GLAVEL
FOAMED GLASS AGGREGATE®

Residential Construction
-Technical Guide-

This guide helps residential builders and homeowners integrate Glavel's foamed glass aggregate into projects. You'll find a comprehensive overview of the company, how foamed glass aggregate is manufactured, technical specifications, delivery logistics, installation guidance, and answers to frequently asked questions.

This guide is intended for general informational and consultative purposes only. Every construction project is unique, and you should consult with a licensed engineer or qualified design professional to ensure compliance with applicable codes and suitability for your specific conditions.

Glavel, Inc. | 50 Lakeside Avenue, Suite 861, Burlington VT 05401 | (802) 540-0843 | **glavel.com**

About Glavel

Glavel is a Vermont-based manufacturer of foamed glass aggregate with a commitment to low carbon construction solutions. Foamed glass aggregate is a lightweight, insulating aggregate that replaces traditional board insulation assemblies, enabling construction teams to reduce carbon emissions by providing an environmentally-safe alternative to carbon-intensive insulation materials.

Glavel's mission is to decarbonize the built environment by transforming recycled glass into foamed glass aggregate with renewable energy. With North America's first Environmental Product Declaration and Declare Label for foamed glass aggregate, Glavel offers builders and homeowners transparent data to support low carbon design and material selection.

How it's Made

Recycled glass is cleaned and ground into a powder, then combined with a foaming additive, creating a mixture that resembles damp sand. The mixture is deposited onto a 6' wide belt before entering the kiln and slowly heating to 1,600°. As the glass powder mixture heats up, it softens and fuses back into a solid mass while the foaming additive expands and creates a network of closed-cell micropores throughout the foamed glass slab.

The foamed glass slab then exits the kiln and quickly begins fracturing into aggregate due to thermal stress from exiting the kiln.

Most foamed glass aggregate kilns are powered by natural gas. Glavel has electrified its kiln and sourced renewable energy to power manufacturing operations, contributing to a low embodied carbon material.

Site Delivery

Foamed glass aggregate is delivered in 3 cubic yard supersacks (900 lbs) on flatbed trailers or box trucks. Customers are responsible for unloading bags and specifying delivery drop-off locations. Excavators are commonly used for unloading.

Customer pickup can also be arranged from the manufacturing plant in Essex, Vermont. Scheduling in advance and a vehicle rated for the load's weight and volume are required. The Glavel team will assist with loading.

Box truck delivery, 33CY per truck

Flatbed delivery, 72CY per truck

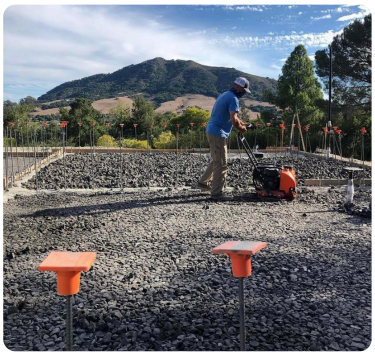
Facility pickup, CY varies based on hauling equipment

Installation Guidelines

Site Prep:
Lay a geotextile in the base of the area where the foamed glass aggregate will be installed or prepare an even stone subbase. A 6oz/yd nonwoven geotextile with 120 grab tensile strength is recommended.

Placement and Handling:
Move the foamed glass aggregate into the specified installation area. Glavel bags can be moved around project sites with an excavator and emptied directly into the specified area. Installers will often suspend bags 5' off the ground with site equipment and then use the spout bottom to empty the bags.

Leveling:
Prior to compaction, the foamed glass aggregate should be leveled by small machinery or by hand with rakes. Leveling the install area will ease compaction and help grading. Installation should be phased in 15" pre-compacted lifts. Installations deeper than 12" (compacted) should be split evenly in pre-compacted lifts, following the same leveling and compaction procedures as the initial lift.



Compaction:
Compact the foamed glass aggregate with a lightweight vibratory plate (<200 lbs). Foamed glass aggregate is compacted 25%, which can be achieved with 4-5 full passes. Additional compaction will increase material consumption but will not improve material properties. Even compaction achieves a grade tolerance of ±1". Work with a design professional to identify compaction requirements for bearing capacity.

Installation Completion:
Complete the installation by wrapping the top and sides of the installed foamed glass aggregate with a geotextile and vapor barrier. The geotextile protects the vapor barrier from being damaged by the foamed glass aggregate layer.

Foamed glass aggregate must be installed in accordance with site-specific engineering, code requirements, and manufacturer guidelines, and its performance is not guaranteed under improper conditions or installation practices.

Frequently Asked Questions

Who is responsible for unloading the delivery truck?
Unloading is the customer's responsibility. An excavator, skid steer with forks, or similar equipment are commonly used for unloading. Customers are typically able to unload trucks in an hour.

Does Glavel have a distributor network?
No. Glavel sells foamed glass aggregate direct-to-consumer. Deliveries come from Glavel's manufacturing plant in Vermont.

What is the R-value of Glavel's foamed glass aggregate and is it affected by moisture?
Glavel's foamed glass aggregate's R-value is 1.7 per inch. It does not absorb moisture, so the R-value remains stable even in damp conditions.

How is foamed glass aggregate delivered?
Foamed glass aggregate is delivered on palletized 3 cubic yard bags via 53' flatbeds or 26' box trucks.

Can I pick up foamed glass aggregate at the manufacturer's facility?
Pickups can be arranged from the Glavel facility in Essex, Vermont. Customers must schedule in advance and bring a vehicle rated for the weight and volume. The Glavel Operations Team will assist with loading.

Can radon systems be integrated into a foamed glass aggregate layer?
Yes. foamed glass aggregate supports passive radon systems. We recommend wrapping radon pipes with geotextile to maintain airflow. Active systems may slightly impact thermal performance and should be reviewed with your energy modeler if insulation levels are critical.

What equipment is used to install foamed glass aggregate on residential projects?
Standard equipment can install foamed glass aggregate on residential sites. Use rakes to level the material, then use a lightweight vibratory plate compactor (<200 lbs) to achieve even compaction. 4-5 complete passes will achieve the necessary 25% compaction. Avoid heavy tampers or compactors, which are too heavy to successfully compact foamed glass aggregate.

What payment methods are accepted when purchasing from Glavel?
Check, ACH, and credit card are accepted.

Can foamed glass aggregate be used as backfill outside of foundation walls?
Yes. Foamed glass aggregate can be used to insulate the exterior of foundation walls as loose or compacted fill as long as it is capped and not left exposed.

Can foamed glass aggregate be used underneath footings?
Yes. Foamed glass aggregate can be used beneath footings in many applications when properly evaluated. With compressive strength of 115 - 125 psi when compacted, it's suitable for many residential loads. We recommend working with your engineer to verify suitability for your specific loading conditions.

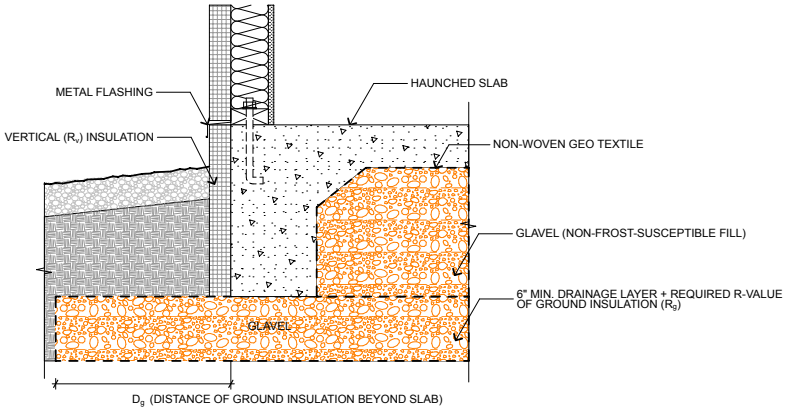
How much does a 3 cubic yard supersack of foamed glass aggregate weigh?
Each 3 cubic yard supersack weighs roughly 900 lbs.

Do you accept returns?
Returns are not accepted.

Sample Assemblies

2025

CONFIRM WITH AUTHORITY HAVING JURISDICTION
FOR COMPLIANCE WITH APPLICABLE CODE



1 FROST PROTECTED SHALLOW FOUNDATION
SCALE: 1 1/2"= 1'-0"

0 6" 12" 18"

FROST PROTECTED SHALLOW FOUNDATION

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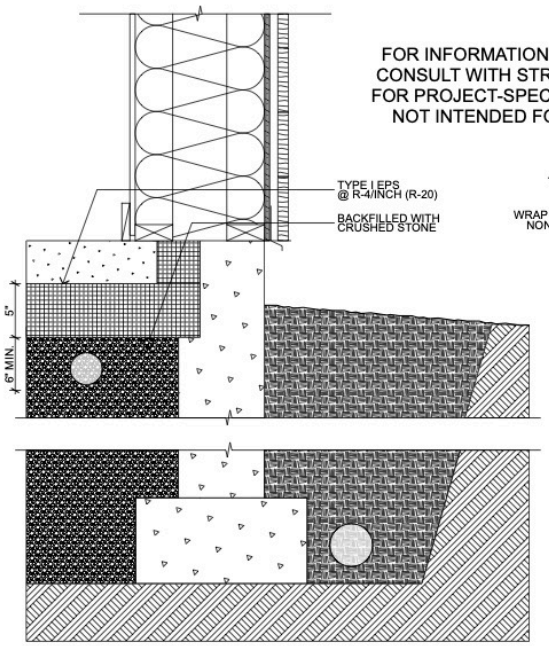
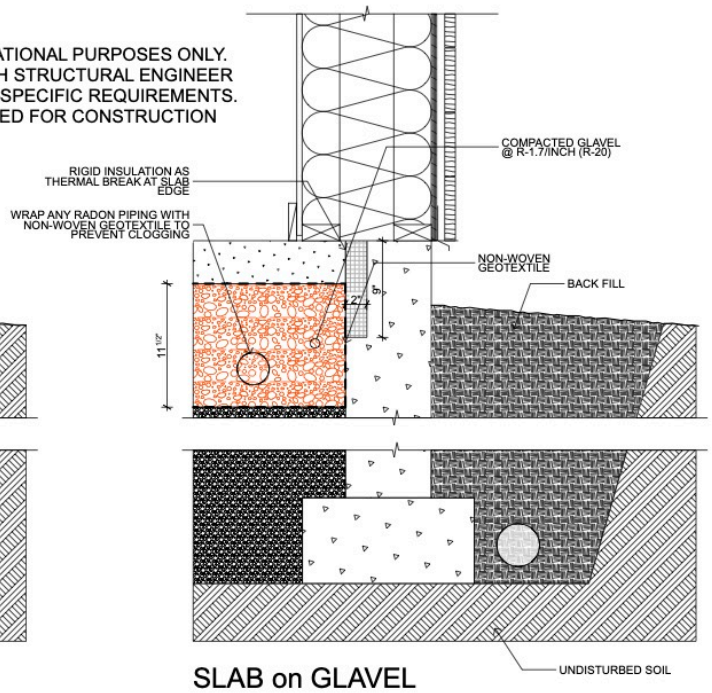
July 2025

FOR INFORMATIONAL PURPOSES ONLY.
CONSULT WITH STRUCTURAL ENGINEER
FOR PROJECT-SPECIFIC REQUIREMENTS.
NOT INTENDED FOR CONSTRUCTION



TYPICAL SLAB WITH FROST WALL
SCALE: 1 1/2"= 1'-0"



SLAB on GLAVEL
SCALE: 1 1/2"= 1'-0"

SLAB WITH FROST WALL

GLAVEL

Sample Assemblies, Continued

A typical slab-on-grade assembly with foamed glass aggregate consists of the following layers from bottom to top:

Compacted subgrade - Stable, well-compacted soil base
Non-woven geotextile - Separation layer between subgrade and insulation
Compacted foamed glass aggregate (12-18 inches) - Providing R20-R30 continuous insulation plus drainage
Non-woven geotextile - Protection layer above insulation
Vapor barrier (15+ mil) - Moisture protection beneath slab
Concrete slab - Structural floor system

This assembly eliminates the traditional layers of crushed stone for drainage and rigid foam boards for insulation, consolidating both functions into the foamed glass aggregate layer. The result is simpler construction, fewer materials to coordinate, and continuous thermal performance without interruption. For frost-protected shallow foundations, foamed glass aggregate can be used both beneath the slab and as insulated backfill around the perimeter, creating a continuous insulated envelope that protects against frost heaving while maintaining thermal performance.

Technical Data

Density (Unit Weight)
Uncompacted dry bulk density (ASTM C29).....9 - 10pcf

Estimated Dry Density
1.11 Compression Ratio (10% compaction of each lift).....10 - 11pcf
1.25 Compression Ratio (20% compaction of each lift).....11.25 - 12.5pcf

Compressive Strength (EN 1097-11)
25% compaction.....115-125psi

Typical Gradation Characteristics (uncompacted) (ASTM C136 / ASTM C117)
Measured in sieve size
4”.....100%
2”.....85-100%
3/8”.....0-15%

Physical Characteristics
Hydraulic conductivity (ASTM D2434-68).....0.086 cm/s
Moisture content
Volumetric.....0.47%
Gravimetric (ASTM C566).....0.62%
Particle Specific Gravity (ASTM C127).....0.54

Soundness
Sodium sulfate (ASTM C88).....4.7% - 5.3% loss

Chemical Characteristics
Sulfates (AASHTO T 290).....<10ppm
Chlorides (AASHTO T 291).....<10ppm
TCLP (SW 846).....Non-leaching

Material Transparency

Glavel is committed to full material disclosure and third-party verification to support informed decision-making in low carbon design.

Glavel's Environmental Product Declaration (EPD) reports Glavel's environmental impacts across a cradle-to-gate scope (A1–A3), covering raw material extraction, transportation, and manufacturing. Developed in accordance with ISO 14025, EN 15804 and ISO 21930:2017, the EPD enables direct comparisons within product categories and is fully integrated into the EC3 (Embodied Carbon in Construction Calculator) platform for benchmarking and specification.

Glavel also holds a Declare Label verifying that the product is Red List Free. This supports material health goals across programs like the Living Building Challenge, LEED v4.1/5, and WELL. By combining verified embodied carbon data with material health transparency, Glavel empowers designers and builders to meet both performance and sustainability targets without compromise. This commitment reflects the broader mission to make the construction industry cleaner, healthier, and more accountable.

As the construction industry increasingly prioritizes low-carbon design, material choices beneath the slab can have a significant impact on a project's total embodied carbon. Below is a comparison of subslab insulation assemblies, measured by total Global Warming Potential (GWP) in kg CO_2e per square meter for assemblies providing equivalent thermal performance.

Embodied Carbon Comparisons per m² at R20

Assembly	**Total GWP** (kg CO2e / m²)	**GWP Increase vs Glavel's Assembly**
Glavel Foamed Glass Aggregate	7.71	-
Type IX EPS + #57 Stone	17.20	123.05%
Type IV XPS* + #57 Stone	33.29	331.49%

*Includes B1 and C4 to account for blowing agent emissions during installation and disposal.

Our Story

We are on a mission to decarbonize the built environment. By transforming recycled glass into foamed glass aggregate with renewable energy, we are proving that low carbon building materials can beat traditional materials on both performance and cost.

Glavel's story began from a 2016 discovery made by Glavel's Founder and CEO Rob Conboy at the International Passive House Conference in Darmstadt, Germany. He was searching for building materials that could advance energy efficient construction in North America when he discovered foamed glass aggregate, a lightweight, insulating aggregate with decades of proven performance. Immediately he recognized the potential and committed to bringing it to North America.

Rob spent two years learning the product and understanding the market while identifying how to bring it to North America. In 2019, Glavel began importing foamed glass aggregate from Germany to introduce the product to the Passive House community. Not long after, Rob decided that the most impactful way to bring this product to market in North America was by transitioning away from industry-standard fossil fuel powered kilns, and instead pioneering North America's first fully electrified foamed glass aggregate kiln.

Glavel now produces industry-leading foamed glass aggregate from 100% post-consumer recycled glass, powered by a 5-megawatt solar array in northern Vermont provided by Encore Renewable Energy. Rob and the Glavel team's commitment to decarbonization, circularity, and social responsibility continue to drive the built environment to a low carbon future.