



Rational Coating Formulation: Concepts and Applications (CP-6680)

A large number of coatings require substantial reformulation to achieve desired properties. The new *Rational Coating Formulation* approach differs from conventional approaches in that it relies upon the established material properties of coating ingredients and assesses the interactions and reactions among ingredients prior to formulation. This leads to coatings that require minimal formulation adjustment and shorter periods of durability testing. The approach is similar to material reliability, practiced in aeronautic and electronics industries to develop and produce reliable and high-performing products with minimal accelerated testing.

The objective of this highly interactive course is to demonstrate, discuss, compare and contrast the methodologies used in *Rational Formulation* approaches. Intrinsic and extrinsic properties of all raw materials in most common coating technologies will be evaluated and the clear justification of choice of raw materials will be discussed. In addition, the effects of materials' attributes and the *Rational Formulation* approach upon coating performance, durability and overall cost of architectural, industrial and automotive coatings will be presented.

WHO SHOULD ATTEND?

This interactive training is highly recommended for coating formulators, chemists, researchers, and design and spec engineers at all levels who need to learn and implement the most efficient formulation methodologies and produce the highest performing coating products.

WHAT YOU WILL LEARN:

- Become familiar with *Rational Formulation* concepts and approaches.
- Gain in-depth knowledge of the material science of coatings and performance criteria.
- Learn *Rational Formulation* approaches to reduce reformulation attempts and cost.
- Learn how the reactions and interactions of raw materials affect coating performance.
- How to design an original formula: What, when, how much to use and why?
- Learn how to estimate performance and durability ahead of formulation.
- Develop understanding of material properties and their effect on performance.
- Learn how to interpret non-linear test results and reduce reformulation steps.

Course Outline

- **Day One**
 - The *Rational Formulation* concept.
 - Conventional and *Rational Formulation* comparisons.
 - How raw material interactions are verified.
 - The role of raw material interactions in formulation and coating properties.
 - What is solvent and what is diluent? The effect of each on coating properties.
 - The concepts of solubility, dispersion and homogeneity.
 - The role of additives, and their selection.

- How to avoid additive deactivation by other coating ingredients.
- Concepts and misconceptions about PVC and CPVC.
- How to determine the dispersion parabola and PVC/CPVC relationship.

- **Day Two**
 - Order of addition hypothesis and conventional development.
 - Dissecting published coating formulas.
 - Three key formulation cornerstones and parameters.
 - Identifying key controlling parameters of primer, basecoat, and clearcoat.
 - *Rational Formulation*-based starting point formulation development: Industrial, architectural and automotive OEM/aftermarket coating systems.
 - Performance comparison of the *Rational Formulation* approach to a conventional approach to formulation.
 - Application of *Rational Formulation* to waterborne, powder and sustainable coatings.
 - *Rational Formulation* and conventional formulation review.