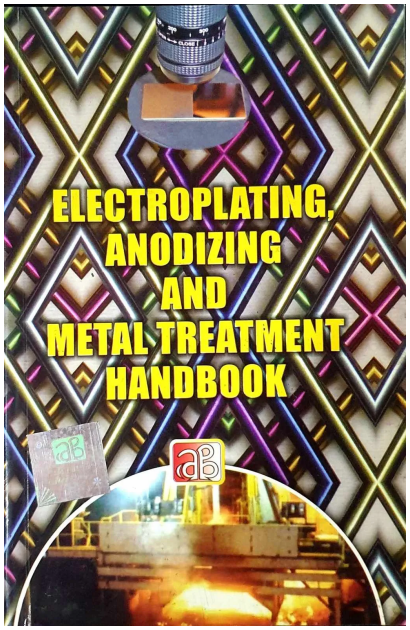
Entrepreneur India

106-E, Kamla Nagar, New Delhi-110007, India.
Tel: 91-11-23843955, +91 9097075054
Mobile: +91-9097075054
Email: npcs.ei@gmail.com, info@entrepreneurindia.co
Website: www.entrepreneurIndia.co



Electroplating, Anodizing & Metal Treatment Handbook

Code	NI63
Format	paperback
Indian Price	₹1475
US Price	$150
Pages	720
ISBN	9788178331386

Publisher	Asia Pacific Business Press Inc.

Description

Surface finishing is a broad range of industrial processes that alter the surface of a manufactured item to achieve a certain property. Currently, the trend is towards surface treatments. Surface engineering techniques are generally used to develop a wide range of functional properties, including physical, chemical, electrical, electronic, magnetic, mechanical, wear-resistant and corrosion-resistant properties at the required substrate surfaces. In general, coatings are desirable, or even necessary, for a variety of reasons including economics, material conservation, unique properties, or the engineering and design flexibility which can be obtained by separating the surface properties from the bulk properties. Surface engineered products thus increase performance, reduce costs, control surface properties independently of the substrate and medium, thus offering an enormous potential in the finishing Industry.
Electro depositing of metals is a very significant industrial process. Electroplating is both an art and science .It entailed adhering a thin metal coating to an object by immersing it into an electrically charged solvent containing the dissolved plating metal. Electroplating served a number of functions, such as protecting from corrosion and wear, decoration, and electrical shielding. Anodizing most closely resembles standard electroplating. Anodizing or anodizing is an electrolytic passivation process used to increase the thickness of the natural oxide layer on the surface of metal parts. Anodizing increases corrosion resistance and wears resistance, and provides better adhesion for paint primers and glues than bare metal. Anodic films are most commonly applied to protect aluminium alloys.
The aim of this handbook is to give the reader a perspective on several metal surface treatment techniques which are generally followed in the finishing Industry. This is a unique compilation and it draws together in a single source technical principles of surface science and surface treatments technologies of plastics, elastomers, and metals along with various formulae of bath solutions, current density, deposit thickness, manufacturing processes, various ingredients used in these processes. It is a very useful guide for the readers, engineers, scientists, practitioners of surface treatment, researchers, students, entrepreneurs and others involved in materials adhesion and processing.

Content

I. METAL SURFACE PREPARATION AND CLEANING
1. Basic Metal Surface
Nature of the Surface

Brightness
2. Polishing, Brushing and Buffing
Polishing
Adhesives
Lubrication
Brushing
Deburring
Buffing and Polishing Equipment
3. Mass Finishing Methods
Vibratory Finishing Equipment
Centrifugal Barrel Finishing
Parts to Media Ratios
Mass Finishing Media and Compounds
4. Electropolishing
The Electropolished Surface
Types of Metal Electropolished
Electropolishing Equipment
5. Solvent Cleaning
Solvent Cleaning
Diphase Cold Cleaning
Stability
Materials of Construction
Design Consideration
Location of Vapour Degreaser
Shutdown Procedure
Choosing a Vapour Degreasing Solvent
Water Removal
6. Alkaline Cleaning
Soils
Machining and Forming Oils
Alkaline Descalers
7. Oxide Removal
Oxide Removal from Copper Alloys
Equipment for Pickling and Bright Dipping

II. TYPICAL PROCESSING AND OPERATING SEQUENCES
8. Metals
Pretreatments
Preliminary Treatment
Final Treatment
Low-Carbon Steel

High-carbon and Low-Alloy Steels
Stainless Steels
Cast Irons
Copper and Copper-Base Alloys
Zinc-Base Die Castings
Magnesium and Its Alloys
Lead and Lead Alloys
Powder Metal Compacts
Less common Metals
Intermediate Electrodeposited Coating as Basis Metal Surface
9. Plastics
Plating
Electroless Plating
10. Wastewater Control and Treatment
Water Supply
Water and Chemical Conservation
Chemical and Water Recovery
Evaporative Recovery
Reverse Osmosis
Electrodialysis
Ion Exchange
Waste water Treatment-Segregation and Collection
Hexavalent Chromium Reduction
Pretreatment
Neutralization
Flocculation
Special Treatment Methods
Solids Management
Maintenance
11. Plating Bath Compositions and Operating Conditions
Effects of Hydrogen
Stripping and Salvaging of Defective Plated Items

III. TESTING ELECTRODEPOSITED COATINGS
12. Thickness Tests
Microscopic-Optical Methods
Double-Beam Interference Microscope, Interferometry
Magnetic Method
Eddy Current
Mass per Unit Area
Weight Gain Method

X-Ray Methods
Beta Backscatter (BBS)
Microresistance Technique
13. Corrosion Tests
Outdoor Exposure Tests
Electrolytic Corrosion (EC) Test
14. Inspection
Factors in Visual Inspection
Arriving at a Standard of Acceptability
Degree of Finish
Inspection of Coloured and Other than Bright Finishes
Inspection Equipment
Inspection Personnel

IV. SURFACE PROTECTION AND FINISHING TREATMENTS
15. Phosphate Coating Processes
Amorphous Phosphate Coatings on Aluminum Surfaces
Process Cycles
Discussion of Process Steps in Practical Procedures
Immersion Processes
Spray Processes, with Solution Recirculation
Design Features
Simplified and Specialized Processes
16. Chromate Conversion Coatings
Metals Commonly Chromated
Control of Electroplating Solutions
Coatings for Conversion Coatings
17 Sulfuric and Chromic Acid Anodizing of Aluminium
Sulfuric Acid Anodizing
Colouring
Power Supply
Coating Properties
Chromic Acid Anodizing
Processing Steps
Electrolyte Maintenance
Deisgnation System for Anodic Coatings
Anodizing and Surface Conversion Treatments
for Magnesium
Pickling
Tank Equipment for Cleaning Acid Pickling
Anodizing Processes

18. Electroplating Formulae of Various
Electroplating and Allied Chemicals
Electroplating not alluminium
Gold Electroplating
Iron Electroplating
19. Principles of Electroplating
Polarisation
20. Properties of Electroplating 428
Conducting Salts
Plating Quality
21. Electroplating or Coatings on Silver, Copper and leads
Coating of Silver
Alkaline Bath
Plant and Machineries Details for Electroplating Baths Salts
22. Conservation of Materials and Energy in
Electroplating Industries with Effluent Treatment
Regeneration and Recovery Techniques Applications
for Waste Water Treatment
Techniques for Uniform Metal Distribution Chemicals
will exceed the costs associated with purchasing
Choice of Finish and Process
Plating From Low Concentrated Solutions at
Room Temperatur
23 Black Chrome Plating for Solar Energy Conversion
Hull Cell Studies
Effect of Plating Time on Optical Properties
24 Pickling of Metals
Chemical and Electrolytic Pickling Compared
Tin and Lead Additions
Regeneration of Pickling Solutions
25 Pickling Conditions and Solution Compositions
Pickling of Cast Iron
Pickling in Salt Baths
Pickling of Copper and Copper Alloys
Pickling of Copper Alloys
Pickling of Aluminium
Acid or Cold Pickling
Pickling of Magnesium
Pickling of Silver
Pickling of Titanium
26 Cadmium Plating

27 Cobalt Plating
28 Copper Plating
Coppering by Simple Immersion
Bath Preparation
29. Iron Plating
30 Nickel Plating
Nickel fluoborate bath
Precautions
Semi-Bright Nickel Plating
Stabilisers
Barrel Nickel Plating
Heavy Nickel Plating
Nickel Electroforming & Electrotyping
31 Silver Plating
Application of silver Plating
32 Gold Electroplating
Stripping Gold
Current-Density, 0.15 Ampere
Gold Baths for Hot Gilding
Tanks for Gold Baths
For Gold-Plating in the Cold Bath the Process Is As Follows
Gold Thread
Methods of Plating Stainless Steel
33 Nonelectrolytic Metal Coating Processes
Non-Catalytic Chemical Methods
Maintainence of Immersion and Contact Baths
Sensitizing for Chemical Reduction
34 Vapour-Phase Methods
Vacuum Evaporation
Coating Properties
Sputtering
Range of Applicability
Apparatus Configuration
Ion Plating
Chemical Vapour Deposition (CVD)
Apparatus Configuration
35 Catalytic Methods
Catalytic Chromium Plating
Electroless Copper Plating
Reducing Agents
The Operation of Electroless Copper Baths

Electroless Copper Treatment Sequence
Solution Formulations
Analysis of Deposit
Corrosion Resistance of Deposits
Applications for Electroless Nickel
Boron Nickel Alloys
36 Electroforming
Mandrel Types and Materials
Mandrel Design and Fabrication
Preparation of Mandrel Surfaces
Electroforming Solutions and Deposit Properties
Control of Electroforming Processes
Machining and Final Finishing of the Electroform
37. Industrial Anodising of Aluminium and its Alloys
Impurities and Bath Control
38. Environmental-Regulatory Restrictions, Response of Paint Industry and Eco-Friendly Coating
Enactment of Rule 66 on the Use of Organic Solvents
Strategy of Paint Industry
Powder Coatings
39 Plating of Precious Metals
Silver Plating
Operating Conditions
Materials of Construction
Maintenance and Control of Solutions
40. Control of Electroplating Solutions Using Hull Cell Studies
Hull Cell
Case Studies using Hull Cell
Current Efficiency Test
41 Corrosion and their Preventive Measures and Pollution Control Consideration
The Mechanism of Basic Corrosion
Protection of Intergranular Corrosion

About Niir

NIIR Project Consultancy Services (NPCS) is a reliable name in the industrial world for offering integrated technical consultancy services. Its various services are: Pre-feasibility study, New Project Identification, Project Feasibility and Market Study,

Identification of Profitable Industrial Project Opportunities, Preparation of Project Profiles and Pre-Investment and Pre-Feasibility Studies, Market Surveys and Studies, Preparation of Techno-Economic Feasibility Reports, Identification and Selection of Plant and Machinery, Manufacturing Process and/or Equipment required, General Guidance, Technical and Commercial Counseling for setting up new industrial projects and industry. NPCS also publishes various technology books, directories, databases, detailed project reports, market survey reports on various industries and profit making business. Besides being used by manufacturers, industrialists, and entrepreneurs, our publications are also used by Indian and overseas professionals including project engineers, information services bureaus, consultants and consultancy firms as one of the inputs in their research.