 100% recycled materials
- Verified carbon footprint

The equipment, time, and working costs for Foamit structural applications are lower than many other methods. Foamit does not require time for settlement. No specialist equipment is required for installation.

Uses

Applications include, for example, roads, tramways and pedestrian walkways, sports fields, yard decking, sewer pipe foundations, building foundations and bridge inlet banks. Foamit is also suitable for underwater structures. Foamit acts as frost insulation too.

Installation instructions

Foamit is delivered to the construction site by truck. The largest one-off delivery loads can reach 150 m³. The most commonly available deliveries are 114–130 m³ per load. Foamit accumulates in a controlled manner when unloading. Foamit is often tipped directly at the installation site, where it is spread by a tracked excavator. The load capacity required for yard areas, bike and pedestrian roads is achieved without compaction. Often these areas are also designed to withstand, for example, being driven over by emergency vehicles, in which case compaction must be carried out in accordance with instructions. Pre-compaction can be done using a tracked excavator with a 0.6 m aggregate layer and using a 200 kg vibrating plate compactor with a 0.4 m aggregate layer. Maximum thicknesses should be observed to achieve the desired long-term load capacity. The final compaction is carried out on top of a 0.15–0.20 m thick layer of crushed stone aggregate applied on top of the foam glass with a vibratory roller. More detailed instructions can be found in the document **Design guidelines for infrastructure construction:** https://foamit.fi/wp-content/uploads/2019/06/Suunnitteluoheje_30s_lr.pdf. Only available in Finnish.

Technical data for foam glass aggregate

Attribute	FOAMIT 60 Rated values	Standard / test method
Particle size	0–60 mm	SFS-EN 933-1 / SFS-EN 13055-2
Density (loose dry bulk)	210 kg/m ³ (±15 %)	SFS-EN 1097-3
Density (dry, compacted) ¹⁾	220–280 kg/m ³	⁶⁾
Dry volume weight concentrated in structure ¹⁾	2.2–2.8 kN/m ³	⁶⁾
Volume weight		
Structure with functional drainage	3.5 kN/m ³	⁶⁾
Structure intermittently underwater (≤ 1 month)	6 kN/m ³	⁶⁾
Structure under water long term (>1 year)	10 kN/m ³	⁶⁾
Volume weight (lifting dimensioning)	3,0 kN/m ³	⁶⁾
Compaction factor ⁵⁾	1.20–1.23	experiential
Friction angle (shear resistance angle) ⁷⁾	40°	triaxial test
pH value	10.5	
Water permeability coefficient	10 ⁻¹ m/s	estimated based on particle size distribution
Water absorption ²⁾		
short term (4 weeks)	≈ 60% w/w	EN 12087
long term (1 year)	≈ 100% w/w	
Capillary rise height	175 mm	SFS-EN 1097-10
Compression strength / crushability resistance by 20% compression	> 0,9 MPa	Material quality control test at the factory. SFS-EN 13055-1
Thermal conductivity		
dry	0.1 W/mK	SFS-EN 12667
moist ³⁾	0.15 W/mK	
wet	0.23 W/mK	
Equivalence in terms of insulation a _i ⁴⁾	4	
Carbon footprint (CO ₂ eq. / m ³)	58.93 kg	
Product approvals	CE, EPD	CE, EPD

1) Density depends on compaction.

2) Sample immersed in water.

3) Water content 25% by weight, dry bulk density 210–280 kg/m³.

4) Equivalence in terms of insulation compared to sand in accordance with the Finnish Transport Infrastructure Agency's guidelines.

5) With a compaction factor of 1.23, Foamit 60 applied in a 615 mm thick layer is compacted into a layer 500 mm thick (615 mm / 1.23 = 500 mm).

6) Volumetric weights are determined from density using the compaction coefficient.

7) Range 36°–45°. At a vertical tension of > 100 kPa, a value of 36° shall be used.

Foam glass partially compacts as a result of processing and transportation.

Load capacity data for foam glass aggregate

Module *	FOAMIT Rated values	Analytical method
Module E ₂	50 MPa ^{1) 2)}	Reclaimed from disk load tests
Resilient Module Mr		
average main tension 40 kPa	≥ 80 MPa	
average main tension 100 kPa	≥ 150 MPa	cyclic 3-axial test
Mixed module, E ₅₀	40 MPa	compacted ≥ 15%

1) The factors that increase the module of foam glass aggregate in the build include thick superstructure, good load capacity of the subsoil and support embankments in the peripheral areas, E₂ being the value used in the build dimensioning (Odemark method).

2) The dimensioning value of the module is realised in the finished structure under the load of the build-up. When measuring load capacity, the E-module is lower than the rated value (approx. 40 MPa) when measuring the load capacity of the base layer applied and compacted on top of the foam glass layer, which is lower than the rated value (approx. 40 MPa), this must be taken into account in the quality control of the site.

The values given in the table can be applied when the foam glass aggregate layer has been compacted after application by > 15% and the load on the surface of the foam glass layer ≤ 75 kPa (where the cyclical load, such as a vehicle or train load, is taken into account as 1.5 times).

Certificates and product approvals: <https://foamit.fi/en/foamit-products/ce/>

Environmental declaration and responsibility: <https://foamit.fi/en/foamit-products/environment/>



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