



Solvents meet their Waterloo

To substitute solvents no loss of performance is still the target

Waterborne coatings have improved significantly during the last years, say Stephan Kögler, Becker Acroma Arti GmbH and Giorgio Sabbadini, Epocat International BV. The experts have also approaches for eventual sensitivity towards humid atmospheres, for example crosslinkers against the external water influence. The next challenge is low temperature curing. You need to know the whole coatings technology to substitute solvents everywhere.

“Achieve comparable or even better performances than the actual high VOC products.”

1 What are the biggest technical challenges for waterbased coatings today?

2 What technical possibilities can help to overcome weak performance of water-based coatings in a humid atmosphere?



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1 Due to the new VOC level restrictions enhanced in certain areas in North America and in Europe, waterbased products will play a big role in the future. Even in some industrial and DIY-market segments water-based coatings have already replaced solventbased products. Unfortunately sometimes their upswing has been hampered by the fact that they are often more permeable towards water vapor and airborne pollutants than solventbased products with the results that they are not as durable as conventional paints. Sometimes waterbased paints exhibit a relatively poor finish because the surface of the coating is not smooth enough. Nevertheless, strong improvement has been achieved during the last years, especially in protective coating applications. One of the biggest challenges we as raw materials supplier will be faced with in the near future will be the development of polymers and intermediates, with the target to perform in terms of film forming and coalescence, also at low temperatures. The next challenge makes it possible for the coatings formulators to achieve comparable or even better performances than the actual high VOC products.

2 Technically speaking, in industrial applications usually less solvent will remain in the coating layer at the end of the film forming process. The adhesion and the protective performance of the final coating will be better. In case of a waterbased coating the humidity of the air and the temperature are key factors that influence and regulate the speed of the release of the water from the surface of the coating which influences the film forming and properties of the coating film. Formulators can use different technical possibilities to overcome this problem, most of them connected with the formulation of the product itself: a) using additives that help to maintain the surface of the open film and regulate the adsorption/desorption of the water as long as the film forming process is not complete, b) using wetting and dispersing agent additives that allow to have as little water as possible in the formulation (usually a concentration helps that does not exceed 15%), c) choosing a base polymer with a slightly hydrophobic character, d) introducing a natural-based coalescent agent that helps to increase the total system hydrophobicity thanks to the natural fat backbone in the chain. ◀