

Sheet-Fed Offset Printing Press: Analysis and Optimization of Printing Substrate Consumption (Uncoated Paper, Coated Paper, and Polypropylene Sheets) for Quality and Efficiency Improvement in Pharmaceutical Packaging Printing

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ABSTRACT

This study was carried out at Akriti Printers, Manesar. It is to reduce the consumption of printing substrate along with the optimum consumption of printing substrate and explore the possible ways of optimum utilization of the printing substrate used in sheet-fed offset processes in Akriti Printers Manesar. Coated Paper, Uncoated Paper, and Polypropylene (PP) Sheets are the kind of substrates being used in this work.

I. INTRODUCTION

Three types of Substrates, mainly used in this study, are -

- Coated Paper
- Uncoated Paper
- Polypropylene (PP) Sheets

II. RESEARCH OBJECTIVE

The objective of this study is to reduce the consumption of printing substrate along with the optimum consumption of printing substrate and explore the possible ways of optimum utilization of the printing substrate used in sheet-fed offset processes in **Akriti Printers Manesar**.

III. RESEARCH METHDOLOGY

The whole study has been divided in 3 sub parts to improve sheet-fed offset works along with the cost, efficiency, consumption of Printing substrates.

The following methodology will be adopted during the study.

1. Study of different Printing substrate used in printing industries.
2. Study of cost, efficiency, and consumption of Printing substrate used in different sheet-fed offset work.
3. Different jobs of the Sheet-fed Offset Presses during project work consuming moderate amount of printing substrate will be selected and the study was conducted on each selected job.

Data collection was done during the study.

IV. DATA COLLECTION

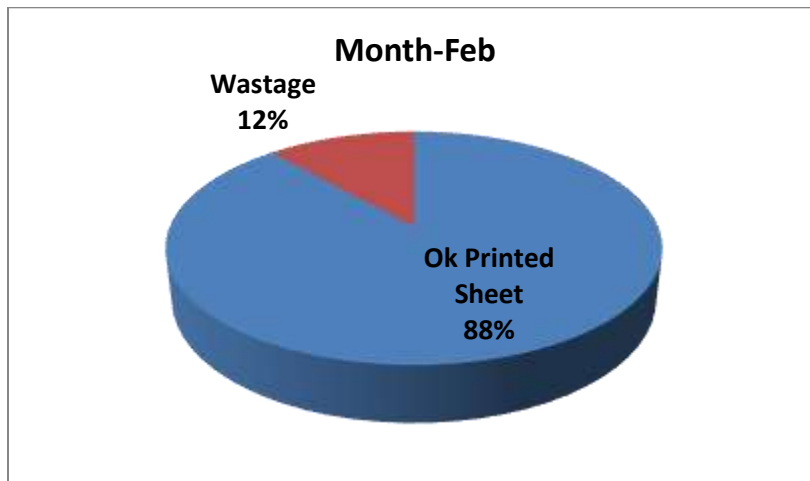
Specifications of Polypropylene (PP) Sheet

- Thickness - 0.10mm to 0.25mm
- Color - Transparent and Translucent Clear and Multi Colour
- Surface Finish : Both side gloss, Single side gloss
- Size- Width - Minimum 350mm and maximum 1000mm x Length Rolls or Sheets as per requirement.
- Thickness - 0.25mm, 0.30mm to 1.60mm
- Color - Translucent, Transparent, Opaque, Natural and Various Colors
- Surface Finish -Matt / Matt , Gloss / Matt, Crossline & various Surfaces available
- Size- Width - Minimum 350mm and maximum 1000mm x Length Rolls or Sheets as per requirement.
- Wide Color Range - Natural, White, Black, Royal Blue, Red, Yellow, Green, Pink, Orange, Purple & etc.

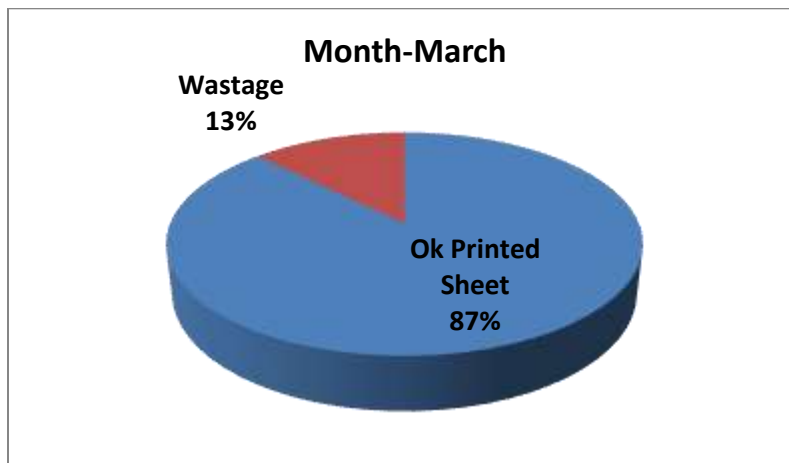
“Akriti Printer’s” Manesar

Name of Machine	:	CD 102 Hidelberg
No. of Units	:	6 color + 1 coater
Machine Speed	:	13000 impressions per hours
Change over time of job on machine	:	30 min.
Per day minimum production approx.	:	104,000 sheets
Copies wastage during production (per job)	:	20-25% approx.

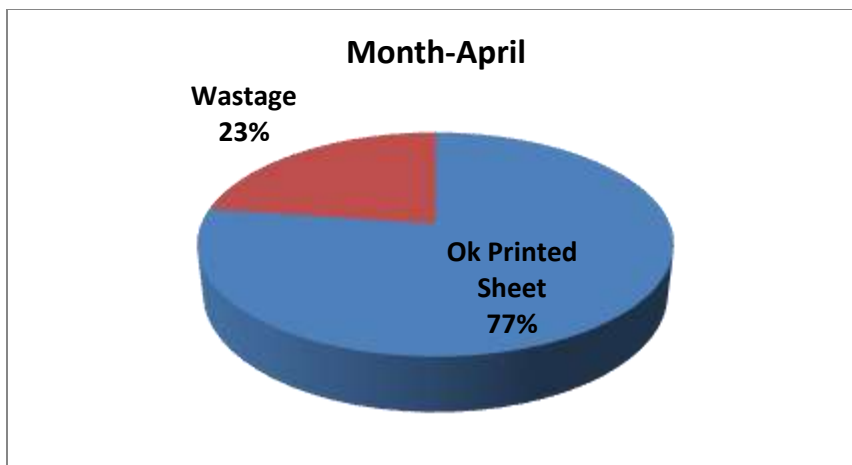
Data of printing on uncoated paperat “akriti printer’s” manesar for the month of february, 2018



Data of printing on coated paper at “akriti printer’s” manesar for the month of march, 2018



Printing on PP sheets at “akriti printer’s” manesar for the month of april, 2018



V. LIST OF SUGGESTION

Following are the list of suggestion incorporated in printing section on sheet fed offset machine after consultation with various press authorities. These points will vary according to machine and press setup along with type of job.

- 1) Speed of Machine.
- 2) Type of printing substrate in In-feed unit at start of Machine.
- 3) Function of printing unit.
- 4) Suitable grade of printing substrate for respective jobs.
- 5) Preparation of job for Machine.
- 6) Thickness of printing substrate applied for each particular job.
- 7) Printing time for printing substrate.
- 8) Proper amount of work dampening unit & inking unit.
- 9) Apply substrate according to printing job.
- 10) Water ratio proper according to printing substrate.
- 11) Machine speed setting according to job and substrate.
- 12) Printing time for printing substrate.

To implement it properly we generate a check list in form of table to check the different factors before all jobs to be handled on particular machine. This will help us to increase productivity and for generation of system for operating the machine and achieving the desired quality level.

NAME OF PRESS

DATE: -

NAME OF SUPERVISION:-

TABLE - CHECK LIST FOR SHEET FED OFFSET MACHINE

Please Tick (√/x) For Each Job

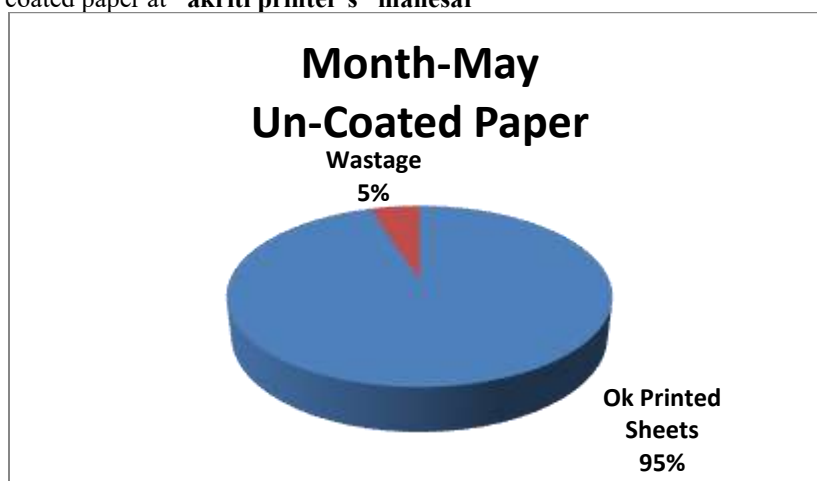
Sr. No	Check Point	Job 1 (√/x)	Job 2 (√/x)	Job 3 (√/x)	Wastage of Sheets (approx.)
1.	Speed of Machine.				
2.	Type of printing substrate in In feed unit at start of Machine.				
3.	Function of printing unit.				
4.	Suitable grade of printing substrate for respective jobs.				

5.	Preparation of job for Machine.				
6.	Printing time for printing substrate				
7.	Proper amount of work dampening unit & inking unit.				
8.	Apply substrate according to printing job				
9.	Water ratio proper according to printing substrate.				
10.	Machine speed setting according to job and substrate.				
11.	Printing time for printing substrate.				

VI. RESULT & DISCUSSION

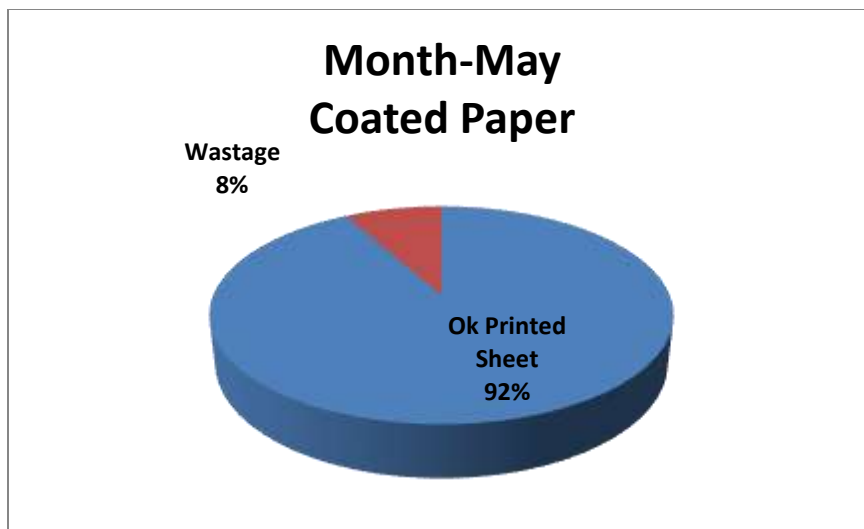
Data of may month for uncoated paper substrate after implementation of suggestion point check list

Data of printing on coated paper at “akriti printer’s” manesar



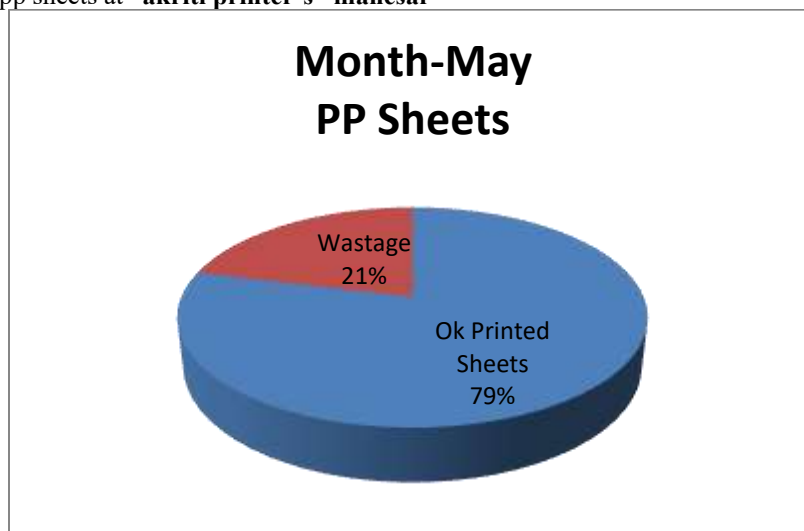
Data of may month for coated paper substrate after implementation of suggestion point check list

Data of printing on coated paper at “akriti printer’s” manesar



Data of may month for PP sheets printing after implementation of suggestion point check list

Data of printing on pp sheets at “akriti printer’s” manesar



VII. CONCLUSION & FUTURE SCOPE

This research focuses on optimum utilization of printing substrate and explore the possible ways of optimum utilization of the printing substrate used in sheet fed offset processes of “Akriti printer’s” Manesar. In all three cases when check list get adopted number of wastage goes down by approx. 12-15% and consumption of printing substrate goes down by approx. 400-600 sheets depending up on the job and machine availability. These preliminary results can be used in future. Check point suggestion incorporated in printing section on sheet fed offset machine after consultation with various press authorities may be indicative for other presses. They may modify, increase or decrease the factors to be considered.

However researcher feels that limited facilities or infrastructure was available in city like Manesar. The result may vary depending upon the type of Machine/Technology, and skills of Man power.

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