WebCorr
CORROSION CONSULTING
SERVICES

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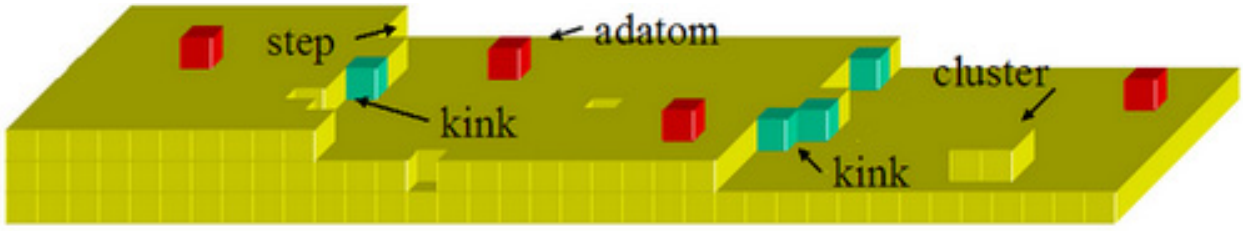
WebCorr Corrosion Consulting Services Presents

An Advanced Course in Electrodeposition

Date/Venue: As published on website



Course Overview

This 5-day electrodeposition course thoroughly and systematically covers the fundamentals, processes, and applications of electroplating, electroless plating, immersion plating, electroforming, anodizing, and electrophoretic deposition (of ceramics and paints). Participants will learn the fundamentals of electrodeposition processes, the effects of process variables on the plating quality, and the various plating techniques such as DC electroplating, pulse electroplating, electroless plating and immersion plating. Modern techniques for the testing and evaluation of electrodeposits and practical methods for trouble-shooting electroplating and electroless plating baths are also presented in this short course.

This 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

1.1 Overview of Electroplating Technology
1.2 Electroplating: Basic Terms and Concepts
- 1.2.1 Primer on Chemistry
- 1.2.2 Redox Reactions
- 1.2.3 The Electromotive Force (EMF) Series
- 1.2.4 Equilibrium Potential, Overpotential and Mixed Potential
- 1.2.5 Effect of Concentration on Potential -Nernst Equation
- 1.2.6 Anode, Cathode and Cell Potentials
- 1.2.7 Conductivity of Electrolyte
- 1.2.8 Electrolysis and Faraday's Law

1.3 Electroplating: Electrode Kinetics
- 1.3.1 Kinetics of Electrodeposition (Tafel & Butler-Volmer Equation)
- 1.3.2 Polarisation and Mass Transport (Diffusion)
- 1.3.3 The Double Layer
- 1.3.4 Rate-Determining Steps in Electrode Reactions
  - Concentration Overvoltage
  - Charge-Transfer Overpotential
  - Crystallisation Overvoltage
  - Resistance Overvoltage

1.4 Materials That Can Be Electroplated: Understanding the Atomic Structure of Metals and Alloys
- 1.4.1 The Crystalline Nature of Metals
- 1.4.2 Lattice Defects in Metals
- 1.4.3 Grains and Grain Boundaries
- 1.4.4 Lattice Defects in Alloys
- 1.4.5 Effect of Lattice Defects on the Mechanical Property
- 1.4.6 Metals That Can Be Electrodeposited

1.5 Electroplating Processes and Process Control
- 1.5.1 Overview of Electrodeposition
- 1.5.2 Essential Components of a Plating System
- 1.5.3 The Nature of Plating Process
- 1.5.4 Electroplating Electrolytes
- 1.5.5 Mass and Current Relationship
- 1.5.6 Current Efficiency

1.6 Exercises and Case Studies
2.1 Electrodeposition Considered at the Atomistic Level
- 2.1.1 Mechanisms of Electrodeposition
- 2.1.2 Electrocrystallisation: Nucleation and Growth of Nuclei
- 2.1.3 Kink Site and Surface Imperfections

Course Outline

5.1.11 Troubleshooting Guide for Acid-Tin-Based Baths
5.1.12 Troubleshooting Guide for Lead-Based Baths
5.1.13 Troubleshooting Guide for 60 Tin/40 Lead Solder Baths
5.1.14 Troubleshooting Guide for Stannate Baths
5.1.15 Troubleshooting Guide for Tin Reflowing
5.1.16 Troubleshooting Guide for Tin-Nickel Plated Alloy
5.1.17 Troubleshooting Guide for Zinc Plating
5.1.18 Troubleshooting Guide for Iron Plating Baths
5.1.19 Troubleshooting Guide for Chromium Plating
5.1.20 Troubleshooting Guide for Cadmium Plating
5.2 Electroforming: Processes and Applications
5.3 Anodizing: Processes and Applications
5.4 Chromating: Processes and Applications
5.5 Phosphating: Processes and Applications
5.6 Electroplating Waste and Waste Treatment
5.7 Exercises and Case Studies
5.8 Course Assessment

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 _____

_____

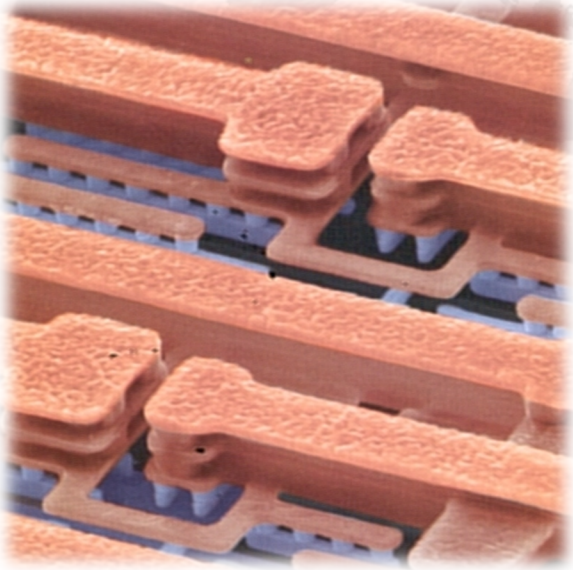
Contact Person _____

Contact Dept _____

Telephone _____ Fax _____

Email _____

Payment should be made by TT or online banking.
Our bank details can be found at the link below:
https://www.corrosionclinic.com/payment.html



Course Fee and Discount

Standard: $4,950 **Discount**: $4,455

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.