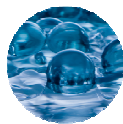


Product Data Sheet



The German spirit of quality since 1854



SiLibeads – Glass beads for water wells / drinking water extraction

First created on: 2017-09-26
Next inspection on: 2021-06-30

Updated on: 2020-09-24
Printed on: 2020-09-24

Version: V28/2020

Product: SiLibeads Glass beads

Material: Polished glass beads made of soda lime glass
Specific weight: 2.50 kg/l
Hydrolytic resistance: (DIN ISO 720) HGB 3 [< 9.0 mm] / HGB 3 [> 9.5 mm]
Acid resistance: (DIN 12116) S 1 [< 9.0 mm] / S 1 [> 9.5 mm]
Alkali resistance: (DIN ISO 695) A 1 [< 9.0 mm] / A 2 [> 9.5 mm]

Fields of application: Glass beads are used as back-up and borehole filter material

Major Advantages of SiLibeads Glass beads:

- Several times higher crushing strength than natural quartz gravel.
- Highest possible effective pore space due to uniform size and spherical shape.
- No flattened and broken sub grain hence wider well screen apertures possible
- No filter packs development necessary.
- No subsequent subsidence of filter pack
- Smooth surface delays iron and manganese incrustation.
- Faster and more efficient well development due to large and regular pore spaces.
- No bridging or jamming during fill-in process.
- Good visibility of filter pack through wire wrapped screens at video inspections

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/(m·K)
Hardness according to Mohs: ≥ 6

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
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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 Specifications

SiLibeads Glass beads meet **AWWA A 100** water well specification.

SiLibeads Glass beads meet **AWWA B 100** filtration specification.

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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".

NSF-Certificate No. C0104873-01:

Sigmund Lindner is NSF International certified and complies with NSF/ANSI/CAN 61 requirements.



Certified to NSF/ANSI/CAN 61

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	0.95	N/A	1.47	91.77
45021R	0.60 - 0.90	30 – 19	0.95	N/A	1.49	93.02
4503R	0.80 - 1.00	22 – 18	0.95	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	0.95	370 N	1.51	94.27
4506R	1.55 - 1.85	13 – 11	0.95	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

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	Inch Sizes	Roundness (nominal values)	Compressive Resistance (Reference values for middle diameter)	Bulk density kg/l	Bulk density lb/ ft.3
50165-B	9.40 - 10.60	3/8" - 7/16"	0.98	6,000 N	1.45	90.52
5017-B	10.50 - 11.50	13/32" - 15/32"	0.98	7,500 N	1.45	90.52
5018-B	11.50 - 12.50	7/16" - 1/2"	0.98	10,500 N	1.45	90.52
5021-B	13.30 - 14.70	17/32" - 9/16"	0.98	13,200 N	1.43	89.27
5023-B	15.30 - 16.70	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)

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Free of Silanes / Glycol / Epoxy:

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

HELPFUL INFORMATION:

Approximate Metric and Imperial Conversion Data

1 Cubic Feet = 1728 Cubic Inches = 28.32 liters
1 Cubic Yard = 27 Cubic Feet = 0.76 Cubic meters
1 US Liquid Gallon = 3.785 liters

1 kg = 2.2046 lbs. or 1 lb. = 0.454 kgs
1 liter = 0.035 Cubic Feet
1 Cubic Meter = 1,000 liters = 35.315 Cubic Feet

Calculating Annular Volume => $(R^2 - r^2) \times \pi \times h$

R^2 = Outer Cylinder Radius or Borehole Radius
 r^2 = Inner Cylinder Radius or Casing
 π = 3.14159265359
h = Height of Filling

Screen slot/ bead ratio

Maximum screen slot aperture recommended for all types of screens = 75% of the smallest bead diameter of the respective gradation.

Bead Sizing - Helpful Formula => $D = d_G \times F_G$

With: $U = d_{60} / d_{10}$
 $F_G = 5 + U$ 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:

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:

Storage: Store containers (big bags) in a dry place, protected from direct sunlight.
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 9001:2015



according to
HACCP-Standard for
glass beads in contact
with food stuffs



Manufacturer/Supplier: Sigmund Lindner GmbH; Oberwarmensteinacher Str. 38; 95485 Warmensteinach / GERMANY

Phone: +49-9277-9940 Web: www.sili.eu
Fax: +49-9277-99499 E-Mail: sili@sili.eu

All data are reference values – subject to change without prior notice