

Ultra-Lightweight
Foamed Glass Aggregate (UL-FGA®)

MATERIAL & APPLICATIONS


HIGHLY FRICTIONAL • NON-LEACHING • ROT-RESISTANT • NON-FLAMMABLE • DURABLE • SAFE

made from recycled container glass





made from recycled container glass

AERO 
AGGREGATES

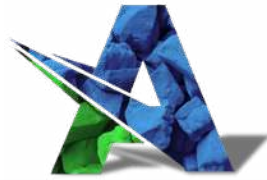
85-90% lighter than
quarried aggregates

High friction angle

Excellent insulating
properties

aeroaggregates.com





UL-FGA®



AeroAggregates produces ultra-lightweight foamed glass aggregate (UL-FGA) from recycled container glass

The idea of foaming waste glass to create a building material has been known for decades but it wasn't until the 1980s when full scale production began in Europe. These aggregates are 85-90% lighter than quarried aggregates, have a high friction angle, and are good insulators due to their closed cell structure. The manufacturing process converts glass cullet into a chemically stable, non-leaching, rot-resistant, non-flammable and durable construction material.

The initial use of UL-FGA was to prevent frost heave in frost susceptible soils throughout Scandinavia. However, the low unit weight and high frictional properties of the material led to other applications and the demand for UL-FGA has continued to increase.

Current civil engineering challenges require construction on soft soils, reduction of lateral earth pressures, decreased loads on structures, and the protection of tunnels and underground utilities. The unique properties of UL-FGA can address these challenges and be a sustainable solution through the beneficial reuse of glass containers.

APPLICATIONS

UL-FGA has been successfully used in building and infrastructure construction projects for over 25 years.

INFRASTRUCTURE

- Embankments
- Retaining Walls & Bridge Abutments
- Roadway Widening
- Tunnels & Culverts
- Utilities
- Load Distribution

COMMERCIAL CONSTRUCTION

- Foundation Walls & Slabs
- Greenroofs
- Plaza Decks

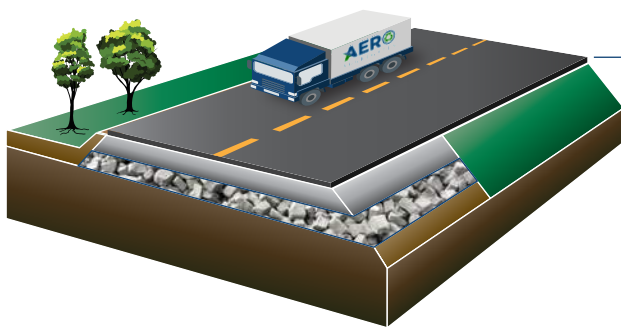
HIGHLY FRICTIONAL • NON-LEACHING • ROT-RESISTANT • NON-FLAMMABLE • DURABLE • SAFE



INFRASTRUCTURE



Ultra-lightweight aggregate provides solutions for the challenges of today's infrastructure projects. Foamed glass aggregate is ideal for projects that require fill to be placed over soft compressible soils or over areas with underground utilities. Large embankments can be built with low net surcharge due to the low unit weight and high friction angle of UL-FGA.

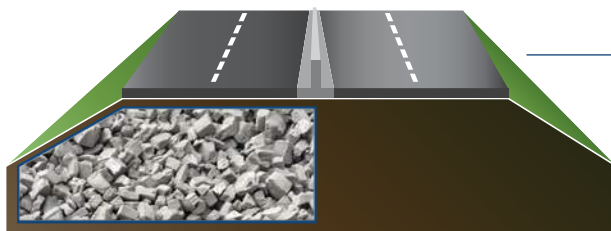
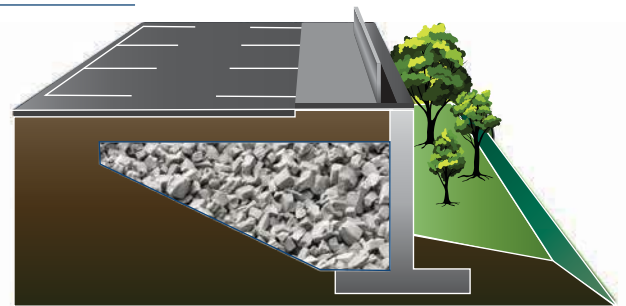


EMBANKMENTS

- Lightweight fill over compressible soils and/or utilities
- Insulating fills for frost susceptible soils
- Resiliency projects requiring fill on soft soil
- Reduced excavation for soil balancing
- Less soil removal and disposal
- Potential to stay out of the water table

RETAINING WALLS & BRIDGE ABUTMENTS

- Lightweight fill behind retaining walls and wing walls
- Greatly reduces lateral load
- Easily excavated for placement or repair of utilities
- Pullout testing completed on various types of reinforcement
- Free draining material
- Reduces settlement of embankments for bridge approaches



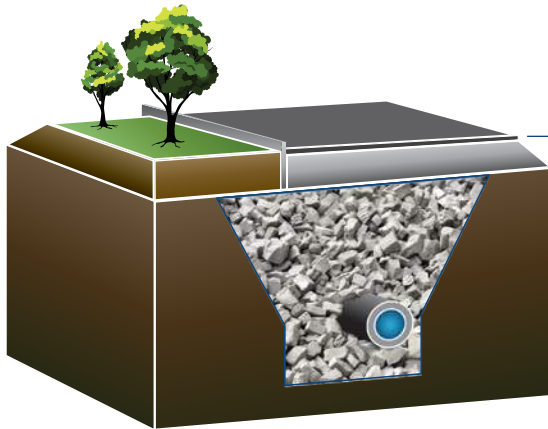
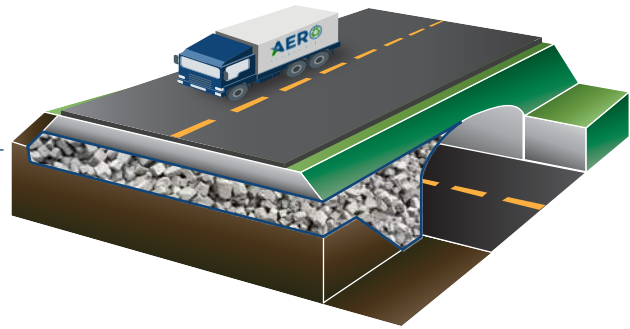
ROADWAY WIDENING

- Roadway widening and shoulder repair
- Slopes up to 1:1 can be built without additional reinforcement
- Increased slope inclination helps with right-of-way limitations



TUNNELS & CULVERTS

- Lightweight backfill over and around tunnels and culverts

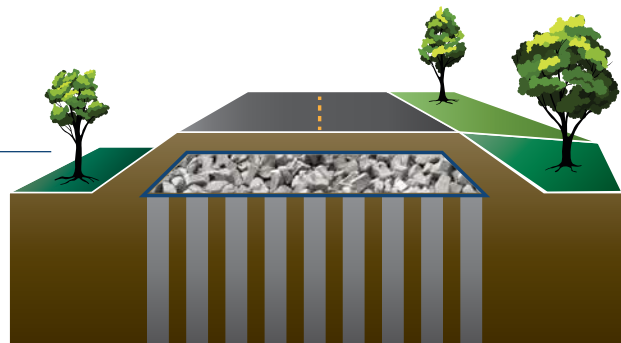


UTILITIES

- Lightweight backfill for sensitive utilities
- Bedding layer for utilities on soft compressible soils
- Insulating backfill for frost protection
- High friction angle creates soil arching to further reduce loads on utilities
- Heat resistant up to 800° F

LOAD DISTRIBUTION

- Reduced weight of embankment fill over load distribution platforms
- Optimize number of piles
- Use in locations where in situ ground improvement is not possible due to underground utilities



ACCELERATED CONSTRUCTION DUE TO LIFT THICKNESS



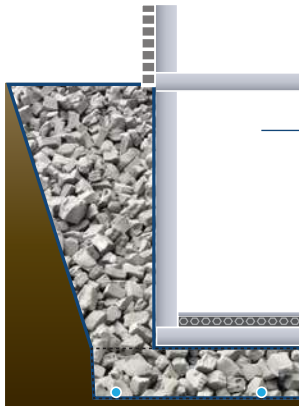
UP TO 100 CUBIC YARDS PER TRUCK



COMMERCIAL



AeroAggregates UL-FGA provides multiple functions in commercial construction applications. Foamed glass aggregate is lightweight against foundation walls or under slabs and provides excellent insulation and drainage. In addition, UL-FGA is not flammable, will not rot or decay, and is easy to place, especially in difficult to reach areas or confined spaces.

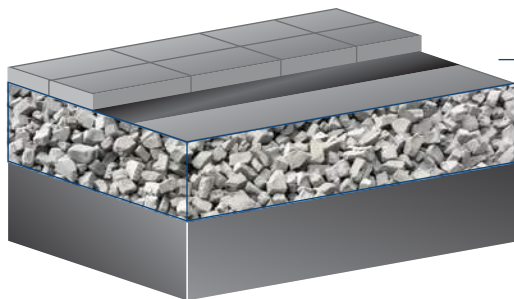
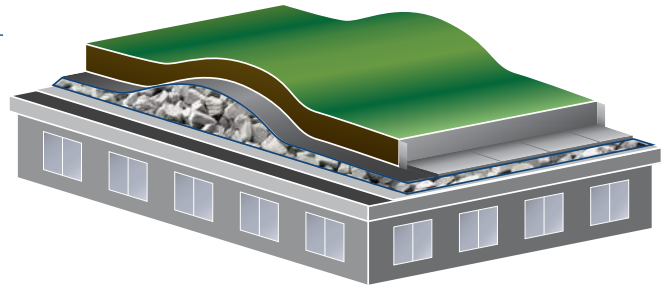


FOUNDATION WALLS & SLABS

- Support of excavation backfill and retaining walls
- Under concrete slabs – as a capillary break and insulator
- Vertical backfill for insulation drainage, and reduced load
- Rot-resistant, non-flammable
- Insulation protection against frost heave

GREENROOFS

- Easily contours and shapes due to friction angle of aggregate
- Insulating and draining layer on roofs
- Reduces load on roof structure



PLAZA DECKS

- Insulates substructure or protects against frost heave
- Free draining
- Reduces load on roof structure or soft soils





TECHNICAL DATA

GOOD INSULATOR

HIGH FRICTION ANGLE

FROST-RESISTANT



ULTRA-LIGHTWEIGHT

CAPILLARY BREAK

FREE-DRAINING

LOAD-BEARING



AeroAggregates UL-FGA G15

Ultra-Lightweight Foamed Glass Aggregate

Density (Unit Weight)

Uncompacted dry bulk density (ASTM C29/C29M/ AASHTO T 19) ¹	12-15 pcf
Estimated compacted dry density	
1.11 Compression Ratio (10% Compaction of Each Lift)	13.3-16.7 pcf
1.25 Compression Ratio (20% Compaction of Each Lift)	15-18.8 pcf
Estimated buoyant unit weight	-15 pcf

Typical Gradation Characteristics (uncompacted) [ASTM C136/ AASHTO T 27] ¹

D85	2.5" (maximum)
D15	0.375" (minimum)

Physical Characteristics

Hydraulic Conductivity (ASTM D 2434-68)	3.0 cm/sec typical
Moisture Content	
Volumetric (%)	0-10 (6% typical)
Gravimetric (%) [ASTM C566/ AASHTO T 255] ¹	0-60 (25% typical)
Particle Specific Gravity (AASHTO T 85)	0.4 (typical)
Porosity	
Uncompacted	0.5
1.25 Compression Ratio	0.38
Soundness (% Loss)	
Magnesium Sulfate (ASTM C88/AASHTO T 104) ¹	4.1-14
Sodium Sulfate (ASTM C88/AASHTO T 104) ¹	3.1- 6.9
Stability	
Angle of internal friction – loose	45°
Angle of internal friction – up to 1200 psf (ASTM D3080) ¹	55°
Angle of internal friction – up to 3000 psf (ASTM D3080) ¹	41°

¹Modified test method due to particle size/density



Physical Characteristics (cont.)

Impurities	
Clay lumps (ASTM C142)	0
Organic impurities (ASTM C40)	0
Popouts (ASTM C151)	0
Electrical Resistance	
Lab (AASHTO T 288)	15,600 ohm-cm

Chemical Characteristics

Ignition loss (ASTM C114)	0
Sulfates (ppm) [AASHTO T 290]	11
Chlorides (ppm) [AASHTO T 291]	<10
TCLP (SW-846)	Non-leaching

Daily Quality Control Testing

Bulk dry density, maximum [EN 1097-3] ¹	15 pcf
Compressive Strength at 20% Deformation, minimum [EN 1097-11] ¹	15,000 psf

Advantages

Good Insulator	Capillary Break	Freeze-Thaw Stable	Rodent Resistant
Highly-Permeable	Volume Stable	Non-Flammable	Accelerated Construction

Shipping & Handling 100 CY/Truckload

By shipping up to 100 CY per truckload, we are not only reducing the number of trucks on the road, helping logistics, but we also are reducing the carbon footprint of your aggregate needs.

Material can also be supplied in super sacks for easy placement on sites with confined access.

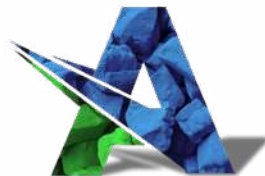
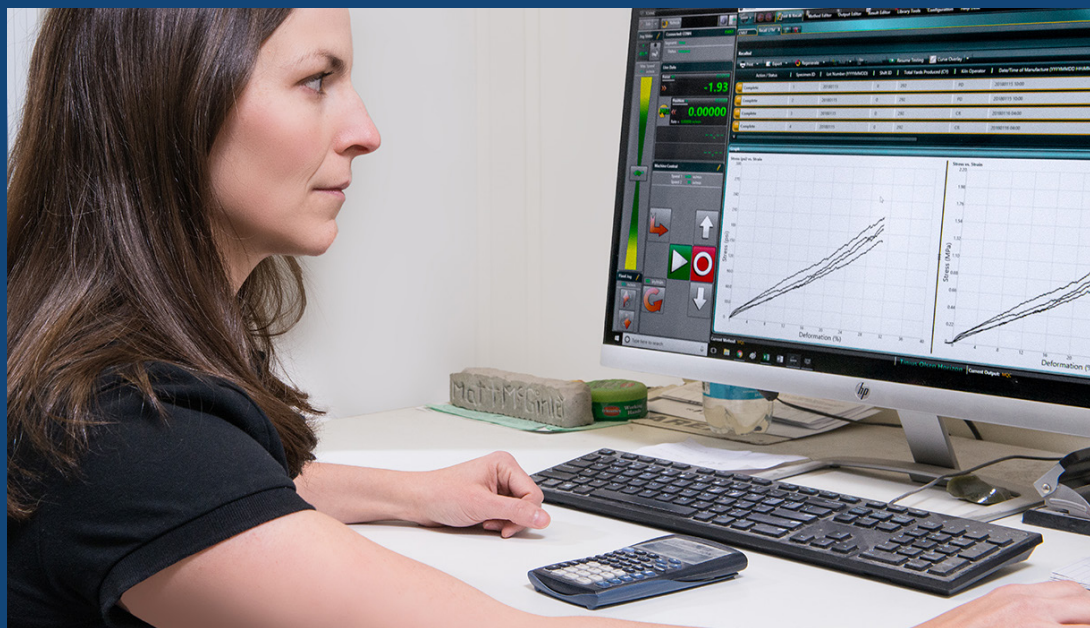
¹Modified test method due to particle size/density

For more information, please visit aeroaggregates.com or call (833) 261-8499.



AeroAggregates of North America, LLC
 1500 Chester Pike | Eddystone, PA 19022
 (833) 261-8499 | www.aeroaggregates.com
 © 2019 AeroAggregates





TECHNICAL SUPPORT

AeroAggregates offers in-house technical support for designers and contractors working with foamed glass aggregate. Our facility includes state-of-the-art testing equipment for both quality control, performance testing, and research and development.





**QUALITY CONTROLLED
PERFORMANCE TESTED**



aeromaggregates.com



06-2019



AeroAggregates of North America, LLC
1500 Chester Pike | Eddystone, PA 19022
(833) 261-8499 | www.aeroaggregates.com
© 2019 AeroAggregates

