

## Product Data Sheet

 First created on: 21.01.2011  
 Next inspection on: 21.01.2012

 Updated on: 21.01.2011  
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Product	SiLibeads Glass beads Type M
<b>Material</b>	polished Glass beads made of soda lime glass Specific weight: 2,50 kg/dm <sup>3</sup> Hydrolytic resistance on Glass beads (≥ 9,5 mm): HGB 1 (based on DIN ISO 719) Hydrolytic resistance on Glass beads (≤ 9,0 mm): HGB 3 (based on DIN ISO 719) Acid resistance on Glass beads: S2/S3 (according to DIN 12116) Alkali resistance on Glass beads: A1 (according to DIN ISO 695)
<b>Application</b>	In the size range between 1,5 mm and 18,0 mm, Glass Beads Type M are mainly used as stirring and mixing media in aerosol sprays, as valves for bottle closures and for the mechanical coating of small metallic pieces, through a special plating process (mechanical plating). Their high degree of purity allows them to reach excellent results in the grinding and dispersing of pigments, dyestuff, agro-chemicals, pharmaceuticals and cosmetic preparations. Glass Beads type M are further used as stilts- and filter material for construction of bubblers.
<b>Technical Data</b>	
Roundness	≥ 0.98; ratio width/length ( $x_{min}/x_{max}$ )
Compressive strength	up to 20 kN (belonging to diameter)
Refractive index	+ 1,5
Air bubbles inside bead (> 0,3 mm)	≤ 1,0 % Visual test: internal control of 200 Glass beads by Microscope
Size (Diameter)	from 1,5 mm up to 18,0 mm (see table Standard Sizes)
Transformation temperature	542 °C
Softening point (Littleton point)	719 °C
Melting point	1.441 °C
Specific thermal Conductivity	1,129 W/km
Coefficient of expansion	9,73 10 <sup>6</sup> (1/K) [20-400 °C]
Specific thermal capacity	1,312 kJ/kg K [>600 °C]
Youngs-Module	65 GPa
Hardness according to Mohs	6

all datas are reference values

**Assessment acc. to Food Legislation**

The Glass beads are a consumer good in the sense of §2 clause 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 of § 31 LFGB and article 3 of the regulation (EC) No 1935/2004.



The heavy metal content of the Glass beads keeps the permitted limits of RoHS.

Microbiological requirements are fulfilled.

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Standard Sizes (special diameters by request)				
Article	Diameter	Tolerance	Bulk density	Amount (pieces per kg)
5002	1,5 mm	+/- 0,2 mm	1,50 kg/dm <sup>3</sup>	226.350
5003	2,0 mm	+/- 0,2 mm	1,50 kg/dm <sup>3</sup>	95.490
5004	2,5 mm	+/- 0,2 mm	1,50 kg/dm <sup>3</sup>	48.890
5005	3,0 mm	+/- 0,3 mm	1,50 kg/dm <sup>3</sup>	28.290
5006	3,5 mm	+/- 0,3 mm	1,50 kg/dm <sup>3</sup>	17.810
5009	4,0 mm	+/- 0,3 mm	1,50 kg/dm <sup>3</sup>	11.930
5010	4,5 mm	+/- 0,3 mm	1,50 kg/dm <sup>3</sup>	8.380
5011	5,0 mm	+/- 0,3 mm	1,50 kg/dm <sup>3</sup>	6.110
5012	6,0 mm	+/- 0,3 mm	1,48 kg/dm <sup>3</sup>	3.530
5013	7,0 mm	+/- 0,3 mm	1,48 kg/dm <sup>3</sup>	2.220
5014	8,0 mm	+/- 0,4 mm	1,48 kg/dm <sup>3</sup>	1.490
5015	9,0 mm	+/- 0,4 mm	1,45 kg/dm <sup>3</sup>	1.040
50155	9,5 mm	+/- 0,4 mm	1,45 kg/dm <sup>3</sup>	880
5016	10,0 mm	+/- 0,5 mm	1,45 kg/dm <sup>3</sup>	760
50165	10,3 mm	+/- 0,5 mm	1,45 kg/dm <sup>3</sup>	670
5017	11,0 mm	+/- 0,5 mm	1,45 kg/dm <sup>3</sup>	570
5018	12,0 mm	+/- 0,5 mm	1,45 kg/dm <sup>3</sup>	440
5021	14,0 mm	+/- 0,5 mm	1,43 kg/dm <sup>3</sup>	270
5023	16,0 mm	+/- 0,5 mm	1,43 kg/dm <sup>3</sup>	180
5025	18,0 mm	+/- 0,5 mm	1,43 kg/dm <sup>3</sup>	130

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

Name	Methode	Weight		CAS-No.	EINECS
		reference value in Weight-%	tolerance value in Weight-%		
Silicon dioxide SiO <sub>2</sub>	DIN 51001	69,10	+/- 3,50	7631-86-9	231-545-4
Sodium oxide Na <sub>2</sub> O	DIN 51001	14,55	+/- 1,00	1313-59-3	215-208-9
Calcium oxide CaO	DIN 51001	8,20	+/- 0,15	1305-78-8	215-138-9
Aluminium oxide Al <sub>2</sub> O <sub>3</sub>	DIN 51001	3,15	+/- 0,70	1344-28-1	215-691-6
Magnesium oxide MgO	DIN 51001	1,45	+/- 0,30	1309-48-4	215-171-9
Boric oxide B <sub>2</sub> O <sub>3</sub>	DIN 51086-1	1,20	+/- 0,70	1303-86-2	215-125-8
Zinc oxide ZnO	DIN 51001	1,15	+/- 1,15	1314-13-2	215-222-5

**Additional Information**

Storage indication	Store in a dry manner in closed (original) container by room temperature. We recommend storage life of maximum 3 years.
Disposal	There is no type of waste that occurs due to the product that requires special supervision according to the German "Closed Substance Waste Management Act" or the 91/689/EWG and 2006/12/EG guidelines.
Safety advice	High risk of slipping due to spillage of product
Product information	Sample card ... glass beads for technical applications, Safety Data Sheet SiLibeads Type M; Test Reports
<b>Manufacturer/Supplier</b>	Sigmund Lindner GmbH; Oberwarmensteinacher Straße 38; D-95485 Warmensteinach Phone: 09277-9940 Fax: 09277-99499 Web: <a href="http://www.sili.eu">www.sili.eu</a> E-Mail: <a href="mailto:sili@sigmund-lindner.com">sili@sigmund-lindner.com</a>