

Interactions of Solvent Based Inks and Vinyl for Ultrawide Format Graphics

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Abstract

Commercial inkjet printers want to be able to print a wide variety of media from a sizable number of manufacturers. Ink manufacturers need to be able to develop inks that meet printers' demands. The design of a solvent based ink set for ultrawide format printing on synthetic substrates, such as vinyl, requires an understanding of the surface energetics of the substrates and the ability of such inks to wet the surfaces. In this paper, we present a study of the wetting properties of four solvent-based ink formulations on five (or six) commercially available vinyls. We determined the surface energies of the vinyl media, analyzed the polar and dispersive nature of the surfaces, and characterized all four inks on each of the vinyls using both dynamic contact angle (DCA) and actual print measurements. The differences of textured fiber-reinforced versus non-textured vinyls, such as pressure sensitive adhesive-based vinyls will be studied. Print dot size and base width measurements from the DCA are compared to help predict the final print dot size on the various vinyls for each ink as well as to understand the micro- and macro-scale spreading relationships. Other print attributes, such as ink color density and dry times, are related to the overall performance of the inks on the various vinyls.

Biographies

Kevin P. Andrews is a Research and Development Chemist with MetroMedia Technologies, Inc., 1061 Venture Blvd., Wooster, OH 44691. Kevin has been with MMT for seven years, working to characterize inks and coatings used to print super wide format graphics. Kevin received his Ph.D. (1994) in Chemistry and his M.S. in Chemical Physics (1990) from the University of Maryland at College Park. He received his B.A. (1987) in Physics from the College of Wooster.

Nathaniel R. Schwartz is the Business Development Manager for Flint Ink Corporation's Digital Division at the Ann Arbor World Headquarters location. He has over 10 years of ink jet experience. At Flint Ink, he is responsible for new business development for Flint's piezo drop-on-demand ink jet development efforts. He has co-authored several papers and holds 2 U.S. and European patents. He received his B.S. (1990) and M.S. (1998) in Chemical Engineering from the University of Massachusetts Lowell and is an active member of IS&T.

Michael Fein is an Engineer for Flint Ink Corporation's Physical Sciences Laboratory in Ann Arbor, Michigan. He recently received a B.S. (2000) in Chemical Engineering from the University of Michigan.