

formulations. Depending on the grade of material, reflecting index of Barium Titanate glass is between 1.9 to 2.2 compared to $n \approx 1.5$ of Soda Lime and Borosilicate glasses. Barium Titanate glass microspheres will reflect back more light directly to the viewer, which is beneficial for applications where retroreflectivity is desired, such as motion tracking targets in medical devices, endoscopy, micro-optics, defense and microscopy.

b) Borosilicate Glass Microspheres and Spheres



Borosilicate Glass is well-known for its durability, low coefficient of expansion, low density, high softening point, high resistance to acids and thermal shock, compared to other glass formulations. The chemical composition consists primarily of silicon oxide (SiO_2) and boron oxide (B_2O_3). Coefficient of thermal expansion for borosilicate glass is about one third of other glass compositions making it resistant to thermal shock, which is critical for those applications where minute deviations in shape might matter.

True Particle Density: $\sim 2.2 \text{g/cc}$

Index of Refraction: ~ 1.48

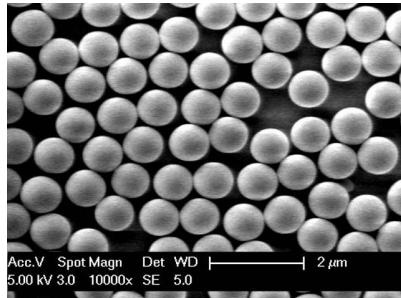
Annealing Temperature: $\sim 560\text{C}$

Softening Temperature: $\sim 820\text{C}$

Thermal Expansion: $\sim 30 \times 10^{-7}/\text{C}$

Chemical Resistance: resistant to corrosive environments

c) Conductive Silver-Coated Monodisperse Silica Microspheres 2.3g/cc to 4.1g/cc , $\text{CV} < 10\%$ - $2 \mu\text{m}$ to $9 \mu\text{m}$ used to carry electron movement across sphere.



Non-porous

Density: $\sim 2.0 \text{g/cc}$

Particles in Size Range: $\text{CV} < 10\%$

Spherical Particles: $> 95\%$

Structure: amorphous
Purity: >99.9%
Refractive Index: ~1.4
Surface Area: 2-6 m²/g

3. Simple vs. Compound: Using two spheres in contact. Slipping/rolling motion amongst them can help in further focusing and magnification control.