

GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES COMPARITIVE ANALYSIS OF SID OF WHITE OPAQUE NTR AND GOLDEN OPAQUE NTR PRINTED WITH DRY TONER BASED DIGITAL PRINTING PROCESS

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ABSTRACT

NTR is a white opaque substrate which is actually a polyester film, coated on both sides which are suitable for electro photography printing. Polyester film base provides tear resistance with thermal stability for long term durability. This non tear able paper is more economical and durable as compared to silver halide paper. Most of the conventional printing is carried out on normal paper made up of cellulose fibres. This is first of its kind study where NTR is printed and is tested for SID. This paper will help printers to have a better understanding of SID of NTR when printed with dry toner based digital printing.

I. INTRODUCTION

Paper may be defined as Material manufactured in thin sheets from the pulp of wood or other fibrous substances, used for writing, drawing, or printing on, or as wrapping material. The use of paper and paper board in printing and packaging sector has been accelerated during the last couple of years in order to meet the developing needs of the printing and packaging arena. Synthetic paper is a type of calendared plastic sheet which is a unique mixture of Calcium-carbonate i.e. clay and polypropylene resin. This duo combination results in fabrication of paper with not only printing facility but also durability and tear resistance of plastic. In case of white opaque paper which is fine mat finish single-layered substrate has excellent bonding strength and facilitates superior ink adhesion characteristics Life span of this paper is long because of its synthetic nature and it can handle a lot of stress without tearing. This paper is water resistant and does not degrade in water because it lacks wood fiber. This paper can be folded without any cracking. . It is easily printable without any surface treatment, but this study was carried out by using untreated NTR paper and printing it on Dry toner based Digital Printing Machine.

II. RESEARCH METHODOLOGY

My research objective is to analyze critically the dry toner based digital printability of golden and white opaque NTR (Non-tear able) synthetic paper. Therefore in order to study aforesaid research objective both NTR sheets were printed on Xerox Digital Printing machine and testing task of the printed sheets for SID (solid ink density) was carried out at “Galaxy Offset Pvt. Ltd”.

Method

Prepress- Master was designed with HD images, text, different quality control patches in CorelDraw software.

Press – All sheets are printed with digital printing process.

As my project title is “Critical analysis of printability of synthetic paper while printed with Digital printing (Dry Toner based)”. During my project time I worked on dry toner based digital printing machine. Its technical specifications is as below: -

Digital Printing Machine Xerox® Versant® 2100 Press

Technical Specifications

Productivity/Print Speeds

- Duty Cycle: 660,000
- Average Monthly Print Volume Range: 75,000–250,000

- 100 ppm (8.5" x 11"/A4 letter), 52–300 gsm
- 80 ppm (8.5" x 11"/A4 letter), 301–350 gsm
- 52 ppm (11" x 17"/A3), 52–300 gsm
- 44 ppm (11" x 17"/A3), 301–350 gsm

Image Quality

- 2400 x 2400 dpi VCSEL ROS
- Halftone Screens
 - 150, 175 (EFI only), 200, 300, 600 Clustered Dot
 - 150 (EFI only), 200 Rotated Line Screen
 - FM (Stochastic) Screen

Paper Format/Sizes

- Maximum Sheet Size: 13" x 19.2" (330 mm x 488 mm)
- Minimum Sheet Size: 5.5" x 7.2" (139 mm x 182 mm), tray inserter kit supports 3.9" x 5.8" (98 mm x 148 mm)
- Maximum Print Area: 12.83" x 18.98" (326 mm x 482 mm)
- Maximum Print Image Assurance: 12.48" x 18.98" (317 mm x 482 mm)

III. DATA COLLECTION AND ANALYSIS

The printed sheets were tested and analysed for SID values using a X-Right reflection type spectrophotometer and is represented in tabular form as under.

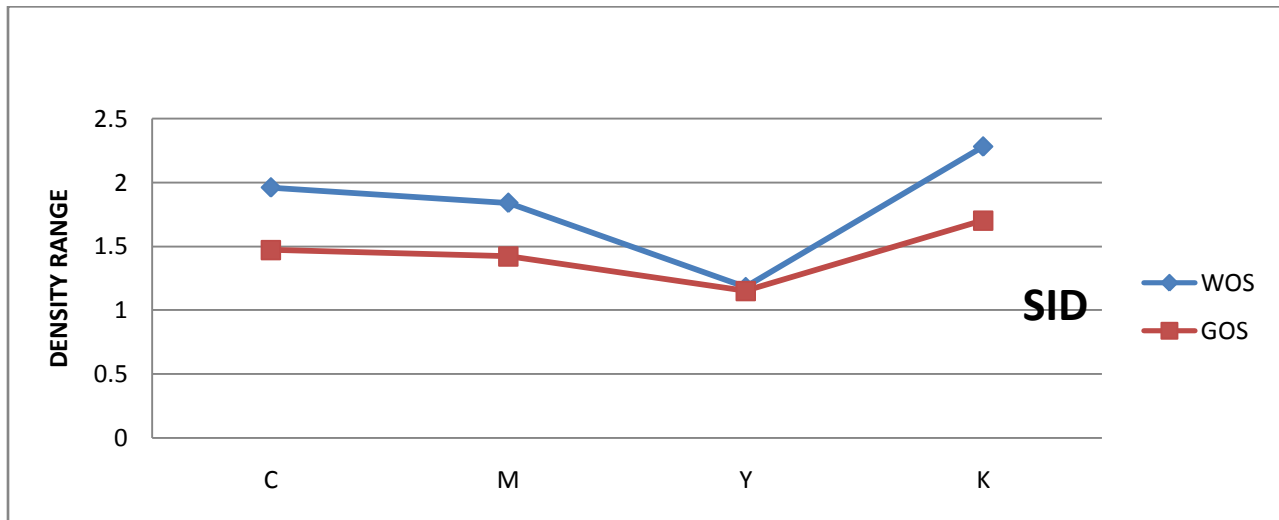
TESTING OF OPTICAL PROPERTIES ON WHITE OPAQUE SHEETS PRINTED WITH DIGITAL PRINTING (DRY TONER BASED)					
SR.NO.	SAMPLE	SOLID INK DENSITY			
		C	M	Y	K
1	SAMPLE 1	1.96	1.84	1.19	2.29
2	SAMPLE 2	1.95	1.83	1.18	2.28
3	SAMPLE 3	1.96	1.84	1.17	2.27
4	SAMPLE 4	1.95	1.86	1.16	2.28
5	SAMPLE 5	1.96	1.85	1.18	2.29
6	SAMPLE 6	1.97	1.84	1.19	2.27
7	SAMPLE 7	1.96	1.85	1.17	2.28
8	SAMPLE 8	1.95	1.86	1.18	2.27
9	SAMPLE 9	1.97	1.85	1.19	2.26
10	SAMPLE 10	1.96	1.87	1.18	2.29
11	SAMPLE 11	1.95	1.85	1.17	2.3
12	SAMPLE 12	1.94	1.84	1.18	2.27
13	SAMPLE 13	1.96	1.83	1.17	2.26
14	SAMPLE 14	1.95	1.85	1.18	2.29
15	SAMPLE 15	1.96	1.83	1.19	2.28
16	SAMPLE 16	1.97	1.84	1.17	2.27

17	SAMPLE 17	1.95	1.83	1.19	2.29
18	SAMPLE 18	1.97	1.85	1.18	2.26
19	SAMPLE 19	1.95	1.84	1.16	2.28
20	SAMPLE 20	1.96	1.83	1.17	2.27
21	SAMPLE 21	1.97	1.83	1.19	2.29
22	SAMPLE 22	1.96	1.86	1.17	2.28
23	SAMPLE 23	1.95	1.85	1.18	2.27
24	SAMPLE 24	1.97	1.84	1.19	2.26
25	SAMPLE 25	1.95	1.85	1.18	2.28
26	SAMPLE 26	1.94	1.86	1.19	2.29
27	SAMPLE 27	1.96	1.84	1.18	2.27
28	SAMPLE 28	1.97	1.83	1.19	2.26
29	SAMPLE 29	1.95	1.84	1.18	2.29
30	SAMPLE 30	1.96	1.83	1.17	2.27
	Average	1.96	1.84	1.18	2.28

TESTING OF OPTICAL PROPERTIES ON GOLDEN OPAQUE SHEETS PRINTED WITH DIGITAL PRINTING (DRY TONER BASED)

SR.NO.	SAMPLE	SOLID INK DENSITY			
		C	M	Y	K
1	SAMPLE 1	1.48	1.4	1.14	1.7
2	SAMPLE 2	1.47	1.42	1.15	1.71
3	SAMPLE 3	1.47	1.41	1.12	1.72
4	SAMPLE 4	1.46	1.43	1.14	1.74
5	SAMPLE 5	1.47	1.44	1.13	1.66
6	SAMPLE 6	1.47	1.42	1.14	1.7
7	SAMPLE 7	1.46	1.43	1.15	1.69
8	SAMPLE 8	1.47	1.41	1.14	1.7
9	SAMPLE 9	1.46	1.43	1.15	1.69
10	SAMPLE 10	1.47	1.41	1.14	1.75
11	SAMPLE 11	1.47	1.42	1.12	1.72
12	SAMPLE 12	1.48	1.43	1.15	1.67
13	SAMPLE 13	1.47	1.4	1.14	1.7
14	SAMPLE 14	1.48	1.42	1.15	1.67
15	SAMPLE 15	1.46	1.43	1.12	1.7
16	SAMPLE 16	1.47	1.41	1.16	1.68
17	SAMPLE 17	1.46	1.42	1.16	1.7
18	SAMPLE 18	1.47	1.43	1.15	1.72
19	SAMPLE 19	1.48	1.44	1.14	1.73

20	SAMPLE 20	1.47	1.43	1.16	1.66
21	SAMPLE 21	1.48	1.4	1.15	1.7
22	SAMPLE 22	1.47	1.43	1.17	1.67
23	SAMPLE 23	1.48	1.41	1.16	1.71
24	SAMPLE 24	1.49	1.42	1.15	1.7
25	SAMPLE 25	1.48	1.41	1.17	1.75
26	SAMPLE 26	1.46	1.42	1.16	1.71
27	SAMPLE 27	1.49	1.4	1.15	1.67
28	SAMPLE 28	1.47	1.43	1.17	1.7
29	SAMPLE 29	1.46	1.42	1.15	1.67
30	SAMPLE 30	1.48	1.41	1.17	1.7
	Average	1.47	1.42	1.15	1.70



IV. CONCLUSIONS

The average SID values of White opaque NTR were found to be 1.96 for Cyan, 1.84 for magenta, 1.18 for yellow & 2.28 for Black and the SID values for Golden opaque NTR were 1.47 for cyan, 1.42 for Magenta, 1.15 for yellow and 1.17 for Black. The SID values of Cyan Magenta & Black colour on White opaque NTR were on the higher side than Golden Opaque NTR. And then SID value of yellow colour on Both White Opaque NTR and Golden Opaque NTR was found nearly same.

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