



PRODUCT DATA SHEET

P2453BTA

METALLIZED BARIUM TITANATE GLASS MICROSPHERES
FLUOROCHEMICALLY COATED

PHYSICAL DATA

Description	Hemispherically aluminum coated barium titanate glass microspheres with a fluoropolymer coating.
Appearance	Grey powder
Component Materials	BaO, TiO ₂ , SiO ₂ , CaO + MgO
Coating/Weight %	Solvent-based fluoropolymer; <1%
Specific Gravity	4.49 +/- 0.01
Index of Refraction	1.92 – 1.94
Diameter	Mean—40 to 44 microns; 90th percentile—44 to 48 microns
CAS Numbers	65997-17-3 [glass, oxide]; 7429-90-5 [aluminum]

PRODUCT DESCRIPTION

P2453BTA microspheres are solid glass spheres made of barium titanate glass that have been hemispherically coated with a thin aluminum shell. The high refractive index of barium titanate glass, when combined with the aluminum coating on half the glass sphere, provides the mechanism for retro reflectivity since light passes through the clear half of the sphere and “bounces” off the aluminum coating. The light reflected from the sphere’s surface returns directly back to the light source or viewer, resulting in greater visibility in dark or night time conditions.

Because any retro reflective effect depends on the transmission of light through the clear half of a sphere, placement of the sphere at the surface of an ink or coating is critical. Prizmalite fluorochemically-coated P2453BTA spheres are coated with a proprietary, patented coating that creates a tension with the surrounding resin system that “repels” the sphere to the surface, maximizes potential light transmission, and enhances the intensity of the retro reflective appearance.

APPLICATION BENEFITS

There are two basic types of retro reflective materials, depending on the method of their manufacture: reflective sheeting and tape, which are based on pyramid based glass cubes, and inks or coatings that incorporate metallized barium titanate glass spheres. While reflective sheeting and tape are more intense when viewed at a direct 90° viewing angle, their visibility drops off dramatically at less than 90° viewing angles. In addition, tapes are not as durable as most coatings and are less flexible in terms of application.

While coatings and paints incorporating Prizmalite fluorochemically-coated P2453BTA microspheres are not as bright when viewed head on (90°), unlike sheeting and tape, they maintain good visibility from all viewing angles, creating the effect of a “ribbon of light”. When Prizmalite’s proprietary coatings are applied to the P2453BTA, not only do the metallized spheres migrate to the surface of the surrounding resin, but the coatings also create a strong adhesive bond that holds the spheres in place for long term retro reflectivity.

FORMULATION GUIDANCE

P2453BTA spheres can be incorporated into water or solvent-based resin systems and certain plastics. They can also be incorporated into plastisol inks for application to textiles, and in certain proprietary powders for powder coating applications.

The density of barium titanate glass requires adjustments to standard application methods to prevent the spheres from sinking to the bottom of the surrounding material. Loading levels are generally in the range of 15% to 25% [calculated on a dry weight basis] but can go as high as 100% depending on the level of retro reflectivity desired and the density of the surrounding resins or powders. The application of Prizmalite’s proprietary fluorochemical coating to the P2453BTA metallized spheres, however, generally means that a lower loading of Prizmalite spheres delivers the desired retro reflectivity because of the efficiency of their placement at the surface.