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DIGITAL PRINTING ANALYSIS ON DIFFERENT COATINGS SURFACES: COLOR VARIATION & COLOR DENSITY FORVARIOUS SUBSTRATES (COATED PAPER, SEMI – COATED PAPER, & UNFINISHED PAPER) (A CASE STUDY OF "GRAPHICA DIGITAL" & OTHER DIGITAL PRESSES IN DELHI)

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ABSTRACT

Digital print is making its way to the outer world because it allows print suppliers to improve the levels of service they offer to customers. Printing is a Servicing Industry. It 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. It's not a dictum that society is concerned about environmental damages. We try to aware our society about the practices with which we can protect our ecosystem. Printing is also making its way to the outer world regarding the protection of environment from harmful materials. Like any other strata of our society, Printing also own three factors for its optimization – Time, Money, & Energy.

I. INTRODUCTION

Digital printing technology is mainly a non-impact method to reproduce impressions on the kind of substrate that is compatible to it.

II. RESEARCH OBJECTIVES

Every research work has to be focus on certain parameters and their consequences. Accordingly various aspects related with these parameters are to be studies from various angles. This concrete area of focus needs elaboration from time to time. Hence, the study is based on the following research objectives:

- To explore the future possibilities of Digital Printing techniques.
- To check color variation on the following papers:

i. Coated Paper
ii. Semi – coated paper
iii. Unfinished paper

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III. RESEARCH METHODOLOGY

The whole study has been divided in sub parts namely utilization of printing substrates, improve color variation in digital printing works along with the cost, efficiency, ink consumption.

The following methodology will be adopted during the study.

1. Study of different printing substrate used indigital printing industries.
2. Study of the color variation on different substrate in different digital work along with the cost, efficiency, consumption.
3. Different jobs of the " Digital printing" during project work consuming moderate amount of printing substrate will be selected and the study will be conducted on each selected job.

IV. DATA COLLECTION AND ANALYSIS

SpectroDensitometer is an all-purpose measurement device that is universally used for quality control in the printing industry as well as for other tasks, where colors have to be judged critically. Spectro Densitometer is exceptionally suitable, no matter which application. Thanks to the individually adjustable display functions, you can quickly set up the device for your particular job. The solid aluminum unibody case makes the device a reliable tool even in a harsh industrial environment. Direct positioning of the measurement head on the measurement field ensures a secure and quick measurement. In addition to single measurements you can easily carry out scan measurements.

Canon Printer:The Canon Pixma G2000 Multifunction Printer produces crisp and clear prints with a maximum resolution of 4800 × 1200 dpi. It has a high document printing speed with approx. 5 imp for color and approx. 8.8 imp for Black & White. Borderless photos can be printed up to A4 sizes in approx. 60 seconds. The printer provides you high volume printing at a low running cost.

Data Collection:We collected data from Graphica press, New Delhi. Later, we compiled all data for concluding results. Two parameters i.e. solid ink density and LAB value has been recorded for comparing quality. By using spectrophotometer and densitometer the statistical data is collected and then we get result on coated paper, semi coated paper and uncoated paper.

Data Collection of January Month: 2018

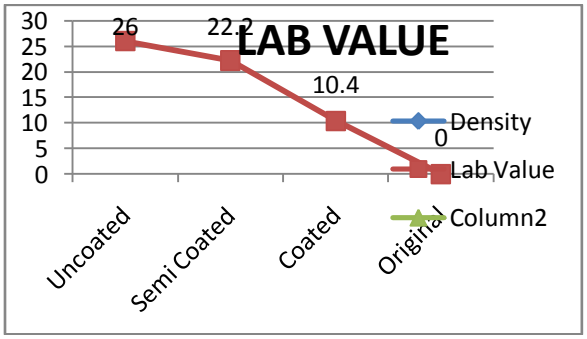

Table 1: lab value - color variation

ORIGINAL	COATED PAPER	SEMI COATED	UN COATED
0	10.4	22.20	26.00

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Data collection of february month: 2018

Table 2: lab value – color variation

ORIGINAL	COATED PAPER	SEMICOATED PAPER	UN COATED PAPER
0	3.35	8.25	13.6

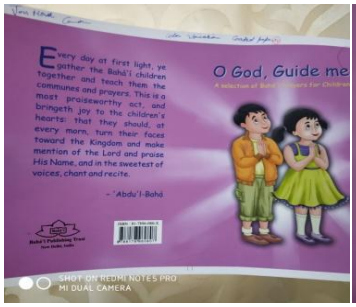


Fig. uncoated paper

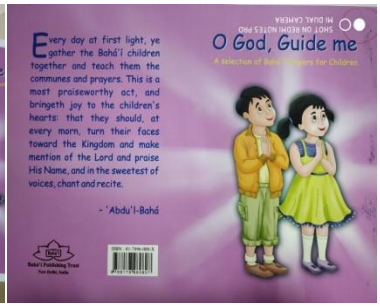


Fig. Coated paper

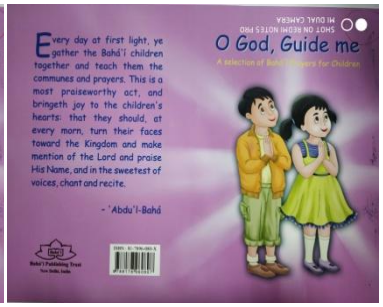
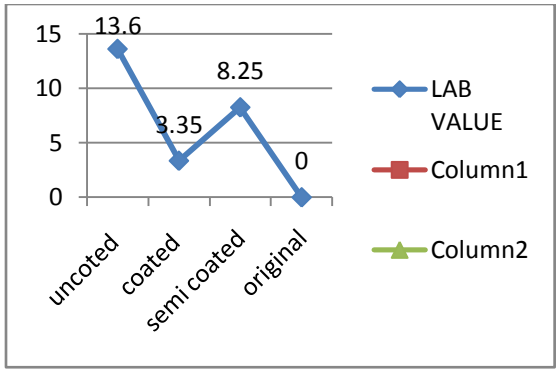


Fig. Semi coated paper



Data collection of march month: 2018

Fig. Uncoated Paper

Fig. coated paper

Fig. semi coated paper

Table 3 : lab value – color variation

ORIGINAL	COATED	SEMICOATED	UNCOATED
0	7.24	10.59	7.19

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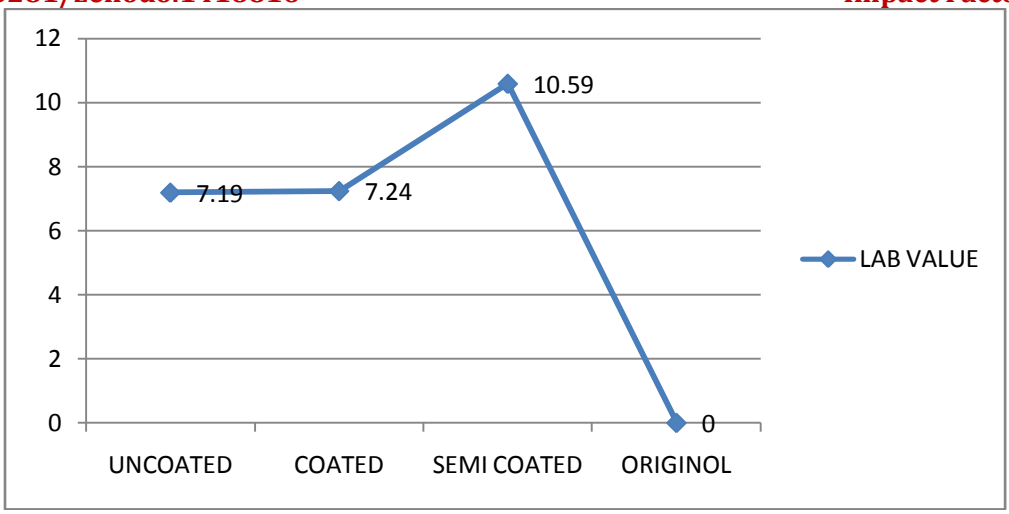
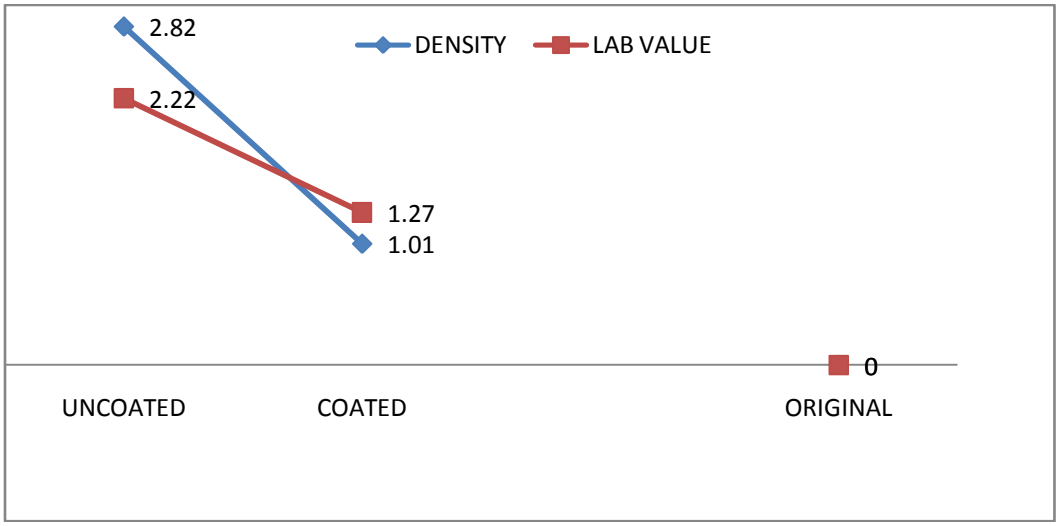
Impact Factor- 5.070



Data collection of april month: 2018

Table 4 : lab value and density value

ORIGINAL	COATED PAPER	UNCOATED PAPER
0	1.01	2.82
0	1.27	2.22



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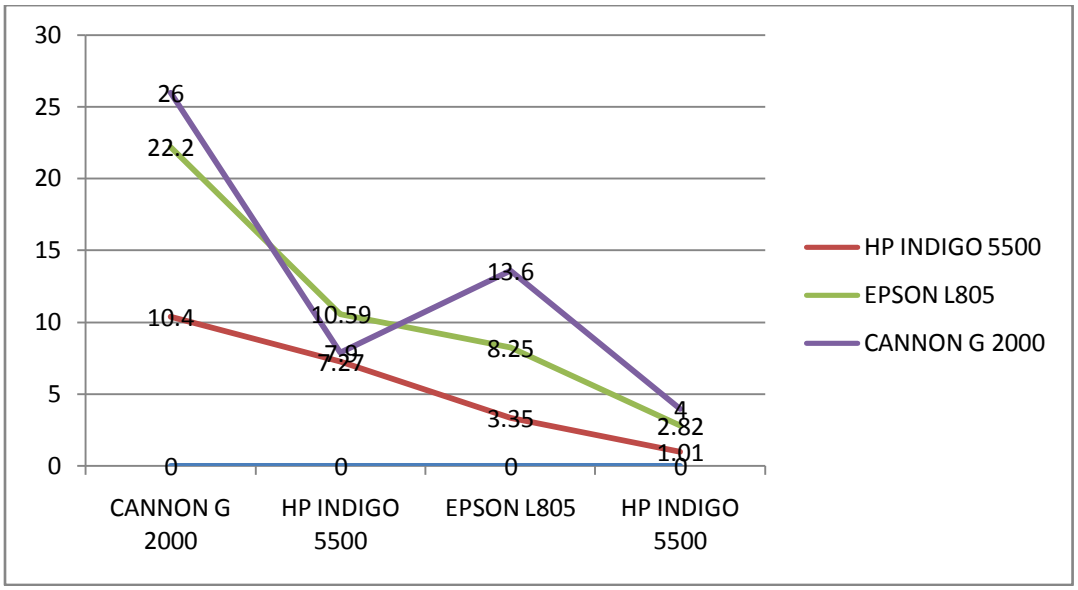
Data collection as per digital printing machines: april 2018



V. RESULT ANALYSIS

After analysis of data collected from the measurement of various parameters, the following results are found:
LAB VALUE: LAB value is more in uncoated paper (26) as compared to semi coated (22) and coated paper (10). That's why for getting good results, high print quality at low production cost. We have to pay more attention for color variation factor on uncoated paper. Basically, LAB value defines the color properties of ink on substrate. Slightly variation in lab value means appearance of color change and quality will adversely affect.

VI. DENSITY

Density is the property of ink. It defines the deposition of thickness of ink on substrate. As the deposition of ink on paper increase,color of ink will change. In this study, I noticed what is perfect density range for coated, uncoated and semi coated paper.

VII. CONCLUSION

This paper is regarding digital printing. By this dissertation we reached at a result that color variation is more on uncoated paperas compared to coated paper.

1. The present scope of digital printing

It is evolving technology and if you observe the advantages of it, defines that digital printing will have scope in Printing Industry.

Some advantages of digital printing are mentioned below:

i. Low volume printing can be more economical because set up costs are less.
ii. Turnaround times can be shortened because the plate making process is eliminated and the proofing process is simplified.
iii. Less waste is achieved because ink and water balance is not required.
iv. Variable data printing is possible so each print can be unique with different data from a computer database.

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