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## WATERBORNE TOPCOATS: IT IS THE FINAL FLOW THAT MAKES THE COATING SHINE

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### Biography

Bart Reuvers has completed his PhD from Twente University. He worked as a Physical Chemist at Akzo Nobel Coatings for 20 years. Currently, he is working as a Senior Scientist at DSM Resins in the field of Rheology. He has published more than ten papers in reputed journals.

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How to achieve a high-gloss surface for a water-borne coating drying on top of an uneven substrate? To answer this question, we examined the gloss level of dried topcoats as a function of a series variables both related to the substrate (: topography) and the topcoat (: volume fraction non-volatile components, film thickness, viscosity of the emulsified binder and rate of X-linking). To reveal the basic mechanisms underlying gloss development, we monitored the evolution of the surface topography of drying topcoats, using a white light interferometer. The study revealed the existence of two distinct different stages in the evolution of the surface topography. Firstly, the glossy wet film surface becomes uneven due to (damped) telegraphing of the substrate unevenness, driven by evaporation of water. This process is accompanied by loss of gloss. After coalescence of the emulsified binder particles subsequently, the telegraphed unevenness levels out driven by pressure gradients. This process results into gloss recovery. Full gloss recovery is promoted by low viscosity of the emulsified binder, high film thickness and slow X-linking

Evolution of the surface topography  
of an alkyd emulsion drying on top of a primer

