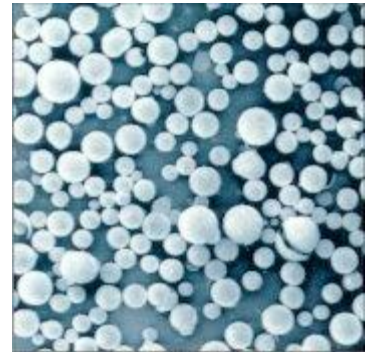




Cenospheres – Lightweight Functional Fillers (Microspheres)

Cenospheres (alumino-silicate microspheres) are lightweight, inert, free flowing hollow spheres largely made up of silica and alumina and filled with air or an inert gas, mostly nitrogen or carbon dioxide. Cenospheres are naturally created as a byproduct of coal combustion at thermal power plants. Their color ranges from light beige and light grey to almost white.



Properties:

- Cenospheres are lighter than most other commonly used fillers. A bulk density in the range of 0.35 – 0.45 g/ cm³ provides for great buoyancy and weight reduction.
- Cenospheres are hard (5-6 Mohs) and rigid, and, with a compression strength of more than 3,600 psi (25 MPa), they are stronger than most other hollow micro spheres.
- Cenospheres have high temperature resistance and are stable up to 1,400 – 1,600 °C.
- Their thermal conductivity (≈ 0.1 W/m K) is low providing for a strong insulative character.
- Their thermal expansion coefficient ($\approx 8 \times 10^{-6}$ /K) is low, making them an ideal material for high temp applications.
- Low rate of oil absorption of approx. 16g/ 100g. Due to their spherical form, cenospheres have the lowest surface to volume area. This enables a high loading factor, reduced binder / resin usage as well as improved viscosity and flow ability.
- Due to its by-product character its usage saves resources and is cost efficient.

Areas of Application:




- **Construction:** Lightweight cements, mortars, stucco, putties, sealants, adhesives, insulating panels, oil well cements, paints and coatings
- **Epoxies / Poly Urethane Foams:** adhesives, wear resistant coatings, fillers
- **Plastics:** Low density composites, syntactic foams, fiber reinforced plastics
- **Automotive:** Insulating composites, sound proofing
- **Ceramics / Refractory:** Tiles, firebricks, hi-temp sealants, adhesives, refractories
- **Technology:** Thermal coatings, drilling fluids, adhesives, aeronautical composites
- **Recreation:** Light weight composites for floatation devices, kayaks, surf boards
- **Abrasives / Friction:** Brakes Pads and blocks, cutting discs, grinding wheels



Cenospheres Data Sheet

<u>Physical Property</u>	<u>Unit</u>	<u>Range</u>
Color:		light grey - white
Bulk weight :	g/ cm ³	0.35 – 0.45
Density:	g/ cm ³	0.70 – 0.95
Bulk volume:	l/ kg	2.22 - 2.86
PH – value:		7.0 – 10
Wall thickness:	%	10
Melting point:	°C	1,400 – 1,600
Hardness:	Mohs	5 - 6
Compression Strength:	psi	≈ 3,600 (25 MPa)
Specific thermal conductivity:	W/m K	< 0.1
Thermal expansion coefficient:	1/K	8 x 10 ⁻⁶
Floating rate:		> 95
Sinkers:	%	< 5
Moisture content:	%	< 0.5
Chemical Composition:	%	
SiO ₂	%	56.0 – 58.0
Al ₂ O ₃	%	34.0 – 38.0
Fe ₂ O ₃	%	< 3.0
MgO	%	< 1.0
TiO ₂	%	< 1.0
CaO	%	< 2.0
LOI	%	< 1.0

Types:

RSS-500 S	RSS-500 A	RSS-500 R
		

The above values represent typical property values of the product and are accurate to the best of Riverside's knowledge. Before using the material, user should test the properties of the materials and ensure the materials fulfill the required properties. User assumes all risk and liabilities in connection therewith.