



# Cellular Microsphere Filler

**Overview** Sil-Cell is an ultra-light, naturally occurring, Aluminum Silicate, microcellular filler that is inert, inorganic, non-toxic and pH neutral. Particles are formed by creating a structure of multicellular spherical bubbles.

Sil-Cell is exclusive to Silbrico and manufactured at our facilities in Illinois and Pennsylvania, as well as in Australia.

**Uses** Sil-Cell has been found to be cost effective in the manufacturing of joint compounds, adhesives, auto body putty, cultured marble, wall patching compounds, stucco, ready mix gypsum plasters, resins, plastics and a variety of other composites.

It can also be treated with unique proprietary surface coatings to modify the particle's surface. In both organic and inorganic composites, these coupling agents improve adhesion.

**Structure** Sil-Cell is an excellent functional filler because of its inert properties, low density and structure. The multicellular structure provides greater tensile strength versus other types of micro fillers.

Due to its low effective specific gravity (E.S.G.), it is an exceptional density reducing agent for composites. Sil-Cell's E.S.G. ranges from 0.17 to 0.336 g/cm<sup>3</sup> compared to calcium carbonate type fillers that range from 2.5 to 2.8 g/cm<sup>3</sup>.

### Standard Chemical Analysis

- SiO<sub>2</sub>** Silicon Dioxide **73%**
- Al<sub>2</sub>O<sub>3</sub>** Aluminum Oxide **17%**
- K<sub>2</sub>O** Potassium Oxide **5%**
- Na<sub>2</sub>O** Sodium Oxide **3%**
- CaO** Calcium Oxide **1%**
- Trace Elements **1%**



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### Trace Elements

Manganese	<0.3%
Sulfur	<0.2%
Titanium	<0.1%
Barium	<0.1%
Gallium	<0.05%
Boron	<0.01%
Chromium	<0.0075%
Zirconium	<0.003%
Molybdenum	<0.002%
Nickel	<0.002%
Copper	<0.0015%
Lead	<0.001%*
Arsenic	<0.001%*
Chlorine	<0.0005%

All analyses are shown in elemental form even though the actual forms present are mixed glassy silicates. Free Silica may be present in small amounts, characteristic of the particular ore body.

\*By Food Chemicals Codex Method

### Representative Particle Distribution

### Percent Retained by Weight (U.S. Sieve)

			Sil-32	Sil-42	Sil-35	Sil-43	Sil-50
+50	Mesh	+300 µm	1%	0%	0%	0%	0%
-50+100	Mesh	-300+150 µm	8%	1%	Trace	Trace	Trace
-100+200	Mesh	-150+75 µm	26%	16%	12%	11%	4%
-200+325	Mesh	-75+45 µm	22%	26%	24%	21%	13%
-325+450	Mesh	-45+32µm	12%	12%	18%	19%	10%
-450+635	Mesh	-32+20 µm	6%	18%	13%	15%	23%
-635	Mesh	-20 µm	25%	27%	33%	34%	50%
			100%	100%	100%	100%	100%

### Physical Properties

- Hygroscopic Moisture 0%**
- Surface pH 6.5-7.5**
- Color White**
- Fusion Point (°F) 2300**
- Fusion Point (°C) 1260**

Typical Specifications (Grade)	Sil-32	Sil-42	Sil-35	Sil-43	Sil-50
Effective Particle Density-ESG (lbs/ft <sup>3</sup> )	10.5	13.5	15.0	16.0	21.0
Effective Particle Density-Range (lbs/ft <sup>3</sup> )	10.0-11.5	12.3-14.4	14.2-15.6	15.2-17.3	19.3-21.5
Dry Bulk Density (lbs/ft <sup>3</sup> )	7.0	8.5	9.0	10.5	13.0
Dry Bulk Density Range (lbs/ft <sup>3</sup> )	6.5-7.5	8.0-9.0	8.5-9.5	10.0-11.0	12.5-13.5
Effective Particle Density-ESG (g/cm <sup>3</sup> )	0.170	0.216	0.240	0.255	0.336
Effective Particle Density-Range (g/cm <sup>3</sup> )	0.160-0.184	0.197-0.231	0.228-0.250	0.244-0.277	0.310-0.345
Dry Bulk Density (g/cm <sup>3</sup> )	0.112	0.136	0.144	0.168	0.208
Dry Bulk Density Range (g/cm <sup>3</sup> )	0.104-0.120	0.128-14.4	0.136-0.152	0.160-0.176	0.200-0.216
Average Particle Size (µm)	75	45	40	37	32
Particle Size Range (µm)	1-300	1-220	1-150	1-150	1-110
Thermal Conductivity (BTU-in/hr/sqft/°F)	0.36	0.40	0.41	0.43	0.45

### Proprietary Surface Treatments are Available to Improve Performance

Type	Ordering Code(s)	Molecular Structure	Hydrophobic	Oleophobic
Uncoated	BC		No	No
Silane	23	Monomer	Yes	Yes
Silicone	34 (18)	Polymer	Yes	Yes

#### 23 Coating

- Is an organometallic silane type reactive monomer
- Creates a monolayer film on the surface of the particle
- Demonstrates moderate hydrophobic and oleophobic properties
- Significantly reduces the surface viscosity of perlite
- Improves the Rheological properties of composites
- Demonstrates moderate resistance in temperature and pressure

#### 34 (18) Coating

- Is an organometallic silicone type reactive polymer
- Creates a multiple layer formation on the surface of the particle
- Demonstrates significant hydrophobic and oleophobic properties
- Moderately reduces the surface viscosity of perlite
- Improves the Rheological properties of composites
- Demonstrates significant resistance in temperature and pressure

For more information or to arrange for samples,  
please call: **800-323-4287** or email: [info@silbrico.com](mailto:info@silbrico.com)

