



QUALITY COMPARISON OF VARIOUS INLINE COATING FINISHES FOR SHEET-FED OFFSET PRINT PRODUCTION

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ABSTRACT

The aim of this paper is to shed light on the various types of coating finish options available to the printers and to determine the suitability of UV coating for different printing applications. Coating finishes have gained significant popularity as a finishing method that is well-suited for a broad spectrum of substrates and print jobs. The research was conducted at Edelmann Packaging Pvt. Ltd. in Baddi, with data being collected on a daily basis. Printed sheets were meticulously examined after undergoing UV coating to assess the degree of finishing, coating thickness, to identify any defects that may arise during the process and to find out best coating application. The research findings revealed that UV textured coating results in the highest print gloss compared to other coating methods.

KEYWORDS: UV Coating, Gloss coating, Textured Coating, Coating defects, Misting, Picking.

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INTRODUCTION

UV coating is a visually appealing and glossy finish applied to printed materials like business cards, presentation folders, postcards, rack cards, door hangers, and typically, print jobs using heavy-weight cover stock. In the past, UV coating used to be costly, considered an additional expense, and often seen as a status symbol. However, today, many commercial print shops offer UV coating with little or no additional cost, making it the standard method for producing printed materials. In fact, it has become so common that opting out of UV coating might result in longer production times, as the printer may have to wait for enough non-UV-coated jobs to fill a print run. UV coating is available in a wide range of finishes, spanning from glossy to textured appearances. Various advantages of UV Technology for Sheet-fed Offset Printers includes instant ink drying allows for immediate finishing and dispatch of jobs. Sheets can be folded, cut, bound, and processed right away, reducing work-in-progress and significantly shortening lead times.

Print Without Limitations: UV and UV LED inks enable printing on a wide range of stock types, including PE, PET, PU, synthetic paper, etc. It also enhances product diversity with the ability to print on coated and uncoated papers, plastics, and foil-laminated sheets.

UV Coating Machine : (Ultracoat 900 Fast)

Specification of Machine

Machine Name:	ULTRACOAT 900 FST	Electrical power consumption:	39.00 kw
Sheet size max.:	640mm×940mm	Height of feed pile:	1050mm
Sheet size min.:	330mm×406mm	Height of delivery:	1000mm
Max. image area :	630mm×930mm	Diameter of impression cylinder:	280mm
Plate size:	730mm×945mm	Photopolymer plate:	1.7mm
Blanket size:	730mm×945mm	Handle stock range:	80 gsm to 450 gsm
Plate cylinder undercut:	total 2.5 mm		
Weight approximate:	4500 kgs		
Space required:	3035×2728×1965		
Max. cylinder speed:	10000 sph		

It eliminates marking of sheets in the delivery or perfecting process. Machine varnish or sealer is no longer necessary, streamlining the printing process. It eliminates the need for spray powder, reducing contamination and associated cleaning and maintenance efforts.

UV curing retrofits result in sharper dots, contributing to improved print quality. It achieves more vibrant colours, enhancing the overall visual appeal of the finished product.

RESEARCH OBJECTIVES

UV coating is a new trend to enhance print quality in term of texture, gloss and surface finish. UV coating is applied in different amount and the coating suitability depends upon type of job.

Objective of research is:

1. To determine most suitable coating for different kinds of printing jobs.
2. To find out correct amount of UV coating for different printing jobs.
3. To investigate best UV coating for various packaging applications.

RESEARCH METHODOLOGY

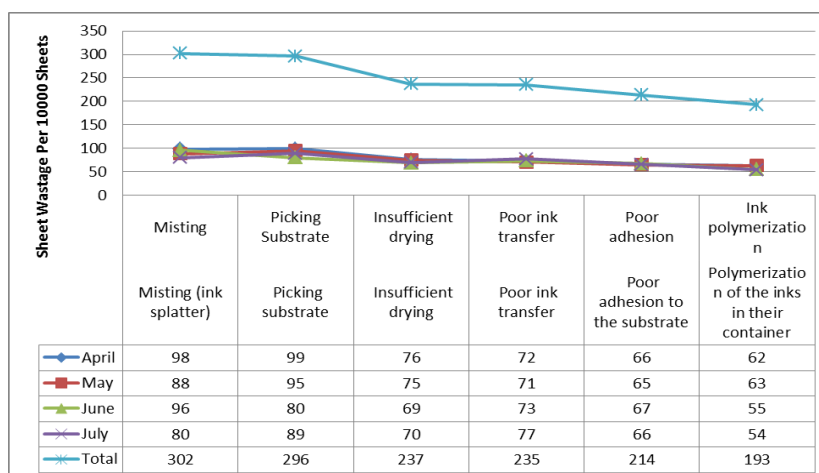
The research work was carried out at Edelmann Packaging Pvt. Ltd. printing organization. The data was collected on day to day basis. The specifications of printing and coating machines are:

DATA COLLECTION & ANALYSIS

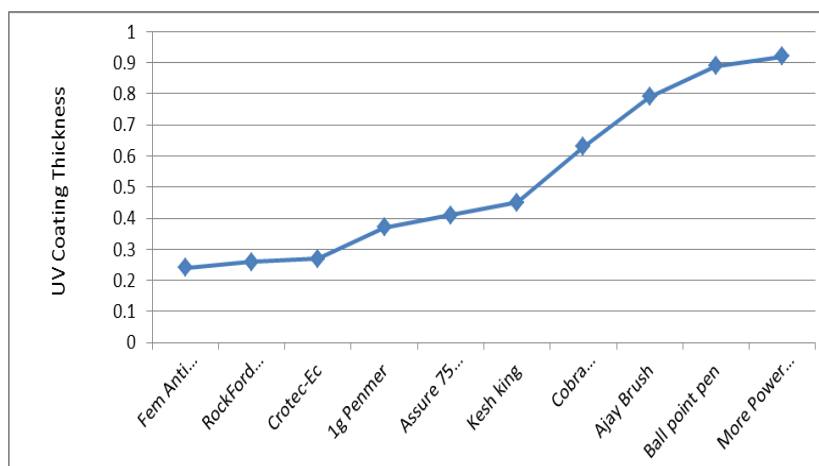
Ten jobs were examined during pressrun and types of UV coating were analysed for coating thickness and degree of finish as follows:

Table.1. Type of coating and coating thickness data of 10 jobs studied

Sr. no.	Job Name	Coating Thickness (mm)	Type of Coating
1	Fem Anti Darkening Hair Removal Cream	0.24	Uv Gloss
2	RockFord Whiskey	0.26	Uv Gloss & Texture
3	Ball Point Pen	0.89	Uv Gloss
4	More Power Ayurvedic Capsules	0.92	Uv Gloss & Texture
5	1g Penmer	0.37	Uv Gloss
6	Cobra perfume	0.63	Texture Coating
7	Brush (Ajay)	0.79	Blister coating
8	Assure 75 GM Soap	0.41	Uv Gloss
9	Crotec-Ec	0.27	Uv Gloss
10	Kesh King	0.45	Uv Gloss & Texture



Graph.1. Sheets wastage arising with various UV coating defects during April-July, 2014



Graph.2. UV Coating thickness (mm) of 10 jobs examined

RESULT AND DISCUSSIONS

UV Coating suitability for Various Jobs

By analyzing Tables 1, it is quite evident that UV gloss, UV textured and UV gloss with textured coatings are most widely used coating in printing and packaging industry. UV gloss coating was used in Gem Anti Darkening Hair Removal Cream and Ball Point pen packing, 1g Penmer, Assure 75 GM Soap and Crotec-Ec. The reason behind using UV gloss coating is that it makes the jobs shiny, reduces rub resistance and makes the sample jobs more visually appealing.

UV textured coating was used in Cobra Perfume. The reason of using this type of coating is to give a textured touch to the package which acts as a value addition tool to enhance package design. UV textured coating is used in jobs where no further gloss is required. The requirement of textured coating is just to enhance the touch of the substrate but without enhancing the gloss of the package.

UV textured with gloss coating was used in Rock Ford Whiskey, More Power Ayurvedic Capsuls and Kesh King. This type of coating results into combined benefit of both gloss and textured

coating which gives excellent shiny look and textured touch to the target audiences.

UV Coating Amount for Various Jobs:

The thickness of textured coating is highest in the case of UV gloss with textured coating, attributed to the use of matte coating prior to textured coating.

UV gloss coating imparts the minimum coating thickness, as observed in the case of Fem Anti Darkening hair removal cream.

It is evident that gloss coating results in the least thickness, while UV textured coating contributes to the maximum coating thickness for packaging.

Most Common Defects during UV Coating:

Misting (ink splatter), picking substrate, insufficient drying, poor ink transfer, poor adhesion to substrates, and polymerization of inks in containers are the most common defects during UV coatings.

Misting and substrate picking are the most frequently occurring defects during UV coating, while ink polymerization and poor adhesion to the substrate are the least frequent.

Overall sheet wastage due to various coating defects was found to be up to 2%.

CONCLUSION

- UV gloss, UV textured, and UV gloss with textured coatings are widely used in the printing and packaging industry.
- UV gloss coating enhances shine, reduces rub resistance, and improves the visual appeal of printed materials.
- UV textured coating is primarily used to enhance the tactile experience of the substrate without increasing gloss.
- UV textured gloss coating combines the benefits of both gloss and textured coatings, providing a shiny look and textured touch.
- The maximum thickness of textured coating is achieved in UV gloss with textured coating.
- Misting and substrate picking are the most common defects during UV coating, while ink polymerization and poor substrate adhesion are less frequent.
- Overall, sheet wastage due to coating defects was observed to be up to 2%.
- MET PET with UV resulted into the drip-off effect which was having the maximum print gloss and hence said to be best UV coating for packaging applications.

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