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IMPACT OF TOTAL QUALITY MANAGEMENT TO ENHANCE THE QUALITY
OF CORRUGATED BOXES, KRAFT PAPER & CORRUGATED BOARDS IN
CORRUGATION PRINTING

(A CASE STUDY OF “ASIAN GROUP OF INDUSTRIES”, BADDI)

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Abstract

This study was carried out at **Asian Group of Industries, Baddi**. Printing is an art, craft, science, & technology of reproduction of ‘n’ number of replicas with the help of a suitable Printing Process on the desired substrate and surface. It has an impact on everyone’s life. 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.

I. INTRODUCTION

This study is carried out to improve the quality of Corrugated boxes by Implementing TQM Process and reduce the wastage of Kraft paper & Corrugated boards by using different techniques in “Asian Group of Industries, Baddi”.

II. RESEARCH OBJECTIVE

The Objective of this study is to improve the quality of Corrugated boxes by Implementing TQM Process and reduce the wastage of Kraft paper & Corrugated boards by using different techniques in “Asian Group of Industries, Baddi”.

III. RESEARCH METHODOLOGY

The whole Study include Total Quality management system that is built in a corrugation industry by use of quality management tools and techniques , methods and procedures that are referred to as quality improvement initiatives.

The following methodology will be adopted during the study;

1. Study of different techniques & processes used for Implementing TQM in Corrugation Printing.
2. Study of paper & board wastage reduction techniques in Corrugation Printing.
3. Some jobs of the “Asian Group of Industries, Baddi” during project work will be selected in which Paper & Board wastage is more & the study will be conducted on each selected job.
4. Data Related to Quality management & Wastage Reduction will be collected during the study.

IV. DATA COLLECTION & ANALYSIS

ASIAN GROUP OF INDUSTRIES AUTOMATIC CORRUGATION BOX PRINTING PLANT, BADDI
 SPECIFICATION OF CORRUGATION PLANT:-

Plant Name: - XINGUANG MACHINERY CHINA

Capacity: - Capable of Production up to 5000 sheets per hour for 3 ply & 3500 sheets per hours for 5 ply.

Speed: - 100-150 km/h

Steam Pressure:-11 Kpa

Temperature: - 150-160 C

Reel Stand: - 5 Reel Stands with length – 164 cm (Min. Deckle -74 cm & Max. Deckle – 145 cm)

Flute Types: - C & B type Flute

Flute Height: - C-3.66 mm & B-2.50 mm

Flute Percentage: - C- 45% & B – 40%

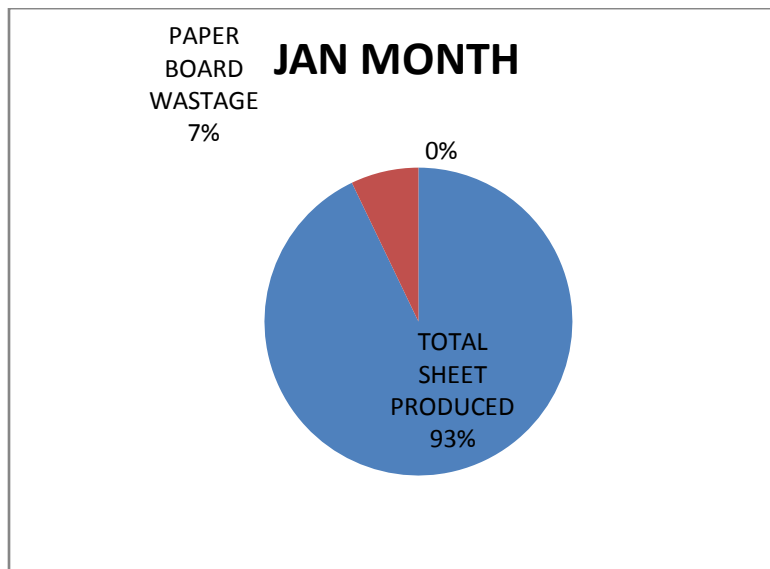
Take- up Factor: - C-1.42 & B – 1.31

Viscosity: - 40 to 50 sec for Corrugation & 100 to 120 sec for Pasting.

Gal Point: - 65 sec

Pre Heater: - 3 with temp. 100 to 105 C for pasting.

Table No.1- DATA OF CORRUGATION PLANT ON XINGUANG MACHINERY CHINA AT ASIAN GROUP OF INDUSTRIES, BADDI FOR THE MONTH OF JANUARY, 2018 (BEFORE TQM)



SPECIFICATION OF FLEXO PRINTING MACHINE:-

Machine Name: - SHANGHAI DINGLONG MACHINERY

Capacity: - Capable of Production up to 300 sheets per minute or 18000 sheets per hour but capacity utilized is 200-250 sheets per minute or 12000-15000 per hours.

Max Feeding Size: - 900x2000 mm

Max Feeding Size (Skip) :- 1100x2000 mm

Min. Feeding Size:-280x650 mm

Max. Printing Area: - 850x1950 mm

Standard Printing Plate Thickness: - 7.2 mm

Printing Plate Position adjustment: - Left 5.5 mm, Right 5.5 mm

Max Stack Height: - 1700 mm

Max. Speed: - 300 rpm

Max. Slot Interval: - 240x60 mm

Table No.2 - DATA OF FLEXO PRINTING ON SHANGHAI DINGLONG MACHINERY AT ASIAN GROUP OF INDUSTRIES, BADDI FOR THE MONTH OF FEB, 2018

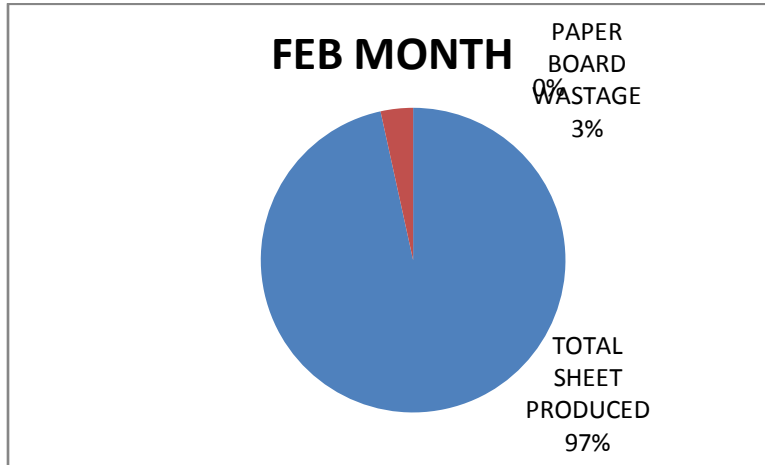
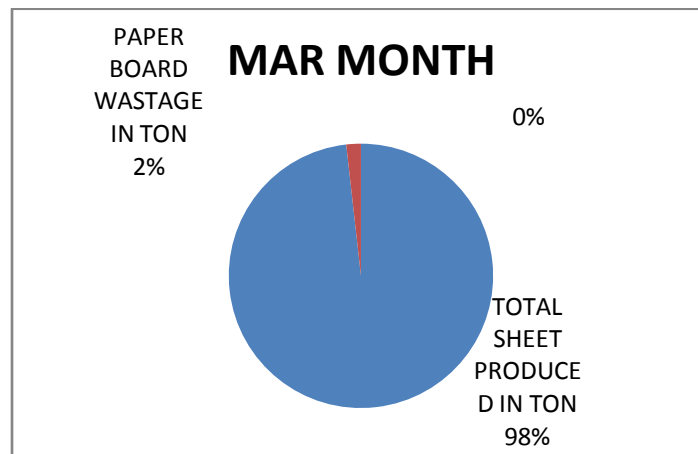


Table No. 3- DATA RELATED TO KRAFT PAPER ON CORRUGATION PLANT OF XINGUANG MACHINERY CHINA AT ASIAN GROUP OF INDUSTRIES, BADDI FOR THE MONTH OF FEB, 2018
 SPECIFICATION OF KRAFT PAPER FOR CORRUGTION PLANT:-

Plant Name: - XINGUANG MACHINERY CHINA
 Kraft Paper Grade: - VK/Semi Kraft /Wood Pulp/Waste to Waste Paper/White Kraft Paper
 Kraft Paper Shade: - Royal Gold/Natural /Golden/Brown/White
 Kraft Paper GSM: - 240/200/180/160/150/140/120/100/90 GSM
 Kraft Paper B.F:- 35/28/25/22/20/18/16
 Kraft Paper RCT: - 0.8, 1.1, 1.6, 1.9, 2.2...Knm
 Kraft Paper Moisture Content: - 8+/-2
 Kraft Paper Cobb Value: - 40-50
 Kraft Paper Identification: - Labels related to vendor`s Information
 Kraft Paper Reel Size Used: - 74 cm to a45 cm max.



V. SUGGESTIONS

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

- 1) Reduction in Deckle Size.
- 2) Reduction in Cutting Length.
- 3) Type of Kraft Paper used in In-feed unit at start of Machine.
- 4) Reduction in Breakdown time.
- 5) Identification of Various defects during production.
- 6) Maintaining Glue quality & quantity.
- 7) Maintaining Moisture & temperature.
- 8) Maintaining Steam Pressure.
- 9) Organising Training Programme for various operators & workers.
- 10) Reuse the wastage by using various techniques & methods.
- 11) Proper inspection carried out by Quality Inspector.
- 12) Maintaining Crease Pressure.
- 13) Maintain the Ink Balance & shade during printing.
- 14) Maintain the Slotting & feeding section during printing.
- 15) Maintaining pressure during printing.
- 16) Implementation of Reel Core Cap, Corner guide & Single joint indicator.
- 17) Inspection Of incoming Reels .

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 corrugation plant & also on printing machine. This will help us to reduce wastage & to increase productivity with better quality and for generation of system for operating the machine with less wastage and achieving the desired quality level.

NAME OF PRESS

DATE:-

NAME OF SUPERVISION:-

Sr.No.	Check Point	Result Before TQM	TQM IMPLENTATION	Result After TQM	wastage Reduction
1	Reduction in Deckle Size.	Deckle Size :- W+H+ 30 mm	Reduction In Reel Size	Deckle Size :- W+H+ 20 mm	Wastage Reduction -10 mm
2	Reduction in Cutting Length.	Cutting Length :- L+W X2 +50 mm	Reduction In Cutting Length	Cutting Length :- L+W X2 + 35mm	Wastage Reduction -15 mm

3	Type of Kraft Paper used in In-feed unit at start of Machine.	Less GSM to High GSM & Excess joints Problems	Improve the quality of Kraft Paper	Less Paper Wastage Due to excess joints	Wastage Reduction- 1 - 2%
4	Reduction In Breakdown time.	Once Or twice in a Month	Implement Weekly Maintenance Schedule	Reduction In Breakdown time	Productivity Improved
5	Identification of Various defects during production.	No. of Defects occur cause wastage	Identify & come with solution	Wastage due to defects becomes lesser	Wastage Reduction- 1 - 2%
6	Maintaining Glue quality & quantity.	Facing Problem due to Glue Viscosity Variation	Proper Inspection Before & After Glue made	Reduction In Delimitation Problem	Wastage Reduction- 0.5 %
7	Maintaining Moisture & temperature.	Problem due to Excess Moisture & Temperature	Proper Inspection Before & During Production	Reduction In Warp & Cracking Problem	Wastage Reduction- 0.5 %
8	Maintaining Steam Pressure.	11.5 to 12.5 Kpa	Proper utilization of resources	10-11 Kpa	Steam Saved
9	Organizing Training Programme for various operators & workers.	Lake of Skills due to less Trainings	Organize Training Programmes	Operators are Well Trained	Productivity Increase
10	Reuse the wastage by using various techniques & methods.	Waste Cannot reuse Send for Recycle Only	List of jobs calculated Where we can use reused sheets	Wastage percentage reduced due to reuse technique	Productivity Increase
11	Proper inspection carried out by Quality Inspector.	Inspection Carried Out alternatively	A particular Person is Trained For this work only	Results Improve after Implementation	Productivity Increase
12	Maintaining Crease Pressure.	Pressure variation due to single creaser	Implementation of double creaser	Proper Crease observe	Productivity Increase
13	Maintain the Ink Balance & shade during printing.	Lake of shade card	provide shade card for proper color matching	Wastage becomes less due to ink imbalance	Productivity Increase
14	Maintain the Slotting & feeding section during printing.	Improper Slotting & Feeding Of Sheets Sometime	Slotting blades timely changing schedule & trained the operators	Wastage due to wrong slotting & feeding becomes lesser	Productivity Increase
15	Maintaining pressure during printing.	Uneven Pressure	Adjustment of Pressure roller properly	Wastage due to uneven pressure becomes less	Productivity Increase

16	Implementation of Reel Core Cap ,Corner guide & Single joint indicator.	Wastage due to Reel damage from corners	Party Meeting	Safe Roll	Productivity Increase
17	Inspection Of incoming Reels	Inspection carried out some no. of samples	Inspection of all reels	Wastage becomes lesser due to defects in reels	Productivity Increase

Table No.4- DATA OF CORRUGATION PLANT ON XINGUANG MACHINERY CHINA AT ASIAN GROUP OF INDUSTRIES, BADDI FOR THE MONTH OF APRIL, 2018 (AFTER TQM)

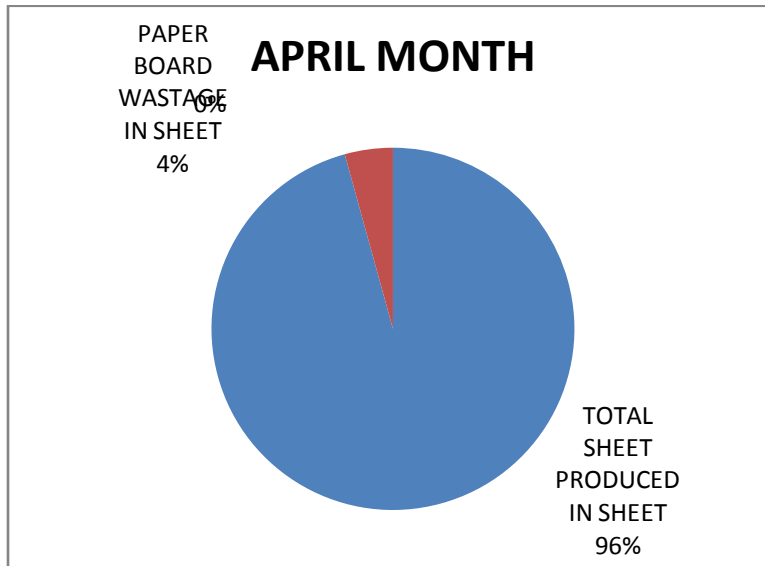


Table No. 5- DATA OF FLEXO PRINTING ON SHANGHAI DINGLONG MACHINERY AT ASIAN GROUP OF INDUSTRIES, BADDI FOR THE MONTH OF APRIL, 2018

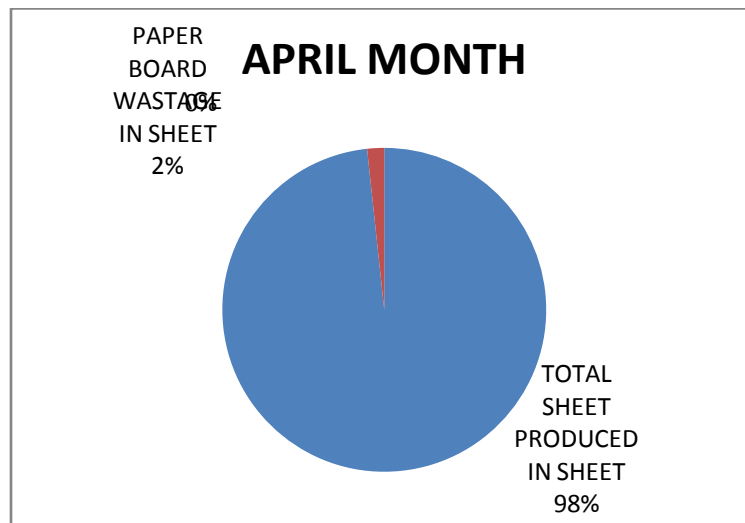
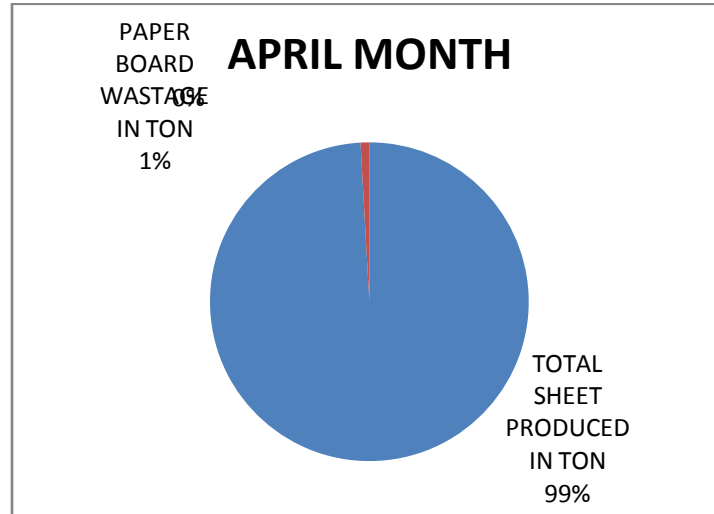


Table No. 3- DATA RELATED TO KRAFT PAPER ON CORRUGATION PLANT OF XINGUANG MACHINERY CHINA AT ASIAN GROUP OF INDUSTRIES, BADDI FOR THE MONTH OF APRIL, 2018



VI. CONCLUSION

This research focuses on Paper & Printed or Non – Printed Board wastage reduction in Corrugation Industry & to maintain the Quality at various stages to increase productivity at Asain Group of Industries. In all cases when Checklist get adopted no. of wastage goes down from 7-8 % to 4 – 5 % on corrugation plant & 3-4 % to 1-2 % on printing machine. The Overall result depends upon the behaviour & Quality of Kraft Paper or Glue during Production. It also includes the Percentage of Moisture & Temperature during this procedure. 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 Corrugation Plant & on Printing Machine. And the check points help to reduce the wastage of Kraft paper & Printed or non-printed Board along with optimum consumption of raw materials. The study may be concluded in a manner that, if all suggestion were implemented in matter of practice on Corrugation Plant & on Printing Machine; will goes down along with increase in production & Quality of the Board and also it helps to increase Profit.

VII. FUTURE SCOPE

The research of Total Quality Management & Wastage reduction in Corrugation Industry have wide scope in future to reduce wastage by Implementing various techniques & to improve the Overall Productivity & to increase the profit of the Organization. Total Quality Management Links to overall Business growth; It maintain the company good will in the market & provide profitability for growth.

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