



Archives available at [journals.mriindia.com](http://journals.mriindia.com)

**International Journal of Recent Advances in Engineering and Technology**

ISSN:2347-2812  
Volume 14 Issue 02,2025

## **A comparative analysis of Solid Ink Density values on Polypropylene (PP), Polyethylene (PE), and Chromo Paper print media utilizing Flexography printing.**

<sup>1</sup>Prashant Kumar Shrivastav, <sup>2</sup>Sanjay Sharma

<sup>1</sup>M.Tech. Scholar, Department of Printing Technology, GJUS&T, Hisar, Haryana, India.

<sup>2</sup>Lecturer kalaniketan polytechnic college, Jabalpur M.P. India.

### **Peer Review Information**

*Submission: 17 Feb 2025  
Revision: 21 March 2025  
Acceptance: 23 April 2025*

### **Keywords**

*Flexography label printing, print quality, solid ink density, Polypropylene, Polyethylene-film Chromo Paper.*

### **Abstract**

The flexography printing method is the newest way to print labels. It makes very high-quality prints on a wide range of surfaces and is very cheap to copy. Flexography printing easily meets the criteria of the current label business, which needs work that is both cheap and of good quality. Flexography label printing needs a lot of study and analysis of print quality criteria to be competitive in the business. This will help improve color reproduction and print quality. The solid ink density parameters for flexography label printing on different print media are the basis of this study.

### **Introduction**

Flexography printing is a type of relief printing that used to be called aniline printing. In flexography printing, the image is carried by plates made of rubber, soft polymer, or photopolymer, which are plates that are responsive to light. The image area on flexography printing plates is raised. With a flexible printing plate and low-viscosity ink, flexography printing can print on a wide range of surfaces, both absorbent and non-absorbent. Polypropylene, or PP, is a cheap thermoplastic that has great tensile strength, clarity, and gloss. Polyethylene is the cheapest and most common plastic used for labeling.

### **Solid Ink Density**

Solid ink density is the measurement of a solid printed patch on paper, including the density of the paper. It has to do with how thick the ink

film is. Density is a way to estimate how much light is reflected off a printed sheet.

### **Research Objective**

Flexography printing is the best way to make labels right now, and it is competing with offset and gravure printing. So, it's very crucial to keep improving. The goal of this study is to compare the print quality characteristics, such as density, on different types of print media that are utilized in flexography label printing.

### **Material And Methodology**

A master test chart for comparing the print quality of SID on print media including polypropylene, polyethylene, and chromo paper has been made with desktop publishing software. These test charts provide everything you need. Flexography has been the printing procedure used to check the printability in a press room with the right amount of light. After

A comparative analysis of Solid Ink Density values on Polypropylene (PP), Polyethylene (PE), and Chromo Paper print media utilizing Flexography printing.

that, all the measurements were made with the x-rite precise spectrophotometer. An inline flexography press printed on all of the selected substrate.

### Data Analysis

All the data that has been needed to do the study task correctly and accurately has been collected, processed, and a conclusion has been drawn. Here is a mention of the graphical

representation of the data that has been collected.

### Solid Ink Density

**A – value of solid ink density (SID) of cyan colour on different print media (PP, PE, Chromo Paper):** Figure 1 shows a visual representation of the solid ink density value on various print mediums. The solid cyan ink density ranges from 1.64 to 1.74, 1.49 to 1.62, and 1.55 to 1.80 on various print medium (pp, pe, and chromo paper), respectively.

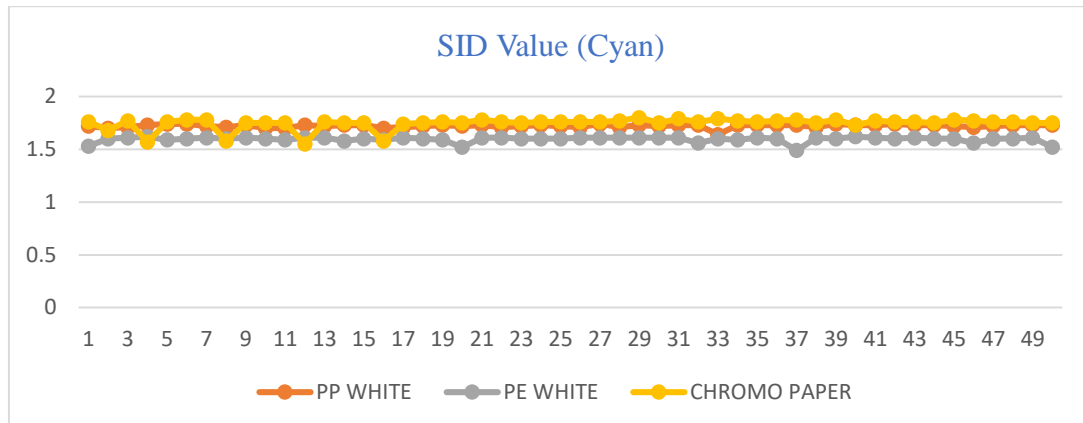


Figure1: solid ink density value of cyan colour on media PP, PE and CHROMO PAPER.

**B – value of solid ink density (SID) of magenta colour on different print media (pp, pe and chromo paper):** Figure 2 shows a visual representation of the solid ink density value for the colour magenta on various print mediums.

On various print media (paper, pp, and pe), the solid ink density of magenta colour ranges from 1.39 to 1.44, 1.43 to 1.54, and 1.47 to 1.56, respectively.

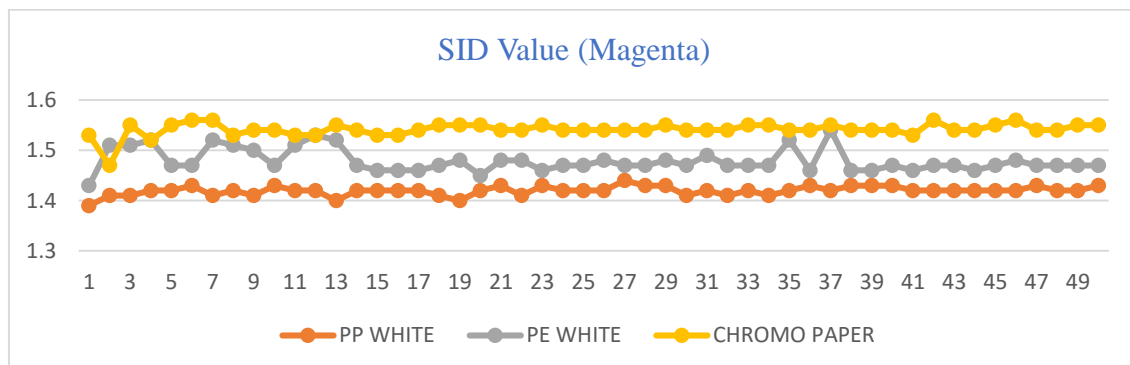


Figure2: solid ink density value of MAGENTA colour on media PP, PE and CHROMO PAPER.

**C – value of solid ink density (SID) of yellow colour on different print media (pp, pe and chromo paper):** Figure 3 shows a visual representation of the solid ink density value for the colour yellow on various print mediums.

Solid yellow ink density ranges between 1.09 and 1.11, 1.06 and 1.14, and 1.08 and 1.20 on various print medium (pp, pe, and chromo paper), respectively.

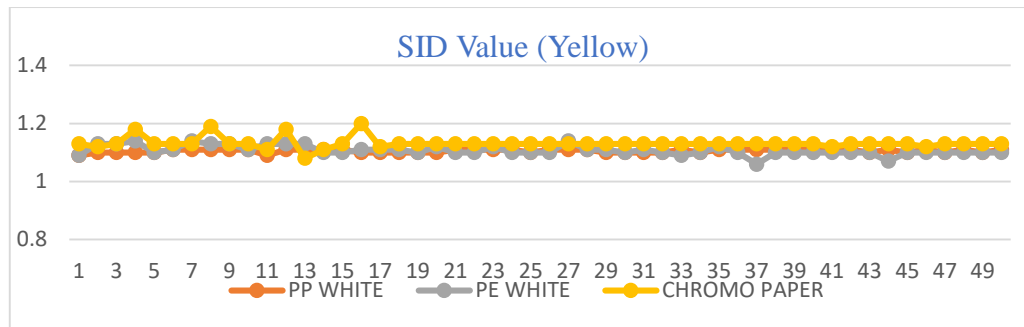


Figure3: solid ink density value of YELLOW colour on media PP, PE and CHROMO PAPER.

**D - value of solid ink density (SID) of black colour on different print media (pp, pe and chromo paper):** Figure 4 shows a visual representation of the solid ink density value of black on various print mediums. The solid black

ink density ranges from 1.46 to 1.56, 1.42 to 1.58, and 1.17 to 1.27 on various print medium (pp, pe, and chromo paper), in that order.

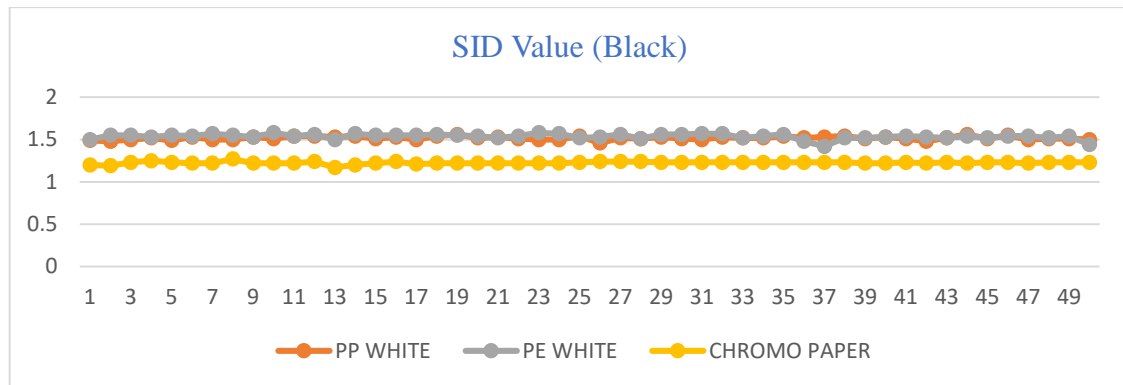


Figure 4: solid ink density value of BLACK colour on media PP, PE and CHROMO PAPER.

### Result And Discussion

During the data collecting and analysis process, it has been observed that the SID value on PP, PE, and

CHROMO PAPER substrates utilising flexographic printing has been repeatedly recurring.

The following tables, which are provided below, summarise these data:

MEDIA	SOLID INK DENSITY							
	CYAN		MAGENTA		YELLOW		BLACK	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
PP	1.49	1.74	1.39	1.44	1.09	1.11	1.46	1.56
PE	1.55	1.62	1.43	1.54	1.06	1.14	1.42	1.58
CP	1.96	1.8	1.47	1.56	1.08	1.2	1.17	1.27

Figure 5: minimum and maximum solid ink density value of BLACK colour on media PP, PE and CHROMO PAPER.

According to the solid ink density print factor, PP and PE substrate work better than chromo paper for cyan, magenta, and yellow colours, and PE and CHROMOPAPER work better for black colours.

### References

Sheth, Gaurav Dinesh, "Extended Colour Gamut for Flexographic Printing" (2013). Masters Theses. 138.  
[https://scholarworks.wmich.edu/masters\\_theses/138](https://scholarworks.wmich.edu/masters_theses/138)

A comparative analysis of Solid Ink Density values on Polypropylene (PP), Polyethylene (PE), and Chromo Paper print media utilizing Flexography printing.

Printing materials: Science and Technology, Bob Thompson (page no 331)

BOLANCA, Stanislav; MAJNARIC, Igor; GOLUBOVIC, Kristijan. Packaging Printing Today. Acta Graphica, [S.l.], v. 26, n. 4, p. 27-33, dec. 2016. ISSN 1848-3828.  
<https://actagraphica.hr/index.php/actagraphica/article/view/26>

Preparation of High Polarity Polypropylene Packaging Films Yabo Fu, Dongli\* Li, Wencai Xu, Hua We - Google Search. (n.d.). Retrieved June 22, 2023.

Bassemir, R. W., & Krishnan, R. (1991). Surface Phenomena in Water based Flexo Inks for Printing on Polyethylene Films. Surface Phenomena and Fine Particles in Water-Based Coatings and Printing Technology, 27–34.

What is polyethylene film? Learn it here | Weber Marking Systems. (n.d.). Retrieved June 22, 2023.

Jangra, Vikas, Abhishek Saini, and Anil Kundu. "Relationship of Solid Ink Density and Dot Gain in Digital Printing." International Journal of Engineering and Technical Research (IJETR) (2014): 2321-0869

Comparative analysis of Solid Ink Density on Conventional and Bio-based plastics using Gravure Process Pankaj Kumar, Prof. Ambrish Pandey, Prof. Rajendrakumar Anayathdoi: 10.48047/ecb/2023.12.si4.1222  
<https://www.eurchembull.com/issue-content/comparative-analysis-of-solid-ink-density-on-conventional-and-bio-based-plastics-using-gravure-process-5311>