

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

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European Technical Assessment

ETA-17/0914
of 25 April 2018

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

veriso

Product family
to which the construction product belongs

Factory made cellular glass loose fill

Manufacturer

Veriso GmbH
Knesebeckstraße 98A
10623 Berlin
DEUTSCHLAND

Manufacturing plant

Schaumglas Husum GmbH
Nienburger Str. 6
D-31632 Husum

This European Technical Assessment
contains

8 pages including 1 annex which form an integral part of
this assessment

This European Technical Assessment is
issued in accordance with Regulation (EU)
No 305/2011, on the basis of

EAD 040394-00-1201

This version replaces

ETA-17/0914 issued on 4 December 2017

European Technical Assessment

ETA-17/0914

English translation prepared by DIBt

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Specific Part

1 Technical description of the product

This European Technical Assessment applies to the cellular glass loose fill material that consists of factory made particles of cellular foamed glass, with typical size 10/60 mm (nominal sizes d/D). The cellular glass loose fill is manufactured from recycled glass powder."

The thermal insulation product has the designation:

"veriso".

The European Technical Assessment has been issued for the product on the basis of agreed data/ information, deposited with Deutsches Institut für Bautechnik, which identifies the product that has been assessed. The European Technical Assessment applies only to products corresponding to this agreed data/information.

2 Specification of the intended use in accordance with the applicable European Assessment Document

The cellular glass loose fill is intended to be used as load bearing and thermal insulation layer. The load bearing function is limited to predominantly static loads. The typical application is underneath floor slabs.

Further applications are:

- a thermal insulation/frost protection layer in areas with in-ground frost
- a lightweight fill

The performance according to section 3 only applies if the insulation product is installed according to the manufacture's installation instructions in a compressed state with a compression of 1.3:1 in accordance with the bulk density given in the ETA and if it is protected from precipitation, wetting or weathering during transport, storage and installation.

As to the application of the thermal insulation material, the respective national regulations shall in addition be observed.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the cellular glass loose fill "veriso" of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

For sampling, conditioning and testing the provisions of the EAD No. 040394-00-1201 "FACTORY MADE CELLULAR GLASS LOOSE FILL" apply.

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Oedometer modulus in accordance with ISO 17892-5:2017 and EAD No. 040394-00-1201, Annex A.1	See Annex A, table 1
Compressive stress at 10% deformation or compressive strength in accordance with EN 826:2013 of the dry material after water absorption test by total immersion after the freezing and thawing test	600 kPa 400 kPa 452 kPa
Characteristic value of compressive stress or compressive strength 5%-fractile value for a one-sided confidence level of 75 % under unknown or known variance using ISO 12491:1997	$\sigma_{0,05} = 619 \text{ kPa}$ ($n = 50$; $\sigma_{\text{mean}} = 639 \text{ kPa}$; $s_{\sigma} = 11 \text{ kPa}$)
Crushing resistance	No performance assessed
Creep strain	No performance assessed
Behaviour under cyclic loading	No performance assessed
Loose bulk density in accordance with EN 1097-3:1998	130-170 kg/m ³
Installation-specific density based on EN 1097-3:1998 Density after compaction 1.3:1, dry Density after compaction 1.3:1, wet	170-220 kg/m ³ No performance assessed
Shear parameter in accordance with DIN 18137-3:2002 Cohesion c' Friction angle φ' Nominal shear stress	30 kN/m ³ 30,5° See Annex A, table 2

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire classified according to EN 13501: 2007 + A1:2009	Class A1
* according to decision 96/603/EC (as amended)	

3.3 Hygiene, health and the environment (BWR 3)

Essential characteristic	Performance																		
Content, emission and/or release of dangerous substances																			
CMR-Substances																			
Substance/s classified as EU-cat. Carc. 1A and/or 1B ^{a)}	The product does not contain these dangerous substances. ^{b)}																		
Substance/s classified as EU-cat. Muta. 1A and/or 1B ^{a)}																			
Substance/s classified as EU-cat. Repr. 1A and/or 1B ^{a)}																			
Recycled glass is used and the glass powder therefore assessed. ^{c)}																			
Leachable Substances	<table border="1"> <thead> <tr> <th>Solids content acc. to EN 13657:2002</th> <th>Eluate concentration acc. to EN 12457-4:2002</th> </tr> </thead> <tbody> <tr> <td>Arsenic (As)</td> <td>< 45 mg/kg</td> </tr> <tr> <td>Lead (Pb)</td> <td>< 210</td> </tr> <tr> <td>Cadmium (Cd)</td> <td>< 3</td> </tr> <tr> <td>Chromium (total) (Cr)</td> <td>< 180</td> </tr> <tr> <td>Copper (Cu)</td> <td>< 120</td> </tr> <tr> <td>Nickel (Ni)</td> <td>< 150</td> </tr> <tr> <td>Mercury (Hg)</td> <td>< 1.5</td> </tr> <tr> <td>Zinc (Zn)</td> <td>< 450</td> </tr> </tbody> </table>	Solids content acc. to EN 13657:2002	Eluate concentration acc. to EN 12457-4:2002	Arsenic (As)	< 45 mg/kg	Lead (Pb)	< 210	Cadmium (Cd)	< 3	Chromium (total) (Cr)	< 180	Copper (Cu)	< 120	Nickel (Ni)	< 150	Mercury (Hg)	< 1.5	Zinc (Zn)	< 450
Solids content acc. to EN 13657:2002	Eluate concentration acc. to EN 12457-4:2002																		
Arsenic (As)	< 45 mg/kg																		
Lead (Pb)	< 210																		
Cadmium (Cd)	< 3																		
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Copper (Cu)	< 120																		
Nickel (Ni)	< 150																		
Mercury (Hg)	< 1.5																		
Zinc (Zn)	< 450																		
Release scenario regarding BWR 3: S/W 1																			

^{a)} In accordance with Regulation (EC) No 1272/2008.

^{b)} Assessment based on the detailed manufacturer's statements.

^{c)} Statement according to test report.

3.4 Energy economy and heat retention (BWR 6)

Essential characteristic	Performance
Thermal conductivity test acc. to EN 12667:2001 and/ or EN 12664:2001 and EN 13167:2012+A1:2015, Annex A	0,081 W/(m·K)
Moisture correction factor (condition 1) at water absorption in accordance with EN 12087:2013 determined	1,15 (at 1 - 5 Vol-% moisture)
Water absorption by total immersion (test duration 28 days) in accordance with EN 12087:2013, method 2A compacted specimens particles	7,5 Vol. % 44 % by weight
Freeze/ thaw resistance with the guidelines in EN 12090:2013 and in acc. with EAD No. 040394-00-1201, clause 2.2.13.1 compacted specimens particles	7,5 Vol.-% 34 % by weight
Freeze/ thaw resistance in traffic areas	No performance assessed.
Particle size distribution in accordance with EN 933-1:2012	See Annex A, table 3
Capillary water suction height	No performance assessed.

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with EAD No. 040394-00-1201, the applicable European legal act is: 1995/467/EC

The systems to be applied are:

- a) for uses as load bearing and thermal insulation layer: 1
- b) for uses as thermal insulation layer without load bearing function: 3

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 25 April 2018 by Deutsches Institut für Bautechnik

Prof. Gunter Hoppe
Head of Department

beglaubigt:
Wendler

veriso

Annex A

Table 1: Oedometer modulus

Test specimen: Mean values of 9 tests (specimen taken from three lots) Mean value of loose bulk density 120 kg/m ³ (single values 112-130 kg/m ³) Degree of compaction 1.3:1				
Initial thickness reduction, X ₀ (%)	Load (kPa)	Total deformation, X _{total} (mm)	Related thickness reduction, X _{load} (%)	Oedometer Modulus, E _{oed} According to ISO 17892-5; Annex A.3 (kPa)
0,40	60	2,82	0,61	9520
	80	3,79	0,82	9520
	100	4,99	1,08	7690
	125	6,37	1,38	8330
	150	7,85	1,70	7810
	200	11,18	2,42	6940
	250	15,89	3,44	4900
	300	24,71	5,35	2610
	400	44,66	9,67	2310
	500	66,27	14,35	2130

Note:

In case the cellular glass loose fill is used under concentrated/ centered loads an additional assessment could be necessary.

Table 2: Shear parameter

Test specimen: Mean value of loose bulk density 125 kg/m ³ Degree of compaction 1.3:1			
Vertical stress load (kN/m ²)	Rates of deformation (mm)	Shear displacement, (mm)	Nominal shear stress (kN/m ²)
25	2,2	73,4	44,2
50	3,4	82,2	56,2
100	5,5	95,7	96,4
150	8,5	91,8	114,5
250	15,8	87,8	139,1

veriso

Annex A

Table 3: Particle size distribution

Specified test sieves	Passage through the sieve with a											
	mesh size of				square-perforated hole width of							
	0,13	0,25	0,5	1	2	4	8	16	31,5	45	63	90
Passage in % by weight	1	2	2	2	3	3	3	4	22	72	100	100