Handbook on Printing Technology (Offset, Flexo, Gravure, Screen, Digital, 3D Printing with Book Binding and CTP) 5th Edition

Author:- NIIR Board of Consultants & Engineers Format: paperback Code: NI73 Pages: 616 Price: Rs.1875US\$ 150 Publisher: NIIR PROJECT CONSULTANCY SERVICES Usually ships within 5 days

Printing is a process for reproducing text and image, typically with ink on paper using a printing press. It is often carried out as a large-scale industrial process, and is an essential part of publishing and transaction printing. Modern technology is radically changing the way publications are printed, inventoried and distributed. Printing technology market is growing, due to technological proliferation along with increasing applications of commercial printing across end users.

In India, the market for printing technology is at its nascent stage; however offers huge growth opportunities in the coming years. The major factors boosting the growth of offset printing press market are the growth of packaging industry across the globe, increasing demand in graphic applications, the wide range of application in various industry, and industrialization. 3D printing market is estimated to garner \$8.6 billion in coming years. The global digital printing packaging market is expected to exceed more than US\$ 40.02 billion by 2026 at a CAGR of 13.9%. Computer-to-plate systems are increasingly being combined with all digital prepress and printing processes.

This book is dedicated to the Printing Industry. In this book, the details of printing methods and applications are given. The book throws light on the materials required for the same and the various processes involved. This popular book has been organized to provide readers with a firmer grasp of how printing technologies are revolutionizing the industry.

The major content of the book are principles of contact (impression), principles of noncontact printing, coated grades and commercial printing, tests for gravure printing, tests for letterpress printing, tests for offset printing, screen printing, application of screen printing, offset lithography, planography, materials, tools and equipments, sheetfed offset machines, web offset machines, colour and its reproduction, quality control in printing, flexography, rotogravure, creative frees printer, shaftless spearheads expansion, digital printing, 3D printing, 3D printing machinery, book binding, computer-to-plate (ctp) and photographs of machinery with suppliers contact details.

A total guide to manufacturing and entrepreneurial success in one of today's most printing industry. This book is one-stop guide to one of the fastest growing sectors of the printing

industry, where opportunities abound for manufacturers, retailers, and entrepreneurs. This is the only complete handbook on the commercial production of printing products. It serves up a feast of how-to information, from concept to purchasing equipment.

Contents **1. INTRODUCTION** History Four Major Printing Processes **Relief Printing Process** The Process Letter Press Printing Process Plano Graphic Offset The Advantages of Offset Printing Include Screen Printing Process **Other Printing Methods Digital Printing** Paper for Printing 2. MODERN PRINTING TECHNIQUES Printing (Press Operation) Colour Printing How a Printing Press Works The Latest Technologies in Printing Industry **Digital Inkjet Printing 3D Printing Rise** Software Innovations Hybrid Print Technologies Efficient Technology **Special Printing Technologies Basic Principles of Hybrid Printing System** Hybrid Printing System Concepts of Combining Conventional Printing Technologies Hybrid Printing Systems Combining NIP Technologies Hybrid Printing Systems Combining Conventional and NIP Technologies Hybrid Printing Systems Combining Computer to Press/Direct Imaging with NIP Technologies Hybrid Printing Systems Combining Conventional Printing Technologies with Computer to Press **Technologies** Basic Principles of Waterless Offset Printing Advantages/Merits of Waterless Printing **Qualitative Advantages Production Advantages Ecological Advantages Basic Principle of Digital Printing** Flow Chart of Digital Composition of a Printed Page Direct Imaging (with master) Computer to Print (without master) Scope and Job suitability of Digital Printing Process Digital Printing has a very bright future because Digital Printing is Suitable for **Basic Principle of Direct Imaging** Once Imagebale Master (Plate Imaging) Re-imagebale Master (Surface Imaging)

3. PRINCIPLES OF CONTACT (IMPRESSION) PRINTING PROCESSES Introduction **Printing Methods** The Printing System **Preparatory Sections** Halftone Photography Platemaking Printing **Binding and Finishing** Inks for Letterpress and Lithography **Speciality Printing** 4. PRINCIPLES OF NONCONTACT PRINTING Introduction Impactless printing system for variable printing Summary 5. COATED GRADES AND COMMERCIAL PRINTING **Coated and Commercial Papers Coating Methods Coating Materials** Adhesives **Coated Paper Properties and Use** 6. TESTS FOR GRAVURE PRINTING Introduction **Print Smoothness** Gravure Print Testing 7. TESTS FOR OFFSET PRINTING Introduction Runnability Surface Strength Water Resistance **Mechanical Properties** Web Runnability 8. SCREEN PRINTING Select Correct Screen Printing Fabric An Antistatic Stencil Mesh Screen Printing Frames Stretching Equipment **Correct Stretching** Adhesives The Manufacture of Diapositives Stencils The Diapositive 9. APPLICATION OF SCREEN PRINTING **Screen Printing Accessories** Stencils **Chemicals Used and Formulations Common Faults in Screen Printing** Printing Unit Automatic Screen Printing Machine Screen Printing on Different Surfaces Inks for Screen Printing **10. OFFSET LITHOGRAPHY**

Printing Processes Origin and History of Lithography Job Planning **Evolution of Offset Printing** Offset Machine Construction Pre-Make Ready and Make Ready Setting the Machine for Operation Small Offset **Running Problems** Colour Rollers **11. PLANOGRAPHY** Origin of Planography Principle of Planographic Printing **Direct Printing Process Offset Printing Process** Working Process 12. MATERIALS, TOOLS AND EQUIPMENTS Lithographic varnish Acids Turpentine French Chalk Resin Asphaltum Paraffin Driers Sponge Dampening Cloth Vaseline **Tools and Equipments** Scraper Ink Knife Wrench **Proofing Devices Mechanical Features** Automatic Proof Presses Qualities of a Good Proof **13. SHEETFED OFFSET PRINTING** Names of the machines **Mechanical Features** Lubrication Sheet feeding mechanism Sheet board Functions of blowers Functions of the blower foot Sheet lifting and forwarding **Sheet Controls** Sheet Register Sheet Insertion and Transfer Inking System **Distribution System** Multiroll System Wash-up device

Adjustment of Rollers **Different Dampening Systems Cleaning of Dampeners** Construction of the machine Working on the cleaning machine **Plate Cylinder Blanket Cylinder** Impression Cylinder Adjustment of Cylinders Advantages of Both Principles **Delivery Mechanism** Anti-setoff Spray **Miscellaneous Operations** 14. WEB OFFSET PRINTING **Driving Mechanism Printing Units** Main Parts of Printing Unit Inking System **Delivery Unit** Folding Unit Ancillary Operations by Delivery Unit **15. COLOUR AND ITS REPRODUCTION** Terminology Related to Colour Mixing and Matching of Colors Sequence of Colours in Printing **16. QUALITY CONTROL IN PRINTING Before Printing During Printing** After Printing 17. FLEXOGRAPHY 407 Flexography Flexographic Platemaking **Photochemical Change Rotary Principle Rubber Plates** Substrates Paper and Board **18. ROTOGRAVURE 19. DIGITAL PRINTING** Introduction **Digital Printing** Important Things We Should Know About Digital Printing Types of Digital Printing 1. Inkjet Printer 2. Laser Printer Important Features of Laser Printer Advantages of Digital Printing Benefits of Digital Printing Design & Printing 1. Cheaper Printing 2. High quality Difference between Screen Printing and Digital Printing Screen Printing **Digital Printing**

Comparison between Digital Printing and Press Printing **Digital Printing** Press Printing 20. 3D PRINTING Introduction History of 3D Printing How Does 3D Printing Work? Technology **3D Printing Applications** 1. Medical and Dental 2. Aerospace **Complex Designs** Weight Reduction Improved Strength and Durability **Major Savings** 3. Automotive 4. Jewellery 5. Art/Design/Sculpture 6. Architecture 7. Fashion 8. Food Benefits of 3D Printing Advantages of 3D Printing in Manufacturing 1. 3-D Printers are Becoming More Affordable 2. Quicker Turnaround Times for Prototyping 3. Quicker Product Launches 4. Competitive Advantage 5. Reduction in Manufacturing Errors 6. Complex Geometries 7. Mass Customization 8. Less Tooling 9. Fewer Costs 10. Environmentally Friendly Benefits of 3D Printing in Healthcare What Materials do 3D Printers Use? 1. Plastics (a) Nylon (Polyamide) Features (b) PLA Filament Features (c) ABS Filament Features (d) PVA Filament 2. Powders 3. Resins Features 4. Other Materials How do the Different 3D Printing Technologies Work? 1. Fused Deposition Modeling (FDM) How does FDM Work? Materials for FDM ABS (Acrylonitrile Butadiene Styrene) ABSi (Acrylonitrile Butadiene Styrene – Biocompatible)

ABS-M30 (Acrylonitrile Butadiene Styrene) ABS-M30i (Acrylonitrile Butadiene Styrene – Biocompatible) PC (Polycarbonate) ABS-ESD7 (Acrylonitrile Butadiene Styrene – Static-Dissipative) PC-ABS (Polycarbonate ABS) PC-ISO (Polycarbonate ISO) **Ultem 9085** 2. Stereolithography and Digital Light Processing (SLA & DLP) 3. Selective Laser Sintering (SLS) 4. Material Jetting (PolyJet and MultiJet Modeling) 5. Binder Jetting 6. Metal Printing (Selective Laser Melting and Electron Beam Melting) **Electron Beam Melting Characteristics** Selective Laser Melting Applications 7. PolyJet Photopolymer **Benefits of Polyjet Realistic Finish Greater Choices** Multiple Materials and Colors **Polyjet Materials** 1. Digital Materials 2. Digital ABS 3. High Temperature Wide Range of Applications 4. Transparent **3D Print Clear and Tinted Prototypes 3D Printing With Transparent Material 3D Print Translucent Shades and Patterns** Wide Range of Applications 5. Rigid Opaque 6. Polypropylene-like 3D Print Tough, Flexible Models 7. Bio-compatible **3D Print Medical Devices** 3D Printing With Bio-compatible Material 8. Rubber-like 3D Print Flexible, Soft-touch Models 3D Printing With Rubber-like Material 8. Syringe Extrusion 9. Other Methods 3D Printing is a Game Changer 21. 3D PRINTING MACHINERY Airwolf AW3D HD SLA 3D Printing Machine **3D** Printing Machine Makerbot Replicator **Dual Head 3D Printer Prototyping Machine** Flashforge Finder **3D Systems Cube** 3D Jet Formlabs

22. BOOK BINDING Terms and Techniques Cutting & Folding Folded Sheet or Section Binding **Book Binding Methods** Perfect Binding Hardcover/Case Binding Saddle Staple (Fold, Staple, Trim) Binding Wiro Binding Automatic Book Binding Machine Programmable Logic Controllers (PLC) Perfect Book Binding Machine **Disc Perfect Binding Machine** Perfect Binding Line Thread Book Sewing Machine Semi Automatic 23. COMPUTER-TO-PLATE (CTP) **CTP** Technologies **Regulatory Requirements Plate Development** Visible Laser Plates Using Silver Halide Thermal Laser Plates Using Ablation Plate Making Process Steps Temperature Control for Computer to Plate Technology Process Platesetter Cooling Plate Processor Cooling **CTP** Technology in Offset Printing Digital Plate Setter UV CTP Machine 24. PROCESS FLOW DIAGRAMS & LAYOUTS 25. PHOTOGRAPHS OF MACHINERY WITH SUPPLIER'S CONTACT DETAILS Single Color Offset Printing Machine Two Color Satellite Offset Printing Machine Offset Printing with Numbering and Perforating Machine Web Offset Printing Machine Color Screen Printer Flatbed Screen Printer Automatic Sheetfed Offset Printing Machine Sheetfed Offset Machine Mini Offset Printing Machine **Flexographic Printing Machine** Label Master Flexographic Printing Press **Poly Offset Printing Machines Prepress Equipments** Flip Top Printing Down Frame Single/Double Sided Machine Instant Start Metal Halide Plate Exposure Plate Coating Whirler **Plate Curing Equipment** Damper Roller Washer Vertical Process Camera **3M Plate Processor** Computer-to-Screen Exposure System **IGP Plate Processor**

Screen CTP System Inkjet CTP System (Computer to Plate Machine) **Rotogravure Printing Machine** 4 Hi Tower (Automatic) 3 Colour + Stack Unit (Manual) **Finishing System** UV Inkjet Digital Printing System Perfecting Production System **Tape Binder** High Light Color System **Color Printer Digital Press Digital Color Press** Manual Offset Printing Machine **Rotogravure Printing Machine** Black and White Digital Print Production System **Digital Printing Machine** Paper Binding Machine

About NIIR

NIIR PROJECT CONSULTANCY SERVICES (NPCS) is a reliable name in the industrial world for offering integrated technical consultancy services. NPCS is manned by engineers, planners, specialists, financial experts, economic analysts and design specialists with extensive experience in the related industries.

Our various services are: Detailed Project Report, Business Plan for Manufacturing Plant, Startup Ideas, Business Ideas for Entrepreneurs, Start up Business Opportunities, entrepreneurship projects, Successful Business Plan, Industry Trends, Market Research, Manufacturing Process, Machinery, Raw Materials, project report, Cost and Revenue, Pre-feasibility study for Profitable Manufacturing Business, Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Business Opportunities, Investment Opportunities for Most Profitable Business in India, Manufacturing Business Ideas, Preparation of Project Profile, Pre-Investment and Pre-Feasibility Study, Market Research Study, Preparation of Techno-Economic Feasibility Report, Identification and Section of Plant, Process, Equipment, General Guidance, Startup Help, Technical and Commercial Counseling for setting up new industrial project and Most Profitable Small Scale Business.

NPCS also publishes varies process technology, technical, reference, self employment and startup books, directory, business and industry database, bankable detailed project report, market research report on various industries, small scale industry and profit making business. Besides being used by manufacturers, industrialists and entrepreneurs, our publications are also used by professionals including project engineers, information services bureau, consultants and project consultancy firms as one of the input in their research.

Our Detailed Project report aims at providing all the critical data required by any entrepreneur vying to venture into Project. While expanding a current business or while venturing into new business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line.

NIIR PROJECT CONSULTANCY SERVICES, 106-E, Kamla Nagar, New Delhi-110007, India. Email: npcs.india@gmail.com Website: NIIR.org Sat, 17 May 2025 13:23:58 +0000