

Rotogravure for Printed Electronics

Alexandra Pekarovicova, Erika Hrehorova, Paul D. Fleming, Marian Rebros, Margaret K. Joyce

Center for Ink and Printability Research, Department of Paper Engineering, Chemical Engineering and Imaging, Western Michigan University, Kalamazoo, MI 49008

a.pekarovicova@wmich.edu; erika.hrehorova@wmich.edu; dan.fleming@wmich.edu;
marian.rebros@wmich.edu; margaret.joyce@wmich.edu;

Abstract

A flexo press unit was modified to print in a gravure offset configuration, direct gravure equipped with metering roll, and in a direct gravure with an enclosed doctor blade mode. Rotogravure test forms were prepared by laser ablation and chemical etching. Different features such as lines, gaps and source and drain electrodes were engraved at different angles to the print direction. Graphic ink and conductive nanosilver and silver flake water based inks were used for printing. Results showed that offset gravure did not produce missing areas/missing dots, however, printed lines had much higher gains than those printed by direct gravure. Direct gravure with metering roll causes premature solvent evaporation resulting in missing areas in fine features printed on paper substrates. Direct gravure printing with an enclosed doctor blade produced the most consistent results.