

Two questions, two answers:

- 1 Which technological innovations will influence water-based coatings in the next years?**
- 2 What are the main hurdles to convert current solvent-borne to water-based systems?**



Source: Ingo Bartussek - Fotolia

1 Water-borne coatings provide endless possibilities of formulation for which ingredients as binders, pigments, dispersing agents, or rheology modifiers are continuously being developed and improved.

One major concern in the coatings industry is titanium dioxide. This unique pigment has not found clear and viable alternatives, despite significant efforts developed in the area. Permanent price volatility and the possible classification of titanium dioxide as a suspect carcinogen have put pressure on coatings and raw materials manufacturers. Therefore, for the next years we expect to see innovations related with the opacity of the paint. New products may be developed as inorganic fillers or pigments, to reduce or replace titanium dioxide. Organic polymers can also play a role, not only as opacifying agents but as spacers for titanium dioxide, thereby increasing its efficiency.

Other areas of interest in our markets are industrial water-borne coatings and architectural renovation related to the increasing market of short term rentals in historic city centres. Properties such as anti-corrosion and water-resistance are being sought, especially on latex binders. For this purpose, powerful and versatile crosslinking systems can be useful tools.

Finally, we believe more and more renewable options for coatings ingredients will be available, responding to consumer and market demand for more sustainable products. We expect developments in the synthesis of traditional building block but from renewable sources and also modification of current biomass residues in order for them to be useful as paint ingredients.

“We expect to see innovations related with the opacity of the paint.”



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2 In many decorative paints applications, water-borne technologies already dominate. However, for industrial coatings, alkyd, urethane or epoxy systems have not been easily replaced. Several current characteristics of water-borne formulations explain this. In a water-based paint, the polymeric binder is present as a dispersion of high molecular weight solid particles, instead of being dissolved. For stability and application purposes, a careful mix of rheology modifiers needs to be added to the paint. When applying the coating, the smooth brushability of a solvent-borne product is not achieved. The following film formation is also affected since particle coalescence is needed and a completely smooth surface is not reached, which limits gloss properties.

Additionally, the solvent being water changes the drying behaviour of the paint, dependent on temperature and humidity, which might give unsatisfactory drying times.

Corrosion resistance is another solvent-borne property that is not easily achievable in water-borne coatings. On the one hand, typical solvent-borne systems rely on polymers that will increase their molecular weight and even crosslink during or after drying. This creates a dense polymer structure that becomes a barrier for corrosion. Water-borne systems do not typically possess such an ability of becoming a 3D network. On the other hand, water-based paints contain several water sensitive ingredients such as emulsifiers and other surfactants that will remain in the coating film after drying and might give water access to the substrate.

As discussed in the first answer, crosslinking technologies might play an important role here, as well as core-shell approaches to the latex binder. **3**