EFFECT OF SUBSTRATE PROPERTIES ON CONDUCTIVE TRACES PRINTED WITH SILVER-BASED FLEXOGRAPHIC INK

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Summary

Applications for printed electronics are quickly growing, due to the development of new materials and methods to achieve low cost flexible electronics. This has stimulated great interest in various printing technologies. Many materials, mainly extruded polymer films are being used as substrates for the printing of radio frequency identification (RFID) components. To further the advancements in materials processing, paper and board substrates were evaluated for their suitability as the carrier material for supporting printed electronic components. Paper substrates were characterized according to their physical and surface properties to evaluate their effect on the printability and conductivity of silver flake inks. This is the first step in understanding the factors that affect the printing of conductive traces for radio frequency components. Traces printed on paper substrates with silver flake conductive inks had edge raggedness less than 60µm and sheet resistivity as low as 0.35Ω/sq at 2µm ink film thickness. Substrate properties, such as roughness and surface energy, had an influence on print quality, ink film thickness and the sheet resistivity of the printed conductive traces. Substrates with higher roughness and lower surface energy were required to print traces with low sheet resistivity.

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