TiO_2 extender contender

22 June 2009

Aimed at cost saving, 20 Microns' barytes opacifier and alumino-silicate extender grades can partially replace TiO2 in paints and coatings by 15-25%

Leading Indian industriaL minerals producer, 20 Microns Ltd, has developed two new grades for the replacement of titanium dioxide (TiO_2) in solvent and water based paints and coatings – Lithomer-R, an opacifier, and Alsil ZX, an an extender for TiO_2.

In mineral coating applications TiO_2 efficiently scatters visible light, and by doing so it imparts brightness, opacity and whiteness to paints and coatings. However, the cost of TiO2 has risen steadily since 2008, and in May the world's top five producers all increased their TiO2 grades by $75/tonne or more (*see IM June '09: Kronos sparks TiO_2 price resurgence*).

With raw material costs rising, paints and coatings are also becoming more expensive. There are two ways to stabilise prices – either by lowering the quality of the paint by using less of the essential ingredients, or by using a subsidiary product in the replacement of the primary product. This can be achieved via partial or complete replacement.

TiO_2 partial replacement

Opacifier

20 Microns has developed a new white pigment opacifier grade, Lithomer-R, formed via the co-precipitation of synthetic barium sulphate with TiO_2 sourced from "natural alumino-silicate". The co-precipitation is claimed to produce an ultrafine particle size distribution, which is adjusted for optical rheological properties.

Lithomer opacifier is recommended for partial replacement of TiO_2 by 15-25%, and enhances optical properties with high gloss.

Precipitated alumino-silicate

In addition to its new opacifier grade, 20 Microns has developed a new extender for TiO_2 – called Alsil ZX – for use in emulsion paint formulations. Alsil is a precipitated alumino-silicate, which the company recommends for replacement of TiO_2 by 20-25%.

Alumino-silicate pigments contain an alkaline earth metal, usually calcium or magnesium, in addition to an alkali metal such as sodium. In terms of chemical composition, these pigments are distinguishable from co-precipitates.

The pigments are prepared by introducing dilute solutions of an alkali silicate and an aluminium salt of a mineral acid into an agitated aqueous receiving medium, which contains an alkaline earth salt or hydroxide.

20 Microns recommends that the use of thickeners and thickening agents be reduced when the Alsil extender is added to formulations, as its small particle size (plus high degree of whiteness and absorption) can lead to an increase in the viscosity of the final formulation.

Markets

The development of 20 Microns' new grades could not be better timed. Despite the global decline in the automobile and construction sectors (and thus the fall in demand for coatings, paints and pigments), growth in the Indian paint and coatings markets is likely to require an additional 1m. tpa of coatings demand by 2013 – bringing overall demand to 2.7m. tonnes (*see IM online news 30 April 2009: Indian paint growth forecast*).

Lithomer properties

- high gloss and low haze
- low binder requirement
- no abrasion or wear on metallic materials
- good flow performance
- excellent dispensability and coverage
- resistance to yellowing

Alsil properties

- improved opacity and whiteness
- decreased yellowness
- improves scrub and abrasion resistance
- stain resistance and removal

- increases paint stability during storage
- anti-settling agent
- viscosity regulator in paints, coatings and inks