

EverWhite® Pigment (EWP-5) for Partial TiO₂ Independence in White, Yellow, and Red Low-Density Polyethylene Compound

Chris Ahmer and Josh Lensbouer, US Silica, Katy, TX

Michael Schmitz, ARDL, Akron, OH

Chris Lambert, TiPMC Solutions LLC, Nashville, TN

Abstract

One of the most widely used industrial minerals today is titanium dioxide (TiO₂), which primarily delivers superior whiteness and opacity to consumer and industrial products. Challenges in using titanium dioxide are well known and include volatility in price and supply due to producers' inability to effectively manage fluctuating demand. As a result, market dynamics warrant exploration of alternative products for high-volume applications – such as plastics.

An innovative alternative that is rapidly gaining traction is engineered cristobalite, a mineral product that offers its users some level of titanium dioxide independence alongside additional “enhancements” not possible with titanium dioxide alone. Not only can this material be used as a white pigment and opacifier in white plastics, but it can also be used in colored compounds where its lower refractive index can become an advantage. This paper highlights the benefits of incorporating cristobalite into white, red, and yellow plastics, with a focus on processing, mechanical strength, weathering, color and opacity. The analysis suggests that between 25% and 50% of TiO₂ can be replaced in plastic compound by a particular size and type of cristobalite (EverWhite® Pigment 5) without any depreciation of aesthetic or performance attributes.