



Made from recycled glass and extremely high quality. **STRONG. WARM. DURABLE**

Veriso foam glass is an insulation material, which is lightweight, instantly load bearing, moisture resistant, totally thermal insulating and rot proof. It is economically and environmentally sound too.

Veriso foam glass is a high quality insulation material made of 100% recycled glass, meeting all requirements of a lightweight aggregate with best characteristics. Veriso foam glass takes over the draining function, is load earing and works simultaneously as a thermal insulation for covered construction components. This is a brilliant solution for a thermal bridge-free floor construction in one easy step.





Production of veriso foam glass USED GLASS AS A RAW MATERIAL



The raw material - used glass

Recycled glass is crushed into extremely fine powder and blended with foaming agents. This process reuses valuable raw materials and saves energy initially required for the production of virgin glass. Due to this, the energy used in producing **veriso foam glass** is significantly less.

The manufacturing process

Veriso foam glass is sintered at high temperatures. Foam glass arises out of glass powder during an expansion process in the most modern tunnel kilns at a temperature of approximately 900°C. The foam glass cake comes out of the kiln on the conveyor belt to cool down. During this cooling process, tension cracks occur and breaks it down into our foam glass gravel. The end result of production is high-quality foam glass and expanded glass.

Use beneath the ground without strip footing (no basement) | DIN EN ISO 13793





Veriso foam glass is revolutionizing the conventional floor structure and replaces the capillary-breaking layer, sub base and extruded rigid foam panels. The circumferential insulation of the foundation-/cellar plate, results in a closed umbrella-shaped insulation. Therefore, the conventional and time-consuming strip foundation can be omitted. Veriso foam glass forms a homogeneous exterior insulation without thermal bridges.

Please look at our references (QR Code) to get details to this project as well as detailed static calculations of the floor slab with veriso foam glass.

- Suitable for the thermal insulation beneath the ground slab of single-family houses, production halls, schools and industrial buildings
- Higher compressive strength than other materials at a more simple and costeffective installation technology
- Operations, such as grading excavation, installation of gravel-, grit- and fine sand ground, up to lean concrete layer can be eliminated
- Strip-foundation can be eliminated.



Use beneath the ground with strip footing (no basement)





Ground slabs with veriso foam glass are typically executed without strip footing. Should the constructional requirements need a strip footing (slope, rising level), veriso foam glass presents the perfect thermal insulation between foundations. As a bulk material, veriso foam glass is significantly easier and quicker to install compared to insulating boards. No cutting, just dumping, distributing and compacting.

- Simple and quick to install
- Suitable for the thermal insulation beneath the ground slab of single-family houses, production halls, schools and industrial buildings
- Operations, such as grading excavation, installation of gravel-, grit- and fine sand ground, up to lean concrete layer can be eliminated
- Draining and thermal insulation in one step



1 Sub-grade 2 Geotextile if required **3** Veriso foam glass 4 PE-Foil 5 Foundation Slab 6 Strip Footing Covering Screed PE-Foil GEOMATERIALS expanded glass Sealing in acc. with Standard Interior wall construction in acc. Foundation Slab Exterior wall construction in acc with specification: Client! PE-Foil with specification: Client! - Veriso foam glass - Geotextile finished floot top level finished floot top level ground floor around floor GEOMATERIALS expanded glass veriso foam glass. Perimeter insulation 1,3:1 compressed TERRAIN LINE level of natural ground 4.24 .. 1,1 , 2 ::; Structural thickness of veriso foam glass in acc. with calculation Concrete flat stone with reinforcement in acc. with static specifications

Floor construction without ground slab



The floor construction with veriso foam glass is suitable for new constructions and renovations.

Especially in the application of renovation of floor systems of old buildings where the construction height is limited, veriso foam glass combines a draining layer and thermal insulation in one product and thus reduces the construction height. Furthermore, you can do without ground slabs, if you make the floor structure with veriso foam glass. In accordance to the requirements of building sealing, this is initially mandatory.



- Suitable for new constructions and renovation of old buildings
- No foundation slabs, capillary-breaking layer or granular subbases required
- Significant lower construction height with veriso foam glass
- Environmentally harmless and thus perfectly suited for living areas





Floor construction without ground slab



With veriso foam glass, a significantly lower construction height can be realized. Due to the systematical construction with, i.e. 30 cm compacted veriso foam glass, you can achieve a perfect floor construction in combination with the subsequent screed layer.

- Suitable for the renovation of old buildings
- No requirement of foundation slabs and capillary breaking layer
- Ideal floor construction in combination with a screed
- Significant lower construction height
- Environmentally harmless and thus perfectly suited for living areas



- 1 Sub-grade
- 2 Geotextile if required
- 3 Veriso foam glass
- 4 PE-Foil
- 5 Granular subbase*/

GEOMATERIALS expanded glass*

- 6 Compaction according to*
- ⑦ Screed (reinforced screed)
- 8 Exterior Insulation
- Masonry
 Masonry

*can be eliminated



Floor construction without ground slab

Easy floor renovation in combination with veriso foam glass and GEOMATERIALS expanded glass





In this combination, **veriso foam glass** is used for rough level compensation. Together with **GEOMATERIALS expanded glass**, which is the mineral alternative to a conventional EPS fill under the screed, this results in an easy, dry, moisture resistant and incombustible solution for the rebuilding of floor systems.

GEOMATERIALS expanded glass is low weight, stable, resistant to ageing and is ideal for loose or bonded thermal insulation fill. In this application, up to 1.20 m height is compensated for in the underconstruction.

?

- Suitable for the renovation of old buildings
- No requirement of foundation slabs and capillary breaking layer
- Ideal floor construction in combination with a screed
- Significant lower construction height
- Environmentally harmless and thus perfectly suited for living areas
- Low weight

1 Sub-grade



2 Geotextile 3 Veriso foam glass possible to use a fleece or PE-Foil ④ Granular subbase* / **GEOMATERIALS** expanded glass* mineral-bounded / cement-bounded 5 Screed 6 Compaction according to DIN* Covering - Screed 7 Ceramic Cover Scieca Sealing in acc. with Standard CEOMATERIALS expanded glass with mind. binder 8 Edge Insulating Strips - PE-Foil - Veriso foam glass 9 Foundation - Geotextile *can be eliminated finished floor top level ground floor GEOMATERIALS expanded glass veriso foam glass 1,3:1 compressed



Insulation of vaults

with veriso foam glass and/or GEOMATERIALS expanded glass



Veriso foam glass relieves old vaults

Reducing weight and a slim floor structure is the key when it comes to the insulation of old vaults. It is desirable to bring in as little additional humidity as possible. Veriso foam glass is extremely light and allows for a dry and easy installation. In combination with a plug and play system for underfloor heating, veriso foam glass allows an ultra-thin floor structure at the highest ecological quality of living - in function of a heat storage system.



- Low weight and hardly burdens on old constructions
- Suitable for over-insulation of old buildings
- Extremely low floor structure at the highest ecological living quality
- Moisture resistant: veriso foam glass absorbs almost no water and dries out quickly



- Vault
- 2 Veriso foam glass compacted manually
- 3 GEOMATERIALS expanded glass*

mineral-bounded / cement-bounded, PE-Foil*

- 4 Footfall sound insulation
- 5 Floor heating system
- 6 Screed
- **7** Fleece (Footfall Insulation)
- 8 Covering

*can be eliminated





Vertical wall- and drainage fill with veriso RED expanded glass - aqua store



Exposing the masonry, sealing according to DIN, creating a drainage system



Filling in the working pit and compressing veriso RED expanded glass - aqua store in layers

In addition to the creation of a working drain, backfilling with veriso RED expanded glass is a suitable method through a controlled release of surface water into the ground.

More information: www.veriso.de/en/products/red

- Veriso RED expanded glass aqua store is a light, load-bearing bulk material with water-storing and water-regulating properties
- Load capacity: can store up to 40% more water volume
- Water regulating: water will not only be stored in the grain structure, but is also located in the grain and thus reduces the buoyancy process. If the water sinks it quickly releases the stored water again.
- Environmentally friendly and energy efficient in production
- Incombustible A1
- Save time and money due to significantly fewer or shorter work steps during installation



 Sub-grade
 Geotextile
 Veriso foam glass possible to use a fleece or PE-Foil
 Granular subbase*/ GEOMATERIALS expanded glass* mineral-bounded / cement-bounded
 Screed
 Compaction according to DIN*
 Ceramic Cover
 Edge Insulating Strips
 Foundation
 Veriso RED expanded glass - aqua store





Pipeline construction with veriso foam glass



Due to its special properties **veriso foam glass** suits brilliantly for distant and local heating pipes with sub-terrain tanks, e.g. water reservoir or biogas plans, transmission stations and distributors.

Veriso foam glass provides a solid base for pipework in poor soils and reduces heat loss by providing decoupling from the ground.

- Weight stabilization
- High draining function, cross- and alongside draining
- Reduce thermal losses
- Can be modelled
- Sub-grade
 Geotextile
 Veriso foam glass
 Frost buffer









What you should know before installation



1. Determining the base area (A_{p})

The base area is the area on which **veriso foam glass** must be installed. Please consider the vertical protrusion above the ground slab.

2. Determining the delivery quantity (L)

The necessary quantity results out of the product of base area, finished installation height and compaction ratio.

$L = A_p \cdot H_v \cdot v$

- L Quantity delivered [m³]
- $A_{\rm D}$ Base area [m²]
- H_s Dumping height [m]
- H_v Finished installation height [m]
- v Compression ratio

3. Information regarding the construction site



Depending on the accessibility of the construction site, we offer various options for the installation of **veriso foam glass**. Please contact your veriso consultant to determine the ideal delivery form for your construction site.

Correct compaction



1,3 : 1 After a compaction of 1,3:1 veriso foam glass should look like this.

U-Value Calculation:

 $\frac{\lambda}{\text{Thickness (in m)}} = U-Value$

Recommended equipment for installation of veriso foam glass



For processing veriso foam glass gravel, we recommend forwardrunning, lightweight vibratory plates with a slight forward drive. Vibratory plates with forward and reverse travel (reversible models) are not suitable for compaction. A compaction ratio of 1,3:1 can be achieved, e.g. with vibrating plates ~ 100 - 120 kg, frequency 80 - 100 Hz, and a working width \geq 500 mm.

The proposed equipment gives insight into machinery alternatives for compaction, especially the manually operated plate vibrator that gives the required propulsion for a good compaction result.

Please do not hesitate to contact your veriso consultant for the best delivery or the best compaction machine for your construction site!

Delivery on schedule, direct discharge at the installation site and precise installation without transshipment as well as the correct selection of equipment saves time and money.

The fundamentally better alternative

for all application areas





It's so easy! veriso foam glass – installation step by step

Please note: The use of veriso foam glass in the capillary fringe of groundwater or water source areas is not allowed. The natural ground must be well permeable to water. In the presence of cohesive or stratified soils, where accumulation or stratum water can occur, a drainage according to DIN 4095 has to be provided.



Excavation: Excavate immediately prior to the **veriso foam glass** to meet flatness and compressive strength in accordance with the object-related requirements. Unless otherwise specified, the requirements for flatness and compressive strength should be based on the principles of ZTVE – StB 94. Lay sewage pipes in pipe trenches and fill with sand on sub-grade level.



Lay the GEOTEXTILE: Set up the formwork for veriso foam glass and lay out the flat surface with geo-textile (150g/m²) overlapping. Provide sufficient overhang so that the finished fill can be completely packed later. Position splice bars with markings for the dumping height are positioned at regular intervals.



Install veriso foam glass: If **veriso foam glass** is delivered loose, it is offloaded directly into the excavated pit. Above the installation site, the Big Bags have to be lifted and opened from below with the help of an excavator or crane.



Distribute veriso foam glass: At smaller construction sites, it is spread evenly to the marked height using an excavator shovel and rakes. For larger construction sites the material is spread mechanically in front of the head using a loader or a shovel excavator. Driving over the uncompacted material should be avoided, as this precompaction increases material consumption.



Compact veriso foam glass: For compaction, we recommend forward-running, lightweight vibratory plates with light propulsion. A compaction ratio of 1,3:1 can be achieved, e.g. with vibrating plates ~ 100-120 kg, frequency: 80-100 Hz and a working width \geq 500 mm.

An earth roller can be used for areas > 200 m². Compaction in excess of the specifications results in higher material consumption, but has no negative impact on the technical properties. For planning thicknesses greater than 30 cm, **veriso foam glass** must be poured in two layers and compacted in each case. The flatness of the surface must be established before the compaction process in such a way that a flatness tolerance of at least +- 3 cm is achieved in relation to a length of 4 m.



Lay the separation layer: After finishing of compaction, the geotextile is wrapped around the sides and the entire veriso foam glass layer is covered with a PE-foil to protect against cement residue.



Install formwork for foundation slab: Place the formwork for the floor slab directly on the prepared surface and create the floor slab according to the specifications. The ring drainage (sewer pipes) is laid around the pit after the formwork has been removed.



COMPACTION WITH A VIBRATING PLATE

Generation of the dynamical compaction energy depending on the dwindling mass. Frequency [Hz] Centrifugal Force [kN]

Working direction and working speed activated through the exciter system.

THIS IS HOW IT IS COMPACTED: Static load + dynamical compaction energy

Technical Data

WPK	Compliance with product quality characteristics, factory production control (WPK)
General technical approval	DIBT - Approval
Check of load-carrying capacity	according to DIN 18134

According to DIBT Approval for application 'thermal insulation', there is no plate load testing necessary.

In Germany and Austria it is required that near-surface, loosened layers must be removed before plate load testing carefully and the test has to be carried out on an undisturbed soil. This is not possible with foam glass - in this case, **veriso foam glass** behaves like any other lightweight building material. This near-surface, loosened grain is measured of the measurement of the initial stressing will be comparatively low, due to the plastic behaviour. Thus, a ratio value of Ev2 / Ev1 between 3 and 6 (depends on compaction) is absolutely normal for **veriso foam glass**.



Tips for extensive installation

LEGEND

Working direction of the manual whacker

Angle of response after offloading by a walking floor truck

Manual whacker <= 12 t Shovel >= 1,8 m³ without teeth

Precalculated area on which the loading volume should be distributed





Extensive installation of veriso foam glass for a production hall



Possibilities for delivery and installation



Delivery of bulk material by a walking floor truck

Delivery of bulk material by a container truck

the material can be brought step by step.

This form of delivery is suitable for construction sites, which can be easily reached. A walking floor truck cannot tilt, but rather shuffles the material with its moving floor from back to front.

Typical dimensions: $L \times W \times H = 18 \times 4 \times 2,8 \text{ m}$ Loading capacity: 85 - 95 m³ depends on the type of truck Non steerable axles!

Please consider: through the minimized quantity and the additional expense, we charge an extra container surcharge.

Typical dimension towing vehicle: $L \times W \times H = 9 \times 4 \times 2,8 \text{ m}$

This form of delivery is suitable for narrow access roads. The bulk material is divided into the towing vehicle and a trailer. Therefore



Loading capacity: 76 - 80 m³ depends on the type of truck

Delivery packed in Big Bags

We also offer the material in packaged form (disposable packaging):

veriso foam glass Big Bag 1,5 m³ veriso foam glass Big Bag 2 m³ veriso foam glass Big Bag 3 m³



Installation by a dispensation-towel

Especially for stepped, impassable areas, there is the possibility to install **veriso foam glass** with the help of a dispensation-towel. The material is conveyed from the walking floor truck into the towel, spread on the ground with a capacity of 12 m³. The dispensation-towel can be moved with a crane. The distribution of the material happens through the outlet spigot. We can provide dispensation-towel for your construction project for a daily fee.



Extensive application

for business and industrial objects



Lightweight load-bearing bulk material with thermal insulation properties

Non-capillary: Replaces the capillary-braking layer





Load bearing: Highly resistant in industrial construction



Cost and energy saving: Especially in extensive installation



We point out that all pictures, graphics and drafts shown in this publication are only non-binding detailed descriptions. All relevant DIN must be strictly adhered by the user.

Concrete floor slab with a basement/slope





We point out that all pictures, graphics and drafts shown in this publication are only non-binding detailed descriptions. All relevant DIN must be strictly adhered by the user.

Saving construction costs

with veriso foam glass



- Load bearing insulation with high sustainability
- No gravel necessary
- Strip-foundation can be eliminated
- Significantly lower construction height with veriso foam glass
- Saving working time
- Thermal bridge free construction

TECHNICAL DATA AND PROPERTIES veriso Blähglasschotter Aqua Store

application area: Lightweight, load-bearing bulk material for application in water storage systems					
Particle size distribution	EN 933-1	10 - 63	mm		
Bulk density, dry 🕦	EN 1097-3	238 - 262	kg/m³		
max. water absorption at 12% compression (2)	Factory spec.	≤ 50	M %		
Portion of aggregate spores in bulk material	Factory spec.	26 - 35	%portion/m³		
Portion of aggregate spores at 12% compression	Factory spec.	15 - 22	%portion/m ³		
max. water saturation of the bulk material (2)	Factory spec.	~ 425	Liter/m ³		
max. water saturation at 12% compression (2)	Factory spec.	~ 385	Liter/m ³		
Water release after 2 days	Factory spec.	~ 60	%WA/m³		
Water release after 8 days	Factory spec.	~ 85	%WA/m³		
max. installation weight with water saturation of the bulk material $^{\scriptscriptstyle (3)}$	Factory spec.	~ 375	kg/m³		
max. installation weight with water saturation of the materials with 12% compression $^{\scriptscriptstyle (3)}$	Factory spec.	~ 420	kg/m³		
Water infiltation speed dependent on compression $\ensuremath{^{(4)}}$	Factory spec.	≥ 0,005	m/s		
Water permeability $[k_r]$ after 12 % compression	EN 18130-1	≥ 0,001	m/s		
Water - buoyancy dependent on compression and water saturation	Factory spec.	~ 2,7	kN		
Unconfined compressive strength with transverse strain preven- ted, static load 10 % compression in the cylinder	EN 13055-1A	≥ 500	kPa		
With cyclic loading (5)	Factory spec.	≤ 60	mm		
Shear parameters for internal friction	Factory spec.	42 - 45	o		
Cohesion (calculation value)	Factory spec.	0	kN/m²		
Capillary water suction height	EN 1097-10	≤ 20	mm		
Freeze-thaw-resistance	resistant when installed in accordance with the application				
Environmental sustainability	according to TL Gestein StB 04/23				

The technical data and properties meet the requirements of: Konformität zur DIN EN 13055-2/2004 · the manufacturer's WPK manual in its currenent version



When handling and processing veriso Blähglasschotter, the manufacturer's processing instructions and safety data sheet in their current version must be observed.

The manufacturer is responsible for changes to technical information, service descriptions and other relevant information without further notice if it is for the improvement of the product or the result achieved with the product.

(1) Proportion of moisture: ≤ 5 M%

(2) Water content [WA]: WA on and in the grain/ WA in the aggregate spores

(3) Without water content [WA] in the aggregate pores

(4) Modified application according to specifications from the manufacturer's WPK manual

(5) With selective cyclic loading (10kN/40kN) and 500.000 load cycles, installation height 0,5 m

Version: 10/2024



TECHNICAL DATA AND PROPERTIES

veriso Schaumglasschotter LFV

application area: lightweight, load-bearing aggregates in loose or bound form technical data apply to the unbound aggregate					
Particle size distribution	EN 933-1	10 - 63	mm		
Bulk density, dry (1)	EN 1097-3	130 - 170	kg/m³		
max. water absorption at 30% compression	Factory spec.	≤ 40	M %		
max. water absorption per individual particle	EN 1097-6	≤ 10	V %		
Water permeability in the fill after 30% compression $^{\scriptscriptstyle (2)}$	EN 18130-1	≥ 0,001	m/s		
Bulk density of individual particle (3)	EN 1097-6	0,220 -0,320	g/cm³		
Unconfined compressive strength of individual particle (4)	EN 17892-7	≥ 0,80	N/mm²		
Unconfined compressive strength with transverse strain prevented at 30% pre-compression and a further 10% compression $^{\scriptscriptstyle{(5)}}$	EN 826	≥ 580	kPa		
Rated value of compressive stress	Factory spec.	≤ 30 % of the normal stress			
Stiffness behavior $[E_s]$ depending von compression	Factory spec.	≥ 12000	kPa		
Shear parameters for internal friction	Factory spec.	42 - 45	0		
Cohesion (calculation value)	Factory spec.	0	kN/m²		
Capillary water suction height	EN 1097-10	≤ 10	mm		
Freeze-thaw-resistance	Installation in groundwater areas and water- bearing layers conditionally permissible				
Fire behavior	EN 4102-1	Al			
Environmental sustainability	according to GFS-LAWA				
Water permeability coefficient according to DIN 18130	degree of compression 1,3:1 \rightarrow k f.Wert = 104-2 to 104-3				

The technical data and properties meet the requirements of: Konformität zur DIN EN 13055-2/2004

When handling and processing veriso Schaumglasschotter LFV, the manufacturer's processing instructions and safet data sheet in their current version must be observed.

The manufacturer is responsible for changes to technical information, service descriptions and other relevant information without further notice if it is for the improvement of the product or the result achieved with the product.

(1) Proportion of moisture: ≤ 5 M%

(2) Modified application according to specifications from the manufacturer's WPK manual

(3) Modified application according to specifications from the manufacturer's WPK manual

- (4) Modified application according to specifications from the manufacturer's WPK manual
- (5) Testing in a round test fram with a diameter of 250 mm and a height of 230 mm

TECHNICAL DATA AND PROPERTIES

veriso Schaumglasschotter LDV

application area: load-bearing insulation material under foundation elements / DIN 4108-10 DEO, PB						
Particle size distribution	EN 933-1	10 - 60	mm			
Bulk density, dry 🕦	EN 1097-3	130 - 170	kg/m³			
max. water absorption at 30% compression (2)	Factory spec.	≤ 40	M %			
max. water absorption per individual particle	EN 1097-6	≤ 10	V %			
Bulk density of individual particle (3)	EN 1097-6	0,220 -0,300	g/cm³			
Unconfined compressive strength of individual particle $^{\scriptscriptstyle (4)}$	EN 17892-7	≥ 0,8	N/mm²			
Unconfined compressive strength with transverse strain prevented at 30% pre-compression and a further 10% compression $^{\scriptscriptstyle{(5)}}$	EN 826	≥ 580	kPa			
Rated value of compressive stress	ABZ	275	kPa			
Absorbable horizontal stresses	ABZ ≤ 30% of the normal stress					
Thermal conductivity [grenz]	EN 12667	≤ 0,0820	W/mk			
Rated value of thermal conductivity	ABZ	0,12	W/mk			
Shear parameters for internal friction	Factory spec.	42-45	0			
Cohesion (calculation value)	Factory spec.	0,00	kN/m²			
Capillary water suction height	EN 1097-10	≤ 10	mm			
Freeze-thaw-resistance	when used in accordance with the approval Freeze-thaw-resistant					
Fire behavior	EN 4102-1	Al				
Environmental sustainability	according to DIBt-regulations 2.1.2 GFS-LAWA (compared to attachment I-D.1)					
Water permeability coefficient according to DIN 18130	degree of compression 1,3:1 → k_f-Wert = 10^-2 to 10^-3					

The technical data and properties meet the requirements of: Allgemeiner Bauaufsichtlichen Zulassung (ABZ) in its current version



When handling and processing veriso Schaumglasschotter LDV, the manufacturer's processing instructions and safety data sheet in their current version must be observed.

The manufacturer is responsible for changes to technical information, service descriptions and other relevant information without further notice if it is for the improvement of the product or the result achieved with the product.

(1) Proportion of moisture: ≤ 5 M%

(2) Modified application according to specifications from the manufacturer's WPK manual

(3) Modified application according to specifications from the manufacturer's WPK manual

(4) Modified application according to specifications from the manufacturer's WPK manual

(5) Testing in a round test fram with a diameter of 250 mm and a height of 230 mm



veriso – expertise and experience of the companies SCHLÜSSELBAUER and REILING.

VERISO GmbH & Co. KG Zeppelinstraße 15 D-75438 Knittlingen

Telefon: + 49 7043 955 595 0 E-Mail: info@veriso.de

VERISO GmbH & Co. KG Nienburger Straße 6 D-31632 Husum

Telefon: + 49 5027 771 995 2 E-Mail: info@veriso.de





www.veriso.de/en