

WebCorr Corrosion Consulting Services Presents

Plating on Plastics: Fundamentals and Processes

Date: As published on website Venue: As published on website

Course Overview

Compared with metals, plastics are much cheaper, lighter and easier to mould. With the development in electrodeposition technology, many metals can be plated on plastics. Metal plated plastics today has found many applications from shower heads to auto parts. This course covers the fundamentals and processes of plating on plastics from pretreatment to different methods of plating.

This 2-day electroplating course can be taken as in-house training course, course-on-demand, online course and distance learning course worldwide. It can also be customized to meet the specific needs of your organization.

Who Should Attend

Plating technicians, plating operators, technical/sales representatives, process engineers and project managers, and QA/QC personnel working in the electroplating and metal finishing industry.

Course Outline

1. Fundamentals of Plating
 - 1.1 Electroplating: Basic Terms and Concepts
 - 1.1.1 Primer on Chemistry
 - 1.1.2 Redox Reactions
 - 1.1.3 The Electromotive Force (EMF) Series Series
 - 1.1.4 Equilibrium Potential, Overpotential and Mixed Potential
 - 1.1.5 Effect of Concentration on Potential (Nernst Equation)
 - 1.1.6 Anode, Cathode and Cell Potentials
 - 1.1.7 Conductivity of Electrolyte
 - 1.1.8 Electrolysis and Faraday's Law
 - 1.2 Electroplating: Electrode Kinetics
 - 1.2.1 Kinetics of Electrodeposition (Tafel & Butler-Volmer Equation)
 - 1.2.2 Polarisation and Mass Transport (Diffusion)
 - 1.2.3 The Double Layer
 - 1.2.4 Rate-Determining Steps in Electrode Reactions
 - Concentration Overvoltage
 - Charge-Transfer Overpotential
 - Crystallisation Overvoltage
 - Resistance Overvoltage



- 1.3 Materials That Can Be Electroplated:
 - Understanding the Atomic Structure of Metals and Alloys
 - 1.3.1 The Crystalline Nature of Metals
 - 1.3.2 Lattice Defects in Metals
 - 1.3.3 Grains and Grain Boundaries
 - 1.3.4 Lattice Defects in Alloys
 - 1.3.5 Effect of Lattice Defects on the Mechanical Property
 - 1.3.6 Metals That Can Be Electrodeposited
- 1.4 Electroplating Processes and Process Control
 - 1.4.1 Overview of Electrodeposition
 - 1.4.2 Essential Components of a Plating System
 - 1.4.3 The Nature of Plating Process
 - 1.4.4 Electroplating Electrolytes
 - 1.4.5 Mass and Current Relationship
 - 1.4.6 Current Efficiency
 - 1.4.7 Quality and Throwing Power
- 1.5 Exercises and Case Studies
2. History, application of metal plated plastics, kinds of plastics
 - 2.1 Applications
 - 2.2 Plateable Plastics
 - 2.2.1 ABS
 - 2.2.2 PC
 - 2.2.3 PP
 - 2.2.4 PA
 - 2.2.5 PAA
 - 2.2.6 Summary of plating grade plastics
 - 2.3 History
3. Mechanism of adhesion and pretreatment
 - 3.1 Mechanisms of adhesion
 - 3.2 Pretreatment

Course Outline

- | | |
|---|---|
| <ul style="list-style-type: none">4. Surface catalyzation<ul style="list-style-type: none">4.1 Starting electroless metal deposition4.2 Colloidal palladium catalyst4.3 Surface catalyzation4.4 Acceleration5. Electroless metal deposition<ul style="list-style-type: none">5.1 General consideration5.2 Principles of metal deposition without external current source5.3 Mechanism of electroless copper deposition5.4 Mechanism of electroless nickel deposition | <ul style="list-style-type: none">5.5 Summary6. Direct plating<ul style="list-style-type: none">6.1 General consideration6.2 Sulphide-based systems6.3 Palladium-based systems6.4 Summary7. Process compilation<ul style="list-style-type: none">7.1 Process comparison7.2 Application7.3 Future trend |
|---|---|

Course Registration

Please register online at www.corrosionclinic.com
Or use the form below (photocopies of this form may be used for multiple bookings).

Dr/Mr/Ms _____

Organization _____

Contact Person _____

Contact Dept _____

Telephone _____ Fax _____

Email _____

Payment should be made by TT or online banking. Currencies in Australian Dollar, Canadian Dollar, US Dollar, Euro and Sterling Pound can be transferred directly without conversion. Our bank details can be found at the link below:

<https://www.corrosionclinic.com/payment.html>

Course Fee and Discount

Standard: \$3,500 **Discount:** \$3,150

The fee includes a hardcopy of course note, certificate, light lunch, coffee breaks each day during the course.

Discount applies to a group of 3 or more persons from the same organization registering at the same time, or early-birds making payment at least 8 weeks before the course commencing date.

Cancellation and Refunds

Cancellation or replacement should be conveyed to WebCorr in writing (email or fax). An administration charge of 50% of the course fee will be levied if the cancellation notice is received from 14 to 7 days before the course commencing date. No refund will be made for cancellation notice received 6 days and less. No refunds will be given for no-shows. Should WebCorr find it necessary to cancel a course, paid registrants will receive full refund. Refund of fees is the full extent of WebCorr's liability in these circumstances.



WebCorr has NACE certified Corrosion Specialist (#5047) providing customized in-house training, online and distance learning corrosion courses, corrosion seminars and workshops on corrosion, materials, metallurgy, paints and metallic coatings. Our corrosion courses are developed and taught by NACE certified Corrosion Specialist with over 30 years of practical experience in the field. Our training success is measured by your learning outcome.