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ANALYSIS OF BLACK ELECTROINK SCREENING ELEMENTS AFTER PRETREATMENT THE FINE ART PAPER SUBSTRATE

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Abstract

Coating the substrate as a method of surface finishing is very common in the printing industry. It is used to improve the properties of the final printed paper substrate and also as a pretreatment method before applying the printing ink. Such pretreatment is primarily used to modify the surface tension of a substrate, which primarily aims to achieve higher print quality and better ink adhesion. In this paper, the effect of the HP Indigo WS 6800 print press on the paper substrate was tested with a variation of corona power (0 W, 450 W, and 950 W) and the application of the different thicknesses of primer intended for working with ElectroInk inks (0 g/m^2, 0,5 g/m^2 and 1 g/m^2).
To determine their influence on achromatic reproduction, an image analysis is carried out to determine the diameter of the black halftone elements (Personal PIAS), which could also diagnose the halftone shapes (deformation of the circle of black print dots). Black separation without corona treatment produces the smallest, but also the most deformed halftone elements, while the optimum (highest print dot) is achieved by a corona voltage of 450 W. The most effective black print is achieved by applying a primer of 0,5 g/m^2.

Problem Description

This research will further elucidate the interaction between the paper, the surface tension fluid and the results of the corona treatment, which will provide new recommendations for printing circular printing elements (black separation) on HP Indigo electrophotographic machines.

Methods

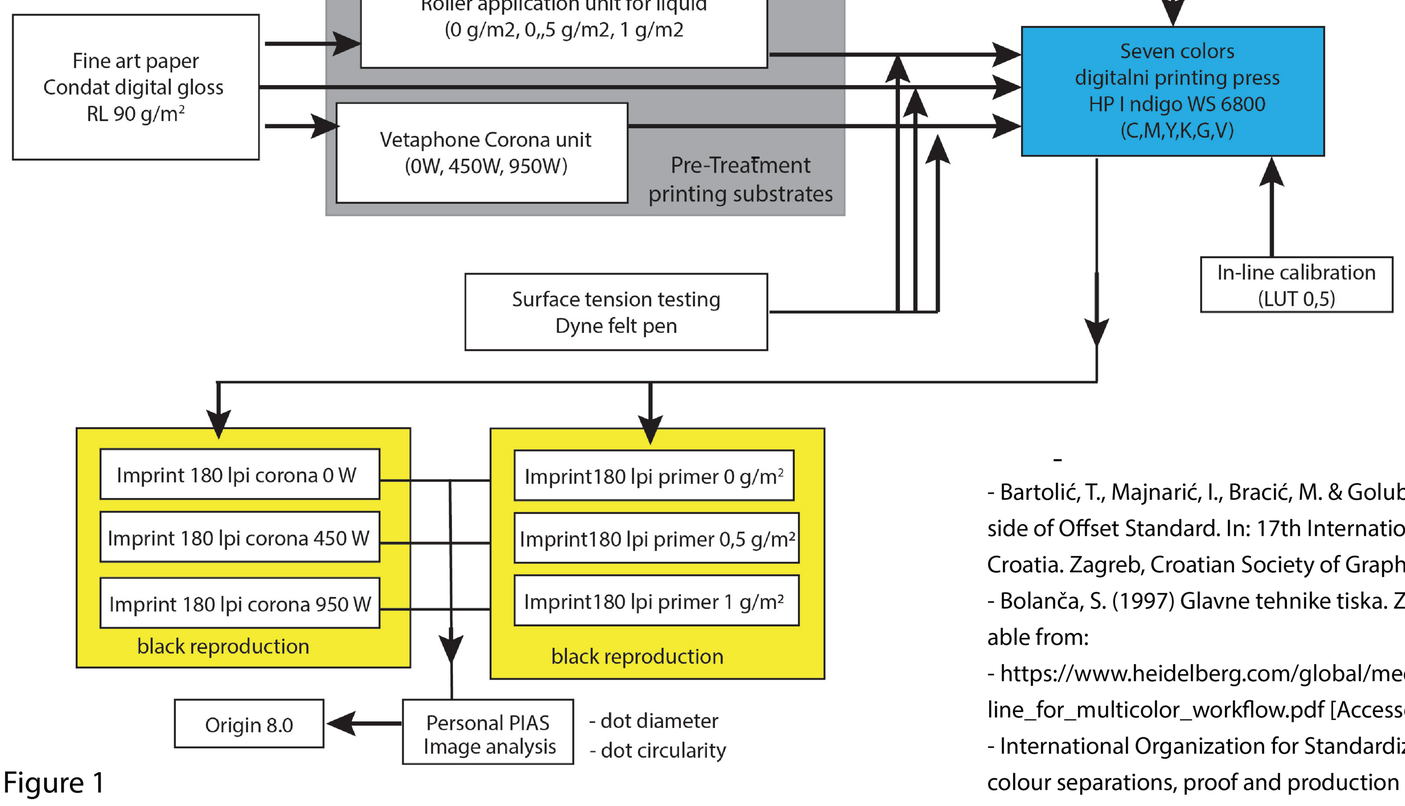
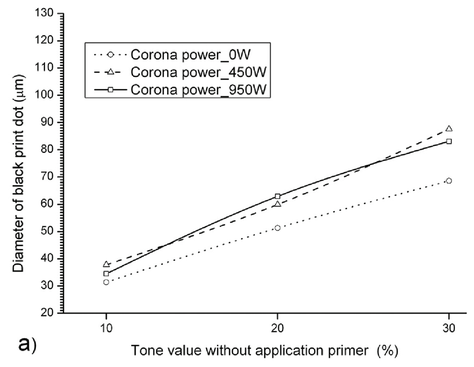


Figure 1

Schematic representation of a chronologically executed experiment

Results / Discussion



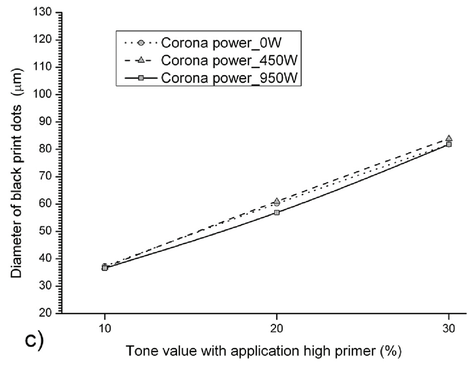
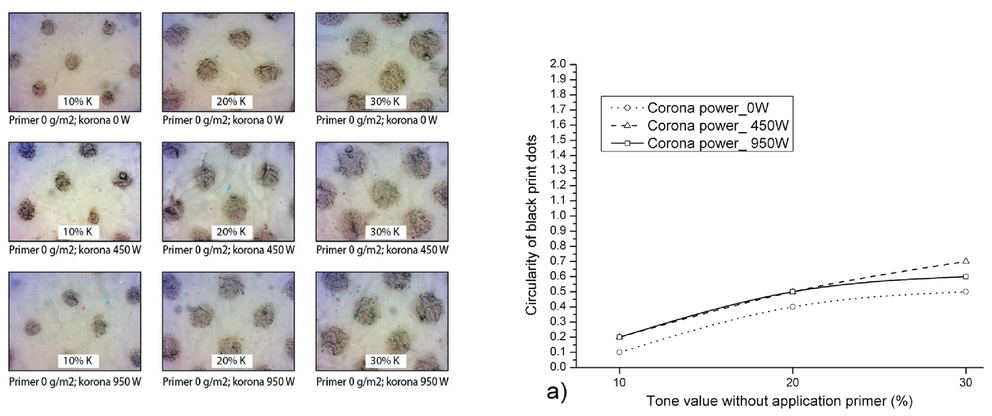


Figure 2 Curves of the dependence of the diameter of halftones on the imprints are obtained byvarying the corona power of 0 W; 450 W and 950 W, and application of the primer in a surface mass of a) 0 g/m2; b) 0,5 g/m2; c) 1 g/m2



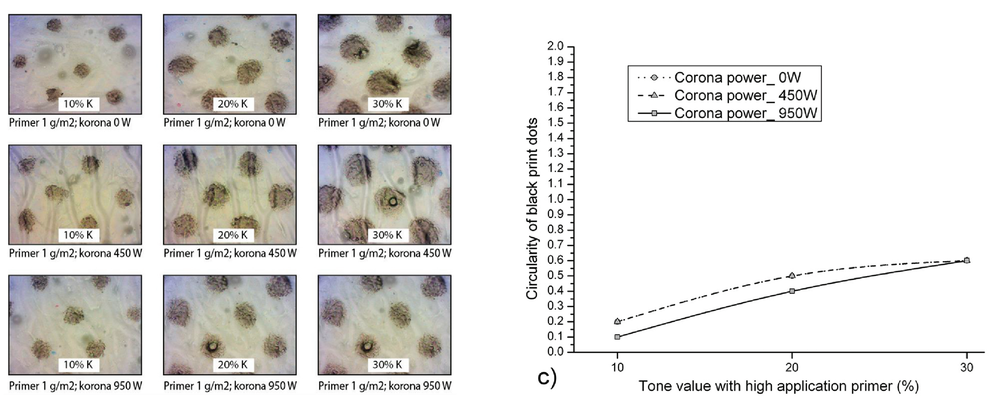


Figure 3 Curves of the dependence of the circularity of the halftones on the imprints are obtained by varying the corona power of 0 W; 450 W and 950 W, and application of the primer in a surface mass of a) 0 g/m2; b) 0,5 g/m2; c) 1 g/m2

Conclusion

The smallest halftones were found in the prints created without use of corona treatment and primer (standard prints). On a standard HP Indigo print, the corona treatment increases the diameter of the halftones. When the corona treatment is activated at 450W, larger halftones are realized in comparison with prints where the corona treatment was activated at 950 W, resulting in more articulated halftone dots.
Applying primer in the amount of 0,5 g/m2 will not cause significant changes in the realized black halftones, and corona treatment will also produce microscopically visible (larger in diameter) halftone deformations. A larger application of primer (1 g/m2) eliminates the action of the corona device.
If the corona device is not activated, black imprints without a primer will achieve the higher regularity of halftone elements (circularity). Using a primer to fine art paper makes halftones more rounded, which is more noticeable in higher tonal values (30% < TV). The optimal shape of the HP Indigo halftones will be obtained with an application of 1 g/m2 primer and activation of the corona power of 950 W.

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