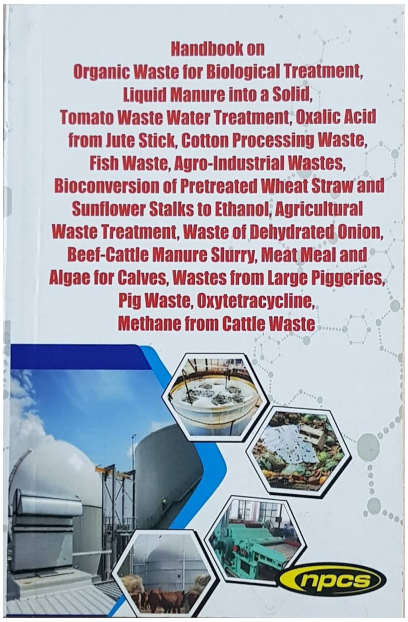
Entrepreneur India

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



Handbook on Paint Testing Methods

Code	NI237
Format	paperback
Indian Price	₹1575
US Price	$150
Pages	568
ISBN	9788178331423
Publisher	Asia Pacific Business Press Inc.

Description

Paints and their allied products like varnishes, enamels, pigments, printing inks and synthetic resins protect assets from corrosion. These are increasingly being used in automotive, engineering and consumer durable sectors. Paint testing can be done in a number of different ways. The fact of the matter is that many industries use several different paint testing methods in order to ensure accurate results. Paint should be tested in a wet form for particular properties but also in the dry form. Testing of paints generally falls into three categories: testing of the raw materials, testing of the finished product and performance testing using accelerated weathering and other simulation type methods of evaluation. Coatings technologists deal with interfaces of all classes gas liquid as in an aerosol spray liquid liquid, as in an emulsion gas solid, as in a dry pigment before its immersion in a vehicle liquid solid, as in a pigment dispersion and solid solid, as when the crystal faces of two different pigment particles are in tight contact. Paint scientists are particularly interested in the formation of liquid solid interfaces that are stable in the package, that is, in the permanent replacement of the air at the air solid interface of the pigment by the vehicle to give the liquid solid interface of the dispersion. In coatings and similar products, the criteria for best performance particulate ingredients; inorganic, organic, extender and metallic flake pigments and dispersed phase of latexes depends on the size and shape of particles composing the particulate materials. The purpose of paint testing is to help and ensure that the minimum requirements for ingredients and material characterization are met by the manufacturer on a batch basis, and to help ensure that the formulated product will provide satisfactory performance in the environment.
Handbook on Paint Testing Methods explains about aspect of gloss, specular glass, sheen, contrast gloss, absence of bloom gloss, distinctness of image gloss, specular gloss evaluation, specular reflectance, geometric considerations, instrumentation, goniophotometers, specular glossmeters, basic factors producing hiding power, refractive indexes of white pigments, refractive indexes of organic pigments, films for testing preparation of films for test, pigments and extenders, metallic flake pigments, latexes, methods for determining particle, treatment of data, particle size with light microscope etc.
This handbook elaborates the different testing methods of paints with an understanding of the various tests that can be performed on product performance. This handbook will be very helpful to its readers who are related to this field and will also find useful for upcoming entrepreneurs, existing industries, technical institution, etc.

Content

1. OPTICAL PROPERTIES COLOUR AND LIGHT

Introduction, Light source, Standard Illuminants, Color Temperature, Color Matching Booth, Metamerism, Non-visible Radiation, The observer, Color Deficiency, Reflectance and Transmittance, Color mixing, Addition of Lights, Subtractive colorimetry, Color order systems, Munsell system, Ostwald color system, ISCC-NBS System, Din – color system, Atlas de los colores, Federal color standard, Specialized color order systems, Gardner Liquid color standards, Loviond Tintometer, Parlin color standards, Gardner – Delta color comparator, ASTM color Scale, ASTM Method D 1500, Intermental color measurement, Spectrophotometers, Abridged Spectrophotometers, Tristimulus colorimeters

2. GLOSS

Aspect of gloss, Specular Glass, Sheen, Contrast Gloss, Absence of Bloom Gloss, Distinctness – of- Image Gloss, Specular Gloss Evaluation, Specular Reflectance, Geometric Considerations, Instrumen-tation, Goniophotometers, Specular Glossmeters, Distinctness – of – Image Glossmeters, Specular Gloss Methods, Two–Parameter Methods, Distinctness – of Image – Methods, Gloss standards, Material for standards, Calibration of standards, Use of standards

3. HIDING POWER

Definition of Hiding Power, Basic Factors Producing Hiding Power, Refractive Indexes of White Pigments, Refractive Indexes of Organic Pigmenfs, Practical Determination of Hiding Power, Checkerboard Brush-Out Method, Haslam Method, Early Hiding-Power Methods, Krebs Method, ASTM Relative Hiding Power, Pfund Cryptometer, Black and White Cryptomet, Rotary Cryptometer, Pfund Precision Cryptometer, Assessment of Cryptometers, Hallett Hidimeter, Hanstock Method, Bruce Hiding-Power Tests, Gordon-Gildon Method, Some Hiding-Power Findings-I, Pigment Concentration Versas Hiding Power, Contrast Design and Visual Sensitivity, Fell Equation, Hiding Power of Colored Pigments, Kubelka-Munk Two-Constant Theory, Importance and Applicability of Kubelka-Munk Tlreory, Equation, Judd Groph, Schmutz-Gallagher Melhod, New York Club Method, Van Eyken-Anderson Method, Federal Test for Dry Opacity, ASTM Method, First Method-Uses Cardboard , Procedure, Computation, Precision, DIN Method, Universally Applicable Technique, Bruehlman-Ross Method, Day Method, Some Hiding-Power Findings-II, Hiding Power VersusConcenlration for Titanium Pigments, Hiding Power Versus Concentration for Zinc Sulfide Pigments, Reflectance and Hiding Power of Tinted Paints-l, Reflectance and Hiding Power of Tinted Paints-II, Some Applications of Kubelka-Munk S. and K.Values, Unification of Paint Phenomeno-I, Unificattion of Paint Phenomena-II, Influence of Particle Size of Extender on S-Value, Influence of Particle Size of Titanium Pigment on S-Value Versus PVC, Formulation of Paints from Predetermined S-Values, Instrumental Color Malching Using Both S- and K.Values, Relation Detween Tinting Strength and Hiding Power, Hallell Equation, Scallering Cofficient and Tinting Strength, Calculation of While Hiding Power from Tinting Strength

4. MASS COLOR AND TINTING STRENGTH

Definition, Mass color, Tinting Strength, Back Factors Producing MC and TS, Mixing Pigment and Vehicle, Spatula and Muller Methods, Hoover Automatic Muller, Laboratory Ruller Mill, Pall Glass Mill, Pigment concentration, Application, Dispersion Time, Visual Mass – color Methods, ASTM Method, Other Methods, Mass color of white Pigments, Visual Tinting –strength Methods, ASTM Method for colored pigments, NPIRI Method for Colored Pigments, TAPPI Method of Colored Pigments, Tintograph, ASTM Method for White Pigments, NPIRI Method for White Pigments, NJZ Method for Zine Oxide and Titanium Dioxide, duPont Method for Titanium Dioxide, Reynolds Constant Volume Method, Instrumental Mass Color, Maxwell Color Triangle, MC, atul S- and K-Values , Mass Color of While Pigments, Visual Versus Instrumental White, Instrumental Timing-Strength Methods, Early Methods, DIN Method, Japanese Method, Mttnk Theory, ASTM Method for White Pigments, Some Tinting-Strength Findings, Pigment Concentration, Lightness Versus PVC, Tone Versus PVC, Tone of Colored Pigments, Calculation of Instrumental Color Matches, History, Simple Case—One Constant, General Case—One Constant, More Than Three Wavelengths, General Case—Two Constants, Pigment Standards for Federal Specifications, Artist’s Oil Paints Commercial Standard CS98-42, Permanent Palettes

5. PHYSICAL PROPERTICS

Density, Specific Gravity, Density of Liquids with Pycnometer, Procedure, Weight Per Gallon, Specific Gravity of Liquids with the Specific Gravity Balance, Specific Gravity of Liquids with the Hydrometer, Specific Gravity of Pigments, Vacuum Method, Method B-Accurate Testing of Single Specimens, Method C-Rapid and Accurate Testing of Single Specimens, Centrifuge Methods for Specific Gravity of Pigmeots, Zieglemann Method, Baker-Martin Method, Dunn Method for Specific Gravity of Pigments, Calculating Specific Gravity of Mixed Pigments, Apparent Density of Pigments, Primitive Method, Becker Method, Displacement Method for Specific Gravity, Flotation Method for Specific Gravity, Settling of Pigments in Paints, ASTM Evalutation, New Jersey Zinc Company (NJZ) Test , Hancock-Brown Test, Arnold Test, New Jersey Zinc Company (NIZ) Accelerated Test, Eagle-Picher Accelerated Test, Hancock-Brown Accelerated Settling Test, ASTM Accelerated Settling Test, New York State Accelerated Settling Test, Paint Formula Yield

6. VISCOSITY AND CONSISTENCY

Introduction, Definitions, Rheology, Flow, Viscosity, Absolute Dynamic, Newtonian Liquid, Consistency, Non-Newtonian Liquid, Plastic Flow, Plastic Viscosity, Pseudoplastic flow, Dilatant Flow, Thixotropy, False-Body, Instrument Types, Capillary Viscometers, Standard Capillary Viscometers, Hercules Capillary Viscometer, Bingham-Green Plustometer, Vacuum Plastometer, Caster Severs Viscometer, Gardner Pressurized Flow Cup, Eflux Type Viscometers, Saybolt Viscometer, Ford Cup, Shell Cup, Zahn Cup, ASTM Consistency Cup, Parlin Cups, Prall and Lambert Cup, Gottsch Consistency Cone, Scott Viscometer, Westinghouse Cup, Demmler Cup, Viscosity Cup

Correlation Duta, Rotational Viscometers, Brookfield Viscometer, MacMichael Viscometer, Krebs-Stormer Viscometer, Brabender Recording Viscometer, Kämpf Viscometer, The Wolffe-
Hoepke Turboviscometer, High-Shear Rotational Viscometer, Brushometer, Interchemical Rotational Viscometer, Devilbiss Electro-Viscometer, Rotovisco Viscometer, ICI Rotothinner, ICI Cone and Plate Viscometer, Ferranti-Shirley Cone and Plate Viscometer, Ferranti Portable Viscometer, Wells-Brookfield Micro Cone and Plate Viscometer, Falling Ball Viscometers, Hercules Falling Ball Method, Astom Method for Cellulose Derivatives, Hoeppler Viscometer, Band Viscometer, Bubble Viscometer, Gardner-Holdt Bubble Viscometer, Other Instruments, Gardner Vertical Viscometer, Interchemical Inclined Tube Viscometer, Collins Bubble Viscometer, Steiner Bubble Viscometer, Gardner Mobilometer, SIL Mobilometer, Laray Viscometer, Clarvoe Consistometer, Influx Viscometer, Flowmeters, Gardner Flowmeters, Flowmeters, Inclined Plane Type, Thixotrometers, Brushability, Brushability from Stormer Data, Brushability by High-Shear Method, Sagging, Sagging Measurements Using Modified Stormer, Sagging Measurements using the Rotovisco, Sag Test Instruments, Leveling, Tensiometer for Leveling , Recent Leveling Investigations, Practical Evaluations of LevelingComb Tests, Leveling by Drawdown Method, Leveling by Shell Flow Comparator

7. SURFACE ENERGETICS

Free Interfacial Energy, Wetting, Surface Tension, Surface Tension Measurements, Capillary Rise Method, Maximum Bubble Pressure Method, Drop-Weight Method, Ring Method, Other Methods, Contact Angle, Shadow Method, Tilting Plate Method, Displacement Cell Method

8. PARTICLE SIZE MEASUREMENT

Pigments and Extenders, Metallic Flake pigments, Latexes, Methods for Determining Particle, Treatment of Data, Particle Size with Light Microscope, Direct Measurement Method, Reticle Method, Dark Field Technique, Particle Size with Electron Microscope, Particle Size by Sieving, Hand Sieving, Machine Sieving, Particle size by Sedimentation, Gravity Sedimentation, Centrifugal Sedimentation, M-S-A Particle Size Analyzer, Sedimentation by Ultracentrifuge, Particle
Size by Photometry, Transmission Methods, Spectrophotometric Techniques, Angular-Dependence Techniques, X-ray Scattering, Particle Size by Elutriation, Thompson Classifier, Roller Particle Size Analyzer, Felvartion, Particle Size from Surface Area, Adsorption of Gas, Adsorption of Solutes, Soap Titration Method, Permeation Method, Electronic Size Analyzer, Particle Size and Thickness of Metallic Flake Pigments, Coarse Particles, Sieve Method, Gallie-Parritt Apparatus, Dunn Test, Thin-Film Drawdown for Oversize Particles, Dunn Texture Test for Dry Pigments, North Standards, Fineness-of-Dispersion Gages, X-ray Microradiograply Technique

9. OIL ABSORPTION OF PIGMENTS

Introduction, Nature of Oil Adsorption, Methods for Determining Oil Absorption, ASTM

Rubout Method, British Standards Institution Method, Azam Method, Hoffman Method, Smith Stead Method, National Lead Company Method, Density End Point Method, Bessey-Lammiman Method, Gardner–Coleman Method, Free Binder, Liquid Absorption by Pigments, Critical Pigment Volume, Critical Pigment Volume Concentration Cell, Pigment Packing Factor, Cole Method for CPVC, Pierce-Holsworth Method for CPVC, Procedure, CPVC AND OA, CPVC, OA, and Viscosity, Calcula-ting OA of Pigment Mixtures, Characterization of Dispersions, Dispersant Demand of Extender Pigments

10. FILMS FOR TESTING PREPARATION OF FILMS FOR TEST

Preparation of Films by Spray, Bell Laboratories Method, Battelle Automatic Sprayer, Preparation of Films with the Doctor Blade, Gardner Adjustable Film Casting Knife, DiCostanzo Adjustable Doctor Blade, Gardner Ultra Applicator, Parks Film-O-Graph, Dow Film Caster for Latex, Bird Film Applicator, Boston-Bradley Adjustable Doctor Blade, Parks Rapid Coater, Brier-Wagner Spreader, Grooved Rod Applicators, Baker Film Applicator, Automatic Doctor Blade, Motor Drive for Doctor Blades, Magnetic Chuck, Wedge-Shape Films, Tape Method, Howard Suction Plate, Preparation of Films by Flowing, Preparation of Films by Dipping, Bruins Method, Payne Dip Coater, Hot Rolling Method (Asphalt Trimmer), Hydraulic Press Method, Preparation of Films by Spinning, Preparation of Free Films, Sized Paper Substrate for Free Films, Mercury Substrate for Free Films, Aluminum Substrate for Free Films, Polyethylene Substrate for Free Films, Silvered-Glass Substrate for Free Films.

11. MEASUREMENT OF FILM THICKNESS

Wet Film Thickness, Inmont Wet Film Gage, Pfund Wet Film Gage, Tooth Gages, Needle Micrometer, Dry Film Thickness, Machinists’ Micrometer, Gardner Needle Thickness Gage, Gardner Carboloy Drill Thickness Gage, Gardner Gage Stand, Gardner Micro-Depth Gage, Microscope for Film Thickness, Magnetic Thickness Gages, Inductance Thickness Gage, Eddy-Current Thickness Gage, General Electric Gage, Type B, Elcometer, Minitector, Gardner Scratch Thickness Gage, Profile Measurement, Keane-Tator Surface Profile Comparator, Elcometer Surface Profile Gage

12. DRYING TIME

Effects of Environment, Set-to-Touch Time, Dust-Free Time, Cotton Fiber Method, Powder Method, Glass Bead Method, Tack-Free Time, Tack-Free Time with Paper, Zapon Tester, Blom Drying Time Tester, Gardner Magnetic Tack Tester, General Electric Tackmeter, Siccometer, Final Drying Times, Dry, Dry Hard, Dry-Through, Dry-To-Recoat, Touch Controller, Gardner Drying Time Meter, Parks Dry-O-Graph, Gardner Drying Time Recorder, Sanderson Drying Time Meter, Paraffin Companies Drying Time Machine, Gardner Circular Drying Time Recorder, RCI Drying Time Recorder, Erichsen Universal Drying Time Recorder, Rolling Ball Testers, Drying Time with Hardness Rocker

13. MECHANICAL PROPERTIES OF FILMS

HARDNESS AND RELATED PROPERTIES

Concept and Definition, Scratch Hardness, Laurie-Baily Hardness Tester, Graham-

Linton Hardness Tester, Clemen Hardness Tester, duPont Scratch Testing Machine, Hoffman Scratch Tester, Taber Shear/Scratch Tester, DEF Scratch Resistance, Bierbaum Microcharacter, Schopper Hardness Tester, Parker-Siddle Scratch Tester, Simmons Scratch Tester, Dantuma Scratch Tester, Rondeau Scratch Tester, Sheppard-Schmitt Scratch Dynamometer, Arco Microknife, Pencil Method, Mechanical Pencil Method, Pendulum-Rocker (damping) Hardness, Walker-Steele Swinging Beam, Persoz Pendulum, Konig Pendulum, The Sward Rocker, Identation Hardness, Methods and Devices, Identation Rheology, Indentation Hardness Miscellaneous, Theory of Indentation Hardness and Rheology, Comparative Results, Mar Resistance, Concept and Definition, Single Scratch Methods, Impinging Abrasive Method, Scuffing Methods, Miscellaneous Methods

14. ABRASION RESISTANCE

Introduction, Definition, Relation to Other Physical Properties, Mar Resistance, Hardness, Modulus of Elasticity and Tensile Strength, Correlation with Service Performance, Mechanism of Abrasion, Classification of Test Methods, Methods Using Loose or Falling, Falling Sand Abrasion Test, Pebble Abrasion Test, Olsen Wearometer, Gloss Reduction Methods, Abrasive Blast Methods, Bell Laboratory Abrasiometer, Roberts Jet Abrader, Gravelometer, Methods Using Rotating Disks, Bell Laboratory Rotating Disk Abrasion Test, Wolf Abrasion Method, Camp Abrasion Machine, FDC Wear Test, Schiefer Abrasion Testing Machine, Methods Using Rotating Wheels, Taber Abraser, Methods Employing Rectilinear Motion, Armstrong Abrader, Gardner Heavy-Duty Wear Tester, Parlin Abrasion Testing Machine, Rain or Water Erosion, Wet Abrasion Methods, Gardner Wet-Abrasion (washability) Machine, PEl Abrasion Tester, Peters Abrasion Block, Traffic Paint Tests, Miscellaneous Methods

15. ADHESION

Concept and Definition, Classification of Test Methods, Method of Removal, Knife Removal Methods, Penknife, Rossmann Chisel Adhesion Test, König Knife-Wedge Device and Method, New York Club Chisel Adhesion Test, Koole Chisel Adhesion Test, Arco Microknife, Adherometer, Wolf Adhesion Chisel, Adherometer-Integrometer, Graham-Linton Edge Adhesion Test, Meredith and Guminski Chisel Test, duPont Sharp Tool Adhesion Test, Hesiometer, Scraping and Scratching Methods, Crosscut Adhesion Test, Window Adhesion Test, Balanced-Beom Scrape-Adhesion, Automatic Scrape-Adhesion, Pocket Scrape-Adhesion Tester, Scratchmaster, ASTM Pre-cut Scrape Adhesion, Hoffman Scratch Tester, Rondeau Scratch Tester, van Laar Scratch Test, Angular Scribe-Stripping Technique, Pass Test, Pencil Test, Princeton Adhesion and Scratch Tester, Adhesive Joint Methods, Tensile Shear Methods (lap joint), Torque Shear Methods, Cleavage Tests, Peel Tests, Gardner-van Heuckeroth Adhesion Test, Courtney-Wakefield Adhesion Test, Russian Method, Adhesive Tape Tests, Weyerhaeuser Paint Adhesion Tester, Procedure, Method of DIN 53 151, Brown and Garnish Crosshatch-Metal Strip Tape Test, Ford Motor Company Crosshatch Tape Test, Liquid Jet Test, Liquid Wedge Test, Dannenberg Blister, Hoffman Air Pressure Method,

Inertia Tests, Ultrasonic Vibration Test, Ultracentrifuge Adhesion Test, ICI Bullet Method Adhesion Test, Impact and Bending Methods, Other Methods, Hydrophil Balance

16. FLEXIBILITY

Definition, Interpretation, External Factors Affecting Flexibility, Humidity, Temperature, Strain Rate, Determination of Flexibility, Mandrels, T-Bend, Cupping Tests, Forming Tests, Impact Tests, Cold Crack, Exposures

17. TENSILE STRENGTH AND ELONGATION

Definition, Interpretation, Determination, Specimen Preparation, Tension Testing Machines, Film Mounting, Controlled Conditions Cabinets, Reproducibility, Predicting Durability

18. CHEMICAL PROPERTIES OF FILMS

Resistance to Water Vapour and Liquid in the Atmosphere, Introduction, Water Vapor Transmission, General Method for Materials in Sheet Form, Resistance to Rain and Condensation, ASTM Method D 1735, Water Fog Testing of
Organic Coatings, JAN-H-792 Humidity Cabinet, ASTM Method D 2247, Testing Coated Metal Specimens at 100 Percent Relative Humidity, Early Condensation Tests, Cleveland Condensation Tester (ASTM Method D 2247, Appendix II), Resistance to Water from Within a Structure, Levin-Christian Blister Box, Forest Products Laboratory Blister Box, Veer Blister Box, ASTM Method D 2366, Accelerated Testing of Moisture Blister Resistance of Exterior House Paints on Wood, Blister Houses, Moisture Content of Substrates, Electric Moisture Meters , Electric Hygrometers, Hair Hygrometer, Salt Color-Change Hygrometer

19. CHEMICAL RESISTANCE

Introduction, Spot Tests, Staining from Household Chemicals, Staining in the Transportation Industry, Immersion Tests, Resistance to Water, Resistance to Alkali, Resistance to Detergents, Battelle Chemical Resistance Cell, Bratt Conductivity Cell for Chemical Resistance, Gearhart-Ball Solvent Resistance Tests, Perspiration Resistance, Salt Fog Test

20. FIRE RETARDANCE AND HEAT RESISTANCE

Introduction, Cypress Shingle Tests, Schulz Firl-Retardant Tester, New Jersey Zinc Company Box Test, British Box Test, ASTM Cabinet Test, Stick and Wick Test, Westgate Vertial Match Test, Crib Test, Fire-Tube Test, Roof Corner Test, Sidewall Test, Corner-Wall Test, SS-A-118 Test, Schlyter Method, Radiant Panel Test, Twenty-Five-Foot Tunnel Test, Eight-Foot Tunnel Test, SURD 16-Foot Tunnel Test, Two-Foot Tunnel Test, Heat Resistance, 400 F Test, 1200 F Test (on aluminun paint), 1400 F Test, ASTM Heat/Service Test, Melting Point Bars for Testing Heat-Resistant Paint, Houston Heat Resistant Tester, New Jersey Zinc Company HeatResistant Tester, Spontaneous Combustion, Mackey Apparatus for Spontaneous Combustion, Sawdust Method, Louisville Methods

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.