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.
1. OPTICAL PROPERTIES COLOUR AND LIGHT

2. GLOSS

3. HIDING POWER

4. MASS COLOR AND TINTING STRENGTH

5. PHYSICAL PROPERTIES
   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
Method, Baker-Martin Method, Dunn Method for Specific Gravity of Pigments, Calculating Specific Gravity of
Jersey Zinc Company (NJZ) Test, Hancock-Brown Test, Arnold Test, New Jersey Zinc Company (NJZ)
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 Data, Rotational Viscometers, Brookfield
Viscometer, MacMichael Viscometer, Krebs-Stormer Viscometer, Brabender Recording Viscometer, Kämpf
Viscometer, The Wolffes-
Hoepke Turbomicroviscometer, 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,
Clavoe Consistometer, Influx Viscometer, Flowmeters, Gardner Flowmeters, Flowmeters, Included 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 Leveling-Comb 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, Titling 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,
Velvation, 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
Microradiography Technique

9. OIL ABSORPTION OF PIGMENTS

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

10. FILMS FOR TESTING PREPARATION OF FILMS FOR TEST

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, Garner Carboly 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

13. MECHANICAL PROPERTIES OF FILMS
HARDNESS AND RELATED PROPERTIES

14. ABRASION RESISTANCE

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,
von 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
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 Vertical Match Test, Crib Test, Fire-Tree
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 aluminum paint), 1400 F Test, ASTM Heat/Service Test,
Melting Point Bars for Testing Heat-Resistant Paint, Houston Heat Resistant Tester, New Jersey Zinc
Company Heat-Resistant Tester, Spontaneous Combustion, Mackey Apparatus for Spontaneous
Combustion, Sawdust Method, Louisville Methods

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