

Flow Control Agents: Silica Supported or Masterbatch?

As the powder coating market has developed so too have the raw materials needed to support it. In addition to advances in the resin portion of flow control agents, changes have occurred in the delivery form. Silica supported flow control agents have been the mainstay of the industry for over 25 years. However, as the industry has pushed the envelope of coating appearance to more and more demanding applications, some inherent weaknesses to silica supported flow control agents have surfaced. Estron supplies flow control agents not only adsorbed onto silica but also dispersed in resins to address these weaknesses. The question now facing formulators is *which delivery form is best suited for a specific application?*

Flow control agents for powder coating are traditionally high-viscosity liquid resins adsorbed onto silica at levels around 65% active to facilitate handling and incorporation in the premix phase of production with the other solid ingredients. During the extrusion phase of production, the silica is broken down and the resin portion of the flow control agent is uniformly released and dispersed throughout the coating.

There are some applications where this mechanism may not occur effectively or where the silica carrier might interfere with the final film properties. In both clear and very high flow powder coatings, shear during the extrusion phase can be reduced and the release and dispersion of the flow control agent may be compromised. As a consequence, cured powder films might exhibit very small craters. In some cases, the film imperfections may not be visible to the eye but may manifest as a reduction in the twenty or eighty-five degree angle gloss values. These imperfections are likely due to larger, undispersed particles of silica that contain a higher concentration of the resin portion of the flow control agent. This creates a surface tension gradient compared to the surrounding coating surface, giving rise to craters. In addition, silica, whether it is fully dispersed or not, can cause a haze in the final film of clear coatings. Finally, in very thin film applications, undispersed particles of silica may create film protrusions in the cured coating.

Removing the silica by changing the carrier for the resin portion of the flow control agent to a masterbatch (flow control agent dispersed in a resin compatible with the binder resin) can alleviate these problems. For high flow or thin film pigmented applications, Estron supplies Resiflow LV dispersed in various polyester resins. For clear applications, Resiflow L-64F is supplied in either a polyester or an epoxy resin. All of these masterbatches contain 10% active flow control and 90% dispersing resin. The chart on the next page should aid formulators in deciding which flow control agent, whether silica supported or masterbatched in a resin, is best suited for a specific application. The final decision is, of course, left to the formulator taking into consideration appearance, application and other required coating properties.

FLOW CONTROL AGENTS FOR POWDER COATINGS MASTERBATCH SELECTION GUIDE



THE EDGE OF INNOVATION

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