Formulation and Manufacturing Process of Paints, Pigments, Varnishes and Enamels
Paint is any liquid, liquefiable, or mastic composition that, after application to a substrate in a thin layer, converts to a solid film. It is most commonly used to protect, color, or provide texture to objects. Paint can be made or purchased in many colors—and in many different types, such as watercolor, synthetic, etc. Paint is typically stored, sold, and applied as a liquid, but most types dry into a solid.
A pigment is a material that changes the color of reflected or transmitted light as the result of wavelength-selective absorption. This physical process differs from fluorescence, phosphorescence, and other forms of luminescence, in which a material emits light.

Many materials selectively absorb certain wavelengths of light.
Materials that humans have chosen and developed for use as pigments usually have special properties that make them ideal for coloring other materials. A pigment must have a high tinting strength relative to the materials it colors. It must be stable in solid form at ambient temperatures.
Varnish is a transparent, hard, protective finish or film that is primarily used in wood finishing but also for other materials. Varnish is traditionally a combination of a drying oil, a resin, and a thinner or solvent. Varnish finishes are usually glossy but may be designed to produce satin or semi-gloss sheens by the addition of "flatting" agents. Varnish has little or no color, is transparent, and has no added pigment, as opposed to paints or wood stains, which contain pigment and generally range from opaque to translucent.
Varnishes are also applied over wood stains as a final step to achieve a film for gloss and protection. Some products are marketed as a combined stain and varnish.
Enamel paint is paint that air dries to a hard, usually glossy, finish, used for coating surfaces that are outdoors or otherwise subject to hard ware or variations in temperature; it should not be confused with decorated objects in "painted enamel", where vitreous enamel is applied with brushes and fired in a kiln.
The name is something of a misnomer, as in reality, most commercially available enamel paints are significantly softer than either vitreous enamel or stoved synthetic resins, and are totally different in composition; vitreous enamel is applied as a powder or paste and then fired at high temperature. There is no generally accepted definition or standard for use of the term enamel paint, and not all enamel-type paints may use it.
Market Outlook

The market size of the Indian paints sector has been pegged at Rs 170 bn in value terms and is very fragmented. While in value terms, the industry grew by 17% to 18% in FY09, in volume terms, the growth stood at 9% YoY, the lowest in the last five years. The per capita consumption of paints in India stands at 0.5 kg per annum as compared to 1.6 kgs in China and 22 kgs in the developed economies. India's share in the world paint market is just 0.6%.
Indian paint market is expected to reach 49,545 INR Crs by 2016 - 17, decorative market will continue to grow and would have higher share compared to industrial paints.

The decorative paint market is expected to witness CAGR of 12.7 per cent and the industrial paint market CAGR of 9.5 per cent.
The Indian paint market will grow with a CAGR of around 14% during 2015-16 to 2019-20.

Demand for interior paint is forecast to grow 2.9% per year to 535 million gallons in 2020.
Interior Paint in the Residential Market to offer Best Growth opportunities through 2020
Global Production of Paints and Coatings

[Diagram showing global production distribution with categories like China, Europe, North America, India, Other Asia, Middle East, Central/South America, Africa, CIS, South Korea, Other, and Japan.]
Paints and varnishes production expected to post 10.9% CAGR over 2015-2020, due to a healthy construction sector and expected growth of automotive production capacity.

The global pigments market is expected to reach revenues of $34.2 billion USD by 2020.
Pigment Market

- Coatings: 54.9%
- Plastics: 12.9%
- Inks: 4.5%
- Cosmetics: 3.4%
- Textiles: 1.1%
- Electronics: 0.9%
- Non-impact printing: 22.4%
Table of Contents

1. TESTING OF RAW MATERIALS FOR COATINGS

- Pigments
- Oil Absorption
- Color
- Tinting Strength of Colored pigments
- Tinting Strength of White Pigments
- Coarse Particles
- Oils
• Mono-Di-and Triglycerides
• Instrumental Analysis of Oils
• Gas Chromatography
• Resins, Polymers, Plasticizers
• Solvents
2. PAINT TESTING

- Importance of testing
- Classification
- Discernment of Appropriate Qualities
- Selection of Test
- Conduct of Test
- Interpretation of Results
- Establishment of Standard Variances
- Color Testing
- Incorrect Standards And Test Procedures in Industry
- Statistical Analysis
3. COLOR IN PAINT

• Visible Spectrum
• Three Dimensions of Color
• Tristimulus Values X, Y, Z
• Chromaticity Coordinates
• Color Order Systems
• Sample Preparation for Color Measurement
• Tolerance Specification
• Color Control by Visual Observation
• Color Control by Instrumentation
• Mac Adam Tolerances
• Instrument Accuracy for Tolerance Limitations
• Gloss and Its Effect on Color
• Light Sources For Color Matching
• Color Formulation
4. MAINTENANCE PAINTS

- Paint Types and Selection
- Barrier Protection
- Sacrificial Protection
- Coating Types
- Resistances
- Description by Generic Types
- Oil Derived
- Sacrificial Metal
- Silicones
- Thermosetting Resins
- Neoprene
- Waxes and Greases
- Bitumens
- Rubber Base
- Vinyl Chloracetate
- Principles of Effective Maintenance Painting
- Failure Mechanism
- Coating Thicknesses
- Number of Coats
- Wood
- Nonferrous Metals
- Effect of Exposure
- Paint System and Application
- Surface Preparation
- Priming
- Intermediate and Finish Coating
5. EMULSION PAINTS

- Ingredients of an Emulsion Paint
- Surfactants
- Structure of Surfactants
- Types of Surfactants
- Behavior of Emulsions
- Protective Colloid
- pH
- Emulsion Formation
- Emulsion Polymerization
- Polymerization.
- Ingredients
- Post-emulsification
- Stability of Emulsions
6. EXTERIOR OR INTERIOR PAINTS

- Exterior or Interior White Medium Texture Masonary Paint
- (TT-C-00555) (Styrene-Acrylate/Chlorinated Paraffin)
- Exterior or Interior White Medium Texture Masonary Paint
- (TT-C-00555) (Styrene-Acrylate/Chlorinated Paraffin/Resin)
- Exterior or Interior White Medium Texture Masonry Paint
- (TT-C-00555) (Styrene-Butadiene/Chlorinated Paraffin)
- Exterior or Interior White Medium Texture Masonry Paint
- (Vinyl Toluene-Acrylate/Chlorinated Paraffin)
- Exterior or Interior White Medium Texture Masonry Paint
- (TT-C-00555) (Vinyl Toluene-Butadiene/Chlorinated Paraffin)
- Exterior or Interior General Purpose Aluminum Paint (Alkyd)
- Exterior or Interior General-Purpose High-Quality Aluminum Paint (Coumarone-Indene/Menhaden Oil)
7. EXTERIOR OR INTERIOR MULTICOLOR PAINTS

- Exterior or Interior White Multicolor Paint
  (Vinyl Toluene-Butadiene)
- Exterior or Interior Tint Base Multicolor Paint
  (Vinyl Toluene-Butadiene)
- Exterior or Interior Black Multicolor Paint
  (Vinyl Toluene-Butadiene)
- Exterior or Interior Red Multicolor Paint
  (Vinyl Toluene-Butadiene)
- Exterior or Interior Varnish
- Exterior or Interior Clear Varnish (Polyurethane)
8. EXTERIOR SWIMMING POOL PAINTS AND ENAMELS

- Exterior White Swimming Pool or Masonry Paint (Chlorinated Rubber/Hydrocarbon Resin/Chlorinated Paraffin)
- Exterior Semigloss Blue Swimming Pool Paint (TT-P-95A) (Styrene-Acrylate)
- Exterior Gloss Blue Swimming Pool Paint (Styrene-Acrylate)
• Exterior Gloss Blue Swimming Pool Paint
  (TT-P-95A) (Styrene-Acrylate)
• Exterior Blue Swimming Pool Enamel
  (Chlorinated Rubber/Chlorinated Paraffin)
• Exterior Light Green Swimming Pool Enamel
  (Two Component: Urethane-Catalyst)
9. INTERIOR CEILING PAINTS

- Interior Flat White Ceiling Paint (Alkyd)
- Interior Flat White Ceiling Paint (Alkyd)
- Interior Flat White Ceiling Paint (Alkyd)
- Interior Flat White High-Quality Low Cost Ceiling Paint (Alkyd)
10. METAL PAINTS

- Ready-Mix Aluminum Paint
- (Linseed Oil)
- Galvanized Metal Primer
- Zinc Chromate Primer
- Specification of Suspension Properties
- Lower Cost Utility Red Oxide Primer
- Corrosion Resistant Top Coat
- Deep Yellow Aerosol Enamel
- Gray Automotive Enamel
- Gray Automotive Enamel
- Implement Enamel
• Screw-Cap Coating
• White Coating for Can Bodies
• Metal Protective Coating
• Valve and Actuator Selection
• Application
• Zinc Rich Primer
• Zinc Chromate Primer
• Iron Oxide - Zinc Chromate Primer
• Epoxy-Ester Zinc Chromate Spraying Primer
• Lead Silico Chromate Primer
• Baking Primers
• Red Lead Metal Primer
• Uses
• Red Lead/Red Iron Oxide General Purpose Flash Dry Primer
• Iron Oxide Primer
• Red Primer
• Automotive Flash Primer
• Strontium Chromate Primer
• Appliance and Metal Furniture Primer
• Detergent-Resistant Appliance Primer
• Stainless Steel Industrial Maintenance Primer
• Gray Baking Sanding Primer Surfacer
• Uses
• White Appliance Enamel
• Epoxy White Gloss Enamel
• White Enamel
• White Brushing Enamel
• White Metal Deco Enamel
• Machinery Enamel
• Gray Enamel
• Epoxy Green Enamel
• Clear Epoxy Coating
• Application
• Epoxy Clear Film
• Black Aerosol Enamel
• Gray Spraying Finish
• Uses
• Unpigmented Can Coating
• Can Coating and Drum Lining
• Unpigmented Drum Lining
• Clear Interior Drum Lining
• Uses
• Unpigmented Tank Lining
• High Solids Tank Liner
• Chemical Resistant Metal Coating
• White Roller Coat Tube Enamel
• Red Lead-Iron Oxide Mastic Coating
• Resin Coating
• Procedure
• Aluminum Paint
• Interior Mill White Gloss Enamel
• (Triamino-Ester)
• Coil Coating - Resistant Siding Type
• Polyester White Coil Coating Enamel
• White High Gloss Electrocoating
• Primer for Galvanized
• Red Iron Oxide Primer
• Procedure
• Dark Grey Single Coat or Primer
• Beige Single Coat
• Latex Maintenance Enamels
• Exterior Latex Metal Paint
• Interior Latex Flat Wall Paint for Machine and Tube
• Colorants -
• Latex Aluminum Paint
• Latex Aluminum Paint
• Zinc Chromate, Corrosion Inhibiting Primer
• Maintenance Primer
• Acrylic Lacquer Aerosol Metal Coating
• Package
• Directions for Use
• Precautions
• Aerosol Aluminum Enamel
• Aerosol High Temperature Aluminum Paint
• Package
• Directions for use
• Precautions
• Lead Primer
• Lead Silico Chromate Primer
• Anticorrosive Primer
• Anticorrosive Chlorinated Rubber Thick Coatings Primers
• Anticorrosive Chlorinated Rubber Topcoats
• Thixotropic Zinc Chromate Primer
11. MARINE PAINTS

- Marine Anticorrosive Primer High Flash Point Solvent
- Marine Anti-Fouling Ship-Bottom Paint with High Flash Point
- Marine Vinyl/Alkyd Enamel (Black)
- Grey Marine Vinyl/Alkyd Enamel
- Zinc Dust Primer
- Underwater Coating
- Composition of Rosin-Vinyl Antifouling Paints (Nonvolatile Portion Only)
- Rosin Antifouling Coatings
- Chlorinated Rubber Marine High-Build Coatings with Inhibiting Pigment for Airless Spray
• Metallic Lead Primer
• Chlorinated Rubber Antifouling Coatings
• Chlorinated Rubber Antifouling Marine Paint System
• (Metallic Coatings)
• (Thick Coatings)
• (Antifouling Topcoat)
• Marine Coating for Cold, Damp Weather Application
• Marine Primer for Cold, Damp Weather Application
• Tri-Amino Marine Enamel
• Tri-Amino Marine Spar Varnish
12. ENAMEL PAINTS

- Semi-Gloss Enamel
- White Semi-Gloss Enamel
- Dark Green Porch and Deck Enamel
- High Quality Semi-Gloss Enamel
- Black Rapid-Dry Enamel
- Gloss White Architectural Enamel
- Semigloss Tint Base
- Odorless Alkyd Gloss Enamel
- Odorless High Gloss White
- Nonpenetrating Semi-Gloss
- Nonpenetrating Gloss Enamel
• Spraying Red Automotive Enamel
• Alkyd Aerosol Enamels
• Aerosol Packing
• White Aerosol Enamel
• Deep Yellow Aerosol Enamel
• Stipple Gloss Enamel
• High Solids, Light Blue Enamel
• Preparation of Base Component
• High Solids, Beige Enamel
• Preparation of Base Component
• White Tinting Enamel
• Black Aerosol Enamel
• White Aerosol Enamel
• Epoxy-Amine High Solids White Spray Coating
• Epoxy Solventless Enamel
• Gloss Enamel
• Semigloss Enamel
• Painter Enamel
• Gray High Solids Epoxy-Polyamide Spraying Enamel
• Vanoxy Green, Enamel
• Red Epoxy Enamel
• Epoxy Green Enamel
• Epoxy White Enamel
• Yellow Gloss Epoxy Enamel
• Gloss White Enamel
• Blue Gloss Enamel
• Yellow Industrial Enamel
• Automotive and Equipment White Enamel
• Bright Red Automotive Enamel
• Industrial Orange Enamel
13. INTERIOR FIRE-RETARDANT PAINTS

- Interior Intumescent Fire-Retardant White Paint
- Interior Intumescent Fire-Retardant White Paint
- Interior Intumescent Fire-Retardant White Paint
- Interior Intumescent Fire-Retardant White Paint
- Interior Fire-Retardant White Paint
14. INTERIOR GLOSS PAINTS

- Interior Gloss White Paint (Acrylic)
- Interior Gloss White Paint (Acrylic)
- Interior Gloss White Paint (Acrylic)
- Interior Gloss White Paint (Acrylic)
- Interior Gloss White Paint (Acrylic)
- Interior Gloss White Paint (Acrylic/Vinyl Acetate-Acrylic)
- Interior Gloss White Paint (Acrylic/Vinyl Acetate-Acrylic)
- Interior Gloss White Paint (Latex)
- Interior Gloss White Paint (Styrene-Acrylate)
- Interior Gloss White Paint (Vinyl Acetate)
• Interior Gloss White Paint (Vinyl Acetate-Acrylic)
• Interior Gloss White Paint [Vinyl Acetate-Acrylic(S)]
• Interior Gloss White Paint (Vinyl Acetate-Ethylene)
• Interior Gloss White Paint (Vinyl Acetate-Ethylene)
• Interior Gloss White Paint (TT-p-1511A, Type II) (Acrylic)
• Interior Full Gloss White Paint (Acrylics)
• Interior High Gloss White Paint (Acrylic)
• Interior Gloss White And Tint Base Paint (Vinyl Acetate)
• Interior Gloss White And Tint Base Paint
• Interior Gloss White and Tint Base Paint
• Interior Gloss White And Tint Base Paint
• (Vinyl Acetate - Ethylene)
• Interior Gloss Tint Base Paint (Vinyl Acetate-Ethylene)
• Interior gloss enamels
• Interior Gloss White Enamel (Acrylic)
• Interior Gloss White Enamel (Acrylic-Styrene/Alkyd)
• Interior Gloss White Enamel (Alkyds)
• Interior High Gloss White Enamel (Acrylic)
• Interior High Quality Gloss White Enamel (Acrylic)
• Interior High Quality Gloss White Enamel (Acrylic)
• Interior High Quality Gloss White Enamel (Acrylic)
• Interior High Quality Gloss White Enamel (Acrylic)
• Interior High Quality Gloss White Enamel (Acrylic)
• Interior High Quality Gloss White Enamel (Acrylic)
• Interior Medium Cost Gloss White Enamel (Acrylic)
• Interior Gloss White And Tint Base Enamel (Acrylic)
• Interior Gloss White And Tint Base Enamel (Alkyd)
• Interior High Gloss White And Tint Base Enamel (Alkyds)
15. INTERIOR SEMIGLOSS WHITE PAINTS

- Interior Semigloss White Paint (Acrylic)
- Interior Semigloss White Paint (Acrylic)
- Interior Semigloss White Paint (Acrylic)
- Interior Semigloss White Paint (Acrylic)
- Interior Semigloss White Paint (Acrylic)
- Interior Semigloss White Paint (Acrylic)
- Interior Semigloss White Paint (Acrylic)
- Interior Semigloss White Paint (Acrylic)
- Interior Semigloss White Paint (Vinyl Acetate-Acrylic)
- Interior Semigloss White Paint (Vinyl Acetate-Acrylic)
• Interior Semigloss White Paint (Vinyl Acetate-Acrylic)
• Interior Semigloss White Paint (Vinyl Acetate-Acrylic)
• Interior Semigloss White Paint (Vinyl Acetate-Acrylic)
• Interior Semigloss White Paint (Vinyl Acetate-Acrylic)
• Interior Semigloss White Paint (Vinyl Acetate-Acrylic)
• Interior Semigloss White Paint (Vinyl Acetate-Acrylic)
• Interior High Quality Semigloss White Paint (Vinyl Acetate)
• Interior High Quality Semigloss White Paint (Vinyl Acetate-Acrylic)
• Interior High Quality Semigloss White Paint (Vinyl Acetate-Acrylic)
• Interior High Quality Semigloss White Paint (Vinyl Acetate-Acrylic)
- Interior High Quality Semigloss White Paint (Vinyl Acetate-Acrylic)
- Interior High Quality Semigloss White Paint (Vinyl Acetate-Acrylic)
- Interior Low Cost Semigloss White Paint (Acrylic)
- Interior Low Cost Semigloss White Paint (Acrylic)
- Interior Low Cost Semigloss White Paint (Acrylic)
- Interior Low Cost Semigloss White Paint (Acrylic)
- Interior Low Cost Semigloss White Paint (Vinyl Acetate)
- Interior Low Cost Semigloss White Paint (Vinyl Acetate-Acrylic)
- Interior Medium Priced Semigloss White Paint
• (Vinyl Acetate-Acrylic)
• Interior Medium Priced Semigloss White Paint
• (Vinyl Acetate-Acrylic)
• Interior Semigloss White and Tint Base Paints
• Interior Semigloss White and Tint Base Paint (Acrylic)
• Interior Semigloss White and Tint Base Paint
• (Vinyl Acetate)
• Interior High Quality Semigloss White and Tint Base Paint (Acrylic)
• Interior Low Cost Semigloss White and Tint Base Paint
• (Vinyl Acetate)
• Interior Low Cost Semigloss White and Tint Base Paint
• (Vinyl Acetate)
• Interior Low Cost Semigloss White and Tint Base Paint
• (Vinyl Acetate-Acrylic)
• Interior Semigloss Tint Base Paint
• Interior Semigloss Tint Base Paint (Acrylic)
• Interior Semigloss Tint Base Paint (Acrylic)
• Interior Semigloss Tint Base Paint (Acrylic)
• Interior Semigloss Tint Base Paint (Acrylic)
• Interior Semigloss Tint Base Paint (Acrylic)
• Interior Semigloss Medium Tint Base Paint (Acrylic)
• Interior Semigloss Pastel Tint Base Paint (Acrylic)
• Interior High Quality Semigloss Tint Base Paint (Acrylic)
• Interior Semigloss Enamel
• Interior Semigloss White Enamel (Acrylic)
• Interior Semigloss White Paint (Acrylic)
• Interior Semigloss White Enamel (Acrylic)
• Interior Semigloss White Enamel (Acrylic)
• Interior Medium Gloss White Enamel (Acrylic)
• Interior Medium Gloss White Enamel (Acrylic)
• Interior High Quality Semigloss White Enamel (Acrylic)
• Interior High Quality Semigloss White Enamel (Acrylic)
• Interior High Quality Semigloss White Enamel (Acrylic)
• Interior Low Cost Semigloss White Enamel (Vinyl Acetate)
• Interior Moderate Cost Semigloss White Enamel (Acrylic)
• Interior Semigloss White and Tint Base Enamel (Alkyd)
• Interior Semigloss White and Tint Base Enamel (Alkyd)
• Interior Semigloss White and Tint Base Enamel (Vinyl-Acetate Acrylic)
• Interior High Semigloss White and Tint Base Enamel (Alkyd/Acrylic)
16. PAINT FORMULATION

- Art
- Science
- Raw Materials
- Manufacture
- Cost
- Performance
- Principles
- Pigment - Volume Concentration
- Critical Pigment Volume Concentration
• Pigments
• Vehicle
• Solvents and Driers
• Formulation Example
• White House Paint
• Computer
17. MANUFACTURING TECHNOLOGY

1. Process Technology
   1.1 Paint Manufacture
   1.2 Powder Coating Manufacture
   1.3 Resin Manufacture
2. Equipments
3. Laboratory Equipment
4. Quality Control
5. Automation
18. THE MANUFACTURE OF NATURAL COPAL VARNISHES

- Disintegration or Size Reduction of the Copal
- Method of Heating
- Stirring
- Capacity of the Kettle
- Condensation of Vapours
- Addition of Drying Oil
- Addition of Driers Lithorge, etc.
- Addition of Liquid Driers and Thinners
- Temperature Measurement
• Discharging
• Access to the Inside of the Kettle
• Flanged or Welded Bottoms
• Choice of Metal
• Special Accessories
• Fire Risks
• Special Plant Designs
• Choice of Running Kettle
• General Plant Arrangement
19. THE MANUFACTURE OF BLACK VARNISHES

- Charging the Vessel with Bitumen
- Heating and Sweating
- Addition of Resin
- Addition of Oil
- Addition of Driers
- Cooling and Thinning
- Cleansing
- Storage
- Oil-free Black Varnishes
- Special Equipment
20. THE MANUFACTURE OF SPIRIT VARNISHES

- Spirit Manila Varnishes
- Shellac Varnishes
- Accroides Varnishes
- Oxidised Rosin Varnishes
- Phenolic Resin Varnishes
- Urea-formaldehyde Resin Varnishes
- Hydrocarbon Base Varnishes
21. FLOOR PAINTS AND ENAMELS

- Medium Tint Base Paint (Vinyl Acetate-Acrylic/Epoxy)
- Gray Floor Paint (Acrylic)
- Green Floor Paint (Vinyl Acetate-Acrylic/Epoxy)
- Red Floor Paint (Vinyl Acetate-Acrylic/Epoxy)
- Gray Floor Enamel (Acrylic/Alkyd)
22. INTERIOR CONCRETE PAINTS AND ENAMELS

- Interior White Concrete Floor Paint (TT-P-0091D) (Styrene-Butadiene)
- Interior Brown Concrete Enamel (Styrene-Butadiene)
- Interior Battleship Gray Concrete Enamel (Styrene-Butadiene)
- Interior Light Gray Concrete Enamel (Styrene-Butadiene)
• Interior Olive Gray Concrete Enamel (Styrene-Butadiene)
• Interior Silver Gray Concrete Enamel (Styrene-Butadiene)
• Interior Dark Green Concrete Enamel (Styrene-Butadiene)
• Interior Tile Red Concrete Enamel (Styrene-Butadiene)
• Interior Yellow Concrete Enamel (Styrene-Butadiene)
23. EXTERIOR WHITE ENAMELS

- Exterior Low Gloss White Low-Odor Enamel (Two-Component, Epoxy-Polyester)
- Exterior Low Gloss White Low-Odor Enamel (A.P.A. Approved) (Two-Component, Epoxy-Polyester)
- Exterior Low Gloss White Low-Odor Enamel (A.P.A. Approved) (Two-Component, Epoxy-Polyester)
- Exterior Low Gloss White Low-Odor Enamel (TT-C-545D Type) (Two-Component, Epoxy-Polyester)
- Exterior Semigloss White Enamel (Alkyd)
• Exterior Semigloss White Enamel (TT-E-490B) (Alkyd)
• Exterior Semigloss White Low-Odor Enamel (Two-Component: Epoxy Polyester)
• Exterior Semigloss White Low-Odor Enamel (Two-Component: Epoxy-Polyester)
• Exterior Semigloss White Enamel (Styrene-Acrylate)
• Exterior Semigloss White Enamel (Styrene-Acrylate)
• Exterior Gloss White Color-Retentive Enamel (Acrylic)
• Exterior Gloss White Enamel (Alkyd)
- Exterior Gloss White Fast-Drying Enamel (Alkyd)
- Exterior Gloss White Fast-Drying Enamel (Alkyd)
- Exterior Gloss White Odorless Enamel (Alkyd)
- Exterior Gloss White Trim Enamel (Alkyd)
- Exterior Gloss White Enamel (Two-Component: Epoxy-Polyester)
- Exterior Gloss White Low-Odor Enamel (Two-Component: Epoxy-Polyester)
- Exterior Gloss White Enamel (Oxazoline)
• Exterior Gloss White Enamel (Styrene-Acrylate)
• Exterior Gloss White Enamel (Styrene-Acrylate)
• Exterior Gloss White Marine and General Purpose Low-Cost Enamel (Urethane)
• Exterior White Rapid-Drying Enamel (Alkyd)
• Exterior White Enamel (Urethane)
• Exterior White Tile-Like Enamel
• (Two-Component: Urethane-Catalyst)
24. EXTERIOR OR INTERIOR ENAMELS

- Exterior or Interior Gloss White Enamel (Alkyd)
- Exterior or Interior Gloss White Enamel (Alkyd)
- Exterior or Interior Gloss Blue Enamel
  (Alkyd/Hydrocarbon Resin)
- Exterior or Interior Gloss Gray Enamel
  (Alkyd/Hydrocarbon Resin)
- Exterior or Interior Gloss Green Enamel
  (Alkyd/Hydrocarbon Resin)
- Exterior or Interior Gloss Yellow Enamel
  (Hydrocarbon Resin)
25. VARNISHES, LACQUERS AND FLOOR FINISHES

- Cold-Blend Spar Varnish Metal
- General-Purpose Utility Varnish
- Crown Cap Varnish
- Furniture Rubbing Varnish
- Four-Hour Floor and Trim Varnish
- Clear Floor Varnish
- Flatted Alkyd Varnish
- Alkyd Rubber Lacquer
- Epoxy Clear Coating
- Epoxy-Amine Clear Coating
• Epoxy Clear Coating
• Clear Flexible Epoxy-Amine Exterior Coating
• Flatting Base
• Clear Varnish
• Gray Floor Enamel
• MFMA Gym Floor Finish â€“ 40% Solids
• General Purpose Varnish â€“ 50% Solids.
• Marine Spar Varnish
• Chemically Resistant Varnish
• Overpaint Varnish
• Porch and Deck Varnish
• Venetian Blend Varnish
• Clear Acrylic Lacquer
• Directions for Use
• Package
• Precautions
• Acryloid Acrylic Wood Lacquer
• Protective Acrylic Coating for Copper Metal
• Acrylic Lacquer
• Clear Sanding Sealer
• Varnish
• Maroon Floor Varnish
• (Phenolic Resin)
• Shellac Primer Sealer
• Furniture Lacquer
• Cold-Blend Floor Varnish
• Maroon Floor Paint
• Vehicle
• Gray Floor Enamel
• Dull Finish Varnish
• Flooring Primer
• Green Floor Enamel
• Red Floor Enamel
26. PIGMENTS - GENERAL CLASSIFICATION AND DESCRIPTION

- Part A. Pigment Classification
- Definition of Paint
- The Functions of Pigments in Paint
- Types of Pigments
- Principles of Hiding Power
- The Hiding Power of Paint
- Part B. Supplemental Pigments
• Definition
• History
• White Pigment Evaluation Methods
• General Properties of Supplemental Pigments
• Manufacture of Supplemental Pigments
• The Major Supplemental Pigments
• The Future of Supplemental Pigment Technology
27. WHITE PIGMENTS

- Opacity
- The Reactive White Pigments
- Basic Carbonate White Lead

28. COLORED PIGMENTS

- Chrome Yellows
- Zinc Yellows
- Strontium Yellow
- Nickel Titanate Yellow
- Nickel Azo Yellow
• Cadmium Yellow
• Yellow Iron Oxide
• Hansa Yellows
• Benzidine Yellows
• Vat Yellows
• Chrome Orange
• Molybdate Orange
• Cadmium Orange
• Mercadium Orange
• Benzidine Orange
• Dinitraniline Orange
• Vat Dye Oranges
• Chrome Greens
• Chromium Oxide
• Hydrated Chromium Oxide
• Copper Phthalocyanine Green
• Organic Green Toners
• Iron Blues
• Copper Phthalocyanine Blues
• Ultramarine Blue
• Organic Blue Toners
• Indanthrone Blue
• Carbazole Dioxazine Violet
- Organic Violet Toner
- Mineral Violet
- Quinacridone Violet
- Lithols
- Para Reds
- Toluidine Reds
- BON (-OxynaphthOic) Reds and Maroons
- Lithol Rubine
- Chlorinated Para Red
- Quinacridone reds and maroons
- Red Iron Oxide
- Cadmium Red and Maroons
• Mercadium Reds and Maroons
• Red Lead
• Thioindigo Reds and Maroons
• Arylide Maroons
• Siennas, Ochers and Umbers
• Carbon Blacks, Lampblacks and Bone Blacks
• Tinting Properties of Colored Pigments
• Chrome Yellows
• Zinc Yellows
• Basic Zinc Chromate
• Strontium Yellow
• Nickel Titanate Yellow
- Nickel Azo Yellow
- Cadmium Yellow
- Yellow Iron Oxide
- Hansa Yellow
- Benzidine Yellow
- Vat Yellows
- Chrome Orange
- Molybdate Orange
- Cadmium Orange
- Mercadium Orange
• Benzidine Orange
• Dinitraniline Orange
• Vat Dye Orange
• Chrome Greens
• Chromium Oxide
• Hydrated Chromium Oxide
• Copper Phthalocyanine Green
29. PIGMENT DISPERSION

- Definition
- Method
- Equipment
- Mill Base Formulation
- Setting up a Laboratory Formula
- Equipment Setups and Limitations
- Tank Configuration
- Premixers
- Conclusions
30. PLASTICIZERS

- History
- Theory
- Properties
- Compatibility
- Efficiency
- Permanence
- Stability
- Odor, Taste, Toxicity, Color, etc.
- Classification of Plasticizers
- Monomeric Chemical Plasticizers
- Polymeric
- Oil and Fatty Acid Derivatives
31. OXYGENATED SOLVENTS

- Ester Solvents
- Ketone Solvents
- Glycol Ether Solvents
- Alcohols
- Other Solvents
- Solvent Properties
- Resin Solubility
- Evaporation Rate
- Solvent Strength
- Flash Point
• Odor
• Water Sensitivity
• Pounds per Gallon
• Formulation of Solvent Systems
• Nitrocellulose
• Vinyl Copolymer Resins
• Acrylics
• Epoxy
32. WOOD COATINGS

- Procedure
- Blister-Resistant Oil-Based Primer

33. PAINT AND VARNISH REMOVERS

- Paint Removal
- Formulation
- Solvent Paint and Varnish Removers
- Solvents
- Co-solvent
34. THE MANUFACTURE OF PAINT REMOVERS

- Activators
- Chemical Removers
- Nonchlorinated Solvent Paint Removers
- Removal of Epoxies
- Mechanism of Paint Removal
- Methods of Paint Removal

See more
https://goo.gl/2fleHr
https://goo.gl/4nJkSw
https://goo.gl/Mz3xNa
VISIT US AT

www.entrepreneurindia.co
Take a look at Niir Project Consultancy Services on #Street View
https://goo.gl/VstWkd

Locate us on Google Maps
https://goo.gl/maps/BKkUtq9gevT2

www.entrepreneurindia.co
Our inexhaustible Client list includes public-sector companies, Corporate Houses, Government undertaking, individual entrepreneurs, NRI, Foreign investors, non-profit organizations and educational institutions from all parts of the World. The list is just a glimpse of our esteemed & satisfied Clients.

Click here to take a look
https://goo.gl/G3ICjV
Selection process starts with the generation of a product idea. In order to select the most promising project, the entrepreneur needs to generate a few ideas about the possible projects. Here’s we offer a best and easiest way for every entrepreneur to searching criteria of projects on our website www.entrepreneurindia.co that is “Instant Online Project Identification and Selection”
NPCS Team has simplified the process for you by providing a "Free Instant Online Project Identification & Selection" search facility to identify projects based on multiple search parameters related to project costs namely: Plant & Machinery Cost, Total Capital Investment, Cost of the project, Rate of Return% (ROR) and Break Even Point % (BEP). You can sort the projects on the basis of mentioned pointers and identify a suitable project matching your investment requisites.

Click here to go

http://www.entrepreneurindia.co/project-identification
Contact us

Niir Project Consultancy Services
106-E, Kamla Nagar, Opp. Spark Mall,
New Delhi-110007, India.
Email: npcs.ei@gmail.com , info@entrepreneurindia.co
Tel: +91-11-23843955, 23845654, 23845886, 8800733955
Mobile: +91-9811043595
Website : www.entrepreneurindia.co , www.niir.org
Take a look at NIIR PROJECT CONSULTANCY SERVICES on #StreetView

https://goo.gl/VstWkd
Niir Project Consultancy Services

AN ISO 9001:2008 COMPANY

www.entrepreneurindia.co
Who are we?

- One of the leading reliable names in industrial world for providing the most comprehensive technical consulting services.

- We adopt a systematic approach to provide the strong fundamental support needed for the effective delivery of services to our Clients’ in India & abroad.
We at NPCS want to grow with you by providing solutions scale to suit your new operations and help you reduce risk and give a high return on application investments. We have successfully achieved top-notch quality standards with a high level of customer appreciation resulting in long lasting relation and large amount of referral work through technological breakthrough and innovative concepts. A large number of our Indian, Overseas and NRI Clients have appreciated our expertise for excellence which speaks volumes about our commitment and dedication to every client's success.
We bring deep, functional expertise, but are known for our holistic perspective: we capture value across boundaries and between the silos of any organization. We have proven a multiplier effect from optimizing the sum of the parts, not just the individual pieces. We actively encourage a culture of innovation, which facilitates the development of new technologies and ensures a high quality product.
What do we offer?

- Project Identification
- Detailed Project Reports/Pre-feasibility Reports
- Business Plan
- Industry Trends
- Market Research Reports
- Technology Books and Directory
- Databases on CD-ROM
- Laboratory Testing Services
- Turnkey Project Consultancy/Solutions
- Entrepreneur India (An Industrial Monthly Journal)
We have two decades long experience in project consultancy and market research field

We empower our customers with the prerequisite know-how to take sound business decisions

We help catalyze business growth by providing distinctive and profound market analysis

We serve a wide array of customers, from individual entrepreneurs to Corporations and Foreign Investors

We use authentic & reliable sources to ensure business precision
Our Approach

- Requirement collection
- Thorough analysis of the project
- Economic feasibility study of the Project
- Market potential survey/research
- Report Compilation

www.entrepreneurindia.co
Who do we serve?

- Public-sector Companies
- Corporates
- Government Undertakings
- Individual Entrepreneurs
- NRI’s
- Foreign Investors
- Non-profit Organizations, NBFC’s
- Educational Institutions
- Embassies & Consulates
- Consultancies
- Industry / trade associations
Sectors We Cover

- Ayurvedic And Herbal Medicines, Herbal Cosmetics
- Alcoholic And Non Alcoholic Beverages, Drinks
- Adhesives, Industrial Adhesive, Sealants, Glues, Gum & Resin
- Activated Carbon & Activated Charcoal
- Aluminium And Aluminium Extrusion Profiles & Sections,
- Bio-fertilizers And Biotechnology
- Breakfast Snacks And Cereal Food
- Bicycle Tyres & Tubes, Bicycle Parts, Bicycle Assembling
Sectors We Cover cont...

- Bamboo And Cane Based Projects
- Building Materials And Construction Projects
- Biodegradable & Bioplastic Based Projects
- Chemicals (Organic And Inorganic)
- Confectionery, Bakery/Baking And Other Food
- Cereal Processing
- Coconut And Coconut Based Products
- Cold Storage For Fruits & Vegetables
- Coal & Coal Byproduct
Sectors We Cover cont...

- Copper & Copper Based Projects
- Dairy/Milk Processing
- Disinfectants, Pesticides, Insecticides, Mosquito Repellents, Electrical, Electronic And Computer based Projects
- Essential Oils, Oils & Fats And Allied
- Engineering Goods
- Fibre Glass & Float Glass
- Fast Moving Consumer Goods
- Food, Bakery, Agro Processing
Sectors We Cover

- Fruits & Vegetables Processing
- Ferro Alloys Based Projects
- Fertilizers & Biofertilizers
- Ginger & Ginger Based Projects
- Herbs And Medicinal Cultivation And Jatropha (Biofuel)
- Hotel & Hospitality Projects
- Hospital Based Projects
- Herbal Based Projects
- Inks, Stationery And Export Industries
Sectors We Cover

- Infrastructure Projects
- Jute & Jute Based Products
- Leather And Leather Based Projects
- Leisure & Entertainment Based Projects
- Livestock Farming Of Birds & Animals
- Minerals And Minerals
- Maize Processing (Wet Milling) & Maize Based Projects
- Medical Plastics, Disposables Plastic Syringe, Blood Bags
- Organic Farming, Neem Products Etc.
Sectors We Cover

- Paints, Pigments, Varnish & Lacquer
- Paper And Paper Board, Paper Recycling Projects
- Printing Inks
- Packaging Based Projects
- Perfumes, Cosmetics And Flavours
- Power Generation Based Projects & Renewable Energy Based Projects
- Pharmaceuticals And Drugs
- Plantations, Farming And Cultivations
- Plastic Film, Plastic Waste And Plastic Compounds
- Plastic, PVC, PET, HDPE, LDPE Etc.

www.entrepreneurindia.co
- Potato And Potato Based Projects
- Printing And Packaging
- Real Estate, Leisure And Hospitality
- Rubber And Rubber Products
- Soaps And Detergents
- Stationary Products
- Spices And Snacks Food
- Steel & Steel Products
- Textile Auxiliary And Chemicals
- Township & Residential Complex
- Textiles And Readymade Garments
- Waste Management & Recycling
- Wood & Wood Products
- Water Industry (Packaged Drinking Water & Mineral Water)
- Wire & Cable
Contact us
Niir Project Consultancy Services
106-E, Kamla Nagar, Opp. Spark Mall,
New Delhi-110007, India.
Email: npcs.ei@gmail.com, info@entrepreneurindia.co
Tel: +91-11-23843955, 23845654, 23845886, 8800733955
Mobile: +91-9811043595
Website: www.entrepreneurindia.co, www.niir.org
Take a look at NIIR PROJECT CONSULTANCY SERVICES on
#StreetView
https://goo.gl/VstWkd
THANK YOU!!!