



**Coatings and Corrosion Control:
Materials and Applications
(CP-6605)**

This workshop is designed to provide a sound assessment of the latest developments in materials, application methods, and process selection for the automotive and general industries. The focus will be on the material properties of both coatings and substrates, their application, and the design of high performance and environmentally compliant coating operations. In addition, the course will discuss methods of preventing corrosion by protective coatings, many case histories, and troubleshooting approaches. The informal atmosphere, with its emphasis on problem solving discussions and its "Learner Controlled" instructional style, will make it easy for you to obtain answers to your specific questions.

WHO SHOULD ATTEND?

Coating users and suppliers; product manufacturers dealing with decorative and protective coatings and corrosion prevention technology; process, design, design and specification engineers; quality control, chemists, and technical service and sales personnel. The course is appropriate for personnel with limited to very good knowledge of coatings operations who need or want to learn fundamentals, current trends, and new technologies in corrosion control.

WHAT YOU WILL LEARN:

- Develop an overall understanding of coatings and corrosion prevention methods and processes.
- How to select coatings and become familiar with their properties, application methods and cost.
- The *Rational Formulation* approach to develop corrosion resistant coatings.
- Gain insight into the durability of coatings and how to improve long term performance.
- How to reduce costs by implementing more efficient processes and judicious selection of materials.
- Receive unbiased technical opinions on what works, what does not, and why.
- Reinforce your mastery of troubleshooting and problem solving capabilities.

Course Outline

- **How Coatings Can Control Corrosion**
 - What are intact and non-intact coatings?
 - Cathodic Inhibition: Coating as a physical barrier.
 - Anodic Inhibition: Protection through choice of pigments.
 - Resistance Inhibition: High electrical resistance.

- **Formulating for Corrosion Control**
 - Selecting polymers for best self-adhesion.
 - Selecting hydrophobic resins with gradient properties.
 - Use of inhibitive pigments and mixed small/large particle sizes.
 - Increasing crosslink density and toughness.
 - Increasing elastic recovery through resin selection.

- Avoiding water soluble additives
- **Adhesion of Coatings**
 - Requirements for good adhesion.
 - Methods of promoting and maintaining adhesion.
 - Effect of adhesion on the durability and corrosion resistance of coatings.
- **Surface Pretreatment**
 - Surface nature and characteristics.
 - Reasons for, and benefits of, surface pretreatment.
 - Selection and application of primers, adhesion promoters and corrosion inhibitors.
 - How to select a proper surface treatment process.
 - Mechanical and physical surface treatments.
 - Conversion coatings: zinc and iron phosphate.
 - Cutting-edge surface treatment technologies and methods.
 - Anodizing treatment of aluminum.
- **Electrocoating and Plating**
 - Corrosion protection through electrocoating.
 - Electrodeposition types, processes and applications.
 - Performance properties and economics.
 - Corrosion protection through plating.
- **Corrosion Protection by Coatings**
 - How do coatings protect, and why do they fail?
 - Factors affecting the corrosion protection ability of coatings.
 - Selecting coatings for corrosion protection.
 - Approaches to preventing corrosion.
 - Methods of evaluating the corrosion protection of coatings.
- **Corrosion and Corrosion Prevention**
 - Selection of materials.
 - Process variables.
 - Intact and non-intact protection methods.
 - Fundamentals of corrosion.
 - Corrosion types and mechanisms.
 - Methods of preventing corrosion.
 - The effect of coatings variables on corrosion.
- **Selection, Properties and Application of Organic Coatings**
 - Rating the performance of conventional and compliant coatings.
 - Liquid coating types and properties.
 - Selecting compliant liquid coatings.
 - Powder coating types and properties.
 - Selecting powder coatings and application methods.
 - What does it take to convert to powder coating?
 - Possible service life prediction.
 - Recent developments and future trends.

- **Durability and Testing of Coatings, and Data Interpretation**
 - Why do coatings fail?
 - Factors affecting the performance of coatings.
 - Mechanisms of paint failure.
 - Predicting coating service life - possible methods.
 - How to extend the life of a coating?
 - How to test coatings for specific applications?
 - Evaluation of coatings.

- **Coatings Case Histories**