

Product Data Sheet

First created on: 2015-04-29 Updated on: 2015-04-29
 Next inspection on: 2015-12-31 Printed on: 2015-04-29

PRODUCT	SiLibeads Glass beads
Material	Polished glass beads made of soda lime glass Specific weight: 2.50 kg/l Hydrolytic resistance on Glass beads: HGB 1 (based on DIN ISO 719) Acidic resistance on Glass beads (> 10,0 mm): S1 (according to DIN 12116) Acidic resistance on Glass beads (< 6,0 mm): S3 (according to DIN 12116) Alkaline resistance on Glass beads: A1 (according to DIN ISO 695)
Fields of application	Glass beads are used as back-up and borehole filter material
Major Advantages of SiLibeads Glass beads	<ul style="list-style-type: none"> • Highest possible effective pore space due to exact particle size and spherical shape. • Optimal adaption of well screen openings due to narrow grading curve of glass beads. • High purity hence no pump cleaning necessary. • No disinfection before installation required. • Minimal, smooth surface inhibits iron and manganese incrustation. • Improved rehabilitation of filter pack due to large and regular pore spaces. • No subsequent subsidence of filter pack. • Due to low friction and high sphericity no bridging or jamming during fill-in process. • Higher fracture strength than natural quartz gravel.
Technical Data	
Sizes	see table of standard sizes
Deformation temperature	600 °C
Softening point (Littleton point)	741 °C
Melting point	1475 °C
Specific thermal Conductivity	1.135 W/km
Hardness according to Mohs	≥ 6

All data are reference values

Chemical Analysis; Glass beads made of soda lime glass; CAS-Nr. 65997-17-3 / EINECS 266-046-0

Name	Method	Weight (reference values)	CAS-No.	EINECS
Silicon dioxide SiO ₂	DIN 51001	65.0 - 75.0 %	7631-86-9	231-545-4
Sodium oxide Na ₂ O	DIN 51001	12.0 - 17.0 %	1313-59-3	215-208-9
Calcium oxide CaO	DIN 51001	< 10.0 %	1305-78-8	215-138-9
Aluminium oxide Al ₂ O ₃	DIN 51001	< 5.0 %	1344-28-1	215-691-6
Magnesium oxide MgO	DIN 51001	< 5.0 %	1309-48-4	215-171-9

The heavy metal content of the Glass beads keeps the permitted limits of EU directive 2011/65/EC (RoHS).

Lead < 1000 ppm Cadmium < 100 ppm Chrome VI < 1000 ppm Mercury < 1000 ppm

Assessment acc. to Food Legislation

The tested Glass beads are a consumer good in the sense of §2 Abs. 6 No. 1 German Code for Food Stuff (LFGB), Commodities and Feeding Stuff. Therefore they have to comply with the legal requirements.

The Glass beads comply with the requirements § 31 of the German Food and Feed Code (LFGB) and of the European Food Regulation 1935/2004/EC, Article 3.

SiLibeads fulfill the micro biological requirements according to DIN EN ISO 14698-1 and VDI 6022.

Conformity to Water Well and Water Filtration SpecificationsSiLibeads Glass beads meet **AWWA A 100** water well specification.SiLibeads Glass beads meet **AWWA B 100** filtration specification.**Conformity to BS 6920:2000**

SiLibeads Glass beads have satisfied the criteria set out in BS 6920: Part 1: 2000 "Specification" and thus complies with the requirements of the "Water Regulations Advisory Scheme Tests of Effect on Water Quality".



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NSF-Certificate No. C0104873-01

Sigmund Lindner is NSF International certified and complies with NSF/ANSI61 requirements.



Particle Size Conversion

Mesh	mm
80	0.177
70	0.210
60	0.250
50	0.297
45	0.354
40	0.420
35	0.500
30	0.595
25	0.707
20	0.841
18	1.00
16	1.19
14	1.41
12	1.68
10	2.00
8	2.38
7	2.83
6	3.36
5	4.00
4	4.76
3 1/2	5.66

Article	Diameter / mm	(approx.) Mesh Sizes	Roundness (nominal values)	Compressive Resistance (Reference values for middle diameter)	Bulk density kg/l	Bulk density lb/ ft.3
4501R	0.25 – 0.50	60 – 35	0.94	N/A	1.46	91.14
45015R	0.40 – 0.60	40 – 30	0.93	N/A	1.47	91.77
4502R	0.60 – 0.90	30 – 19	0.95	N/A	1.49	93.02
4503R	0.80 – 1.00	22 – 18	0.93	170 N	1.50	93.64
4504R	1.00 – 1.30	18 – 15	0.95	250 N	1.51	94.27
4505R	1.25 – 1.65	16 – 12	0.93	370 N	1.51	94.27
4506R	1.55 – 1.85	13 – 11	0.93	520 N	1.52	94.89
4507R	1.70 – 2.10	12 – 9	0.95	620 N	1.52	94.90
4508R	2.00 – 2.40	10 – 8	0.95	770 N	1.53	95.51
4510R	2.40 – 2.90	8 – 7	0.95	920 N	1.53	95.52
4511R	2.85 – 3.45	7 – 6	0.95	1.270 N	1.53	95.53
4512R	3.40 – 4.00	6 – 5	0.95	1.550 N	1.53	95.54
4513R	3.80 – 4.40	5 1/2 - 4 1/2	0.95	1.900 N	1.53	95.55
4514R	4.50 – 5.50	4 1/2 - 3 1/2	0.94	2.350 N	1.49	93.02
4515R	5.00 – 6.00	3 3/4 - 3 1/4	0.92	3.150 N	1.47	91.77

Other diameters and tolerances available upon request

Article	Diameter / mm	Inch Sizes	Roundness (nominal values)	Compressive Resistance (Reference values for middle diameter)	Bulk density kg/l	Bulk density lb/ ft.3
50165-B	10.30	3/8" - 7/16"	0.98	6.000 N	1.45	90.52
5017-B	11.00	13/32" - 15/32"	0.98	7.500 N	1.45	90.52
5018-B	12.00	7/16" - 1/2"	0.98	10.500 N	1.45	90.52
5021-B	14.00	17/32" - 9/16"	0.98	13.200 N	1.43	89.27
5023-B	16.00	19/32" - 21/32"	0.98	16.500 N	1.43	89.27

inches	mm
1/4	6.35
0.265	6.73
5/16	8.00
3/8	9.51
7/16	11.2
1/2	12.7
0.53	13.5
5/8	16.0
3/4	19.0
7/8	22.6
1.0	25.4

Glass Beads ≥ 10 mm can have a variance in size of approximately +/- 0.7 mm

Other diameters and tolerances available upon request

Roundness: simultaneous measurement of roundness through digital image processing (Retsch-Camsizer, value b/l3)

Free of Silanes / Glycol / Epoxy

We hereby confirm that Silanes, Glycol or Epoxy are not used during the production and packaging process.



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HELPFUL INFORMATION

Approximate Metric and Imperial Conversion Data

1 Cubic Feet = 1728 Cubic Inches = 28.32 liters
 1 Cubic Yard = 27 Cubic Feet
 1 US Liquid Gallon = 3.785 liters
 1 kg = 2.2046 lbs. or 1 lb. = 0.4536 kgs
 1 liter = 0,03531466672148859 Cubic Feet
 1 Cubic Meter = 1,000 liters = 35.315 Cubic Feet

Calculating Annular Volume => (R² - r²) x π x h

R² = Outer Cylinder Radius or Borehole Radius
 r² = Inner Cylinder Radius or Casing
 π = 3.14159265359
 h = Height of Filling

Bead Sizing - Helpful Formula => D = d_G x F_G

With: U = d₆₀ / d₁₀
 F_G = 5 + U for U < 5 and F_G = 10 for U > 5

Derived from uniformity coefficient (U), characteristic grain size (d_G) and filter factor (F_G) based on reliable formation sieve analysis.

INSTALLATION

Water Wells

SiLibeads are used as filter pack media in the annulus of water wells. They are applied in the same way as natural gravel or sand. The bag is placed with its bottom end right above the feed hopper. The beads shall be placed by the use of a tremie pipe lowered to the bottom of the space to be packed and slowly raised as the beads fill the annular space. As the beads are being poured into the tremie pipe, water shall be poured in during the filling process to help in their placement

Filter Beds

SiLibeads replace natural sand and gravel in filter beds. They are applied in the same way as mineral filter media. They can be applied directly from the bag without any preparation of the filter bed

PREPARATION FOR USE & ROUTINE MONITORING

The product is delivered from the factory in a pure and clean condition, therefore no special preparation or disinfection are necessary providing that the packing or wrapping is unharmed.
 If used properly, the product has no lifetime limits. The average cycle of use is several decades.
 There is no need for special routine checks during use apart from the mandatory process or system checks.

ADDITIONAL INFORMATION

Disposal	Please consult national laws and local regulations in force for disposal or landfill.
Safety advice	High risk of slipping due to spillage of the product
Product information	Sample card SiLibeads ... glass beads for technical applications Material safety data sheet SiLibeads; test reports

Certifications	according to DIN EN ISO 9001:2008		according to HACCP-Standard for glass beads in contact with food stuffs	

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