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and types of construction

Bautechnisches Prüfamt

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General Part

Technical Assessment Body issuing the
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

GLAPOR Dämmschotter SG 600 E,
GLAPOR Dämmschotter SG 800 E

Product family
to which the construction product belongs

Factory made cellular glass loose fill

Manufacturer

glapor Werk Mitterteich GmbH
Hüblteichstraße 17
95666 Mitterteich
DEUTSCHLAND

Manufacturing plant

glapor Werk Mitterteich GmbH
Hüblteichstraße 17
95666 Mitterteich

This European Technical Assessment
contains

11 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

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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 16/63 mm or 32/63 mm (nominal sizes d/D). The cellular glass loose fill is manufactured from recycled glass powder.

The cellular glass loose fills "GLAPOR" are designated depending on particle size as follows:

particle size 16/63 mm	"GLAPOR Dämmschotter SG 600 E"
particle size 32/63 mm	"GLAPOR Dämmschotter SG 800 E"

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 (also in road construction)
- 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 "GLAPOR Dämmschotter SG 600 E" and "GLAPOR Dämmschotter SG 800 E" 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 "GLAPOR Dämmeschotter SG 600 E", "GLAPOR Dämmeschotter SG 800 E"	See Annex A, table 1
Compressive stress at 10% deformation or com- pressive strength in accordance with EN 826:2013 "GLAPOR Dämmeschotter SG 600 E" of the dry material after the freezing and thawing test "GLAPOR Dämmeschotter SG 800 E" of the dry material after the freezing and thawing test	≥ 480 kPa 500 kPa ≥ 800 kPa 933 kPa
Characteristic value of compressive stress or com- pressive strength 5%-fractile value for a one-sided confidence level of 75 % under unknown or known variance using ISO 12491:1997 "GLAPOR Dämmeschotter SG 600 E" "GLAPOR Dämmeschotter SG 800 E"	$\sigma_{0,05} = 636 \text{ kPa}$ ($n= 50$; $\sigma_{\text{mean}}= 799 \text{ kPa}$; $s_{\sigma}= 95 \text{ kPa}$) $\sigma_{0,05} = 778 \text{ kPa}$ ($n= 50$; $\sigma_{\text{mean}}= 956 \text{ kPa}$; $s_{\sigma}= 108 \text{ kPa}$)
Crushing resistance	No performance assessed
Creep strain acc. to EAD No. 040394-00-1201, chapter 2.2.4 and Annex A.1 "GLAPOR Dämmeschotter SG 600 E"	See Annex A, table 2
Behaviour under cyclic loading acc.to EAD No. 040394-00-1201, chapter 2.2.5 and Annex A.1 "GLAPOR Dämmeschotter SG 600 E"	See Annex A, table 3

Essential characteristic	Performance
Loose bulk density in accordance with EN 1097-3:1998 "GLAPOR Dämmschotter SG 600 E" "GLAPOR Dämmschotter SG 800 E"	100-120 kg/m ³ 150-170 kg/m ³
Installation-specific density based on EN 1097-3:1998 Density after compaction 1.3:1, dry "GLAPOR Dämmschotter SG 600 E" "GLAPOR Dämmschotter SG 800 E" Density after compaction 1.3:1, wet	130 – 160 kg/m ³ 195 – 220 kg/m ³ No performance assessed
Shear parameter in accordance with DIN 18137-3:2002 "GLAPOR Dämmschotter SG 600 E" Cohesion c' Friction angle φ' Nominal shear stress "GLAPOR Dämmschotter SG 800 E" Cohesion c' Friction angle φ' Nominal shear stress	26.9 kN/m ³ 31 ° See Annex A, table 4 53.1 kN/m ³ 41.2° See Annex A, table 4

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	
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)}	

Essential characteristic	Performance			
Leachable Substances	Solids content acc. to EN 13657:2002		Eluate concentration acc. to EN 12457-4:2002	
Arsenic (As)	< 45	mg/kg	< 20	µg/L
Lead (Pb)	< 210		< 80	
Cadmium (Cd)	< 3		< 3	
Chromium (total) (Cr)	< 180		< 25	
Copper (Cu)	< 120		< 60	
Nickel (Ni)	< 150		< 20	
Mercury (Hg)	< 1.5		< 1	
Zinc (Zn)	< 450		< 200	
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 "GLAPOR Dämmschotter SG 600 E" "GLAPOR Dämmschotter SG 800 E"	0.080 W/(m·K) 0.085 W/(m·K)
Moisture correction factor (condition 1) determined at water absorption in accordance with EN 12087:2013 "GLAPOR Dämmschotter SG 600 E", "GLAPOR Dämmschotter SG 800 E"	1.20 (at 1 - 5 Vol-% moisture)
Water absorption by total immersion (test duration 28 days) in accordance with EN 12087:2013, method 2A "GLAPOR Dämmschotter SG 600 E", "GLAPOR Dämmschotter SG 800 E" compacted specimens	10 Vol. %

Essential characteristic	Performance
Freeze/ thaw resistance with the guidelines in EN 12090:2013 and in acc. with EAD No. 040394-00-1201, clause 2.2.13.1 Water absorption (Vol. %) "GLAPOR Dämmschotter SG 600 E"; "GLAPOR Dämmschotter SG 800 E" compacted specimens	≤ 8 Vol. %
Freeze/ thaw resistance in traffic areas	No performance assessed.
Particle size distribution in accordance with EN 933-1:2012 "GLAPOR Dämmschotter SG 600 E" "GLAPOR Dämmschotter SG 800 E"	d/D = 16 - 63 mm See Annex A, table 5 d/D = 32 - 63 mm See Annex A, table 5
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 1 June 2022 by Deutsches Institut für Bautechnik

Frank Iffländer
Head of Section

beglaubigt:
Wendler

GLAPOR Dämmschotter SG 600 E,
GLAPOR Dämmschotter SG 800 E

Annex A

Table 1 Oedometer modulus¹

GLAPOR Dämmschotter SG 600 E				
Test specimen (Degree of compaction 1.3:1): Mean values of 9 tests (specimen taken from three lots) Mean value of loose bulk density 120 kg/m ³ (single values 113-119 kg/m ³)				
Initial thickness reduction, X ₀ (%)	Load (kPa)	Total deformation, X _{total} (mm)	Related thickness reduction, X _{load} (%)	Oedometer Modulus, E _{oed} acc. to ISO 17892-5; Annex A.3 (kPa)
0.11	60	0.95	0.21	20000
	80	1.36	0.30	22220
	100	2.13	0.47	11760
	125	3.22	0.71	10410
	150	4.45	0.98	9250
	200	6.72	1.48	10000
	250	10.31	2.27	6320
	300	16.21	3.57	3840
	400	29.15	6.42	3500
	500	46.40	10.22	2630
GLAPOR Dämmschotter SG 800 E				
Test specimen (Degree of compaction 1.3:1): Mean values of 9 tests (specimen taken from three lots) Mean value of loose bulk density 162 kg/m ³ (single values 161-163 kg/m ³)				
Initial thickness reduction, X ₀ (%)	Load (kPa)	Total deformation, X _{total} (mm)	Related thickness reduction, X _{load} (%)	Oedometer Modulus, E _{oed} Acc. to ISO 17892-5; Annex A.3 (kPa)
0.625	60	3.31	0.707	24390
	80	3.98	0.85	13980
	100	4.69	1.002	13150
	125	5.51	1.177	14280
	150	6.23	1.33	16330
	200	7.53	1.608	17980
	250	9.35	1.995	12910
	300	11.09	2.368	13400
	400	15.75	3.362	10060
	500	22.11	4.719	7360

¹ In case the cellular glass loose fill is used under concentrated/ centered loads an additional assessment could be necessary.

Table 2: Creep behaviour

GLAPOR Dämmschotter SG 600 E				
Test specimen (Degree of compaction 1.3:1):				
Mean values of 2 tests (specimen taken from the same lots as for the determination of the Oedometer modulus)				
Mean value of loose bulk density 128 kg/m ³				
Test time (days)	Initial thickness reduction, X_0 (%)	Load stage (kPa)	Total deformation, X_{total} ($h_0=457.3$ mm) (mm)	Related thickness reduction, X_{load} (%)
0	1.94	250	0	0
1			1436	3.14
2			18.66	4.08
5			20.72	4.53
10			22.45	4.91
15			23.37	5.11
16			23.41	5.12
17			23.51	5.14
18			23.60	5.16
19			23.69	5.18
20			23.73	5.19
21			23.78	5.20

Table 3: Behaviour under cyclic load

GLAPOR Dämmschotter SG 600 E					
Test specimen (Degree of compaction 1.3:1): Mean values of 3 tests (specimen taken from the same lots as for the determination of the Oedometer modulus) Mean value of loose bulk density 100 -120 kg/m ³					
Initial thickness reduction, X ₀ (%)	Numbers of load changes	Load stage (kPa)	Total deformation, X _{total} (h ₀ =457,6 mm) (mm)	Related thickness reduction, X _{load} (%)	
1.94	50	250	0	0	
		125	14.09	3.08	
	100	250	14.19	3.10	
		125	14.51	3.17	
	250	250	14.64	3.20	
		125	15.56	3.40	
	500	250	15.65	3.42	
		125	16.89	3.69	
	750	250	16.98	3.71	
		125	17.89	3.91	
	1000	250	17.94	3.92	
		125	18.67	4.08	
			250	18.72	4.09

Table 4: Shear parameter

GLAPOR Dämmschotter SG 600 E			
Test specimen (Degree of compaction 1.3:1) Mean value of loose bulk density 100 kg/m ³			
Vertical stress load (kN/m ²)	Rates of deformation (mm)	Shear displacement, (mm)	Nominal shear stress (kN/m ²)
25	2.0	96.2	40.2
50	4.5	86.3	59.5
100	9.4	> 65.2	> 86.1
150	16.6	> 44.0	> 97.8
250	22.4	> 25.0	> 92.5

GLAPOR Dämmschotter SG 800 E			
Test specimen (Degree of compaction 1.3:1)			
Mean value of loose bulk density 170 kg/m ³			
Vertical stress load (kN/m ²)	Rates of deformation (mm)	Shear displacement, (mm)	Nominal shear stress (kN/m ²)
25	4.7	16.1	70.5
200	9.0	30.5	221.3
50	5.4	23.8	98.9
100	8.1	25.9	146.8
250	7.5	39.3	274.9

Table 5: Particle size distribution

GLAPOR Dämmschotter SG 600 E												
Specified test sieves	Passage through the sieve with a											
	mesh size of				square-perforated hole width of							
	0.125	0.25	0.5	1	2	4	8	16	31.5	45	63	90
Passage in % by weight	1	2	3	3	3	3	3	3	4	15	71	99
GLAPOR Dämmschotter SG 800 E												
Specified test sieves	Passage through the sieve with a											
	mesh size of				square-perforated hole width of							
	0.125	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