

## **GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES IMPACT OF COST, EFFICIENCY, COVERAGE AREA & DRYING TIME ON OPTIMUM CONSUMPTION OF ADHESIVE MEANT FOR PERFECT BINDING PROCESS**

**(A Case study of Caxton Offset Private Limited, Hyderabad)**

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### **ABSTRACT**

In this paper, we have analyzed the utilization of adhesives; improve different binding works along with the cost, efficiency, coverage area & drying time, influence of binding process and influence of utilization of adhesive used in perfect binding. Printing is the second largest industry of India. We are basically providing services to the society; being overlapped by various branches of Education like Computers, Electronics, Manufacturing, Chemical, Electrical, Optical and, what not? It is impossible to imagine survival of human beings without Printing. Sir Johannes Gutenberg, Father of Printing, was declared as 'Man of Millennium' by Time magazine. And, Printing is declared as the 'Greatest Invention of Millennium' again, by Time magazine. Present era is meant for the 'Survival of the Fittest'. And, this is where Printing has touched one and all. It is said that Printing had started with humanization. On a parallel track, it has an association with human lives till time.

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### **I. INTRODUCTION**

We have studied the utilization of adhesives; improve different binding works along with the cost, efficiency, coverage area & drying time, influence of binding process and influence of utilization of adhesive used in perfect binding.

#### **Research Objective**

The objective of this study is to reduce the consumption of adhesive along with the optimum utilization of adhesives and explore the possible ways of optimum utilization of the adhesives used in different binding processes in "Caxton offset private limited, of Hyderabad.

#### **Research Methodology**

The whole study has been divided in 3 sub parts to utilization of adhesives improve different binding works along with the cost, efficiency, coverage area & drying time, influence of binding process and influence of utilization of adhesive used in perfect binding.

The following methodology was adopted during the study.

1. Study of different binding processes used in printing industries.
2. Study of the adhesives used in different binding works along with the cost, efficiency, coverage area & drying time.
3. Different jobs of the Caxton offset private limited, Hyderabad during project work consuming moderate amount of adhesives were selected and the study was conducted on each selected job.

II. DATA COLLECTION ANALYSIS

Table - DATA FOR BINDING JOBS FOR CAXTON OFFSET PRIVATE LIMITED, OF HYDERABADFOR THE MONTH OF JANUARY, 2018 (AUTOBIND M/C)

Name of Machine	:	Auto bind
No. of Clamp	:	1
Machine Speed	:	450 copies per hours
Change over time of job on machine	:	20 min.
Per day minimum production approx.	:	3200 copies
Copies wastage during binding (per job)	:	25-30 approx.
Adhesive remaining in tank	:	350gm (approx.)
Wastage of Adhesive in the form of fumes (For 8 hours working of machine.)	:	250 gm (approx.).

Table - data for binding jobs for caxton offset private limited, of hyderabadfor the month of january, 2018

CAXTON OFFSET PRIVATE LIMITED, OF HYDERABAD						
Sr. No.	Type of Binding	No. of Days	Qty. of Binding	Adhesive Used	No. of Copies Wasted	Wastage of Adhesive (approx)
1.	Perfect Binding	26days	78000	390 Kg	1430 copies	6 kg. In form of fumes 300 gm. Remaining in Tank

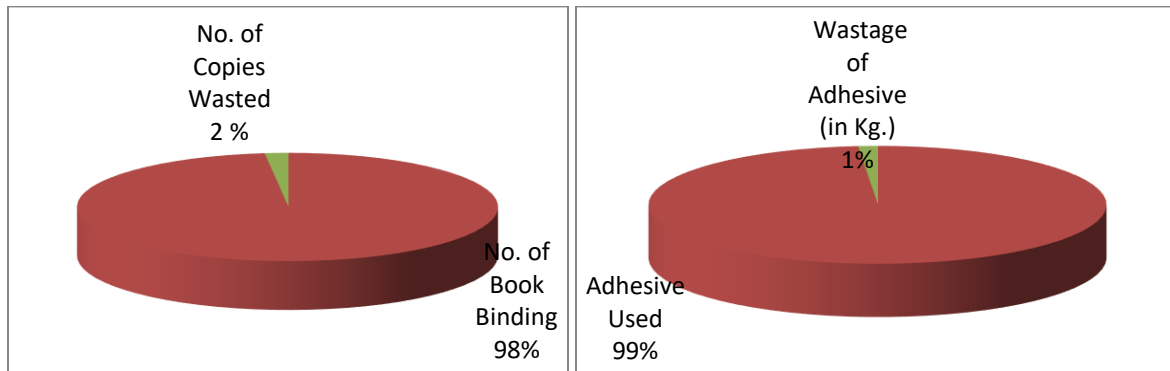


TABLE - DATA FOR BINDING JOBS FOR CAXTON OFFSET PRIVATE LIMITED, OF HYDERABADFOR THE MONTH OF FEB, 2018 (WELLBOUND M/C)

Name of Machine	:	Wellbound
No. of Clamp	:	1
Machine Speed	:	500 copies per hour
Change over time of job on machine	:	15 min.
Per day minimum production approx.	:	4000 copies
Copies Wastage during Binding (per job)	:	20–25 approx.
Adhesive Remaining in Tank	:	300gm. (approx.)
Wastage of Adhesive in the form of fumes (For 8 hours working of machine.)	:	250 gm. (approx.)

CAXTON OFFSET PRIVATE LIMITED						
Sr. No.	Type of Binding	No. of days	Qty. of Binding	Adhesive Used	No. of Copies Wasted	Wastage of Adhesive (approx)
1.	Perfect Binding	27days	81000	392 Kg	1377 copies	6.3 kg. In form of fumes 300 gm. Remaining in Tank

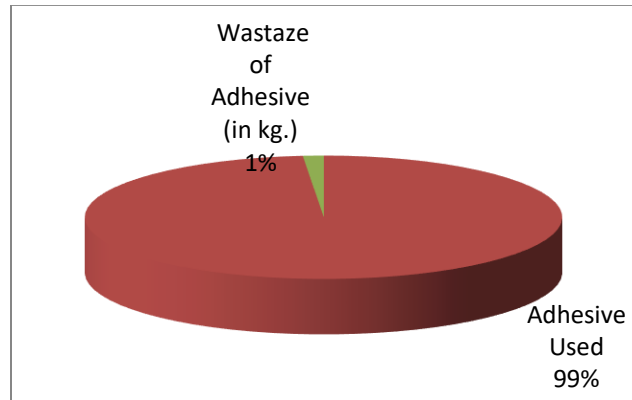
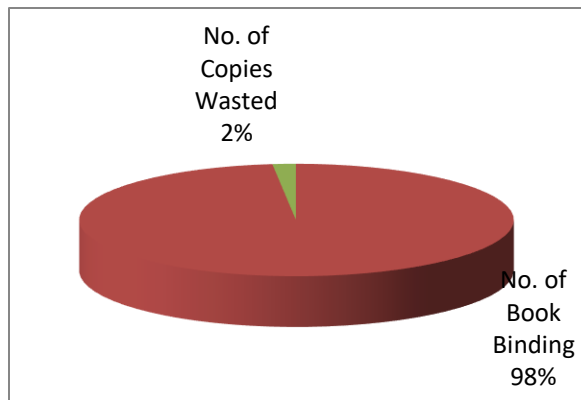
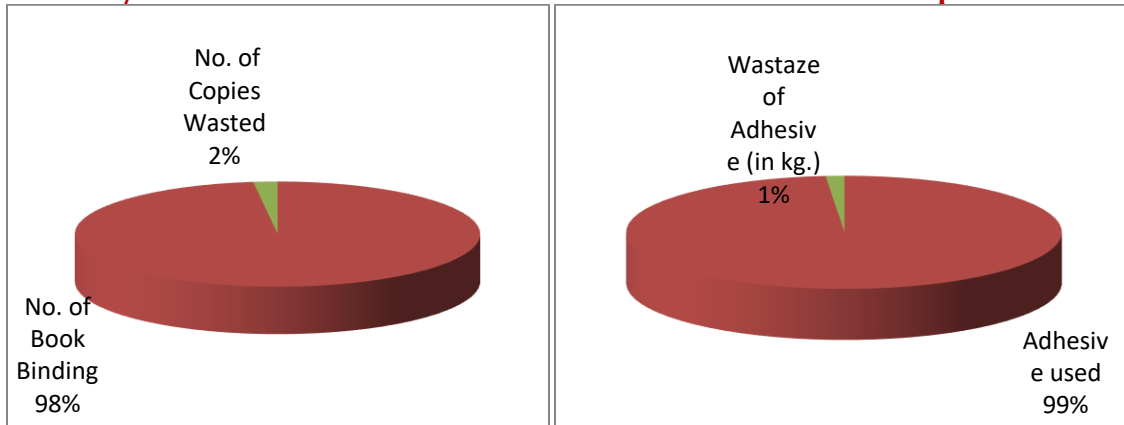


TABLE - DATA FOR BINDING JOBS FOR CAXTON OFFSET PRIVATE LIMITED FOR THE MONTH OF MARCH, 2018 (BINDWELL M/C)

Name of Machine	:	BindWell
No. of Clamp	:	2
Machine speed	:	750 copies per hour
Change over time of job on machine	:	15 min.
Per day minimum production approx.	:	5000 copies
Copies wastage during binding (per job)	:	20–25 approx.
Adhesive remaining in tank	:	300 gm. (approx.)
Wastage of Adhesive in the foam of fumes	:	300 gm. (approx.)

(For 8 hours working of machine).

CAXTON OFFSET PRIVATE LIMITED						
Sr. No.	Type of Binding	No. of Days	Qty. of Binding	Adhesive used	No. of Copies Wasted	Wastage of Adhesive (approx)
1.	Perfect Binding	26 Day	104000	486 Kg	2125 copies	7.1 kg. In form of fumes 300 gm. Remaining in Tank



### III. LIST OF SUGGESTION

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

- 1) Temperature of Adhesive.
- 2) Quantity of Adhesive in tank at start of Machine.
- 3) Function of Clamp.
- 4) Suitable grade of Adhesive for respective jobs.
- 5) Preparation of job for Machine.
- 6) Thickness of Adhesive applied for each particular job.
- 7) Open time for Adhesive.
- 8) Cover for Adhesive Tank.
- 9) Apply Adhesive according to spine.
- 10) Water ratio proper according to Adhesive. (in water based Adhesive.)
- 11) Machine speed setting according to job and Adhesive.
- 12) Melting time for Adhesive.

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:-

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TABLE - CHECK LIST FOR PERFECT BINDING MACHINE

Please Tick (√/x) For Each Job

Sr. No	Check Point	Job 1 (√/x)	Job 2 (√/x)	Job 3 (√/x)	Wastage of Adhesive (approx)
1.	Temperature of Adhesive				
2.	Quantity of Adhesive in Tank				

3.	Function of Clamp				
4.	Suitable grade of Adhesive for respective job				
5.	Preparation of job for Machine				
6.	Thickness of Adhesive applied for each particular job				
7.	Open time for Adhesive				
8.	Cover for Adhesive Tank				
9.	Apply Adhesive according to spine				
10.	Water ratio proper according to Adhesive. (in water based Adhesive)				
11.	Machine speed setting according to job and Adhesive.				
12.	Melting time for Adhesive				

#### IV. RESULT & DISCUSSION

DATA OF APRIL MONTH FOR ALL THREE PRESSES AFTER IMPLEMENT OF SUGGESTION POINT CHECK LIST

TABLE - DATA FOR PERFECT BINDING JOBS FOR AUTOBIND M/C, CAXTON OFFSET PRIVATE LIMITED FOR THE MONTH OF APRIL, 2018

CAXTON OFFSET PRIVATE LIMITED						
Sr. No.	Type of Binding	No. of days	Qty. of Binding	Adhesive Used	No. of Copies Wasted	Wastage of Adhesive (approx)
1.	Perfect Binding	26days	78000	325 Kg	945copies	3.6 kg. In form of fumes in air 300 gm. Remaining in Tank

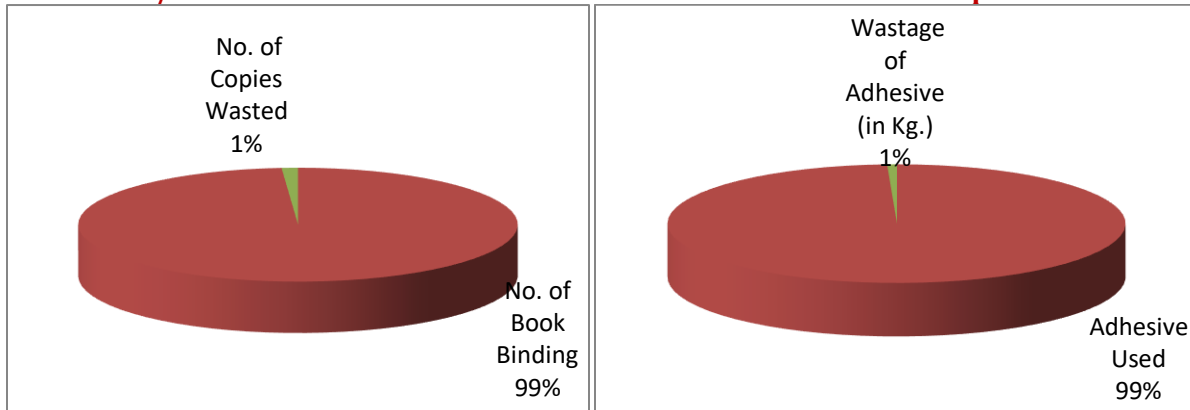


TABLE - DATA FOR PERFECT BINDING JOBS FOR WELLBOUND M/C, CAXTON OFFSET PRIVATE LIMITED, FOR THE MONTH OF APRIL, 2018

CAXTON OFFSET PRIVATE LIMITED						
Sr. No.	Type of Binding	No. of Days	Qty. of Binding	Adhesive used	No. of Copies Wasted	Wastage of Adhesive (approx)
1.	Perfect Binding	26 Day	104000	405 Kg	1125 copies	4.6 kg. In form of fumes 300 gm. Remaining in Tank

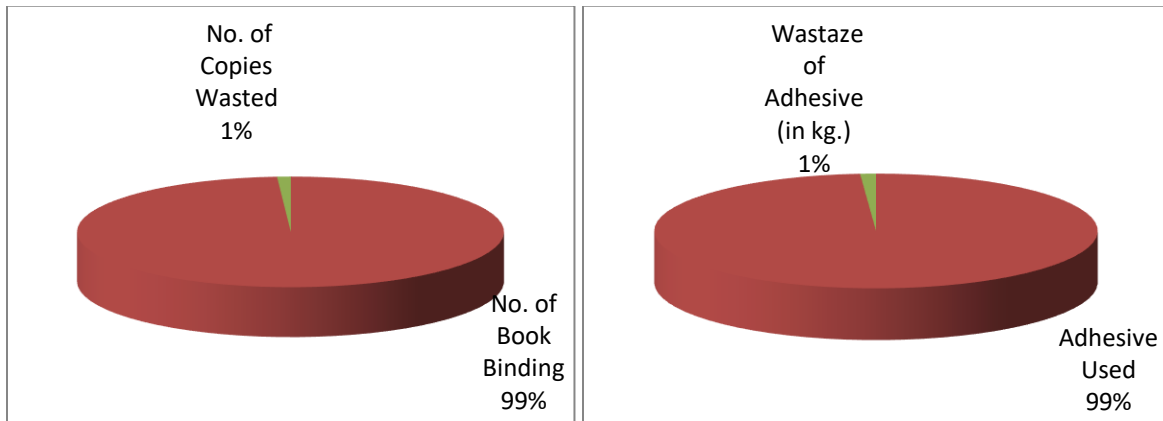
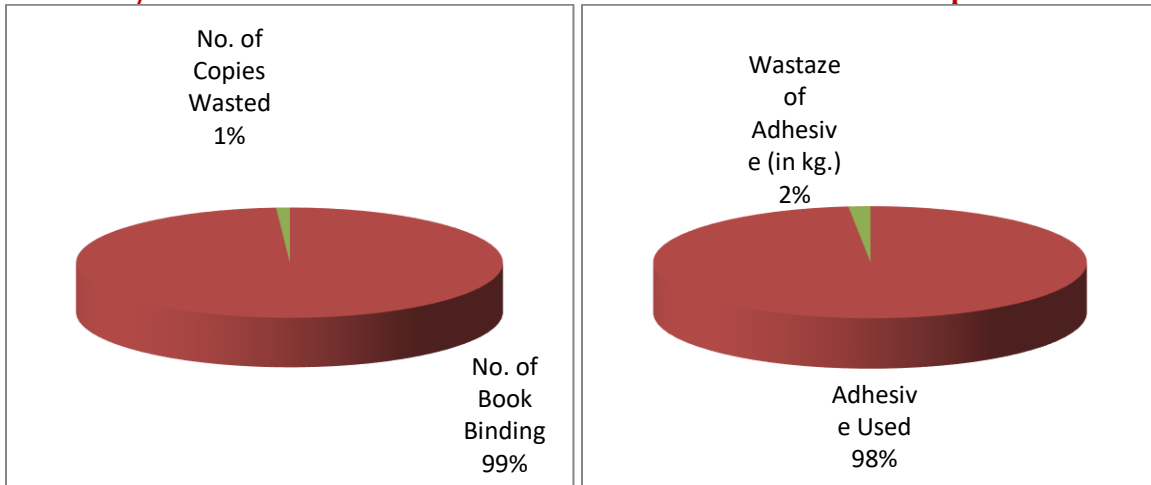


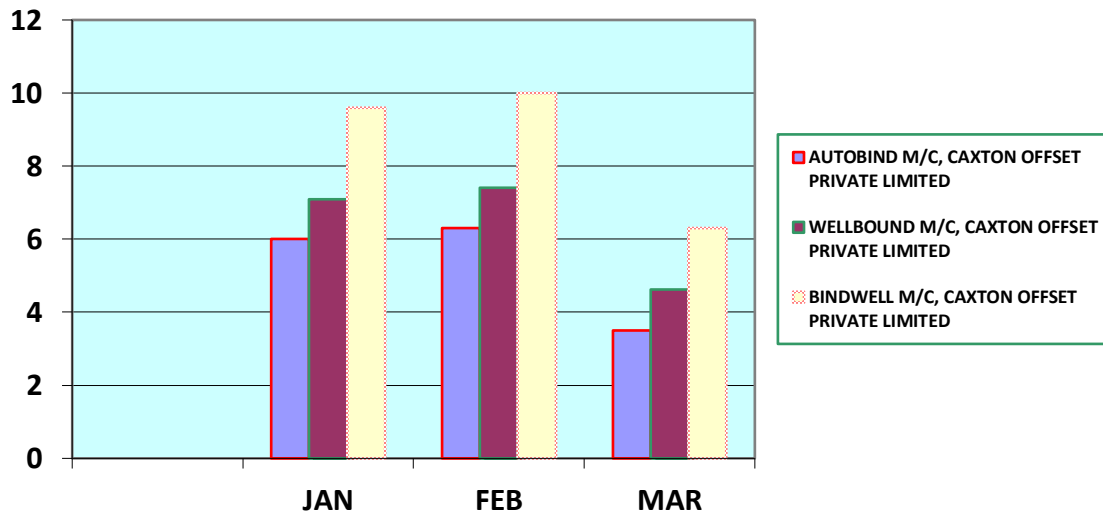
TABLE - DATA FOR BINDING JOBS FOR BINDWELL M/C, CAXTON OFFSET PRIVATE LIMITED, FOR THE MONTH OF APRIL, 2018

CAXTON OFFSET PRIVATE LIMITED						
Sr. No.	Type of Binding	No. of days	Qty. of Binding	Adhesive used	No. of Copies Wasted	Wastage of Adhesive (approx)
1.	Perfect Binding	26 Day	130000	450 Kg	1350 copies	6.3 kg. In foam of fumes 300 gm Remaining in Tank



Above tables and graphs are self-depicting in nature, and they reflect that adhesives used in all three presses in going down when we implemented the suggested list of check point and make aware the man power of presses to value and raw material. It translates not into the saving of adhesive but also no. of wastage of copies goes down in all the three presses. Through machines are not fully automatic and man power are not fully skilled otherwise the wastage of copies may go further down the study may be implemented in other presses also for further good results. Further research may also work in this topic again to get better results and other processes also. Here is the scope to calculate the cost saving and reduction of carbon foot prints as well.

WASTAGE OF ADHESIVE IN ALL THREE PRESSES



V. CONCLUSION & FUTURE SCOPE

This research focuses on optimum utilization of adhesives and explores the possible ways of optimum utilization of the adhesives used in perfect binding processes in Caxton offset private limited. In all three cases when check list get adopted number of wastage goes down by approx. 25-40% and consumption of adhesive goes down by approx. 40-60 kg depending up on the job length and machine availability. These preliminary results can be used

in future. Check point suggestion incorporated in binding section on perfect binding machine after consultation with various press authorities may be indicative for other presses. They may modify, increase or decrease the factors to be considered.

To implement the suggestions properly we generate a check list in form of table to check the different factors before all jobs to be handled on particular Machine on daily binding. And the check point helps to reduce the consumption of adhesive along with optimum utilization of adhesives. The study may be concluded in a manner that, if all suggestion were implemented in matter of practice on Perfect Binding Machine, consumption of Adhesive will go done along with controlled / minimized wastage.

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

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