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**PRODUCTION OF FOIL EFFECT ON METALIZED BOARDS WITH DIGITAL
PRINTING PROCESS**

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ABSTRACT

A study of production of foil effect on metalized boards was done and the measurement of the reflectivity of printed metallic boards was performed. A psychophysical property for this percept was identified as visual brilliance. The visual judgments of a series of printed boards were compared with measurements from various types of specular reflectance instruments. The results showed that gloss linearly follows the appearance of highly reflective specular surfaces. It was observed that the foil effect was highly related to the incorporation of primer coating on to the metalized board normalized. Further, It was, thus, concluded that foiling effect can be produced on a metalized board by printing it with a dry toner based digital printing process without primer coat.

KEYWORDS:Specular reflectance, gloss.

INTRODUCTION

Foil covering of the base to be used can be accomplished by a common glue lamination technique, which utilizes heat, pressure and hot glue to bond foil to the base. Glue lamination is performed by several paper companies. A foil surface can also be created by the process of vacuum metalizing, on machines commonly referred to as vacuum metalizers. Many different types of foil coatings can be selected, depending on the finish desired. In this study, an aluminium based foil is used. Tinted or laser patterned foils also may be used. Both the glue lamination and vacuum metalizing techniques commonly yield foil on one surface of the base.

The present study relates to a method for creating printed images on foil-covered surfaces. The method is particularly useful in the manufacture of high-quality printed matter such as sports figure cards or makeup and perfume packaging. However, it also is applicable to other printed matter, such as playing cards, greeting cards, tags, signs and badges. A novel method of printing an image on a foil-covered surface wherein a portion of the surface is coated with opaque white ink provides a unique high-quality graphic wherein the figures printed on bare foil are more prominently presented in comparison to figures printed on the surfaces covered with opaque white ink.

It is well known in the printing industry that images printed on foil-covered surfaces are prominently presented to the eye, this result is known as "foil effect" it is even more apparent when printed with an image printed on a non-foil covered surface.

Methods for producing foil effect are known. One standard industry practice involves spot lamination of foil to selected areas of paper sheets. Through a separate process and by a different machine, the portion of the desired image to be presented with a foil effect is then printed on the foil as the remaining portion of the image is also printed on the non-foil portion of the board.

In this process, as the foil base portion of the surface is created in a process separate from that which prints the image on the foil and non-foil portions of the surface, problems develop in keeping the respective images from printing on the wrong surfaces. The result of this process commonly is an undesirable soft edge between the images. This problem

is exacerbated when complex designs are printed. As this procedure requires two separate machines and processes, it also is time consuming and expensive.

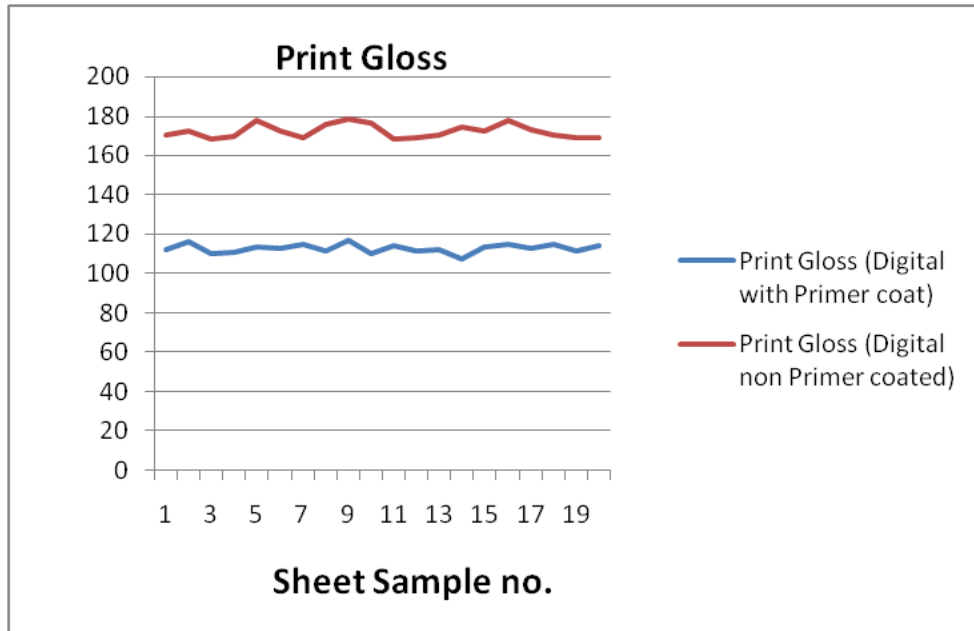
Another practice in the industry to create a "foil effect", particularly on baseball or other popular board, comprises printing a 4-color image on plastic sheets, opposite the side from which the printed image will be viewed. Opaque white ink then is printed over areas where foil is not to be revealed. After the inks are dry, foil is laminated to the printed side of the plastic. Paper of suitable weight, which may be printed on the side which will be the back of the completed card, is laminated to the foil which previously had been laminated to the printed plastic. This procedure is complex, time consuming, and inefficient.

Still another method of producing a "foil effect" comprises coating white paper with foil over all of one surface. The parts of the paper where it is desired to block the foil effect are printed in opaque white ink on a letterpress printing press, familiar to those in the printing arts. When the opaque white ink dries, the sheets are printed via offset printing methods, also familiar to those skilled in the printing arts, in different colors, over both the exposed foil and opaque white inked surfaces.

In this process, the opaque white ink is printed on letterpress equipment, and the colors are added on different, offset equipment. The different colored inks are printed on the same offset equipment, but may be printed at different times. Problems develop in making the opaque white ink and colored ink images line up, or "register" with one another. Further, letterpress printing is slower than offset printing and this process is very slow.

Thus, it has not been known in view of the prior art to utilize digital printing methods to create sharp, high quality, complex, multi-color, foil-effect designs contrasted with non-foil designs or non-foil backgrounds on the same foil-covered surfaces at relatively high speed and low cost.

Primer coated and non primer coated sheets of metalized boards were printed with dry toner based digital printing machine. And the printed sheets were tested and analysed for Print gloss using a gloss meter. The results for both primer coated sheets and non primer coated sheets were compared.



The readings from the gloss meter showed that the non primer coated metalised sheets have an average print gloss of 113% whereas the metalized sheets with primer coat have an average print gloss of 174%.

It was concluded that foiling effect can be produced on a metalized board by printing it with a dry toner based digital printing process without primer coat. Dry toner based Digital printing methods can be utilized to produce sharp, high quality, complex, multi-colour, foil-effect designs in backgrounds on the same foil-covered surfaces at relatively high speed and low cost

REFERENCES

- [1] Method for producing printed images on foil-covered surfaces (US 5333549 A) William Feldman
- [2] Method for producing paper products having increased gloss in which surface characteristics of a release film are imparted to coated substrates (US 5064692 A)
- [3] Leroy C. Hofmann, Robert W. Hicks, Jasper H. Field, Stephen H. Monroe
- [4] Modeling the appearance of metal-like packaging printing Danny C. Rich^{1,*}, Robert Marcus¹, Veronika Lovell¹ and Ted Kreutz²
- [5] Metalized paper or board product and method of preparation. Harry A. Parker, Joseph Greenman
- [6] Exploring the multi-scale structure of printing paper – a review of modern technology. G. Chinga-Carrasco
- [7] Dependence between paper properties and spectral optical response of uncoated paper. Håkan Hägglund, Ole Norberg, Magnus Neuman, and Per Edström