The Correlation of Macro Print Mottle to Surface Topography as Measured by an Optical Surface Topography System

Roy Rosenberger*

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Extended Abstract
A group of coated and uncoated printing grade papers was tested on a new instrument that displays and objectively quantifies the surface topography of paper and board. The numeric ranking from the instrument was then correlated to the quality of the print produced on offset and rotogravure presses using an objective print mottle measurement and, for coated board, with expert evaluators.

Images generated by the topographic instrument are presented for visual comparison of the surfaces studied. This new instrument, can measure, in one action taking less than 30 seconds, the topography in areas as large as 200 mm x 200 mm. In the experiments conducted on coated board the entire area was measured as a unit. In the print trials the instrument software enabled the large imaged area to be sub-divided to measure and report the unprinted surface topography separate from the mottle measurement in the printed areas.

It is demonstrated that the Verity-Topo instrument can emulate the human in visual printing surface evaluation and holds a great potential to objectively predict the quality of print based upon surface topography measurements. The methodology tested and described in this paper is applicable to any surface destined to receive a printed image using a contact printing method and may have application to non-contact print.

Topographic Surface vs. Print Mottle
Shown in Figure 1 are magnified images of two grades of coated 80# Text. The coatings on these sheets differed, one being a matte finish the other best classified as a semi-gloss. The images in Figure 1 are extractions from the larger images used to create the data shown in Table 1 and plotted in Chart 1 in the main body of the work. The Topo numbers shown under the images are for

* Verity IA, 4106 Meadowview Lane, Oshkosh, WI 54904 USA

the small area measured but, as can be observed in the data in the main body of the paper, they can be extrapolated to the larger area.

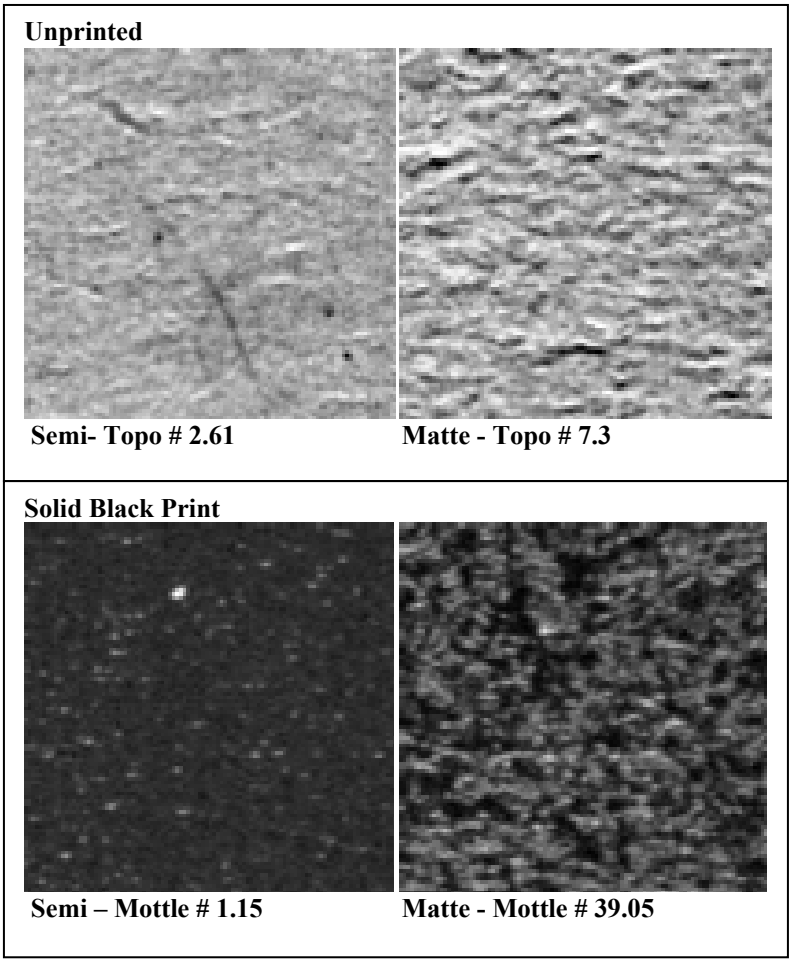

Figure 1: Very small areas of the originals used in the work comparing the topographic measurement of 80# Text, semi & matte finishes, unprinted area of sheet to a solid black print on the same sheet, demonstrating relationship between topographic measurements and visual characteristics.

All images are enhanced to increase detail visibility.
Physical size: 4.2 mm x 4.2 mm: 17.64 sq mm (Normal size used in investigation was between 950 sq mm for the unprinted margin and 3800 sq mm for printed areas.)