

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 Imageable Master (Plate Imaging)

Re-imageable 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, Start-up 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 various 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

Fri, 09 May 2025 06:59:32 +0000