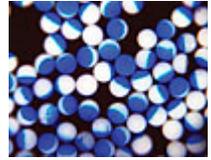


Opaque Polyethylene Microspheres for Coatings Applications

by Yelena Lipovetskaya

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Microspheres are well known in the coatings industry for their use as low-surface-area fillers that offer benefits in viscosity and density control, solids content, application and flow characteristics. Cospheric LLC, a Santa Barbara-based microtechnology company, recently launched a line of opaque polyethylene microspheres that act as a superior opacifying agent and provide maximum hiding power with just one monolayer of microspheres as small as 40 microns in diameter. Microspheres are manufactured in any color imaginable and even in combinations of two differently colored hemispheres.

Microsphere Characteristics



When light strikes an interface between two substances, in general some may be reflected, some absorbed, some scattered and the rest transmitted. An opaque substance transmits very little light, and therefore reflects, scatters or absorbs most of it. High level of opacity becomes more difficult to achieve for microscopic particles, because opacity is proportional to the thickness of the material. An opaque microsphere does not allow any light to pass through, which means every single particle has maximum hiding power.

Opaque microspheres provide superior coverage with one invisible and feather-light layer – revolutionizing coatings products. Today Cospheric is the only company in the world to manufacture truly opaque microspheres.

“While sourcing materials for one of our projects, we searched the globe for microspheres that were truly opaque in a monolayer arrangement. We found a handful of companies that sent us samples, but under the microscope we saw poor opacity, dust, debris and non-spherical particles. “Frustrated with the lack of opaque microspheres on the market, we developed our own proprietary process to produce polymer microspheres with tightly controlled particle size, opacity, color, sphericity, as well as internal and surface charge and magnetic properties,” says Brian Gobrogge, CEO and co-founder of Cospheric.

Cospheric microparticles are guaranteed to be >90% spherical and within specified particle size range. The exceptional smoothness, sphericity and particle size uniformity are responsible for the ball-bearing effect, which imparts the finished product with a silky texture, enhanced slip, glide and omni-directional spreadability. Outstanding roundness enhances lubrication.

Red, green, blue, yellow or even multi-color microspheres make a product that is not only functional but fun and exciting by adding a hint of color, sparkle or even a color changing effect, without dealing with difficult-to-disperse pigments.

Composition

Opaque microspheres are made from polyethylene. The polymer is pigmented to achieve the exact color and opacity level desired by the customer. Particle size ranges from 10-25 microns up to 850-1,000 microns are available and supplied as a dry powder that can be easily mixed into coatings, adhesives and oils. Just like clear polyethylene microspheres, opaque grades are inert in most solvents.

Cospheric uses eco-friendly manufacturing practices. There are absolutely no solvents or waste in the spherical microparticle manufacturing process. Microparticles that do not meet tight specifications are recycled back into the process.

Orientation of Dual-Functional Microspheres in an Electromagnetic Field

High-quality, dual-functionalized microspheres recently became available on the market in bulk quantities and reasonable prices. There are numerous applications for this amazing product, with most of them still waiting to be discovered.

One particularly interesting and unique feature of these miracle microspheres is their ability to orient themselves in response to electromagnetic fields and show a visual response. This is achieved by making spheres both bipolar and bichromal, with dipole precisely aligned with two differently colored hemispheres. Due to the dipole the sphere will rotate in an electromagnetic field to align the more positive hemisphere to the negatively charged stimuli and vice versa. As the spheres align themselves, the viewer will observe the color of one hemisphere, while the other hemisphere will be hidden from view, providing an obvious strong visible indication of the presence of the field. In an alternating electromagnetic field, these microspheres can spin at hundreds of times per second.

This superior functionality is achieved with a proprietary and patented process that allows extremely precise coating on one hemisphere without affecting the other. Each coating is custom formulated for color, charge, magnetic, electric and surface properties, and solvent resistance per customers' needs. Hemispherical coatings of less than 1 micron with tolerances as low as 0.25 micron have been routinely demonstrated. Color combinations are truly unlimited. White, black, silver, blue, green, red, yellow, brown, purple as well as transparent microspheres have been made. Sphericity of greater than 90% and custom particle size ranges are offered.

The spheres were originally developed for very high-tolerance electronic paper reflective digital displays, where functionalized microspheres are used to create an image that appears to the viewer. To achieve high resolution in display applications it is critical that every single sphere responds to the electromagnetic field in the same way at the same time and aligns precisely with the other spheres. It is also critical that there are no color gradients in the display.

High-quality opaque polyethylene microspheres are now available in sample and bulk

quantities and reasonable prices to scientists and engineers who would like to add color and functionality to new generations of their products.

For more information, visit www.cospheric.com or call 805/687.3747 to discuss your application.

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